



**Smith Grant**  
Environmental Consultancy

**Proposed Quarry Restoration:  
Yew Tree Quarry, Stairfoot Brickworks, Wombwell Lane, Stairfoot**

**AIR QUALITY ASSESSMENT**

**For: Green Earth Development Group Limited and Axis P.E.D. Limited**

**Date: October 2025**

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## **PROPOSED QUARRY RESTORATION:**

**Yew Tree Quarry, Stairfoot Brickworks, Wombwell Lane, Stairfoot**

## **AIR QUALITY ASSESSMENT**

**For: Axis P.E.D. Limited and Green Earth Development Group Limited**

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## 1 Introduction

### 1.1 General

1.1.1 A planning application is to be submitted to Barnsley Metropolitan Borough Council (BMBC) for infilling and restoration of part of the former Stairfoot Brickworks Quarry Complex (hereafter referred to as the 'Proposed Development'). The application Site comprises the former Yew Tree Quarry (hereafter referred to as the 'Site'), which is located in the south-eastern part of the Quarry Complex located off Wombwell Lane (the A633) in Barnsley.

1.1.2 Smith Grant LLP (SGP) was instructed by the project planning consultants, Axis P.E.D. Ltd., acting on behalf of Green Earth Development Group Limited (GEDG), to undertake an Air Quality Assessment (AQA) of the Proposed Development and to provide a report for provision with the planning application.

1.1.3 The Site lies within the administrative area of BMBC with respect to mineral planning and environmental health and air quality.

### 1.2 Scope and Objectives of the Report

1.2.1 The following report describes the AQA undertaken by SGP in accordance with the brief agreed with the client. The report has been prepared with reference to the Planning Practice Guidance provided in relation to minerals<sup>1</sup> and air quality<sup>2</sup> under the National Planning Policy Framework (NPPF)<sup>3</sup>. It follows the frameworks described in IAQM guidance in relation to planning and air quality<sup>4</sup> and dust<sup>5, 6</sup>.

1.2.2 The report describes the methods used to assess the impacts, the baseline conditions currently existing at the Site and surroundings, the potential direct and indirect impacts of the Proposed Development arising from aerial emissions, and the mitigation measures required to prevent, reduce, or offset the impacts.

1.2.3 SGP is an environmental consultancy specialising in air quality assessments, particularly in association with fugitive dust emissions from mineral sites. The report author, Katrina Hawkins, Partner, is a Member of the Institute of Air Quality Management (IAQM).

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<sup>1</sup> Ministry of Housing, Communities and Local Government, Planning Practice Guidance: Minerals, issued October 2014

<sup>2</sup> Ministry of Housing, Communities and Local Government, Planning Practice Guidance: Air Quality, issued March 2014, last updated 1<sup>st</sup> November 2019

<sup>3</sup> Ministry of Housing, Communities and Local Government, National Planning Policy Framework, issued March 2012, last updated 7<sup>th</sup> February 2025

<sup>4</sup> Institute of Air Quality (IAQM), Land-Use Planning & Development Control: Planning for Air Quality, v1.2, January 2017

<sup>5</sup> Institute of Air Quality Management (IAQM), Guidance on the Assessment of Mineral Dust Impacts for Planning, v1.1, May 2016

<sup>6</sup> Institute of Air Quality Management (IAQM), Guidance on the Assessment of Dust from Demolition and Construction. v2.2, January 2024

## 2 Planning Policy, Legislative and Technical Context

### 2.1 Technical Context

- 2.1.1 The proposals include for the importation and infilling with non-hazardous restoration materials into the quarry void to achieve the required restoration.
- 2.1.2 Material handling operations give rise to releases of airborne particulate matter (PM) (also referred to as 'dust'). The nature and quantity of airborne matter released at any one time will depend on a wide variety of factors including, but not limited to, the nature of the material being handled, the quantity of materials being handled, the handling processes incorporated and the weather conditions at the time of handling.
- 2.1.3 Airborne PM is made up of condensed phase (solid or liquid) particles suspended in the atmosphere and comes from both man-made and natural sources. It ranges in sizes from a few nanometres to around 100µm. The size of the particle influences the aerodynamic and gravitational effects that determine the distance it travels and how long it stays suspended in the air before settling on a surface.
- 2.1.4 The deposition and subsequent accumulation of dust on a surface can result in disamenity due to soiling (referred to as 'disamenity dust'). Dust soiling arises from the deposition of particulate matter in all size fractions but will be associated mostly with particulate matter greater than 30 µm. Dust accumulation may also affect sensitive habitats through direct impacts on vegetation and aquatic ecosystems from dust deposition and indirect impacts on fauna (e.g. on foraging habitats).
- 2.1.5 Smaller particles fall out of the atmosphere very slowly remaining suspended in the air for longer distances (referred to as 'suspended particulate matter'). Particles of aerodynamic diameter less than 10 µm (referred to as 'PM<sub>10</sub>') correspond to the inhalable fraction of particulate matter and, depending on the nature and concentrations of the particles, can be associated with adverse health impacts. PM<sub>10</sub> includes both fine (those particles of less than 2.5 µm; referred to as PM<sub>2.5</sub>) and coarse (diameter between 2.5-10µm; PM<sub>2.5-10</sub>) fractions of suspended particulate matter. These normally arise from different sources, and for quarries most of the suspended dust would be in the coarse fraction.
- 2.1.6 The use of diesel and petrol fuelled combustion engines for on-road transport, on-site non-road mobile machinery (NRMM) and on-site plant will also result in exhaust emissions. The principal emissions of interest are nitrogen oxides (NO<sub>x</sub>; comprises nitrogen dioxide (NO<sub>2</sub>) and nitric oxide (NO)) and PM<sub>10</sub> (including PM<sub>2.5</sub>). NO itself is not considered harmful to human health. However, on release to the atmosphere it usually oxidises rapidly to NO<sub>2</sub> which is associated with adverse

effects on human health, causing inflammation of the lungs at high concentrations. Long term exposure to NO<sub>2</sub> can affect lung function and respiratory symptoms.

2.1.7 On-road transport and NRMM are also a source of primary PM<sub>10</sub> both as direct emissions through vehicle exhausts and as indirect emissions through tyre and brake wear, re-suspension of particulate matter on the road and road wear (mechanical abrasion and corrosion). Road transport may also be responsible for secondary PM formed via gas-to-particle conversion.

2.1.8 The legislative and planning policy context in relation to these potential aerial emissions are discussed further below in sub-sections 2.2-2.6. The impacts that may arise from these aerial emissions are discussed further in Sections 6 and 7.

## 2.2 Legislation and Guidance

### *Air Quality Strategy*

2.2.1 In January 2019 Defra published the **Clean Air Strategy**<sup>7</sup> which outlined a comprehensive suite of actions required across all parts of Government to improve air quality and maximise public health benefits. This included national regulations to reduce emissions from domestic burning, industry and farming, alongside stronger powers, and an improved framework for local government to tackle more localised issues, as well as a commitment to set a legally binding target for PM<sub>2.5</sub>.

2.2.2 Under the Environment Act 1995, as amended by the Environment Act 2021, the UK Government and the devolved executives are required to produce a national air quality strategy ('AQS') every 5 years. The AQS is to provide an over-arching strategic framework for air quality management in the UK setting out a framework to enable local authorities to contribute to long-term air quality goals and setting out standards, objectives, and measures for improving ambient air quality.

2.2.3 In April 2023 the UK Government published the **2023 Air Quality Strategy** ('2023 AQS')<sup>8</sup> which superseded an earlier 2007 AQS (in respect of England only). The 2023 AQS includes previously established standards that have been previously set for specific pollutants deemed to pose a risk for human health or other receptors, a number of which were derived from the EU limit and target values, although requirements for compliance varied. The strategy also includes new standards for PM<sub>2.5</sub> established under the Environment Act 2021 and the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023.

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<sup>7</sup> UK Government, Clean Air Strategy, published 14 January 2019, <https://www.gov.uk/government/publications/clean-air-strategy-2019>

<sup>8</sup> Department for Environment, Food & Rural Affairs (2023); The air quality strategy for England.

*Air Quality Standards for Human Health*

- 2.2.4 Ambient air quality standards in the UK have been established through the combination of transposition of European legislation and additional UK legislation and requirements. This includes NO<sub>2</sub> and suspended particulate matter. Following the departure of the UK from the EU the air pollution limits established under EU requirements remain in place having been enshrined in UK law, the principal legislation being the Air Quality Regulations 2010 (as amended) which implemented EU Directives 2008/50/EC and 2004/107/EC.
- 2.2.5 In addition, Part IV of the Environment Act 1995 imposes a duty on local authorities in the UK to review existing and projected air quality in their area. Any location likely to exceed the UK AQOs must be declared an Air Quality Management Area (AQMA) and an Action Plan prepared and implemented, with the aim of achieving the objectives. This process is referred to as Local Air Quality Management (LAQM). The LAQM process is supported by national statutory policy<sup>9</sup> and technical guidance<sup>10</sup> provided by Defra. The standards and objectives relevant to the LAQM framework are prescribed through the Air Quality (England) Regulations 2000.
- 2.2.6 The pollutants that must be assessed under the LAQM Framework include NO<sub>2</sub> and PM<sub>10</sub>, but not PM<sub>2.5</sub> which is recognised as a regional pollutant for which many sources are outside local authority control. Local authorities are however expected to reduce PM<sub>2.5</sub> emissions from the sources that are within their control.
- 2.2.7 The applicable air quality standards relevant to the Site and Proposed Development with regards to protection of human health that are to be achieved are summarised in Table 2.1 below. These are referred to in this report as Air Quality Assessment Levels (AQALs).

**Table 2.1: Air Quality Assessment Levels**

Pollutant	AQAL	Averaging period
<b>To be currently achieved</b>		
NO <sub>2</sub>	40 µg/m <sup>3</sup>	annual mean
	200 µg/m <sup>3</sup>	hourly mean, not to be exceeded more than 18 times per annum
PM <sub>10</sub>	40 µg/m <sup>3</sup>	annual mean
	50 µg/m <sup>3</sup>	24-hour mean, not to be exceeded more than 35 times per annum
PM <sub>2.5</sub>	20 µg/m <sup>3</sup>	annual mean
	% reduction relative to average exposure indicator (AEI), dependant on initial concentration; to at least 10 µg/m <sup>3</sup>	annual mean
<b>Future standards</b>		

<sup>9</sup> Defra, Local Air Quality Management, Policy Guidance (PG22), August 2022<sup>10</sup> Defra, Local Air Quality Management, Technical Guidance (TG22), August 2022

Pollutant	AQAL	Averaging period
<b>To be currently achieved</b>		
PM <sub>2.5</sub>	12 µg/m <sup>3</sup> (interim target; <i>to be achieved by 2028</i> )	annual mean
	reduction in population exposure of 22% compared to 2018 <i>by 2028</i>	annual mean
	10 µg/m <sup>3</sup> (legal target; <i>to be achieved by 2040</i> )	annual mean
	reduction in population exposure of 35% compared to 2018 <i>by 2040</i>	annual mean

1: PM<sub>2.5</sub>: responsibility for meeting the PM<sub>2.5</sub> target sits with national government although local authorities have a role in delivering reductions in PM<sub>2.5</sub>

2.2.8 For the purposes of the AQALs ambient air refers to the outdoor air and excludes workplaces where members of the public do not have regular access. Advice is given in Defra guidance<sup>10</sup> as to where the UK AQOs should apply as summarised below:

**Table 2.2: Summary of where the AQOs should apply**

Averaging period	Locations where the objective should apply
annual mean	all locations where members of the public might be regularly exposed; including facades of residential properties, schools, hospitals, care homes etc
24-hour mean and 8-hr mean	all locations where the annual mean objectives apply together with hotels and gardens of residential properties
1-hour mean	all locations where the annual mean, 24-hour and 8-hour means apply; also kerbside Sites, parts of car parks, bus stations and railway stations which are not fully enclosed and any outdoor locations where members of the public might reasonably be expected to spend 1 hour or longer.
15-min mean	all locations where members of the public may be reasonably exposed for a period of 15 minutes.

Note: the AQOs do not apply at building facades or other places of work where members of the public do not have regular access

#### *Air Quality Standards for Ecological Sites*

2.2.9 Additional statutory and non-statutory ambient air quality standards (termed Critical Levels) are also provided by the UK Air Quality Strategy and Environment Agency (EA) / Institute of Air Quality Management (IAQM) guidance for the protection of vegetation and ecosystems to be applied at nature conservation sites. Applicable standards for this assessment are detailed in Table 2.3 below:

**Table 2.3: Additional Non-Statutory Critical Levels for Protection of Vegetation and Ecosystems**

Pollutant	Concentration ( $\mu\text{g}/\text{m}^3$ )	Measured as
nitrogen oxides (as $\text{NO}_2$ )	30	annual mean
	75 / 200 <sup>1</sup>	daily mean

1: The Critical Level is generally considered to be  $75 \mu\text{g}/\text{m}^3$ , but this only applies where there are high concentrations of  $\text{SO}_2$  and this is not generally the situation in the UK

2.2.10 In addition, Critical Loads are provided for nitrogen nutrient and acidity deposition; these are dependent on the specific habitat and location and are provided in detail on the Air Pollution Information Service (APIS) website<sup>11</sup>. Any relevant Critical Loads to a specific nature conservation sites or habitat feature are provided in the relevant sections of this assessment if applicable.

#### *Ambient Dust Standards and Control*

2.2.11 Deposition dust as such is not regulated as a pollutant under the above requirements. There are no UK statutory or recommended levels that define the point when deposited dust causes annoyance or disamenity ('disamenity dust') although standard 'custom and practice' thresholds are referred to.

2.2.12 Public concerns in relation to dust accumulation and soiling may be related to a range of factors including the nature of a site and locality and baseline levels. Controls of soiling and annoyance impacts are typically achieved through conditions within planning permissions and / or environmental permits requiring the implementation of a dust management plan to prevent amenity impacts. Deposited dust may also give rise to 'nuisance', as Statutory, private and public nuisance as defined in environmental law and insofar as nuisance relates to unacceptable effects of emissions.

