

Air Quality Assessment Report

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Executive Summary

Hilson Moran has been instructed by Wates Construction London Residential to undertake an air quality assessment for Phase 3 of the Abbey Area Regeneration project in the London Borough of Camden.

This report presents the findings of the assessment, which addresses the potential air quality impacts during both the construction and operational stages of the Proposed Development. The assessment has been undertaken in line with the relevant policy and guidance, and where necessary, outlines the required mitigation measures to minimise impacts.

A qualitative assessment of construction phase impacts has been carried out. There is a high risk of dust soiling and fugitive PM₁₀ emissions affecting human health from demolition, a medium risk for earthworks, a medium risk for construction and a high risk from trackout. Through good site practice and the implementation of suitable mitigation measures, the impact of dust and PM₁₀ releases will be minimised. The residual effect of the construction phase on air quality is therefore not significant.

A detailed assessment using ADMS-Urban has been undertaken to consider the impact of operational phase development generated road traffic on existing and proposed receptor locations. The findings of the assessment indicate:

- The impact on annual mean NO₂, PM₁₀ and PM_{2.5} concentrations at all existing receptors is classified as negligible;
- Annual mean NO₂ concentrations are well below 60 µg/m³ at all existing receptors, therefore exceedances of the 1-hour mean NO₂ AQS objective is unlikely;
- There are no predicted exceedances of the daily mean PM₁₀ at existing receptors; and
- All proposed receptors are classified as APEC Level A for both long-term and short-term averaging periods with the Proposed Development operational.

Based on the findings of the assessment no mitigation is required and the Application Site is suitable for the introduction of the proposed receptor type.

The overall residual effect for the operational phase is not significant.

The Proposed Development was found to be compliant in relation to Building and Transport emissions and is therefore air quality neutral. No mitigation or additional off-setting is required.

Overall, with the inclusion of standard mitigation measures as best practice (construction phase only), the proposals would be compliant with legislation and policy.

1. Introduction

Hilson Moran has been instructed by Wates Construction London Residential to undertake an air quality assessment for Phase 3 of the Abbey Area Regeneration project in the London Borough of Camden. The proposals are hereafter referred to as the 'Proposed Development' or 'Application Site'.

1.1. Proposed Development

Abbey Area Phase 3 is part of a larger 3 phase masterplan. At this stage, Phase 1 and Phase 2 are completed, Phase 1 providing 141 homes, alongside some retail and office space and Phase 2 delivering improved and enhanced, fit for purpose facilities to replace the Abbey Community Centre and Belsize Priory Health Clinic. Phase 3, which this air quality assessment report supports, will provide 139 new homes across three residential buildings ranging in height from four to eleven storeys, with the height stepping up towards the junction of Abbey and Belsize Road, with ancillary flexible commercial floorspace at ground floor and a private communal garden to the rear which will include children's play space. The development is proposed to be car-free, except for wheelchair accessible parking which will be accommodated adjacent to the site.

The development description is as follows:

"Demolition and redevelopment of Emminster and Hinstock blocks including Belsize Priory Health Centre, Abbey Community Centre, public house and commercial units to provide new residential accommodation (Use Class C3) and ground floor commercial space (Use Class E/Sui Generis) to be used as flexible commercial units, across three buildings ranging from 4 to 11 storeys, along with car and bicycle parking, landscaping and all necessary ancillary and enabling works."

The wider masterplan aims to improve the landscape and public realm across all phases, including enhancements to the junction of Abbey Road and Belsize Road. The Application Site Boundary is illustrated in Figure 1.1.

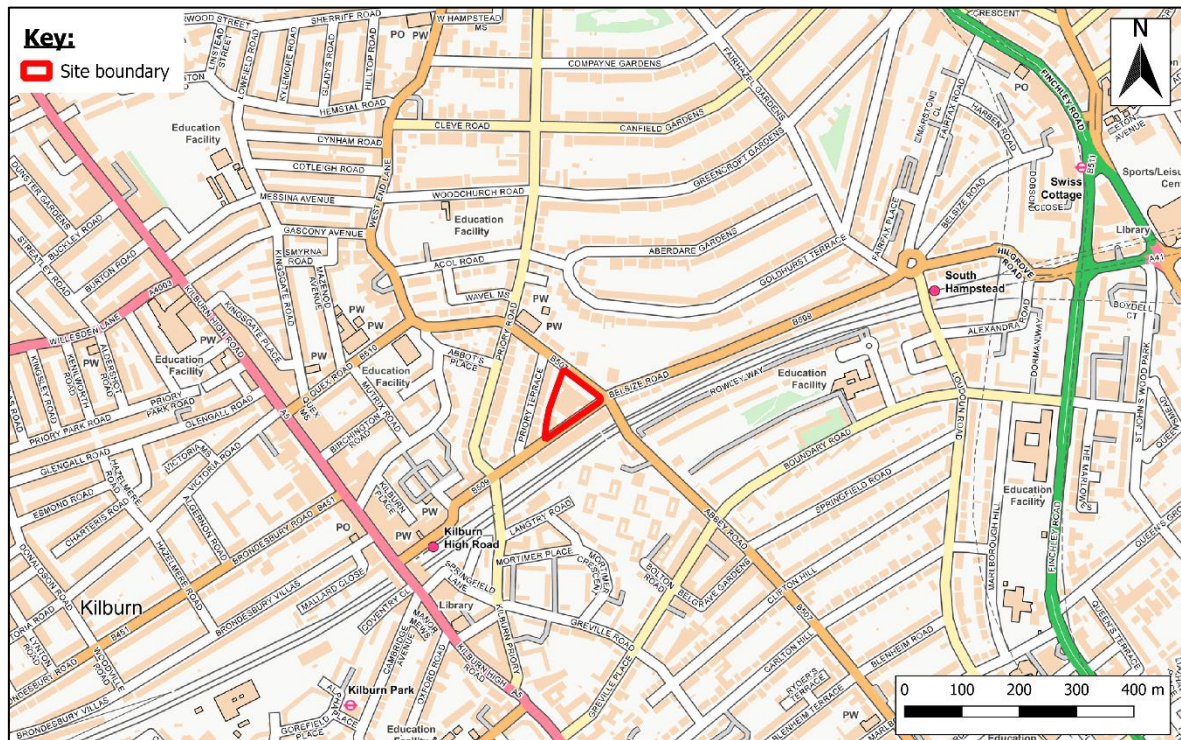


Figure 1.1 **Application Site Boundary** (Contains OS data © Crown copyright and database right, 2022)

1.2. Potential Impacts

This report presents the findings of the AQIA for both the operational and construction phases. During the construction phase, activities on the Site could give rise to dust, which, if transported beyond the site boundary, could have an adverse effect on local air quality. During the operational phase, consideration is given to the appropriateness of the site for the introduction of new receptors associated with the development. For both phases, the impacts are identified and the mitigation measures that should be implemented to minimise the impact these are described.

Furthermore, an Air Quality Neutral Assessment (AQNA) has been undertaken in accordance with the Mayor of London's Supplementary Planning Guidance.

A glossary of terms is provided in Appendix A.

2. Legislation, Policy & Guidance

The following Section provides a summary of the relevant legislation, planning policy and best practice guidance relevant to air quality and the assessment of impacts from development.

2.1. Air Quality Legislation and Policy

2.1.1. Air Quality Strategy for England, Scotland, Wales and Northern Ireland

The Government's policy on air quality within the UK is set out in the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland¹, most recently updated in July 2007. The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that the European Union and International agreements are met in the UK.

The AQS covers the following air pollutants: ammonia (NH₃), benzene (C₆H₆), 1,3 butadiene (C₄H₆), carbon monoxide (CO), lead (Pb), oxides of nitrogen (NO_x) (including nitrogen dioxide (NO₂)), particulate matter (PM₁₀ and PM_{2.5}), sulphur dioxide (SO₂), ozone (O₃) and polycyclic aromatic hydrocarbons (PAHs).

The AQS Sets standards and objectives for the listed pollutants for the protection of human health, vegetation and ecosystems. The standards are based on recommendations by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO) based on current understanding and scientific knowledge about the effects of air pollution on health and the environment. The air quality objectives are policy-based targets set by the UK Government that are often expressed as maximum concentrations not to be exceeded either without exception or with a limited number of exceedances within a specified timescale.

For the pollutants considered in this assessment, there are both a long-term (e.g., annual mean) and short-term (e.g., one hour mean). In the case of NO₂, the short-term standard is for a 1-hour averaging period (no more than 18 exceedances of 200 µg/m³ per year), whereas for PM₁₀ it is a 24-hour averaging period (no more than 35 exceedances of 50 µg/m³ per year). The variation in time periods reflects the varying impacts on health of differing exposures to pollutants.

2.1.2. Air Quality Standards Regulations

The air quality objectives in the AQS are statutory in England with the Air Quality (England) Regulations 2000² and the Air Quality (England) (Amendment) Regulations 2002³ for the purpose of Local Air Quality Management (LAQM).

The regulations require likely exceedances of the AQS objectives to be 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...'

The Air Quality Standards (Amendment) Regulations 2016⁴ transpose the European Union Ambient Air Quality Directive (2008/50/EC) into law in England, with the Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019⁵ ensuring continuation of the transposition of the Directive. This Directive sets legally binding limit values for concentrations in outdoor air of major air pollutants that impact public health such as NO₂, PM₁₀ and PM_{2.5}. The limit values for NO₂ and PM₁₀ are the same concentration levels as the relevant AQS objectives and the limit value for PM_{2.5} is a concentration of 25 µg/m³. The relevant air quality objectives are presented in Table 2.1.

Table 2.1 Air Quality Objectives for Relevant Pollutants

Pollutant	Concentration	Measured as
NO ₂	200 µg/m ³	1-hour mean, not to be exceeded more than 18 times a year (99.79%ile)
	40 µg/m ³	Annual mean
PM ₁₀	50 µg/m ³	24-hour mean, not to be exceeded more than 35 times a year (90.41%ile)
	40 µg/m ³	Annual mean
PM _{2.5}	25 µg/m ³	Annual mean

2.1.3. Environment Act

Part IV of the Environment Act 1995⁶ requires local authorities to periodically review and assess the quality of air within their administrative area. The reviews have to consider both the air quality at the time of review and likely future air quality during the 'relevant period' and whether any air quality objectives prescribed in regulations are being achieved or are likely to be achieved in the future. Where the objectives are not likely to be achieved, an authority is required to designate an Air Quality Management Area (AQMA). For each designated AQMA the local authority is required to produce an Air Quality Action Plan (AQAP) that works to ensure compliance with the objectives by implementing a number of air quality improvement measures.

2.1.4. Environment Act 2021

Part VI of the Environment Act 2021⁷, Schedule 11 sets out the amendments made from the Environment Act 1995. The principles remain consistent in that the Environment Act 2021 requires local authorities to periodically review and assess the quality of air within their administrative area. Where the objectives are not likely to be achieved, an authority is required to designate an AQMA. For each designated AQMA the local authority is required to produce an Air Quality Action Plan (AQAP) that works to ensure compliance with the objectives by implementing a number of air quality improvements measures.

2.1.5. Environmental Protection Action

Section 79 of the Environmental Protection Act 1990 (as amended)⁸ makes provision for the identification and control of statutory nuisances. The Act identifies statutory nuisance, in relation to air quality, as:

- 'Any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance'; and,
- 'Any accumulation or deposit which is prejudicial to health or a nuisance'.

As a result, the level at which a nuisance occurs is highly variable and dependent on perception with effects influenced by existing conditions and the degree of change that has occurred.

Where a statutory nuisance has been demonstrated the Local Authority must serve an abatement notice, non-compliance with which would constitute a legal offence. The abatement notice may prevent or restrict occurrence of re-occurrence of the nuisance or may, itself, undertake action to abate the nuisance and recover any associated expenses.

2.1.6. WHO Guidelines

Table 2.2 states the WHO Air Quality Guidelines for NO₂, PM₁₀ and PM_{2.5}. Whilst these guidelines are not targeted in the UK, there is a push to meet the guidelines and be more stringent with air quality control.

Table 2.2 WHO Guidelines for Relevant Pollutants

Pollutant	WHO Guidelines	Measured as
NO ₂	200 µg/m ³	1-hour mean, not to be exceeded more than 18 times a year (99.79 %ile)
	25 µg/m ³	24-hour mean, not to exceeded more than 3 to 4 times a year (99th %ile)
	10 µg/m ³	Annual mean
PM ₁₀	45 µg/m ³	24-hour mean, not to be exceeded more than 35 times a year (90.41 %ile) for UK, not to exceeded more than 3 to 4 times a year (99th %ile) under WHO
	15 µg/m ³	Annual mean
PM _{2.5}	15 µg/m ³	24-hour mean, not to exceeded more than 3 to 4 times a year (99th %ile)
	5 µg/m ³	Annual mean

2.2. Planning Policy

A summary of the national, regional and local planning policy relevant to air quality and the Proposed Development is detailed below.

2.2.1. National

2.2.1.1. National Planning Policy Framework

The National Planning Policy Framework (NPPF)⁹ sets out policies which will apply to the preparation of local plans and to development management decisions. This framework sets out the Government's economic, environmental and social planning policies for England. Taken together, these policies articulate the Government's vision of sustainable development, which should be interpreted and applied locally to meet local aspirations.

The NPPF sets out the Government's planning policies on the conservation and enhancement of the natural environment, with the following paragraphs relating to air quality:

- Paragraph 8c, which states '*to 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*';
- Paragraph 55, 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 104d, which states '*the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains*';

- Paragraph 105, which states *‘the planning system should actively manage patterns of growth in support of these objectives. 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. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making’*;
- Paragraph 174e, which states *‘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 186, 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’*;
- Paragraph 188, 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’*; and,
- Paragraph 211c, which states *‘ensure that any unavoidable noise, dust and particle emissions and any blasting vibrations are controlled, mitigated or removed at source, and establish appropriate noise limits for extraction in proximity to noise sensitive properties’*.

2.2.2. Regional

2.2.2.1. Clearing the Air: The Mayor’s Air Quality Strategy (2010)

The Mayor’s Air Quality Strategy¹⁰ is focused on delivering improvements to London’s air quality and identifies road traffic as the largest contributor to air pollution. The strategy sets out a framework for improving air quality and details a number of measures to reduce emissions in London, these include:

- Development of electric vehicle infrastructure;
- Congestion charging and the London Low Emission Zone (LEZ);
- Smarter travel initiatives to encourage a shift to greener modes of transport;
- Funding and supporting car clubs (especially hybrid and electric cars);
- Maintaining roads in good repair to reduce the contribution of particulate matter from road surface wear;
- Smoothing traffic;

- Bus emissions programme, so that older buses have been fitted with particulate traps and diesel-electric hybrid buses are introduced as quickly as possible; and
- Publication and implementation of the London Best Practice Guidance for controlling dust and emissions from construction.

Regarding new developments, the Strategy plans to make use of the existing planning system to ensure that any new development does not have a negative impact on air quality in London by stating *'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 also aims to implement the Construction Best Practice Guidance on all construction sites across London.

