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51 CALTHORPE STREET, LONDON
Air Quality Assessment

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Air Quality Assessment

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Reference: LP/CC/P12-385/20

Date: May 2015

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Air Quality Assessment

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APPENDICES

TABLES

REGISTRATION OF AMENDMENTS

Revision	Date	Amendment Details	Revision Prepared By	Revision Approved By

1.0 INTRODUCTION

1.1 Create Consulting Engineers Ltd have been commissioned by Mr Simon Firth to provide an Air Quality Assessment (AQA) in support of the planning application for the proposed development at 51 Calthorpe Street, London, WC1X 0HH (the Site) in the London Borough of Camden.

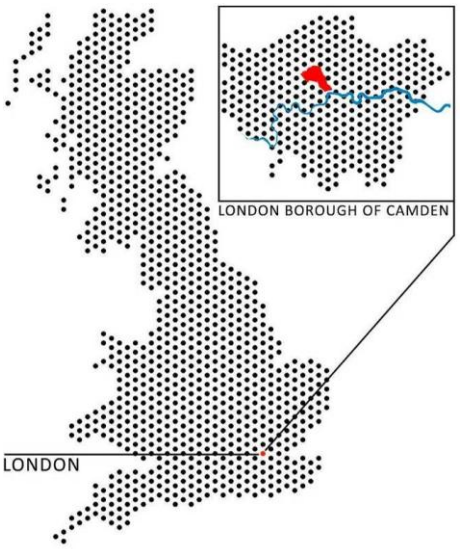


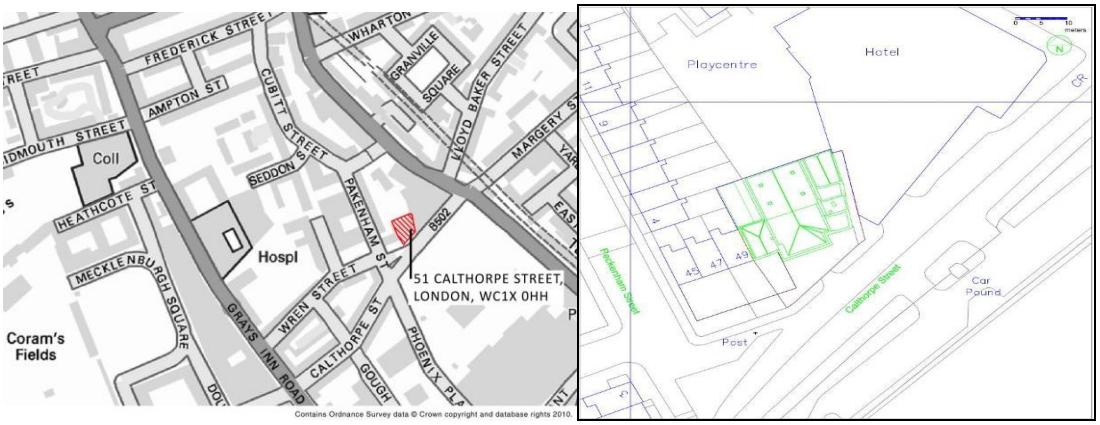
Figure 1.1 London Borough of Camden, Location Map

1.2 The following AQA has been undertaken in accordance with guidance set out by the Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) to assess any likely air quality impacts associated with the proposed development upon the surrounding area and whether the site location can be considered as suitable for the proposed use.

1.3 In the event that potential impacts are identified, specific mitigation measures will be recommended in order to help safeguard the health and well being of existing and future occupiers of the site and surrounding area.

Current Site Use

1.4 The site is located at 51 Calthorpe Street, London, WC1X 0HH, and comprises an existing three storey Victorian-era building that is currently used as offices and storage. The building's eastern side is located adjacent to the Holiday Inn Hotel and the western side abuts other residential buildings on Calthorpe Street. The front of the existing development faces south-east over Calthorpe Street and is opposite the Mount Pleasant Royal Mail sorting centre. The rear north-west elevation of the development faces the Cubitt Street play centre. The site is accessed solely via Calthorpe Street.



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Figures 1.2 & 1.3: Site Location Plans

Proposed Development

1.5 The development proposals includes the partial demolition and removal of some existing structures (including the roof) with the retention of the external walls and some floors followed by the construction of 17 new flats over six storeys, including a new basement level below the footprint of the building, and the excavation of the forecourt. There will be no balconies.

