

**CHARTERHOUSE STRATEGIC LAND**

**SELSFIELD ROAD, ARDINGLY**

**AIR QUALITY ASSESSMENT**

**REPORT REF – 196651-03**

**MAY 2022**

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## 1.0 INTRODUCTION

### Proposed Development

- 1.1 Ardent Consulting Engineers Ltd have been commissioned by Charterhouse Strategic Land (2) Ltd to carry out an Air Quality Assessment (AQA) in support of a planning application for a proposed residential development at Selsfield Road, Ardingly (hereafter known as 'the Site') located within the Mid Sussex District Council (MSDC) area.
- 1.2 The proposal is for the development of 35 new residential dwellings, with associated parking and landscaping.

### Scope

- 1.3 This report describes baseline air quality within the study area and considers both the suitability of the Site for the proposed development and the potential impact of the proposed development on local air quality during both the construction and the operational phases.
- 1.4 The main air pollutants of concern related to the construction phase are dust and particulate matter (PM<sub>10</sub>) from on-site construction activities and as a result of material tracked out by construction vehicles, and emissions of nitrogen dioxide (NO<sub>2</sub>) and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) from construction vehicle emissions. There is also a potential for impacts on existing designated ecological sites as a result of emissions of nitrogen oxides (NO<sub>x</sub>), NO<sub>2</sub> and ammonia (NH<sub>3</sub>) from development-generated construction vehicles.
- 1.5 The main air pollutants of concern related to the operational phase are emissions of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> associated with operational traffic generation which may impact on existing properties. There is also a potential for impacts on existing designated ecological sites as a result of emissions of NO<sub>x</sub>, NO<sub>2</sub> and NH<sub>3</sub> from development-generated operational vehicles. The air pollutants of concern in terms of the suitability of the Site for its proposed end-use are baseline concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> as a result of emissions from the local road network and background concentrations.

- 1.6 The proposed energy strategy will comprise air-source heat pumps (ASHPs) to and will, therefore, not produce any on-site emissions. As such, the overall effect of the proposed energy strategy can be screened out as being 'not significant'.
- 1.7 The AQA also includes the calculation of damage costs associated with operational development-generated traffic, as well the identification of a number of potentially suitable mitigation measures.
- 1.8 This AQA has been prepared taking into account relevant local and national guidance, policy and legislation.

## 2.0 LEGISLATION, POLICY AND GUIDANCE

### National Air Quality Legislation and Strategy; Human Health

#### *The Air Quality Strategy*

- 2.1 The Air Quality Strategy (Defra, 2007) established the policy framework for ambient air quality management in the UK, with the objective of ensuring a quality of ambient air for all that would not pose a significant risk to health or quality of life. This document set out the National Air Quality Objectives (NAQOs) and the policy for achieving them. It followed part IV of the Environment Act (UK Government, 1995) which introduced a system of Local Air Quality Management (LAQM) requiring local authorities to regularly review and assess air quality within their boundary and appraise plans in light of these assessments.
- 2.2 Where a NAQO is unlikely to be met, the local authority must designate an Air Quality Management Area (AQMA) and draw up an Air Quality Action Plan (AQAP) which should include measures expected to ensure that the NAQOs are met within the AQMA.

#### *National Air Quality Objectives*

- 2.3 NAQOs were defined by The Air Quality Strategy (Defra, 2007) and enshrined in regulations by the Air Quality Standards Regulation (Statutory Instrument, 2010, No 1001) and Air Quality Standards (Amendment) Regulations (Statutory Instrument, 2016 No. 1184) which implemented the European Union Directive on ambient air quality and cleaner air for Europe (Directive 2008/50/EC). Relevant objectives are set out in **Table 2-1**.
- 2.4 The Environment Act 2021 (UK Government, 2021) establishes a legally binding duty on government to set a long-term target for at least one air quality matter, in addition to a separate requirement to set a target regarding annual mean PM<sub>2.5</sub> concentrations, by October 2022. An online consultation is ongoing (between 16<sup>th</sup>

March and 11<sup>th</sup> May 2022) regarding the proposed new targets<sup>1</sup> (Defra, 2022). As these proposed new targets are still subject to consultation and approval, the consideration of air quality within this AQA is undertaken in the context of the currently approved objectives only, as set out in **Table 2-1**.

**Table 2-1: NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> Objectives**

| Pollutant                               | Time Period               | Objective                                                                      |
|-----------------------------------------|---------------------------|--------------------------------------------------------------------------------|
| Nitrogen Dioxide (NO <sub>2</sub> )     | 1-hour mean               | 200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year             |
|                                         | Annual mean               | 40 µg/m <sup>3</sup>                                                           |
| Particulate Matter (PM <sub>10</sub> )  | 24-hour mean              | 50 µg/m <sup>3</sup> not to be exceeded more than 35 <sup>2</sup> times a year |
|                                         | Annual mean               | 40 µg/m <sup>3</sup> <sup>3</sup>                                              |
| Particulate Matter (PM <sub>2.5</sub> ) | Annual mean               | 25 µg/m <sup>3</sup> <sup>4</sup>                                              |
|                                         | Annual mean               | 20 µg/m <sup>3</sup> <sup>5</sup>                                              |
|                                         | Exposure reduction target | 15% reduction between 2010 and 2020 at Urban Background sites                  |

2.5 Analysis of long-term monitoring data suggests that if the annual mean NO<sub>2</sub> concentration is less than 60 µg/m<sup>3</sup> then the 1-hour mean NO<sub>2</sub> objective is unlikely to be exceeded where road transport is the main source of pollution (Defra, 2016). This concentration has therefore been used in this AQA to screen whether an

<sup>1</sup> Proposed air quality targets are 1) Annual Mean PM<sub>2.5</sub> Concentration Target of 10 µg/m<sup>3</sup> to be met across England by 2040; and 2) Population Exposure PM<sub>2.5</sub> Reduction Target of a 35% reduction in population exposure by 2040 (as compared to a base year of 2018).

<sup>2</sup> 7 times a year for Scotland.

<sup>3</sup> 18 µg/m<sup>3</sup> for Scotland.

<sup>4</sup> 12 µg/m<sup>3</sup> for Scotland.

<sup>5</sup> Indicative stage 2 limit value post 2020, derived based on the exposure reduction target of a 15% reduction between 2010 and 2020. This value has been used as the relevant air quality objective throughout this assessment in order to ensure a conservative approach.

exceedance of the 1-hour mean NO<sub>2</sub> objective is likely. Similarly, an annual mean PM<sub>10</sub> concentration of 32 µg/m<sup>3</sup> is used to screen whether an exceedance of the 24-hour mean PM<sub>10</sub> objective is likely.

- 2.6 Local Air Quality Management Technical Guidance 2016 (LAQM.TG(16)) (Defra, 2016) provides guidance to local authorities as to where objectives apply. These are summarised in **Table 2-2**.

**Table 2-2: Relevant Exposure**

| Averaging Period | Relevant Locations                                                          | Objectives should apply                                                                                       | Objectives don't usually apply                                                  |
|------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Annual mean      | Where individuals are exposed for a cumulative period of 6 months in a year | Facades of residential properties, schools and hospitals                                                      | Gardens, facades of offices, hotels and shops or kerbside sites                 |
| 24-hour mean     | Where individuals are expected to be exposed for 24-hours or longer         | As above, with the addition of hotels and gardens of residences                                               | Kerbside sites and areas where the public is unlikely to spend significant time |
| 1-hour mean      | Where individuals are expected to spend one hour or longer                  | As above, with the addition of locations with regular access such as car parks, bus stations, parks and cafes | Locations not publicly accessible or where occupation is not regular            |

***National Air Quality Plan for Nitrogen Dioxide (NO<sub>2</sub>) in the UK***

- 2.7 The National Air Quality Plan (Defra and DfT, 2017) was written as a joint venture between The Department For Environment, Food and Rural Affairs (Defra) and the Department for Transport (DfT) and aims to tackle roadside concentrations of NO<sub>2</sub> in the UK. It includes a number of measures such as those aimed at investing in Ultra Low Emission Vehicles (ULEVs) charging infrastructure, public transport and grants to help local authorities in improving air quality.
- 2.8 The plan requires all local authorities in England with areas expected not to meet the Objectives by 2020 (known as 'air quality hotspots') to develop plans to bring

concentrations within these values in "*the shortest time possible*". These plans are to be reviewed by the government and suggestions included in the plan include actions such as utilising retrofitting technologies, changing road layout and encouraging public transport and ULEV use. Where these approaches are not considered sufficient, the local authority may need to consider implementation of a Clean Air Zone (CAZ) which places restrictions on vehicle access to an area and may include charging certain (or all) vehicles or restrictions on the type of vehicle allowed to access an area.