2.2.2.2. The London Plan: Spatial Development Strategy for Greater London (2021)

Planning policy in respect of development planning and air quality management is also presented in the adopted London Plan¹¹. Policy SI 1 on improving air quality states that:

- A.) Development Plans, through relevant strategic, site-specific and area-based policies, should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the Mayor's or boroughs' 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.
 - 2) In order to meet the requirements in Part 1, as a minimum:
 - d) development proposals must be at least Air Quality Neutral;
 - e) 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 retrofitted mitigation measures;
 - f) 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;
 - g) 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 guidance¹².
- 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.

2.2.3. Local

2.2.3.1. London Borough of Camden Local Plan (2017)

The Camden Local Plan¹³ sets out the Council's planning policies. It ensures that Camden continues to have robust, effective and up to-date planning policies that respond to changing circumstances and the borough's unique characteristics and contribute to delivering the Camden Plan and other local priorities. The Local Plan covers the period from 2016-2031.

The policies of interest within the local plan include: Policy CC4 – Air Quality, which states:

'The Council will ensure that the impact of development on air quality is mitigated and ensure that exposure to poor air quality is reduced in the borough.

The Council will take into account the impact of air quality when assessing development proposals, through the consideration of both the exposure of occupants to air pollution and the effect of the development on air quality. Consideration must be taken to the actions identified in the Council's Air Quality Action Plan.

Air Quality Assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution. Where the AQA shows that a development would cause harm to air quality, the Council will not grant planning permission unless measures are adopted to mitigate the impact. Similarly, developments that introduce sensitive receptors (i.e. housing, schools) in locations of poor air quality will not be acceptable unless designed to mitigate the impact.

Development that involves significant demolition, construction or earthworks will also be required to assess the risk of dust and emissions impacts in an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan'.

In addition to Policy CC4, this Plan also actively supports the improvement of air quality in Camden by:

- Requiring all new development in the borough to be 'car-free' (see Policy T2 Parking and car-free development);
- Maintaining and increasing green infrastructure (see Policy A2 Open space);
- Reducing emissions associated with new development (see Policy CC1 Climate change mitigation); and,
- Supporting and encouraging sensitive energy efficiency improvements to existing buildings (see Policy CC1 Climate change mitigation).

2.2.3.2. Camden Draft Clear Air Action Plan (2019)

The Camden Draft Clean Air Action Plan¹⁴ has been produced as part of the borough's duty to London Local Air Quality Management. It outlines the action they will take to improve air quality in Camden between 2019 and 2022. The Clean Air Action Plan (CAAP) is split across seven themes:

- Building Emissions;
- Construction Emissions;
- Transport Emissions;
- Communities and Schools;
- Delivery, Servicing and Freight;
- Public Health and Awareness; and,
- Lobbying.

The CAAP has been developed in recognition of the role local authorities have under the Environment Act to meet the air quality obligations. Camden's role in this includes:

- Working to reduce emissions from their own estate and operations;
- Helping residents and visitors to reduce emissions and exposure;
- Using planning policy and regulation to reduce air pollution;
- Implementing innovative projects across the borough to improve air quality;
- Using their influence to lobby for increased financial and regulatory support for the mitigation of air pollution;
- Maintaining a monitoring network and ensuring the data is freely accessible; and,
- Raising awareness on how to reduce emissions and exposure.

The CAAP is supported by a number of other plans and strategies (including Camden 2025, Our Camden Plan, Green Action for Change 2010 – 2020, Camden's Parking and Enforcement Plan, Camden's Transport Strategy 2019 – 2022 and the Joint Strategic Needs Assessment) with the overarching aim of improving air quality in the borough of Camden.

2.3. Guidance

A summary of the publications referred to in undertaking the air quality assessment is provided below.

2.3.1. National

2.3.1.1. National Planning Practice Guidance

The National Planning Practice Guidance¹⁵ outlines how the planning process can address potential air quality impacts associated with new development. It provides guidance on the level of detail required, how impacts can be mitigated and also provides information on how local authorities may take air quality as a specific consideration in a planning decision.

2.3.1.2. Land-Use Planning and Development Control: Planning for Air Quality

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have published guidance¹⁶, which offers advice as to when and air quality assessment may or may not be required. The guidance document details what should be included within an assessment, how to determine the significance of air quality impacts and the likely mitigation measures required to minimise the impacts.

2.3.1.3. Guidance on the Assessment of Dust from Demolition and Construction

This document¹⁷, published by the IAQM, provides guidance on how to assess the impact of construction activities on air quality associated with new developments. The methodology prescribed within the document allows the impacts to be categorised based on risk (with particular reference to dust and PM₁₀ on sensitive human and ecological receptors) and, where applicable identify mitigation measures associated to the risk classification determined.

2.3.2. Regional

2.3.2.1. London Local Air Quality Management Technical Guidance

The Mayor of London has published guidance for use by the London boroughs in their review and assessment work¹⁸. The guidance is referred to as LLAQM.TG(19) and has been appropriately used within this assessment.

2.3.2.2. London Councils Guidance for Air Quality Assessments

The London Councils have published guidance¹⁹ for undertaking air quality assessments in the London Boroughs, the majority of which have declared AQMA's. The guidance sets out suggested methodologies for undertaking air quality assessments and sets out criteria for determining the impacts of a new development on air quality.

2.3.2.3. Mayor of London's Supplementary Planning Guidance for the Control of Dust and Emissions during Construction and Demolition

The Supplementary Planning Guidance (SPG)²⁰ builds on the London Councils guidance to establish best practice when mitigating impacts on air quality during construction and demolition. The SPG, offers further detail and seeks to address emissions from Non-Road Mobile Machinery (NRMM) through the use of a Low Emission Zone, which was introduced in 2015.

The SPG provides a methodology for assessment the impacts on air quality of the construction and activities following the same procedure set out in the IAQM guidance. It identifies the potential impacts and risks to sensitive receptors and details the relevant control measures required to mitigate any adverse impacts.

2.3.2.4. Greater London Authority: Sustainable Design and Construction Supplementary Planning Guidance

Section 4.3 of this SPG²¹ provides guidance on when an air quality assessment is required, looks at how transport measures can minimise emissions to air and sets out emissions standards/limits for combustion plant.

The SPG also contains guidance on assessing the air quality neutrality of a new development. Emission benchmarks for transport and buildings for NO_x and PM₁₀ are detailed in the SPG.

Developments that do not exceed the calculated emission benchmarks are considered 'air quality neutral', however when the emission benchmarks are exceeded the development is not 'air quality neutral'. Where a development exceeds the benchmarks, additional mitigation or off-setting is required. This can be achieved by providing appropriate abatement including green planting, upgrade or additional abatement to on-site combustion plant, retro-fitting of abatement technology for vehicles or flues and exposure reduction. Such measures can be achieved by condition or S106 contribution. The SPG states that air quality monitoring is not an eligible method for off-setting air quality impacts as this does not contribute to actual air quality improvements.

2.3.2.5. Air Quality Neutral Planning Support Guidance

The Air Quality Neutral Planning Support Guidance²² provides a methodology for assessing the air quality neutrality of Proposed Developments in London.

2.3.2.6. Air Quality Neutral Draft London Plan Guidance (2021)

Policy SI 1 of the London Plan includes requirements for new development to be Air Quality Neutral. To assist developers, boroughs and others involved in designing and planning new development, draft London Plan Guidance on Air Quality Neutral has been prepared. The Air Quality Neutral London Plan Guidance²³ sets air quality benchmarks for all development, in order to ensure that their transport and building emissions do not worsen air quality in London. The guidance also outlines a simplified approach for minor developments.

2.3.2.7. Air Quality Positive Draft London Plan Guidance (2021)

The Air Quality Positive approach aims to maximise benefits to local air quality in and around a large-scale development sites and masterplan area while also minimising exposure to existing sources of poor air quality. The Air Quality Positive Draft London Plan Guidance²⁴ should be applied at the plan making stage to masterplans (for example Supplementary Planning Documents) and development briefs that include large-scale development sites that are likely to be subject to an Environmental Impact Assessment.

2.3.3. Local

2.3.3.1. Camden planning Guidance – Air Quality

The Camden Planning Guidance on Air Quality²⁵ forms a Supplementary Planning Document that supports the policies contained within the Local Plan, providing information on key air quality issues within the borough. The guidance outlines what the Council requires in relation to air quality for a planning application, what an air quality assessment should cover, and what measures can be implemented to minimise pollutant and protect public exposure. This guidance has been used to inform this assessment where appropriate.

2.3.3.2. Local Air Quality Management Review and Assessment Technical Guidance

The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities. This technical guidance, identified as LAQM.TG(16)²⁶, is for use by local authorities for their review and assessment work and has been applied where appropriate to this assessment.

2.3.3.3. COVID-19: Supplementary Guidance Local Air Quality Management Reporting in 2021

The Department for Environment, Food and Rural Affairs (Defra) has published this guidance²⁷ for local authorities in England (including London). As a result of impacts from COVID-19 and the associated restrictions on activity, this document informs local authorities of the following changes and points of reference with respect to Local Air Quality Management (LAQM) duties, as described in Part IV of the Environment Act 1995, for the 2021 reporting year.

3. Methodology

3.1. Scope of Assessment

The scope of the assessment has been determined in the following way:

- Consultation with the Environmental Health Officer (EHO) at the London Borough of Camden to agree the scope of the assessment and the methodology to be applied;
- Review of the London Borough of Camden's latest review and assessment reports²⁸ and the air quality data for the area surrounding the Application Site, including the London Borough of Camden, Defra²⁹, the London Air Quality Network (LAQN)³⁰ and the London Atmospheric Emissions Inventory³¹;
- Desk study to confirm the locations of nearby existing receptors that may be sensitive to changes in local air quality, and a review of the Proposed Development to establish the location of new sensitive receptors;
- Review of the traffic data provided by Stantec (transport consultants for this application); and,
- Review of energy strategy and heating/hot water proposals.

The proposals do not include on-site energy generation through combustion sources, such as centralised gas-fired boilers or Combined Heat and Power (CHP) unit or gas-fired boilers etc., therefore an assessment of this source has been scoped out.

3.2. Construction Phase

Assessment of the risk of impact associated with the generation of dust during the construction phase of the Development and determination of subsequent mitigation measures necessary has been undertaken following Institute of Air Quality Management (IAQM) guidelines.

The assessment is based on a series of steps: screening the requirement for a detailed assessment, classification of the likely magnitude of dust emissions; characterisation of the area of influence and establishment of its sensitivity to dust; and establishment of the overall risk of impact. The risk of impact from dust emissions from the Development considers effects on human health, nuisance as a result of dust soiling and ecological receptors from four main activities: demolition; earthworks; construction; and trackout. The potential for dust emissions from each activity should be considered unless any of them are not relevant to the Development.

The guidelines identify appropriate screening criteria for the identification of potential receptors, based on a conservative approach and in consideration of the exponential decline in both airborne concentrations and the rate of deposition with distance. A detailed assessment of the impact of dust from construction sites will be required where:

- A 'human receptor' is located within 350 m of the boundary of the site or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance;
- An 'ecological receptor' is located within 50 m of the boundary of the site or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance.

The magnitude of dust emissions for each activity is classified as small, medium or large depending upon the scale of the works proposed, materials involved, and level of activity required. The IAQM guidelines provide examples of how the magnitude of emission can be defined, which are

identified in Table 3.1. The Development is unlikely to satisfy all criteria within the examples, therefore professional judgement and site-specific information are used to identify appropriate emission magnitude.

Table 3.1 *Dust Emission Magnitude (Source: IAQM Guidance, v1.1 Updated June 2016)*

Activity	Small	Medium	Large
Demolition	<ul style="list-style-type: none"> • Total building volume <20,000 m³ • Construction material with low potential for dust release (e.g. metal cladding or timber) • Demolition activities <10 m above ground level • Demolition during wetter months 	<ul style="list-style-type: none"> • Total building volume 20,000 - 50,000 m³ • Potentially dusty construction material • Demolition activities 10-20 m above ground level 	<ul style="list-style-type: none"> • Total building volume >50,000 m³ • Potentially dusty construction material (e.g. concrete) • On-site crushing and screening • Demolition activities >20 m above ground
Earthworks	<ul style="list-style-type: none"> • Total site area <2,500 m² • Soil type with large grain size (e.g. sand) • <5 heavy earth moving vehicles active at any one time • Formation of bunds <4 m in height • Total material moved <20,000 tonnes • Earthworks during wetter months 	<ul style="list-style-type: none"> • Total site area 2,500 - 10,000 m² • Moderately dusty soil type (e.g. silt) • 5 - 10 heavy earth moving vehicles active at any one time • Formation of bunds 4 – 8 m in height • Total material moved 20,000 - 100,00 tonnes 	<ul style="list-style-type: none"> • Total site area >10,000 m² • Potentially dusty soil type (e.g. clay) • >10 heavy earth moving vehicles active at any one time • Formation of bunds >8 m in height • Total material moved >100,000 tonnes
Construction	<ul style="list-style-type: none"> • Total building volume <25,000 m³ • Construction material with low potential for dust (e.g. metal cladding or timber). 	<ul style="list-style-type: none"> • Total building volume 25,000 - 100,000 m³ • Potentially dusty construction material (e.g. concrete) • On-site concrete batching 	<ul style="list-style-type: none"> • Total building volume >100,000 m³ • On-site concrete batching, sandblasting
Trackout	<ul style="list-style-type: none"> • <10 HDV (>3.5t) outward movements* in any one day[#] • Surface material with low potential for dust release • Unpaved road length <50 m 	<ul style="list-style-type: none"> • 10 - 50 HDV (>3.5t) outward movements* in any one day[#] • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50 - 100 m 	<ul style="list-style-type: none"> • >50 HDV (>3.5t) outward movements* in any one day[#] • Potentially dusty surface material (e.g. high clay content) • Unpaved road length >100 m
<p>* A vehicle movement is a one-way journey, i.e. from A to B, and excludes the return journey. [#] HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average.</p>			

Consideration is given to the likely sensitivity of the area to the impacts of dust, establishing a sensitivity of low, medium or high for dust soiling, human health and ecological receptors. The sensitivity of the area considers a number of factors, including the specific sensitivities of receptors in the area, the proximity and number of those receptors, local baseline conditions such as background concentrations and site-specific factors.

The first step in identifying the sensitivity of the area is to establish the sensitivity of the receptor, based on the presence or level of activity associated with the area influenced by the Development. Professional judgement and site-specific information are used to assign an appropriate level of receptor sensitivity using the principles outlined in Table 3.2. Following this, the sensitivity of the area can be established from Tables 3.3 to 3.5 based on the sensitivity of the receptor, number of receptors (in the case of human health and dust soiling) and the distance from source.