1.6 The assessment has been based on drawings prepared by Brooks/Murray Architects (April 2015).

2.0 LEGISLATION AND POLICY CONTEXT

National Legislation

The Air Quality Strategy

2.1 European Union (EU) legislation forms the basis for UK air quality policy, the legislation has been developed in response to the identification of the relationship between air pollution and adverse effects upon human health and ecosystems. The EU Framework Directive 96/62/EC[1] on ambient air quality assessment and management came into force in November 1996 and had to be implemented by Member States by May 1998. The Directive aims to protect human health and the environment by avoiding, reducing or preventing harmful concentrations of air pollutants.

2.2 Directive 96/62/EC and the three daughter Directive's that followed were combined to form Council Directive 2008/50/EC[2] on Ambient Air Quality and Cleaner Air for Europe, that came into force in June 2008.

2.3 The Government's policy on air quality within the UK is set out in the Air Quality Strategy (AQS) for England, Scotland, Wales & Northern Ireland[3], originally adopted in 1997[4], reissued in 2000[5], and amended in 2003[6]. It has been set out in accordance with the requirements of Part IV of the Environment Act (1995)[7]. The AQS sets standards and objectives for pollutants to protect human health, vegetation and ecosystems. The AQS sets out a framework for Local Authorities to reduce adverse health effects from air pollution and ensures that international commitments are met (the Local Air Quality Management system).

2.4 Air quality objectives and limit values that currently apply in the United Kingdom can be divided into four groups:

- United Kingdom air quality objectives set down in regulations for the purpose of Local Air Quality Management (LAQM);
- United Kingdom national air quality objectives not included in regulations;
- European Union (EU) Limit Values transcribed into United Kingdom legislation; and
- Guidelines: e.g. World Health Organization (WHO) guidelines.

[1] European Parliament (1996). Council Directive 96/62/EC on ambient air quality assessment and management.

[2] European Parliament (2008). Council Directive 2008/50/EC on ambient air quality and cleaner air for Europe.

[3] Department for Environment, Food and Rural Affairs (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Island. HMSO, London.

[4] Department of the Environment (1997). The UK National Air Quality Strategy. HMSO, London.

[5] Department of the Environment, Transport and the Regions (2000). The Air Quality Strategy for England, Scotland, Wales and Northern Island. HMSO, London.

[6] Department of the Environment, Transport and the Regions (2003). The Air Quality Strategy for England, Scotland, Wales and Northern Island: Addendum. HMSO, London.

[7] Department for Environment, Food and Rural Affairs (1995). The Environment Act 1995. HMSO, London.

2.5 The current air quality standards and objectives are presented in Table 2.1. The standards and objectives relevant to the LAQM framework have been developed through the Air Quality (England) Regulations (2000)[8] and the Air Quality (England) (Amendment) Regulations 2002[9]; with the Air Quality Standards Regulations 2010[10] implementing the EU Directive 2008/50/EC.

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	5 µg m^{-3}	Annual mean	31/12/2010
1, 3 Butadiene	2.25 µg m^{-3}	Running annual mean	31/12/2003
Carbon Monoxide	10 mg m^{-3}	Maximum daily running 8-hour mean	31/12/2003
Lead	0.25 µg m^{-3}	Annual mean	31/12/2008
Nitrogen Dioxide (NO_2)	200 µg m^{-3}	1-hour mean not to be exceeded more than 18 times per year	31/12/2005
	40 µg m^{-3}	Annual mean	31/12/2005
Particles (PM_{10})	50 µg m^{-3}	24-hour mean not to be exceeded more than 35 times per year	31/12/2004
	40 µg m^{-3}	Annual mean	31/12/2004
Particles ($PM_{2.5}$)	25 µg m^{-3}	Annual mean (target)	2020
	15% cut in annual mean (urban background exposure)		2010 - 2020
Sulphur Dioxide (SO_2)	350 µg m^{-3}	1-hour mean not to be exceeded more than 24 times a year	31/12/2004
	125 µg m^{-3}	24-hour mean not to be exceeded more than 3 times a year	31/12/2004
	266 µg m^{-3}	15-minute mean not to be exceeded more than 35 times a year	31/12/2005

Table 2.1: Air Quality Strategy Objectives (England)

2.6 The LAQM Technical Guidance (2009)[11] outlines the review and assessment process to be followed by Local Authorities in relation to air quality. If following a detailed assessment, a Local Authority considers that one or more of the air quality objectives is not being met, an Air Quality Management Area (AQMA) must be declared.

