



# Air Quality Constraints and Opportunities Appraisal Statement

**Infinity House, Anderson Way, Belvedere, DA17 6BG**

Presented to **Lysander**

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Delta-Simons Project No. 20-2295.02



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## Report Details

<b>Client</b>	Lysander
<b>Report Title</b>	Air Quality Constraints and Opportunities Appraisal Statement
<b>Site Address</b>	Infinity House, Anderson Way, Belvedere, DA17 6BG
<b>Project No.</b>	20-2295.02
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## Executive Summary

<p><b>Site and Report Context</b></p>	<p>Delta-Simons was instructed by Lysander (the 'Client') to prepare an Air Quality Constraints and Opportunities Appraisal Statement in support of a planning application for the demolition of existing buildings and redevelopment of the Site to provide a deck for the storage of operational vehicles, associated parking, access alterations, guard hut, welfare block, landscaping, and associated infrastructure (the 'Proposed Development'), at Infinity House, Anderson Way in Belvedere, DA17 6BG (the 'Site').</p> <p>The Site is located in the borough-wide Bexley Air Quality Management Area (AQMA), which was declared by the London Borough of Bexley due to exceedances of the annual mean Air Quality Objective (AQO) for nitrogen dioxide (NO<sub>2</sub>) and the annual and 24-hour mean AQOs for particulate matter (PM<sub>10</sub>). The Site is also located in an area where air quality is mainly influenced by road traffic emissions along the A2016 and the local road network; as such, elevated pollutant concentrations may be experienced at this location. Subsequently, the development has the potential to cause adverse impacts to existing pollution levels at nearby sensitive receptors. As such, an Air Quality Constraints and Opportunities Appraisal is required to determine baseline conditions at the Site, to assess potential impacts associated with the Proposed Development, in accordance with the requirements of the National Planning Policy Framework (NPPF), and to consider the requirement for any further assessment.</p> <p>This statement presents the findings of the appraisal, which addresses the potential air quality impacts during both the construction and operational phases of the Proposed Development. For both phases, the type, source and significance of potential impacts were identified, and the measures that should be employed to minimise these proposed.</p>
<p><b>Summary</b></p>	<p>The assessment of construction phase impacts associated with fugitive dust and fine particulate matter of an aerodynamic diameter of less than 10 and 2.5 microns, respectively (PM<sub>10</sub> and PM<sub>2.5</sub>) emissions has been undertaken in line with the relevant Institute of Air Quality Management (IAQM) guidance. This identified that there is a <b>medium to low risk</b> of dust soiling impacts and also a <b>medium to low risk</b> of increases in particulate matter concentrations due to unmitigated construction activities. However, through good site practice and the implementation of suitable mitigation measures, the effect of dust and particulate matter releases would be significantly reduced. The residual effects of the construction phase on air quality are considered to be <b>not significant</b>.</p> <p>The Proposed Development is not predicted to result in traffic increase above the relevant criteria on road links with relevant exposure once operational and therefore no significant effects on air quality are anticipated at existing receptors.</p>
<p><b>Conclusions and Recommendations</b></p>	<p>Based on the results of the assessment and the implementation of the proposed mitigation measures, it is considered that, the Proposed Development complies with national and local planning policies and there are no air quality constraints considered to restrict planning consent.</p>
<p>This is intended as a summary only. Further detail and limitations of the assessment is provided within the main body of the statement.</p>	

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## 1.0 Introduction

### 1.1 Appointment

- 1.1.1 Delta-Simons Environmental Consultants Limited ('Delta-Simons'), was instructed by Lysander (the 'Client') to prepare an Air Quality Constraints and Opportunities Appraisal Statement in support of a planning application for the demolition of existing buildings and redevelopment of the Site to provide a deck for the storage of operational vehicles, associated parking, access alterations, guard hut, welfare block, landscaping, and associated infrastructure (the 'Proposed Development'), at Infinity House, Anderson Way in Belvedere, DA17 6BG (the 'Site').
- 1.1.2 Reference should be made to **Figure 1** for a map of the Site and surrounding area.

### 1.2 Site Location and Context

- 1.2.1 The Site is located in the borough-wide Bexley Air Quality Management Area (AQMA), which was declared by the London Borough of Bexley (LBB) due to exceedances of the annual mean Air Quality Objective (AQO) for nitrogen dioxide (NO<sub>2</sub>) and the annual and 24-hour mean AQOs for particulate matter (PM<sub>10</sub>). The Site is also located in an area where air quality is mainly influenced by road traffic emissions along the A2016 and the local road network. As such, elevated pollutant concentrations may be experienced at this location. Subsequently, the development has the potential to cause adverse impacts to existing pollution levels at nearby sensitive receptors. As such, an Air Quality Constraints and Opportunities Appraisal was required to determine baseline conditions at the Site, to assess potential impacts associated with the Proposed Development in accordance with the requirements of the National Planning Policy Framework (NPPF), and to consider the requirement for any further assessment.
- 1.2.2 The main potential sources of air pollution were identified as emissions from road transport using the A2016 and the local road network.
- 1.2.3 The statement presents the findings of an assessment of the potential air quality impacts of the Proposed Development during both the construction and operational phases. For both phases, the type, source and significance of potential impacts are identified, and the measures that should be employed to minimise these described.
- 1.2.4 The standard limitations associated with this assessment are presented in **Appendix A**.
- 1.2.5 A glossary of terms used in this report is provided in **Appendix B**.

## 2.0 Legislation and Policy

### 2.1 Air Quality Legislation and Policy

2.1.1 A summary of the relevant air quality legislation and policy is provided below.

#### UK Air Quality Strategy (2007)

2.1.2 The Government's policy on air quality within the UK is set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS)<sup>1</sup>. The AQS provides a framework for reducing air pollution in the UK with the aim of meeting the requirements of European Union legislation.

2.1.3 Under the European Union (Withdrawal) Act 2018 (as amended), domestic legislation derived from EU law, which was in force immediately prior to the end of the transition period on 31<sup>st</sup> December 2020, continues to form part of UK domestic law thereafter. This new body of law resulting from the Withdrawal Act is referred to as 'retained EU Law'.

2.1.4 The AQS also sets standards and objectives for nine key air pollutants to protect health, vegetation and ecosystems. These are benzene (C<sub>6</sub>H<sub>6</sub>), 1,3 butadiene (C<sub>4</sub>H<sub>6</sub>), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), sulphur dioxide (SO<sub>2</sub>), ozone (O<sub>3</sub>), and polycyclic aromatic hydrocarbons (PAHs). The standards and objectives for the pollutants considered in this assessment are given in **Appendix C**.

2.1.5 The air quality standards are levels recommended by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO) with regards to current scientific knowledge about the effects of each pollutant on health and the environment.

2.1.6 The air quality objectives are medium-term policy-based targets set by the Government, which take into account economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to the EPAQS recommended standards or WHO guideline limits, whereas others involve a margin of tolerance, i.e. a limited number of permitted exceedances of the standard over a given period.

2.1.7 For the pollutants considered in this assessment, there are both long-term (annual mean) and short-term standards. In the case of NO<sub>2</sub>, the short-term standard is for a 1-hour averaging period, whereas for PM<sub>10</sub> it is for a 24-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants, for example temporary exposure on the pavement adjacent to a busy road, compared with the exposure of residential properties adjacent to a road.

2.1.8 The AQS contains a framework for considering the effects of a finer group of particles known as 'PM<sub>2.5</sub>' as there is increasing evidence that this size of particles can be more closely associated with observed adverse health effects than PM<sub>10</sub>. Local authorities are required to work towards reducing emissions/concentrations of particulate matter within their administrative area. However, there is no statutory objective given in the AQS for PM<sub>2.5</sub> at this time.

#### Air Quality Regulations (2016)

2.1.9 Many of the objectives in the AQS have been made statutory in England with the Air Quality (England) Regulations 2000<sup>2</sup> and the Air Quality (England) (Amendment) Regulations 2002<sup>3</sup> for the purpose of Local Air Quality Management (LAQM).

2.1.10 These Regulations require that likely exceedances of the AQS objectives are assessed in relation to:

'[...] the quality of air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present [...]

<sup>1</sup> Department for Environment, Food and Rural Affairs (Defra) and the Devolved Administrations (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2).