#### *Other Relevant Legislation*

2.2.13 The Non-Road Mobile Machinery (Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018 implemented EU regulations 2016/1628 and impose increasingly stringent emission limits to the engines of NRMM and power plant with the aim of progressively reducing the emissions and phasing out polluting equipment from 2019.

2.2.14 In addition, vehicle emission limits for new cars, vans and HGVs in Europe have been progressively tightened since the early 1990s. Separate standards are provided for cars and vans, with the Euro 6 standards applying to all new cars and vans sold after September 2015 and the Euro VI standards being applicable to all HGVs sold after September 2015. As the older vehicle fleets are gradually replaced, a progressive reduction in emissions is achieved.

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<sup>11</sup> Air Pollution Information Service, [www.apis.ac.uk](http://www.apis.ac.uk)

## 2.3 National Planning Policy

2.3.1 The **National Planning Policy Framework, 2024 (NPPF)**<sup>3</sup> sets out the Government's planning policies for England and how these are expected to be applied. The Framework provides some general guidance to local authorities on taking air pollution into account in planning policies and decisions. Paragraph 187 of the Framework states: *'Planning policies and decisions should contribute to and enhance the natural and local environment by [...] preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality.'*

2.3.2 The NPPF further states in paragraph 198 that *'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.'*

2.3.3 More specific guidance regarding air quality is provided in Paragraph 199, which states:

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

2.3.4 The **Planning Practice Guidance on Minerals**<sup>1</sup> (PPG-M) includes guidance to Mineral Planning Authorities (MPAs) on addressing dust and outlines the requirements for dust assessments. The essence of the guidance is the control of emissions through good site management and the guidance requires the specification of mitigation measures to control dust.

2.3.5 Further guidance is provided in the **Planning Practice Guidance on Air Quality**<sup>2</sup> (PPG-AQ) which provides guiding principles on how planning can take account of the impact of new development on air quality. The guidance states that air quality *'assessments should be proportionate to the nature and scale of the development proposed and level of concern about air quality and are therefore likely to be locationally specific'*.

- 2.3.6 Defra is developing guidance for developers and planning authorities on how to consider the new legal air quality targets for PM<sub>2.5</sub> in planning decisions. A consultation on the new approach and guidance is expected to be published in 2025. In the meantime, Defra has issued interim guidance to provide developers and planning authorities with clarity on how to consider the new targets whilst the full guidance is under development<sup>12</sup>.
- 2.3.7 The interim guidance sets out that whilst achievement of the targets will be assessed at relevant monitoring sites across the UK, the targets apply to ambient air across the UK. Applicants and Local Planning Authorities should therefore consider the impact of developments on air quality in all ambient air, whether or not a monitor is in place. The interim guidance sets out a series of questions to be used as prompts to support the interim process.
- 2.3.8 No further specific guidance is currently provided in the NPPF or PPG-AQ. In assessing the risks posed by dust and vehicle exhaust emissions to, or by, new development, reference is therefore made to non-statutory guidance issued by the IAQM as detailed below.

## 2.4 Local Planning Policy

- 2.4.1 The **Barnsley Local Plan**<sup>13</sup>, adopted in January 2019, sets out a number of planning policies and proposals to control development over future years. The following policies are relevant to air quality management:

### ***Policy Poll1 - Pollution Control and Protection***

*“Development will be expected to demonstrate that it is not likely to result, directly or indirectly, in an increase in air, surface water and groundwater, noise, smell, dust, vibration, light or other pollution which would unacceptably affect or cause a nuisance to the natural and built environment or to people.*

*We will not allow development of new housing or other environmentally sensitive development where existing air pollution, noise, smell, dust, vibration, light or other pollution levels are unacceptable and there is no reasonable prospect that these can be mitigated against.*

*Developers will be expected to minimise the effects of any possible pollution and provide mitigation measures where appropriate.”*

### ***Policy AQ1 - Development in Air Quality Management Areas***

*“Development which impacts on areas sensitive to air pollution in air quality management areas will be expected to demonstrate that it will not have a harmful effect on the health or living*

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<sup>12</sup> Department for Environment, Food and Rural Affairs, PM<sub>2.5</sub> Targets: Interim Planning Guidance, undated

<sup>13</sup> Barnsley Metropolitan Borough Council, Barnsley Local Plan, adopted January, available at: <https://www.barnsley.gov.uk/services/planning-and-buildings/local-planning-and-development/our-local-plan/barnsleys-local-plan/>, accessed 15<sup>th</sup> January 2025

*conditions of any future users of the development in terms of air quality (including residents, employees, visitors and customers), taking into account any suitable and proportionate mitigation required for the development.*

*We will only allow residential development which impacts on areas sensitive to air pollution, where the developer provides an assessment that shows living conditions will be acceptable for future residents, subject to any required mitigation.*

*We will only allow development which impacts on areas sensitive to air pollution which could cause more air pollution, where the developer provides an assessment that shows there will not be a significantly harmful effect on air quality, subject to any required mitigation.*

*Furthermore, development which impacts on areas sensitive to air pollution due to traffic emissions will be expected to demonstrate suitable and proportionate mitigation relative to the increased traffic emissions generated by the development.”*

2.4.2 BMBC is the waste and mineral planning authority. **Policy MIN 1** from the Barnsley Local Plan outlines the councils mineral planning policy. Policy MIN 1 states that all mineral proposals should “*have no unacceptable adverse environmental or amenity impacts.*”

2.4.3 The **Barnsley, Doncaster, and Rotherham Joint Waste Plan**<sup>14</sup> outlines the councils waste planning policy. Policy WCS6 from the Joint Waste Plan is relevant to air quality management:

**Policy WCS6 – General Considerations for All Waste Management Proposals**

*“Proposals for waste development will only be permitted within Barnsley, Doncaster and Rotherham provided they can demonstrate how they:*

*[...]*

*9) provide adequate means of controlling noise, vibration, glare, dust, litter, odour and vermin and other emissions (e.g. greenhouse gases and leachate) so as to avoid adverse effects on the amenity of the immediate and surrounding environment and human health, both during and after operations;*

*10) will not result in loss or damage to the diversity of wildlife and habitats at the site or adjoining land, including linear or other features that facilitate the dispersal of species;*

*[...]*

*12) will not have an adverse impact upon the integrity of conservation sites of national and international importance, particularly Thorne and Hatfield moors;*

*[...]*

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<sup>14</sup> Metropolitan Borough Councils of Barnsley, Doncaster, and Rotherham, Barnsley, Doncaster, and Rotherham Joint Waste Plan, adopted March 2012.

*14) maintain, safeguard and enhance green infrastructure corridors and assets, particularly within areas of sensitivity such as the greenbelt, air quality management areas, country parks, river and wildlife corridors”*

## **2.5 Environmental Permitting**

2.5.1 A wide range of industrial, waste, and agricultural installations require an Environmental Permit to operate under the Environmental Permitting (England and Wales) Regulations 2007 and subsequent amendments (termed EPR). The aim of the permitting system is to prevent, and where that is not practicable, reduce, emissions to air, water, and land by potentially polluting and other installations. Permits are issued by either the Environment Agency or the Local Authority depending on the nature and size of the facility.

2.5.2 Operations and installations that are controlled under a Permit are required to operate in such a way that a) all the appropriate preventative measures are taken against pollution, in particular through the application of best available techniques; and b) no significant pollution is caused.

2.5.3 EA guidance<sup>15</sup> regarding developments requiring both a planning permission application and environmental permit application clarifies that when deciding on a planning application the authorities should a) be confident that the development will not result in unacceptable risks from pollution when considering if the development is an appropriate use of the land and b) not focus on controlling pollution where it can be controlled by other pollution regulations, such as EPR.

2.5.4 The importation of materials to Site would be regulated under an Environmental Permit as discussed further in Section 6.

## **2.6 National Best Practice and Guidance**

2.6.1 The IAQM **Planning for Air Quality**<sup>4</sup> document provides specific non-statutory guidance on air quality and the planning system for new development. The guidance clarifies when an air quality assessment is required, what it should contain and how impacts should be described and assessed. The guidance sets out a recommended approach to assess the significance of the air quality impacts and provides suggestions to reducing emissions and impacts.

2.6.2 The IAQM **Guidance on the Assessment of Mineral Dust Impacts for Planning**<sup>5</sup> document provides specific non-statutory guidance on dust assessments on mineral sites. The guidance clarifies when a dust assessment is required and outlines a recommended methodology for carrying out impact assessments and determining the significance of impacts and effects. The guidance also sets out suggested approaches to mitigating emissions and impacts. Although the

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<sup>15</sup> Environment Agency (EA), Guidelines for developments requiring planning permission and environmental permits (England), 9<sup>th</sup> October 2013

guidance is primarily designed for mineral extraction activities it is also covers restoration activities.

2.6.3 The IAQM **Guidance on the Assessment of Dust from Demolition and Construction**<sup>6</sup> document provides specific non-statutory guidance in relation to dust and emissions from construction and demolition. Parts of this guidance may also be applied to importation and restoration activities where these present similar risks of impacts, and the relevant guidance is referred to concerning mitigation measures.

2.6.4 The IAQM **Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites**<sup>16</sup> provides specific non-statutory guidance in relation to the assessment of air quality impacts of development on designated nature conservation sites.

2.6.5 In addition to the above guidance is provided by the EA in controlling and monitoring emissions from permitted activities including in relation to dust<sup>17</sup>.

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<sup>16</sup> Institute of Air Quality Management (IAQM), A guide to the assessment of air quality impacts on designated nature conservation sites, version 1.1, May 2020

<sup>17</sup> <https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit>

### 3 Assessment Methodology

#### 3.1 Scope

3.1.1 The AQA has considered the potential for the generation of aerial emissions due to the Proposed Development and likely impacts on nearby receptors. The principal aspects considered during the AQA are:

- potential for material handling / restoration activities to result in adverse impacts due to particulate matter (deposition dust and PM<sub>10</sub> (and PM<sub>2.5</sub>)); and
- potential impacts of traffic associated with the works on local air quality and any nearby sensitive receptors;
- potential impacts of NRMM operating on site on local air quality and any nearby sensitive receptors.

3.1.2 In undertaking the AQA, SGP carried out the following activities:

- visit to view the Site and surrounding area;
- review of Proposed Development information including layout, proposed activities, and traffic movements;
- review of baseline air quality and local weather conditions;
- review of background site sensitivity data and nature conservation sites;
- qualitative assessment of potential dust / airborne particulate matter impacts;
- screening assessment of vehicle emissions taking into account vehicle movements and routing on local road network;
- provision of recommendations for additional mitigation measures;
- assessment of residual impacts on human and ecological receptors and significance of effects.

#### 3.2 Sources of Information

3.2.1 The baseline data has been gathered through a desk top study and the site visit. In undertaking the assessment reference has been made to the following sources of information:

**Table 3.1: Information Sources**

Date and Reference	Author and Source	Purpose and Content
<b>Background and Topographical Information</b>		
Promap	Ordnance Survey	general mapping information including topographic data, ground features, rights of ways, communications etc
Aerial satellite imagery; imagery date March 2021 and earlier	aerial photography (various)	site setting

Date and Reference	Author and Source	Purpose and Content
<a href="https://magic.defra.gov.uk/">https://magic.defra.gov.uk/</a>	multi-agency	web-based interactive map containing information on nature conservation areas
<b>Air Quality Information</b>		
2024 Air Quality Annual Status Report (ASR), July 2025 <sup>18</sup> (and earlier reports)	Barnsley Metropolitan Borough Council (BMBC)	Update of local authority air quality monitoring and assessment; details air quality data up until end 2024
<a href="https://uk-air.defra.gov.uk/aqma/">https://uk-air.defra.gov.uk/aqma/</a>	Defra	Details and maps of AQMAs throughout UK
<a href="https://laqm.defra.gov.uk/">https://laqm.defra.gov.uk/</a>	Defra	Local Authority air quality management support; background pollutant maps

Note: all information websites were accessed in March 2025

3.2.2 Information has been provided by the project transport consultants, Axis, in relation to transport movements and routing<sup>19</sup> and the project ecological consultants, Urban Green, in relation to nature conservation sites.

### Site Inspection

3.2.3 A visit to the Site and surroundings was undertaken by a suitably qualified SGP Air Quality Consultant on 20<sup>th</sup> January 2025.

### 3.3 Consultations

3.3.1 An Environmental Impact Assessment (EIA) Scoping Report was submitted by Axis to BMBC in relation to the Proposed Development<sup>20</sup>.

3.3.2 The Scoping Report set out the content and extent of matters to be covered by the proposed Environmental Statement (ES), where these matters were those considered to be the principal potential effects related to the Proposed Development. The Scoping Report also set out other environmental effects which could arise from the Proposed Development, but which were considered not to warrant specific detailed assessment within the proposed ES and which were to be scoped out.

3.3.3 The Scoping Report accordingly proposed to scope Air Quality out of the proposed ES on the basis it was considered unlikely the Proposed Development would result in significant effects in relation to air quality. The Scoping Report did however provide for provision of a stand-alone AQA with the application.

<sup>18</sup> Barnsley Metropolitan Borough Council, 2025 Air Quality Annual Status Report (ASR), July 2025

<sup>19</sup> Axis, Stairfoot Quarry, Transport Assessment, 3263-01-TA01, July 2025

<sup>20</sup> Axis, Stairfoot Brickworks, Environmental Statement Scoping Report, ref: 3283-01-ESSR, December 2024

3.3.4 The BMBC Scoping Opinion<sup>21</sup> agreed that Air Quality could be scoped out of the planning application but should be addressed elsewhere in the application where appropriate. The Environmental Health Officer (Pollution Control) – Regulatory Services recommended a number of conditions should planning permission be granted including: *No development (including construction, land raising and demolition if required) shall be carried out other than in accordance with a Construction Environmental Management Plan (CEMP) that is first submitted to, and approved by, the local planning authority. The CEMP is expected to include measures to control noise and dust.*

### 3.4 Assessment Methodology

3.4.1 The AQA has been undertaken to assess the risk of emissions from the Proposed Development causing an impact. In accordance with national and local planning policy the AQA considers whether or not the Proposed Development would give rise to *significant adverse impacts* on health, quality of life or the natural environmental or *unacceptable levels* of air pollution.