2.7 In response to the issuing of an AQMA, an Air Quality Action Plan (AQAP) must be submitted within 12 - 18 months by the Local Authority setting out the measures intended to reach the exceeded air quality objectives.

[8] UK Parliament (2000). Air Quality (England) Regulations 2000, SI 2000/928. HMSO, London

[9] UK Parliament (2002) The Air Quality (England) (Amendment) Regulations 2002, SI 2002/3043. HMSO, London.

[10] UK Parliament (2010). The Air Quality Standards Regulations 2010, SI 2010/1001. HMSO, London.

[11] Department of Environment, Food and Rural Affairs (2009). Local Air Quality Management Technical Guidance, TG (09). HMSO, London.

The National Planning Policy Framework (2012)

2.8 In March 2012 the Department of Communities and Local Government published the National Planning Policy Framework (NPPF)[12]. The purpose of the framework is to help achieve sustainable development within the planning sector. Section 11 of the policy refers to the conservation and enhancement of the natural environment, and identifies air pollution as a development risk.

2.9 Section 11: Conserving and Enhancing the Natural Environment also states that the planning system should contribute to and enhance the natural and local environment by:

'...preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability;'

2.10 The NPPF states that planning policies should take into account the presence of any AQMAs and the cumulative impact of individual sites whilst maintaining compliance with the LAQM procedure, and states that *'Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan'.*

Planning Policy Guidance (2014)

2.11 The National Planning Policy Guidance (NPPG)[13] details the instances when air quality would be relevant to a planning application. Considerations could include whether a development would:

- *'Generate or increase traffic volumes or congestion, changing vehicle speeds;*
- *Introduce new sources of air pollution;*
- *Expose people to existing sources of air pollution;*
- *Give rise to unacceptable impacts during construction for sensitive receptors; and*
- *Affect biodiversity by deposition or concentration of pollutants.'*

2.12 The NPPG provides guidance for the completion of air quality assessments, stating the importance of an assessment to be location specific, and being *'proportionate to the nature and scale of development proposed and the level of concern about air quality.'*

2.13 The mitigation measures necessary for a development are stated to be *'location specific, depend on the proposed development and should be proportionate to the likely impact.'*

[12] Department of Communities and Local Government (2012). National Planning Policy Framework. HMSO, London.

[13] Department for Communities and Local Government (2014). National Planning Policy Guidance. HMSO, http://planningguidance.planningportal.ov.uk/

Regional Planning Policy

The London Plan (2015)

2.14 The London Plan, Further Alterations London Plan (FALP)[14] was adopted in March 2015 and contains updated guidance for air quality and planning decisions under Policy 7.14.

2.15 Policy 7.14 Improving Air Quality states that:

'The Mayor recognises the importance of tackling air pollution and improving air quality to London's development and the health and well-being of its people. He will work with strategic partners to ensure that the spatial, climate change, transport and design policies of this plan support implementation of his Air Quality and Transport strategies to achieve reductions in pollutant emissions and minimize public exposure to pollution.'

'Development proposals should:

- *minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within Air Quality Management Areas (AQMAs) and where development is likely to be used by large numbers of those particularly vulnerable to poor air quality, such as children or older people) such as by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plan;*
- *promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practice guidance in the GLA and London Councils' 'The control of dust and emissions from construction and demolition';*
- *be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as Air Quality Management Areas (AQMAs));*
- *ensure that where provision needs to be made to reduce emissions from a development, this is usually made on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, and that it is possible to put in place measures having clearly demonstrated equivalent air quality benefits, planning obligations or planning conditions should be used as appropriate to ensure this, whether on a scheme by scheme basis or through joint area-based approaches; and*

[14] Greater London Authority FALP (2015). The London Plan: Spatial Development Strategy for Greater London FALP. GLA, London.

- *where the development requires a detailed air quality assessment and biomass boilers are included, the assessment should forecast pollutant concentrations. Permission should only be granted if no adverse air quality impacts from the biomass boiler are identified'.*

2.16 Poor air quality is a public health issue that is linked to the development of chronic diseases and can increase the risk of respiratory illness. Action is needed to improve air quality in London and the Mayor is committed to working towards meeting the EU limit values of fine particulate matter (PM_{10}) by 2011 and nitrogen dioxide (NO_2) by 2015.

2.17 Increased exposure to existing poor air quality should be minimised by avoiding the introduction of potentially new sensitive receptors in locations where they will be affected by existing sources of air pollution (such as road traffic and industrial processes). Particular attention should be paid to development proposals such as housing, homes for elderly people, schools and nurseries. Where additional negative air quality impacts from a new development are identified, mitigation measures will be required to ameliorate them.