<sup>2</sup> The Air Quality (England) Regulations 2000 - Statutory Instrument 2000 No.928.

<sup>3</sup> The Air Quality (England) (Amendment) Regulations 2002 - Statutory Instrument 2002 No.3043.

- 2.1.11 The Air Quality Standards (Amendment) Regulations 2016<sup>4</sup> amends the Air Quality Standards Regulations 2010 that transpose the European Union Ambient Air Quality Directive (2008/50/EC) into law in England. This Directive sets legally binding limit values for concentrations in outdoor air of major air pollutants that impact public health such as PM<sub>10</sub>, PM<sub>2.5</sub> and NO<sub>2</sub>. The limit values for NO<sub>2</sub> and PM<sub>10</sub> are the same concentration levels as the relevant AQS objectives and the limit value for PM<sub>2.5</sub> is a concentration of 25µg/m<sup>3</sup>.

### **Environmental Protection Act 1990 - Control of Dust and Particulates Associated with Construction**

- 2.1.12 Section 79 of the Environmental Protection Act 1990 gives the following definitions of statutory nuisance relevant to dust and particles:

'Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance'; and

'Any accumulation or deposit which is prejudicial to health or a nuisance'.

- 2.1.13 Following this, Section 80 says that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.

- 2.1.14 There are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist. Nuisance is a subjective concept and its perception is highly dependent upon the existing conditions and the change which has occurred.

### **Environment Act 1995**

- 2.1.15 Under Part IV of the Environment Act 1995, local authorities must review and document local air quality within their area by way of staged appraisals and respond accordingly, with the aim of meeting the air quality objectives defined in the Regulations. Where the objectives are not likely to be achieved, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it intends to work towards achieving air quality standards in the future.

### **Clean Air Strategy (2019)**

- 2.1.16 In 2019, the UK government released its Clean Air Strategy 2019<sup>5</sup>, part of its 25 Year Environment Plan<sup>6</sup>. The Strategy sets out the comprehensive action that is considered to be required from across all parts of government and society.

- 2.1.17 The primary focus of air quality management has primarily related to NO<sub>2</sub>, and its principal source in the UK, road traffic. The 2019 Strategy aims to broaden the focus to other areas, including actions on clean growth, and emissions from domestic wood burning stoves, industry and agriculture.

## **2.2 Planning Policy**

- 2.2.1 A summary of the national and local planning policy relevant to the Proposed Development and air quality is provided below.

### **National Planning Policy**

#### **National Planning Policy Framework (2019)**

- 2.2.2 The Government's overall planning policies for England are described in the National Planning Policy Framework<sup>7</sup>. The core underpinning principle of the Framework is the presumption in favour of sustainable development, defined as:

'[...] meeting the needs of the present without compromising the ability of future generations to meet their own needs.'

<sup>4</sup> The Air Quality Standards (Amendment) Regulations 2016 - Statutory Instrument 2016 No. 1184.

<sup>5</sup> Department for Environment, Food and Rural Affairs (Defra) (2019) Clean Air Strategy 2019.

<sup>6</sup> Department for Environment Food and Rural Affairs (Defra) (2018) A Green Future: Our 25 Year Plan to Improve the Environment.

<sup>7</sup> Ministry of Housing, Communities & Local Government (2019) National Planning Policy Framework.

2.2.3 One of the three overarching objectives of the NPPF is that planning should 'contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.'

2.2.4 In relation to air quality, the following paragraphs in the document are relevant:

- ▲ Paragraph 54, which states 'Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition.';
- ▲ Paragraph 103, which states 'Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health.';
- ▲ Paragraph 170, which states 'Planning policies and decisions should contribute to and enhance the natural and local environment by: [...] e) 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, taking into account relevant information such as river basin management plans.';
- ▲ Paragraph 180, which states '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.';
- ▲ Paragraph 181, 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.'; and
- ▲ Paragraph 183, which states 'The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities'.

### Local Planning Policy

#### The Mayor of London's Air Quality Strategy for London

2.2.5 In 2010 the Greater London Authority (GLA) / Mayor of London published a new Mayor's Air Quality Strategy for London<sup>8</sup>. This strategy is focused on improving London's air quality. It also explains the current air quality experienced across London and gives predictions of future levels of pollution. The sources of pollution are outlined and a comprehensive set of policies and proposals are set out that will improve air quality in the London Boroughs.

<sup>8</sup> Greater London Authority / Mayor of London (2010) Cleaning London's air, The Mayor's Air Quality Strategy (December 2010).

- 2.2.6 Policy 7 'Using the planning process to improve air quality' states that the Mayor will ensure that new developments in London shall as a minimum be 'air quality neutral' through the adoption of best practice in the management and mitigation of emissions. It should be demonstrated therefore that a development has no significant impact on local air quality in order to obtain planning approval.
- 2.2.7 In addition, Policy 6 'Reducing emissions from construction and demolition sites' states that the Mayor will work to encourage implementation of Best Practice Guidance for construction and demolition sites across London, through supplementary planning guidance.
- 2.2.8 The Strategy sets out a framework for delivering improvements to London's air quality and includes measures aimed at reducing emissions from transport, homes, offices and new developments, promoting smarter more sustainable travel, as well as raising awareness of air quality issues.

### **The London Plan - The Spatial Development Strategy for Greater London (2021)**

- 2.2.9 The London Plan 2021<sup>9</sup>, published in March 2021, is the overall strategic plan for London, setting out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years. This document replaces all previous versions of the London Plan, and is more ambitious and focused. The concept of Good Growth, growth that is socially and economically inclusive and environmentally sustainable, underpins the London Plan and ensures that it is focused on sustainable development. The document places a specific focus on tangible policies and planning issues and provides greater clarity over how the plan will be implemented and where in London major development and infrastructure should be delivered.
- 2.2.10 There are six Good Growth objectives which planners, planning applicants and decision-makers should consider the when working to develop and improve London. One relevant to air quality is 'GG3 Creating a healthy city':
- 'To improve Londoners' health and reduce health inequalities, those involved in planning and development must: [...]
- F seek to improve London's air quality, reduce public exposure to poor air quality and minimise inequalities in levels of exposure to air pollution'.
- 2.2.11 Policy Design 1 'London's form, character and capacity for growth' states that boroughs should undertake area assessments to define the characteristics, qualities and value of different places within the plan area to develop an understanding of different areas' capacity for growth. Area assessments should cover the elements listed below:
- '5) air quality and noise levels'.
- 2.2.12 Furthermore, Policy D3 'Optimising site capacity through the design-led approach', states the following, with regard to air quality:
- 'D Development proposals should: [...]
- 9) help prevent or mitigate the impacts of noise and poor air quality'.
- 2.2.13 Policy Sustainable Infrastructure 1 'Improving air quality', states how development plans should seek opportunities to identify and deliver further improvements to air quality and should not reduce the air quality benefits that result from the Mayor's or borough's activities to improve air quality.
- 'B To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed:
- 1) Development proposals should not:
- a) lead to further deterioration of existing poor air quality
- b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits
- c) create unacceptable risk of high levels of exposure to poor air quality.

<sup>9</sup> Mayor of London (2021) The London Plan: The Spatial Development Strategy for Greater London [Online] Available at: [https://www.london.gov.uk/sites/default/files/the\\_london\\_plan\\_2021.pdf](https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf) [Accessed on 09/03/2021].

- 2) In order to meet the requirements in Part 1, as a minimum:
  - a) development proposals must be at least Air Quality Neutral
  - b) development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retro-fitted mitigation measures
  - c) major development proposals must be submitted with an Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of B1
  - d) development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people should demonstrate that design measures have been used to minimise exposure.
- C Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating:
  - 1) how proposals have considered ways to maximise benefits to local air quality, and
  - 2) what measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this.
- D In order to reduce the impact on air quality during the construction and demolition phase development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance.
- E Development proposals should ensure that where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of development on local air quality acceptable, this is done on-site. Where it can be demonstrated that emissions cannot be further reduced by on-site measures, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated within the area affected by the development.'

### **Mayor of London's Environment Strategy**

- 2.2.14 The Mayor's London Environment Strategy<sup>10</sup> sets the target for London to have the best air quality of any major world city by 2050 and goes one step further than the previous strategy by requesting developments be 'air quality positive'. This supersedes the Mayor's Air Quality Strategy, and therefore requires consideration in future. The Strategy states that guidance will be produced on the most effective approach to take to ensure a larger development is 'air quality positive' which is at time of writing as yet unavailable. The minimum requirement is still to remain air quality neutral.