3.4.2 The assessment of potential pollutant impacts considers the potential magnitude of a release (the source potential), the effectiveness of the pathway (i.e., dispersion of a pollutant towards a receptor), and the sensitivity of the receptor. The AQA therefore considers the location of the Site, associated activities and transport routes in relation to sensitive receptors, and the control measures to be implemented, to assess the probability of significant adverse air quality impacts occurring during restoration operations. Consideration is made of the orientation and distance of receptors to the Site and the prevailing weather conditions.

3.4.3 Receptors considered in this AQA comprise:

- human receptors: locations where a person or property may experience adverse impacts of airborne dust or exposure to ambient pollutants or odours (i.e., residential, leisure, amenity, and sensitive commercial use); and,
- ecological receptors: where this refers to any sensitive habitat that may be affected by dust soiling or increased ambient pollution (e.g., locations with an international, national, or local designation and sensitive habitat features).

3.4.4 The IAQM guidance on mineral dust<sup>5</sup> advises that PM<sub>10</sub> needs to be assessed if there are sensitive human health receptors within 1km. Reduced screening distances are applicable in relation to deposition dust and human and ecological receptors beyond which adverse impacts would not be expected. To provide a conservative assessment therefore a search radius of 1km of the Site boundary has initially been applied in relation to the dust assessment.

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<sup>21</sup> Barnsley Metropolitan Borough Council, Proposed restoration of Yews Quarry, Environmental Statement Scoping Opinion, ref: 2024/ENQ/00517, dated 31/01/2025

3.4.5 The IAQM guidance on air quality and planning<sup>4</sup> does not specify at what distance a receptor should be to an affected road to indicate the need for assessment. However, pollution concentrations fall rapidly away from the roadside and are expected to return to background levels within 100m of a road source. For the purposes of the assessment reference is made to HE DMRB<sup>22</sup> guidance which requires assessment of receptors within 200m of affected roads. Where there are no receptors within 200m of affected roads vehicle emissions are not considered further and potential impacts can be considered negligible. The Study Area therefore encompasses an area up to 200m of the expected HGV routes to / from the Site as discussed further in Section 7.

3.4.6 Further details on the selection of receptors and the methodology of the assessments as detailed in the relevant guidance is described in Appendix B.

### 3.5 Scoped Out Matters

3.5.1 The restoration proposals include for the importation and placement with non-hazardous soil materials. The proposed materials would consist of soils excavated from development sites in the local area. The scope of materials to be deposited would place controls on the biodegradable waste fraction and consequently limit the potential for odour releases from the material. Considering these rigorous controls, the potential for odorous emissions that may result in a loss of amenity or pose a nuisance from the Proposed Development is considered to be *negligible*. Further assessment is not therefore deemed necessary.

3.5.2 The operation of on-site plant and machinery (non-road mobile machinery (NRMM)) during the operations will give rise to vehicle exhaust and combustion plant emissions. However, these are typically considered unlikely to give rise to significant impacts on local air quality and further consideration has been scoped out of this assessment.

### 3.6 Assessment of Significance

3.6.1 The resulting effects of aerial emissions are the consequences of the potential impacts, i.e., changes in pollutant concentrations and / or deposition, at receptors. IAQM guidelines do not provide a traditional matrix assessment of significant effects with regards to air quality. The frameworks outlined in the guidance above and described in Appendix B provide methodologies for describing air quality impacts and resulting effects at individual receptors. These frameworks are therefore used as a starting point to assess the significance of predicted effects.

3.6.2 Where *negligible* impacts are predicted, the overall effects will be **not significant**. In general, where *slight* impacts at receptors are predicted the resulting effects would be considered to be **not significant**. *Moderate* and *substantial* impacts could result in **significant** effects. However, the judgement of the overall significance of the air quality effects of the proposals is informed by

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<sup>22</sup> Highways England (HE), Design Manual for Roads and Bridges (DMRB), LA 105 Air Quality, Revision 0, November 2019

the predicted impacts and effects at individual receptors and takes into account a number of factors, such as, but not limited to:

- the existing and predicted future air quality in the absence of the proposed development;
- the extent of current and future population exposure to the predicted impacts and the severity of those impacts;
- whether the predicted impacts potentially result in failure to achieve compliance, or enhance compliance, with EU AAD values and / or UK AQOs and national and / or local air quality action plans;
- whether the predicted impacts potentially result in the need for declaration of a new or extended AQMA, or removal of an existing AQMA;
- whether the predicted impacts potentially result in permanent or temporary damage, or improvements, to nature conservation sites of local, national or international importance and the geographical extent of those impacts;
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts.

## 4 Site Details and Proposed Development

### 4.1 Site Details and Existing Development

4.1.1 The Site, the former Yew Tree Quarry, is located within the wider area of the Stairfoot Quarry Complex which extends to the southeast, south, west and northwest. It is centred on OS grid reference SE 38150 05175 and comprises about 4.4 hectares (ha) in size consisting of bare ground, with trees and brambles around the edges, and a standing body of water. The Site boundary additionally includes the access which is to be taken from the historical access into the former brickworks off the A633 Wombwell Lane to the southwest.

4.1.2 The Site and wider Quarry Complex lies to about 2km to the southeast of Barnsley as shown below in Figures 4.1-4.2.

Figure 4.1: Site Location (1:25,000 scale mapping base)

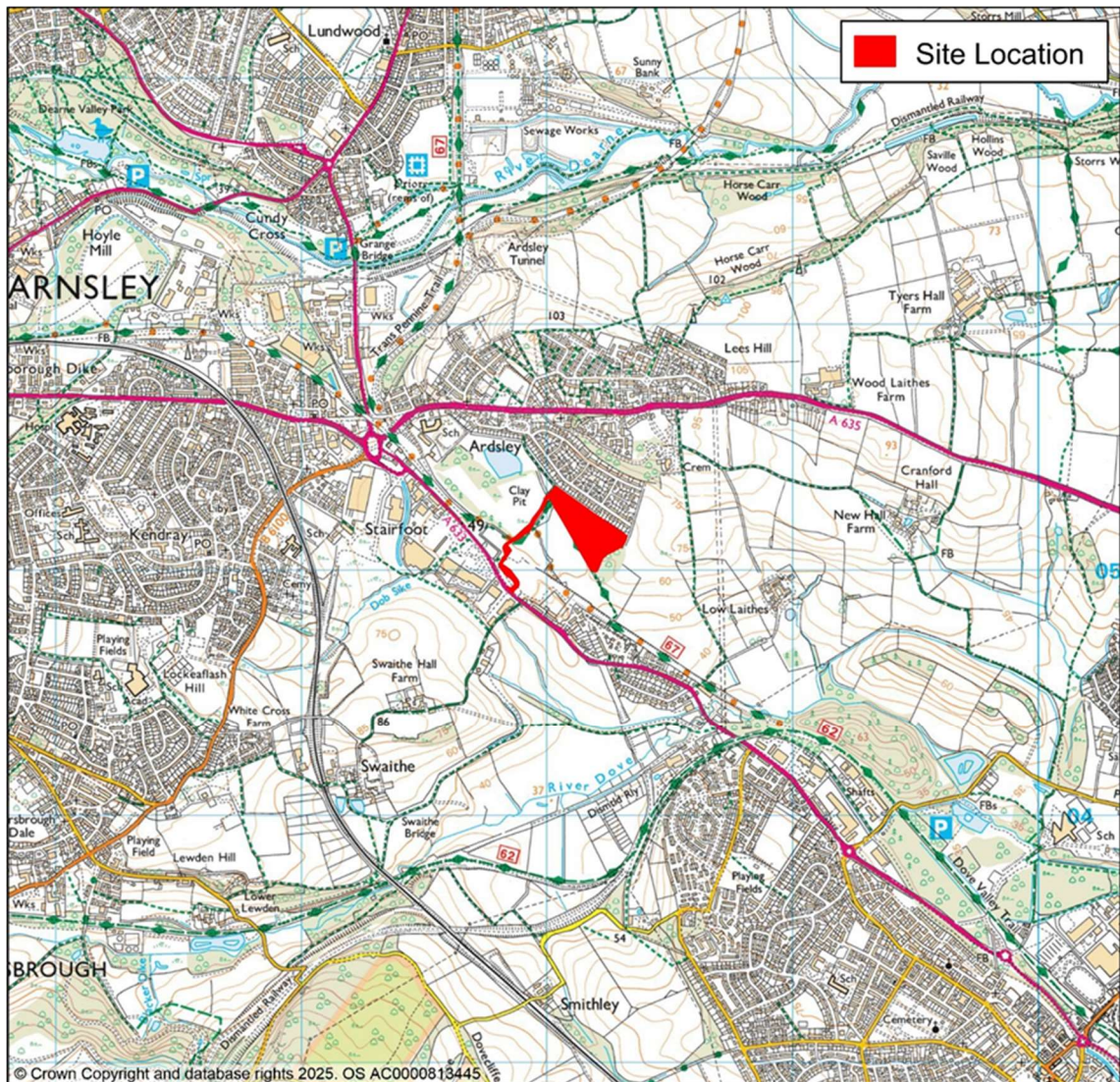
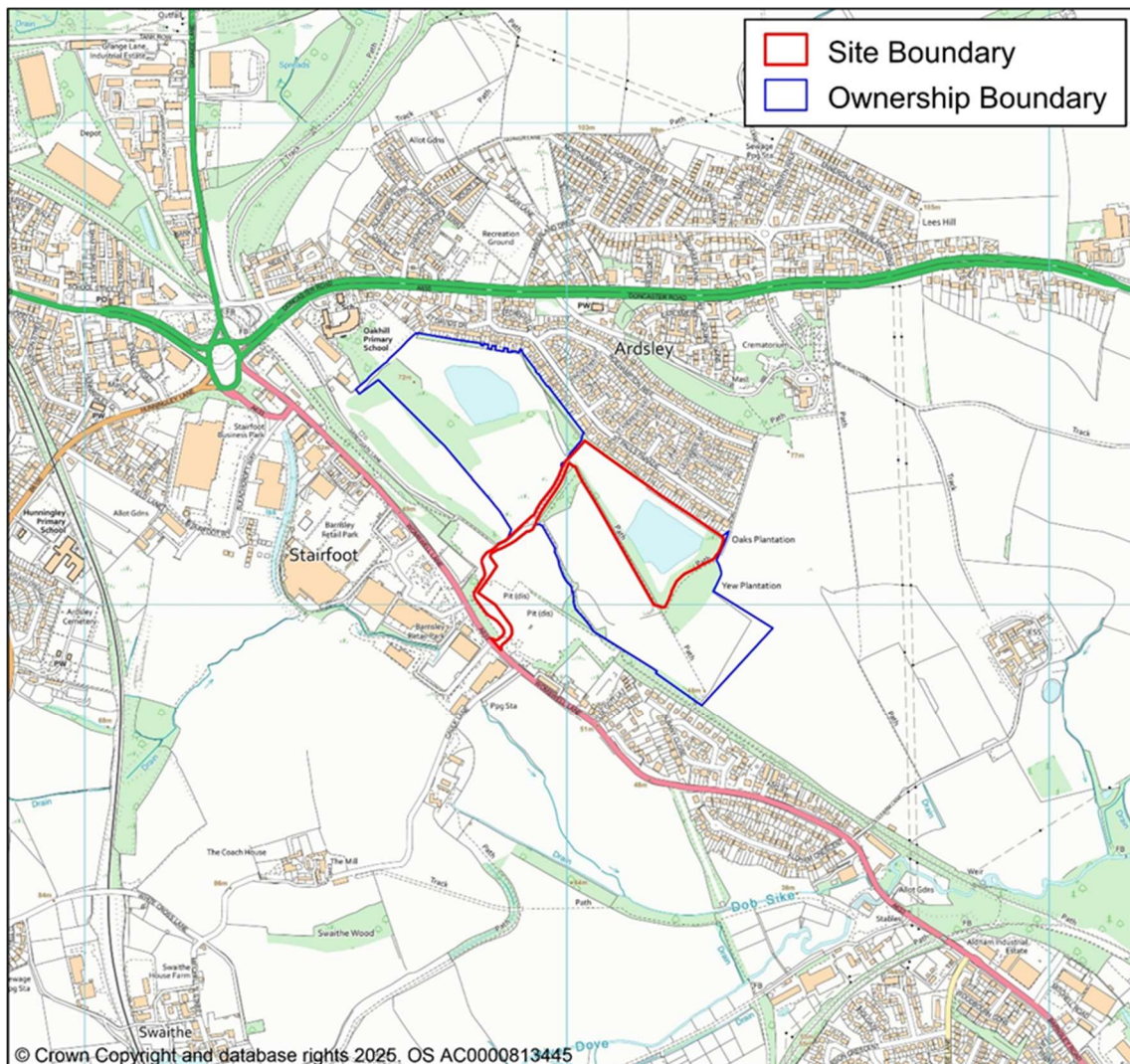


Figure 4.2: Site Location (1:10,000 scale mapping base)



## 4.2 Proposed Development

4.2.1 Full descriptions of the proposals are provided in the planning application and supporting documentation and only those aspects of relevance to the dust and air quality assessment are described here. The proposed phasing plans are included in Appendix A.

4.2.2 Proposals are for the restoration of the former quarry through the importation and placement of non-hazardous soil materials. Imported material is to comprise soils excavated from development sites in the local area. It is estimated that circa 400,000m<sup>3</sup> of non-hazardous soil materials would be imported over a period of 111 weeks. As the material would be sourced from development projects it would be imported on a 'campaign basis' dependent on availability.

4.2.3 Access to the Site would be provided via the historical access to the former brickworks off A633 Wombwell Lane. An enabling works planning application was approved by BMBC in September 2023 (ref. 2022/1218), which allows for a series of improvements to the existing access junction off Wombwell Lane. This enabling works application relates to a more recent full planning

application, submitted by Potters Ballotini Limited, for the redevelopment of the former Stairfoot Brickworks site to comprise a glass recycling and repurposing facility (ref. 2024/0373) which was approved in November 2024.

4.2.4 The proposals include for construction of a temporary site compound which would include a wheelwash, parking and welfare facilities.

4.2.5 Restoration material would be delivered straight into the void and placed immediately in accordance with the phasing plan. Stockpiling of materials would not typically be expected to occur. Plant and machinery to be used would comprise dozers, rollers and 8-wheeled road tipper HGVs.