The Mayors Air Quality Strategy (2010)

2.18 Cleaning the Air: The Mayor's Air Quality Strategy[15] within Chapter 4 outlines a number of policies relating to new developments and pollutant emissions.

2.19 Policy 6 Reducing emissions from construction and demolition sites:

'The Mayor will work with London Boroughs, the GLA group and the construction industry to encourage implementation of the Best Practice Guidance for construction and demolition sites across London.'

2.20 Policy 7 Using the planning process to improve air quality:

'The Mayor will ensure that new developments in London shall as a minimum be 'air quality neutral' through the adoption of best practice in the management and mitigation of emissions.'

Local Planning Policy

Camden Core Strategy 2010 – 2025 – Local Development Framework (2010)[16]

2.21 The Core Strategy was adopted in November 2010 and sets the key elements of The London Borough of Camden's vision. It is a central part of the Local Development Framework (LDF).

[15] Greater London Authority (2010). Clearing the Air: The Mayor's Air Quality Strategy. GLA, London.

[16] London Borough of Camden(LBC). (2010). Camden Core Strategy 2010-2025. LBC, London

2.22 Within Section 3, paragraph 16.14 states the following:

"Camden suffers from poor air quality which impacts on human health, particularly the very young, older people and those with existing heart and lung conditions. The avoidance of localised air pollution is therefore very important in avoiding a potential negative impact on health and on the environment..."

2.23 Under Development Policies, Policy DP32 – Air Quality and Camden's Clear Zone, states the following:

"The Council will require air quality assessments where development could potentially cause significant harm to air quality. Mitigation measures will be expected in developments that are located in areas of poor air quality.

The Council will also only grant planning permission for development in the Clear Zone region that significantly increases travel demand where it considers that appropriate measures to minimise the transport impact of development are incorporated. We will use planning conditions and legal agreements to secure Clear Zone measures to avoid, remedy or mitigate the impacts of development schemes in the Central London Area."

2.24 Still under Development Policies, paragraph 32.4 adds:

"The Council will take into account impact on air quality when assessing development proposals. Regard will be paid to Camden's Air Quality Action Plan and to Cleaning London's Air: The Mayor's Air Quality Strategy. Where development could potentially cause significant harm to air quality, we require an air quality assessment. Where the assessment shows that a development would cause significant harm to air quality, planning permission will be refused unless mitigation measures are adopted to reduce the impact to acceptable levels..."

2.25 Paragraph 32.6 adds that:

"Core Strategy policy CS13 promotes the use of renewable energy technologies to reduce carbon emissions and tackle climate change. The burning of biomass in a boiler is identified as a renewable energy resource in the Mayor's Energy Strategy. Boilers can burn solid biomass or liquid biofuels and are popular on high density sites with small footprints as their use can be the only way for development to reduce their carbon emissions by 20%. However, in central London there are air quality implications for the use of biomass as higher levels of nitrogen oxides (NOx) and particulates are released than conventional gas boilers or gas-fired community heating facilities. Given the existing poor air quality in Camden, the use of biomass as a renewable energy source will be the Council's least preferred option for the provision of renewable energy. We will expect developments to focus on energy efficiency and an efficient energy supply..."

2.26 Policy CS13 - Tackling climate change through promoting higher environmental standards provides the overarching policy requirements with respect to minimising the effects of climate change, adaptation measures and improved environmental standards during construction and occupation. The main requirements are:

- Ensuring patterns of land use that minimise the need to travel by car and help support local energy networks;
- Promoting the efficient use of land and buildings;
- Minimising carbon emissions from the redevelopment, construction and occupation of buildings by implementing, in order, all of the elements of the energy hierarchy;
- Ensuring buildings and spaces are designed to cope with, and minimise the effects of climate change.

2.27 The assessment has been completed to address the key points raised by the adopted policies and follows the guidance provided by the GLA and LBC.

3.0 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

3.1 This section outlines the assessment methodology and the criteria that have been used to assess the significance of risk associated with the proposed development.

