

# Station Road, Market Bosworth

Air Quality Assessment

Miller Homes

Project number: 60716351

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Quality information

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# 1. Introduction

## Overview

- 1.1 Miller Homes are submitting a planning application to develop the land south of Station Road in Market Bosworth (the site).
- 1.2 The site will include 138 dwellings and an area allocated for future employment uses.
- 1.3 AECOM has been instructed by Miller Homes to complete an air quality impact assessment of the site to support the full planning application for the residential aspects of the site and an outline application for the commercial aspects of the site.

## Site Description

- 1.4 The site currently is predominantly agricultural land. There are commercial units to the north of the site, some of which will be demolished as part of the development.
- 1.5 There are existing commercial units to the west of the site which will remain, a water pumping station to the south-west, agricultural parcels of land to the south and existing residential dwellings to the east.
- 1.6 A new residential development has been recently built to the west of the site (planning reference: 21/00379/FUL) with the heritage railway running along its eastern boundary.
- 1.7 Permission for a new commercial building associated with JJ Churchill at the south west of the site has recently been approved (planning reference: 23/00646/FUL).
- 1.8 The main air pollution source is likely to be traffic on Station Road which runs laterally to the north of the site. No significant air pollution sources (e.g. stacks) have been identified within the commercial units. The heritage railway runs steam locomotives, however based on the distance from the site boundary and the very limited number of trains (a maximum of 40 passes per week in peak season), this has not been identified as a significant air pollution source.
- 1.9 The site location is shown in [Figure 1](#) including the redline boundary.

**Figure 1: Site location**

Source: 2024 TomTom, OpenStreetMap, Vexcel Imaging, 2024 Microsoft

## Proposed Development

- 1.10 The current application relates to 140 dwellings and an area allocated for future employment as shown in [Figure 2](#). There is the possibility in the future for additional dwellings to be constructed to the east of the current site boundary. As a precautionary approach, the 2029 traffic data used in this air quality assessment included traffic associated with this possible additional phase.

**Figure 2: Site layout**



Source: Nineteen47 Chartered Town Planners and Urban Designers, on behalf of Miller Homes

## 2. Legislation and Planning Policy

### Overview

- 2.1 This section identifies and describes the relevant legislation, policy and guidance to be followed when assessing the air quality effects of the Proposed Development.

### National Air Quality Legislation

- 2.2 The principal air quality legislation within the United Kingdom is the Air Quality Standards Regulations (as amended 2016) (Ref 1), including amendments, such as 'The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020' (Ref 2).
- 2.3 The UK is no longer a member of the European Union, however, some types of EU legislation such as Regulations and Decisions, are directly applicable as law in an EU Member State. This meant that, as a Member State, these types of legislation applied automatically in the UK, under section 2(1) of the European Communities Act 1972 (c.68), without any further action required by the UK. These types of legislation are published by the Publications Office of the European Union on the EUR-Lex website and are now published on legislation.gov.uk as 'legislation originating from the EU'.
- 2.4 Other types of EU legislation, such as Directives, are indirectly applicable, which means they require a Member State to make domestic implementing legislation before becoming law in that State. Legislation as it applied to the UK on 31<sup>st</sup> December 2020 is now a part of UK domestic legislation, under the control of the UK's Parliaments and Assemblies. The Clean Air for Europe (CAFE) programme (Ref 3) revisited the management of Air Quality within the EU and replaced much of the existing air quality legislation with a single legal act, Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe (Ref 4). This Directive repealed and replaced the EU Framework Directive 96/62/EC on Ambient Air Quality Assessment and Management and its associated Daughter Directives 1999/30/EC (Ref 5), 2000/69/EC (Ref 6), 2002/3/EC (Ref 7) (relating to limit values for ambient air pollutants) and the Council Decision 97/101/EC (Ref 8) which established a reciprocal exchange of information and data within Member States.
- 2.5 The UK National Air Quality Strategy (Ref 9) (AQS) was initially published in 2000, under the requirements of the Environment Act 1995 (Ref 10), as amended by the Environment Act 2021 (Ref 11). The 2007 version of the AQS (Ref 12) set objectives for key pollutants as a tool to help local authorities manage local air quality improvements, with the aim of avoiding, preventing or reducing harmful effects on human health and on the environment as a whole.

### National Clean Air Strategy (2019)

- 2.6 In 2019, the UK government released its Clean Air Strategy 2019 (Ref 13), part of its 25 Year Environment Plan. The Strategy places greater emphasis on improving air quality in the UK than has been seen before and outlines how it aims to achieve this (including the development of new enabling legislation).
- 2.7 Air quality management focus in recent years has primarily related to one pollutant, NO<sub>2</sub>, and its principal source in the UK, road traffic. However, the 2019 Strategy broadened the focus to other areas, including domestic emissions from wood burning stoves and from agriculture.

### A Green Future: 25 Year Plan to Improve the Environment

- 2.8 The 25 Year Environment Plan, originally published in January 2018, sets out the actions the UK Government will take to help the natural world regain and retain good health (Ref 14). The Environment Plan was updated in 2023 with the publication of the Environmental Improvement Plan 2023, which includes targets specifically for England (Ref 15). The plan outlines several actions that are being taken to improve air quality, most notably the publication of the Clean Air Strategy (Ref 13) and the introduction of several Clean Air Zones (CAZs) across England. Emphasis is also placed on PM<sub>2.5</sub> concentrations, with several new targets for PM<sub>2.5</sub> concentrations stated within the plan including:

*"A legal target to reduce population exposure to PM<sub>2.5</sub> by 35% in 2040 compared to 2018 levels, with a new interim target to reduce by 22% by the end of January 2028. A legal target to require a maximum annual mean concentration of 10 micrograms of PM<sub>2.5</sub> per cubic metre (µg/m<sup>3</sup>) by 2040, with a new interim target of 12 µg/m<sup>3</sup> by the end of January 2028."*

## Environment Act (2021)

- 2.9 The Environment Act 2021 (Ref 11) was approved on 9<sup>th</sup> November 2021, after being first introduced to Parliament in January 2020 to address environmental protection and the delivery of the Government's 25-year Environment Plan following Brexit. It includes provisions to establish a post-Brexit set of statutory environmental principles and ensure environmental governance through an environmental watchdog, the Office for Environmental Protection (OEP). Part IV of the Environment Act (2021) requires the Government to update the AQS which contains standards, objectives and measures for improving ambient air quality. Details regarding the AQS and recent updates are provided below.
- 2.10 The Environment Act (2021) proposes that the Secretary of State will publish a report reviewing the AQS every five years (as a minimum and with yearly updates to Parliament), in the form of the Environmental Improvement Plan (Ref 15).

## UK Air Quality Strategy

- 2.11 The most recent AQS was published in April 2023 (Ref 16). It sets out the actions the government expects local authorities to take in support of achieving the new national PM<sub>2.5</sub> targets, by reducing emissions from sources within their control.
- 2.12 The Air Quality Objectives set out in the AQS (Ref 12, Ref 16) have been outlined in legislation solely for the purposes of local air quality management. Under the local air quality management (LAQM) regime, the local authority has a duty to carry out regular assessments of air quality against the objectives and if it is unlikely that they will be met in the given timescale, they must designate an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) with the aim of achieving the objectives. The boundary of an AQMA is set by the governing local authority to define the geographical area that is to be subject to the management measures to be set out in a subsequent action plan. Consequently, it is not unusual for the boundary of an AQMA to include within it, relevant locations where air quality is not at risk of exceeding an Air Quality Objective. The UK's national Air Quality Objectives for the pollutants of relevance to this assessment are displayed in Table 1, including the new national targets for PM<sub>2.5</sub> concentrations stated within the Environment Act 2021 (Ref 11), the Environmental Improvement Plan 2023 (Ref 15) and the Air Quality Strategy 2023 (Ref 16)

**Table 1: UK AQS Objectives**

| Pollutant                                    | Averaging Period                    | Value                             | Maximum Permitted Exceedances / Target   |
|----------------------------------------------|-------------------------------------|-----------------------------------|------------------------------------------|
| Nitrogen Dioxide (NO <sub>2</sub> )          | Annual Mean                         | 40 µg/m <sup>3</sup>              | None                                     |
|                                              | Hourly Mean                         | 200 µg/m <sup>3</sup>             | 18 times per year                        |
| Particulate Matter (PM <sub>10</sub> )       | Annual Mean                         | 40 µg/m <sup>3</sup>              | None                                     |
|                                              | 24-Hour Mean                        | 50 µg/m <sup>3</sup>              | 35 times per year                        |
| Fine Particulate Matter (PM <sub>2.5</sub> ) | Annual Mean                         | <sup>a</sup> 20 µg/m <sup>3</sup> | None                                     |
|                                              |                                     | <sup>b</sup> 10 µg/m <sup>3</sup> | By 2040                                  |
|                                              |                                     | <sup>c</sup> 12 µg/m <sup>3</sup> | Interim target, (by end of January 2028) |
|                                              | Exposure reduction compared to 2018 | <sup>b</sup> 35%                  | By 2040                                  |
|                                              |                                     | <sup>c</sup> 22%                  | Interim target, (by end of January 2028) |
|                                              |                                     |                                   |                                          |

<sup>a</sup> Air Quality Strategy 2007 (Ref 12)

<sup>b</sup> The Environment Act 2021 (Ref 11)

<sup>c</sup> Environmental Improvement Plan 2023 (Ref 15), Air Quality Strategy 2023 (Ref 16).

- 2.13 Table 2 summarises the advice provided in Defra's local air quality management technical guidance (LAQM.TG22) (Ref 17) on where the Air Quality Objectives for pollutants considered within this report apply.

**Table 2: Examples of Where the Air Quality Objectives Apply**

| <b>Averaging Period</b> | <b>Objectives Should Apply At</b>                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Objectives Should Not Apply At</b>                                                                                                                                                                                                                                                                                                                        |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Annual mean             | All locations where members of the public might be regularly exposed.<br>Building façades of residential properties, schools, hospitals, care homes etc.                                                                                                                                                                                                                                                                                | Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence<br>Gardens of residential properties<br>Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term. |
| 24-hour mean            | All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties.                                                                                                                                                                                                                                                                                                                     | Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.                                                                                                                                                                                                                   |
| 1-hour mean             | All locations where the annual mean and 24-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer. | Kerbside sites where the public would not be expected to have regular access.                                                                                                                                                                                                                                                                                |

## Dust

- 2.14 The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations (2010) and subsequent amendments, such as construction sites, is that provided in Section 79 of Part III of the Environmental Protection Act (Ref 11). The Act defines nuisance as:

*"any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance."*

- 2.15 Enforcement of the Act, in regard to nuisance, is currently under the administration of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (Ref 11). Enforcement can insist that there be no dust beyond the boundary of the works. The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practice measures.