### **Bexley Core Strategy**

- 2.2.15 Bexley Core Strategy<sup>11</sup> was adopted in February 2012, and sets out the Council's spatial planning framework for the borough until 2026.
- 2.2.16 A review of the document indicated the following policy in relation to air quality that is relevant to this assessment:

'Policy CS01 Achieving Sustainable Development

The Council will seek to achieve sustainable development, in line with the vision set out in Bexley's Sustainable Community Strategy, to create a 'strong, sustainable and cohesive community', in

<sup>10</sup> Greater London Authority (2018). London Environment Strategy. May 2018. Mayor of London. [Online] Available at: [https://www.london.gov.uk/sites/default/files/london\\_environment\\_strategy\\_0.pdf](https://www.london.gov.uk/sites/default/files/london_environment_strategy_0.pdf) [Accessed on 19/01/2021].

<sup>11</sup> London Borough of Bexley (February 2012). Bexley Core Strategy. [Online] Available at: <https://www.bexley.gov.uk/sites/default/files/2020-05/Bexley-Core-Strategy.pdf> [Accessed on 19/01/2021].

order to provide people equal access to a better quality of life, protect the environment, promote the local economy and encourage an active and healthy lifestyle. [...]

Developers will be required to address the sustainable development principles set out below.

In conjunction with the requirements identified in this Core Strategy, as well as the requirements of all other documents that make up Bexley's Development Plan, sustainable development will be achieved by applying the following principles: [...]

b maximising the effective and efficient use of natural and physical resources, including land, water and energy, whilst addressing pollution issues, such as contamination, noise and air quality, to contribute to the health and well being of the community and the environment; [...]

2.2.17 The above policies relating to air quality are considered within this assessment.

## 2.3 Guidance

2.3.1 A summary of the publications referred to in the undertaking of this assessment is provided below.

### Local Air Quality Management Review and Assessment Technical Guidance (2018)

2.3.2 The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities in their review and assessment work<sup>12</sup>. This guidance, referred to in this document as LAQM.TG16, has been used where appropriate in the assessment presented herein.

### Land-Use Planning & Development Control: Planning for Air Quality (2017)

2.3.3 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have published guidance<sup>13</sup> that offers comprehensive advice on: when an air quality assessment may be required; what should be included in an assessment; how to determine the significance of any air quality impacts associated with a development; and, the possible mitigation measures that may be implemented to minimise these impacts.

### Guidance on the Assessment of Dust from Demolition and Construction (2016)

2.3.4 This document<sup>14</sup> published by the IAQM was produced to provide guidance to developers, consultants and environmental health officers on how to assess the impacts arising from construction activities. The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM<sub>10</sub> impacts on public exposure and impact upon sensitive ecological receptors) and to identify mitigation measures appropriate to the level of risk identified.

### National Planning Practice Guidance - Air Quality (2019)

2.3.5 This guidance<sup>15</sup> provides a number of guiding principles on how the planning process can take into account the impact of new development on air quality, it explains how much detail air quality assessments need to include for proposed developments, and how impacts on air quality can be mitigated. It also provides information on how air quality is taken into account by local authorities in both the wider planning context of Local Plans and neighbourhood planning, and in individual cases where air quality is a consideration in a planning decision.

### London Local Air Quality Management Review and Assessment Technical Guidance (2019)

2.3.6 The GLA has published technical guidance to support London boroughs in their review and assessment work<sup>16</sup>. This guidance, referred to in this document as LLAQM.TG19, has been used where appropriate in the assessment presented herein.

<sup>12</sup> Department for the Environment, Food and Rural Affairs (Defra) (2018) Part IV The Environment Act 1995 and Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Technical Guidance LAQM.TG16.

<sup>13</sup> Environmental Protection UK and Institute of Air Quality Management (Version 1.2 Updated January 2017). Land Use Planning & Development Control: Planning for Air Quality.

<sup>14</sup> Institute of Air Quality Management (Version 1.1 Updated June 2016). Guidance on the Assessment of Dust from Demolition and Construction.

<sup>15</sup> Department of Communities and Local Government (DCLG) (Updated November 2019). National Planning Practice Guidance.

<sup>16</sup> Mayor of London (2019) London Local Air Quality Management (LLAQM) Technical Guidance 2019 (LLAQM.TG(19)). Available at: [https://www.london.gov.uk/sites/default/files/llaqm\\_technical\\_guidance\\_2019.pdf](https://www.london.gov.uk/sites/default/files/llaqm_technical_guidance_2019.pdf)

### London Councils Guidance for Air Quality Assessments

- 2.3.7 The London Councils have published guidance<sup>17</sup> for undertaking air quality assessments in the London Boroughs, the majority of which have declared AQMAs. The guidance sets out suggested methods for undertaking such an assessment within the London area and provides a methodology to assist in determining the impacts of a development proposal on air quality. The main message of the document is, as above, that the factor of greatest importance will generally be the difference in air quality as a result of the proposed development.

### Mayor of London's Supplementary Planning Guidance for the Control of Dust and Emissions During Construction and Demolition

- 2.3.8 This Supplementary Planning Guidance (SPG)<sup>18</sup> builds on the voluntary guidance published in 2006 by the London Councils to establish best practice in mitigating impacts on air quality during construction and demolition work. The SPG incorporates more detailed guidance and best practice, and seeks to address emissions from Non-Road Mobile Machinery (NRMM) through the use of a Low Emission Zone, which was introduced in September 2015.
- 2.3.9 The SPG provides a methodology for assessing the potential impact of construction and demolition activities on air quality following the same procedure as set out in the IAQM guidance. It then identifies the relevant controls and mitigation measures that should be put in place to minimise any adverse impacts, which need to be set out, in draft, in an air quality assessment report submitted with the planning application, and then formalised post submission as an Air Quality and Dust Management Plan. Details of site air quality monitoring protocols are also provided with varying requirements depending on the size of the site and the potential risk of adverse impacts.

### Greater London Authority: Sustainable Design and Construction Supplementary Planning Guidance

- 2.3.10 Section 4.3 of the Supplementary Planning Guidance (SPG) provides guidance on when a developer will be required to undertake an air quality assessment, looks at how design and transport measures can be used to minimise emissions to air, and sets out emissions standards for combustion plant.
- 2.3.11 The SPG also contains guidance on assessing the air quality neutrality of a Proposed Development in order to comply with the London Plan and the Mayor's Air Quality Strategy. Air Quality neutral benchmarks for both transport and buildings NO<sub>x</sub> and PM<sub>10</sub> emissions are provided within the SPG.
- 2.3.12 Developments that do not exceed these benchmarks (considered separately) will be considered to be 'air quality neutral', whilst developments that exceed the benchmarks after appropriate on-site mitigation measures have been incorporated will be required to off-set any excess in emissions off site. This can be achieved by providing NO<sub>x</sub> and PM abatement measures in the vicinity of the development, such as: green planting/walls and screens, with special consideration given to planting that absorbs or suppresses pollutants; upgrade or abatement work to combustion plant; retro-fitting abatement technology for vehicles and flues; and exposure reduction. These measures can be secured by condition or Section 106 contribution. Air quality monitoring is not eligible for funding as it is not considered to contribute to actual air quality improvements.

### Air Quality Neutral Planning Support Guidance (2014)

- 2.3.13 The Air Quality Neutral (AQN) Planning Support guidance<sup>19</sup> provides a methodology for assessing the air quality neutrality of Proposed Developments in London. It provides benchmarks for various land use (planning class) types against which total development transport and building emissions can be compared.

<sup>17</sup> London Councils (January 2007): Air Quality and Planning Guidance – Revised version.

<sup>18</sup> Mayor of London (July 2014): The control of dust and emissions during construction and demolition – Supplementary Planning Guidance.

<sup>19</sup> AQC and ENVIRON UK Ltd (2014). Air Quality Neutral Planning Support.