### ***The Road to Zero Strategy***

- 2.9 The 'Road to Zero' strategy (HM Government, 2018) set out the governments aims regarding zero emissions vehicles. These include the aim that all new cars and vans have zero tailpipe emissions by 2040 and for almost every car to be zero emission by 2050. Measures are aimed at encouraging uptake of the cleanest vehicles and supporting electric charging infrastructure.

### ***Clean Air Strategy***

- 2.10 The Clean Air Strategy (Defra, 2019) sets out policies to lower national emissions of pollutants in order to reduce background pollution and human exposure. It aims to create a strong framework to tackle air pollution and to reduce the number of people living in locations with PM<sub>2.5</sub> concentrations exceeding 10 µg/m<sup>3</sup> by 50% by 2025.

### **National Air Quality Legislation; Ecology**

- 2.11 Poor air quality can have a negative impact on ecological habitats as well as human health. The Conservation of Habitats and Species Regulations (Statutory Instrument, 2017) was put in place in order to protect ecological sites following the publication of European Directive 92/43/EEC (European Economic Community (EEC), 1992) regarding the designation of Special Areas of Conservation (SACs) and 2009/147/EC (European Community, 2009) regarding the designation of Special Protection Areas (SPAs).

- 2.12 The Wildlife and Countryside Act (UK Government, 1981) sets out the requirement for the identification of areas of land that are considered to be of 'special interest' (due to flora, fauna and / or geological or physiographical features) as Sites of Special Scientific Interest (SSSIs), and the Countryside and Rights of Way (CROW) Act (HM Government, 2000) sets out the specific protections afforded to SSSI, stating that where a development is 'likely to damage' a SSSI then the appropriate conservation body must be consulted.
- 2.13 The Environment Act (UK Government, 1995) and the Natural Environment and Rural Communities Act (HM Government, 2006) set out a general requirement for conservation of biodiversity.

### **Critical Levels**

- 2.14 Critical levels have been set for a number of gaseous pollutants. These are the concentrations of pollutants below which there is no known harmful effects on vegetation or ecosystems. These levels have been set by UK government and are considered to be relevant objectives for all internationally designated sites, as well as for nationally designated sites such as SSSIs, and locally designated sites such as Local Nature Reserves (LNR) and Ancient Woodland (AW). The relevant critical levels are set out in **Table 2-3**.

**Table 2-3: Ecological Critical Levels**

| Pollutant                                          | Time Period | Objective                                                                                       |
|----------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|
| Nitrogen Oxides<br>(expressed as NO <sub>2</sub> ) | Annual Mean | 30 µg/m <sup>3</sup>                                                                            |
| Ammonia (NH <sub>3</sub> )                         | Annual Mean | 3 µg/m <sup>3</sup> (unless lichens or<br>bryophytes are present, then<br>1 µg/m <sup>3</sup> ) |

### **Critical Loads**

- 2.15 Critical loads represent the amount of pollutant deposited to a given ecosystem over a year, below which it is understood that there is no harmful effect to the ecosystem. Critical loads have been identified for a number of different types of ecosystem, based on their sensitivity to adverse effects. Critical loads for the

deposition of nitrogen have been set for the protection from eutrophication, whilst critical loads for the purpose of protection against acidification have been set for deposition of both nitric acid and sulphuric acid, together termed as acid deposition. Critical loads for sensitive ecological sites vary throughout the UK.

## **Planning Policy**

### ***National Planning Policy***

- 2.16 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021) sets out the Government's planning policies for England and how they expect these to be implemented. Consideration of air quality within planning is considered an important element of this framework which recommends that transport and the potential impact on the environment should be considered at an early stage in order to allow for mitigation or even avoidance of impacts through location and layout of developments.
- 2.17 It is recommended that both the impacts of a potential development on the environment and the risk to new development from existing pollution be taken into account when planning policy is drafted. Furthermore these should contribute to compliance with relevant limit values or objectives and should be consistent with any local AQAP.
- 2.18 The NPPF also recommends that *"existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."*
- 2.19 The NPPF also states that:
- "Planning policies and decisions should contribute to and enhance the natural and local environment by:*
- *Protecting and enhancing...sites of biodiversity or geological values...*

- *minimising impacts on...biodiversity..."*

2.20 The Planning Practice Guidance (PPG) provides guidance on how planning can enact the policies set out in NPPF. It is set out as separate papers for different sectors and, therefore, the 'Air Quality' PPG (Ministry of Housing, Communities and Local Government, 2019) is aimed at addressing policy relating specifically to air quality. This document gives guidelines for when air quality is likely to be relevant to a planning decision:

*"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."*

2.21 The 'Air Quality' PPG also states that more detailed information such as whether the development could have a significant impact on air quality, baseline air quality and whether occupiers of the development could experience poor air quality may be required in order to make an informed decision. Further, it notes that any assessment should be proportionate, taking into account the scale of the proposed development, as well as any potential impacts.

2.22 Some suggestions on mitigation measures are set out within the PPG, such as separation distances, filtration/ventilation, green infrastructure, promotion of low emission forms of transport, control of dust and emissions from construction and, finally, contributing funding to measures such as those identified in AQAPs to offset impacts from the development.

## **Local Policy**

### ***MSDC Local Plan***

2.23 The Mid Sussex District Plan (MSDP) was adopted in March 2018 (MSDC, 2018) and covers the period between 2014 and 2031. A central aim of the MSDP is to "increase the sustainability of communities within Mid Sussex ..." and *"to make communities more sustainable by ... reducing the environmental impacts of*

increased traffic and congestion on air pollution and quality of life". The MSLP includes the following relevant policy:

- Policy DP29 'Noise, Air and Light Pollution' states the following:

*"The environment, including nationally designated environmental site, nationally protected landscapes, areas of nature conservation or geological interest, wildlife habitats, and the quality of people's life will be protected from unacceptable levels of ... air pollution by only permitting development where the applicant can prove that the proposed development:*

*Air Pollution:*

- *"It does not cause unacceptable levels of air pollution;*
- *Development on land adjacent to an existing use which generates air pollution or odour would not cause any adverse effects on the proposed development or can be mitigated to reduce exposure to poor air quality to recognised and acceptable levels;*
- *Development proposals ... are consistent with Air Quality Management Plans".*

## **MSDC AQAP**

- 2.24 Under LAQM (Defra, 2016), MSBC are required to regularly review and assess air quality within the Borough and determine whether or not the air quality objectives are likely to be achieved.
- 2.25 There is currently one declared AQMA within MSDC, the 'Mid Sussex AQMA No. 1' located at the Stonepound Crossroads in Hassocks, which was declared as a result of exceedances of the annual mean NO<sub>2</sub> objective. The proposed development Site is located approximately 14.8 km to the north of this AQMA.

2.26 Following the declaration of 'Mid Sussex AQMA No. 1' in 2012, MSDC produced an AQAP which was since updated in September 2020 (MSDC, 2020). The AQAP focussed on a range of measures designed to achieve the annual NO<sub>2</sub> air quality objective. The current actions within the AQAP include the following:

- Minimising HGV movements – advisory lorry routes;
- "Cut Engine, Cut pollution" signs;
- Improve and promote cycle routes; and
- Encourage alternate transport modes.

#### **Assessment Guidance**

2.27 This assessment has been based on a number of guidance documents, the most significant of which are set out below:

#### ***Local Air Quality Management Technical Guidance (LAQM.TG(16))***

2.28 Defra's LAQM.TG(16) guidance document (Defra, 2016) was published for use by local authorities for review and assessment work, but also includes a number of technical guidelines on carrying out modelling assessment and management of monitoring data which set out best practice and are, therefore, relevant to all air quality assessments.

#### ***Land-Use Planning and Development Control: Planning for Air Quality***

2.29 The Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) have published joint guidance on the assessment of air quality impacts for planning purposes (EPUK & IAQM, 2017). This includes information on when an air quality assessment is required, what should be included in an assessment and the assessment of significance.

#### ***Guidance on the Assessment of Dust from Demolition and Construction***

2.30 The IAQM have produced guidance which includes a methodology for identifying the risk magnitude of potential dust sources associated with demolition,

construction, earthworks and trackout (IAQM, 2014). This is then used to identify the level of mitigation necessary in order for the impacts to be 'not significant'.