## National Planning Policy

### National Planning Policy Framework (December 2023)

- 2.16 The National Planning Policy Framework (NPPF) (Ref 18) sets out the Government's environmental, economic and social planning policies for England and how these are expected to be applied. The revised Framework replaces the previous National Planning Policy Framework published in March 2012, revised in July 2018, updated in February 2019, revised in July 2021 and updated in September 2023 and December 2023.
- 2.17 Paragraphs 180, 191, 192, and 194 of the NPPF provide advice on when air quality should be a material consideration in development management decisions. In particular, paragraph 192 states that:

*"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."*

### Planning Practice Guidance (2023)

- 2.18 The Planning Practice Guidance (PPG) was launched in March 2014 and was updated on 1st November 2019 (Ref 19) with specific reference to air quality. The PPG states that the planning system should consider the potential effect of new developments on air quality where relevant limits have been exceeded or are near the limit. Concerns also arise where the development is likely to adversely affect the implementation of air quality strategies and action plans. In addition, air quality may also be considered to be material if the Proposed Development would be particularly sensitive to poor air quality in its vicinity. The PPG states:

*"Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity."*

## Local Planning Policy

- 2.19 The Hinckley and Bosworth Local Plan (Ref 20) was adopted in 2009. There is no specific policy with respect to air quality, however Policy 20 "Green Infrastructure" references air quality as follows:

*“The implementation of the Green Infrastructure Network as outlined on the Key Diagram is a key priority of the council.*

*To assist delivery of this plan, the following strategic interventions will be supported:*

*...Hinckley Town Centre - Mitigate against the urban ‘heat island’ effect by increasing the number of street trees to provide shade, cooling and air quality improvements,”*

- 2.20 Hinckley and Bosworth Borough Council currently do not have any declared AQMAs and so the proposed development is not located within an AQMA.

## Air Quality Guidance

### Air Quality Guidance for Development

- 2.21 Guidance jointly issued by Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) (Ref 21) sets out principles of scoping and conducting air quality assessments, and how the significance of the effects arising from air quality impacts may be determined, using an impact matrix. This approach has been used for classifying the magnitude and significance of air quality impacts from the operational phase of the Proposed Development.
- 2.22 The IAQM has also issued guidance on the assessment of dust from construction activities (Ref 22) which has informed the construction dust assessment of the Proposed Development.

### Local Air Quality Management Technical Guidance

- 2.23 The Department for Environment, Food and Rural Affairs (Defra) provides and maintains guidance and tools to support local authorities in carrying out their duties under the Environment Act 1995 and subsequent regulations. In order to provide consistency with the Council's own work on air quality, the guiding principles for air quality assessments, as set out in the latest guidance and tools provided in LAQM.TG(22) (Ref 17) have been followed in this assessment.

## 3. Baseline Conditions

- 3.1 For this assessment, the baseline year of 2023 has been selected. This is the most recent year with meteorological data and nearby air quality monitoring data available.

### Local Air Quality Management

- 3.2 The Proposed Development is located within Hinckley and Bosworth Borough Council (HBBC), which has local air quality management review and assessment responsibilities for the area.
- 3.3 Local authorities publish an annual review of matters pertaining to air quality in a Defra reviewed standardised document called an Annual Status Report (ASR), the most recent of which was published in 2024 (Ref 23).

### Local Air Quality Monitoring

- 3.4 In the 2024 ASR, HBBC did not undertake any automatic monitoring of NO<sub>2</sub> and PM<sub>10</sub>.
- 3.5 HBBC undertook non-automatic (diffusion tube) monitoring of NO<sub>2</sub> at 16 sites in 2023. There was no exceedance of the annual mean air quality objective for NO<sub>2</sub> in 2023 - the highest recorded concentration, at DT10/12/14 was 26.1 µg/m<sup>3</sup>, which is well below the objective. None of the diffusion tubes are located in the vicinity of the proposed development site; the nearest is over 8.4 km away.
- 3.6 Due to the large distances between the proposed development site and the local authority monitoring sites, this monitoring cannot be considered to be representative of the proposed development site. Pollutant concentrations in the vicinity of the proposed development site are anticipated to be low.

### Background Concentrations

- 3.7 A large number of small sources of air pollutants exist, which individually may not be significant, but collectively, over a large area, need to be considered in the modelling process. Pollutant emissions from these sources contribute to background air quality, which when added to modelled emissions allow estimates of total ambient pollutant concentrations to be made.
- 3.8 The Department for Environment, Food and Rural Affairs (Defra) has produced maps of background pollutant concentrations covering the whole of the UK (Ref 24) for use by local authorities and consultants in the completion of LAQM reports and Air Quality Assessments where local background monitoring is unavailable or inappropriate for use. The maps provide background pollutant concentrations for each 1-km grid square within the UK for all years between 2019 and 2030.
- 3.9 The Proposed Development site is located within the grid square 439500, 303500 and 439500, 302500. The background concentrations for this grid square from the Defra mapped values in 2023 and the Proposed Development opening year 2029 are given in Table 5. The background concentrations are well below the relevant annual mean objective values.
- 3.10 Defra provides a tool that allows particular background sources to be removed from the background concentrations (Ref 25), when those sources form part of the modelled contribution, to avoid double counting. The values presented in Table 5 have had modelled sources removed (in-square motorway, primary A road, and trunk A-road contributions).

**Table 3: Defra Mapped Background Pollutant Concentrations at the Proposed Development Site in 2023 and 2029**

| Pollutant         | Annual Mean Concentration (µg/m <sup>3</sup> ) |      |
|-------------------|------------------------------------------------|------|
|                   | 2023                                           | 2029 |
| NO <sub>2</sub>   | 7.5                                            | 6.6  |
| PM <sub>10</sub>  | 12.6                                           | 12.2 |
| PM <sub>2.5</sub> | 7.6                                            | 7.3  |

## Baseline Roadside Concentrations

3.11 Roadside concentrations may be substantially raised above background levels. Baseline roadside concentrations at representative receptors (see Table 7 in Section 4) were modelled according to the methodology described in Section 4 and results are presented in Table 4 below.

**Table 4: Predicted Baseline Pollutant Concentrations**

| Receptor ID | Annual Mean NO <sub>2</sub><br>Concentration (µg/m <sup>3</sup> ) | Annual Mean PM <sub>10</sub><br>Concentration (µg/m <sup>3</sup> ) | Days exceeding<br>the PM <sub>10</sub> 24-hour<br>objective | Annual Mean PM <sub>2.5</sub><br>Concentration (µg/m <sup>3</sup> ) |
|-------------|-------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------|
| R01         | 12.2                                                              | 13.2                                                               | 0                                                           | 8.0                                                                 |
| R02         | 11.4                                                              | 13.0                                                               | 0                                                           | 7.8                                                                 |
| R03         | 11.2                                                              | 13.7                                                               | 0                                                           | 7.9                                                                 |
| R04         | 10.8                                                              | 12.8                                                               | 0                                                           | 7.7                                                                 |
| R05         | 12.8                                                              | 12.9                                                               | 0                                                           | 8.0                                                                 |
| R06         | 18.2                                                              | 14.5                                                               | 0                                                           | 8.9                                                                 |
| R07         | 11.0                                                              | 12.9                                                               | 0                                                           | 7.8                                                                 |
| R08         | 11.7                                                              | 12.5                                                               | 0                                                           | 7.8                                                                 |
| R09         | 12.6                                                              | 12.8                                                               | 0                                                           | 8.0                                                                 |
| R10         | 12.8                                                              | 12.8                                                               | 0                                                           | 8.0                                                                 |
| R11         | 11.6                                                              | 12.5                                                               | 0                                                           | 7.8                                                                 |
| R12         | 11.2                                                              | 12.4                                                               | 0                                                           | 7.8                                                                 |
| R13         | 11.7                                                              | 13.1                                                               | 0                                                           | 7.9                                                                 |
| R14         | 13.0                                                              | 13.4                                                               | 0                                                           | 8.1                                                                 |
| R15         | 16.3                                                              | 13.9                                                               | 0                                                           | 8.6                                                                 |
| R16         | 11.8                                                              | 12.6                                                               | 0                                                           | 7.9                                                                 |
| R17         | 11.0                                                              | 12.3                                                               | 0                                                           | 7.7                                                                 |
| R18         | 12.2                                                              | 12.7                                                               | 0                                                           | 7.9                                                                 |
| R19         | 12.1                                                              | 12.6                                                               | 0                                                           | 7.9                                                                 |
| R20         | 12.6                                                              | 12.7                                                               | 0                                                           | 8.0                                                                 |
| R21         | 17.8                                                              | 14.7                                                               | 0                                                           | 8.7                                                                 |
| R22         | 14.0                                                              | 14.1                                                               | 0                                                           | 8.4                                                                 |
| R23         | 15.4                                                              | 13.6                                                               | 0                                                           | 8.4                                                                 |
| R24         | 13.1                                                              | 13.0                                                               | 0                                                           | 8.1                                                                 |
| R25         | 12.1                                                              | 13.2                                                               | 0                                                           | 7.9                                                                 |
| R26         | 14.2                                                              | 13.5                                                               | 0                                                           | 8.1                                                                 |
| R27         | 11.2                                                              | 13.0                                                               | 0                                                           | 7.8                                                                 |

3.12 Although roadside concentrations are higher than background levels, in all cases they are predicted to be well below the relevant objectives.

## 4. Assessment Methodology

### Scope of the Assessment

- 4.1 AECOM liaised with Hinckley and Bosworth Borough Council (HBBC) regarding the assessment methodologies. The Environmental Health Officer (EHO) confirmed that the proposed assessment methodologies used in this report are acceptable, including the assessment of PM<sub>2.5</sub>.
- 4.2 The EHO confirmed that there are no recent/relevant odour complaints relating to the existing industrial units in the vicinity.
- 4.3 The scope of the air quality assessment includes:
  - Review of local and national planning policy of relevance to the Proposed Development.
  - Review of baseline air quality.
  - A qualitative assessment of construction phase dust emissions impacts in line with industry standard guidance.
  - Quantitative detailed dispersion modelling of road traffic emissions contributions to pollutant concentrations in an existing baseline, future baseline and future operational scenarios.
  - Identification of required levels of mitigation.

### Construction Phase Air Quality

#### Dust Risk Assessment

- 4.4 Construction activities during the construction phase of the Proposed Development have the potential to generate dust and finer particulate (PM<sub>10</sub>) emissions that could impact sensitive receptors located close to the construction site boundary and public roads used by construction traffic. A qualitative assessment has been undertaken to consider these impacts, in line with guidance published by the Institute of Air Quality Management (IAQM) (Ref 22). Any impacts would be temporary, i.e. during the period of the construction works only.
- 4.5 According to the IAQM, the main air quality impacts that may arise during demolition and construction activities are:
  - Dust deposition, resulting in the soiling of surfaces.
  - Visible dust plumes, which are evidence of dust emissions.
  - Elevated PM<sub>10</sub> concentrations resultant of dust generating activities on site.
  - An increase in concentration of airborne particles and NO<sub>2</sub> due to exhaust emissions from diesel powered vehicles and equipment on site (non-road mobile machinery) and vehicles accessing the Site.
- 4.6 Activities on construction sites are classified into four types to reflect their different potential impacts:
  - Demolition.
  - Earthworks.
  - Construction (erection of buildings and structures).
  - Track-out (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 local road network).
- 4.7 The following steps, as defined by the IAQM, were followed as part of the construction dust assessment:
  - Step 1: Screen the need for a more detailed assessment. Human and ecological receptors were identified and the distance to the Site and construction routes were determined.