## 3.0 Scope and Methodology

### 3.1 Scope

3.1.1 The scope of the appraisal has been determined in the following way:

- ▲ Review of the latest available Air Quality Annual Status Report from LBB<sup>20</sup> and air quality data for the area surrounding the Site, including data from LBB, London Air<sup>21</sup>, Defra<sup>22</sup> and the Environment Agency (EA)<sup>23</sup>;
- ▲ Desk study to confirm the locations of nearby existing receptors that may be sensitive to changes in local air quality, as a result of the Proposed Development; and
- ▲ Review of the traffic data provided by the Project Transport Consultant (the 'PTC').

3.1.2 The scope of the assessment includes consideration of the potential impacts on local air quality resulting from:

- ▲ Dust and particulate matter generated by on-site activities during the construction phase;
- ▲ Increases in pollutant concentrations as a result of exhaust emissions arising from construction traffic and plant; and
- ▲ Increases in pollutant concentrations as a result of exhaust emissions arising from traffic generated by the Proposed Development once operational.

### 3.2 Methodology

#### Construction Phase

3.2.1 While it is not anticipated that the Proposed Development would involve extensive, external construction activities, in order to represent a robust review of potential impacts, the methodology by the IAQM has been followed.

3.2.2 Dust comprises particles typically in the size range 1-75 micrometres ( $\mu\text{m}$ ) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials. The larger dust particles fall out of the atmosphere quickly after initial release and therefore tend to be deposited in close proximity to the source of emission. Dust therefore, is unlikely to cause long-term or widespread changes to local air quality; however, its deposition on property and cars can cause 'soiling' and discolouration. This may result in complaints of nuisance through amenity loss or perceived damage caused, which is usually temporary.

3.2.3 The smaller particles of dust, are known as particulate matter (PM), with less than  $10\mu\text{m}$  in aerodynamic diameter ( $\text{PM}_{10}$ ) representing only a small proportion of total dust released; this includes a finer fraction, known as  $\text{PM}_{2.5}$  (with an aerodynamic diameter less than  $2.5\mu\text{m}$ ). As these particles are at the smaller end of the size range of dust particles they remain suspended in the atmosphere for a longer period of time than the larger dust particles, they can therefore be transported by wind over a wider area.  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  are small enough to be drawn into the lungs during breathing, which in sensitive members of the public could have a potential impact on health. However, it is worth noting that, according to the IAQM guidance, the majority of fugitive particulate emissions arising from construction sites are expected to relate to the coarser fractions (i.e.  $\text{PM}_{2.5-10}$ ) with just 10-15% expected to comprise  $\text{PM}_{2.5}$ . The IAQM guidance therefore focusses on  $\text{PM}_{10}$  for the purposes of assessment.

3.2.4 An assessment of the likely significant impacts on local air quality due to the generation and dispersion of dust and  $\text{PM}_{10}$  during the construction phase has been undertaken using: the relevant assessment methodology published by the IAQM; the available information for this phase of the Proposed Development provided by the Client and Project Team; and, professional judgement.

<sup>20</sup> London Borough of Bexley (2019) Annual Status Report for Air Quality in Bexley during 2018

<sup>21</sup> London Air - Monitoring Sites [Online] Available at: <http://londonair.org.uk/london/asp/publicdetails.asp> [Accessed on 19/01/21].

<sup>22</sup> Department for the Environment, Food and Rural Affairs (Defra) Local Air Quality Management (LAQM) Support Pages. [Online] Available at: <http://laqm.defra.gov.uk/> [Accessed on 19/01/21].

<sup>23</sup> Department for the Environment, Food and Rural Affairs (Defra) [Online] Available at: <https://data.gov.uk/dataset/cfd94301-a2f2-48a2-9915-e477ca6d8b7e/pollution-inventory> [Accessed on 19/01/21].

- 3.2.5 The IAQM methodology assesses the risk of potential dust and PM<sub>10</sub> impacts from the following four sources: demolition, earthworks, general construction activities and track-out. It takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM<sub>10</sub> levels to assign a level of risk. Risks are described in terms of there being a low, medium or high risk of dust impacts. Once the level of risk has been ascertained, then site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined. A summary of the IAQM assessment methodology is provided in **Appendix D**.
- 3.2.6 In addition to impacts on local air quality due to on-site construction activities, exhaust emissions from construction vehicles and plant may have an impact on local air quality adjacent to the routes used by these vehicles to access the application Site and in the vicinity of the application Site itself. As information on the number of vehicles and plant associated with the construction phase was not available at the time of writing, a qualitative assessment of their impact on local air quality has been undertaken using professional judgement and by considering the following:
- ▲ The number and type of construction traffic and plant likely to be generated by this phase of the development;
  - ▲ The number and proximity of sensitive receptors to the application Site and along the likely routes to be used by construction vehicles; and
  - ▲ The likely duration of the construction phase and the nature of the construction activities undertaken.

#### **Meteorological Data**

- 3.2.7 Meteorological data used in this assessment were obtained from the observing station at London City Airport for 2010 - 2019. This station is considered to provide representative data for the assessment. A wind rose generated from the meteorological data used for the consideration of construction phase impacts is provided in **Appendix E**.

#### **Operational Phase Assessment**

- 3.2.8 In accordance with the EPUK/IAQM guidance, a significant change would be described as a change in Light Duty Vehicle (LDV) flows of 500 Annual Average Daily Traffic (AADT) and/or Heavy Duty Vehicle (HDV) flows of 100AADT or more on local roads with relevant receptors. Alternatively, a change in LDV flows of 100AADT and/or HDV flows of 25 AADT or more on routes through an AQMA would also be considered a significant change in accordance with the guidance. Where these thresholds are not exceeded, a detailed assessment of air quality is not normally required.
- 3.2.9 The Proposed Development includes the demolition of the existing warehouse and the erection of a decked van storage facility which would provide dedicated storage for the vans required to operate the existing distribution warehouse at Crabtree Manorway North. Therefore, the storage of the vans at this Site is a functionally linked necessity for the effective operation of the distribution warehouse.
- 3.2.10 In this regard, and given the capacity of the distribution centre will not be increased as a result of these proposals, the anticipated traffic flows present will already be present on the wider network and thus do not constitute new trips in their own right. The operation of the Site therefore, will only result in a redistribution of existing trips. The PTC has indicated that there will be a nominal change in traffic on roads with relevant exposure.
- 3.2.11 As such, it is not anticipated that the above thresholds would be exceeded on local roads with relevant receptors, and therefore based on the EPUK/IAQM guidance, the Proposed Development is expected to result in a **negligible** impact associated with the operational phase traffic on nearby receptors, and the associated effect of the Proposed Development is therefore, considered to be **not significant**.
- 3.2.12 As such, this element of the operational phase is not considered further in the assessment.

### Selection of Background Concentrations

- 3.2.13 Background pollutant data for the operational phase assessment have been taken from the national maps provided on the Defra website<sup>24</sup>, where background concentrations of those pollutants included within the AQS have been mapped at a grid resolution of 1x1km for the whole of the UK. Estimated background concentrations are available for all years between 2018 and 2030.
- 3.2.14 There is current uncertainty over NO<sub>2</sub> concentrations within the UK, with the implementation of new vehicle emission standards not resulting in the previously expected reduction in roadside levels.
- 3.2.15 The maps assume that background concentrations will improve (i.e. reduce) over time, in line with the predicted reduction in vehicle emissions, and emissions from other sources. Due to the uncertainty discussed above, and in line with the findings of many local authorities that measured concentrations have not reduced as anticipated, 2021 background concentrations for NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> have been utilised in this assessment. This provided a robust assessment and is likely to overestimate pollutant concentrations during the operation of the Proposed Development.

### Air Quality Neutral Assessment

- 3.2.16 As the Proposed Development is primarily a vehicle storage area, with only small ancillary buildings incorporated, building emissions are not considered within this Statement.
- 3.2.17 With regard to transport emissions, the PTC has confirmed that the Proposed Development will lead to a minor change to the pattern of vehicle movements but is expected to generate nominal new trips. Further details of this are provided in the Operational Phase Assessment in **Section 5**. As such, it is anticipated that the development will be at least Air Quality Neutral in accordance with the guidance and therefore not further consideration of air quality neutrality should be required.

## 3.3 Selection of Sensitive Receptors

- 3.3.1 Sensitive locations are places where the public or sensitive ecological habitats may be exposed to pollutants resulting from activities associated with the Proposed Development. These will include locations sensitive to an increase in dust deposition and PM<sub>10</sub> exposure as a result of on-site construction activities, and locations sensitive to exposure to gaseous pollutants emitted from the exhausts of construction and operational traffic associated with the Proposed Development.