Table 3.2 *Receptor Sensitivity Definitions (Source: IAQM Guidance, v1.1 Updated June 2016)*

Activity	Low	Medium	High
Dust Soiling	<ul style="list-style-type: none"> • Enjoyment of amenity would not reasonably be expected; • There is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; • Transient exposure, where people or property is only expected to be present for limited periods of time as part of the normal pattern of use; • Indicative examples include playing fields, farmland, footpaths, short-term car parks and roads. 	<ul style="list-style-type: none"> • Users would expect to enjoy a reasonable level of amenity, but not reasonably at same level as in their home; • The appearance, aesthetics or value of property could be diminished by soiling; • Indicative examples include parks and places of work. 	<ul style="list-style-type: none"> • Users can reasonably expect enjoyment of a high level of amenity; • The appearance, aesthetics or value of property would be diminished by soiling, and continuous or regularly extended periods of presence expected during normal pattern of land use; • Indicative examples include dwellings, museum and other culturally important collections, medium and long-term car parks and car showrooms.
Human Health	<ul style="list-style-type: none"> • Locations where human exposure is transient; • Indicative examples include public footpaths, playing fields, parks and shopping streets. 	<ul style="list-style-type: none"> • Locations where the people exposed are workers[#], and exposure is over a time period relevant to the air quality objective for PM₁₀*; • Indicative examples include office and shop workers, but not those occupationally exposed to dust. 	<ul style="list-style-type: none"> • Locations where members of the public are exposed over a period of time relevant to the air quality objective for PM₁₀*; • Indicative examples include residential properties, hospitals, schools and residential care homes.
Ecological	<ul style="list-style-type: none"> • Locations with a location designation where the features may be affected by dust deposition, e.g. Local Nature Reserve. 	<ul style="list-style-type: none"> • Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; • Locations with a national designation where the features may be affected by dust deposition, e.g. Site of Special Scientific Interest. 	<ul style="list-style-type: none"> • Locations with an international or national designation and the designated features may be affected by dust soiling, e.g. Special Area of Conservation with acid heathland; • Location where there is a community of a particular dust sensitive species such as vascular species

Activity	Low	Medium	High
			included in the Red Data List for Great Britain.
<p>* In the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day, following Defra guidance.</p> <p># Workers are considered to be less sensitive than the general public as a whole because the most sensitive to the effects of air pollution, such as young children, are not normally workers.</p>			

Table 3.3 *Sensitivity of the Area to Dust Soiling Effects on People and Property (Source: IAQM Guidance, v1.1 Updated June 2016)*

Receptor Sensitivity	Number of Receptors	Distance from Source			
		<20m	<50m	<100m	<350m
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 3.4 *Sensitivity of the Area to Human Health Impacts (Source: IAQM Guidance, v1.1 Updated June 2016)*

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from Source				
			<20 m	<50 m	< 100 m	<200 m	<350 m
High	>32 µg/m ³	>100	High	High	High	Medium	Low
		10 – 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32 µg/m ³	>100	High	High	Medium	Low	Low
		10 – 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 – 28 µg/m ³	>100	High	Medium	Low	Low	Low
		10 – 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	<24 µg/m ³	>100	Medium	Low	Low	Low	Low
		10 – 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	>32 µg/m ³	>10	High	Medium	Low	Low	Low
		1 – 10	Medium	Low	Low	Low	Low
	28 - 32 µg/m ³	>10	Medium	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
	24 – 28 µg/m ³	>10	Low	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
	<24 µg/m ³	>10	Low	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
	-	>1	Low	Low	Low	Low	Low
		>1	Low	Low	Low	Low	Low

Table 3.5 *Sensitivity of the Area to Ecological Impacts (Source: IAQM Guidance, v1.1 Updated June 2016)*

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

3.2.1. Establishing Significance

The risk of dust related impacts from the Proposed Development is established from the sensitivity of the area and the likely dust emission magnitude. The risk should be established, on the worst-case area sensitivity and in the absence of mitigation, for each of the construction related activities (demolition, earthworks, construction and trackout) following the matrix in Table 3.6.

Table 3.6 *Risk of Dust Impacts from Each Activity (Source: IAQM Guidance, v1.1 Updated June 2016)*

Sensitivity of Area	Activity	Dust Emission Magnitude		
		Large	Medium	Small
High	Demolition	High Risk	Medium Risk	Medium Risk
	Earthworks	High Risk	Medium Risk	Low Risk
	Construction	High Risk	Medium Risk	Low Risk
	Trackout	High Risk	Medium Risk	Low Risk
Medium	Demolition	High Risk	Medium Risk	Low Risk
	Earthworks	Medium Risk	Medium Risk	Low Risk
	Construction	Medium Risk	Medium Risk	Low Risk
	Trackout	Medium Risk	Low Risk	Negligible
Low	Demolition	Medium Risk	Low Risk	Negligible
	Earthworks	Low Risk	Low Risk	Negligible
	Construction	Low Risk	Low Risk	Negligible
	Trackout	Low Risk	Low Risk	Negligible

The IAQM guidelines identify a range of mitigation measures intended to reduce the emission and effects of dust from construction sites, and identify their likely applicability to a development based on the level of impact risk attributed. Consideration is given to these in the development of mitigation measures, with the significance of the residual effect based on professional judgement.

3.3. Operational Phase

3.3.1. Road Traffic Emissions

Road traffic emissions are typically the main source of NO_x, PM₁₀ and PM_{2.5} concentrations resulting from developments.

To understand the NO₂, PM₁₀ and PM_{2.5} concentrations arising as a result of the development, a detailed assessment using the air dispersion model ADMS-Urban, Version 5.0 (release date 16/03/2021) has been undertaken. This model uses detailed road traffic information, surface roughness and local meteorological information to predict the impact on pollutant concentrations at specific receptor points. Table 3.7 summarises the air quality modelling parameters for road traffic.

Table 3.7 ADMS Roads Modelling Parameters

Parameter	Local Area	Met. Measurement Site
Latitude	51.3	51.3
Surface Roughness	30	30
Monin-Obukhov Length (m)	30	30

The ADMS model uses meteorological data, including wind speed and direction, to determine how pollution is transported and diluted with distance from the source. For this assessment meteorological data from London City Airport for 2019 (to align with the baseline year) has been utilised as this is considered representative of the Application Site

The traffic data used in the air quality assessment is identified in Appendix B and the roads identified in Figure 3.1.

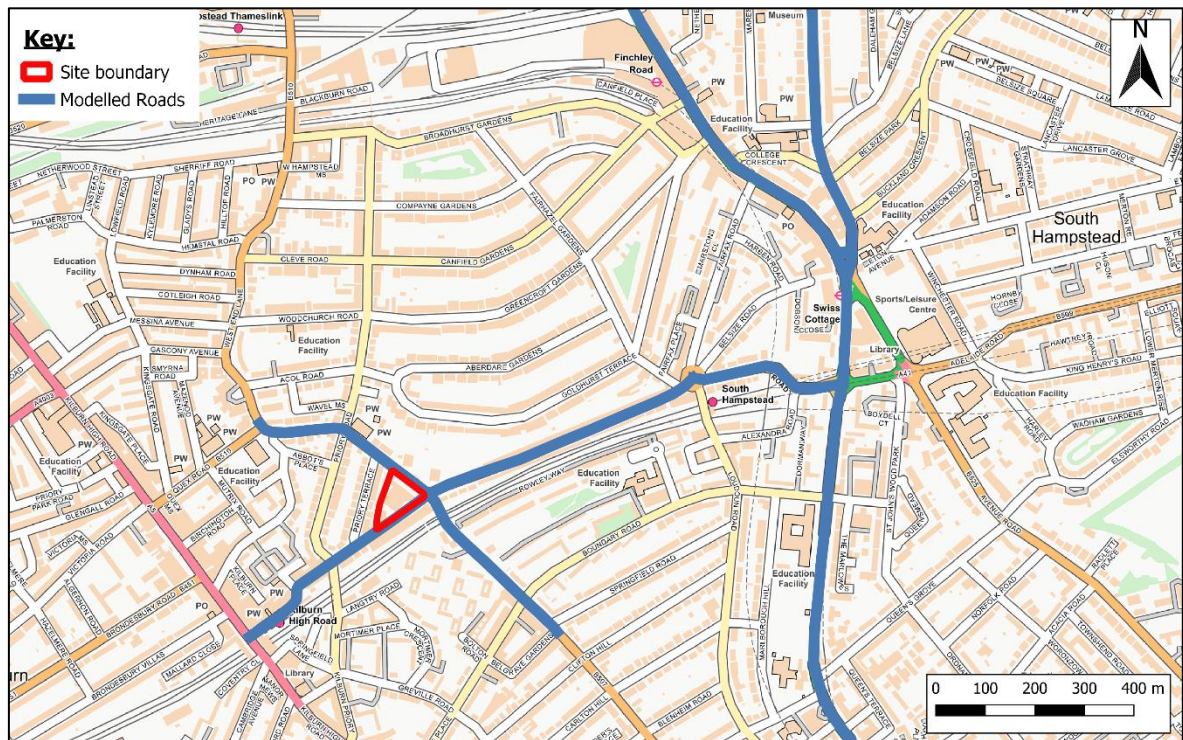


Figure 3.1 Modelled Road Network (Contains OS data © Crown copyright and database right, 2022)

3.3.1.1. Model Scenarios

For the assessment, the following scenarios have been modelled:

- 2019 – Baseline & Model Verification;
- 2024 – Baseline + Committed Developments; and,
- 2024 – Baseline + Committed Developments + Proposed Development.

3.3.1.2. Vehicle Emission Factors

Vehicle emission factors for input into ADMS-Urban have been calculated using the EFT version 11.0 (published November 2021), available on the Defra website³². The EFT allows for the calculation of emission factors arising from road traffic for all years between 2018 and 2030. For the predictions of future year emissions, the toolkit considers factors such as anticipated advances

in vehicle technology and changes in fleet composition, such that vehicle emissions are assumed to reduce over time. There is good evidence from real-world testing of EURO 6 (VI) compliant vehicles of substantial improvements in vehicle emissions compared to earlier EURO categories, in particular with respect to NO_x emissions. Total pollutant concentrations are, therefore, likely to be lower in 2024 than in 2019.

For the assessment, emission factors for 2019 have been applied to the baseline and model verification scenario and emission factors for 2024 have been applied to the future baseline and with development scenario.

3.3.1.3. Selection of Background Concentrations

Background concentrations for NO₂, PM₁₀ and PM_{2.5} have been obtained from Defra's website, which provides background concentrations mapped at a grid resolution of 1 x 1 km for the whole of the UK. Estimated background concentrations are available for all years between 2018 and 2030, and the maps assumed that background concentrations will reduce (*i.e.*, improved) over time.

For the assessment, 2019 background concentrations have been applied to the baseline and model verification scenario and 2024 background concentrations have been applied to the future baseline and with development scenarios - this approach aligns with the emission factors utilised.

Background concentrations for each of the receptors are included in Appendix C.

3.3.1.4. Model Verification

The ADMS-Roads dispersion model has been validated by the software developer and is considered to be fit for purpose, however local model validation, *i.e.* in the vicinity of the Proposed Development, has not been undertaken. Therefore, to validate the model and to determine how well the model is performing at a local level, comparing the modelling results with local monitoring data is undertaken. The verification process aims to minimise model uncertainty and error by adjusting the modelled results by a factor to offer greater confidence in the final results. This is undertaken in accordance with the methodology specified in Chapter 7, Section 4 of LAQM.TG16.

Details of the verification factor calculations are presented in Appendix D. An adjustment factor of 1.2 was obtained during the verification process, which indicated that the model was under-predicting. This factor was applied to the modelled road-NO_x outputs prior to conversion to annual mean NO₂ concentrations utilising the NO_x to NO₂ calculator (version 8.1, released August 2020) provided by Defra³³.

No local roadside monitoring data was available for PM₁₀ and PM_{2.5}, therefore the adjustment factor calculated for NO_x has been applied to both the modelled PM₁₀ and PM_{2.5} concentrations prior to adding to the appropriate background concentration. This approach is in accordance with LAQM. TG16.

3.3.2. Combustion Plant Emissions

The proposed development does not include for combustion plant for the provision of heating and hot water; therefore, a detailed assessment of this source has been scoped out. Furthermore, there will also be no allowance for any on-site diesel generators.

As a result, consideration of impacts associated with building emissions are not required and have therefore been excluded from the assessment. Furthermore, with non-combustion sources replacing existing combustion sources, the overall effect from the building is likely to be positive in relation to building related emissions.

3.3.3. Significance Criteria

The EPUK and IAQM provide guidance for establishing the significance of air quality impacts arising as a result of the Proposed Development. The magnitude of impact on individual receptors is dependent upon the long-term average pollutant concentrations at the receptor in the assessment year and the percentage change relative to the Air Quality Assessment Level (AQAL), as identified in Table 3.8.

Table 3.8 *Impact Descriptors*

Long-term Average Concentration at Receptor in Assessment Year	Percentage Change in Concentration to AQAL*			
	1	2-5	6-10	>10
75% of less of AQAL	Negligible	Negligible	Slight	Moderate
76 – 94% of AQAL	Negligible	Slight	Moderate	Moderate
95 – 102% of AQAL	Slight	Moderate	Substantial	Substantial
103 – 109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

* Where the % change is <0.5% the change is described as 'Negligible' regardless of concentration.

The guidelines do not, however, provide a set method for establishing the significance of impact. Whilst the establishment of the impact magnitude on individual receptors can be identified as negligible, slight, moderate or substantial, the significance of the overall effect is dependent on a number of factors. Therefore, professional judgement will be applied to determine the likely significance of effects, with the following factors considered:

- The existing and future air quality in the absence of the development, notably whether the Air Quality Objectives are likely to be met or the scale of exceedances in the long-term and short-term concentrations;
- The extent of current and future population exposure to the impacts, notably the number of properties and/or people present and the scale of impact (e.g. whether the majority of the local population is subject to substantial or slight magnitude impacts);
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts, such as establishing a worst-case scenario for sensitive receptors.

In addition, the London Council's guidance for air quality assessment³⁴ provides a flow chart for assessing the significance of air quality impacts. These are illustrated in Table 3.9.

Table 3.9 *London Council's Flow Chart Method for Assessing the Significance of Air Quality Impacts*

Effect of Development	Outcome
Will development interfere with or prevent implementation of measures in the AQAP?	Air Quality is an overriding consideration.
Is development likely to cause a worsening of air quality or introduce new exposure into the Air Quality Management Area (AQMA)?	Air Quality of a highly significant consideration.
Would the development contribute to air quality exceedances or lead to the designation of a new AQMA?	Air Quality is a highly significant consideration.
Is the development likely to increase emissions of or increase/introduce new exposure to PM ₁₀ ?	Air Quality is a significant consideration.

The London Councils guidance for air quality assessments has published the Air Pollution Exposure Criteria (APEC) specifically for new exposure to determine the significance of new exposure to poor air quality and level of mitigation required. The APEC criteria are identified in Table 3.10.