- Step 2: assess the risk of dust impacts. This is done separately for each of the four activities (demolition; earthworks; construction; and track-out) and takes account of: the scale and nature of the works, which determines the potential dust emission magnitude (Step 2A); and the sensitivity of the area (Step 2B).
- Step 2C: Risk of dust impacts described in terms of there being a low, medium or high risk of dust impacts for each of the four separate potential activities. Where there are low, medium or high risks of an impact, then site-specific mitigation will be required, proportionate to the level of risk.
- Step 3: Determine the project-specific mitigation for each of the four potential activities. Based on the risk of impacts occurring, site specific mitigation measures were determined.
- Step 4: Examine the residual effects and determine whether or not these are significant for each activity.

4.8 Full details of the construction dust assessment methodology are set out in Appendix C.

4.9 For amenity effects from coarser dust ( $>PM_{10}$ ), the aim of the IAQM guidance method is to bring forward a scheme, including mitigation measures where necessary, that would control impacts so that they give rise to negligible or minor effects (at worst) at the closest sensitive receptors. Measures that reduce dust emissions will also reduce emissions of finer particles ( $PM_{10}$ ). Determination of whether an effect is likely to be significant or not is based on professional judgement (based on experience of similar projects), taking account of whether effects are permanent or temporary, direct or indirect, constant or intermittent and whether any secondary effects are caused (in this instance, 'secondary effects' refers to dust that is generated and deposited (primary impact) and then re-suspended and deposited again by further activity).

4.10 The classification of dust soiling (amenity) and health effects on receptors exposed to impacts has been assessed using the relationship between the magnitude of impact identified, in combination with receptor sensitivity and other related factors where appropriate (as described in the IAQM guidance (Ref 22), which results in a classification of effects as defined in [Table 5](#).

**Table 5: Definition of Significance of Fugitive Dust and  $PM_{10}$  Effects**

| Effect     | Change in Dust Deposition Rate and Short-term $PM_{10}$ Concentrations                                                                                                                                                                                                                                                                                                                                                                                                   | Significance                                                                                                                                                             |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Major      | Impact is likely to be intolerable for any more than a very brief period of time and is very likely to cause complaints from local people.<br>Increase in $PM_{10}$ concentrations at a location where concentrations are already elevated and to the extent that the short term $PM_{10}$ air quality objective is likely to be exceeded.<br>Deposition impact likely to harm habitat within a designated nature conservation area of international importance.         | A significant effect that is likely to be a material consideration in its own right.                                                                                     |
| Moderate   | Impact is likely to cause annoyance and might cause complaints but may be tolerated if short-term and prior warning and explanation has been given.<br>Increase in $PM_{10}$ concentrations at a location where concentrations are already elevated and to the extent that the short term $PM_{10}$ air quality objective is at risk of being exceeded.<br>Deposition impact likely to harm habitat within a designated nature conservation area of national importance. | A significant effect that may be a material consideration in combination with other significant effects but is unlikely to be a material consideration in its own right. |
| Minor      | Impact may be perceptible, but of a magnitude or frequency that is unlikely to cause annoyance to a reasonable person or to cause complaints. Limited increase in $PM_{10}$ concentrations.<br>Deposition impact likely to harm habitat within a designated nature conservation area of local importance.                                                                                                                                                                | An effect that is not significant but that may be of local concern.                                                                                                      |
| Negligible | Impact is unlikely to be noticed by and/or have an effect on sensitive receptors. Negligible increase in $PM_{10}$ concentrations and deposition.                                                                                                                                                                                                                                                                                                                        | An effect that is not significant.                                                                                                                                       |

## Construction Phase Vehicle Emissions

4.11 IAQM guidance (Ref 22) indicates that emissions from non-road mobile machinery (NRMM) and construction vehicles may result in air quality impacts. However, it goes on to state that NRMM are unlikely to make a significant impact. Emissions associated with construction phase vehicle movements are temporary and will only last for the duration of the construction work. Given the size of works, it is considered unlikely that construction vehicle movements will be above the relevant screening criteria (see

[Table 6](#)) and it is therefore considered unlikely that they will result in significant impacts. Therefore, emissions from NRMM and construction phase vehicle movements have been scoped out of further assessment.

# Operational Phase Air Quality

## Vehicle Traffic and Emissions Data

- 4.12 Road traffic emissions are those associated with vehicle movements on the public road network resulting from the Proposed Development.
- 4.13 Traffic data has been supplied by the Proposed Development transport consultant. A summary of the traffic data used to inform the air quality assessment is provided in Appendix B. The traffic data provided included:
- 24-hour Annual Average Daily Traffic (AADT) flows; and
  - Percentage of Heavy Duty Vehicles (HDVs, vehicles with a weight of 3.5 tonnes or more).
- 4.14 Traffic speed data used to inform the dispersion modelling was based on local speed limits.
- 4.15 These data were provided for the following scenarios:
- Baseline scenario (2023);
  - Future baseline scenario (2029); and
  - Future with Proposed Development scenario (2029).
- 4.16 EPUK/IAQM guidance (Ref 21) sets out specific criteria to determine whether the Proposed Development warrants a quantitative air quality assessment. The relevant criteria to this assessment are summarised in [Table 6](#).

**Table 6: IAQM/EPUK relevant criteria for requiring an air quality assessment**

| The development will:                                                                                       | Indicative Criteria to proceed to an assessment                                                               |
|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Cause significant change in Light Duty Vehicles (LDV) traffic flows on local roads with relevant receptors. | A change of LDV flows of:<br>More than 100 AADT within or adjacent to an AQMA<br>More than 500 AADT elsewhere |
| Cause significant change in Heavy Duty Vehicles (HDV) traffic flows on local roads with relevant receptors. | A change of HDV flows of:<br>More than 25 AADT within or adjacent to an AQMA<br>More than 100 AADT elsewhere  |

- 4.17 The Proposed Development results in several roads exceeding the above criteria (see Appendix B), and therefore a quantitative air quality assessment was undertaken.
- 4.18 The traffic data provided has been used to calculate NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> emission rates for the relevant assessment years using Defra's Emissions Factors Toolkit (EFT) (version 12.1, released August 2024) (Ref 26).

## Receptors

### Human Health Receptors

- 4.19 Air quality receptors sensitive to changes in air quality on the basis of human health typically include residential properties, schools, care homes, and hospitals.
- 4.20 A total of 37 receptors have been modelled that are located in close proximity to roads that experience a traffic impact in excess of relevant screening criteria that may be affected by the Proposed Development. Each selected receptor is representative of other sensitive receptors within their vicinity and were chosen to represent locations where pollutant concentrations are expected to be highest (those closest to the road). All schools in study area were included as receptors but only representative receptors were chosen for residences.
- 4.21 The selected receptors are summarised in [Table 7](#) and shown in Figure A- 1.

**Table 7: Modelled Human Health Receptors**

| Receptor ID | Location                      | Distance from Site Boundary | X      | Y      | Height |
|-------------|-------------------------------|-----------------------------|--------|--------|--------|
| R01         | Station Rd                    | 109m                        | 439621 | 303130 | 1.5    |
| R02         | Station Rd                    | 7m                          | 439535 | 303134 | 1.5    |
| R03         | White House                   | 1650m                       | 437691 | 303141 | 1.5    |
| R04         | St Peters CofE Academy        | 701m                        | 439892 | 303228 | 1.5    |
| R05         | Market Bosworth High School   | 792m                        | 440346 | 303108 | 1.5    |
| R06         | Dixie Grammar School          | 858m                        | 440533 | 303093 | 1.5    |
| R07         | Station Rd                    | 284m                        | 439849 | 303119 | 1.5    |
| R08         | Station Rd                    | 441m                        | 439960 | 303133 | 1.5    |
| R09         | Station Rd                    | 444m                        | 440003 | 303181 | 1.5    |
| R10         | Station Rd                    | 437m                        | 440080 | 303167 | 1.5    |
| R11         | Station Rd                    | 539m                        | 440207 | 303103 | 1.5    |
| R12         | Station Rd                    | 452m                        | 440114 | 303117 | 1.5    |
| R13         | Station Rd                    | 168m                        | 439727 | 303119 | 1.5    |
| R14         | Station Rd                    | 200m                        | 439238 | 303230 | 1.5    |
| R15         | The Park                      | 977m                        | 440676 | 303012 | 1.5    |
| R16         | The Park                      | 1139m                       | 440820 | 303011 | 1.5    |
| R17         | The Park                      | 1200m                       | 440872 | 303013 | 1.5    |
| R18         | The Park                      | 1562m                       | 441221 | 303245 | 1.5    |
| R19         | The Park                      | 1690m                       | 441332 | 303259 | 1.5    |
| R20         | The Park                      | 1797m                       | 441463 | 303303 | 1.5    |
| R21         | The Park                      | 2570m                       | 442222 | 303269 | 1.5    |
| R22         | The Park                      | 2435m                       | 442081 | 303314 | 1.5    |
| R23         | Main Street                   | 949m                        | 440606 | 303158 | 1.5    |
| R24         | Station Rd                    | 775m                        | 440453 | 303062 | 1.5    |
| R25         | Station Rd                    | 111m                        | 439324 | 303177 | 1.5    |
| R26         | Dixie Grammar Junior School   | 3089m                       | 436237 | 302489 | 1.5    |
| R27         | Proposed Residential Property | *0m                         | 439504 | 303134 | 1.5    |
| R28         | Proposed Residential Property | *0m                         | 439450 | 303032 | 1.5    |
| R29         | Proposed Residential Property | *0m                         | 439439 | 303005 | 1.5    |
| R30         | Proposed Residential Property | *0m                         | 439509 | 303072 | 1.5    |
| R31         | Proposed Residential Property | *0m                         | 439570 | 302994 | 1.5    |
| R32         | Proposed Residential Property | *0m                         | 439650 | 302984 | 1.5    |
| R33         | Proposed Residential Property | *0m                         | 439514 | 302961 | 1.5    |
| R34         | Proposed Residential Property | *0m                         | 439429 | 302931 | 1.5    |
| R35         | Proposed Residential Property | *0m                         | 439543 | 302910 | 1.5    |
| R36         | Proposed Residential Property | *0m                         | 439600 | 302897 | 1.5    |
| R37         | Proposed Residential Property | *0m                         | 439618 | 302957 | 1.5    |

## Designated Nature Conservation Receptors

4.22 There are no nature conservation receptors within 200 m of a road affected by the Proposed Development traffic. Nature conservation receptors are not considered further within this assessment.