Data Sources

3.2 The key data sources reviewed as part of this study are listed in Table 3.1 below.

Data Source	Reference
Department for Environment, Food and Rural Affairs (Defra)	Defra (2009). LAQM Technical Guidance, TG (09)
	Defra (2011). LAQM Background Maps - 1 x 1 km grid background maps for NO_x, NO_2, PM_{10} and $PM_{2.5}$ (2011-2030)
Environmental Protection UK (EPUK)	EPUK (2010). Development Control: Planning For Air Quality (2010 Update)
Institute of Air Quality Management (IAQM)	IAQM (2014). Guidance on the assessment of dust from demolition and construction
Greater London Authority (GLA)	GLA (2006) The control of dust and emissions from construction and demolition: Best Practice Guidance
	GLA (2013). The Control of Dust and Emissions during Construction and Demolition (Draft published for consultation)
	GLA (2015). The London Plan FALP: Spatial Development Strategy for Greater London
	GLA (2010). Clearing the Air: The Mayor's Air Quality Strategy
Department for Transport (DfT) Highways Agency	Highways Agency (2007). Design Manual for Roads and Bridges (DMRB), Volume 11: Environmental Assessment, Section 3: Environmental Assessment Techniques, Part 1, HA 207/07
	Highways Agency (2013). Interim Advice Note 170/12 v3: Updating air quality advice of the future NO_x and NO_2 projections for users of DMRB Volume 11, Section 3, Part 1 'Air Quality'
The London Borough of Camden	Core Strategy2010-2025 – Local Development Framework
	Camden's Clean Air Action Plan 2013-15 Air quality progress report 2014 Fifth round review and assessment: updating and screening assessment 2012

Table 3.1: Key Information Sources

Scope of Air Quality Assessment

3.3 The following document assesses the suitability of the site for the proposed development and whether any significant air quality impacts are expected as a result of the construction and operation of the proposed development.

3.4 A staged assessment approach has been adopted. This ensures that the approach taken for the assessment of risk is proportional to the risk of an unacceptable impact being caused. Where a simple review of the impacts associated with the proposed development shows that the risk of a health/annoyance impact is negligible, this will be sufficient and no further assessment will be undertaken.

3.5 In cases where the risk involved cannot be regarded as insignificant, a more detailed and quantitative assessment will be undertaken.

3.6 The methodology used in this assessment is presented in the following sections.

Dust Assessment

3.7 Potential dust impacts associated with construction activities have been assessed in accordance with guidance from the Institute of Air Quality Management (IAQM)[17] and the Greater London Authority (GLA)[18] best practice documents. The IAQM provides guidance on a five step process to assess the potential impacts of construction dust pre-mitigation, provide mitigation measures specific to the risk and assess the post-mitigation impacts.

3.8 The assessment procedure follows the following framework:

- Screen the requirement for a more detailed assessment;
- Assess the risk of dust impacts of the four phases of construction (demolition, earthworks, construction and trackout), taking into account:
  - the scale and nature of the works, which determines the potential Dust Emission Magnitude; and
  - the sensitivity of the area.
- Determine the site-specific mitigation for the potential activities;
- Examine the residual effects and determine whether or not these are significant; and
- Prepare the Construction Dust Assessment.

3.9 In the process for defining the sensitivity of an area/receptor, the following guidance has been used.

Sensitivity of Area	Human Receptors	Ecological Receptors
High	Very densely populated area, 10-100 dwellings within 20m of site. Annual mean concentrations of PM_{10} close to/in exceedence of the national	Internationally or nationally designated site, the designated features may be affected by dust soiling. A location where there is dust sensitive species

[17] Institute of Air Quality Management (2014). Guidance on the assessment of dust from demolition and construction. IAQM, London.

[18] Greater London Authority and London Councils (2006). The Control of dust and emissions from construction and demolition: Best Guidance Practice. GLA, London.

	objective (40 µg m^{-3}). Very sensitive receptors (e.g. residential properties, hospitals, schools, care homes).	present.
Medium	Densely populated area, 1-10 dwellings within 20m of site. Annual mean concentrations of PM_{10} below the national objective (> 28 µg m^{-3}). Medium sensitivity receptors (e.g. office and shop workers).	Nationally designated site where the features may be affected by dust deposition. A location with a particularly important plant species where its dust sensitivity is unknown.
Low	Sparsely populated area, 1 dwelling within 20m of site. Annual mean concentrations well below the national objectives (< 28 µg m^{-3}). Low sensitivity receptors (e.g. public footpaths, playing fields, shopping streets).	Locally designated site where the features may be affected by dust deposition.

Table 3.2: IAQM Factors for Defining the Sensitivity of an Area

Traffic Exhaust Emissions

3.10 The proposed development is proposed to be car free. Therefore, it has not been considered necessary to quantify traffic exhaust emissions as a result of the operation of the proposed development.