4.2.6 There would not be any processing undertaken on site such as crushing or screening.

4.2.7 Works would initially be undertaken in the northwest corner of the Site with subsequent infilling from southeast to northwest and works on the northern boundary to achieve the final restoration contours. Final restoration would include grassland species and shrub boundary planting.

4.2.8 Proposed hours of operation would be 0730 to 1630 Monday to Friday; 0800 to 1300 Saturdays with no activities on Sundays, or on Public and Bank Holidays. There would not be any vehicle deliveries on Saturdays.

### **4.3 Regulatory Controls**

4.3.1 In addition to any controls that may be imposed via planning condition the material import and infilling activities would also be regulated under an Environmental Permit (Part A1) to be issued by the Environment Agency. The Permit would establish strict procedures with regards to material acceptance and include measures on environmental pollution control, including management of dust and incoming materials and a standard boundary condition in relation to dust.

## 5 Setting and Baseline Conditions

### 5.1 General Site Setting

5.1.1 Adjoining areas of the wider Quarry Complex include the Yew Tree Plantation to the southeast, South Quarry to the southwest, and North Quarry to the northwest. The former Stairfoot Brickworks lies around 125m to the southwest beyond an area of clay stockpiles.

5.1.2 North Quarry was backfilled with waste material and has been restored. It currently consists of wooded parts, scrubland, and a large body of water. South Quarry currently consists of open scrubland.

5.1.3 The former Stairfoot Brickworks area is currently a parcel of bare hardstanding, although as noted above planning permission has been granted for redevelopment of this site to a glass recycling and repurposing facility.

5.1.4 Residential areas of Ardsley lie to the north and open land to the east.

5.1.5 The Site boundaries and immediate environs are summarised below in Table 5.1:

**Table 5.1: Site Boundaries and Immediate Environs**

	Boundary	Neighbouring land
<b>North / Northeast</b>	Brambles / Trees	Rear gardens of residential properties on St. Pauls Parade
<b>East / Southeast</b>	Brambles / Trees	Trees and woodland, including Yew Tree Plantation; open agricultural land
<b>South</b>	Brambles / Trees	Marine Band beyond which lies an area of trees and residential properties
<b>Southwest</b>	Brambles / Trees	former South Quarry beyond which lie clay stockpiles and the former Brickworks
<b>West</b>	Brambles / Trees	former North Quarry Public footpath, Parkland, Woodland, North Quarry

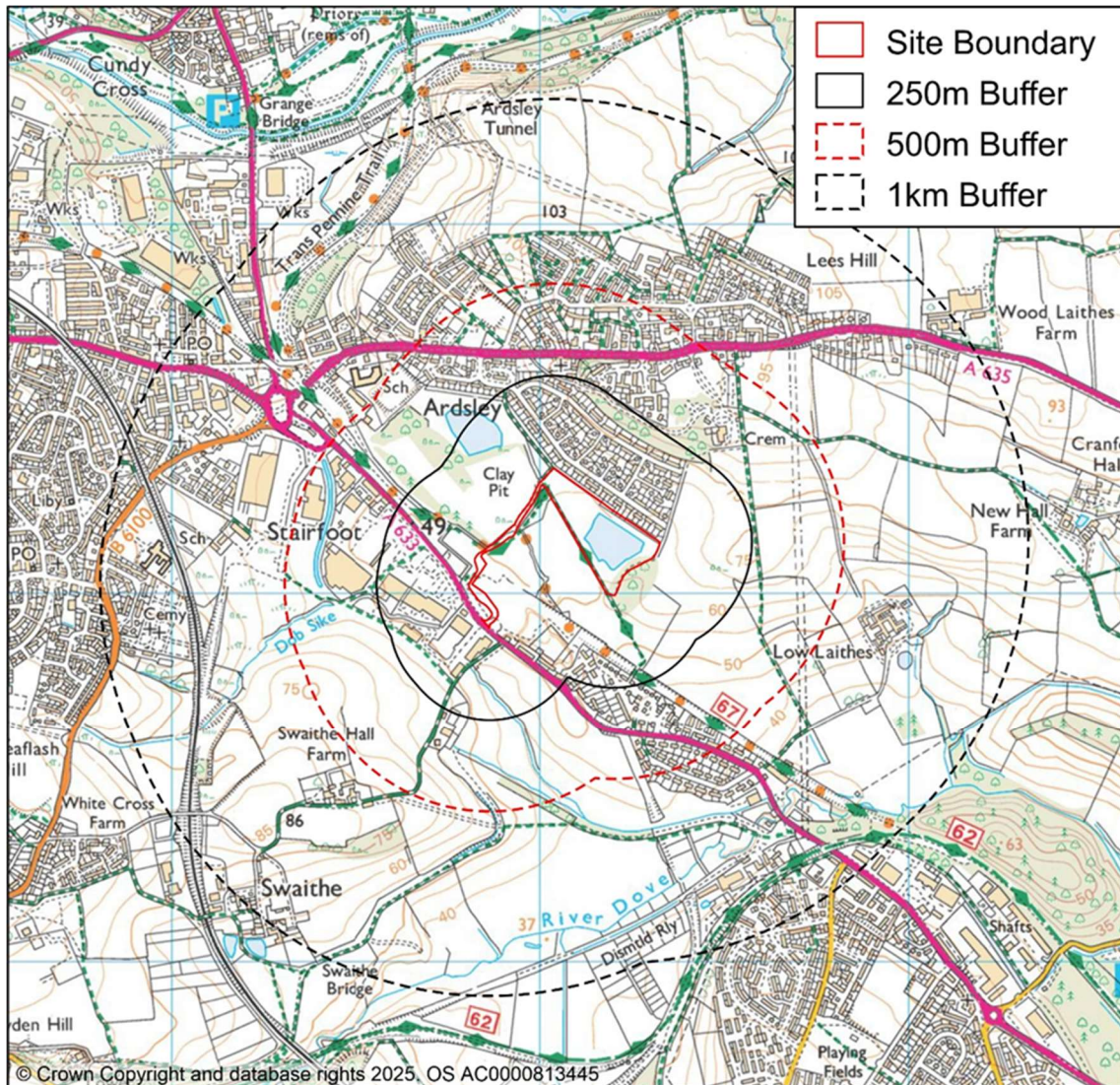
5.1.6 The nearest residential dwellings to the Site are those on St Pauls Parade, and beyond, the gardens of which extend to the site boundary to the north / northwest.

5.1.7 Other residential properties within 500m of the Site include those on Clae Cott Lane, and on Albany Close, 150m and 175m to the south respectively and those on Wombwell Lane, 280m to the west.

5.1.8 The playing grounds of Oakhill Primary School extend to about 430m to the northwest of the Site, with the school buildings lying 530m distant. No other schools, hospitals, or other such high occupancy sensitive receptors have been identified within 500m of the Site boundary.

5.1.9 Footpaths run along the southwestern and northern boundaries of the Site. The Trans Pennine Trail (TPT) is located 150m to the south of the Site, which is a coast-to-coast route for walkers, cyclists, and horse riders.

Figure 5.1: Site Setting



## 5.2 Future Site Setting

5.2.1 No proposed land use changes have been identified within the vicinity of the Site, other than the consented redevelopment of the former brickworks.

### 5.3 Nature Conservation Sites

5.3.1 The following designated nature conservation sites have been identified within 2km. The locations are shown below in Figure 5.2.

**Table 5.2: Nature Conservation Sites within 2km**

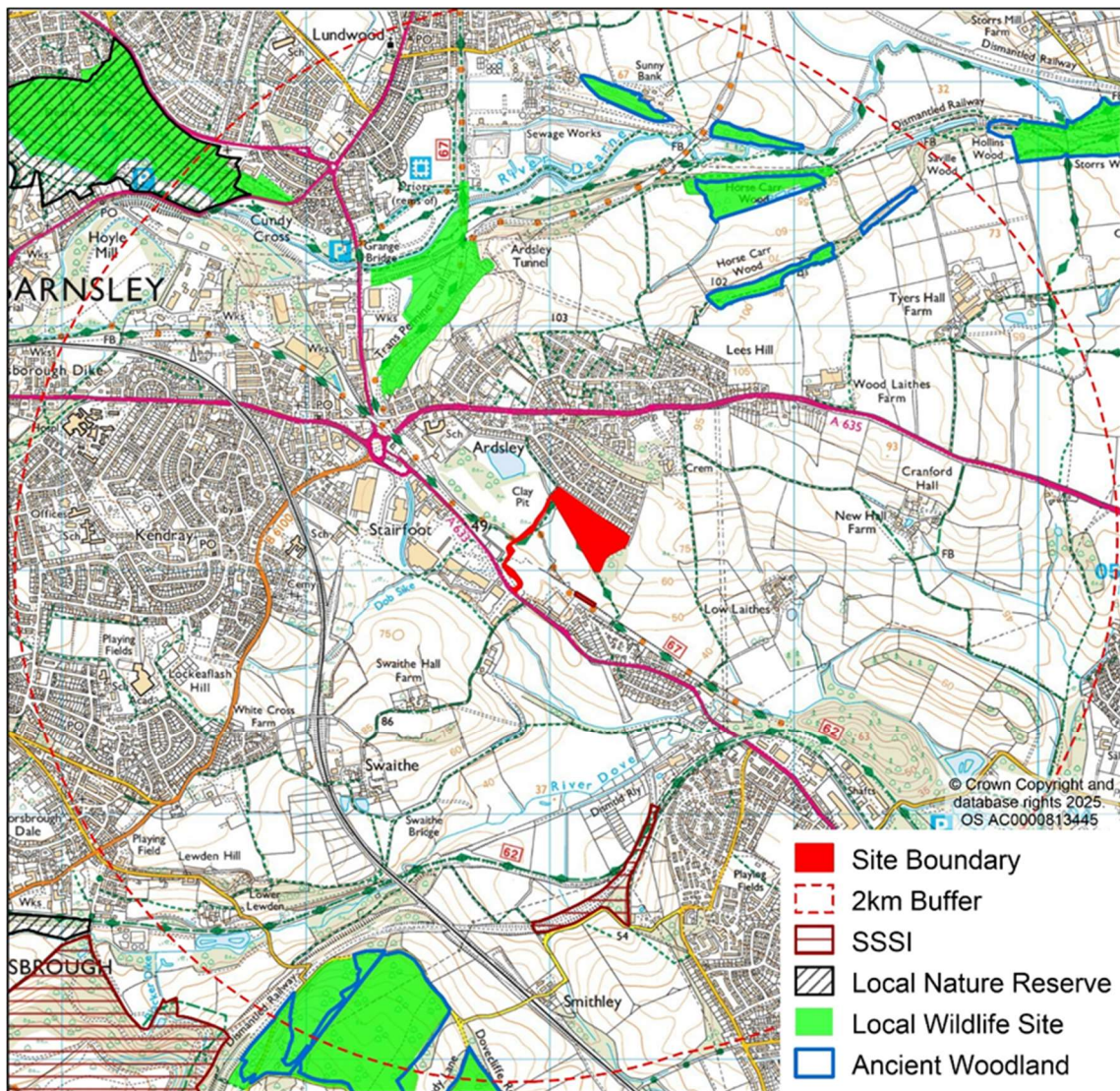
Name	Designation	Distance and Orientation from Site
<b>Statutory Designated Sites</b>		
<b>International Sites</b>		
<i>none</i>		
<b>National and Local Sites</b>		
Stairfoot Brickworks	SSSI (Geological Interest)	120m S
Dearne Valley Wetlands	SSSI (Biological Interest)	1.00km S
Dearne Valley Park	Local Nature Reserve (LNR)	1.74km NW
<b>Other National / Local Non-Statutory Sites</b>		
Stairfoot Disused Railway	LWS	790m NW
Cliff Wood	LWS	1.8km NW
Wombwell Wood	LWS	1.8km SSW
Sunny Bank, Horse Carr and Storrs Wood	LWS	800m NE

SSSI – Site of Special Scientific Interest; LWS – Local Wildlife Site;

5.3.2 Stairfoot Brickworks SSSI is designated due to geological features and therefore is not considered further in this assessment.

5.3.3 In addition, several areas of Ancient Woodland and Semi-Natural Ancient Woodland are mapped within 2km of the Site. The closest is Horse Calanan Wood (South) which lies about 995m to the north.

Figure 5.2: Designated Nature Conservation Sites within 2km



Note: Local wildlife Site boundaries are approximate. See information provided by project Ecologists, Urban Green, for exact locations.

## 5.4 Topography

5.4.1 The main area of the Site is currently a void with water pooling on the eastern side of the Site. The land surrounding the Site is at a much higher elevation. There is a sloped section in the north-western corner of the Site, allowing for vehicles to enter down into the void.

## 5.5 Background Air Quality Data

5.5.1 Defra publishes predicted background pollutant concentration maps for 1km x 1km grid squares across the UK. The maps are based on a combination of ambient monitoring and meteorological data along with modelling using information including on the age and distribution of vehicles and emission factors. These are updated periodically due to updates in background data such as vehicle emissions factors. The current maps were issued in 2024 based on 2021 ambient

monitoring and meteorological data. Predicted data is provided by Defra for each year from 2021 to 2040.

5.5.2 These are updated periodically due to updates in background data including vehicle emissions factors and the age and distribution of the UK vehicle fleet. The current maps were issued in 2024 and the predicted data is based on 2021 ambient monitoring and meteorological data. Predicted data is provided by Defra for each year from 2021 to 2040.

5.5.3 Predicted NO<sub>2</sub>, NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> data for the grid squares in which the Site and nearest receptors are located for the current year (2025) and for a future year (2030) are detailed in Table 5.3 below.