### ***A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites***

- 2.31 The IAQM guidance, 'Assessment of Air Quality Impacts on Designated Nature Conservation Sites', (IAQM, 2020) sets out the appropriate approach for this element of assessment. Due to the complexity of ecological impacts, an air quality professional alone can only identify whether emissions are unlikely to have a significant impact when compared against the relevant critical load / level. Where it cannot be ascertained that emissions are below this level, the combined input of both an air quality professional and an ecologist is required; the former to identify any changes to concentrations of deposition and the latter to consider the overall effect taking into consideration the location and sensitivity of any given habitat.

### **Air Quality and Emissions Mitigation Guidance for Sussex (2021)**

- 2.32 The Sussex-Air Air Quality Partnership published an updated version of the 'Air quality and emissions mitigation guidance for Sussex (2021)' in April 2021 (Sussex-air, 2021). This guidance details when it is necessary to undertake an AQA and outlines standard mitigation requirements for developments.
- 2.33 The guidance also details the Emissions Mitigation Assessment and Statement procedure that should be followed, including a method for calculating damage costs associated with a proposed development and recommendation of appropriate mitigation measures options.

### **Air Quality Appraisal; Damage Cost Guidance**

- 2.34 The latest version of the 'Air Quality Appraisal; Damage Cost Guidance' was published by Defra in March 2021 (Defra, 2021a) and details the process for assessing the air quality impact of a policy of project and sets out damage cost values for five pollutants.
- 2.35 The guidance references the 'Damage Costs Appraisal Toolkit' (Defra, 2021b) which can be used in conjunction with the guidance (and in conjunction with the

'Air Quality and Emissions Mitigation Guidance for Sussex' within which it is referenced) to calculate the damage costs associated with a development.

### 3.0 METHODOLOGY

- 3.1 The methodology set out in the following sections has been identified as being the most appropriate approach to assess potential impacts associated with the proposed development and whether these impacts are acceptable, along with any required mitigation.

#### **Baseline Air Quality**

- 3.2 Information regarding 'current'<sup>6</sup> and 'future'<sup>7</sup> baseline air quality has been obtained by collating the results of monitoring carried out by GBC, referring to identified AQMAs, considering any exceedances of the EU Limit Values predicted by Defra's Pollution Climate Mapping (PCM) model (Defra, 2020b) or measured by any nearby Automatic Urban or Rural Network (AURN) monitoring site(s) and by considering predicted background concentrations defined based on the national pollution maps published by Defra (Defra, 2020c).

#### **Construction Dust Impacts**

- 3.3 There is a potential for dust from onsite activities and off-site trackout during the construction phase to have an impact on sensitive human and ecological receptors within the study area.
- 3.4 The suspension of dust and particulate matter is related to weather conditions and wind direction, ground and particle characteristics and on-site activities. There is a potential for impacts to occur when dust generating activities coincide with dry, windy conditions and where sensitive receptors are located downwind of the dust source.
- 3.5 Separation distance is an important factor as large particles (>30 µm) which are responsible for most dust annoyance largely deposit within 100 m of sources. Intermediate particles (10-30 µm) can travel 200-500 m but are less likely to

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<sup>6</sup> The 'current' baseline year for the purposes of this assessment has been taken to be 2019 as this is the most recent year for which representative local monitoring data are available.

<sup>7</sup> The 'future' baseline year has been taken to be 2024 as this is the earliest year that any part of the proposed development is anticipated to be operational.

trigger annoyance. Significant annoyance is therefore generally limited to a few hundred metres of the source. Small particles ( $<10\text{ }\mu\text{m}$ ) are deposited slowly and may travel up to 1 km. Whilst these particles are responsible for most impacts on human health, impacts are not likely to be experienced at significant distance due to dispersion effects.

- 3.6 The assessment of construction dust impacts has been carried out following the IAQM's 'Guidance on the Assessment of Dust from Construction and Demolition' (IAQM, 2014). Within the guidance, an 'impact' is described as a change in pollutant concentration or dust deposition and an 'effect' is described as the consequence of an impact.
- 3.7 The assessment considers three potential dust impacts:
- Dust soiling, which may lead to loss of amenity;
  - An increase in concentrations of  $\text{PM}_{10}$ , which may lead to human health effects; and
  - Dust deposition to ecological receptors.
- 3.8 Full details of the approach taken to assessing dust are provided in **Appendix B**. The stages of the assessment are:
- Identify whether there are sensitive receptors within the relevant distances (study area) for site activities during the construction phase;
  - Assess risk of dust impacts for each site activity type (demolition, earthworks, construction and trackout) – this includes identifying the emissions magnitude for each activity type, the sensitivity of the area and then combining these factors to identify risk;
  - Identify mitigation measures, based on assessed risk, sufficient to ensure off-site impacts are not significant; and
  - Assess impacts with mitigation in place. These should normally be not significant.

- 3.9 The IAQM guidance makes it clear that no assessment of the significance of impacts without mitigation should be carried out as mitigation measures will be required due to planning conditions as well as best practice for construction companies. The IAQM guidance also states that the residual impact, taking into account the proposed mitigation will usually be 'not significant'.

### **Development-Generated Construction Road Traffic Impacts**

#### ***Human Health***

- 3.10 The potential impacts on nearby existing sensitive locations as a result of development-generated construction traffic have been qualitatively assessed, taking into consideration the likely volumes, composition and routing of development-generated construction traffic, the anticipated duration of the construction period and any anticipated mitigation measures that are likely to be applied.
- 3.11 Where it is not possible to screen out significant effects from road sources, detailed modelling is then generally required.

#### ***Ecology***

- 3.12 A screening assessment of the potential impacts on nearby existing designated ecological sites as a result of development-generated construction traffic have been assessed, taking into consideration the likely volumes, composition and routing of development-generated construction traffic, the anticipated duration of the construction period and any anticipated mitigation measures that are likely to be applied.
- 3.13 Where it is not possible to screen out significant effects from road sources, detailed modelling and / or additional assessment in conjunction with an ecologist is then generally required.

## **Development-Generated Operational Road Traffic Impacts**

### ***Human Health***

3.14 The IAQM/EPUK guidance 'Land Use Planning and Development Control: Planning for Air Quality' (EPUK & IAQM, 2017) includes a list of indicative criteria for where a detailed air quality assessment would be needed. The criteria relating to screening air quality impacts relating to additional traffic are:

- An increase in Light Duty Vehicle (LDV) traffic of >500 annual average daily traffic (AADT) (or >100 AADT within or adjacent to an AQMA); and/or
- An increase in Heavy Duty Vehicle (HDV) traffic of >100 AADT (or >25 AADT within or adjacent to an AQMA).

3.15 The above criteria apply to any individual link and, therefore, a development generating >500 AADT (or >100 AADT within an AQMA) may be considered to fall below the screening criteria where the increase is spread over a number of different road links.

3.16 Where it is not possible to screen out significant effects from road sources, detailed modelling is then generally required.

### ***Ecology***

3.17 Based on the IAQM guidance (IAQM, 2020) there is a potential for 'significant' effects on ecology as a result of transport emissions in cases where sensitive designated ecological sites are located within 200 m of a road with an affected road where a development alone, or in combination with other committed development(s), will increase traffic flows by >1,000 total AADT and / or >200 HDV AADT.

- 3.18 In cases where committed development traffic is not available and / or the screening criteria referenced by the IAQM guidance is exceeded, then an alternative screening criteria of 50 total AADT and / or 10 HDV AADT for development-generated operational traffic only is commonly used.
- 3.19 Where it is not possible to screen out significant effects from road sources, detailed modelling and / or additional assessment in conjunction with an ecologist is then generally required.

### **Site Suitability**

- 3.20 The potential for exceedances of the relevant objectives at sensitive locations within the proposed development has been assessed qualitatively, taking into consideration the location of the Site in relation to nearby emission sources (e.g. local roads and railway lines), the layout of the proposed development and baseline air quality conditions within the Site and in the surrounding area.
- 3.21 Where it is not possible to screen out the potential for significant effects, detailed assessment is then generally required.
- 3.22 This assessment has also taken into account the following suggested screening criteria set out within LAQM.TG(16) which suggests that screening of road traffic sources should consider:
- Roads with 5,000 AADT where exposure is within 2 m of the kerb and traffic is slow moving or stop/start; and / or
  - Roads with 10,000 AADT; and / or
  - Roads carrying more than 2,500 HDV movements per day.

### **Air Quality Impacts Significance Criteria**

- 3.23 In the absence of official guidance in the UK on how to assess the significance of the air quality impacts of a new development, this assessment has been limited to a comparison of predicted pollutant concentrations within the proposed development, against the relevant objectives (see **Table 2-1** and **Table 2-2**).