Table 3.10 *London Council's Significance Criteria*

APEC Level	Applicable Range Annual Average NO ₂	Applicable Range PM ₁₀	Recommendation
A	>5% below national objective	Annual Mean: >5% below national objective 24-hour Mean: >1 day less than the national objective	No air quality grounds for refusal, however mitigation of any emissions should be considered.
B	Between 5% below or above national objective	Annual Mean: Between 5% below or above national objective. 24-hour Mean: Between 1 day above or below the national objective.	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered – e.g. maximise distance from pollution source, proven ventilation systems, parking considerations, winter gardens, internal layout considered and internal pollutant emissions minimised.
C	>5% above national objective	Annual Mean: > 5% above national objective 24-hour Mean: >1 day more than the national objective	Refusal on air quality grounds should be anticipated unless the Local Authority has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated. Worker exposure in commercial/industrial land uses should be considered further. Mitigation measures must be presented with air quality assessment, detailing anticipated outcomes of mitigation measures.

3.4. Air Quality Neutral Assessment

In line with the Sustainable Design and Construction SPG (2014), an Air Quality Neutral Assessment (AQNA) is required for all new developments. The AQNA compares NO_x and PM₁₀ emission for buildings and transport against calculated benchmarks. NO_x and PM₁₀ emission for buildings and transport have been calculated based on the information in Table 3.11.

Table 3.11 *Input Parameters for AQNA*

Parameter	Value Used
Gross Internal Area (m ²)	C3 – Residential – 12,871 E* – Commercial – 305.3
Energy Centre Total NO _x Emissions (kg/year)	0
Annual Development Generated Vehicle Trips	C3 – Residential – 77,111 A1 (Now E) – Commercial – 2,310

Parameter	Value Used
*Previously Class A, AQ Neutral Assessment still uses Class A1.	

The NO_x and PM₁₀ emissions calculated using the information in Table 3.11 are compared to the benchmarks provided in Table 3.12. Should a benchmark be exceeded (*i.e.* is in deficit), mitigation will be required either locally or by off-setting emissions elsewhere.

Table 3.12 Emission Benchmarks for AQNA

Land Use Class	Benchmark Category	NO _x Benchmark (kg/yr)	PM ₁₀ Benchmark (kg/yr)
C3 – Residential	Buildings	337.2	29.3
	Transport	77.6	13.9
E* - Commercial	Buildings	6.9	0.4
	Transport	66.8	12.0
*Previously Class A, AQ Neutral Assessment still uses Class A1.			

3.5. Sensitive Receptors

Defra provides guidance on locations where the air quality objectives should apply and Table 3.13 and professional judgement have been used to select receptors where likely significant exposure to pollutant concentrations may occur.

Table 3.13 Examples of where the Air Quality Neutral Objectives may or may not apply

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

Averaging Period	Objectives Should Apply	Objectives Should Generally Not Apply
15-minute Mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	-

The modelled receptors used within the study area are identified in Appendix C and illustrated in Figure 3.2.

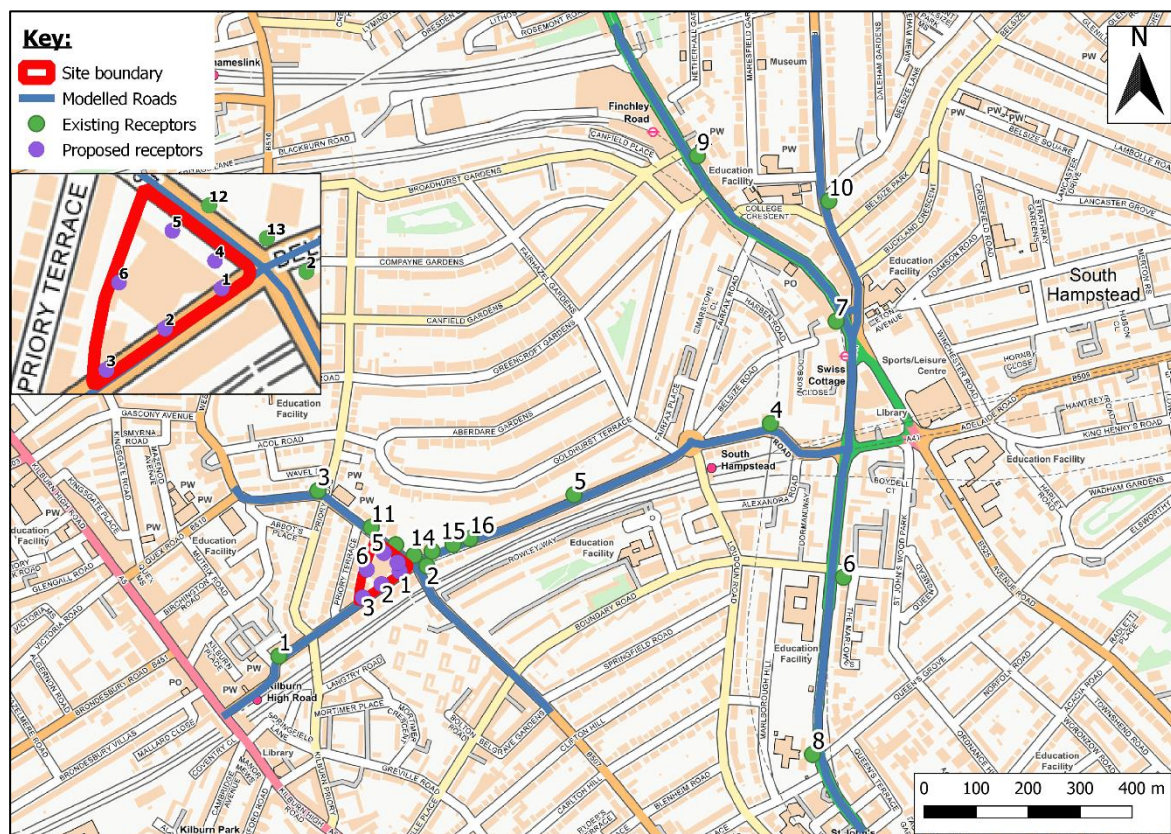


Figure 3.2 *Modelled Receptors* (Contains OS data © Crown copyright and database right, 2022)

3.6. Limitations and Assumptions

Professional judgement has been used in the completion of the construction phase dust assessment for the Proposed Development.

It is assumed that the information provided by the transport consultants (Stantec) and M&E engineers is accurate.

The ADMS Roads dispersion model has been used in this assessment to assess the impact of development generated traffic. The dispersion models rely on input data, such as traffic data and predicted emissions data, etc., which may have uncertainties associated with them. The models simplify complex environments and does not always accurately reflect local micro-climatic conditions which may ultimately affect the predicted pollutant concentrations.

The Defra background concentrations indicate air quality conditions at ground level. These ground level concentrations have been applied to all receptors, including those at height. As a result, the

concentrations are likely to be lower at the receptors at height than predicted, but the assessment presents the worst-case scenario and is therefore appropriate.

Hilson Moran consider the assumptions made in the assessment to be reasonable and robust.

4. Baseline Conditions

4.1. Defra 2018 Background Maps

The UK Air Information Resource (AIR) is operated by Defra and includes computer modelled predictions of background concentrations of air pollutants over the whole of the UK with a grid resolution of 1 km². Background concentrations are those levels that would be expected to be observed away from specific sources of air pollutants, such as roads and industrial installations. The background information for relevant pollutants in the grid squares covering the development are provided in Table 4.1.

Table 4.1 *Defra 2018 Background Pollutant Data Relevant to the Assessment*

Grid Square	Pollutant	Pollutant Concentration (µg/m ³)		
		2019	2023	2024
525500 184500	NO ₂	26.0	22.5	21.8
	PM ₁₀	18.0	16.9	16.7
	PM _{2.5}	11.7	11.0	10.8
526500 184500	NO ₂	30.3	26.2	25.4
	PM ₁₀	19.2	18.0	17.8
	PM _{2.5}	12.3	11.5	11.4
526500 183500	NO ₂	29.2	25.2	24.5
	PM ₁₀	18.9	17.7	17.5
	PM _{2.5}	12.1	11.3	11.2
525500 183500	NO ₂	28.3	24.6	23.9
	PM ₁₀	18.9	17.7	17.5
	PM _{2.5}	12.1	11.4	11.2

4.2. Local Air Quality Information

Between 1998 and 2000, the London Borough of Camden (LBC) undertook its first round of review and assessment for air quality. Following this review, it was concluded that a borough wide AQMA warranted designation due to exceedances of the AQS objectives for annual mean of NO₂ and PM₁₀ concentrations and 24-hour PM₁₀ concentrations, predominantly brought about by road transport emissions. The Proposed Development lies within the existing AQMA and in close proximity to an Air Quality Focus Area (AQFA) - see Figure 4.1. Since then, exceedances of the objective for annual mean concentrations of NO₂ have persisted in many locations (most pronounced at roadside).

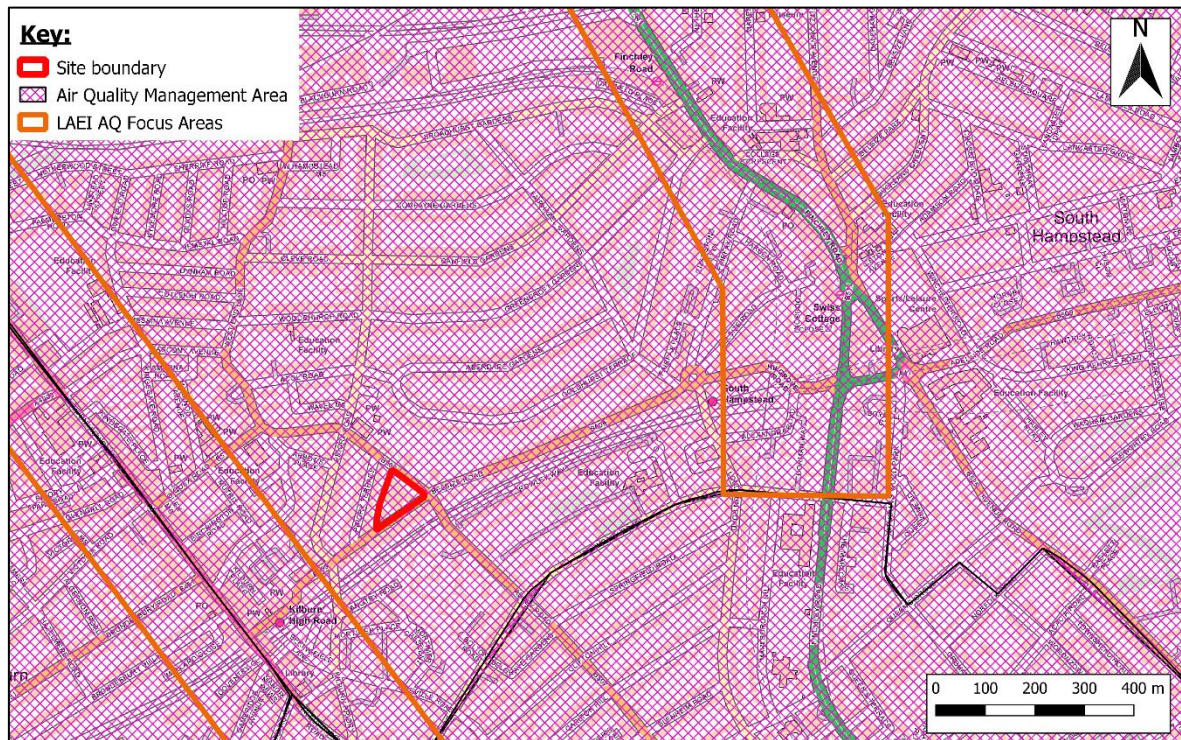


Figure 4.1 Air Quality Management Area & Air Quality Focus Area (Contains OS data © Crown copyright and database right, 2022)

4.2.1. Local Air Quality Monitoring Data

LBC operates four continuous monitoring stations and undertakes passive diffusion tube monitoring at 14 locations. The relevant monitoring locations are presented in Figure 4.2.

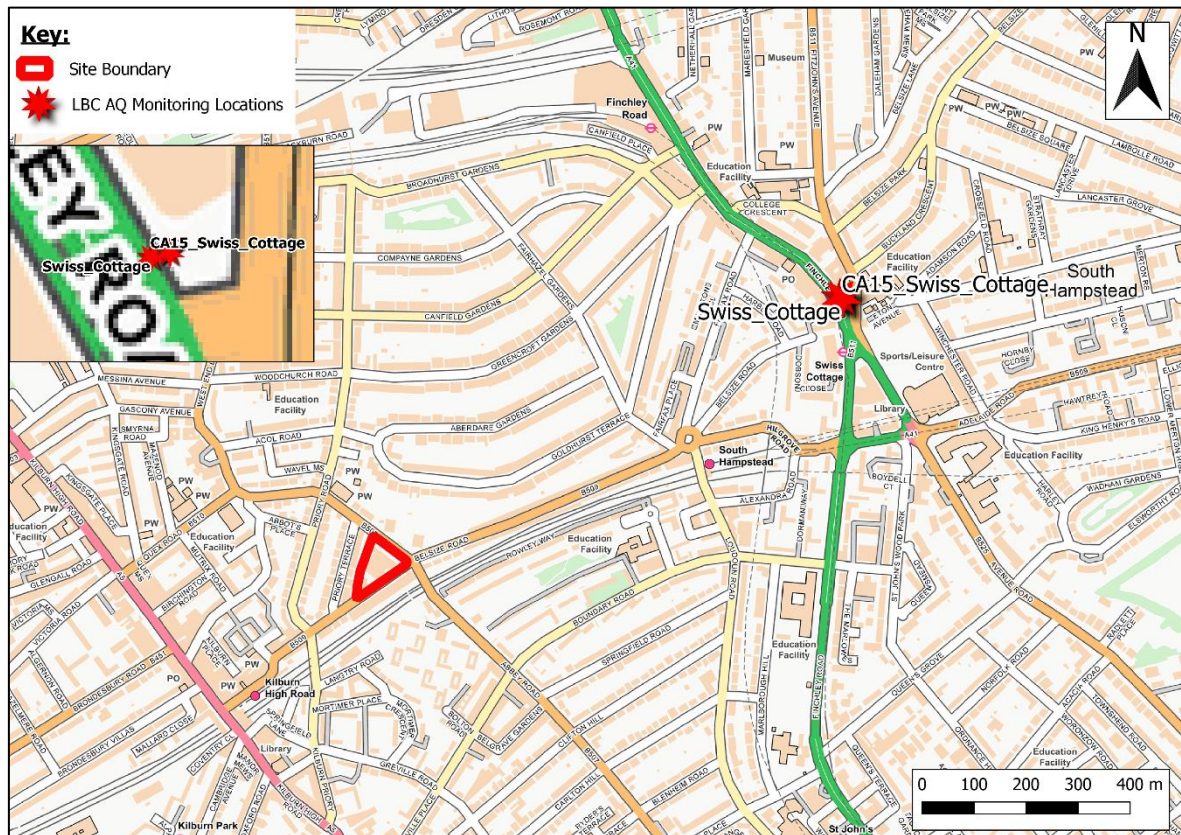


Figure 4.2 *Local Air Quality Monitoring (Contains OS data © Crown copyright and database right, 2022)*

Nitrogen Dioxide

Table 4.2 and Table 4.3 presents the annual mean NO₂ concentrations and the number of exceedances of the 1-hour NO₂ objective, respectively for the most representative continuous monitors.