**Table 5.3: Predicted Background Air Quality Data – Nitrogen Oxides and Particulate Matter**

Grid Square	Location	Annual Mean Pollutant Concentration (µg/m <sup>3</sup> )			
		NO <sub>2</sub>	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
<b>2025</b>					
438500 405500	Site & nearest receptors	8.31	10.68	12.26	6.31
437500 405500	West of Site / Oakhill Primary School	9.18	11.90	12.50	6.41
<b>2030</b>					
438500 405500	Site & nearest receptors	6.86	8.72	11.92	6.00
437500 405500	West of Site / Oakhill Primary School	7.44	9.50	12.19	6.10
<b>Objective (annual mean)</b>		<b>40</b>	<b>30 (v)</b>	<b>40</b>	<b>20 (12)<sup>1</sup></b>

Data downloaded in January 2025

(v) – established for the protection of vegetation

1: Interim target of 12 µg/m<sup>3</sup> for PM<sub>2.5</sub> for 2028

5.5.4 The average background concentrations for the grid square in which the Site and nearby receptors are located are predicted to be well below the relevant objectives in 2025. All pollutant concentrations are predicted to fall over time, although PM<sub>10</sub> and PM<sub>2.5</sub> to a lesser extent than NO<sub>2</sub> and NO<sub>x</sub>.

5.5.5 It should be noted that the data are effectively an average concentration across each 1km square. Pollutant concentrations will therefore be higher at any individual receptor close to any significant source.

## 5.6 Air Quality Management Areas (AQMAs)

5.6.1 BMBC has five declared AQMAs within its' administrative area. None of these are located within the vicinity of the Site. The nearest is the Barnsley AQMA No. 7 which encompasses a section of the A61 within Barnsley and is located over 4km to the west of the Site.

5.6.2 According to the 2025 ASR, the Council is currently considering revoking one of the AQMAs, AQMA No.1, due to ongoing compliance with the NO<sub>2</sub> annual mean air quality objective. The revocation of this AQMA had previously been postponed due to proposed 'smart motorway' plans for a stretch of the M1 passing through the borough, although plans for new smart motorways have since been cancelled by the UK government.

5.6.3 No areas of potential poor air quality requiring further review have been identified by BMBC within the vicinity of the Site.

## 5.7 Local Air Quality Monitoring

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

5.7.1 BMBC undertakes ambient air quality monitoring for NO<sub>2</sub> across its administrative area using a combination of automatic (continuous) analysers and passive diffusion tubes.

5.7.2 Neither of the continuous NO<sub>2</sub> monitoring locations are in the vicinity of the Site.

5.7.3 Several of the diffusion tube monitoring locations are within 2km of the Site, as detailed below in Table 5.4 and shown in Figure 5.3.

**Table 5.4: Diffusion Tube Monitoring Locations within 2km of the Site**

ID	Location	Grid Reference	Type	Distance & Orientation from Site
46	Tesco, Wombwell Lane	437554, 405291	Kerbside	470m W
49	Doncaster Road, Ardsley	437528, 405675	Kerbside	620m NW
55	Wombwell Lane, adj, Keel Inn	437367, 405458	Roadside	670m W
57	Grange Lane, Stairfoot, Northbound	437242, 405772	Roadside	910m NW
58	Grange Lane, Stairfoot, Southbound	437250, 405813	Roadside	930m NW
40	Grange Lane, Cundy Cross Junction	437122, 406557	Roadside	1.54km NW

Data as presented in the BMBC 2025 ASR (and earlier reports)

5.7.4 The monitoring results for the period 2018-2024 are summarised below in Table 5.6.

**Table 5.6: Diffusion Tube Monitoring Results – Annual Mean NO<sub>2</sub> Concentrations**

ID	Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )						
	2018	2019	2020*	2021*	2022	2023	2024
46	38.4	42.2	29.0	29.4	33.1	30.3	31.3
49	39.0	41.9	30.2	31.2	33.9	29.4	32.0
55	-	42.6	27.0	30.2	30.1	28.3	29.2
57	-	38.9	29.1	27.9	31.7	28.8	27.9
58	-	37.4	26.1	26.6	27.3	25.6	22.7

ID	Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )						
	2018	2019	2020*	2021*	2022	2023	2024
40	-	42.2	30.0	35.4	33.1	31.4	31.3

Data as presented in the BMBC 2025 ASR (and earlier reports); all results bias-adjusted & annualised as appropriate

Highlighted cells are in exceedance of the current air quality objective (40 µg/m<sup>3</sup> as an annual mean).

\*Concentrations recorded in 2020 and 2021 expected to be affected by implications of Covid-19 pandemic

5.7.5 The nearest monitoring location to the Site and local road network is 46, located on the A633, Wombwell Lane, to the west. Monitoring location 55 is located further west along the A633 Wombwell Lane towards the A633 / A635 (Stairfoot) roundabout. Exceedances of the annual mean AQO were recorded at these two locations, and others, in 2019. However, annual mean NO<sub>2</sub> concentrations here have been below the AQO at both locations, and others, since 2020.

5.7.6 It is noted that pollutant concentrations in 2020, and to a lesser extent in 2021, are expected to have been affected by the reduced traffic movements due to the Covid-19 pandemic<sup>23</sup>. However, although roadside NO<sub>2</sub> and NO<sub>x</sub> levels may increase above 2020 / 2021 concentrations the overall trend is expected to continue downwards in light of continuous reduced vehicle emissions. It is considered unlikely that the majority of UK roadside locations are likely to experience concentrations above those experienced in 2019 at any point in the foreseeable future<sup>24</sup>. The results reported above are consistent with these expectations and this is reflected in the proposed revocation of two of the existing BMBC AQMAs.

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

5.7.7 BMBC undertakes ambient air quality monitoring for PM<sub>10</sub> and PM<sub>2.5</sub> using automatic (continuous) analysers as summarised in Table 5.7 below.

**Table 5.7: BMBC Automatic Monitoring Locations – Particulate Matter**

ID	Location	Grid Reference	Type	Distance & Orientation from Site	Pollutants Monitored
BAR9	Barnsley A635 Kendray Roadside	436298, 405691	Roadside	1.77km NW	PM <sub>10</sub>
BAR3	Barnsley Gawber	432525, 407475	Urban Background	5.90km NW	PM <sub>10</sub> , PM <sub>2.5</sub> (and NO <sub>2</sub> , SO <sub>2</sub> , O <sub>3</sub> )

Data as presented in the BMBC 2025 ASR

5.7.8 PM<sub>10</sub> and PM<sub>2.5</sub> monitoring results for the years 2018 to 2024 are provided in Tables 5.8 to 5.9 below.

<sup>23</sup> COVID-19: Following the outbreak of a global pandemic of the Coronavirus disease 2019 (COVID-19) due to the SAR-CoV-2 virus, the UK Government declared several restrictions on non-essential travel and movement during March 2020. Various restrictions remained in place during 2020 and 2021 with resulting implications on transport movements across the UK.

<sup>24</sup> Air Quality Consultants, Trends in UK NO<sub>x</sub> and NO<sub>2</sub> Concentrations – May 2022 Update, 13.05.22

**Table 5.8: Automatic Monitoring Results - Annual Mean PM<sub>10</sub> Concentrations**

ID	Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> )						
	2018	2019	2020	2021	2022	2023	2024
BAR9	18	20	20	19	21	20	16.9
BAR3	-	-	-	-	-	12	11.4

*Data as presented in the BMBC 2025 ASR (and earlier reports)*

*Current Air Quality Objective: 40 µg/m<sup>3</sup> as an annual mean.*

**Table 5.9: Automatic Monitoring Results - Daily Mean PM<sub>10</sub> Concentrations**

ID	Number of PM <sub>10</sub> 24-Hour Means > 50µg/m <sup>3</sup>						
	2018	2019	2020	2021	2022	2023	2024
BAR9	5	11	3	1	7	1	2
BAR3	-	-	-	-	-	0	0

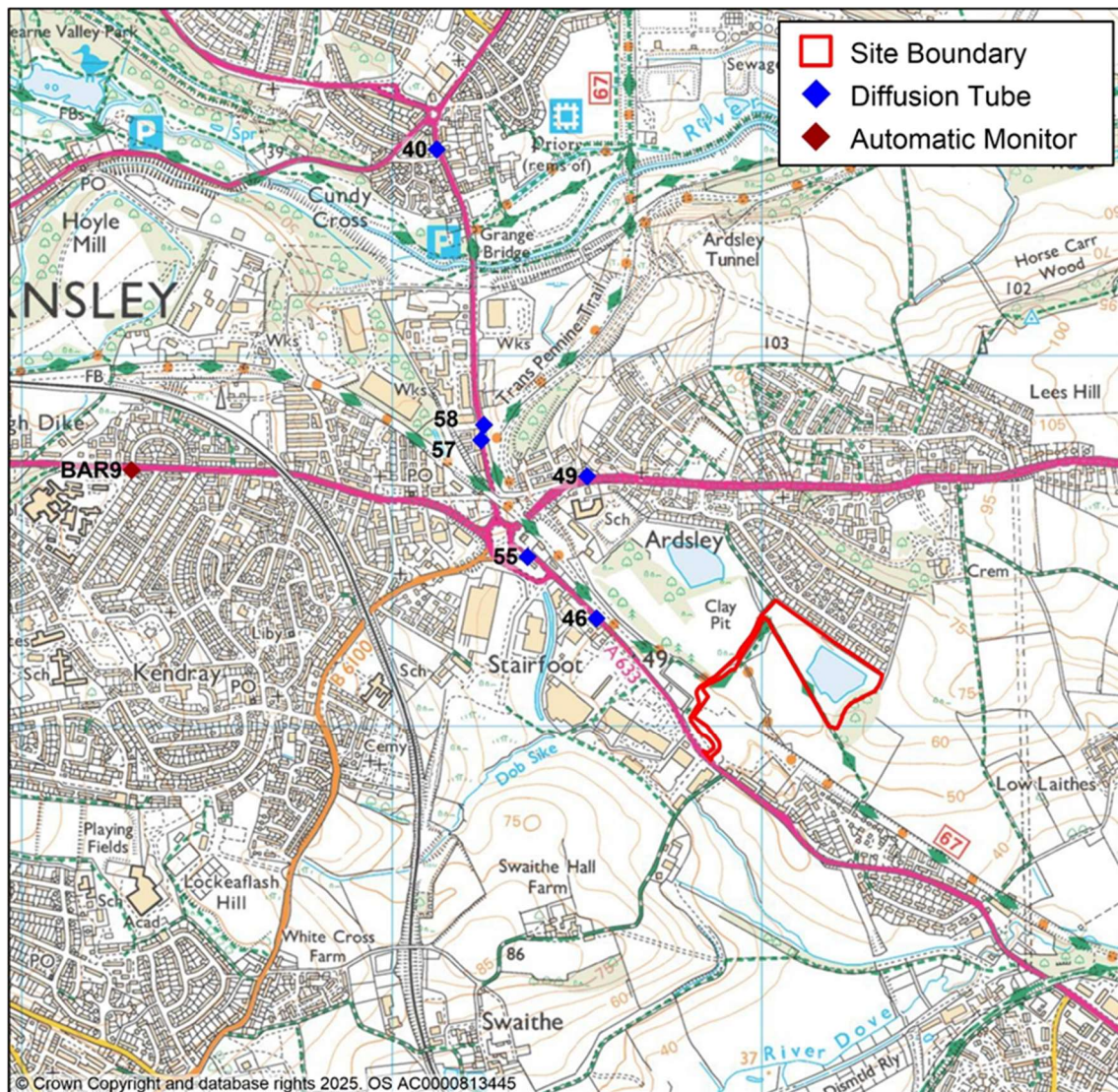
*Data as presented in the BMBC 2025 ASR (and earlier reports)*

*Current Air Quality Objective: 24-hour average of 50 µg/m<sup>3</sup> not to be exceeded more than 35 times per year.*

5.7.9 As shown in the above tables, there were no exceedances of the daily mean PM<sub>10</sub> objective or annual mean PM<sub>10</sub> objective recorded at the BAR9 location or the BAR3 location.

5.7.10 The BAR3 monitoring location, which began monitoring in 2023, also measures PM<sub>2.5</sub>. According to the BMBC 2025 Annual Status Report, the annual mean PM<sub>2.5</sub> concentration recorded at the BAR3 monitor was 7 µg/m<sup>3</sup> in 2023 and 7.1 µg/m<sup>3</sup> in 2024. This is well below the current PM<sub>2.5</sub> AQO of 20 µg/m<sup>3</sup> as an annual average, and the 2028 interim target of 12 µg/m<sup>3</sup> as an annual average.

Figure 5.3: Monitoring Locations within 2km of the Site



## 5.8 Other Area Activities

5.8.1 Neighbouring land uses are primarily residential and agricultural. No potentially significant sources of fugitive dust or aerial emissions have been identified in the vicinity of the Site.

## 5.9 Wind Speed and Direction

5.9.1 The most important meteorological parameters governing the atmospheric dispersion of pollutants are:

- wind direction: determines the broad direction of the transport of the emission;
- wind speed: affects the ground levels concentrations by determining the initial dilution of pollutants emitted;
- atmospheric stability: a measure of atmospheric turbulence and hence dispersion of pollutants.

5.9.2 Reference has been made to wind speed and direction data obtained from the meteorological station at Leeds Bradford Airport (NGR: 422391, 441141; 203.9m AOD) about 37km to the north-northwest. Windspeed and direction data has been provided by ADM Ltd, a recognised supplier of meteorological data, for the years 2014-2023.

5.9.3 The annual wind rose derived from the data is provided in Figure 5.4. This depicts average wind speeds and directions over the relevant total monitoring period.