## Dispersion Modelling

- 4.23 Atmospheric Dispersion Modelling System (ADMS) Roads (v. 5.0.1.3) (Ref 27) detailed modelling software has been used to predict annual mean concentrations of road transport derived pollutants NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> at selected sensitive receptors. ADMS-Roads is a modern dispersion model that has an extensive published track record of use in the UK for the assessment of local air quality impacts, including model validation and verification studies.
- 4.24 ADMS-Roads calculates annual mean concentrations of pollutants emitted from roads at sensitive receptor locations using the following parameters:
- Locational information of the modelled road links and receptors from ArcGIS;
  - Emission factors which account for fleet size, composition, and speed; and
  - Meteorological information from a suitable nearby meteorological station.
- 4.25 The following data was used to construct the scenarios which were considered in this assessment:
- 2023 Baseline Scenario (using 2023 traffic data, 2023 meteorological data, 2023 traffic emissions factors and 2018 backgrounds for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>);
  - 2029 Future Baseline Scenario (using 2029 traffic data, 2023 meteorological data, 2029 traffic emissions factors and 2029 backgrounds for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>); and
  - 2029 Future with Proposed Development Scenario (using 2029 traffic data, 2023 meteorological data, 2029 traffic emissions factors and 2029 backgrounds for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>).
- 4.26 Details of general modelling conditions are provided in Table 10.

**Table 8: General ADMS-Roads Model Conditions**

| Variables                                          | ADMS-Roads Model Input                                                                                |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Surface roughness at source                        | 0.5                                                                                                   |
| Minimum Monin-Obukhov length for stable conditions | 10                                                                                                    |
| Terrain types                                      | Flat                                                                                                  |
| Receptor locations                                 | X, Y, Z coordinates determined by GIS                                                                 |
| Emissions                                          | NO <sub>x</sub> , PM <sub>10</sub> and PM <sub>2.5</sub> based on traffic data supplied               |
| Emissions factors                                  | NO <sub>x</sub> , PM <sub>10</sub> , and PM <sub>2.5</sub> - Emissions Factors Toolkit (version 12.1) |
| Meteorological data                                | Hourly sequential data from Coleshill                                                                 |
| Emission profiles                                  | Based on 2023 average diurnal profiles for Great Britain                                              |
| Receptors                                          | Selected receptors only                                                                               |
| Model output                                       | Long-term annual mean road contributions from NO <sub>x</sub> , PM <sub>10</sub> , PM <sub>2.5</sub>  |

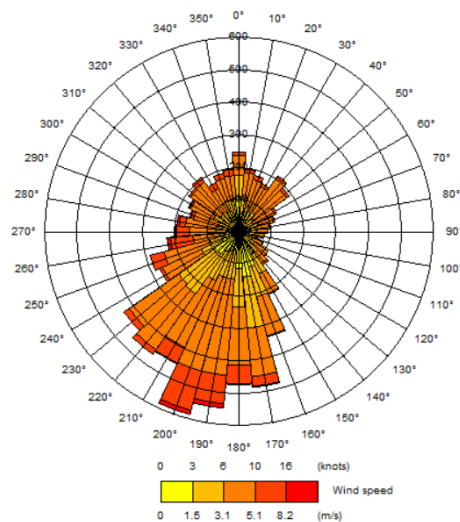
- 4.27 A surface roughness coefficient of 0.5 metres (representative of parkland and open suburbia) was applied across the study area. The surface roughness is important in the approximation of turbulent conditions within the atmospheric boundary layer and thus in the estimation of pollutant concentrations at receptors.
- 4.28 Minimum Monin-Obukhov length (to reasonably limit the occurrence of very stable atmospheric conditions) was defined as 10 metres at the dispersion site (representative of small town areas). This parameter limits the occurrence of very stable boundary layer conditions (i.e. when the air is still) to a degree that is appropriate to the general land-use. In general, the potential for very stable conditions is lowest in large urban areas where the 'heat island' effect promoting turbulent motion in the boundary layer is strongest.

## Meteorological Data

- 4.29 The meteorological dataset used in the assessment was recorded at the meteorological station at Coleshill located approximately 23 km to the South-West of the site. The meteorological site is considered

to be representative of regional meteorological conditions and sufficient to satisfy the requirements of this assessment. A wind rose of the 2023 meteorological data used in this assessment is provided in [Figure 3](#).

**Figure 3: Wind Rose for Coleshill, 2023**



## NO<sub>x</sub> to NO<sub>2</sub> conversion

- 4.30 The proportion of NO<sub>2</sub> in NO<sub>x</sub> varies greatly with location and time according to a number of factors including the amount of oxidant available at location and distance from the emission source. NO<sub>x</sub> concentrations are expected to decline in future years due to falling emissions, therefore NO<sub>2</sub> concentrations will not be limited as much by ozone and consequently it is likely that the NO<sub>2</sub>/NO<sub>x</sub> ratio will in the future increase. In addition, a trend has been noted in recent years whereby roadside NO<sub>2</sub> concentrations have been increasing at certain roadside monitoring sites, despite emissions of NO<sub>x</sub> falling. The direct NO<sub>2</sub> phenomenon is having an increasingly marked effect at many urban locations throughout the UK and must be considered when undertaking modelling studies.
- 4.31 In this study, modelled NO<sub>x</sub> values were converted to NO<sub>2</sub> using the current version of the 'NO<sub>x</sub> to NO<sub>2</sub>' calculator (version 8.1), released by Defra in 2020 (Ref 28). The assessment year and region for which the modelling has been undertaken are specified and the appropriate Defra background NO<sub>2</sub> concentrations at each receptor. The calculation then uses an appropriate factor of NO<sub>x</sub> emitted as NO<sub>2</sub>.

## NO<sub>2</sub> Hourly Mean Objective

- 4.32 Research projects completed on behalf of Defra and the Devolved Administrations by Laxen and Marner in 2003 (Ref 29) and AEA Technology in 2008 (Ref 30) concluded that the hourly average NO<sub>2</sub> AQS Objective is unlikely to be exceeded if annual average concentrations are predicted to be less than 60 µg/m<sup>3</sup>. Therefore, this assessment has evaluated the likelihood of exceeding the hourly average NO<sub>2</sub> objective by comparing predicted annual average NO<sub>2</sub> concentrations at all receptors to an annual average equivalent threshold of 60 µg/m<sup>3</sup>. Where predicted concentrations are below this value, it can be concluded that the hourly average NO<sub>2</sub> Objective is likely to be achieved.

## PM<sub>10</sub> 24-hour Mean Objective

- 4.33 LAQM.TG(22) (Ref 17) provides a calculation method to estimate the number of exceedances of the 24-hour mean PM<sub>10</sub> objective given the annual mean concentration. This method has been used to assess the predicted effect of the Proposed Development with respect to the 24-hour mean PM<sub>10</sub> objective.

## Model Verification

- 4.34 Due to the absence of local monitoring sites, model verification as described by LAQM.TG(22) (Ref 17) could not be carried out. A precautionary verification factor of 3 was adopted for this analysis. This is based on professional judgement informed by previous air quality assessments in the area and can be considered conservative.

## Sensitive Designated Nature Conservation Sites

- 4.35 Modelling was not required for the nature conservation sites, as none of the sites were within 200m of the study area.

## Significance of Local Air Quality Impacts

- 4.36 Significance of local air quality effects is determined in line with IAQM and EPUK guidance (Ref 2). This approach does not define a graduating scale of human health receptor sensitivity. Instead, human health receptors are considered either sensitive or not, depending on the period of time for which they are exposed to emissions. The absolute magnitude of change in pollutant concentrations between the baseline and assessment scenarios, relative to the air quality objective value, is described and this is used to consider the risk of those objectives being exceeded.
- 4.37 For a change in annual mean concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>, of a given magnitude, IAQM and EPUK have published recommendations for describing the effects of such impacts at individual receptors. These are set out in [Table 9](#).

**Table 9: Annual Mean Impact Descriptors at Individual Receptors**

| Annual Mean Concentrations at Receptors in Assessment Year (% of Air Quality Objective) | % Change in Concentration Relative to Air Quality Assessment Level (AQAL) |                 |              |                |              |
|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-----------------|--------------|----------------|--------------|
|                                                                                         | <1% (Imperceptible)                                                       | 1% (Very Small) | 2-5% (Small) | 6-10% (Medium) | >10% (Large) |
| ≤75%                                                                                    | Negligible                                                                | Negligible      | Negligible   | Slight         | Moderate     |
| 76-94%                                                                                  | Negligible                                                                | Negligible      | Slight       | Moderate       | Moderate     |
| 95-102%                                                                                 | Negligible                                                                | Slight          | Moderate     | Moderate       | Substantial  |
| 103-109%                                                                                | Negligible                                                                | Moderate        | Moderate     | Substantial    | Substantial  |
| >110%                                                                                   | Negligible                                                                | Moderate        | Substantial  | Substantial    | Substantial  |

- 4.38 The IAQM/ EPUK guidance states that the descriptors are for individual receptors only and that overall significance is determined using professional judgement. It also states that it is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the objective value. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the objective value, rather than being exactly equal to it.
- 4.39 An impact that is 'Negligible', given normal bounds of variation, would not be capable of having a direct effect on local air quality that could be significant. A 'slight' impact is also likely to be very difficult to distinguish from the inter-annual effects of varying meteorological conditions and are therefore not considered likely to be capable of having a direct effect on local air quality that could be significant. 'Moderate' impacts do not necessarily constitute a significant effect, where they do not contribute to an exceedance or risk of an exceedance of an air quality objective, particularly where such impacts relate to a small minority of receptors with the majority experiencing lesser impacts. A 'Substantial' impact will almost certainly constitute a significant effect that will require additional mitigation to address.

## Overall Significance

- 4.40 The overall significance of the Proposed Development with respect to air quality is determined for the construction phase and the operation phase.
- 4.41 The assessment of significance is informed by the effects on human health as determined by the significance of the construction dust assessment and local air quality assessment.

## Assumptions, Constraints and Limitations

- 4.42 The construction dust assessment is based on the construction information that is currently available. As with all construction air quality assessments, the exact details of construction activities will not be known

before a specific contractor is appointed to complete the works. Once appointed, the contractor would determine their exact construction methods and programme during the detailed design stage.

- 4.43 Modelling results are subject to systematic and random error; such errors arise due to many factors, such as uncertainty in the traffic data and the composition of the vehicle fleet, and uncertainty in the meteorological dataset, especially when projected forward to future years.
- 4.44 The air quality modelling uses a traffic dataset consisting of the most likely forecast traffic flows. Uncertainty associated with traffic data has been minimised by using validated traffic data.
- 4.45 The use of the latest version of the Defra backgrounds concentrations and tools available when the assessment was undertaken has also minimised the uncertainty associated with the air quality predictions presented.
- 4.46 Speed limits have been used as provided, but that these may not accurately reflect true driving speeds, this data is not available.
- 4.47 Street canyons may influence pollutant concentrations as they are unable to disperse as effectively. Street canyon effects have not been considered within the model, as this is not considered proportionate in the light of the reported impacts as described in Section 5.
- 4.48 Uncertainties associated with vehicle emissions data have been minimised by using the most up to date version of Defra's EFT available at the time of undertaking the assessment (V12.1).
- 4.49 The data has not been verified because there is no monitoring to verify against. A factor of 3 has been applied to the model outputs to adjust them for greater conservativeness. This is considered appropriate to mitigate the risks associated with uncertainties in speeds, canyons, and future emissions as described above.