The annual mean NO₂ objective has been exceeded at all monitoring locations between 2013 and 2019. The Urban Background monitor at Bloomsbury fell within the annual mean NO₂ objective for 2017 and 2019, however the kerbside monitor at Swiss Cottage continued to exceed the annual mean NO₂ objective.

As can be seen from Table 4.3, the monitoring data has been compliant with the 1-hour mean NO₂ objective between in all years monitored at London Bloomsbury. Swiss Cottage indicates exceedance of the 1-hour mean objective in 2013 and in 2016, complying with the objective for the first time in 2014 and 2015 and again in 2017, 2018 and 2019.

Table 4.2 Continuous Monitoring – Annual Mean NO₂

Site ID	X, Y	Type	Annual Mean (µg/m ³)						
			2013	2014	2015	2016	2017	2018	2019
London Bloomsbury	530123, 182014	UB	44	45	48	42	38	36	32
Swiss Cottage	526629, 184391	K	63	66	61	66	53	54	43

Bold indicates an exceedance of the annual mean objective.
Data capture was greater than 90% at all monitoring locations in 2019, with 98% for Bloomsbury and 99% for Swiss Cottage.
Notes: UB = Urban Background, K = Kerbside

Table 4.3 Continuous Monitoring – 1-Hour Mean NO₂

Site ID	X, Y	Type	Number of Exceedances of 1-Hour Mean NO ₂ Objective Threshold of 200 µg/m ³ (<18 exceedances/yr)						
			2013	2014	2015	2016	2017	2018	2019
London Bloomsbury	530123, 182014	UB	0	0	0	0	0	0	0
Swiss Cottage	526629, 184391	K	42	14	11	37	1	2	1

Bold indicates an exceedance of the annual mean objective.
Data capture was greater than 90% at all monitoring locations in 2019, with 98% for Bloomsbury and 99% for Swiss Cottage.
Notes: UB = Urban Background, K = Kerbside

Table 4.4 presents a summary of the diffusion tube monitoring collected by LBC between 2013 and 2019.

The Urban Background monitor at Frognal Way (CA7) does not exceed the annual mean NO₂ objective over the monitoring period. However, the other monitors in the study area all exceed the objective between 2013 and 2019, and only the monitor at Emmanuel Primary (CA25) falls beneath the objective over the monitoring period.

Table 4.4 Diffusion Tube Monitoring – Annual Mean NO₂

Site ID	X, Y	Type	Annual Mean (µg/m ³)						
			2013	2014	2015	2016	2017	2018	2019
CA7 Frognal Wy	526213, 185519	UB	31.95	28.55	27.78	27.91	32.26	22.1	22.8
CA15 Swiss Cottage	526633, 184392	K	83.08	74.34	69.28	73.86	-	62.3	49.7
CA17 47 Fitzjohn's Rd	526547, 185125	R	65.24	60.30	55.80	56.38	-	48.1	42.5
CA25A Emmanuel Primary	525325, 185255	R	57.91	48.36	47.70	52.18	55.16	39.8	37.9

Bold indicates an exceedance of the annual mean objective.
Data capture in 2018 was 100% for CA7 Frognal Way, 92% for CA25A Emmanuel Primary and 47 Fitzjohn's Road and 75% for CA15 Swiss Cottage.
Notes: UB = Urban Background, K = Kerbside, R = Roadside

Particulate Matter

Table 4.5 and Table 4.6 presents the annual mean PM₁₀ concentrations and the number of exceedances of the 24-hour PM₁₀ objective, respectively for the most representative continuous monitors.

Annual mean PM₁₀ concentrations (Table 4.5) at both monitoring locations have been well below the air quality objective since 2013. As can be seen from Table 4.6, the measured data also indicates compliance with the short-term air quality objective for PM₁₀ for both sites.

Table 4.5 *Continuous Monitoring – Annual Mean PM₁₀*

Site ID	X, Y	Type	Annual Mean (µg/m ³)						
			2013	2014	2015	2016	2017	2018	2019
London Bloomsbury	530123, 182014	UB	18	20	22	20	19	17	18
Swiss Cottage	526629, 184391	K	21	22	20	21	20	21	19
Bold indicates an exceedance of the annual mean objective. Data capture for 2019 was 92% for Bloomsbury and 96% for Swiss Cottage. Notes: UB = Urban Background, K = Kerbside									

Table 4.6 *Continuous Monitoring – 24-Hour Mean PM₁₀*

Site ID	X, Y	Type	Number of Exceedances of 24-Hour Mean NO ₂ Objective Threshold of 50 µg/m ³ (<35 exceedances/yr)						
			2013	2014	2015	2016	2017	2018	2019
London Bloomsbury	530123, 182014	UB	4	11	6	9	6	1	9
Swiss Cottage	526629, 184391	K	8	12	8	7	8	4	8
Bold indicates an exceedance of the annual mean objective. Data capture for 2019 was 92% for Bloomsbury and 96% for Swiss Cottage. Notes: UB = Urban Background, K = Kerbside									

Table 4.7 presents the annual mean PM_{2.5} concentrations for the Bloomsbury and Swiss Cottage continuous monitors. Annual mean PM_{2.5} concentrations (Table 4.7) at both monitoring locations have been well below the air quality objective since 2015.

Table 4.7 *Continuous Monitoring – Annual Mean PM_{2.5}*

Site ID	X, Y	Type	Annual Mean (µg/m ³)						
			2013	2014	2015	2016	2017	2018	2019
London Bloomsbury	530123, 182014	UB	-	-	11	12	13	10	11
Swiss Cottage	526629, 184391	K	-	-	12	15	16	11	11
Bold indicates an exceedance of the annual mean objective. Data capture for 2019 was 98% for Bloomsbury and Swiss Cottage. Notes: UB = Urban Background, K = Kerbside									

4.2.2. London Atmospheric Emissions Inventory

The LAEI includes dispersion model results for the whole of London for 2019 (updated February 2022). Estimated ground level annual mean concentrations for NO₂, PM₁₀ and PM_{2.5} in the vicinity of the Application Site are presented in Figures 4.3 to 4.5.

Figure 4.3 presents the 2019 LAEI baseline concentrations for annual mean NO₂ in the vicinity of the Application site. This indicates elevated ground level concentrations in excess of 50 µg/m³ along the adjoining roads (Belsize Road and Abbey Road). Within the Application Site boundary, baseline annual mean NO₂ concentrations are typically just below 40 µg/m³.

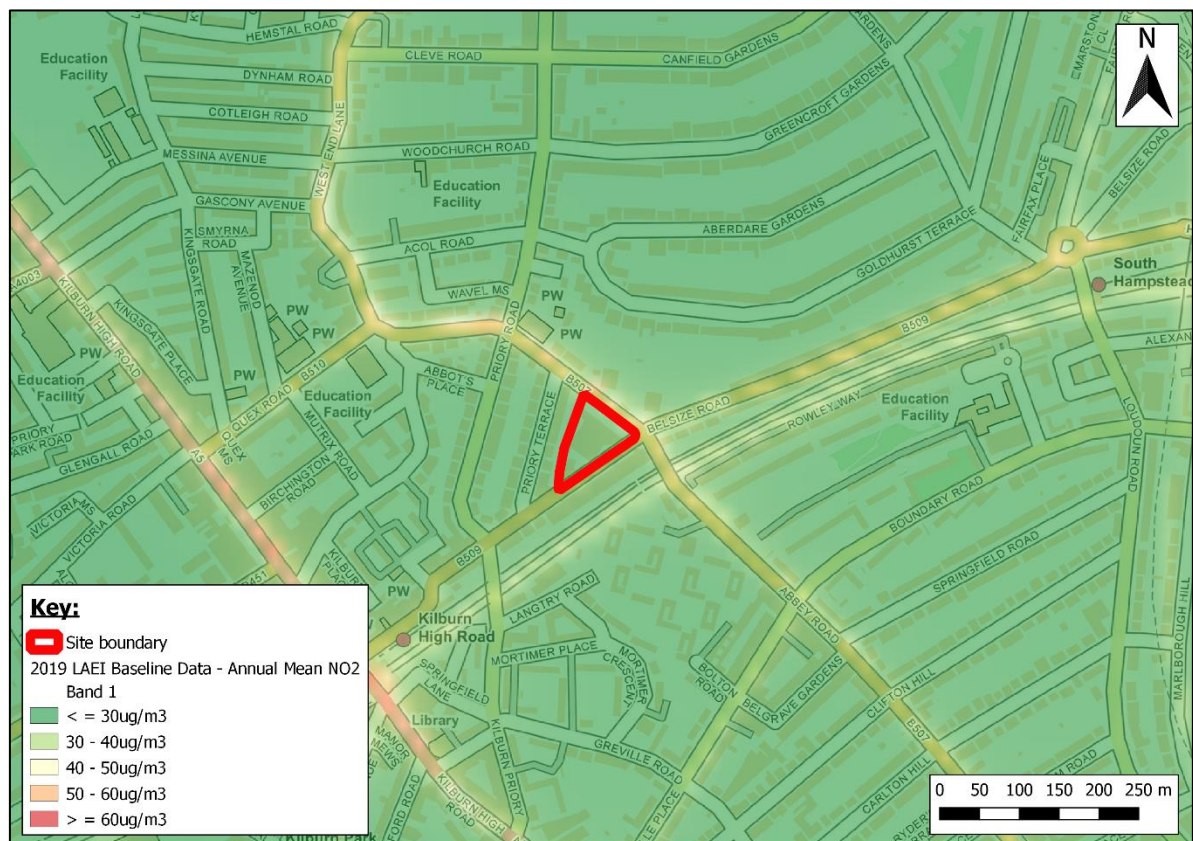


Figure 4.3 2016 LAEI Baseline - Annual Mean NO₂ (Contains OS data © Crown copyright and database right, 2022)

Defra's LAQM.TG (16) guidance provides an approach by which to determine compliance with the 1-hour mean objective for NO₂. It suggests that where annual mean NO₂ concentrations do not exceed 60 µg/m³ then it is likely that exceedances of the 1-hour mean AQS objective does not occur. As identified above the 2019 LAEI baseline data demonstrates that annual mean NO₂ concentrations do not exceed 60 µg/m³ within the Application Site boundary, and therefore it is unlikely that the 1-hour mean AQS objective would be exceeded.

Figure 4.4 presents the 2019 LAEI baseline concentrations for annual mean PM₁₀ in the vicinity of the Application Site. This indicates ground level concentrations are less than 30 µg/m³ along the adjoining roads and within the Application Site boundary.

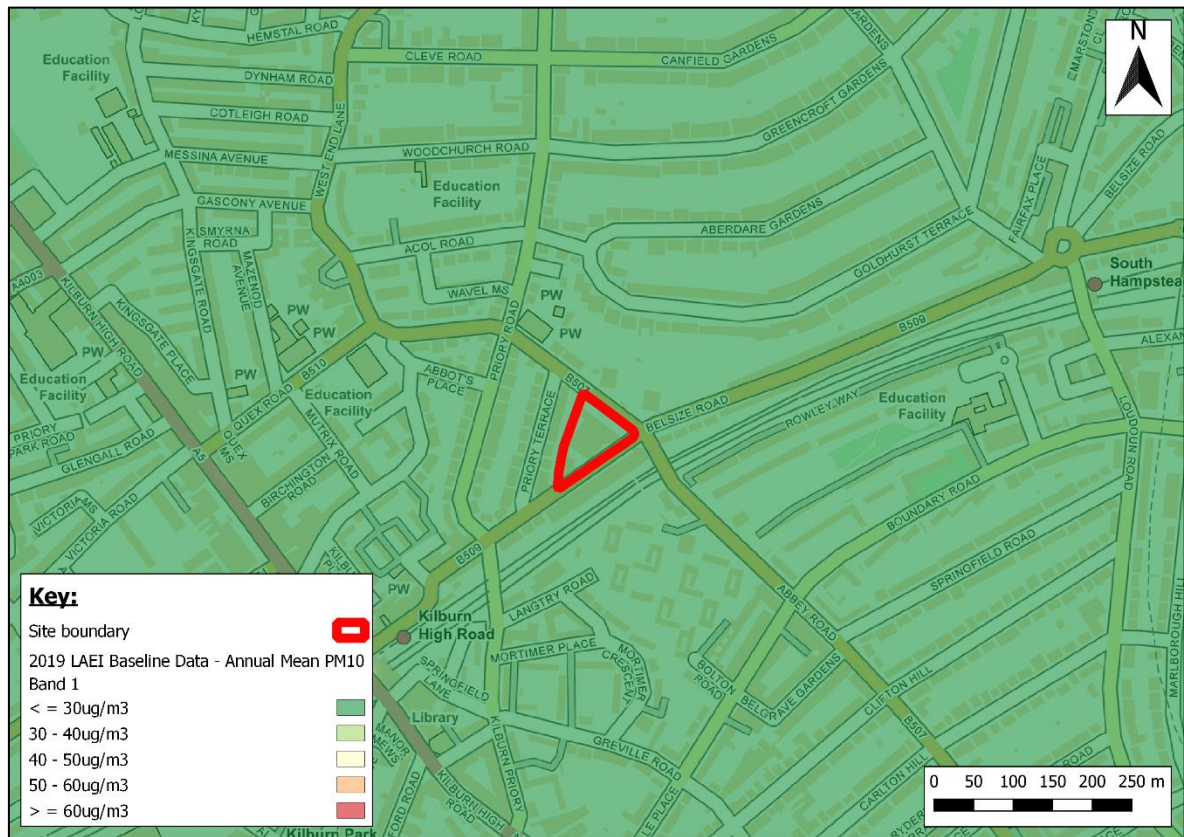


Figure 4.4 2016 LAEI Baseline - Annual Mean PM₁₀ (Contains OS data © Crown copyright and database right, 2022)

Figure 4.5 presents the 2019 LAEI baseline concentrations for annual mean PM_{2.5} in the vicinity of the Application Site. This indicates ground level concentrations are less than 20 µg/m³ along adjoining roads and within the Application Site boundary.