5.9.4 The frequency of winds blowing from each sector are summarised in Table 5.10.

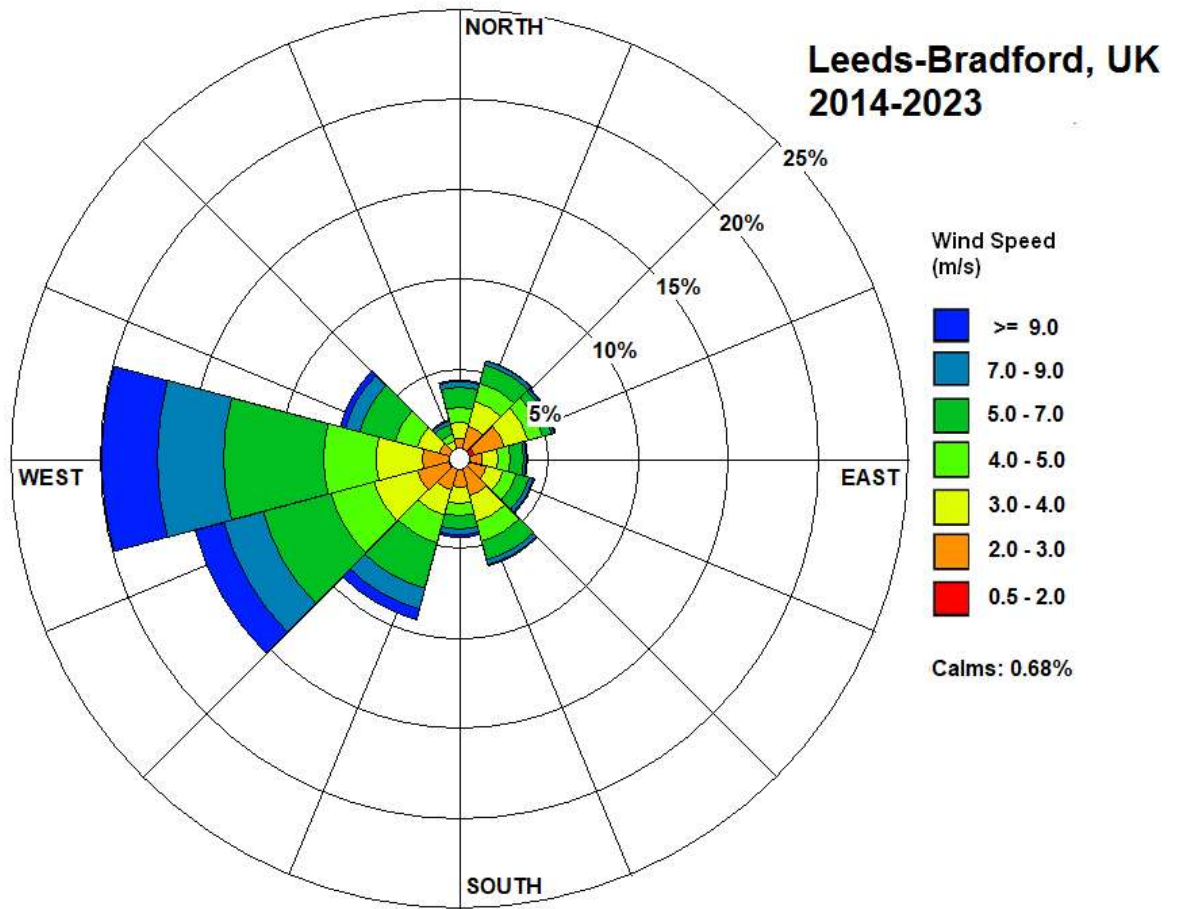
**Table 5.10: Summary Wind Data, Leeds Bradford Airport (2014-2023)**

Direction		Annual Percentage Frequency (%)	
		All Wind Speeds	Wind Speeds >5 m/s
0°	(346 to 15)	4.41	1.53
30°	(16 to 45)	5.67	1.30
60°	(46 to 75)	5.55	0.73
90°	(76 to 105)	3.85	0.99
120°	(106 to 135)	4.32	1.04
150°	(136 to 165)	6.16	1.40
180°	(166 to 195)	4.38	1.19
210°	(196 to 225)	9.22	4.36
240°	(226 to 255)	15.22	7.80
270°	(256 to 285)	19.86	12.24
300°	(286 to 315)	6.94	3.15
330°	(316 to 345)	2.28	0.83
		<b>87.86</b>	<b>36.56</b>

5.9.5 The wind rose shows the prevailing wind direction to be from sectors 210° through to 300°, i.e. from the southwest through to the northwest. These are broadly typical of standard UK conditions, although with a stronger westerly influence than typical.

5.9.6 Winds greater than 10 knots (5 m/s) blow from the southwest to northwest sectors for 27.6% of the time annually. Wind speeds in excess of 10 knots are important as they potentially cause the onset of potentially significant airborne dust emissions due to wind-raising of loose dry dusts from bare ground and stockpiles.

Figure 5.4: Annual Windrose for Leeds Bradford (years 2014-2023)



## **6 Dust Assessment**

### **6.1 General Observations**

- 6.1.1 Airborne dust occurs when fine particles are disturbed and loosened by physical activity such as loading, tipping, and transport. In addition, an airstream passing over such materials can give rise to airborne dust. It is generally accepted that wind speeds greater than 10 knots (~5 m/s) across loose fine materials can cause windblown dust emissions.
- 6.1.2 In calm conditions, any raised dust tends to settle out in the vicinity of the source. In windier conditions, the dust may be carried for a greater distance before settling out.
- 6.1.3 Large dust particles, greater than 30 µm, which constitute the greatest proportion of dust emitted from mineral workings will largely deposit within 100m of the source. Finer particles, which constitute a small proportion of the dust emitted from most mineral operations, are only deposited slowly, and can be transported by light winds. Their concentrations however decrease rapidly from the source due to dispersion and dilution.
- 6.1.4 The distance any generated dust will be carried therefore depends on the wind speed, the particle size, the topography of the site and its surroundings.

### **6.2 Incorporated Mitigation**

- 6.2.1 The proposals include for the retention of the existing vegetation around the Site. Other incorporated in-design mitigation measures include the provision of a wheel-wash. In addition, the infilling and restoration works would be subject to measures and procedures as defined in a Construction Environmental Dust Management Plan (CEMP). This would include measures such as minimisation of drop heights, retention of a site-wide speed limit and further measures as discussed in Section 8.
- 6.2.2 The material import and infilling activities would also be undertaken in accordance with an Environmental Permit, to be issued by the Environment Agency. The Permit would include measures on environmental pollution control, including management of dust and incoming materials and a standard boundary condition in relation to dust.
- 6.2.3 In accordance with IAQM guidance<sup>4,5</sup> these measures are taken as incorporated mitigation within the proposed scheme.

### **6.3 Sources of Dust**

6.3.1 The proposed operations will primarily comprise the importation of soils to site, direct placement within the void and compaction. The principal potential sources of airborne dust associated with the proposals would therefore include:

- materials delivery and internal site haulage,
- materials tipping, handling, and placement,
- external on-road transport,
- wind blow across bare soil.

#### *Materials Handling, Tipping and Placement*

6.3.2 All imported material would be tipped direct at the working area minimising the requirements for any stockpiling of material and potential multiple dust generating handling activities. This would also serve to reduce the likelihood of such material becoming dry and subject to wind blow. Risks would be further minimised through the minimisation of drop heights and compaction of materials immediately following placement. There would not be any long-term stockpiles of soils. Should any temporary stockpiles be required, for example during wet weather, these would be placed close to the working area and the material paced as soon as conditions allow.

6.3.3 Proposed plant and machinery on site include dozers, a roller, and 8-wheel road tipper HGVs.

#### *Material Processing*

6.3.4 No fixed or mobile processing plant is proposed to be used on site.

#### *Internal Haulage*

6.3.5 Internal haulage can be the greatest source of dust on such sites due to the physical disturbance of particles by vehicle movements over bare soils or loose surfaces. Dust may also be raised by on-road haulage if spillages of material are allowed to accumulate on running surfaces.

6.3.6 All incoming material would be imported via an access road from the access point from A633, Wombwell Lane to the weighbridge in the temporary contractor's compound in the northern corner of the Site. This access road would be in the order of 400m in length formed from re-instatement of an existing track.

6.3.7 Materials would be delivered direct to the working area from the weighbridge. Internal haulage could extend up to 320m from the weighbridge to the working area. Internal haulage tracks would be subject to regular inspection and maintained to retain a smooth-running surface.

6.3.8 A tractor (or similar) and water bowser would be used, as and when necessary, and particularly during prolonged dry conditions, to damp down internal haul roads and soil placement areas as required.

*Wind-Blow Across Disturbed Surfaces and Bare Ground*

6.3.9 During dry windy conditions, visible windblown dust may be raised from large areas of open or bare ground, particularly where the materials are loose or have been disturbed by traffic or other operations. All relocated and freshly placed materials would be compacted shortly after placement to reduce the likelihood of windblown dust.

*External Haulage (Off-Site Transport)*

6.3.10 Any soils from unsurfaced and muddy ground that adhere to the wheels and underbodies of vehicles leaving the site may be subsequently deposited as track-out on roads in the vicinity of the Site. On drying this may be raised as dust by the passage of vehicles. Proposals therefore include for provision of a wheel-wash. There would be at least 400m of haul road provided between the wheel wash and the exit to the public highway.

6.3.11 Dust may also be raised from wind blow from un-sheeted loads. All incoming loads would be required to be sheeted to minimise the risk of dust wind-blow whilst on-site. This would also serve to prevent spillages of materials on the local highways and minimise the potential for re-suspension as dust upon material drying out.

*Surface Soils Placement*

6.3.12 The subsequent handling of soils (in this case, the placement of the top soil layer for the purposes of habitat creation) can give rise to substantial dust emissions but are unlikely to be substantially different in terms of potential dust generation compared to agricultural operations such as cultivation and harvesting.

*Summary*

6.3.13 The resulting principal dust sources, taking these measures into account, are summarised below.

**Table 6.1: Summary of Principal Dust Sources (with physical in-design and embedded management mitigation)**

Source	Source Potential	Additional Mitigation Comment
<b>materials handling – tipping and placement</b>	<i>small</i> – dependent on moisture content of imported materials; in order of 200,000m <sup>3</sup> per year over 2 years	typically contained within the quarry void; managed through minimisation of drop heights and immediate placement and compaction of materials where possible
<b>on-site transport – internal haulage from access point to working area</b>	<i>medium</i> – potentially up to 400m from public highway to / from wheelwash and 300m to / from wheelwash and working area; 1km internal haulage distance; average of 160 2-way HGV movements per working day; provision of compacted	establishment of internal speed limit; regular maintenance of smooth-running surfaces; damping down of haul road running surfaces may be required under dry conditions

Source	Source Potential	Additional Mitigation Comment
	hardcore between weighbridge and public highway.	
<b>external road transport</b>	<i>medium</i> – average of 80 departing HGVs a day; potential peak of 100 per day; provision of wheel wash in temporary contractors compound ~400m length from wheel wash to public highway	all imported loads to be sheeted or otherwise contained; internal access roads to be maintained in good condition and damped down if necessary in prolonged dry conditions to minimise any track out to public highway
<b>wind-raised dust (stockpiles)</b>	<i>small</i> – materials to be placed direct at working area where possible with minimal stockpiling required	stockpile management; stockpile edges would be maintained neatly; damping down of stockpiles before disturbance, particularly during prolonged dry periods
<b>wind-raised dust (bare / exposed surfaces)</b>	<i>medium</i> – potentially exposed areas up to 30,000m <sup>2</sup> ; placed material to be compacted after placement	damping down of exposed surfaces as necessary under dry conditions

6.3.14 The resulting overall dust emission magnitude for works on site, taking into account the physical in-design and outlined mitigation measures, is *medium*. The dust emission magnitude for track-out is *medium*.

## 6.4 Dust Assessment

6.4.1 As detailed in the IAQM guidance<sup>5</sup> the larger dust particles (>30 µm) will mainly deposit within 100m of a source whereas intermediate sized particles (10-30 µm) may travel up to 400m, i.e. those larger and intermediate particles that may result in disamenity impacts. It is commonly accepted however that the greatest impacts will be within 100m of a source.

6.4.2 The IAQM guidance on mineral dust<sup>5</sup> advises that adverse dust impacts are uncommon beyond 250m from sand and gravel sites and beyond 400m from hard rock quarries, as measured from the nearest dust generating activities. The IAQM guidance on construction activities<sup>4</sup> advises assessment distances of up to 250m of a site boundary along with additional assessment of the roads used to access a site up to 250m from the site egress. Neither guidance is specifically relevant to the proposed activities at the Site. To provide a conservative assessment therefore the deposition dust assessment considers receptors up to 250m from the restoration area boundary.

*Area Sensitivity*

6.4.3 The impact of dust at a receptor will depend on the inherent sensitivity of the receptor and the perception of the acceptability of the effects of dust.

6.4.4 The maximum sensitivity of the area to dust soiling, human health and ecological impacts has been assessed taking into account the planning application and phasing boundaries and is summarised below in Table 6.2.