## 5. Assessment Results

- 5.1 This section identifies the potential likely effects on air quality sensitive receptors as a result of the construction and subsequent operation of the Proposed Development.

### Construction Phase

- 5.2 This section contains an assessment of the potential impacts of air quality receptors as a result of the construction phase of the Proposed Development.

### Dust Effects

- 5.3 As described in Section 4 and Appendix C the construction dust and particulate matter assessment follows the step-by-step approach set out in relevant IAQM guidance (Ref 22). This process is summarised in the sub-sections below.

#### Step 1 Screen the requirement for a detailed assessment

- 5.4 There are high sensitivity amenity and human health receptors including residences within 350m of the construction site boundary. Therefore, a detailed assessment is required. There are no ecological receptors within 50m of the construction site boundary. Therefore, ecological impacts are screened out.

#### Step 2A Determine the Dust Emissions Magnitude

- 5.5 Step 2A requires the determination of the dust emission magnitude, which the guidance states is based on the scale of the anticipated works with the following activities: demolition; earthworks; construction (i.e. the building and erection of structures); and track-out (the deposition of dust and particulate matter onto public roads by construction vehicles), and should be classified as Small, Medium, or Large.

##### *Demolition*

- 5.6 Two residential buildings will be demolished at the site with the total volume of building to be demolished less than 12000 m<sup>3</sup>. The dust emission magnitude is classified as **Low**.

##### *Earthworks*

- 5.7 The area of the proposed development site is approximately 71,200 m<sup>2</sup>. The entire site will be cleared and graded, including ripping concrete foundations and roads. Based on the area of the proposed development site the dust emission magnitude is categorised as **Medium**.

##### *Construction*

- 5.8 The total building volume is likely to exceed >100,000m<sup>3</sup>, and will include dusty activities, such as piling. The dust emission magnitude is classified as **Large**.

##### *Track-out*

- 5.9 Given the size of the site and the proposed extended phasing of the construction works, it is considered unlikely that the number of HGVs will exceed the criteria defined by the IAQM (Ref 22). With regard to the criteria for the dust-generating potential of the surface material and the length of unpaved road, it considered to be a conservative approach to classify the potential dust effects as **Medium**.

#### Step 2B Determine the Sensitivity of the Area

- 5.10 The following were taken into consideration when determining the sensitivity of the area to dust soiling and health effects of PM<sub>10</sub>.
- The site is located in a predominantly residential area, with residential dwellings located nearby and therefore the receptors are considered to be High sensitivity.
  - There are between 10-100 properties within 20m of the site boundary, including sensitive commercial sites.
  - The annual mean background concentration of PM<sub>10</sub> is 9.5 µg/m<sup>3</sup> in the baseline year.
  - Taking the above into consideration the sensitivity of the area to dust soiling effects is **High** and the sensitivity of the area to the health effects of PM<sub>10</sub> is **Low**.

## Step 2C - Define the Risk of Impacts

Taking into consideration the conclusion from Steps 2A and 2B, the resultant predicted risk of dust impacts for each activity are provided in [Table 10](#).

**Table 10: Risk of Dust Impacts**

|                             | Demolition | Earthworks | Construction | Trackout |
|-----------------------------|------------|------------|--------------|----------|
| Risk of dust impact         | Medium     | Medium     | High         | Medium   |
| Risk of human health impact | Negligible | Low        | Low          | Low      |

- 5.11 Mitigation measures for these risks are discussed in Section 6. The potential dust effects could be suitably minimised by the application of industry standard mitigation measures as set out in IAQM Guidance on the assessment of dust from demolition and construction, such that the effects are **not significant**.

## Construction Traffic Emission Effects

- 5.12 Effects from construction traffic have been scoped out (see Section 3). Construction traffic emissions effects are anticipated to be **not significant**.

## Operational Phase

### Human Health Receptors

- 5.13 Operational air quality and impacts associated with road traffic emissions have been modelled at selected air quality sensitive locations in the vicinity of the Proposed Development where traffic impacts exceed relevant screening criteria. Operational pollutant statistics at human health sensitive receptors are reported in [Table 11](#) and changes due to the Proposed Development are reported in [Table 12](#). The location of receptors is illustrated in Figure A-1.

**Table 11: Predicted Operational Pollutant Concentrations**

| Receptor ID | Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> ) |      | Annual Mean PM <sub>10</sub> Concentration (µg/m <sup>3</sup> ) |      | Days exceeding the PM <sub>10</sub> 24-hour objective |    | Annual Mean PM <sub>2.5</sub> Concentration (µg/m <sup>3</sup> ) |     |
|-------------|----------------------------------------------------------------|------|-----------------------------------------------------------------|------|-------------------------------------------------------|----|------------------------------------------------------------------|-----|
|             | DM                                                             | DS   | DM                                                              | DS   | DM                                                    | DS | DM                                                               | DS  |
| R01         | 9.7                                                            | 9.9  | 12.9                                                            | 13.0 | 0                                                     | 0  | 7.7                                                              | 7.7 |
| R02         | 9.3                                                            | 9.5  | 12.7                                                            | 12.8 | 0                                                     | 0  | 7.6                                                              | 7.6 |
| R03         | 8.9                                                            | 9.0  | 13.4                                                            | 13.4 | 0                                                     | 0  | 7.7                                                              | 7.7 |
| R04         | 9.0                                                            | 9.1  | 12.5                                                            | 12.6 | 0                                                     | 0  | 7.5                                                              | 7.5 |
| R05         | 10.0                                                           | 10.1 | 12.5                                                            | 12.6 | 0                                                     | 0  | 7.8                                                              | 7.8 |
| R06         | 12.6                                                           | 13.0 | 14.1                                                            | 14.4 | 0                                                     | 0  | 8.6                                                              | 8.7 |
| R07         | 9.1                                                            | 9.2  | 12.6                                                            | 12.6 | 0                                                     | 0  | 7.5                                                              | 7.5 |
| R08         | 9.4                                                            | 9.5  | 12.2                                                            | 12.2 | 0                                                     | 0  | 7.6                                                              | 7.6 |
| R09         | 9.8                                                            | 10.0 | 12.4                                                            | 12.5 | 0                                                     | 0  | 7.7                                                              | 7.8 |
| R10         | 9.9                                                            | 10.2 | 12.5                                                            | 12.6 | 0                                                     | 0  | 7.7                                                              | 7.8 |
| R11         | 9.4                                                            | 9.5  | 12.2                                                            | 12.2 | 0                                                     | 0  | 7.6                                                              | 7.6 |
| R12         | 9.2                                                            | 9.3  | 12.0                                                            | 12.1 | 0                                                     | 0  | 7.5                                                              | 7.5 |
| R13         | 9.4                                                            | 9.6  | 12.8                                                            | 12.8 | 0                                                     | 0  | 7.6                                                              | 7.7 |
| R14         | 10.1                                                           | 10.3 | 13.1                                                            | 13.2 | 0                                                     | 0  | 7.8                                                              | 7.9 |

| Receptor ID | Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> ) |      | Annual Mean PM <sub>10</sub> Concentration (µg/m <sup>3</sup> ) |      | Days exceeding the PM <sub>10</sub> 24-hour objective |    | Annual Mean PM <sub>2.5</sub> Concentration (µg/m <sup>3</sup> ) |     |
|-------------|----------------------------------------------------------------|------|-----------------------------------------------------------------|------|-------------------------------------------------------|----|------------------------------------------------------------------|-----|
|             | DM                                                             | DS   | DM                                                              | DS   | DM                                                    | DS | DM                                                               | DS  |
| R15         | 11.6                                                           | 11.9 | 13.5                                                            | 13.7 | 0                                                     | 0  | 8.3                                                              | 8.4 |
| R16         | 9.5                                                            | 9.6  | 12.2                                                            | 12.3 | 0                                                     | 0  | 7.6                                                              | 7.6 |
| R17         | 9.1                                                            | 9.1  | 12.0                                                            | 12.0 | 0                                                     | 0  | 7.5                                                              | 7.5 |
| R18         | 9.5                                                            | 9.7  | 12.3                                                            | 12.4 | 0                                                     | 0  | 7.7                                                              | 7.7 |
| R19         | 9.5                                                            | 9.6  | 12.3                                                            | 12.4 | 0                                                     | 0  | 7.6                                                              | 7.7 |
| R20         | 9.7                                                            | 9.9  | 12.4                                                            | 12.5 | 0                                                     | 0  | 7.7                                                              | 7.7 |
| R21         | 12.5                                                           | 12.8 | 14.4                                                            | 14.5 | 0                                                     | 0  | 8.4                                                              | 8.5 |
| R22         | 10.6                                                           | 10.8 | 13.8                                                            | 13.8 | 0                                                     | 0  | 8.1                                                              | 8.1 |
| R23         | 11.2                                                           | 11.5 | 13.3                                                            | 13.5 | 0                                                     | 0  | 8.1                                                              | 8.2 |
| R24         | 10.1                                                           | 10.3 | 12.6                                                            | 12.7 | 0                                                     | 0  | 7.8                                                              | 7.8 |
| R25         | 9.7                                                            | 9.8  | 12.9                                                            | 12.9 | 0                                                     | 0  | 7.7                                                              | 7.7 |
| R26         | 10.3                                                           | 10.5 | 13.2                                                            | 13.3 | 0                                                     | 0  | 7.8                                                              | 7.9 |
| R27         | -                                                              | 9.4  | -                                                               | 12.8 | -                                                     | 0  | -                                                                | 7.6 |
| R28         | -                                                              | 8.7  | -                                                               | 12.4 | -                                                     | 0  | -                                                                | 7.4 |
| R29         | -                                                              | 8.7  | -                                                               | 12.3 | -                                                     | 0  | -                                                                | 7.4 |
| R30         | -                                                              | 8.8  | -                                                               | 12.4 | -                                                     | 0  | -                                                                | 7.4 |
| R31         | -                                                              | 8.5  | -                                                               | 12.7 | -                                                     | 0  | -                                                                | 7.4 |
| R32         | -                                                              | 8.5  | -                                                               | 12.7 | -                                                     | 0  | -                                                                | 7.4 |
| R33         | -                                                              | 8.5  | -                                                               | 12.7 | -                                                     | 0  | -                                                                | 7.4 |
| R34         | -                                                              | 8.5  | -                                                               | 12.7 | -                                                     | 0  | -                                                                | 7.4 |
| R35         | -                                                              | 8.5  | -                                                               | 12.7 | -                                                     | 0  | -                                                                | 7.4 |
| R36         | -                                                              | 8.5  | -                                                               | 12.7 | -                                                     | 0  | -                                                                | 7.4 |
| R37         | -                                                              | 8.5  | -                                                               | 12.7 | -                                                     | 0  | -                                                                | 7.4 |