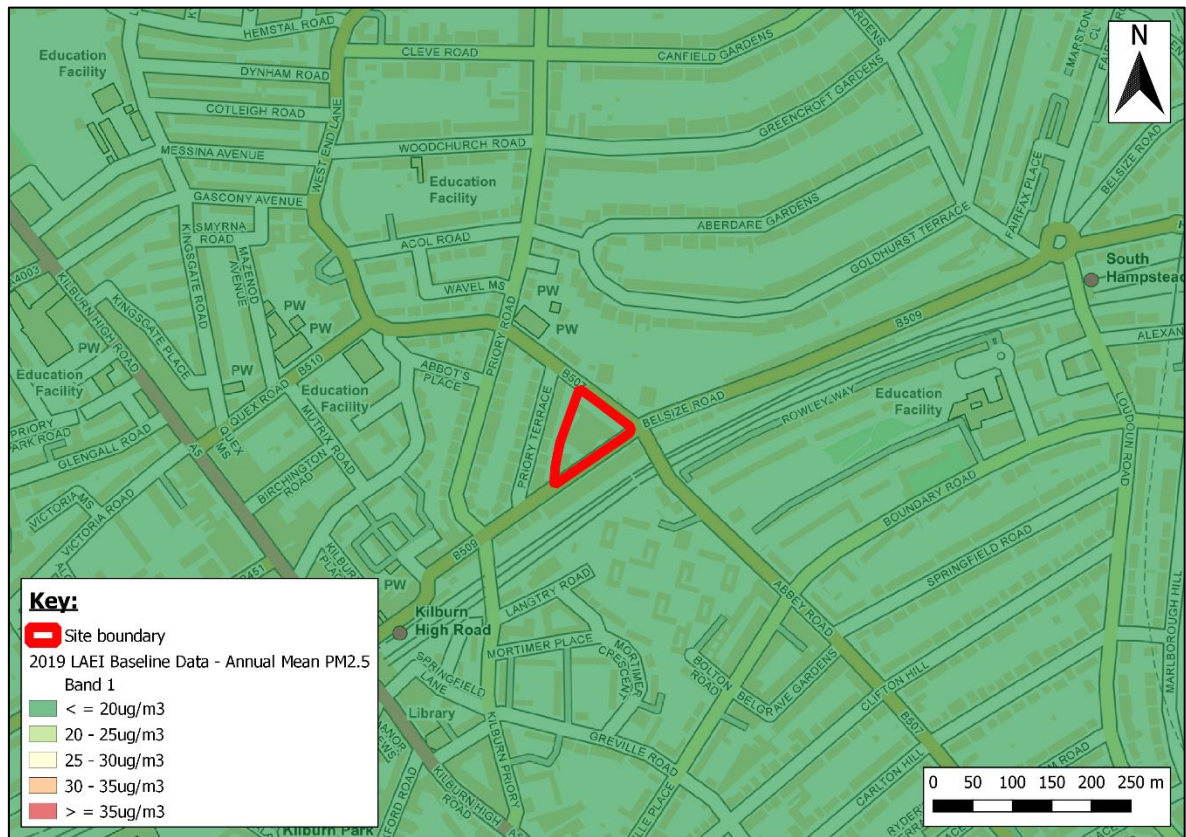


Figure 4.5 **2016 LAEI Baseline - Annual Mean PM_{2.5}** (Contains OS data © Crown copyright and database right, 2022)

With the introduction of the Real Driving Emissions (RDE) testing and the likely improvement in cleaner vehicle technologies (in particular EURO 6 (VI) a, b, c and d fleet categories – which are substantially cleaner than the previous EURO 5 (V), and the uptake of electric/hybrid vehicles) delivering improvements in vehicle emissions, in particular NO_x, then ambient pollutant concentrations could potentially be lower in the future than predicted by the 2019 LAEI baseline. However, it is important to note that such improvements would depend upon traffic growth, congestion and the implementation of government/local authority air quality initiatives and policy.

5. Effects Appraisal and Site Suitability

5.1. Construction

5.1.1. Assessment of Potential Dust Emission Magnitude

The likely magnitude of dust emissions from the Proposed Development for the four main activities has been assessed, as identified in Table 5.1.

Table 5.1 Predicted Magnitude of Dust Emissions from Proposed Development

Activity	Magnitude	Justification
Demolition	Large	The total volume of material to be demolished is likely to exceed 50,000m ³ . The material to be demolished is concrete and therefore has the potential for dust releases. The height of the existing building on the Application Site is approximately 21m in height and therefore exceeds 20m, therefore demolition works will occur above this identified threshold in the IAQM Guidance. Based on this information, it is reasonable to categorise the dust emission magnitude as Large.
Earthworks	Medium	The site area is 5,647 m ² . The soil type is potentially dusty, and it is unlikely that bunds will be constructed. Earthworks will be limited to site levelling and for the establishment of foundations, therefore excavated material is likely to be well below 20,000 tonnes set out for the small threshold. At this stage is understood that less than five heavy earth moving vehicles will be utilised simultaneously (IAQM threshold for small). However, due to the area the site has been classified as Medium.
Construction	Medium	The total building volume is estimated to be between 25,000 – 100,000 m ³ . The material to be used in the construction stage includes steel, brick and timber cladding, composite floor decking and plasterboard partitions – the dust release potential is Medium.
Trackout	Large	Considering the size of the Proposed Development, it is likely that the outward movements of vehicles associated with the construction phase would exceed 50 trips per day (transport consultants estimates 70 per day at the peak construction period). The proposed haul roads are expected to be kept to a minimum (<i>i.e.</i> , <50 m) but will be concrete to minimise dust resuspension. Given the likely number of construction vehicle movements, it is reasonable to apply a Large classification.

5.1.2. Sensitivity of the Area

A wind rose for London City Airport for 2019 is provided in Appendix E, which indicates that the prevailing wind direction is from the south-west. Therefore, existing receptors that are located to the north-east are most likely to fall within the area of influence from dust emissions generated by the construction phase. The extent of the zone of influence from construction dust is identified in Figure 5.1.

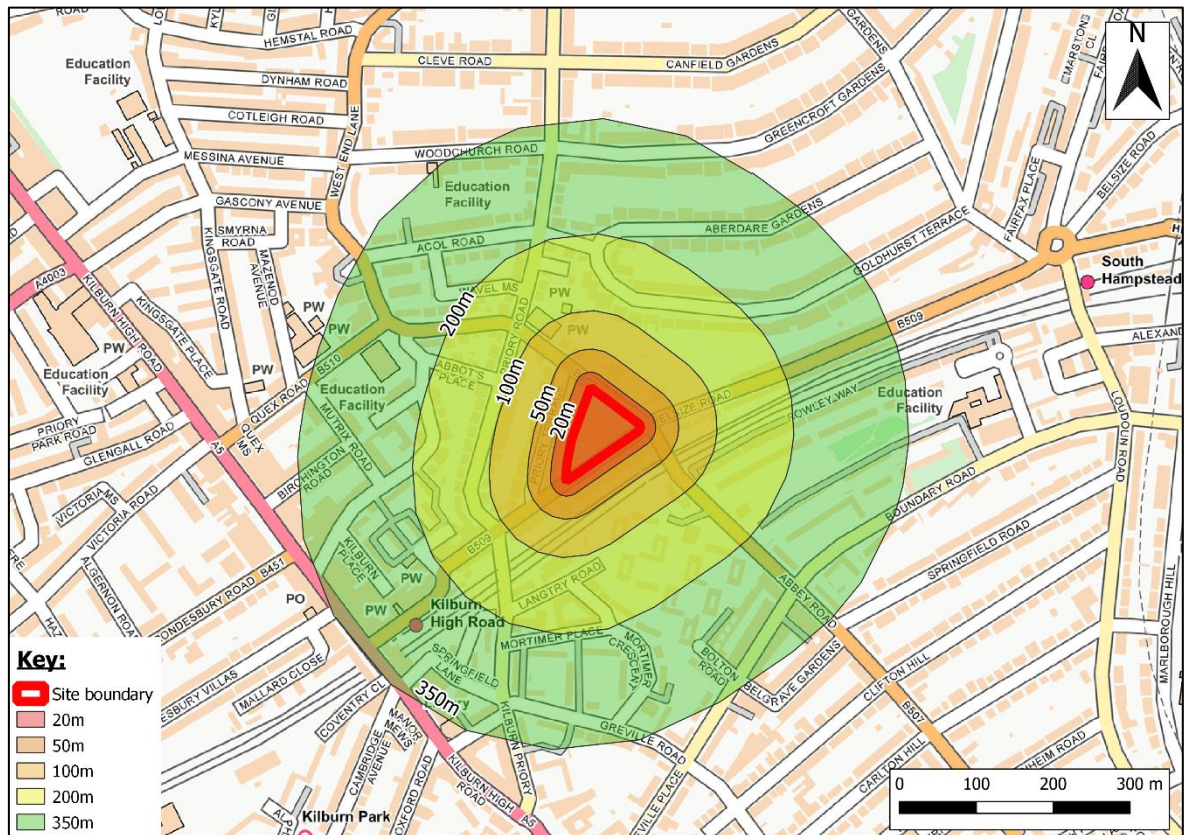


Figure 5.1 Zone of Construction Influence (Contains OS data © Crown copyright and database right, 2022)

The majority of dust generated by the construction stage is likely to be deposited in close proximity to the source. Surrounding the Application Site, the majority of existing buildings are residential in nature, with terraced houses lining both sides of Belsize Road and various apartment buildings present both within the development site and in the wider area along Belsize Road, Abbey Road and Rowley Way on the far side of the railway line. However, with the two existing apartment blocks overlooking Abbey Road (Snowman House and Casterbridge House) there are more than 100 receptors within 20 m of the development. For human health, considering the buildings on site as falling within 20 m of the works represents a worst-case scenario.

There are no ecological receptors located within 50 m of the Application Site, or within 50 m of the likely construction traffic route for 500 m from the site boundary, and therefore consideration of these receptors has been scoped out.

The background PM₁₀ concentration within the Application Site is less than 24 µg/m³, which is well below the annual mean air quality objective.

The sensitivity of the area to each of the previously identified impact types associated with the Proposed Development are identified in Table 5.2.

Table 5.2 Sensitivity of Receptors to Dust Emission Effects

Impact Type	Sensitivity of Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Medium	Medium	Medium	Medium
Ecological	N/A	N/A	N/A	N/A

5.1.3. Risk of Impact

To determine the risk of impacts prior to the implementation of mitigation the dust emission magnitude and the sensitivity of the area have been combined. Table 5.3 below summaries the potential risk of impacts during the construction phase.

Table 5.3 Risk of Dust Related Impacts from the Proposed Development

Impact Type	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High Risk	Medium Risk	Medium Risk	High Risk
Human Health	High Risk	Medium Risk	Medium Risk	Medium Risk
Ecological	N/A	N/A	N/A	N/A

The risk of dust related impacts from the Proposed Development on existing receptors in the vicinity of the Application Site is High to Medium Risk for dust soiling and High to Medium Risk for human health, without the implementation of mitigation.

5.1.4. Construction Road Traffic and Non-Road Mobile Machinery (NRMM)

The greatest impact on air quality due to construction traffic and NRMM is likely to be along roads in the vicinity of the Application Site. It is likely that construction traffic will enter the Application Site via Belsize Road. The volume of construction traffic does not breach the thresholds of the IAQM guidance requiring detailed assessment, therefore this has been scoped out and an assessment using professional judgement has been undertaken.

Based on the current local air quality in the area and the proximity of sensitive receptors to the roads likely to be used by construction vehicles the impacts are therefore considered to be slight adverse without the implementation of mitigation.

5.2. Operational Phase

Full results of the dispersion modelling are presented in Appendix F and a summary is provided below.

Annual Mean NO₂ Concentration

The objective for annual mean NO₂ concentrations is 40 µg/m³. In the 2019 baseline, the annual mean NO₂ concentrations at existing sensitive receptor locations fall within the objective with the exception of one, which is sensitive receptor E6 where the predicted concentration is 52 µg/m³.

In 2024, all existing receptors are predicted to have annual mean NO₂ concentrations below the AQS objective of 40 µg/m³. Existing receptor E6 is predicted to have the highest concentration of 37.4 µg/m³ with the proposed development operational. The greatest predicted change in annual mean NO₂ concentrations is 0.6 µg/m³ at existing receptor E6. In accordance with the IAQM guidance the impact at all existing receptors is classified as negligible – mitigation is therefore not required.

All proposed receptors are predicted to have annual mean NO₂ concentrations below the AQS objective of 40 µg/m³, with the highest predicted annual mean NO₂ concentration being 27.7 µg/m³ at proposed receptor P1. All receptors would be classified as APEC A, with concentrations falling more than 5% under the air quality objective – mitigation is therefore not required.

1-Hour Mean NO₂ Concentration

The objective for 1-hour mean NO₂ concentrations is 200 µg/m³ to be exceeded no more than 18 times a year. Following the approach within Defra's LAQM.TG(16), which suggests that where annual mean NO₂ concentrations do not exceed 60 µg/m³ then it is likely that exceedances of the 1-hour mean concentrations do not occur.

All existing and proposed receptors are predicted to have annual mean NO₂ concentrations below 60 µg/m³, therefore it is unlikely that exceedances of the 1-hour mean NO₂ AQS objective would occur – mitigation is therefore not required.

Annual Mean PM₁₀ Concentration

The objective for annual mean PM₁₀ concentrations is 40 µg/m³. In the 2019 baseline, the annual mean PM₁₀ concentrations at all existing sensitive receptor locations is below the AQS objective. Existing receptor E6 has the highest predicted concentration of 23.3 µg/m³, which is well below the AQS objective.

In 2024, all existing receptors are predicted to have annual mean PM₁₀ concentrations below the AQS objective of 40 µg/m³. Existing receptor E6 is predicted to have the highest concentration of 22.2 µg/m³ with the proposed development operational. The greatest predicted change in annual mean PM₁₀ concentrations is 0.2 µg/m³ at existing receptor E6. In accordance with the IAQM guidance the impact at all existing receptors is classified as negligible – mitigation is therefore not required.

All proposed receptors are predicted to have annual mean PM₁₀ concentrations below the AQS objective of 40 µg/m³, with the highest predicted annual mean PM₁₀ concentration being 18.3 µg/m³ at proposed receptor P1. All receptors would be classified as APEC A, with concentrations falling more than 5% under the air quality objective – mitigation is therefore not required.

Daily Mean PM₁₀ Concentration

The objective for daily mean PM₁₀ concentrations is 50 µg/m³ to be exceeded no more than 35 times a year.

The results indicate that concentrations at both existing and proposed receptors will comply with the objective in 2024, with the greatest number of exceedances indicated to be 7 at existing receptor E6.

The impact on daily mean PM₁₀ concentrations at existing receptors is considered negligible – mitigation is therefore not required.

All proposed receptors are classified as APEC A, with predicted daily exceedances greater than 1 day less than the air quality objective – mitigation is therefore not required.

Annual Mean PM_{2.5} Concentration

The objective for annual mean PM_{2.5} concentrations is 25 µg/m³. In the 2019 baseline, the annual mean PM_{2.5} concentrations at all existing sensitive receptor locations is below the AQS objective. Existing receptor E6 has the highest predicted concentration of 14.9 µg/m³, which is well below the AQS objective.

In 2024, all existing receptors are predicted to have annual mean PM_{2.5} concentrations below the AQS objective of 25 µg/m³. Existing receptor E6 is predicted to have the highest concentration of 13.8 µg/m³ with the proposed development operational. The greatest predicted change in annual mean PM_{2.5} concentrations is 0.1 µg/m³ at existing receptor E6. In accordance with the IAQM guidance the impact at all existing receptors is classified as negligible – mitigation is therefore not required.

All proposed receptors are predicted to have annual mean PM_{2.5} concentrations below the AQS objective of 25 µg/m³, with the highest predicted annual mean PM₁₀ concentration being 11.7 µg/m³ at proposed receptor P1. All receptors would be classified as APEC A, with concentrations falling more than 5% under the air quality objective – mitigation is therefore not required.