### Construction Phase

- 3.3.2 The IAQM assessment is undertaken where there are: 'human receptors' within 350m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s); and/or 'ecological receptors' within 50m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s). It is within these distances that the impacts of dust soiling and increased particulate matter in the ambient air will have the greatest impact on local air quality at sensitive receptors.

### Operational Phase

- 3.3.3 In terms of locations that are sensitive to pollutants emitted from engine exhausts, these will include places where members of the public are likely to be regularly present over the period of time prescribed in the AQS. For instance, on a footpath where exposure will be transient (for the duration of passage along that path) comparison with a short-term standard (i.e. 15-minute mean or 1-hour mean) may be relevant. At a school or adjacent to a private dwelling, where exposure may be for longer periods, comparison with a long-term standard (such as 24-hour mean or annual mean) may be more appropriate. Box 1.1 of LAQM.TG16 provides examples of the locations where the air quality objectives should/should not apply.

<sup>24</sup> Department for the Environment, Food and Rural Affairs (Defra) (2020) Background Concentrations. [Online] Available at <https://uk-air.defra.gov.uk/data/laqm-background-home> [Accessed on 19/01/21].

### 3.4 Significance criteria

#### Construction Phase

- 3.4.1 The IAQM assessment methodology recommends that significance criteria is only assigned to the identified risk of dust impacts occurring from a construction activity with appropriate mitigation measures in place. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.
- 3.4.2 For the assessment of the impact of exhaust emissions from plant used on-site and construction vehicles accessing and leaving the Site on local concentrations of NO<sub>2</sub> and particulate matter, the significance of residual effects has been determined using professional judgement and the principles outlined in the EPUK/IAQM guidance, which are described below.

#### Operational Phase

- 3.4.3 The approach provided in the EPUK/IAQM guidance has been used within this assessment to assist in describing the air quality effects of additional emissions from traffic generated by the Proposed Development once operational.
- 3.4.4 This guidance recommends that the degree of an impact is described by expressing the magnitude of incremental change in pollution concentration as a proportion of the relevant assessment level and examining this change in the context of the new total concentration and its relationship with the assessment criterion, as summarised in **Table 1**.

**Table 1 - Road Vehicle Exhaust Emissions - Significance of Impact**

Long Term Average Concentration at Receptors in Assessment Year	% Change in Concentration Relative to air quality assessment Level (AQAL)			
	1	2 - 5	6 - 10	> 10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76 - 94% of AQO	Negligible	Slight	Moderate	Moderate
95 - 102% of AQO	Slight	Moderate	Moderate	Substantial
103 - 109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

#### Notes

AQAL = air quality assessment Level, which for this assessment related to the UK Air Quality Strategy objectives. Where the %change in concentrations is <0.5%, the change is described as 'Negligible' regardless of the concentration. When defining the concentration as a percentage of the AQAL, 'without scheme' concentration should be used where there is a decrease in pollutant concentration and the 'with scheme;' concentration where there is an increase. Where concentrations increase, the impact is described as adverse, and where it decreases as beneficial.

- 3.4.5 The matrix shown in **Table 1** is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which makes it clearer which cell the impact falls within. It should be noted that changes of 0%, i.e. less than 0.5%, are described as negligible.
- 3.4.6 Following the prediction of impacts at discrete receptor locations, the EPUK/IAQM document provides guidance on determining the overall air quality impact significance of the operation of a development. The following factors are identified for consideration by the assessor:
- ▲ The existing and future air quality in the absence of the development;
  - ▲ The extent of current and future population exposure to the impacts; and
  - ▲ The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

- 
- 3.4.7 The EPUK/IAQM guidance states that for most road transport related emissions, long-term average concentrations are the most useful for evaluating the impacts. The guidance does not include criteria for determining the significance of the effect on hourly mean NO<sub>2</sub> concentrations or daily mean PM<sub>10</sub> concentrations. The significance of effects of hourly mean NO<sub>2</sub> and daily mean PM<sub>10</sub> concentrations arising from the operational phase have therefore been determined qualitatively using professional judgement and the principles described above.
- 3.4.8 The EPUK/IAQM guidance says that 'Where the air quality is such that an air quality objective at the big facade is not met, the effect on residents or occupants will be judged as significant, unless provision is made to reduce their exposure by some means. For people working at new developments in this situation, the same will not be true as occupational exposure standards are different, although any assessment may wish to draw attention to the undesirability of the exposure.'
- 3.4.9 The EPUK/IAQM guidance states that an assessment must reach a conclusion on the likely significance of the predicted impact. It should be noted that this is a binary judgement of either it is significant or it is not significant.

## 4.0 Baseline

### 4.1 Introduction

4.1.1 Existing air quality conditions in the vicinity of the Site were identified in order to provide a baseline for consideration. These are detailed in the following sections.

### 4.2 Local Air Quality Management

4.2.1 According to the latest available Air Quality Annual Status Report from LBB<sup>20</sup>, the entire Borough of Bexley, within which the Site is located, is currently designated as an AQMA. It was declared due to exceedances of the annual mean NO<sub>2</sub> AQO and the annual and 24-hour mean PM<sub>10</sub> AQOs.

### 4.3 Local Emission Sources

4.3.1 The Site is located in an area where air quality is mainly influenced by emissions from road transport using the A2016 and the local road network.

### 4.4 Air Quality Monitoring

4.4.1 Monitoring of pollutant concentrations is undertaken by LBB across their area of jurisdiction utilising automatic (continuous) monitoring methods. The most recent monitoring results recorded within the vicinity of the Site are shown in **Table 2**, **Table 3** and **Table 4**. The closest monitoring locations to the Site are Monitors BX2 and BQ7, approximately 0.7 and 1.4km to the south and south-west, respectively. LBB does not currently undertake any passive (diffusion tube) monitoring.

**Table 2 - LBB NO<sub>2</sub> Monitoring Results**

Monitoring Site			Monitored Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )				
ID	Location	Site Type	2016	2017	2018	2019	2020*
BX2	Belvedere Primary School	Urban Background	28	28	28	-	17
BQ7	Bexley Business Academy	Urban Background	24	21	21	21	16
BX1	Slade Green	Suburban Background	25	25	23	22	18

\*Pollutant concentrations likely to have been affected by the impact of COVID-19 restrictions.

**Table 3 - LBB PM<sub>10</sub> Monitoring Results**

Monitoring Site			Monitored Annual Mean PM <sub>10</sub> Concentration (µg/m <sup>3</sup> )				
ID	Location	Site Type	2016	2017	2018	2019	2020*
BX2	Belvedere Primary School	Urban Background	14	17	19	19	17
BQ7	Bexley Business Academy	Urban Background	15	15	15	18	17
BX1	Slade Green	Suburban Background	18	17	18	17	-

\*Pollutant concentrations likely to have been affected by the impact of COVID-19 restrictions.

**Table 4 - LBB PM<sub>2.5</sub> Monitoring Results**

Monitoring Site			Monitored Annual Mean PM <sub>2.5</sub> Concentration (µg/m <sup>3</sup> )				
ID	Location	Site Type	2016	2017	2018	2019	2020
BX1	Slade Green	Suburban Background	11	11	11	-	-

4.4.2 As shown in **Table 2**, **Table 3** and **Table 4**, the annual mean NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations did not exceed the relevant AQOs at any of the monitoring locations in the vicinity of the Site, for the years where data were available. Reference should be made to **Figure 1** for a map of the closest monitoring locations to the Site.

## 4.5 Background Pollutant Concentrations

4.5.1 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by Defra for the entire of the UK to assist Local Authorities in their Review and Assessment of air quality. The majority of the Site is located in grid square NGR 549500, 179500. Data for this location corresponding with the baseline year were downloaded from the Defra website for the purpose of the project. These data are summarised in **Table 5** below.

**Table 5 - Predicted Background Pollutant Concentrations (2021)**

Location	NO <sub>2</sub>	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
The Site	19.1	27.6	16.4	11.1

4.5.2 As shown in **Table 5**, predicted background NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations are below the relevant AQOs across the assessment extents.

## 5.0 Assessment

### 5.1 Introduction

5.1.1 There is the potential for air quality impacts as a result of the construction and operation of the Proposed Development. These are assessed in the following sections.