Table 12: Change in pollutant concentrations and significance

| Receptor ID | Change in NO <sub>2</sub> (µg/m <sup>3</sup> ) | Significance of change in NO <sub>2</sub> | Change in PM <sub>10</sub> (µg/m <sup>3</sup> ) | Significance of change in PM <sub>10</sub> | Change in days exceeding the DM PM <sub>10</sub> 24-hour objective | Significance of change in days exceeding the DM PM <sub>10</sub> 24-hour objective | Change in PM <sub>2.5</sub> (µg/m <sup>3</sup> ) | Significance of change in PM <sub>2.5</sub> |
|-------------|------------------------------------------------|-------------------------------------------|-------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------|
| R01         | +0.2                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R02         | +0.2                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | +0.1                                             | Negligible                                  |
| R03         | +0.1                                           | Negligible                                | <0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R04         | +0.1                                           | Negligible                                | <0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R05         | +0.2                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R06         | +0.4                                           | Negligible                                | +0.2                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | +0.1                                             | Negligible                                  |
| R07         | +0.1                                           | Negligible                                | <0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R08         | +0.1                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R09         | +0.2                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | +0.1                                             | Negligible                                  |

| Receptor ID | Change in NO <sub>2</sub> (µg/m <sup>3</sup> ) | Significance of change in NO <sub>2</sub> | Change in PM <sub>10</sub> (µg/m <sup>3</sup> ) | Significance of change in PM <sub>10</sub> | Change in days exceeding the DM PM <sub>10</sub> 24-hour objective | Significance of change in days exceeding the DM PM <sub>10</sub> 24-hour objective | Change in PM <sub>2.5</sub> (µg/m <sup>3</sup> ) | Significance of change in PM <sub>2.5</sub> |
|-------------|------------------------------------------------|-------------------------------------------|-------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------|
| R10         | +0.2                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | +0.1                                             | Negligible                                  |
| R11         | +0.1                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R12         | +0.1                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R13         | +0.1                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R14         | +0.2                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | +0.1                                             | Negligible                                  |
| R15         | +0.3                                           | Negligible                                | +0.2                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | +0.1                                             | Negligible                                  |
| R16         | +0.1                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R17         | <0.1                                           | Negligible                                | <0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R18         | +0.1                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R19         | +0.1                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R20         | +0.1                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R21         | +0.3                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | +0.1                                             | Negligible                                  |
| R22         | +0.2                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R23         | +0.3                                           | Negligible                                | +0.2                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | +0.1                                             | Negligible                                  |
| R24         | +0.2                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | +0.1                                             | Negligible                                  |
| R25         | +0.1                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | <0.1                                             | Negligible                                  |
| R26         | +0.2                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | +0.1                                             | Negligible                                  |
| R27         | +0.2                                           | Negligible                                | +0.1                                            | Negligible                                 | 0                                                                  | Negligible                                                                         | +0.1                                             | Negligible                                  |

5.14 Operational conditions at the human health sensitive receptors are summarised as follows.

5.15 Annual mean concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> are well below the respective annual mean air quality objectives for those pollutants (40 µg/m<sup>3</sup> and 20 µg/m<sup>3</sup> respectively) at all modelled locations. PM<sub>10</sub> impacts were predicted to be negligible in all cases.

5.16 Annual mean PM<sub>10</sub> concentrations are such that daily mean exceedances for PM<sub>10</sub> are unlikely (no more than 35 daily exceedances of 50 µg/m<sup>3</sup>).

5.17 Annual mean concentrations of NO<sub>2</sub> were not predicted to exceed the annual mean objective value at any receptor modelled.

5.18 The impact is deemed to be '**negligible**' following IAQM guidance.

5.19 At the sites representing the proposed receptors, all concentrations were well below the relevant annual mean air quality objectives. The site is therefore considered suitable for the proposed use with respect to air quality.

5.20 Overall, the effect of impacts on human health sensitive receptors summarised above and shown in [Table 11](#) and [Table 12](#) are considered to be **not significant**.

## 6. Mitigation

### Construction Phase

#### Step 3: Site Specific Mitigation

- 6.1 Step 3 of the IAQM construction dust guidance uses the risk of dust impacts identified in Step 2C to compile an appropriate list of dust mitigation to offset that risk and ensure that a significant effect does not occur. The IAQM guidance relevant to the construction dust assessment (Ref 22) lists measures that should be applied, if practical, relative to the risk identified. In this instance, a high risk of dust impacts was identified due to the potential dust emission magnitude and the sensitivity of the area. Therefore, the list of IAQM recommended mitigation measures provided below is proportionate to the risk identified.
- 6.2 All of the IAQM dust (and particulate matter) mitigation measures deemed “highly recommended” or “desirable” for **High** risks are listed below. These are to be considered for implementation, but only as and where required, on a site-specific basis.
- 6.3 The IAQM Construction Dust Guidance states that ‘*Given the variety of development sites and the individual issues they face, professional judgement should be used to determine the site-specific mitigation measures to be applied.*’ The following mitigation measures have been developed with respect to those ‘highly recommended’ by the IAQM construction dust guidance for high risk sites, and have been further developed to reflect site-specificity.
- Inform neighbours of commencement of development (for example, by letter drop) 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. This may be the environment manager/engineer or the site manager.
  - Display the head or regional office contact information.
  - 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. The DMP may include monitoring of dust deposition, dust flux, real-time PM<sub>10</sub> continuous monitoring and/or visual inspections.
  - 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 complaints log available to the local authority when asked.
  - 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 logbook.
  - Undertake once-daily site boundary visual inspections at locations of highest risk (where receptors are nearby), to monitor dust, record inspection results, and make the log available to the local authority when asked. Increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
  - 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.
  - Plan the location of construction activities so that machinery and dust causing activities are located away from receptors, where 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, where possible.
  - 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, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.
- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Use mains electricity or battery powered equipment in preference to diesel or petrol powered generators where practicable.
- 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).
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- 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.
- Avoid bonfires and burning of waste materials.
- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
- Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.
- 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.
- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
- 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.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.

- Implement a wheel washing system where reasonably practicable.
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

## Operational Phase

- 6.4 No mitigation specific to the operational phase is proposed for air quality as there are no predicted significant impacts.
- 6.5 However, the Proposed Development does incorporate active travel elements including a pedestrian/cycle link to Heath Road, and a circular footpath that may potentially lead to off-site public rights of way. This may have co-benefits for air quality.
- 6.6 Further mitigation could be provided by the preparation of a green travel plan, the installation of electric vehicle charging points, and/or the provision of non-emitting energy generation (e.g. heat pumps).

## 7. Conclusions

- 7.1 An air quality assessment has been undertaken to determine the potential local air quality effects during the construction and operational phase of the Proposed Development.
- 7.2 The air quality assessment has been undertaken with reference to relevant IAQM and Defra guidance.
- 7.3 During the construction phase of the Proposed Development, construction activities have the potential to generate dust and PM<sub>10</sub> emissions that could impact on and affect sensitive receptors located close to the construction site boundary, and receptors located close to public roads used by construction traffic
- 7.4 The construction phase assessment concluded that the potential dust effects is considered to be **High** risk. With the application of industry standard mitigation measures the potential effects were considered to be **not significant**.
- 7.5 During the operational phase, road traffic movements associated with the Proposed Development have the potential to increase concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> at sensitive receptors located close to the Proposed Development.
- 7.6 At human health receptors, annual mean NO<sub>2</sub> concentrations were predicted to be below the AQ Objective in the opening year with or without the Proposed Development. The changes in annual mean NO<sub>2</sub> concentrations were considered to be **negligible**. Therefore, the air quality effects at human health receptors are considered **not significant**.
- 7.7 At human health receptors, annual mean PM<sub>10</sub> and PM<sub>2.5</sub> concentrations were predicted to be below the AQ Objective in the opening year with or without the Proposed Development. Therefore, the air quality effects at human health receptors are considered **not significant**.
- 7.8 Therefore, the effect of the Proposed Development is considered to be **not significant** for air quality for both construction and operational phases. The Proposed Development is also considered to be consistent with relevant national and local air quality policy.

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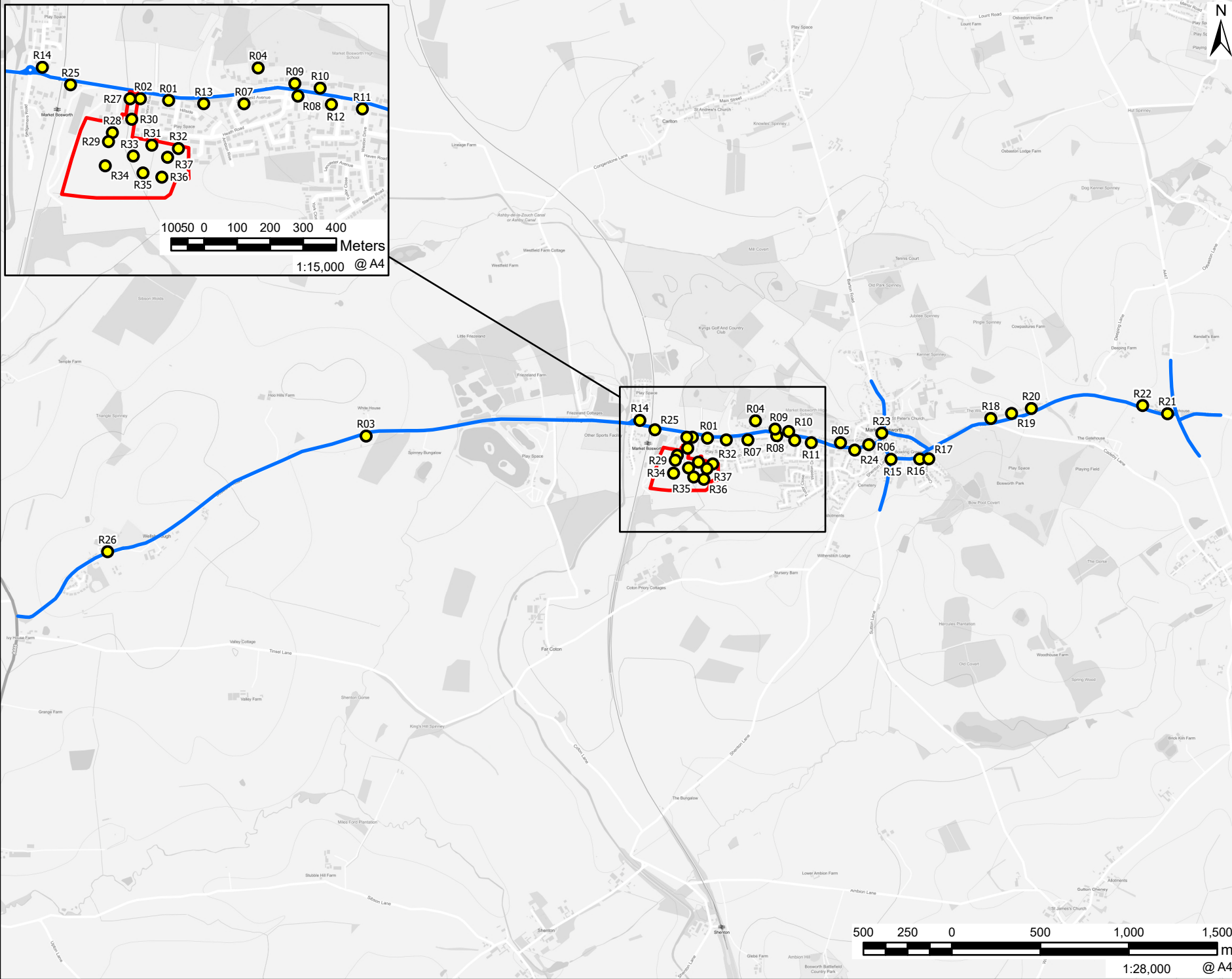
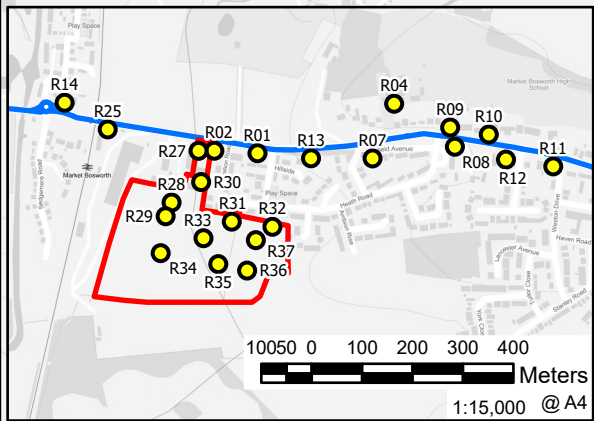
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# Appendix A Figures