### Damage Cost Calculations

- 3.24 As set out within the 'Air Quality and Emissions Mitigation Guidance for Sussex' (Sussex-air, 2021) the damage costs associated with operational traffic generated by the proposed development have been calculated following the approach outlined by Defra's damage cost guidance (Defra, 2021a). This approach involves using Defra's EFT<sup>8</sup> (Defra, 2020d) to calculate the amount of NO<sub>x</sub> and PM<sub>2.5</sub> emissions that operational traffic generated by the proposed development will produce over a five-year period; these have then been multiplied by the damage cost values provided by Defra (using the 'Damage Costs Appraisal Toolkit') (Defra, 2021b) to provide the total attributable development damage costs.

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<sup>8</sup> Defra's EFT v10.1 has been used for the purposes of this AQA. It is acknowledged that an updated version of the EFT, EFT v11.0 (Defra, 2021), has recently (November 2021) been released by Defra, however, as there are no changes to NO<sub>x</sub>, PM<sub>10</sub> or PM<sub>2.5</sub> emission factors that are applicable to the assessment years considered by this AQA, the use of EFT v10.1 (as opposed to EFT v11.0) will make no difference to the outcome of the damage cost calculations.

## 4.0 BASELINE CONDITIONS

### Site Context and Study Area

- 4.1 The Site is set within rural surroundings, predominantly consisting of residential properties and green parcels of land. The Site is bounded to the east by Selsfield Road (B2028), to the north by the South of England Showground, to the west by a green parcel of land and to the south by existing residential properties beyond Ardingly Cricket Club grounds.
- 4.2 There are several designated ecological sites located in close proximity to the Site, including a number of AW sites, the 'Ardingly Reservoir' LNR and the 'Wakehurst and Chiddingly Woods' SSSI.
- 4.3 The study area in relation to air quality has been defined as:
- For the construction dust risk assessment, the study area is the area up to 350 m from the development site boundary and up to 50 m of the route(s) used by construction vehicles on the public highway (up to 500 m from the site exit(s)). This is based on the IAQM guidance (IAQM, 2014);
  - For the assessment of the effect of construction and operational development-generated traffic on human health, the study area incorporates all main roads (and adjacent sensitive human receptors) along which vehicles generated by the proposed development may travel;
  - For the assessment of the effect of construction and operational development-generated traffic on ecology, the study area incorporates all main roads located within 200 m of a designated ecological site along which vehicles generated by the proposed development may travel, as well as parts of the designated ecological site located within 200 m of the road; and
  - For the assessment of Site suitability, the study area has been identified as the area within the boundary of the site and sources which will influence this area.

### EU Limit Values and Clean Air Zones

- 4.4 MSDC has not been identified by The National Air Quality Plan (Defra and DfT, 2017) as being required to implement a CAZ, nor produce a local action plan to address predicted exceedances of the NO<sub>2</sub> EU Limit Value within its area.
- 4.5 There are no AURN monitoring sites located in close proximity to the Site and, therefore, no nearby exceedances of the EU Limit Values have been measured.
- 4.6 Defra's PCM model does not predict any exceedances of the NO<sub>2</sub> annual mean EU Limit Value on roads in close proximity to the Site in 2019. No exceedances of the annual mean PM<sub>10</sub> and PM<sub>2.5</sub> EU Limit Values were predicted on roads in close proximity to the Site in 2018, 2020<sup>9</sup> and 2024.

### LAQM

- 4.7 MSDC has assessed air quality within its area as part of its responsibilities under LAQM. In 2012 MDSC declared an AQMA, the 'Mid Sussex AQMA No. 1' located at Stonepound Crossroads in Hassocks, as a result of exceedances of the annual mean NO<sub>2</sub> objective. The Site is located approximately 14.8 km to the north of this AQMA.

### Monitoring

- 4.8 MSDC carried out NO<sub>2</sub> monitoring at 30 diffusion tube monitoring sites in 2019. However, none of these monitoring sites are located in close proximity to the proposed development Site and the closest sites are not representative of conditions within the Site (the closest the monitoring site (MSAQ1) is located approximately 6.3 km to the south of the Site (see **Figure 4-1**). As such, details of the monitoring sites and measured NO<sub>2</sub> concentrations have not been presented within this AQA.

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<sup>9</sup> 2019 data are not available for PM, and so data for 2018, 2020 and 2025 have been considered instead.



**Figure 4-1: Local Monitoring Locations**

#### Predicted Background Concentrations

- 4.9 Predicted background concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> have been obtained from national maps provided by Defra (Defra, 2020c) and are shown in **Table 4-1**.
- 4.10 The predicted background concentrations are all well below the relevant objectives within the Site in both 2019 and 2024.

**Table 4-1: Predicted Annual Mean Background Concentrations (µg/m<sup>3</sup>)**

| Year       | Location                      | NO <sub>2</sub> | PM <sub>10</sub> | PM <sub>2.5</sub> |
|------------|-------------------------------|-----------------|------------------|-------------------|
| 2019       | Site (approx. 534500, 129900) | 8               | 13               | 9                 |
| 2024       |                               | 7               | 13               | 8                 |
| Objectives |                               | 40              | 40               | 20                |

Predicted concentrations are rounded as appropriate taking into consideration the level of accuracy of the data source as well as the relevant objectives.

## 5.0 PREDICTED IMPACTS

### Construction Dust Impacts

#### *Screening Assessment*

- 5.1 The primary potential effects during the construction phase relate to annoyance and loss of amenity caused by dust soiling, health impacts relating to PM<sub>10</sub> and ecological impacts due to dust deposition. Based on the screening criteria set out by the IAQM, it is considered necessary to carry out a construction dust risk assessment as there are sensitive human receptors located within 350 m of the Site boundary and within 50 m of the roads along which dust may be tracked out by construction vehicles.
- 5.2 There are no ecological sites within 50 m of the site boundary or roads along which dust may be tracked and therefore the assessment of dust deposition on ecological sites can be scoped out.

#### *Further Assessment*

##### *Dust Emission Magnitude*

- 5.3 The dust emission magnitude relating to demolition, earthworks, construction and trackout activities have been determined based on the IAQM guidance (as set out in **Appendix B**).
- 5.4 There are not anticipated to be any demolition activities associated with the proposed development since there are no structures present within the Site. The potential risk of dust emissions associated with demolition activities may, therefore, be screened out and is not considered further.
- 5.5 Proposed earthworks activities are likely to occur across the majority of the Site and include excavating foundations of the proposed development. Works could extend up to approximately 26,300 m<sup>2</sup> (the approximate area of the Site). The soil at the Site is of intermediate depth, with a sand to sandy loam texture and a sandstone subsoil with grains being arenaceous<sup>10</sup> in size (UK Soil Observatory,

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<sup>10</sup> Typical particle size between 0.6 and 2 mm.

2022). As such, the soil composition is considered to have the potential to be moderately dusty. Therefore, the emission magnitude associated with earthworks activities is considered to be 'large'.

- 5.6 The development will involve the construction of 35 new residential dwellings, with an estimated building volume of less than 25,000 m<sup>3</sup> in total. As such, the emission magnitude associated with construction activities is considered to be 'small'.
- 5.7 The number of vehicles exiting the Site which may track material onto roads is unknown, however, given the size and nature of the construction activities at the Site, peak movements are expected to be between 10 and 50 HDVs per day. As such, the dust emission magnitude associated with trackout activities is considered to be 'small'.

#### *Area Sensitivity*

- 5.8 The sensitivity of the area to dust soiling and human health impacts has been assessed based on the criteria shown in **Appendix B**.
- 5.9 Residential properties and schools are considered to be of 'high' sensitivity to dust soiling impacts, whilst commercial premises are considered to be of 'medium' sensitivity to dust soiling. There is one residential property located within 20 m of the Site boundary. Therefore, the overall sensitivity of the area surrounding the Site to dust soiling is considered to be 'medium'.
- 5.10 The guidance states that trackout can occur on roads up to 500 m from 'large' sites (i.e. the development Site). As construction vehicle routing are not currently known, the worst-case assumption has been made that all main roads may be used by HDVs exiting the Site, and that dust and mud may be tracked up to 500 m along these roads from the Site exit(s). There are between 10 and 100 residential properties within 20 m of roads which may be subject to dust soiling impacts from trackout. As such, the sensitivity to dust soiling impacts relating to trackout is considered to be 'high'.
- 5.11 Residential properties and schools are considered to be of 'high' sensitivity in terms of human health impacts, whilst commercial properties are considered to be of 'medium' sensitivity. For the purposes of the construction dust risk assessment,

the assumption has been made that annual mean PM<sub>10</sub> concentrations within the study area are comparable to background concentrations in the current<sup>7</sup> year (i.e. 13 µg/m<sup>3</sup>, as shown in **Table 4-1**). Taking into account the assumed background PM<sub>10</sub> concentrations and the number of sensitive receptors located within 20 m of the Site boundary (see Paragraph 5.9) and within 20 m of the roads where trackout may occur (see paragraph 5.10), the sensitivity of the surrounding area to human health impacts is, therefore, considered to be 'low' for both on-site activities for trackout activities.