### 5.2 Construction Phase Assessment

#### Dust and PM<sub>10</sub> Arising from On-Site Activities

5.2.1 Construction activities that have the potential to generate and/or re-suspend dust and PM<sub>10</sub> include:

- ▲ Site clearance and preparation including demolition activities;
- ▲ Preparation of temporary access/egress to the Application Site and haulage routes;
- ▲ Earthworks;
- ▲ Materials handling, storage, stockpiling, spillage and disposal;
- ▲ Movement of vehicles and construction traffic within the Application Site (including excavators and dumper trucks);
- ▲ Use of crushing and screening equipment/plant;
- ▲ Exhaust emissions from Site plant, especially when used at the extremes of their capacity and during mechanical breakdown;
- ▲ Construction of buildings, roads and areas of hardstanding alongside fabrication processes;
- ▲ Internal and external finishing and refurbishment;
- ▲ Trackout, whereby earth is carried from the Site on vehicle tyres, deposited on roads and may later become suspended in the air as a result of vehicle movements; and
- ▲ Site landscaping after completion.

5.2.2 The majority of the releases are likely to occur during the 'working week'. However, for some potential release sources (e.g. exposed soil produced from significant earthwork activities) in the absence of dust control mitigation measures, dust generation has the potential to occur 24 hours per day over the period during which such activities are to take place.

#### Assessment of Potential Dust Emission Magnitude

5.2.3 The IAQM assessment methodology has been used to determine the potential dust emission magnitude for the following four different dust and PM<sub>10</sub> sources: demolition, earthworks, construction, and trackout. The findings of the assessment are presented below.

##### Demolition

5.2.4 The existing warehouse is to be demolished. This has a total volume of more than 50,000m<sup>3</sup>. As such, the potential dust emission magnitude is considered to be **large** for demolition activities.

##### Earthworks

5.2.5 The total area of the Site is greater than 10,000m<sup>2</sup>. Whilst, it is assumed that fewer than 5-10 heavy earth moving vehicles may be active at any one time, the potential dust emission magnitude is considered to be **large** for earthwork activities, based on the size of the Site.

##### Construction

5.2.6 The total volume of buildings to be constructed on the Site is will be 25,000 - 100,000m<sup>3</sup>. Therefore, the potential dust emission magnitude is considered to be **medium** for construction activities.

Trackout

- 5.2.7 Information on the number of HDVs associated with this phase of the Proposed Development is not available and therefore professional judgement has been used. It has been assumed that given the size of the development area there are likely to be 10 - 50 HDV outward movements in any one day, with unpaved road length in the Site to be below 100m. It is therefore considered that the potential dust emission magnitude is **medium** for trackout.
- 5.2.8 **Table 6** provides a summary of the potential dust emission magnitude determined for each construction activity considered.

**Table 6 - Potential Dust Emission Magnitude**

Activity	Dust Emission Magnitude
Demolition	Large
Earthworks	Large
Construction Activities	Medium
Trackout	Medium

**Assessment of Sensitivity of the Study Area**

- 5.2.9 A wind rose generated from the meteorological data used for the consideration of construction phase impacts is provided in **Appendix E**. This shows that the prevailing wind direction is predominantly from the south-west. Therefore, receptors located to the north-east of the Site are more likely to be affected by dust and particulate matter emitted and re-suspended during the construction phase.
- 5.2.10 Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source. Receptors to the north-east of the Site are expected to be affected the most as a result of the prevailing wind direction. It has been assumed that the construction traffic will access the Site through a newly created access road.
- 5.2.11 There are no ecological receptors within the vicinity of the Site considered to be sensitive to dust or PM, and as such these effects are not considered further within this assessment.
- 5.2.12 Taking the above into account and following the IAQM assessment methodology, the sensitivity of the area to changes in dust and PM<sub>10</sub> has been derived for each of the construction activities considered. The results are shown in **Table 7**.

**Table 7 - Sensitivity of the Study Area**

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	Low	Low
Human Health	Low	Low	Low	Low

**Risk of Impacts**

- 5.2.13 The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. **Table 8** below provides a summary of the risk of dust impacts for the Proposed Development. The risk category identified for each construction activity has been used to determine the level of mitigation required.

**Table 8 - Summary Dust Risk Table to Define Site Specific Mitigation**

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

### Construction Vehicles and Plant

- 5.2.14 The greatest impact on air quality due to emissions from vehicles and plant associated with the construction phase will be in the areas immediately adjacent to the Site access. Construction traffic will access the Site via the local road network. Due to the size of the Site, it is considered likely that the construction traffic will be low in comparison to the existing traffic flows on these roads.
- 5.2.15 Final details of the exact plant and equipment likely to be used on Site will be determined by the appointed contractor, it is considered likely to comprise dump trucks, tracked excavators, diesel generators, asphalt spreaders, rollers, compressors and trucks. The number of plant and their location within the Site are likely to be variable over the construction period.
- 5.2.16 Based on the current local air quality in the area, the proximity of sensitive receptors to the roads likely to be used by construction vehicles, and the likely numbers of construction vehicles and plant that will be used, the impacts are therefore considered to be **negligible** according to the assessment significance criteria.

## 5.3 Operational Phase Assessment

### Road Vehicle Exhaust Emission Impacts

- 5.3.1 As presented in Section 3.2.8, the Proposed Development is expected to result in AADT flows below the EPUK/IAQM criteria on roads in the presence of relevant exposure, and would result in a **negligible** impact associated with the operational phase traffic on nearby receptors, and the resulting effect of the Proposed Development is therefore, considered to be **not significant**.

### Summary

- 5.3.2 Based on the assessment results, the Site is considered suitable for the Proposed Development without the implementation of additional mitigation measures. The overall effect of the Proposed Development is considered to be **not significant**.

## 6.0 Mitigation and Residual Effects

### 6.1 Construction Phase

#### Recommended Mitigation

- 6.1.1 Based on the assessment results, mitigation will be required during the construction phase of the Proposed Development. Recommended mitigation measures are given below.

#### General Communication

- ▲ A stakeholder communications plan that includes community engagement before work commences on-site should be developed and implemented.
- ▲ The name and contact details of person(s) accountable for air quality and dust issues should be displayed on the Site boundary. This may be the environment manager/engineer or the site manager. The head or regional office contact information should also be displayed.

#### Site Management

- ▲ All dust and air quality complaints should be recorded, and causes identified. Appropriate remedial action should be taken in a timely manner with a record kept of actions taken including of any additional measures put in-place to avoid reoccurrence.
- ▲ The complaints log should be made available to the Local Authority on request.
- ▲ Any exceptional incidents that cause dust and/or air emissions, either on or off-site should be recorded, and then the action taken to resolve the situation recorded in the logbook.

#### Monitoring

- ▲ Daily on-site and off-site inspections should be undertaken, where receptors (including roads) are nearby to monitor dust. The inspection results should be recorded and made available to the Local Authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of the Site boundary, with cleaning to be provided if necessary.
- ▲ The frequency of Site inspections should be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

#### Preparing and Maintaining the Site

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

#### Operating Vehicle/Machinery and Sustainable Travel

- ▲ Ensure all vehicle operators switch off engines when stationary - no idling vehicles.
- ▲ Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.

- ▲ A Construction Logistics Plan should be produced to manage the sustainable delivery of goods and materials.

### **Operations**

- ▲ Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- ▲ Ensure an adequate water supply on the Site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- ▲ Use enclosed chutes and conveyors and covered skips.
- ▲ Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- ▲ Ensure equipment is readily available on Site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

### **Waste Management**

- ▲ Avoid bonfires and burning of waste materials.

### **Measures Specific to Demolition**

- ▲ Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- ▲ Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- ▲ Bag and remove any biological debris or damp down such material before demolition.

### **Measures Specific to Earthworks**

- ▲ Stockpile surface areas should be minimised (subject to health and safety and visual constraints regarding slope gradients and visual intrusion) to reduce area of surfaces exposed to wind pick-up.
- ▲ Where practicable, windbreak netting/screening should be positioned around material stockpiles and vehicle loading/unloading areas, as well as exposed excavation and material handling operations, to provide a physical barrier between the Site and the surroundings.
- ▲ Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive properties, taking account of the prevailing wind direction.
- ▲ During dry or windy weather, material stockpiles and exposed surfaces should be dampened down using a water spray to minimise the potential for wind pick-up.