## Figure A-1. Air Quality Study Area





**AECOM**  
**PROJECT**  
Station Road,  
Market Bosworth

**CLIENT**  
Miller Homes

**CONSULTANT**  
AECOM Limited  
2 City Walk  
Leeds  
LS11 9AR  
www.aecom.com

**LEGEND**  
— Modelled Road Network  
● Sensitive Receptors  
□ Red Line Boundary

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**ISSUE PURPOSE**  
FINAL  
**PROJECT NUMBER**  
60716351  
**SHEET TITLE**  
Air Quality Study Area

**SHEET NUMBER**  
Figure A-1

## Figure A-2. Construction Dust Assessment



# AECOM

**PROJECT**  
Station Road,  
Market Bosworth

**CLIENT**  
Miller Homes

**CONSULTANT**  
AECOM Limited  
2 City Walk  
Leeds  
LS11 9AR  
www.aecom.com

- LEGEND**
- Red Line
  - Boundary
  - 20m Buffer
  - 50m Buffer
  - 100m Buffer
  - 250m Buffer

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**ISSUE PURPOSE**  
FINAL  
**PROJECT NUMBER**  
60716351  
**SHEET TITLE**  
Construction Dust Assessment

**SHEET NUMBER**  
Figure A-2

1:5,000 @ A4

# Appendix B Road Traffic Data

| ID | Road                                | Speed Limit (mph) | Baseline 2023 AADT |       | Baseline 2029 AADT |       | With Development 2029 AADT |       | Screened In? |
|----|-------------------------------------|-------------------|--------------------|-------|--------------------|-------|----------------------------|-------|--------------|
|    |                                     |                   | Total Vehicles     | % HDV | Total Vehicles     | % HDV | Total Vehicles             | % HDV |              |
| 1  | B585 Wellsborough Road              | 60                | 2635               | 3.0%  | 2794               | 3.0%  | 2983                       | 3.1%  | N            |
| 2  | A444 Burton Road (N)                | 50                | 8245               | 6.9%  | 8741               | 7.0%  | 8897                       | 6.9%  | N            |
| 3  | Bosworth Road                       | 50                | 5487               | 4.0%  | 5817               | 4.0%  | 6378                       | 3.9%  | Y            |
| 4  | A444 Burton Road (S)                | 50                | 8179               | 7.0%  | 8672               | 7.0%  | 8887                       | 6.9%  | N            |
| 5  | Station Road (west of access)       | 40                | 5327               | 8.4%  | 5648               | 8.4%  | 6209                       | 8.0%  | Y            |
| 0  | Site Access                         | 20                | 0                  | 0.0%  | 0                  | 0.0%  | 1447                       | 3.3%  | Y            |
| 6  | Station Road (east of access)       | 40                | 5327               | 8.4%  | 5648               | 8.4%  | 6534                       | 7.7%  | Y            |
| 7  | Station Road (west of Market Place) | 30                | 6983               | 3.6%  | 7404               | 3.6%  | 8155                       | 3.6%  | Y            |
| 8  | Main Street (north of Market Place) | 30                | 5374               | 4.1%  | 5698               | 4.1%  | 6419                       | 3.9%  | Y            |
| 9  | Main Street (north of Park Street)  | 30                | 2428               | 4.2%  | 2574               | 4.2%  | 2574                       | 4.2%  | N            |
| 10 | Park Street                         | 30                | 3680               | 3.4%  | 3902               | 3.4%  | 4243                       | 3.4%  | N            |
| 11 | The Park                            | 40                | 7078               | 3.2%  | 7504               | 3.2%  | 8182                       | 3.2%  | Y            |
| 12 | Rectory Lane                        | 30                | 3831               | 3.0%  | 4062               | 3.0%  | 4399                       | 3.0%  | N            |
| 13 | Sutton Lane                         | 30                | 94                 | 0.0%  | 100                | 0.0%  | 173                        | 1.2%  | N            |
| 14 | Market Place (north of Sutton Lane) | 30                | 3896               | 3.0%  | 4131               | 3.0%  | 4541                       | 3.0%  | N            |
| 15 | Market Place (south of Main Street) | 30                | 4113               | 3.4%  | 4361               | 3.3%  | 4771                       | 3.3%  | N            |
| 16 | Bosworth Road (west of A447)        | 60                | 6014               | 3.6%  | 6376               | 3.6%  | 7054                       | 3.6%  | Y            |
| 17 | A447 (N)                            | 50                | 10089              | 4.9%  | 10697              | 4.9%  | 10856                      | 4.9%  | N            |

| ID | Road                                          | Speed Limit (mph) | Baseline 2023 AADT |       | Baseline 2029 AADT |       | With Development 2029 AADT |       | Screened In? |
|----|-----------------------------------------------|-------------------|--------------------|-------|--------------------|-------|----------------------------|-------|--------------|
|    |                                               |                   | Total Vehicles     | % HDV | Total Vehicles     | % HDV | Total Vehicles             | % HDV |              |
| 18 | B585 Bosworth Lane                            | 60                | 5139               | 4.5%  | 5448               | 4.5%  | 5771                       | 4.3%  | N            |
| 19 | A447 Ashby Road (S)                           | 50                | 13318              | 4.4%  | 14120              | 4.4%  | 14315                      | 4.4%  | N            |
| 20 | B585 Bosworth Lane (south of Barlestone Road) | 40                | 5543               | 4.5%  | 5877               | 4.5%  | 6200                       | 4.4%  | N            |
| 21 | B585 Barlestone Road (N)                      | 60                | 6861               | 4.7%  | 7274               | 4.7%  | 7315                       | 4.7%  | N            |
| 22 | B582 Barlestone Road (S)                      | 40                | 9939               | 4.8%  | 10538              | 4.8%  | 10820                      | 4.8%  | N            |

# Appendix C Construction Dust Method

## Introduction

- 1.1 This section describes the technical method by which the air quality impact of the Proposed Development from construction phase particulate emissions has been considered.

## Step 1: Screen the requirement for a detailed assessment

- 1.2 Sensitive receptors were identified and the distance to the Site and construction routes were determined according to the examples of sensitivity shown in Table C-1. According to the IAQM, an assessment will normally be required where there are sensitive receptors within 350 m of the boundary of a site and/or within 50 m of route(s) used by construction vehicles on the public highway, up to 500 m from the entrance to the Site.
- 1.3 A human receptor, as considered within the IAQM guidance, is any location where a person or property may experience:
- The annoyance effects of airborne dust or dust soiling e.g. dwellings, industrial or commercial premises such as a vehicle showroom, food manufacturers, electronics manufacturers, amenity areas and horticultural operations; or
  - Exposure to PM<sub>10</sub> over a period relevant to the air quality objectives.
- 1.4 Ecological receptors within 50 m of the boundary of the Site or routes used by construction vehicles on the public highway, up to 500 m from the entrance to the Site, also need to be identified.

**Table C-1: Definition of Significance of Fugitive Dust and PM<sub>10</sub> Effects**

| Sensitivity   | Dust Soiling                                                                                                                                                                                    | Human Health                                                                                                                                                                    | Ecological                                                                                                                             |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>High</b>   | <ul style="list-style-type: none"> <li>Dwellings</li> <li>Museum and other culturally important collections,</li> <li>Medium- and long-term car parks</li> <li>Car showrooms</li> </ul>         | <ul style="list-style-type: none"> <li>Residential properties</li> <li>Hospitals</li> <li>Schools</li> <li>Residential care homes</li> </ul>                                    | Locations with an international or national designation (e.g. SAC) and the designated features may be affected by dust soiling         |
| <b>Medium</b> | <ul style="list-style-type: none"> <li>Parks</li> <li>Places of work</li> </ul>                                                                                                                 | Office and shop workers, but will generally not include workers occupationally exposed to PM <sub>10</sub> , as protection is covered by Health and Safety at Work legislation. | Locations with a national designation (e.g. SSSI) where the features may be affected by dust deposition                                |
| <b>Low</b>    | <ul style="list-style-type: none"> <li>Playing fields</li> <li>Farmland (unless commercially sensitive horticulture)</li> <li>Footpaths</li> <li>Short term car parks</li> <li>Roads</li> </ul> | <ul style="list-style-type: none"> <li>Public footpaths</li> <li>Playing fields</li> <li>Parks</li> <li>Shopping streets</li> </ul>                                             | Locations with a local designation where the features may be affected by dust deposition, such as an LWS with dust sensitive features. |

**Notes:**

SAC = Special Area of Conservation

SSSI = Site of Special Scientific Interest

LWS = Local Wildlife Site

## Step 2: Assess the Risk of Dust Impacts

- 1.5 The risk of dust arising in sufficient quantities to cause annoyance and/or health effects was determined for each activity (demolition, earthworks, construction works and track out), taking account of:

- The scale and nature of the works, which determines the potential dust emission magnitude (small, medium or large) (Step 2A); and
  - The sensitivity of the area (low, medium or high) (Step 2B).
- 1.6 These factors were then combined to give the risk of dust effects with no mitigation applied, as Negligible, Low, Medium or High.
- 1.7 It should be noted that where detailed information was not available to inform the risk category, professional judgement and experience was used and a cautious approach adopted, in accordance with the guidance.