#### *Risk of Impacts*

- 5.12 The risk of construction dust impacts, without mitigation, have been assessed based on the tables provided in **Appendix B** and the identified risks are shown in **Table 5-1**.

**Table 5-1: Risk of Construction Dust Impacts Without Mitigation**

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

- 5.13 Overall, taking into consideration the risks set out in **Table 5-1**, appropriate mitigation measures corresponding to a 'medium risk' site are required, although where measures relate to construction and trackout activities only, measures relating to a 'low risk' site will be sufficient. The recommended list of mitigation measures is set out in **Section 6.0**.
- 5.14 The IAQM recommends that no judgement of the significance of construction dust effects should be made without taking mitigation into account. This is due to the fact that mitigation measures are assumed to be secured by planning conditions and legal requirements as well and construction codes of conduct. Following implementation of the recommended mitigation (as set out in **Section 6.0**), residual impacts will be 'not significant'.

## **Development-Generated Construction Road Traffic Impacts**

### ***Human Health***

- 5.15 The volume of construction traffic generated by the proposed development is not currently available, however, there is likely to be significant fluctuation in the numbers of vehicle movements associated with proposed development throughout the construction period. When these vehicle movements are averaged over a year, they will be significantly lower than peak movements.
- 5.16 Volumes of construction traffic generated by the proposed development are anticipated to be lower than volumes of development-generated operational traffic, as this is typically the case for developments of this size and type. This being the case, it is reasonable to expect that impacts associated with emissions from construction vehicles will be less adverse than those described in Paragraph 5.23.
- 5.17 It should also be taken into consideration that any impacts associated with the construction phase will be temporary in nature, with the construction phase anticipated to have a maximum duration of up to 2 years. Furthermore, it is anticipated that a Construction Environmental Management Plan (CEMP) will be developed and will include measures to minimise emissions associated with construction vehicles, thus further reducing any potential impacts.
- 5.18 On the basis of the above, it is considered that the overall effect of development-generation construction traffic on nearby sensitive existing properties is likely to be 'not significant'.

### ***Ecology***

- 5.19 As described in Paragraph 5.15, specific details regarding the volume and routing of construction traffic generated by the proposed development is not currently available, however, the average vehicle movements during the construction phase are likely to be significantly lower than peak movements. The volume and routing of construction traffic associated with nearby committed developments in the local area is also not known.

- 5.20 Volumes of construction traffic generated by the proposed development are anticipated to be lower than volumes of development-generated operational traffic, as this is typically the case for developments of this size and type, as described in Paragraph 5.16. This being the case, it is reasonable to expect that impacts associated with emissions from construction vehicles will be less adverse than those described in Paragraphs 5.24 to 5.27.
- 5.21 Furthermore, as described in Paragraph 5.17, it should also be noted that the construction phase will be temporary (with an anticipated maximum duration of approximately 2 years) and it is anticipated that emissions will be controlled through the implementation of a CEMP.
- 5.22 On the basis of the above, it is considered that the overall effect of development-generation construction traffic on nearby designated ecological sites is likely to be 'not significant'.

### **Development-Generated Operational Road Traffic Impacts**

#### ***Human Health***

- 5.23 The proposed development will generate a total of 236 AADT<sup>11</sup> during the operational phase<sup>12</sup>. As such, traffic generation falls below the EPUK/IAQM screening criteria and, therefore, it is possible to screen out the overall effect of development-generated operational traffic on nearby sensitive existing properties as being 'not significant', without the need for further detailed assessment.

#### ***Ecology***

- 5.24 There are several designated ecological sites located in close proximity to the Site, including a number of AWs and a SSSI ('Wakehurst and Chiddingly Woods' SSSI) set back from Selsfield Road (B2028), as well as the 'Ardingly Reservoir' LNR located adjacent to Balcombe Lane and part of the 'Wakehurst and

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<sup>11</sup> The percentage of development-generated HDVs have not been provided, however, this is expected to be approximately 0 HDV AADT, which will fall below the EPUK/IAQM screening criteria (as advised by the project's transport consultant; ACE).

<sup>12</sup> Information provided by the project's transport consultant; ACE.

Chiddingly Woods' SSSI set back from Paddockhurst Lane, which are located within 200 m of nearby roads.

- 5.25 The proposed development is anticipated to generate a total of 236 total AADT, some of which may travel along roads located within 200 m of designated ecological sites, including part of the 'Wakehurst and Chiddingly Woods SSSI. However, it is not currently known exactly how the operational traffic will disperse across the wider road network<sup>12</sup>.
- 5.26 As the volume and routing of operational traffic associated with nearby committed developments is not known, it is not possible to directly compare combined proposed development and committed development operational traffic flows with the relevant screening criteria (see Paragraph 3.17). However, taking into consideration the volume of operational traffic anticipated to be generated by the proposed development, in addition to the lack of significant committed developments in the local area (i.e. the majority of committed development in the area are located a substantial distance from roads likely to be used by the proposed development-generated traffic), it is considered to be likely that the combined operational traffic flows will be below the relevant screening criteria (see Paragraph 3.17).
- 5.27 On the basis of the above it is considered that the overall effect of development-generated operational traffic on nearby designated ecological sites is likely to be 'not significant'.

### **Site Suitability**

- 5.28 The proposed development will introduce new areas of sensitive exposure which are sensitive to the annual mean and short-term NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> objectives (i.e. the proposed residences).
- 5.29 The development Site is located alongside Selsfield Road (B2028), which is considered to be the most significant emissions source with the potential to impact on the air quality that new residents of the proposed development will experience. Selsfield Road is a free-flowing rural B-road carrying approximately 6,400 AADT in 2021 (traffic data provided by the project's transport consultant (ACE)).

- 5.30 The proposed residences (i.e. the most sensitive locations) are expected to be set back from Selsfield Road by approximately 25 m. As pollutant concentrations reduce rapidly with distance from the source (i.e. local roads), it is reasonable to expect emissions associated with these roads to disperse considerably before reaching the closest façades of the proposed residences. As such, all of the proposed residences are likely to experience pollutant concentrations comparable to background conditions. Predicted background annual mean concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> are well below the annual mean objectives in 2024<sup>7</sup> (i.e. the earliest year of development occupation) (see **Table 4-1**).
- 5.31 Furthermore, as the closest proposed residence is located approximately 25 m from the kerb of Selsfield Road, and taking into consideration the nature of Selsfield Road, and the distance between this source and proposed residential exposure, the proposed development falls outside the LAQM.TG(16) screening criteria (see Paragraph 3.22).
- 5.32 On the basis that concentrations of pollutants within the Site are anticipated to be below the relevant objectives, it is judged that future residents of the proposed development will experience acceptable air quality and the Site is considered suitable for the proposed end-use.

### Damage Cost Calculations

- 5.33 Damage costs associated with operational traffic anticipated to be generated by the proposed development have been calculated using Defra's 'Damage Costs Appraisal Toolkit' (Defra, 2021b). Annual emissions have been calculated using Defra's EFT v10.1<sup>8</sup> (Defra, 2020d) (EFT inputs are presented in **Table 5-2**) for the five-year period between 2025<sup>13</sup> and 2029; calculated damage costs over this period are presented in **Table 5-3**.

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<sup>13</sup> 2025 is the year that the proposed development is anticipated to be completed.

**Table 5-2: Damage Cost Calculations; EFT Inputs per Year**

| Area                 | Traffic Flow      | %HDV                | Speed (kph)     | Link Length (km) |
|----------------------|-------------------|---------------------|-----------------|------------------|
| England (not London) | 236 <sup>12</sup> | 0 <sup>11, 12</sup> | 50 <sup>a</sup> | 10 <sup>b</sup>  |

<sup>a</sup> Based on the values provided by the Sussex-air guidance (Sussex-air, 2021).