**Table 6.2: Sensitivity of Area<sup>1</sup>**

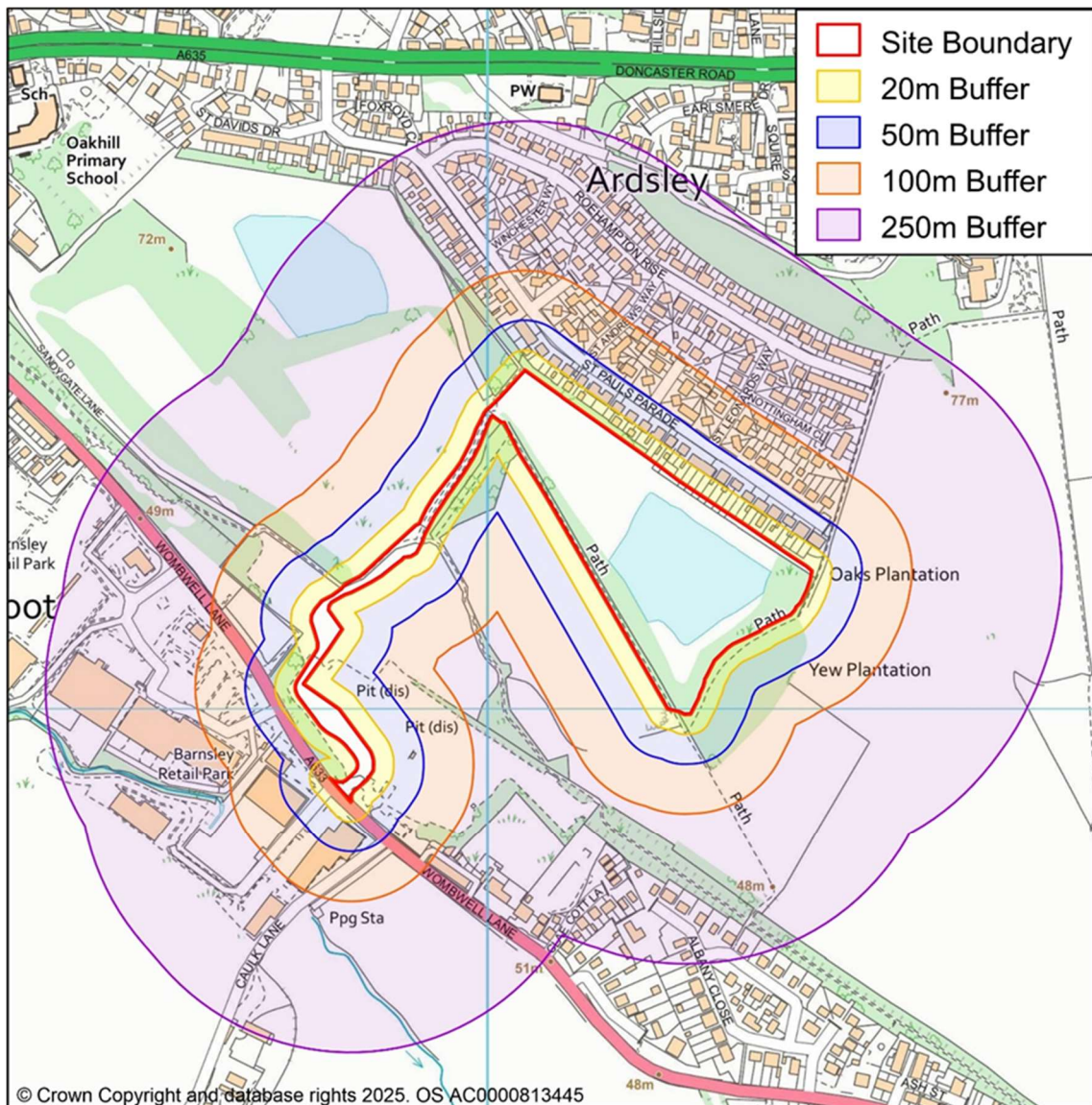
Activity	Sensitivity <sup>2</sup>	Comment
<b><i>Dust Soiling Effects on People &amp; Property</i></b>		
Earthworks	High	10-100 high sensitive receptors <20m from Site Boundary
Trackout	Medium	1-10 high sensitive receptors within 20m of affected roads up to 250m from site egress
<b><i>Human Health Impacts<sup>3</sup></i></b>		
Earthworks	Low	10-100 high sensitive receptors <20m from Site Boundary
Trackout	Low	1-10 high sensitive receptors within 20m of affected roads up to 250m from site egress
<b><i>Ecological Impacts</i></b>		
Earthworks	<i>Not sensitive</i>	<i>No ecological sites within 250m of Site Boundary</i>
Trackout	<i>Not sensitive</i>	<i>No ecological sites within 50m of affected roads up to 250m from site egress</i>

1: With reference to the Site as a whole

2: With reference to Table 2 to 4 of IAQM construction dust guidance<sup>6</sup>

3: IAQM guidance provides different sensitivity banding depending on the area background PM<sub>10</sub> concentrations. Predicted background PM<sub>10</sub> data expected to be <24 µg/m<sup>3</sup> (see Tables 5.3 and 5.7).

Figure 6.1: Disamenity Dust Screening Buffers



6.4.5 In determining the overall sensitivity of the area other factors should be taken into account such as other local dust generating sources and the prevailing wind direction. The following points can be made in this regard:

- no significant sources of dust have been identified in the locality which may impact the overall sensitivity of the area;
- the prevailing wind direction is from the south-west, across the Proposed Development towards the properties in Ardsley; and
- the nearest properties on St Pauls Parade are provided with some tree screening.

6.4.6 The overall sensitivity is defined as set out below.

**Table 6.3: Outcome of Defining the Sensitivity of the Area**

Potential Impact	Sensitivity of Surrounding Area	
	Earthworks	Trackout
Dust Soiling	High	Medium
Human Health	Low	Low
Ecological	<i>Not sensitive</i>	<i>Not sensitive</i>

*Risk of Dust Impacts*

6.4.7 Taking into account the dust emission magnitude and the sensitivity of the area, the risk of dust impacts, in the absence of mitigation, at nearby sensitive receptors are as follows:

**Table 6.4: Risk of Dust Impacts**

Potential Impact	Risk of Impacts	
	Earthworks	Trackout
Dust Soiling	Medium	Medium
Human Health	Low	Low
Ecological	<i>n/a</i>	<i>n/a</i>

Note: Based on Tables 7, 8 and 9 in the IAQM guidance

6.4.8 In summary, the assessment indicates that there is a *medium* risk of dust soiling impacts arising from fugitive dust from the infilling and restoration works, and from trackout. There is a *low* risk of PM<sub>10</sub> human health impacts arising from infilling and restoration works and trackout.

6.4.9 The presence of the public footpaths along the southwestern and northern boundaries of the Site are noted, along with the Trans Pennine Trail TPT) to the south of the Site. Any exposure along these paths would be short-lived and transient and the resulting risk of disamenity dust effects is *negligible*.

## 6.5 Mitigation

6.5.1 The potential for dust related impacts arising from infilling and restoration activities can however be readily controlled and mitigated through the implementation of standard dust management techniques. The above assessment is therefore used to determine the level of mitigation that should be employed during the works to minimise the risk of adverse dust impacts.

6.5.2 The proposed development would operate in accordance with a CEMP / or any conditions under any granted planning permission and separate Environmental Permit which would include measures to minimise dust deposition and air pollution.

6.5.3 The CEMP would be prepared and agreed prior to the onset of construction works and would include best practice measures with respect dust.

6.5.4 Recommended standard measures include, but are not limited to, the following:

- as an over-riding requirement, should winds carry visible dust towards the Site boundaries, and particularly the northeastern boundary, the operations giving rise to the dust in that part of the Site should be modified or suspended until more suitable conditions pertain, or until effective dust control measures are implemented,
- undertake daily on-site and off-site inspections to monitor dust,
- restriction of haulage to designated haul routes; preparation of haulage routes with compacted stone or other similar material; regular inspection and maintenance of good running surfaces,
- setting an appropriate Site speed limit,
- dust suppression by regular spraying with clean water in dry conditions,
- cleaning of any trackout or other deposits from the adjacent highways.
- minimisation of drop heights during tipping; and,
- effective staff training in respect of the causes and prevention of dust.

6.5.5 In designing the CEMP further reference should be made to the recommended measures provided in the IAQM guidance<sup>6</sup> (or as may be appropriate at the time) for 'medium' risk sites. No additional mitigation measures to those standard measures utilised for construction are considered necessary.

6.5.6 The implementation of these mitigation measures would also serve to minimise the potential for generation of PM<sub>10</sub> and PM<sub>2.5</sub>. Through the implementation of an appropriate CEMP during the construction works no significant adverse impacts associated with construction dust are likely.

## 7 Vehicle Exhaust Emissions – Screening Assessment

### 7.1 Potential Traffic Generation and Routing

#### *Heavy Goods Vehicles (HGV) Movements*

- 7.1.1 Proposals are for the importation of 400,000m<sup>3</sup> of material over a 111-week period. This would result in an average of 160 2-way HGV movements per working day (80 in / 80 out) across the importation period.
- 7.1.2 Accounting for no importation on weekends or Bank Holidays the resulting annual average daily traffic (AADT) flows across the duration of the Scheme would be about 110 2-way movements (55 in / 55 out).
- 7.1.3 The material would be sourced on a ‘campaign’ basis and import would therefore be variable depending on the market and availability. It is anticipated that the number of HGVs per working day would not exceed 200 2-way movements (i.e. 100 in / 100 out). However, this would not be sustained over a long period of time and the expected AADT would remain as set out above in paragraph 7.1.2.
- 7.1.4 All access would be via the A633, Wombwell Lane. Routing on the local road network would be dependent on the material sources but it is anticipated the majority of HGVs would route to / from the north of the Site via Stairfoot roundabout, with some HGVs routing to / from the south towards the A6195.
- 7.1.5 The potential flows and distribution are summarised below in Table 7.1.

**Table 7.1: Potential HGV Movements and Routing<sup>1</sup>**

Road Link	Percentage Routing	Average HGV 2-Way Movements per Working Day <sup>2</sup>	HGV 2-way Movements as AADT <sup>3</sup>
Site Access / Egress	100%	160	110
A633 Wombwell Lane (north of access)	72%	115	80
A633 Wombwell Lane (south of access)	28%	45	31

1: Based on data provided by Axis

2: Working Days are Monday to Friday with no importation at weekends or Bank Holidays; these figures represent the average working days movements across the import period; maximum movements on a day may be above this figure.

3: AADT = Annual Average daily Traffic; Calculated from provided working day movements, based on ‘working day x 252/365’

*Light Duty Vehicle (LDVs)*

7.1.6 It is anticipated the Proposed Development would generate 10 two-way staff trips (5 in / 5 out) per working day. Accounting for no working on Sundays or Bank Holidays the resulting AADT flows would be about 8 two-way LDV movements.

**7.2 Screening Assessment – Human Health**

7.2.1 As discussed in Section 5 there are no AQMAs in the vicinity of the Site. It is therefore appropriate to refer to screening thresholds of +100 HGV AADT and +500 LDV AADT to determine the need for some form of AQA, as detailed in Appendix A.

*HGV Movements*

7.2.2 At +110 AADT the potential additional HGV movements on the local road network are above the relevant screening threshold. These movements would however only be experienced at the Site access / egress. There are no residential properties, or other relevant receptors, within 200m of this access.

7.2.3 HGV movements would be dispersed on Wombwell Lane north and south of the access as summarised above in Table 7.1. Movements on stretches of road away from the access would be below the relevant screening threshold. In addition, as noted above in paragraph 5.7.5, annual mean NO<sub>2</sub> concentrations measured along the stretch of Wombwell Lane between the Site access and Stairfoot roundabout have been below the AQO since 2020, in the range 29.0-33.1 µg/m<sup>3</sup>.

7.2.4 Given the additional HGV movements on the local road network near any human receptors are below the screening thresholds, the associated emissions are not expected to result in significant adverse effects on ambient air quality.

*LDV Movements*

7.2.5 At +8 AADT the additional LDV movements that would be experienced at the Site access / egress are well below the relevant screening thresholds. Movements would be further dispersed on the local road network.

**7.3 Screening Assessment – Ecological**

7.3.1 At +110 AADT HGVs and +8 AADT LDVs, the additional vehicle movements that would be generated by the Scheme are well below the screening thresholds of +200 AADT HGVs and +1,000 AADT LDVs provided in relation to ecological sites.

7.3.2 In addition, the only identified designated nature conservation site within 200m of the local road network within 1km of the Site is the Stairfoot Disused Railway LWS. This is located 0.8km to the northwest beyond the Stairfoot roundabout. Vehicle movements would therefore be further

reduced below the screening criteria passed this LWS following distribution at the Stairfoot roundabout. No further assessment is therefore considered necessary in relation to potential increases in ambient NO<sub>x</sub>, nitrogen deposition and / or acid deposition at this site.

#### **7.4 Summary**

7.4.1 On this basis it is concluded that the HGV and LGV movements associated with the Scheme would not result in significant adverse impacts on either human health or vegetation and ecosystems. Further detailed assessment and additional mitigation is not considered necessary.

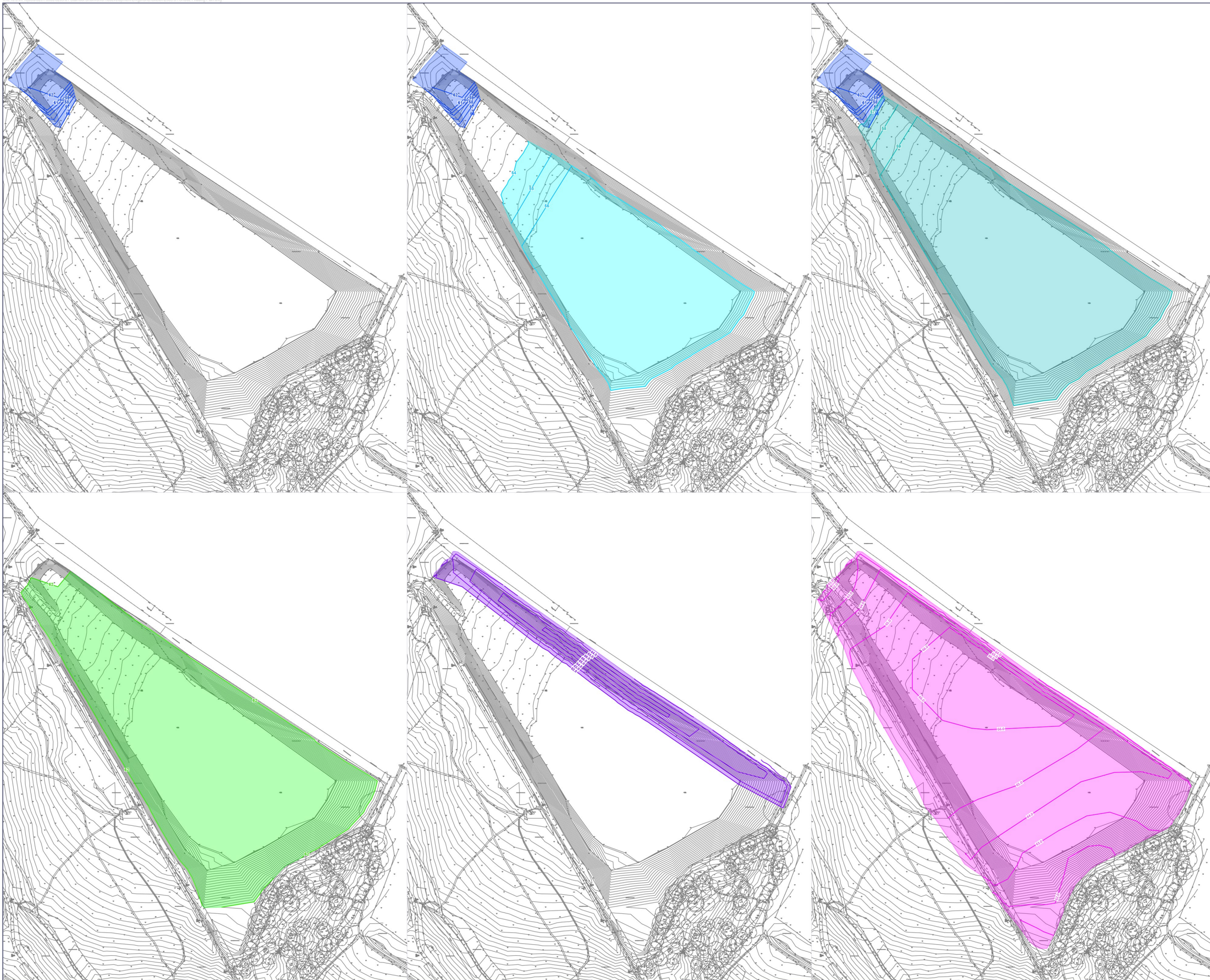
7.4.2 The overall significance with regards to potential effects of vehicle emissions on human health and ecological receptors is **not significant**.