5.2.1. Air Quality Neutral Assessment

A summary of the findings of the AQNA are presented in Table 5.4 below.

Table 5.4 Summary of AQNA

Category	Parameter	NO _x Emissions (kg/annum)	PM ₁₀ Emissions (kg/annum)
Building Emissions	Benchmark	344.1	29.7
	Development	0	0
	Difference	-344.1	-29.7
Transport Emissions	Benchmark	144.4	25.9
	Development	110.6	19.9
	Difference	-33.8	-6.0

The Proposed Development is air quality neutral in relation to building and transport emissions, no mitigation or additional off-setting is required.

6. Mitigation and Residual Effects

6.1. Construction Phase

6.1.1. Mitigation

The IAQM guidelines provide an indication of the mitigation measures that would be appropriate for inclusion within the Proposed Development, based on the level of risk of dust related impacts identified for each of the activities. Consequently, the following mitigation measures should be incorporated into the Proposed Development and delivered through the implementation of a Construction Environment Management Plan (CEMP).

Mitigation measures that are generic to each of the activities, and therefore should be implemented for the duration of the construction related works where applicable are identified in Table 6.1, whilst activity specific mitigation measures are identified in Table 6.2.

Table 6.1 *Mitigation to be Implemented during the Construction Phase*

Development Element	Mitigation Measures
Communication	<p>Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.</p> <p>Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/ engineer or the site manager.</p> <p>Display the head or regional office contact information on the site boundary.</p>
Planning	<p>Development and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority at Planning Condition stage. The level of detail will depend on the risk, and should include as a minimum the measures listed in this table, which includes additional measures identified in the Mayor of London's dust guidance.</p> <p>The DMP may include monitoring of dust deposition, dust flux, real-time PM₁₀ continuous monitoring and/or visual inspections.</p>
Site Management	<p>Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.</p> <p>Make the complaints log available to the local authority when asked.</p> <p>Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.</p>
Monitoring	<p>Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.</p> <p>Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out during prolonged dry or windy conditions.</p> <p>Regular checks of buildings within 100 m of the site boundary should be carried out to check for soiling due to dust with cleaning carried out where necessary.</p>

Development Element	Mitigation Measures
Preparing and Maintaining the Site	<p>Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.</p> <p>Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.</p> <p>Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.</p> <p>Avoid site runoff of water or mud. The construction site should be bunded to prevent runoff. Keep site fencing, barriers and scaffolding clean using wet methods. The water used should be collected and maximise the use of recycled and non-potable water.</p> <p>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.</p> <p>Require a change of shoes and clothes by staff and visitors before going off-site to reduce the transport of dust or provide cleaning facilities such as showers or boot cleaners.</p>
Operating Vehicle/ Vehicle Movements	<p>Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards. For HGVs, the standard is EURO IV for PM and for heavier vans and mini buses it is Euro III.</p> <p>Ensure all vehicles switch off engines when stationary – no idling vehicles.</p> <p>Avoid the use of diesel or petrol powered generators and use mains electricity or batter powered equipment where practicable.</p> <p>Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.</p> <p>Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking and car-sharing).</p>
Operations	<p>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.</p> <p>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.</p> <p>Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. Regularly inspect the site area for spillages;</p> <p>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. Vacuum or sweep regularly to prevent the build-up of fine waste dust material, which has spilled on the site and is designated as waste that is no longer fit for use.</p> <p>Inform the Environment Agency, London Fire and Emergency Planning Authority (LFEPA) or the Health Protection Agency (HPA) if harmful substances are spilled.</p>
Waste Management	<p>Avoid bonfires and burning of waste materials.</p> <p>Developments should produce a waste and/or recycling plan. The Environment Agency suggests that a waste plan includes a number of best practice procedures identified in the dust guidance document.</p>

Table 6.2 Activity Specific Mitigation Measures to be Implemented during the Construction Phase

Development Element	Mitigation Measures
Demolition	<p>Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).</p> <p>Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.</p> <p>Avoid explosive blasting, using appropriate manual or mechanical alternatives.</p> <p>Bag and remove any biological debris or damp down such material before demolition.</p>
Earthworks	<p>Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.</p> <p>Use hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.</p> <p>Only remove the cover in small areas during work and not all at once.</p>
Construction	<p>Avoid scabbling (roughening of concrete surfaces) if possible.</p> <p>Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.</p> <p>Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.</p> <p>For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.</p>
Trackout	<p>Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.</p> <p>Avoid dry sweeping of large areas.</p> <p>Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.</p> <p>Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.</p> <p>Record all inspections of haul routes and any subsequent action in a site log-book.</p> <p>Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.</p> <p>Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).</p> <p>Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever sit size and layout permits.</p> <p>Access gates to be located at least 10 m from receptors where possible.</p>

6.1.2. Residual Effects

The residual effects of dust and PM₁₀ generated by construction activities following the application of the mitigation measures described above and good site practice is not significant.

The residual effects of emissions to air from construction vehicles and NRMM on local air quality is not significant following the implementation of the recommended mitigation measures.

6.2. Operational Phase

6.2.1. Mitigation

The results indicate that the impact of the Proposed Development at all existing receptors for all pollutants and averaging periods is classified as negligible in accordance with the IAQM guidance, therefore mitigation is not required.

The results indicate that the predicted concentration at all proposed receptors is below the relevant AQS objectives. All proposed receptors are classified as APEC Level A; therefore, mitigation is not required.

The Proposed Development is air quality neutral, therefore no mitigation or off-setting is required.

6.2.2. Residual Effects

The overall residual effect for the operational phase is not significant

7. Conclusion

This report presents the findings of the assessment, which addresses the potential air quality impacts during both the construction and operational stages of the Proposed Development. The assessment has been undertaken in line with the relevant policy and guidance, and where necessary, outlines the required mitigation measures to minimise impacts.

A qualitative assessment of construction phase impacts has been carried out. There is a high risk of dust soiling and fugitive PM₁₀ emissions affecting human health from demolition, a medium risk for earthworks, a medium risk for construction and a high risk from trackout. Through good site practice and the implementation of suitable mitigation measures, the impact of dust and PM₁₀ releases will be minimised. The residual effect of the construction phase on air quality is therefore not significant.

A detailed assessment using ADMS-Urban has been undertaken to consider the impact of development generated road traffic on existing and proposed receptor locations. The findings of the assessment indicate:

- The impact on annual mean NO₂, PM₁₀ and PM_{2.5} concentrations at all existing receptors is classified as negligible;
- Annual mean NO₂ concentrations are well below 60 µg/m³ at all existing receptors, therefore exceedances of the 1-hour mean NO₂ AQS objective is unlikely;
- There are no predicted exceedances of the daily mean PM₁₀ at existing receptors; and,
- All proposed receptors are classified as APEC Level A for both long-term and short-term averaging periods with the Proposed Development operational.

Based on the findings of the assessment no mitigation is required and the Application Site is suitable for the introduction of the proposed receptor type.

The overall residual effect for the operational phase is not significant.

The Proposed Development was found to be compliant in relation to Building and Transport emissions and is therefore air quality neutral. No mitigation or additional off-setting is required.

Overall, with the inclusion of standard mitigation measures as best practice (construction phase only), the proposals would be compliant with legislation and policy.

Appendix A Glossary of Terms

Term	Definition
AADT Annual Average Daily Traffic	A daily total traffic flow (24 hours), 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.
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.
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
Dust	Dust comprises particles typically in the size range 1-75 micrometre (µm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials.
Exceedance	A period of time where the concentrations of a pollutant is greater than the appropriate air quality standard.
HDV/HGV	Heavy Duty Vehicle / Heavy Goods Vehicle
LAQM	Local Air Quality Management
Model adjustment	Following model verification, the process by which modelled results are amended. This corrects for systematic error.
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxides
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.
Trackout	The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.
µg/m ³ (micrograms per cubic metre)	A measure of concentration in terms of mass per unit volume. A concentration of 1 µg/m ³ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

Appendix B Traffic Data

Link ID	Link Name	2019 Base					2024 Base + Comm Development					2024 Base + Comm Development + Proposed Development					Speed km/hr
		AADT	AAHT	AADT HGV	AAHT HGV	AADT HGV %	AADT	AAHT	AADT HGV	AAHT HGV	AADT HDV %	AADT	AAHT	AADT HGV	AAHT HGV	AADT HDV %	
1	Hillgrove Road	10741	448	852	36	7.8%	11505	479	897	37	7.8%	11585	483	915	38	7.9%	38
2	Finchley Road North	26536	1106	5762	240	21.7%	28426	1184	6168	257	21.7%	28506	1188	6186	258	21.7%	45
3	Finchley Road	17227	718	2718	113	15.8%	18454	769	2916	121	15.8%	18494	771	2922	122	15.8%	51
4	College Crescent	17091	712	1305	54	7.6%	18308	763	1391	58	7.6%	18308	763	1391	58	7.6%	35
5	Belsize Road East	8908	371	849	35	9.5%	9543	398	907	38	9.5%	9623	401	924	38	9.6%	39
6	Abbey Road North	13501	563	1336	56	9.9%	14462	603	1432	60	9.9%	14497	604	1435	60	9.9%	38
7	Abbey Road South	10539	439	1287	54	12.4%	11290	470	1400	58	12.4%	11387	474	1423	59	12.5%	38
8	Belsize Road West	4751	198	430	18	9.1%	5090	212	463	19	9.1%	5109	213	465	19	9.1%	38
9	Finchley Road South	22624	943	648	27	2.9%	24364	1015	707	29	2.9%	24364	1015	707	29	2.9%	32

Appendix C Modelled Receptors & Defra Background Concentrations

ID	X	Y	Z	2019			2024		
				NO ₂	PM ₁₀	PM _{2.5}	NO ₂	PM ₁₀	PM _{2.5}
E1	525546	183711	4.5	28.3	18.9	12.1	23.9	17.5	11.2
E2	525831	183884	1.5	28.3	18.9	12.1	23.9	17.5	11.2
E3	525621	184028	3	26.0	18.0	11.7	21.8	16.7	10.8
E4	526492	184158	0	30.3	19.2	12.3	25.4	17.8	11.4
E5*	526114	184021	0	30.3	19.2	12.3	25.4	17.8	11.4
E6	526632	183862	1.5	29.2	18.9	12.1	24.5	17.5	11.2
E8	526573	183522	1.5	29.2	18.9	12.1	24.5	17.5	11.2
E7	526618	184354	4.5	30.3	19.2	12.3	25.4	17.8	11.4
E9	526351	184672	4.5	30.3	19.2	12.3	25.4	17.8	11.4
E10*	526604	184585	0	30.3	19.2	12.3	25.4	17.8	11.4
E11	525724	183958	1.5	28.3	18.9	12.1	23.9	17.5	11.2
E12	525771	183925	1.5	28.3	18.9	12.1	23.9	17.5	11.2
E13	525807	183905	1.5	28.3	18.9	12.1	23.9	17.5	11.2
E14	525841	183912	1.5	28.3	18.9	12.1	23.9	17.5	11.2
E15	525882	183925	1.5	28.3	18.9	12.1	23.9	17.5	11.2
E16	525914	183936	1.5	28.3	18.9	12.1	23.9	17.5	11.2
P1	525779	183874	1.5	28.3	18.9	12.1	23.9	17.5	11.2
P2	525744	183849	1.5	28.3	18.9	12.1	23.9	17.5	11.2
P3	525708	183823	1.5	28.3	18.9	12.1	23.9	17.5	11.2
P4	525775	183891	1.5	28.3	18.9	12.1	23.9	17.5	11.2
P5	525748	183909	1.5	28.3	18.9	12.1	23.9	17.5	11.2
P6	525715	183877	1.5	28.3	18.9	12.1	23.9	17.5	11.2
*Basement Level Receptor									

Appendix D Model Verification

The comparison of modelled concentrations with local monitored concentrations is a process termed 'verification'. Model verification investigates the discrepancies between modelled and measured concentrations. Discrepancies occur due to model uncertainties, such as:

- Estimates of background pollutant concentrations;
- Meteorological data uncertainties;
- Traffic data uncertainties;
- Model input parameters; and,
- Overall limitation of the dispersion model.

NO₂ is produced in the atmosphere by the reaction of nitric acid (NO) with ozone. Therefore, model verification for nitrogen oxides (NO_x = NO + NO₂) the primary pollutant is appropriate. This has been undertaken in accordance with Chapter 7 of LAQM.TG(16).

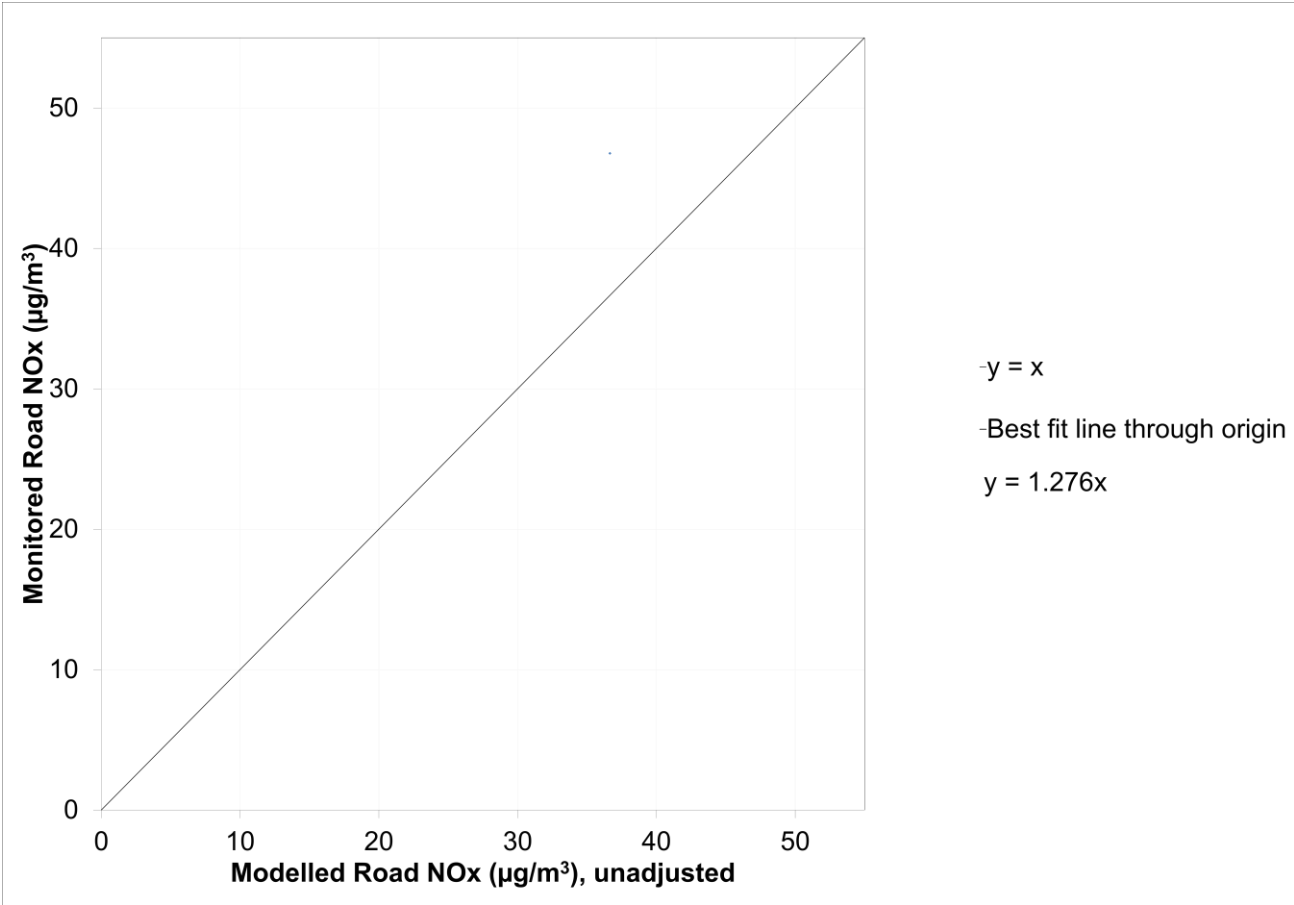
The model has been run to predict the 2019 annual mean road-NO_x contribution at the monitoring location given below. The model outputs of road- NO_x for the location has been compared with the 2018 'measured' road-NO_x, which was determined using the NO_x to NO₂ calculator and the NO₂ concentration data from the London Borough of Camden monitoring.