**Table 5-3: Calculated Damage Costs (Central Present Value) (2025-2029)**

| Pollutant                      | Value (£)    |
|--------------------------------|--------------|
| NO <sub>x</sub> <sup>a</sup>   | 4,907        |
| PM <sub>2.5</sub> <sup>a</sup> | 3,974        |
| <b>Total</b>                   | <b>8,881</b> |

<sup>a</sup> Pollutant source defined as 'Road Transport Urban Small'.

## 6.0 MITIGATION

### Embedded Mitigation

6.1 The proposed development is expected to provide the following mitigation measures which will reduce emissions associated with operational development-generated transport <sup>12</sup>:

- Cycle parking spaces will be provided at the Site (quantum to be provided in accordance with WSCC standards); and
- A Travel Plan Statement, included within the Transport Statement, with the aim of encouraging sustainable travel patterns at the development, in particular by cycling and walking modes. Measures include the provision of travel information packs with information to promote the use of sustainable modes of transport; and
- Electric vehicle charging points will be provided at the Site (quantum to be provided in accordance with WSCC standards);

### Construction Dust

6.2 The following standard mitigation measures have been identified as being appropriate for a 'medium' risk site for earthworks activities and a 'low' risk for construction and trackout activities (see **Table 5-1**). This is based on the recommendations within the IAQM's 'Guidance on the assessment of dust from demolition and construction' (IAQM, 2014).

6.3 The implementation of mitigation in accordance with the IAQM guidance is required by the Sussex-air guidance (Sussex-air, 2021).

6.4 A Dust Management Plan (DMP) should be submitted to MSDC prior to works commencing on site.

### Communications

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;

- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the Site Manager;
- Display the head or regional office contact information.

***Dust Management***

- Develop and implement a 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, realtime PM<sub>10</sub> continuous monitoring and/or visual inspections.

***Site Management***

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints log available to the local authority when asked; and
- Record any exceptional incidents that cause dust and/or air quality pollutant emissions, either on- or off- site, and the action taken to resolve the situation in the log book.

***Monitoring***

- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary;

- 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;
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions; and
- Agree dust deposition, dust flux, or real-time PM<sub>10</sub> continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.

***Preparing and maintaining the site***

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Avoid site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below; and
- Cover, seed or fence stockpiles to prevent wind whipping.

***Operating vehicle/machinery and sustainable travel***

- Ensure all vehicles switch off engines when stationary - no idling vehicles;
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable;
- Impose and signpost a maximum-speed-limit of 15 mph on surfaced 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);
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials; and
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).

***Operations***

- 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; and
- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

**Waste Management**

- Avoid bonfires and burning of waste materials.

**Earthworks**

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable; and
- Only remove the cover in small areas during work and not all at once.

**Construction**

- Avoid scabbling (roughening of concrete surfaces) if possible; and
- 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.

**Trackout**

- 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;
- Record all inspections of haul routes and any subsequent action in a site log book; and
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

**Development-Generated Construction Traffic Impacts**

- 6.5 The overall effect, without mitigation, of traffic generated by the proposed development during the construction phase on existing sensitive locations in the study area is likely to be 'not significant'. Therefore, no further mitigation measures are considered to be necessary.

**Development-Generated Operational Traffic Impacts**

- 6.6 The overall effect, without mitigation, of traffic generated by the proposed development during the operational phase on existing sensitive locations in the study area will be 'not significant'. Therefore, no further mitigation measures are considered to be necessary as a result of the outcome of the of the predicted overall effects.
- 6.7 However, calculated mitigation costs identify that emissions mitigation measures with a combined cost of £8,881 will be required.

**Site Suitability**

- 6.8 Concentrations of pollutants within the proposed development Site are anticipated to be well below the relevant objectives. Therefore, air quality for future residents is considered to be good and no mitigation is required.

**Sussex-Air Air Quality Partnership Guidance; Standard Mitigation Measures**

- 6.9 The 'Air quality and emissions mitigation guidance for Sussex (2021)' (Sussex-air, 2021) requires that the following standard mitigation should be applied for all major residential developments (i.e. including the proposed development):
- All gas-fired boilers to meet a minimum standard of <40 mg NO<sub>x</sub>/kWh. Consideration should be given to renewable sources of energy, e.g. ASHPs, as an alternative. It should be noted that the proposed energy strategy will comprise ASHPs (see Paragraph 1.6);
  - Meet the electric vehicle charging point guidance set out by the governing authority (West Sussex County Council (WSCC)). The guidance produced

by West Sussex (WSCC, 2020), as referenced within the Sussex-air guidance) requires 'active' charging points for electric vehicles to be provided at a minimum of 20% of all parking spaces with ducting provided at all remaining spaces where appropriate to provide 'passive' provision for these spaces to be upgraded in future; and

- Regarding demolition and construction, the guidance requires mitigation in accordance with the IAQM's 'Guidance on the Assessment of Dust from Demolition and Construction' (IAQM, 2014). This has been set out above (see Paragraphs 6.2 to 6.4).

6.10 The following mitigation measures for new residential developments, as provided by the Sussex-air guidance (Sussex-air, 2021), should be considered:

- Invest in electric vehicle charging infrastructure within the development over and above the current recommended standards;
- Provide vouchers for alternatives to private car use;
- Set up a car club within the development or contribute to the cost of a local car club;
- Set up or join an existing car sharing scheme for residents;
- Designate parking spaces for car club / car sharing vehicles;
- Designate parking spaces for low emission vehicles;
- Provide electric bikes;
- Improve cycle paths to link to the existing local cycle network;
- Provide secure cycle storage; and
- Invest in additional evergreen infrastructure to reduce particulates and other pollutants.

6.11 The following additional mitigation measures for all developments, as provided by the Sussex-air guidance (Sussex-air, 2021), should also be considered:

- Contribute to local low or zero emission vehicle refuelling / recharging infrastructure;
- Contribute to low emission bus service provision or waste collection services;
- Contribute to local bike / e-bike hire schemes;
- Contribute to renewable fuel and energy generation projects; and
- Fund incentives for the take-up of low emission technologies and fuels.

## 7.0 CONCLUSIONS

- 7.1 The potential air quality impacts associated with the proposed residential development at Selsfield Road, Ardingly in Mid Sussex have been assessed.
- 7.2 There is the potential for dust and PM<sub>10</sub> impacts during the construction phase. However, with the proposed mitigation measures in place, the overall residual effect will be 'not significant'.
- 7.3 Taking into consideration anticipated volumes of construction traffic, the maximum duration of the construction phase and the anticipated implementation of a CEMP, it is judged that the overall effect of emissions from development-generated construction traffic on existing sensitive locations is likely to be 'not significant'.
- 7.4 The traffic generation associated with the proposed development during the operational phase is below the relevant screening criteria. As such, the overall effect of development-generated operational traffic on existing sensitive properties is screened out as being 'not significant'.
- 7.5 The impact of local air quality on future residents at the proposed development Site has been considered. Taking into consideration the proximity of the development Site to nearby emission sources and baseline air quality conditions in the local area, it is anticipated that baseline pollutant concentrations within the proposed development Site will be below the relevant objectives. As such, it is judged that new residents of the proposed development will experience acceptable air quality and the Site is suitable for its proposed end-use.
- 7.6 Damage costs have been calculated using guidance and tools provided by Sussex-air and Defra. It is a requirement that costs equivalent to the calculated damage cost value shall be spent on air quality mitigation measures. A list of possible mitigation measures has been provided within this AQA. The selected mitigation measures shall be submitted to MSDC within an Emissions Mitigation Statement.
- 7.7 Overall, it is concluded that there are no air quality constraints to the proposed development which is in accordance with local, regional and national policy and guidance.