### **Measures Specific to Construction**

- ▲ Ensure sand and other aggregates are stored in banded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- ▲ For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
- ▲ All construction plant and equipment should be maintained in good working order and not left running when not in use.

### Measures Specific to Trackout

- ▲ Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- ▲ Record all inspections of haul routes and any subsequent action in a site log book.

6.1.2 Detailed mitigation measures to control construction traffic should be discussed with the Local Authority to establish the most suitable access and haul routes for the Site traffic. The most effective mitigation will be achieved by ensuring that construction traffic does not pass along sensitive roads (residential roads, congested roads, via unsuitable junctions, etc.) where possible, and that vehicles are kept clean (through the use of wheel washers, etc.) and sheeted when on public highways. Timing of large-scale vehicle movements to avoid peak hours on the local road network will also be beneficial.

### Residual Effects

- 6.1.3 The residual effects of dust and PM<sub>10</sub> generated by construction activities following the application of the mitigation measures described above and good site practice is considered to be **not significant**.
- 6.1.4 The residual effects of emissions to air from construction vehicles and plant on local air quality is considered to be **not significant**.

## 6.2 Operational Phase

### Mitigation

- 6.2.1 The changes in pollutant concentrations attributable to traffic emissions associated with the operational phase of the Proposed Development (i.e. impacts on local air quality) are **negligible** and therefore, in accordance with the assessment criteria, mitigation is not required.
- 6.2.2 However, it is understood that the Proposed Development will include cycle storage facilities, which will help minimise overall emissions associated with the development by encouraging users of the Site to utilise sustainable modes of transport.

### Residual Effects

- 6.2.3 The Proposed Development is expected to result in AADT flows below the EPUK/IAQM Air Quality criteria on road links with relevant exposure and would result in an overall **negligible** impact associated with the operational phase traffic on nearby receptors.
- 6.2.4 The residual effects of the Proposed Development on air quality are therefore considered to be **not significant** for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> according to the EPUK/IAQM assessment criteria.

## 7.0 Summary and Conclusions

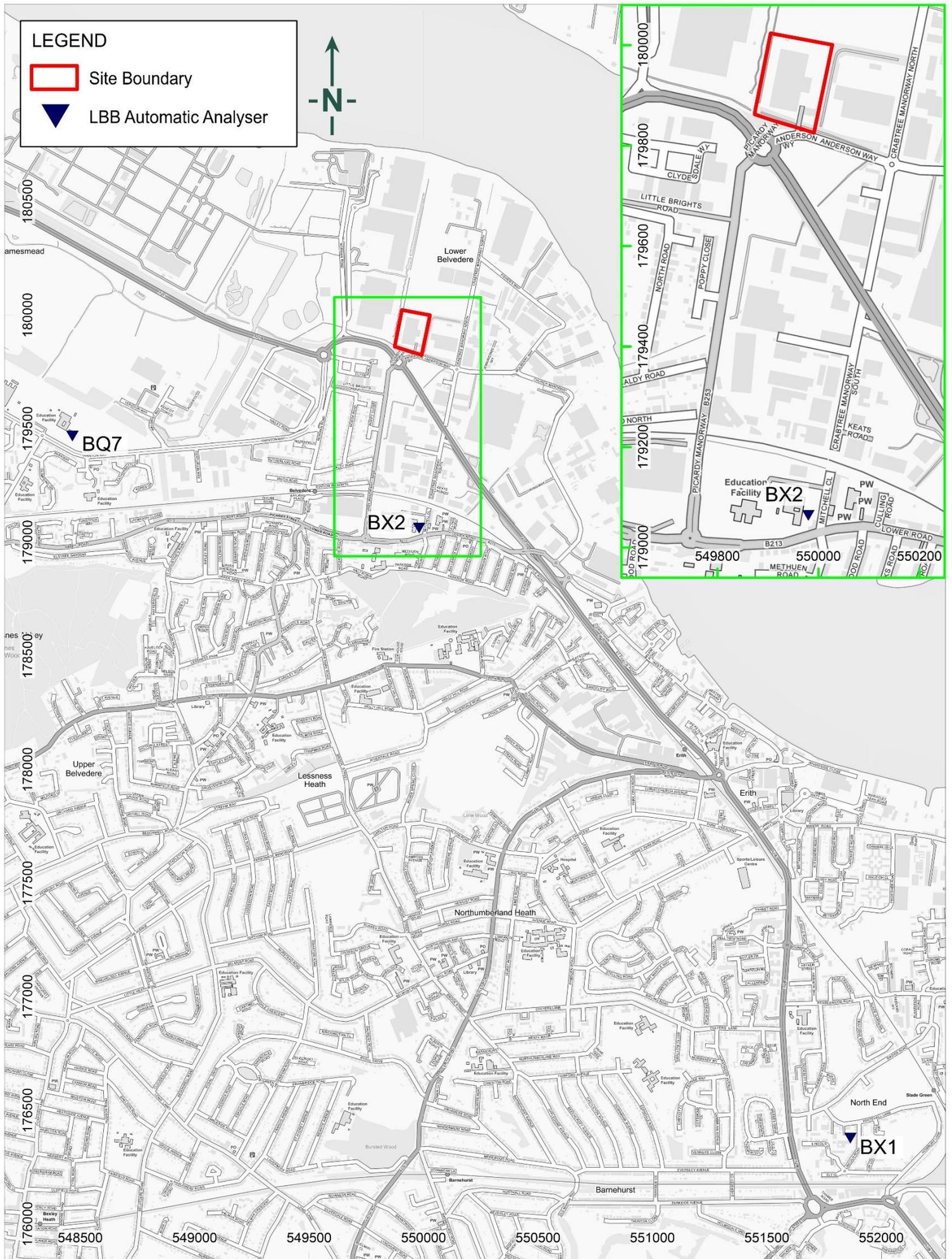
- 7.1.1 Delta-Simons has been appointed to prepare this Air Quality Assessment in support of a planning application for the demolition of existing buildings and redevelopment of the Site to provide a deck for the storage of operational vehicles, associated parking, access alterations, guard hut, welfare block, landscaping, and associated infrastructure at Infinity House, Anderson Way in Belvedere, DA17 6BG.
- 7.1.2 A qualitative assessment of the potential impacts on local air quality from construction activities has been carried out for this phase of the Proposed Development using the IAQM methodology. This identified that there is a **medium to low risk** of dust soiling impacts and a **medium to low risk** of increases in particulate matter concentrations due to unmitigated construction activities. Furthermore, through good site practice and the implementation of suitable mitigation measures, the effects of dust and PM<sub>10</sub> releases would be significantly reduced. The residual effects of dust and PM<sub>10</sub> generated by construction activities on air quality are therefore considered to be **not significant**. The residual effects of emissions to air from construction vehicles and plant on local air quality is also considered to be **not significant**.
- 7.1.3 The Proposed Development is expected to result in AADT flows below the EPUK/IAQM Air Quality criteria on road links with relevant exposure and would result in an overall **negligible** impact associated with the operational phase traffic on nearby receptors. Based on the assessment significance criteria, the residual effects of the Proposed Development are considered to be **not significant** for all pollutants assessed.
- 7.1.4 Furthermore, it is considered that the Proposed Development complies with national and local policy for air quality, and air quality issues are not considered a constraint to planning consent.
- 7.1.5 Based on the assessment results, air quality issues are not considered a constraint to planning consent and there is no requirement for further assessment of potential air quality effects associated with the Proposed Development.

# Figures

**LEGEND**

 Site Boundary

 LBB Automatic Analyser



# Appendices

# Appendix A - Limitations

## Limitations

The recommendations contained in this Report represent Delta-Simons professional opinions, based upon the information listed in the Report, exercising the duty of care required of an experienced Environmental Consultant. Delta-Simons does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions.

Delta-Simons obtained, reviewed and evaluated information in preparing this Report from the Client and others. Delta-Simons conclusions, opinions and recommendations has been determined using this information. Delta-Simons does not warrant the accuracy of the information provided to it and will not be responsible for any opinions which Delta-Simons has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

This Report was prepared by Delta-Simons for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. In particular, Delta-Simons does not intend, without its written consent, for this Report to be disseminated to anyone other than the Client or to be used or relied upon by anyone other than the Client. Use of the Report by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by the Consultant.