## 8 Summary and Conclusions

- 8.1 A planning application is to be submitted in relation to the proposed restoration of the former Yew Tree Quarry within the wider area of the Stairfoot Quarry Complex.
- 8.2 Restoration is to be achieved through the importation and placement of non-hazardous soil materials sourced from local development projects and imported on a 'campaign basis'. It is estimated that circa 400,000m<sup>3</sup> of non-hazardous soil materials would be imported over a period of 111 weeks.
- 8.3 The Site is in a location of high sensitivity with regards to deposition dust and potential disamenity given the presence of residential properties along the northeastern boundary. No nature conservation sites have been identified within the locality within relevant screening distances.
- 8.4 The principal sources of fugitive dust have been identified as internal site haulage and material handling operations. However, the proposed operations are of low intensity and the potential for dust related impacts arising from these activities can be readily controlled and mitigated through the implementation of standard dust management techniques. The required measures would be set out in an overarching CEMP that would be prepared and agreed prior to the on-set of operations and would include best practice measures with respect dust.
- 8.5 Through the incorporation of standard dust mitigation measures during the construction works no unacceptable impacts on amenity have been identified.
- 8.6 Fine particulates (PM<sub>10</sub> and PM<sub>2.5</sub>) also make up a part of fugitive and wind-blown dust and can give rise to human health impacts. The measures that would be set out within the CEMP will similarly serve to minimise PM<sub>10</sub> and PM<sub>2.5</sub> emissions and no unacceptable impacts on human health have been identified.
- 8.7 The Proposed Development would result in additional HGV and LDV movements on the local road network. These would only be experienced for the duration of the restoration works. Movements near relevant receptors are below screening thresholds and no potential significant adverse impacts at receptors due vehicle emissions have been identified.
- 8.8 Overall, no potentially significant impacts and resulting effects that would preclude the granting of planning permission on air quality grounds have been identified.

## **APPENDIX A**

### **Proposed Development Plans**



- Phase 1
- Phase 2
- Phase 3
- Phase 4
- Phase 5
- Phase 6

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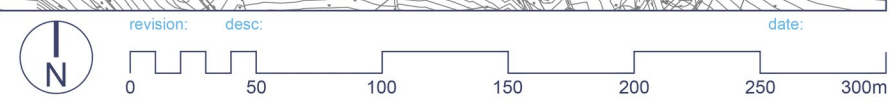
Client  
**Green Earth Group**

Project  
**Stairfoot Quarry Restoration**

Drawing Title  
**Phasing Plan**

Scale	1:3000 @A3	Status	--
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## **APPENDIX B**

### **Assessment Methodologies**

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## Appendix B

### Air Quality Assessment Methodology

#### 1 Dust Assessment

##### 1.1 Introduction

1.1.1 The assessment of the air quality impacts due to the generation and dispersion of dust and PM<sub>10</sub> during the Proposed Development has been undertaken in accordance with the current guidance issued by the Institute of Air Quality Management (IAQM) in relation to mineral dust and where applicable, construction dust, assessments<sup>1,2</sup>.

1.1.2 The guidance documents each describe qualitative assessment methodologies considering three separate dust impacts that may arise from dust generating activities:

- Annoyance due to dust soiling;
- The risk of health effects due to an increase in exposure to PM<sub>10</sub>; and
- Harm to ecological receptors accounting for the sensitivity of the area that may experience these effects.

1.1.3 Neither guidance is specifically relevant to the proposed activities at the Site. The methodology described in the guidance has therefore been adapted as appropriate.

##### 1.2 Step 1: Screening Assessment

1.2.1 The IAQM guidance on mineral dust<sup>1</sup> advises that PM<sub>10</sub> needs to be assessed if there are sensitive receptors within 1km. Reduced screening distances are applicable in relation to deposition dust and human and ecological receptors beyond which adverse impacts would not be expected. To provide a conservative assessment therefore an initial search radius of 1km of the Site boundary has been applied in relation to human health<sup>3</sup>.

1.2.2 In relation to deposition (or dis-amenity) dust adverse impacts are uncommon beyond 250m from sand and gravel sites and beyond 400m from hard rock quarries, as measured from the nearest dust generating activities<sup>1</sup>. The IAQM guidance on construction activities advises an assessment distance of 250m from a site boundary and up to 50m of the route used by construction vehicles on the public highway up to 250m from a site entrance<sup>2</sup>.

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IAQM (2016). *Guidance on the Assessment of Mineral Dust Impacts for Planning, v1.1*. Institute of Air Quality Management, London

Institute of Air Quality Management (2024), *Guidance on the Assessment of Dust from Demolition and Construction, v2.2*

<sup>3</sup> Note: EA guidance on assessment of aerial emission impacts specifies an assessment radius of 10km for international nature conservation sites and 2km for SSSIs and local nature sites. This is however appropriate to point source emissions. A search distance of 1km is considered the maximum appropriate for this assessment

1.2.3 To provide a conservative assessment the Deposition Dust Study Area therefore extends up to 250m from the Site boundary and 50m from edges of roads used for traffic up to a distance of 250m from the access / egress point.

1.2.4 Where there are no receptors within the relevant screening distance it can normally be assumed that a detailed disamenity dust assessment is not required. The risk of impacts would be negligible with **no significant effects**.

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

1.3.1 Where further assessment is required, this is undertaken through use of the source-pathway-receptor concept. The risk of dust arising in sufficient quantities from a site to cause annoyance and / or health or ecological impacts and resulting effects is dependent on:

- the scale and nature of the works (potential **magnitude** of dust emissions);
- the **effectiveness** of the pathway (i.e., dispersion towards a receptor; proximity of receptors); and
- the **sensitivity** of the receptors, both human and ecological.

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

1.3.2 The size of the source emissions is categorised as *small*, *medium*, or *large* for each relevant operational activity (taking into account designed-in mitigation). This takes into account the likelihood of the activity to generate dust emissions and the extent of the activity, e.g., large bare surfaces.

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

1.3.3 The impact of generated dust will depend on the sensitivity of an area. The sensitivity of the area is determined for dust soiling, human health and ecological impacts respectively taking into account several factors, as follows:

- the specific sensitivities of receptors in the area;
- the number of those receptors;
- the distance of the receptors from the dust source;
- in the case of PM<sub>10</sub>, the local background concentrations; and
- site specific factors, such as whether there are natural shelters or screening e.g. trees to reduce the risk of wind-blown dust.

1.3.4 Examples of receptor sensitivities are summarised in the tables below.

**Table 1.2: Example sensitivity of receptors to dust soiling effects**

<b>Sensitivity</b>		
<b>High</b>	<b>Medium</b>	<b>Low</b>
<b>People and Property</b>		
<ul style="list-style-type: none"> <li>• Users expect high level of amenity</li> <li>• Users present continuously</li> <li>• Property appearance / value would be expected to be diminished by dust soiling</li> </ul>	<ul style="list-style-type: none"> <li>• Users expect reasonable level of amenity</li> <li>• Users not present continuously</li> <li>• Property appearance / value might be expected to be diminished by dust soiling</li> </ul>	<ul style="list-style-type: none"> <li>• Users do not expect reasonable level of amenity</li> <li>• Users present for limited time</li> <li>• Property appearance / value would not be expected to be diminished by dust soiling</li> </ul>
<b>Examples</b>		
Dwellings, car showrooms, long-term car parks, sensitive horticultural land	Places of work, parks	Short-term car parks, playing fields, footpaths, non-sensitive farmland, roads

**Table 1.3: Example sensitivity of receptors to PM<sub>10</sub> health effects**

<b>Sensitivity</b>		
<b>High</b>	<b>Medium</b>	<b>Low</b>
Exposure of members of the public for eight hours or more in a day	Exposure of workers for eight hours or more in a day	Exposure is transient
<b>Examples</b>		
<ul style="list-style-type: none"> <li>• Members of the public</li> <li>• Dwellings, hospitals, schools, care homes</li> </ul>	<ul style="list-style-type: none"> <li>• Workers</li> <li>• Offices, shops</li> </ul>	<ul style="list-style-type: none"> <li>• Playing fields, footpaths, parks, shopping streets</li> </ul>

Note: assessment of sensitivity also takes into account local background PM<sub>10</sub> concentrations

**Table 1.4: Example sensitivity of receptors to ecological effects**

<b>Sensitivity</b>		
<b>High</b>	<b>Medium</b>	<b>Low</b>
Locations with international or national designation where the designated feature may be affected by dust soiling	Locations with national designation where the designated feature may be affected by dust soiling	Locations with local designation where the designated feature may be affected by dust soiling
Locations with communities of dust-sensitive species	Locations with important species where dust sensitivity is uncertain	

1.3.5 Receptors are considered up to the following distances:

**Table 1.5: Summary of Distances to Receptors Considered**

	dust soiling	human health	ecological
demolition, earthworks, and construction	up to a distance of 250m from a site		up to a distance of 50m from a site
trackout	up to a distance of 50m from the edge of a road used for construction traffic and up to 250m from the site exit along that road		

1.3.6 The overall sensitivity of an area is calculated based upon receptor sensitivity to dust soiling effects, and the number of receptors within certain distances. The sensitivity of an area to human health impacts also accounts for existing PM<sub>10</sub> levels. The overall sensitivity of an area can then be summarised in the example table below.

**Table 1.6: Example Summary of the Outcome of the Sensitivity of the Area**

Potential Impact	Sensitivity of Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	Medium
Human Health	High	High	High	High
Ecological	Medium	Medium	Low	Low

**Step 2C: Define the Risk of Impacts**

1.3.7 The overall risk of impacts and effects for each activity considers the derived sensitivity of the area and the dust emission magnitude for each phase of the development, as summarised in the matrix below.

**Table 1.7: Risk of Dust Impacts – in the absence of mitigation**

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
<b>Demolition</b>			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
<b>Earthworks</b>			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
<b>Construction</b>			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
<b>Trackout</b>			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

1.3.8 Other factors such as local topography and prevailing wind direction are also considered.

**1.4 Step 3: Site-Specific Mitigation**

1.4.1 The dust risk categories for each of the four activities determined above in **Step 2** are used to define the appropriate, site-specific mitigation measures that should be adopted. Guidance on appropriate mitigation measures is provided.

**1.5 Step 4: Determine Significant Effects**

1.5.1 Once the risk of dust impacts has been determined in **Step 2C** and the appropriate dust mitigation measures identified in **Step 3**, the final step is to determine whether there are significant effects arising from the proposed development. For almost all activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'. There may be cases however where even with mitigation measures in place there may be a significant effect.

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## 2 Vehicle Emissions – Screening Assessment Methodology

### 2.1 Introduction

2.1.1 The assessment of vehicle emissions associated with the Proposed Development has been undertaken in accordance with the IAQM planning guidance in relation to planning, air quality and human health<sup>4</sup> and ecological<sup>5</sup> receptors. Relevant receptors include residential dwellings, schools and hospitals, areas of leisure use and ecologically sensitive sites.

### 2.2 Screening Assessment

2.2.1 The level of assessment required was determined through an initial screening review considering the predicted vehicle movements in association with the proposed activities, the routing of vehicles along the roads within the transport assessment study area and locations of sensitive receptors.

2.2.2 The following criteria were used to determine potentially affected roads:

- LDV (Light Duty Vehicle) flow change by 500 AADT (annual average daily traffic) or more outside an AQMA (Air Quality Management Area), or 100 AADT or more within or adjacent to an AQMA;
- HDV (Heavy Duty Vehicle) flows change by 100 AADT or more outside an AQMA, or 25 AADT or more within or adjacent to an AQMA;
- Road alignment changing by 5m or more;
- Introduction or removal of a junction.

2.2.3 Where these criteria are met and there are relevant receptors present further assessment is required. This may take the form of a Simple or Detailed Assessment. The IAQM guidance does not specify at what distance a receptor should be to an affected road to indicate the need for further assessment. However, pollution concentrations fall rapidly away from the roadside and are expected to return to background levels within 100m of a road source<sup>6</sup>. For the purposes of the assessment reference is made to National Highways DMRB<sup>7</sup> guidance which requires assessment of receptors within 200m of affected roads.

2.2.4 Where there are no receptors within 200m of affected roads, these roads have not been considered further, and potential impacts of vehicle emissions can be considered *negligible* and as having an insignificant effect.

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<sup>4</sup> Institute of Air Quality Management (2017), Land-use Planning & Development Control: Planning for Air Quality. v1.2.

<sup>5</sup> Institute of Air Quality Management (IAQM), A guide to the assessment of air quality impacts on designated nature conservation sites, version 1.1, May 2020

<sup>6</sup> Air Quality Consultants (2008), NO<sub>2</sub> Concentrations and Distance from Roads, J504

<sup>7</sup>National Highways, Design Manual for Roads and Bridges (DMRB), LA 105 Air Quality (Vertical Barriers), Version 0.12.0, June 2024

2.2.5 Separate guidance is provided by Natural England (NE) in relation to ecological sites<sup>8</sup> and is reiterated in IAQM guidance<sup>5</sup>.

2.2.6 To assess whether further assessment in relation to ecological receptors was required reference was initially made to the following screening criteria:

- Total vehicle flow change by 1,000 AADT or more; or HDV flows change by 200 HGV AADT or more, where an ecological receptor is located within 200m of the affected road.

2.2.7 With regards to this planning application the screening assessment concluded that further consideration of vehicle emissions was not required. Full details of the screening assessment are provided in the AQA.

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<sup>8</sup> Natural England (NE), Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations, v1.4 Final, June 2018