## 8.0 REFERENCES

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## Appendix A Glossary

| Abbreviations       | Meaning                                                                                                                                        |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| AADT                | Annual Average Daily Traffic                                                                                                                   |
| ACE                 | Ardent Consulting Engineers                                                                                                                    |
| AQAP                | Air Quality Action Plan                                                                                                                        |
| AQA                 | Air Quality Assessment                                                                                                                         |
| AQMA                | Air Quality Management Area                                                                                                                    |
| ASHP                | Air Source Heat Pump                                                                                                                           |
| ASR                 | Annual Status Report                                                                                                                           |
| AURN                | Automatic Urban and Rural Network                                                                                                              |
| AW                  | Ancient Woodland                                                                                                                               |
| CAZ                 | Clean Air Zone                                                                                                                                 |
| CEMP                | Construction Environmental Management Plan                                                                                                     |
| CROW Act            | Countryside and Rights of Way Act                                                                                                              |
| Defra               | Department for Environment, Food and Rural Affairs                                                                                             |
| DfT                 | Department for Transport                                                                                                                       |
| Diffusion Tube (DT) | A passive sampler used for collecting NO <sub>2</sub> in the air                                                                               |
| DMP                 | Dust Management Plan                                                                                                                           |
| EC                  | European Community                                                                                                                             |
| EEC                 | European Economic Community                                                                                                                    |
| EPUK                | Environmental Protection UK                                                                                                                    |
| HDV                 | Heavy Duty Vehicle; a vehicle with a gross vehicle weight greater than 3.5 tonnes, includes Heavy Goods Vehicles and buses                     |
| HGV                 | Heavy Goods Vehicle                                                                                                                            |
| IAQM                | Institute of Air Quality Management                                                                                                            |
| LAQM                | Local Air Quality Management                                                                                                                   |
| LDV                 | Light Duty Vehicle; a vehicle with a gross vehicle weight equal to or less than 3.5 tonnes, includes Light Goods Vehicles, cars and motorbikes |
| LGV                 | Light Goods Vehicle                                                                                                                            |
| LNR                 | Local Nature Reserve                                                                                                                           |
| MSDC                | Mid Sussex District Council                                                                                                                    |
| NAQO                | National Air Quality Objective as set out in Air Quality Strategy and the Air Quality Regulations                                              |
| NH <sub>3</sub>     | Ammonia                                                                                                                                        |
| NO <sub>2</sub>     | Nitrogen Dioxide                                                                                                                               |

| Abbreviations                         | Meaning                                                                                                                                                                                                                         |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NO <sub>x</sub>                       | Nitrogen Oxides, generally considered to be nitric oxide and NO <sub>2</sub> . The main source is from combustion of fossil fuels, including petrol and diesel used in road vehicles and natural gas used in gas-fired boilers. |
| NPPF                                  | National Planning Policy Framework                                                                                                                                                                                              |
| NRMM                                  | Non-road mobile machinery                                                                                                                                                                                                       |
| PCM                                   | Pollution Climate Mapping                                                                                                                                                                                                       |
| PM <sub>10</sub> or PM <sub>2.5</sub> | Small airborne particles less than 10/2.5 µg in diameter                                                                                                                                                                        |
| PPG                                   | Planning Practice Guidance                                                                                                                                                                                                      |
| PV                                    | Photovoltaic                                                                                                                                                                                                                    |
| Receptor                              | A location where the effects of pollution may occur                                                                                                                                                                             |
| SAC                                   | Special Area of Conservation                                                                                                                                                                                                    |
| SPA                                   | Special Protection Area                                                                                                                                                                                                         |
| SSSI                                  | Site of Special Scientific Interest                                                                                                                                                                                             |
| ULEV                                  | Ultra-Low Emission Vehicle                                                                                                                                                                                                      |
| ULEZ                                  | Ultra-Low Emission Zone                                                                                                                                                                                                         |
| WSCC                                  | West Sussex County Council                                                                                                                                                                                                      |

## Appendix B      IAQM Dust Assessment Approach

### B1      Step 1: Screen the need for an assessment

B1.1      Step 1 is the screen the need for an assessment against the following criteria:

- 'Human receptor' within:
  - 350 m of the boundary of the site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).
- 'Ecological receptor' within:
  - 50 m of the boundary of the site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

B1.2      Where there are no sensitive receptors within these distances, it can be concluded that the impact is negligible and no further assessment relating to construction dust impacts is required.

### B2      Step 2: Assess the risk of dust impacts

B2.1      The risk of dust at sufficient quantum to cause annoyance/health/ecological impacts should be based on:

- The scale and nature of the works (potential dust emission magnitude) (
- **Table B.1**); and
- The sensitivity of the area to dust impacts based on the matrices shown in **Table B.2** and **Table B.3**.

B2.2      These factors are then combined to determine the risk of dust impacts without mitigation applied for each of the four activities (Demolition, Earthworks, Construction and Trackout) following the matrices shown in **Table B.4**, **Table B.5** and **Table B.6**.

**Table B.1: Potential Dust Emission Magnitude**

| Size                | Definition                                                                                                                                                                                                                                                   |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Demolition</b>   |                                                                                                                                                                                                                                                              |
| Small               | Total building volume <20,000 m <sup>3</sup> , construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10 m above ground, demolition during wetter months.                                         |
| Medium              | Total building volume 20,000 m <sup>3</sup> – 50,000 m <sup>3</sup> , potentially dusty construction material, demolition activities 10-20 m above ground level.                                                                                             |
| Large               | Total building volume >50,000 m <sup>3</sup> , potentially dusty construction material (e.g. Concrete), on-site crushing and screening, demolition activities >20 m above ground level.                                                                      |
| <b>Earthworks</b>   |                                                                                                                                                                                                                                                              |
| Small               | Total site area <2,500 m <sup>2</sup> , soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <20,000 tonnes earthworks during wetter months.          |
| Medium              | Total site area 2,500 m <sup>2</sup> – 10,000 m <sup>2</sup> , moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m – 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes. |
| Large               | Total site area >10,000 m <sup>2</sup> , potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height.          |
| <b>Construction</b> |                                                                                                                                                                                                                                                              |
| Small               | Total building volume <25,000 m <sup>3</sup> , construction material with low potential for dust release (e.g. metal cladding or timber).                                                                                                                    |
| Medium              | Total building volume 25,000 m <sup>3</sup> – 100,000 m <sup>3</sup> , potentially dusty construction material (e.g. concrete), on site concrete batching.                                                                                                   |
| Large               | Total building volume >100,000 m <sup>3</sup> , on site concrete batching, sandblasting.                                                                                                                                                                     |
| <b>Trackout</b>     |                                                                                                                                                                                                                                                              |
| Small               | <10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m.                                                                                                                           |
| Medium              | 10-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m.                                                                                                            |
| Large               | >50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m.                                                                                                                   |

**Table B.2: Sensitivity of the Area to Dust Soiling Effects on People and Property**

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

**Table B.3: Sensitivity of the Area to Human Health Impacts**

| Receptor Sensitivity | Annual Mean PM <sub>10</sub> Concentration | Number of Receptors | Distance from the Source (m) |        |        |      |
|----------------------|--------------------------------------------|---------------------|------------------------------|--------|--------|------|
|                      |                                            |                     | <20                          | <50    | <100   | <350 |
| High                 | >32 µg/m <sup>3</sup> <sup>a</sup>         | >100                | High                         | High   | High   | Low  |
|                      |                                            | 10-100              | High                         | High   | Medium | Low  |
|                      |                                            | <10                 | High                         | Medium | Low    | Low  |
|                      | 28-32 µg/m <sup>3</sup> <sup>b</sup>       | >100                | High                         | High   | Medium | Low  |
|                      |                                            | 10-100              | High                         | Medium | Low    | Low  |
|                      |                                            | <10                 | High                         | Medium | Low    | Low  |
|                      | 24-28 µg/m <sup>3</sup> <sup>c</sup>       | >100                | High                         | Medium | Low    | Low  |
|                      |                                            | 10-100              | High                         | Medium | Low    | Low  |
|                      |                                            | <10                 | Medium                       | Low    | Low    | Low  |
|                      | <24 µg/m <sup>3</sup> <sup>d</sup>         | >100                | Medium                       | Low    | Low    | Low  |
|                      |                                            | 10-100              | Low                          | Low    | Low    | Low  |
|                      |                                            | <10                 | Low                          | Low    | Low    | Low  |
| Medium               | >32 µg/m <sup>3</sup> <sup>a</sup>         | >100                | High                         | Medium | Low    | Low  |
|                      |                                            | 10-100              | Medium                       | Low    | Low    | Low  |
|                      |                                            | <10                 | Medium                       | Low    | Low    | Low  |
|                      | 28-32 µg/m <sup>3</sup> <sup>b</sup>       | >100                | Low                          | Low    | Low    | Low  |
|                      |                                            | 10-100              | Low                          | Low    | Low    | Low  |
|                      |                                            | <10                 | Low                          | Low    | Low    | Low  |
|                      | 24-28 µg/m <sup>3</sup> <sup>c</sup>       | >100                | Low                          | Low    | Low    | Low  |
|                      |                                            | 10-100              | Low                          | Low    | Low    | Low  |
|                      |                                            | <10                 | Low                          | Low    | Low    | Low  |
|                      | <24 µg/m <sup>3</sup> <sup>d</sup>         | >100                | Low                          | Low    | Low    | Low  |
|                      |                                            | 10-100              | Low                          | Low    | Low    | Low  |
|                      |                                            | <10                 | Low                          | Low    | Low    | Low  |
| Low                  | -                                          | ≥1                  | Low                          | Low    | Low    | Low  |