# Appendix B - Glossary

## Glossary

Term	Definition
AADT Annual Average Daily Traffic	A daily total traffic flow (24hrs), expressed as a mean daily flow across all 365 days of the year.
Adjustment	Application of a correction factor to modelled results to account for uncertainties in the model
Accuracy	A measure of how well a set of data fits the true value.
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year.
AQMA	Air Quality Management Area.
AQO	Air Quality Objective.
AURN	Automatic Urban and Rural (air quality monitoring) Network, managed by contractors on behalf of Defra.
Conservative	Tending to over-predict the impact rather than under-predict.
Data capture	The percentage of all the possible measurements for a given period that were validly measured.
Defra	Department for Environment, Food and Rural Affairs.
DfT	Department for Transport.
EFT	Emissions Factor Toolkit.
Emission rate	The quantity of a pollutant released from a source over a given period of time.
EPUK	Environmental Protection (UK).
Exceedance	A period of time where the concentrations of a pollutant is greater than the appropriate air quality standard.
GLA	Greater London Authority
HDV/HGV	Heavy Duty Vehicle/Heavy Goods Vehicle.
IAQM	Institute of Air Quality Management.
LAQM	Local Air Quality Management.
LLAQM	London Local Air Quality Management
LBB	London Borough of Bexley
Model adjustment	Following model verification, the process by which modelled results are amended. This corrects for systematic error.
NO <sub>2</sub>	Nitrogen dioxide.
NO <sub>x</sub>	Nitrogen oxides.
PM <sub>10</sub>	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
PM <sub>2.5</sub>	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.
Road link	A length of road which is considered to have the same flow of traffic along it. Usually, a link is the road from one junction to the next.
µg/m <sup>3</sup> microgrammes per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of 1µg/m <sup>3</sup> means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

Term	Definition
Uncertainty	A measure, associated with the result of a measurement, which characterizes the range of values within which the true value is expected to lie. Uncertainty is usually expressed as the range within which the true value is expected to lie with a 95% probability, where standard statistical and other procedures have been used to evaluate this figure. Uncertainty is more clearly defined than the closely related parameter 'accuracy', and has replaced it on recent European legislation.
Validation (modelling)	Refers to the general comparison of modelled results against monitoring data carried out by model developers.
Verification (modelling)	Comparison of modelled results versus any local monitoring data at relevant locations.

# Appendix C - Relevant UK Air Quality Strategy Objectives

## Relevant UK Air Quality Strategy Objectives

National Air Quality Objectives and European Directive Limit Values for the Protection of Human Health						
Pollutant	Applies To	Objective	Measured As	Date to be achieved by and maintained thereafter	European Obligations	Date to be achieved by and maintained thereafter
Nitrogen dioxide (NO <sub>2</sub> )	UK	40µg/m <sup>3</sup>	annual mean	31.12.2005	40µg/m <sup>3</sup>	01.01.2010
	UK	200µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean	31.12.2005	200µg/m <sup>3</sup> not to be exceeded more than 18 times a year	01.01.2010
Particulate Matter (PM <sub>10</sub> ) (gravimetric) <sup>A</sup>	UK (except Scotland)	40µg/m <sup>3</sup>	annual mean	31.12.2005	40µg/m <sup>3</sup>	01.01.2010
	UK (except Scotland)	50µg/m <sup>3</sup> not to be exceeded more than 35 times a year	24-hour mean	31.12.2004	50µg/m <sup>3</sup> not to be exceeded more than 35 times a year	01.01.2005
Particulate Matter (PM <sub>2.5</sub> )	UK (except Scotland)	25µg/m <sup>3</sup>	annual mean	2020	Target value 25µg/m <sup>3</sup>	2010

<sup>A</sup> Measured using the European gravimetric transfer sampler or equivalent

µg/m<sup>3</sup> = microgram per cubic metre

# Appendix D - IAQM Construction Assessment Methodology

# IAQM Construction Assessment Methodology

## Step 1 - Screening the Need for a Detailed Assessment

An assessment will normally be required where there are:

- ▲ 'human receptors' within 350m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s); and/or
- ▲ 'ecological receptors' within 50m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is 'negligible'.

## Step 2a - Define the Potential Dust Emission Magnitude

The following are examples of how the potential dust emission magnitude for different activities can be defined. (Note that not all the criteria need to be met for a particular class). Other criteria may be used if justified in the assessment.

**Table D1 - Examples of Potential Dust Emission Magnitude**

Magnitude	Activity	Criteria
Large	Demolition	>50,000m <sup>3</sup> building demolished, dusty material (e.g. concrete), on-site crushing/screening, demolition >20m above ground level
	Earthworks	Total site area greater than 10,000m <sup>2</sup> Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) More than 10 heavy earth moving vehicles active at any one time Formation of bunds greater than 8m in height More than 100,000 tonnes of material moved
	Construction	Total building volume greater than 100,000m <sup>3</sup> On-site concrete batching Sandblasting
	Trackout	More than 50 Heavy Duty Vehicle (HDV) trips per day Potentially dusty surface material (e.g. high clay content) Unpaved road length greater than 100m
Medium	Demolition	20,000 - 50,000m <sup>3</sup> building demolished, dusty material (e.g. concrete) 10-20m above ground level
	Earthworks	Total site area 2,500m <sup>2</sup> to 10,000m <sup>2</sup> ; Moderately dusty soil type (e.g. silt) 5 to 10 heavy earth moving vehicles active at any one times Formation of bunds 4m to 8m in height Total material moved 20,000 tonnes to 100,000 tonnes
	Construction	Total building volume 25,000m <sup>3</sup> to 100,000m <sup>3</sup> Potentially dusty construction material (e.g. concrete) On-site concrete batching
	Trackout	10 to 50 HDV trips per day Moderately dusty surface material (e.g. high clay content) Unpaved road length 50m to 100m
Small	Demolition	<20,000m <sup>3</sup> building demolished, non-dusty material (e.g metal cladding), <10m above ground level, work during wetter months

Magnitude	Activity	Criteria
Small	Earthworks	Total site area less than 2,500m <sup>2</sup> ; Soil type with large grain size (e.g. sand) Less than 5 heavy earth moving vehicles active at any one time Formation of bunds less than 4m in height Total material moved less than 20,000 tonnes Earthworks during wetter months
	Construction	Total building volume less than 25,000m <sup>3</sup> Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	Less than 10 HDV trips per day Surface material with low potential for dust release Unpaved road length less than 50m

### Step 2b - Define the Sensitivity of the Area

The tables below present the IAQM assessment methodology to determine the sensitivity of the area to dust soiling, human health and ecological impacts respectively. The IAQM guidance provides guidance to allow the sensitivity of individual receptors to dust soiling and health effects to assist in the assessment of the overall sensitivity of the study area.

**Table D2- Sensitivity of the Area to Dust Soiling Effects**

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

**Table D3 - Sensitivity of the Area to Human Health Impacts**

Receptor Sensitivity	Annual Mean PM <sub>10</sub> Concentrations (µg/m <sup>3</sup> )	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low

Receptor Sensitivity	Annual Mean PM <sub>10</sub> Concentrations (µg/m <sup>3</sup> )	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
Medium	>32	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
<24	>10	Low	Low	Low	Low	Low	
	1-10	Low	Low	Low	Low	Low	
Low	-	>1	Low	Low	Low	Low	Low

**Table D4 - Sensitivity of the Area to Ecological Impacts**

Receptor Sensitivity	Distance from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

### Step 2c - Define the Risk of Impacts

The dust emissions magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts without mitigation applied. For those cases where the risk category is 'negligible' no mitigation measures beyond those required by legislation will be required.

**Table D5 - Risk of Dust Impacts**

Sensitivity of Surrounding 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 and Construction</b>			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
<b>Trackout</b>			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

### Step 3 - Site Specific Mitigation

Having determined the risk categories for each of the four activities it is possible to determine the site-specific measures to be adopted. These measures will be related to whether the site is considered to be a low, medium or high risk site. The IAQM guidance details the mitigation measures required for high, medium and low risk sites as determined in Step 2C.

#### **Step 4 - Determine Significant Effects**

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 construction phase. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.

# Appendix E - Wind Rose for London City Airport (2010 - 2019)

# Wind Rose for London City Airport (2010 - 2019)