Details of the data used in the verification process is in the table and figure below.

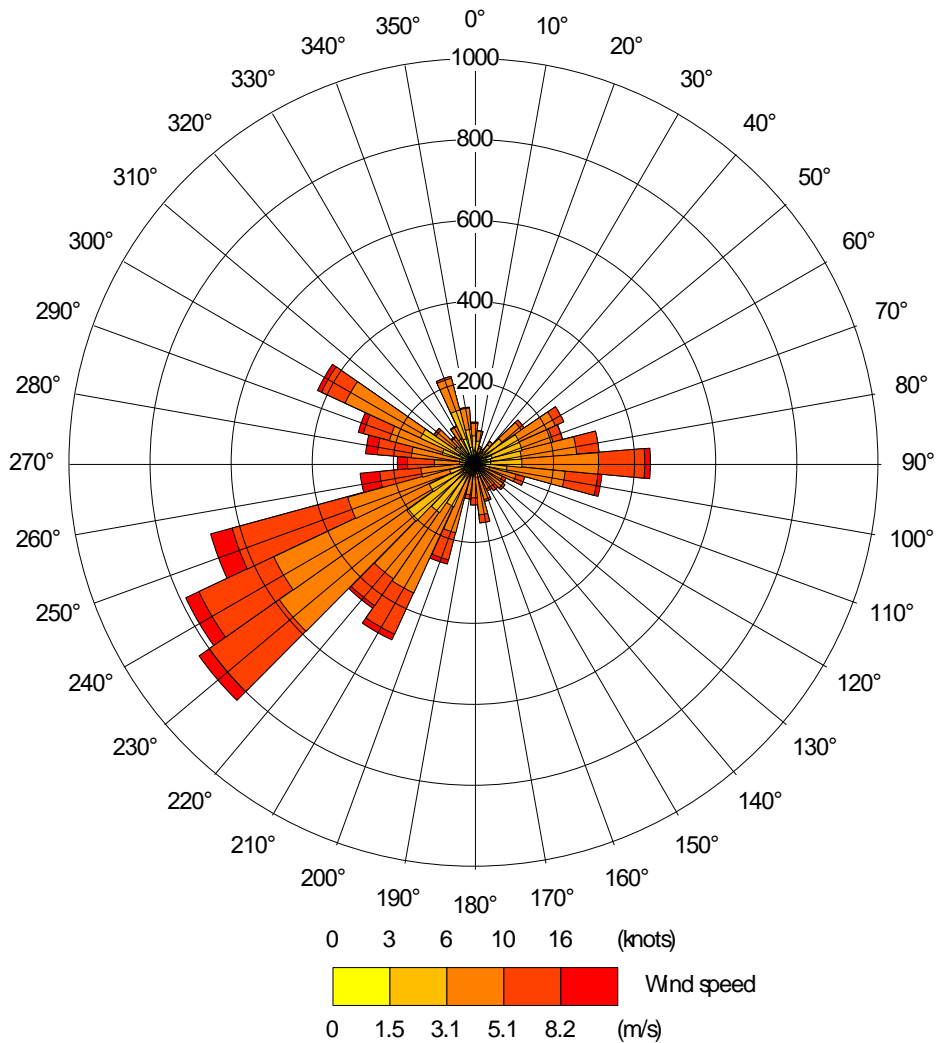
Location	2019 Monitored Total NO ₂ (µg/m ³)	Background NO ₂ (µg/m ³)	2019 Monitored Road Contribution NO _x (µg/m ³)	2019 Modelled Road Contribution NO _x (µg/m ³)	Ratio of monitored/ modelled NO _x road contribution
CA15 Swiss Cottage	49.7	30.3	46.8	36.7	1.2760

The adjustment factor calculated is 1.2760.

For PM₁₀ and PM_{2.5} there are no relevant local monitoring data against which the model could be verified. Consequently, the verification factors determined above for adjusting the road-NO_x contribution has been applied to the predicted road-PM₁₀ and road-PM_{2.5} contributions, consistent with guidance set out in LAQM.TG(16).



Appendix E 2019 Wind Rose for London City Airport



Appendix F Operational Results

Annual Mean NO₂ Results

Receptor ID	2019 Baseline (µg/m ³)	2024		Change (µg/m ³)	Impact
		Without Devt (µg/m ³)	With Devt (µg/m ³)		
E1	29.8	24.7	24.7	0.0	Negligible
E2	36.2	28.3	28.4	0.0	Negligible
E3	30.2	24.2	24.2	0.0	Negligible
E4	34.6	27.9	27.9	0.0	Negligible
E5	34.1	27.6	27.6	0.0	Negligible
E6	52.0	36.8	37.4	0.6	Negligible
E8	36.0	28.2	28.2	0.0	Negligible
E7	38.8	30.0	30.0	0.0	Negligible
E9	36.3	28.5	28.5	0.0	Negligible
E10	38.5	30.1	30.1	0.0	Negligible
E11	34.5	27.4	27.4	0.0	Negligible
E12	35.6	28.0	28.0	0.0	Negligible
E13	36.2	28.4	28.4	0.1	Negligible
E14	36.4	28.4	28.5	0.0	Negligible
E15	36.1	28.2	28.3	0.0	Negligible
E16	35.2	27.8	27.8	0.0	Negligible
P1	-	-	27.7	-	APEC A
P2	-	-	26.1	-	APEC A
P3	-	-	25.7	-	APEC A
P4	-	-	27.3	-	APEC A
P5	-	-	26.3	-	APEC A
P6	-	-	24.9	-	APEC A

Annual Mean PM₁₀ Results

Receptor ID	2019 Baseline (µg/m ³)	2024		Change (µg/m ³)	Impact
		Without Devt (µg/m ³)	With Devt (µg/m ³)		
E1	19.2	17.8	17.8	0.0	Negligible
E2	19.9	18.4	18.4	0.0	Negligible
E3	18.7	17.3	17.3	0.0	Negligible
E4	19.9	18.5	18.5	0.0	Negligible
E5	19.8	18.4	18.4	0.0	Negligible
E6	23.6	21.9	22.2	0.2	Negligible
E8	20.2	18.8	18.8	0.0	Negligible
E7	20.3	18.9	18.9	0.0	Negligible
E9	20.2	18.8	18.8	0.0	Negligible

Receptor ID	2019 Baseline ($\mu\text{g}/\text{m}^3$)	2024		Change ($\mu\text{g}/\text{m}^3$)	Impact
		Without Devt ($\mu\text{g}/\text{m}^3$)	With Devt ($\mu\text{g}/\text{m}^3$)		
E10	20.6	19.1	19.1	0.0	Negligible
E11	19.9	18.5	18.5	0.0	Negligible
E12	19.9	18.5	18.5	0.0	Negligible
E13	19.9	18.4	18.5	0.0	Negligible
E14	19.9	18.5	18.5	0.0	Negligible
E15	20.0	18.5	18.6	0.0	Negligible
E16	20.0	18.6	18.6	0.0	Negligible
P1	-	-	18.3	-	APEC A
P2	-	-	18.1	-	APEC A
P3	-	-	18.0	-	APEC A
P4	-	-	18.2	-	APEC A
P5	-	-	18.1	-	APEC A
P6	-	-	17.8	-	APEC A

Daily Mean PM₁₀ Results

Receptor ID	2019 Baseline (Exceedances)	2024		Change (Days)	Impact
		Without Devt (Exceedances)	With Devt (Exceedances)		
E1	2	1	1	0	Negligible
E2	3	2	2	0	Negligible
E3	2	1	1	0	Negligible
E4	3	2	2	0	Negligible
E5	3	2	2	0	Negligible
E6	9	6	7	1	Negligible
E8	4	2	2	0	Negligible
E7	4	2	2	0	Negligible
E9	4	2	2	0	Negligible
E10	4	2	2	0	Negligible
E11	3	2	2	0	Negligible
E12	3	2	2	0	Negligible
E13	3	2	2	0	Negligible
E14	3	2	2	0	Negligible
E15	3	2	2	0	Negligible
E16	3	2	2	0	Negligible
P1	-	-	2	-	APEC A
P2	-	-	1	-	APEC A
P3	-	-	1	-	APEC A
P4	-	-	2	-	APEC A
P5	-	-	1	-	APEC A

Receptor ID	2019 Baseline (Exceedances)	2024		Change (Days)	Impact
		Without Devt (Exceedances)	With Devt (Exceedances)		
P6	-	-	1	-	APEC A

Annual Mean PM_{2.5} Results

Receptor ID	2019 Baseline (µg/m ³)	2024		Change (µg/m ³)	Impact
		Without Devt (µg/m ³)	With Devt (µg/m ³)		
E1	12.2	11.3	11.3	0.0	Negligible
E2	12.7	11.7	11.7	0.0	Negligible
E3	12.1	11.2	11.2	0.0	Negligible
E4	12.7	11.8	11.8	0.0	Negligible
E5	12.7	11.7	11.7	0.0	Negligible
E6	14.9	13.7	13.8	0.1	Negligible
E8	12.8	11.9	11.9	0.0	Negligible
E7	13.0	12.0	12.0	0.0	Negligible
E9	12.9	12.0	12.0	0.0	Negligible
E10	13.1	12.1	12.1	0.0	Negligible
E11	12.7	11.8	11.8	0.0	Negligible
E12	12.7	11.8	11.8	0.0	Negligible
E13	12.7	11.7	11.7	0.0	Negligible
E14	12.7	11.7	11.8	0.0	Negligible
E15	12.7	11.8	11.8	0.0	Negligible
E16	12.7	11.8	11.8	0.0	Negligible
P1	-	-	11.7	-	APEC A
P2	-	-	11.5	-	APEC A
P3	-	-	11.5	-	APEC A
P4	-	-	11.6	-	APEC A
P5	-	-	11.5	-	APEC A
P6	-	-	11.4	-	APEC A

References

- ¹ 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).
- ² The Air Quality (England) Regulations 2000 - Statutory Instrument 2000 No.928.
- ³ The Air Quality (England) (Amendment) Regulations 2002- Statutory Instrument 2002 No.3043.
- ⁴ The Air Quality Standards (Amendment) Regulations 2016- Statutory Instrument 2016 No. 1184.
- ⁵ The Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 – Statutory Instrument 2019 No. 74.
- ⁶ The Environment Act 1995
- ⁷ The Environment Act 2021
- ⁸ The Environmental Protection Act 1990.
- ⁹ Ministry of Housing, Communities and Local Government (July 2021). National Planning Policy Framework.
- ¹⁰ Mayor of London: Cleaning London's air, The Mayor's Air Quality Strategy (December 2010)
- ¹¹ Mayor of London (March 2021) The London Plan: Spatial Development Strategy for Greater London.
- ¹² Mayor of London (July 2014): The Control of Dust and Emissions During Construction and Demolition - Supplementary Planning Guidance.
- ¹³ London Borough of Camden. Local Plan (Adopted 2017).
- ¹⁴ London Borough of Camden. Draft Clean Air Action Plan (2019-2022).
- ¹⁵ Ministry of Housing, Communities and Local Government (2021). National Planning Practice Guidance – Air Quality. Updated June 2021.
- ¹⁶ Environmental Protection UK and Institute of Air Quality Management (Version 1.2 Updated January 2017). Land Use Planning & Development Control: Planning for Air Quality
- ¹⁷ Institute of Air Quality Management (Version 1.1 Updated June 2016). Guidance on the Assessment of Dust from Demolition and Construction
- ¹⁸ Mayor of London (October 2019) London Local Air Quality Management (LLAQM) Technical Guidance (LLAQM.TG(19))
- ¹⁹ London Councils (January 2007). Air Quality and Planning Guidance – Revised Version.
- ²⁰ Mayor of London (July 2014): The Control of Dust and Emissions during Construction and Demolition – Supplementary Planning Guidance.
- ²¹ Greater London Authority (April 2014): Sustainable Design and Construction - Supplementary Planning Guidance
- ²² AQC & ENVIRON UK Ltd (2014). Air Quality Neutral Planning Guidance.
- ²³ Greater London Authority (November 2021) Air Quality Neutral London Plan Guidance Consultation Draft.
- ²⁴ Greater London Authority (November 2021) Air Quality Positive London Plan Guidance Consultation Draft.
- ²⁵ London Borough of Camden (2021) Camden Planning Guidance – Air Quality. January 2021.
- ²⁶ DEFRA (2021) Part IV The Environment Act 1995 and Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Technical Guidance LAQM.TG16
- ²⁷ DEFRA (April 2021) Covid-19: Supplementary Guidance. Local Air Quality Management Reporting in 2021.
- ²⁸ London Borough of Camden. 2020 Air Quality Status Report.
- ²⁹ Defra Local Air Quality Management (LAQM) Support Pages. Available at: <http://laqm.defra.gov.uk/>. [Accessed on 25/02/2022].
- ³⁰ London Air Quality Network. Available at: <http://www.londonair.org.uk/LondonAir/Default.aspx>. [Accessed on 25/02/2022].
- ³¹ London Atmospheric Emissions Inventory (LAEI). Available at: <https://data.london.gov.uk/dataset/london-atmospheric-emissions-inventory-2013>. [Accessed on 25/02/2022].
- ³² Defra (2021) Defra Emission Factor Toolkit (v11.0) Available at <https://laqm.defra.gov.uk/review-and-assessment/tools/emission-factors-toolkit.html>, accessed on 25/02/2022.
- ³³ Defra (2021) Defra NO_x to NO₂ Calculator (v8.1). Available at <https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc>, accessed on 25/02/2022.
- ³⁴ London Councils (2007) Air Quality and Planning Guidance. Revised version – January 2007.