**Table B.4: Risk of Impacts – Demolition**

| Sensitivity of Area | Dust Emission Magnitude |             |             |
|---------------------|-------------------------|-------------|-------------|
|                     | Large                   | Medium      | Small       |
| High                | High Risk               | Medium Risk | Medium Risk |
| Medium              | High Risk               | Medium Risk | Low Risk    |
| Low                 | Medium Risk             | Low Risk    | Negligible  |

**Table B.5: Risk of Impacts – Earthworks and Construction**

| Sensitivity of Area | Dust Emission Magnitude |             |            |
|---------------------|-------------------------|-------------|------------|
|                     | Large                   | Medium      | Small      |
| High                | High Risk               | Medium Risk | Low Risk   |
| Medium              | Medium Risk             | Medium Risk | Low Risk   |
| Low                 | Low Risk                | Low Risk    | Negligible |

**Table B.6: Risk of Impacts – Trackout**

| Sensitivity of Area | Dust Emission Magnitude |             |            |
|---------------------|-------------------------|-------------|------------|
|                     | Large                   | Medium      | Small      |
| High                | High Risk               | Medium Risk | Low Risk   |
| Medium              | Medium Risk             | Low Risk    | Negligible |
| Low                 | Low Risk                | Low Risk    | Negligible |

**B3 Step 3: Site-specific Mitigation**

- B3.1 Based on the outcome of Step 2, appropriate mitigation measures are recommended. The guidance includes a list of mitigation measures for Low, Medium and High Risk sites but final recommendations should be based on professional judgement and take into account particular site sensitivities and differences in risk for different activities or areas of the site. The mitigation recommended in the guidance are shown in **Table C.7**.

**Table B.7: Mitigation Measures**

| <b>Mitigation Measure</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Low Risk</b> | <b>Medium Risk</b> | <b>High Risk</b> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------|------------------|
| <b>Communications</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                 |                    |                  |
| 1. Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | N               | H                  | H                |
| 2. 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.                                                                                                                                                                                                                                                                                                                                                                                                               | H               | H                  | H                |
| 3. Display the head or regional office contact information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | H               | H                  | H                |
| <b>Dust Management</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                 |                    |                  |
| 4. Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real-time PM <sub>10</sub> continuous monitoring and/or visual inspections. | D               | H                  | H                |
| <b>Site Management</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                 |                    |                  |
| 5. 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.                                                                                                                                                                                                                                                                                                                                                                                                                                     | H               | H                  | H                |
| 6. Make the complaints log available to the local authority when asked.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | H               | H                  | H                |
| 7. Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book.                                                                                                                                                                                                                                                                                                                                                                                                                                      | H               | H                  | H                |
| 8. Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.                                                                                                                                                                                                                                                | N               | N                  | H                |
| <b>Monitoring</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                 |                    |                  |
| 9. Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.                                                                                                                                                                                                      | D               | D                  | H                |

| Mitigation Measure                                                                                                                                                                                                                                                                                                                                                                         | Low Risk | Medium Risk | High Risk |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|-----------|
| 10. 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.                                                                                                                                                                                                              | H        | H           | H         |
| 11. Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.                                                                                                                                                 | H        | H           | H         |
| 12. Agree dust deposition, dust flux, or real-time PM <sub>10</sub> continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction. | N        | H           | H         |
| <b>Preparing and maintaining the site</b>                                                                                                                                                                                                                                                                                                                                                  |          |             |           |
| 13. Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.                                                                                                                                                                                                                                                                 | H        | H           | H         |
| 14. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.                                                                                                                                                                                                                                                      | H        | H           | H         |
| 15. Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.                                                                                                                                                                                                                                          | D        | H           | H         |
| 16. Avoid site runoff of water or mud.                                                                                                                                                                                                                                                                                                                                                     | H        | H           | H         |
| 17. Keep site fencing, barriers and scaffolding clean using wet methods.                                                                                                                                                                                                                                                                                                                   | D        | H           | H         |
| 18. 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.                                                                                                                                                                                                        | D        | H           | H         |
| 19. Cover, seed or fence stockpiles to prevent wind whipping.                                                                                                                                                                                                                                                                                                                              | D        | H           | H         |
| <b>Operating vehicle/machinery and sustainable travel</b>                                                                                                                                                                                                                                                                                                                                  |          |             |           |
| 20. Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.                                                                                                                                                                                                                                              | H        | H           | H         |
| 21. Ensure all vehicles switch off engines when stationary - no idling vehicles.                                                                                                                                                                                                                                                                                                           | H        | H           | H         |
| 22. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.                                                                                                                                                                                                                                                         | H        | H           | H         |

| Mitigation Measure                                                                                                                                                                                                                                                                                                                                                     | Low Risk | Medium Risk | High Risk |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|-----------|
| 23. 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).      | D        | D           | H         |
| 24. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.                                                                                                                                                                                                                                                                   | N        | H           | H         |
| 25. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).                                                                                                                                                                                                                                     | N        | D           | H         |
| <b>Operations</b>                                                                                                                                                                                                                                                                                                                                                      |          |             |           |
| 26. 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.                                                                                                                                                       | H        | H           | H         |
| 27. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.                                                                                                                                                                                                  | H        | H           | H         |
| 28. Use enclosed chutes and conveyors and covered skips.                                                                                                                                                                                                                                                                                                               | H        | H           | H         |
| 29. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.                                                                                                                                                                                           | H        | H           | H         |
| 30. 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.                                                                                                                                                                                     | D        | H           | H         |
| <b>Waste Management</b>                                                                                                                                                                                                                                                                                                                                                |          |             |           |
| 31. Avoid bonfires and burning of waste materials.                                                                                                                                                                                                                                                                                                                     | H        | H           | H         |
| <b>Demolition</b>                                                                                                                                                                                                                                                                                                                                                      |          |             |           |
| 32. Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).                                                                                                                                                                                                          | D        | D           | H         |
| 33. Ensure effective water suppression is used during demolition operations. Hand held 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. | H        | H           | H         |
| 34. Avoid explosive blasting, using appropriate manual or mechanical alternatives.                                                                                                                                                                                                                                                                                     | H        | H           | H         |
| 35. Bag and remove any biological debris or damp down such material before demolition.                                                                                                                                                                                                                                                                                 | H        | H           | H         |

| Mitigation Measure                                                                                                                                                                                                                | Low Risk | Medium Risk | High Risk |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|-----------|
| <b>Earthworks</b>                                                                                                                                                                                                                 |          |             |           |
| 36. Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.                                                                                                                        | N        | D           | H         |
| 37. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable                                                                                                     | N        | D           | H         |
| 38. Only remove the cover in small areas during work and not all at once.                                                                                                                                                         | N        | D           | H         |
| <b>Construction</b>                                                                                                                                                                                                               |          |             |           |
| 39. Avoid scabbling (roughening of concrete surfaces) if possible.                                                                                                                                                                | D        | D           | H         |
| 40. 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. | D        | H           | H         |
| 41. 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.                | N        | D           | H         |
| 42. For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.                                                                                                       | N        | D           | D         |
| <b>Trackout</b>                                                                                                                                                                                                                   |          |             |           |
| 43. 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.                                      | D        | H           | H         |
| 44. Avoid dry sweeping of large areas.                                                                                                                                                                                            | D        | H           | H         |
| 45. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.                                                                                                                       | D        | H           | H         |
| 46. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.                                                                                                   | N        | H           | H         |
| 47. Record all inspections of haul routes and any subsequent action in a site log book.                                                                                                                                           | D        | H           | H         |
| 48. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.                                                                     | N        | H           | H         |
| 49. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).                                                                             | D        | H           | H         |
| 50. 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.                                                                              | N        | H           | H         |
| 51. Access gates to be located at least 10 m from receptors where possible.                                                                                                                                                       | N        | H           | H         |

(H = Highly Recommended, D = Desirable and N = Not Recommended)

**B4 Step 4: Determine Significant Effects**

- B4.1 Recommended mitigation measures should be sufficient to ensure that the impact is normally 'not significant'. There may at times be limitations to appropriate mitigation measures (such as a lack of water) and therefore, an assessment should always be made based on the characteristic of each site and the surrounding area.

**B5 Step 5: Dust Assessment Report**

- B5.1 The dust assessment report should include enough detail to ensure that the basis for the determination of emission magnitude and sensitivity of the area, and therefore the site risk, are clear. The required mitigation so also be set out within the report, along with a description of the mechanism that will ensure that the appropriate level of mitigation will be implemented (such as through a planning condition).