## Step 2A: Determine the Dust Emissions Magnitude

### Demolition

- 1.8 Table C-2 presents the demolition works dust emission classification. Demolition works will be minimal given the current state of the Site.

**Table C-2: Potential Demolition Works Dust Emission Classification**

| Emission Class | Criteria                                                                                                                                                                                                                                                                                                  |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Large</b>   | <ul style="list-style-type: none"> <li>▪ Total building volume &gt;50,000 m<sup>3</sup></li> <li>▪ Potentially dusty construction material (e.g. concrete)</li> <li>▪ On-site crushing and screening</li> <li>▪ Demolition activities &gt;20 m above ground level</li> </ul>                              |
| <b>Medium</b>  | <ul style="list-style-type: none"> <li>▪ Total building volume 20,000 m<sup>3</sup> – 50,000 m<sup>3</sup></li> <li>▪ Potentially dusty construction material</li> <li>▪ Demolition activities 10 – 20 m above ground level</li> </ul>                                                                    |
| <b>Small</b>   | <ul style="list-style-type: none"> <li>▪ Total building volume &lt;20,000 m<sup>3</sup></li> <li>▪ Construction material with low potential for dust release (e.g. metal cladding or timber)</li> <li>▪ Demolition activities &lt;10 m above ground</li> <li>▪ Demolition during wetter months</li> </ul> |

### Earthworks

- 1.9 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. The classifications in Table C-3 are based on examples of suitable criteria. Factors such as existing land use, topography, seasonality, duration and scale were also taken into consideration, where possible.

**Table C-3 Potential Earthworks Dust Emission Classification**

| Emission Class | Criteria                                                                                                                                                                                                                                                                                                                                                              |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Large</b>   | <ul style="list-style-type: none"> <li>▪ Total site area: &gt;10,000 m<sup>2</sup></li> <li>▪ Potentially dusty soil type (e.g. clay)</li> <li>▪ &gt;10 heavy earth moving vehicle active at any one time</li> <li>▪ Formation of bunds &gt;8 m in height</li> <li>▪ Total material moved &gt;100,000 tonnes</li> </ul>                                               |
| <b>Medium</b>  | <ul style="list-style-type: none"> <li>▪ Total site area: 2,500 - 10,000 m<sup>2</sup></li> <li>▪ Moderately dusty soil type (e.g. silt)</li> <li>▪ 5 -10 heavy earth moving vehicle active at any one time</li> <li>▪ Formation of bunds 4 - 8 m in height</li> <li>▪ Total material moved 20,000 – 100,000 tonnes</li> </ul>                                        |
| <b>Small</b>   | <ul style="list-style-type: none"> <li>▪ Total site area: &lt;2,500 m<sup>2</sup></li> <li>▪ Soil type with large grain size (e.g. sand)</li> <li>▪ &lt; 5 heavy earth moving vehicle active at any one time</li> <li>▪ Formation of bunds &lt; 4 m in height</li> <li>▪ Total material moved &lt;20,000 tonnes</li> <li>▪ Earthworks during wetter months</li> </ul> |

## Construction

- 1.10 The key issues when determining the potential dust emission magnitude during the construction phase include the size of the building(s)/ infrastructure, method of construction, construction materials and duration of build. The classifications in Table C-4 are based on examples of suitable criteria. Factors such as seasonality, building type, duration and scale were also taken into consideration, where possible.

**Table C-4: Potential Construction Dust Emission Classification**

| Emission Class | Criteria                                                                                                                                                                                                                |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Large</b>   | <ul style="list-style-type: none"> <li>Total building volume &gt;100,000 m<sup>3</sup></li> <li>Onsite concrete batching</li> <li>Sandblasting</li> </ul>                                                               |
| <b>Medium</b>  | <ul style="list-style-type: none"> <li>Total building volume 25,000 m<sup>3</sup> - 100,000 m<sup>3</sup></li> <li>Potentially dusty construction material (e.g. concrete)</li> <li>Onsite concrete batching</li> </ul> |
| <b>Small</b>   | <ul style="list-style-type: none"> <li>Total building volume &lt;25,000 m<sup>3</sup> construction</li> <li>Material with low potential for dust release (e.g. metal cladding or timber)</li> </ul>                     |

## Track-out

- 1.11 Track-out is 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 local road network. The classifications in Table C-5 are based on examples of suitable criteria. Factors such as vehicle size, speed, numbers, geology and duration were also taken into consideration, where possible.

**Table C-5: Potential Track-out Dust Emission Classification**

| Emission Class | Criteria                                                                                                                                                                                                       |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Large</b>   | <ul style="list-style-type: none"> <li>50 HGV (&gt;3.5t) outward movements in any one day</li> <li>Potentially dusty surface material</li> <li>Unpaved road length &gt;100 m</li> </ul>                        |
| <b>Medium</b>  | <ul style="list-style-type: none"> <li>25 – 100 HGV (&gt;3.5t) outward movements in any one day</li> <li>Moderately dusty surface material</li> <li>Unpaved road length 50 – 100 m</li> </ul>                  |
| <b>Small</b>   | <ul style="list-style-type: none"> <li>&lt;25 HGV (&gt;3.5t) outward movements in any one day</li> <li>Surface material with low potential for dust release</li> <li>Unpaved road length &lt; 50 m)</li> </ul> |

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

- 1.12 The sensitivity of the area takes account of the following factors:
- The specific sensitivities of receptors in the area;
  - The proximity and number of those receptors;
  - In the case of PM<sub>10</sub>, the local background concentrations; and
  - Site specific factors, such as whether there are natural shelters, such as trees to reduce the risk of wind-blown dust
- 1.13 The sensitivity of the area is determined separately for dust soiling impacts on people and properties (Table C-6), human health impacts (Table C-7) and ecology impacts (Table C-8).

**Table C-6: Sensitivity of the Area to Dust Soiling Effects on People and Property**

| Receptor Sensitivity | Number of Receptors | Distance from Source |        |        |        |
|----------------------|---------------------|----------------------|--------|--------|--------|
|                      |                     | <20 m                | <50 m  | <100 m | <350 m |
| <b>High</b>          | <b>&gt;100</b>      | High                 | High   | Medium | Low    |
| <b>Medium</b>        | <b>10-100</b>       | High                 | Medium | Low    | Low    |

| Receptor Sensitivity | Number of Receptors | Distance from Source |       |        |        |
|----------------------|---------------------|----------------------|-------|--------|--------|
|                      |                     | <20 m                | <50 m | <100 m | <350 m |
| Low                  | 1-10                | Medium               | Low   | Low    | Low    |

Table C-7: Sensitivity of the Area to Human Health Impacts

| Receptor Sensitivity | Annual Mean PM <sub>10</sub> Concentrations | Number of Receptors | Distance from Source |        |        |        |
|----------------------|---------------------------------------------|---------------------|----------------------|--------|--------|--------|
|                      |                                             |                     | <20 m                | <50 m  | <100 m | <350 m |
| High                 | >32                                         | >100                | High                 | High   | High   | Medium |
|                      |                                             | 10 – 100            | High                 | High   | Medium | Low    |
|                      |                                             | 1 – 10              | High                 | Medium | Low    | Low    |
|                      | 28 – 32                                     | >100                | High                 | High   | Medium | Low    |
|                      |                                             | 10 – 100            | High                 | Medium | Low    | Low    |
|                      |                                             | 1 – 10              | High                 | Medium | Low    | Low    |
|                      | 24 – 28                                     | >100                | High                 | Medium | Low    | Low    |
|                      |                                             | 10 – 100            | High                 | Medium | Low    | Low    |
|                      |                                             | 1 – 10              | Medium               | Low    | Low    | Low    |
|                      | <24                                         | >100                | Medium               | Low    | Low    | Low    |
|                      |                                             | 10 – 100            | Low                  | Low    | Low    | Low    |
|                      |                                             | 1 – 10              | Low                  | Low    | Low    | Low    |
| Medium               | >32                                         | >10                 | High                 | Medium | Low    | Low    |
|                      |                                             | 1 – 10              | Medium               | Low    | Low    | Low    |
|                      | 28 – 32                                     | >10                 | Medium               | Low    | Low    | Low    |
|                      |                                             | 1 – 10              | Low                  | Low    | Low    | Low    |
|                      | 24 – 28                                     | >10                 | Low                  | Low    | Low    | Low    |
|                      |                                             | 1 – 10              | Low                  | Low    | Low    | Low    |
|                      | <24                                         | >10                 | Low                  | Low    | Low    | Low    |
|                      |                                             | 1 – 10              | Low                  | Low    | Low    | Low    |
| Low                  | -                                           | 1 – 10              | Low                  | Low    | Low    | Low    |

Table C-8: Sensitivity of the Area to Ecological Impacts

| Receptor Sensitivity | Distance from Source |        |
|----------------------|----------------------|--------|
|                      | <20 m                | <50 m  |
| High                 | High                 | Medium |
| Medium               | Medium               | Low    |
| Low                  | Low                  | Low    |

## Step 2C: Define the Risk of Impacts

- 1.14 The dust emission magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of effects with no mitigation applied (Table C-9). This Step is undertaken for each activity undertaken on site.

**Table C-9: Dust Risk without Mitigation**

| Activity     | Sensitivity of Area | Dust Emissions Classification |        |            |
|--------------|---------------------|-------------------------------|--------|------------|
|              |                     | Large                         | Medium | Small      |
| Demolition   | High                | High                          | Medium | Medium     |
|              | Medium              | High                          | Medium | Low        |
|              | Low                 | Medium                        | Low    | Negligible |
| Earthworks   | High                | High                          | Medium | Low        |
|              | Medium              | Medium                        | Medium | Low        |
|              | Low                 | Low                           | Low    | Negligible |
| Construction | High                | High                          | Medium | Low        |
|              | Medium              | Medium                        | Medium | Low        |
|              | Low                 | Low                           | Low    | Negligible |
| Trackout     | High                | High                          | Medium | Medium     |
|              | Medium              | Medium                        | Low    | Negligible |
|              | Low                 | Low                           | Low    | Negligible |
|              | High                | High                          | Medium | Medium     |

## Step 3: Identify the need for Project-Specific Mitigation

- 1.15 Based on the risk of effects determined in Step 2C for each activity, appropriate project-specific mitigation measures were recommended. Appropriate mitigation measures are set out in the IAQM Guidance.

## Step 4: Define Impacts and Their Significance

- 1.16 Finally, the significance of the potential residual dust impacts, i.e. after mitigation, was determined. According to the IAQM Guidance the residual impacts assumes that all mitigation measures (recommended in Step 3) to avoid or reduce impacts are adhered to, and therefore the residual impacts should be '**not significant**'.