Operational Activities

3.11 A qualitative assessment of any likely impacts associated with any operational plant, will be completed based on the finding of the Energy Assessment produce for the same proposals. If necessary, mitigation measures will be recommended in order to minimise any detrimental impacts.

3.12 At this early stage, it is not usually possible to undertake a quantitative assessment of operational plant due to the detailed technical specifications required in order to undertake this work not being available yet.

Significance Criteria

3.13 In the event that the risk is assessed as significant, guidance is provided by the IAQM[19] and EPUK on how to determine any likely changes in air pollutant concentrations and/or exposure as a result of a proposed development.

[19] Institute of Air Quality Management (2009). Significance in air quality. IAQM, London.

3.14 The methodology provided by the EPUK guidance document has been followed to determine the significance of the impacts. This process takes the following into account:

- the magnitude of the change (% change of annual mean concentration);
- the concentration relative to the AQS objective (above or below the objective); and
- the direction of change (adverse or beneficial).

3.15 The magnitude of an impact should be described by using the EPUK criteria set out in Table 3.3 below, the criteria are based on the change in concentration resulting by the proposed development as a percentage of the assessment level.

Magnitude of Change	Annual Mean NO_2/PM_{10}	Days PM_{10} > 50 µg m^{-3}
Large	Increase/decrease >10% (>4 µg m^{-3})	Increase/decrease >4 days
Medium	Increase/decrease 5-10% (2-4 µg m^{-3})	Increase/decrease 2-4 days
Small	Increase/decrease 1-5% (0.4-2 µg m^{-3})	Increase/decrease 1-2 days
Imperceptible	Increase/decrease <1% (<0.4 µg m^{-3})	Increase/decrease <1 day

Table 3.3: Impact Magnitude for Changes in Relation to Concentration of NO_2 and PM_{10}

3.16 The descriptors of impact significance for the annual mean concentration for both NO_2 and PM_{10} that take account of the magnitude of changes for the proposed development based on guidance from EPUK are shown in Table 3.4 below.

Total Concentration Related to Objective/Limit Value	Change in Concentration		
	Small	Medium	Large
Increase With Scheme			
Above Objective/Limit Value with Scheme (>40 µg m^{-3})	Minor Adverse	Moderate Adverse	Major Adverse
Just Below Objective/Limit Value with Scheme (36-40 µg m^{-3})	Minor Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value with Scheme (30-36 µg m^{-3})	Negligible	Minor Adverse	Minor Adverse
Well Below Objective/Limit Value with Scheme (<30 µg m^{-3})	Negligible	Negligible	Minor Adverse
Decrease With Scheme			
Above Objective/Limit Value with Scheme (> 40 µg m^{-3})	Minor Beneficial	Moderate Beneficial	Major Beneficial
Just Below Objective/Limit Value with Scheme (36-40 µg m^{-3})	Minor Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value with Scheme (30-36 µg m^{-3})	Negligible	Minor Beneficial	Minor Beneficial
Well Below Objective/Limit Value with Scheme (< 30 µg m^{-3})	Negligible	Negligible	Minor Beneficial

Table 3.4: Impact Descriptors for Changes to Annual Mean Concentration of NO_2 and PM_{10}

3.17 Once the magnitude of the change has been established, the impact at each relevant receptor needs to be described. The impact magnitude at each receptor location can be described using the changes stated above as Negligible, Minor, Moderate or Major, as either Adverse or Beneficial, and either Temporary or Permanent.

3.18 The overall significance should be described separately for both the impact of emissions related to the proposed development on existing receptors, and for the impacts of emissions from existing source(s) on new exposure being introduced from the proposed development.

3.19 Air quality is not well suited to the rigid application of generic significance matrix to determine the overall significance of a development. Professional judgement should be employed throughout, and the assessment should take into account site specific considerations.

4.0 BASELINE CONDITIONS

Local Air Quality Management

4.1 Under the Government's Air Quality Strategy, all local authorities are required to assess air quality within their borough annually. Kensington and Chelsea Council has been doing this for two decades and continues to be seriously concerned about the impact of air pollution on health.

4.2 As part of the ongoing review and assessment process required by the Environment Act 1995, the London Borough of Camden (LBC) has identified that a large portion of the borough exceeds the Air Quality Strategy (AQS) objectives for both nitrogen dioxide (NO_2) and particulate matter (PM_{10}) and, in 2000, declared an Air Quality Management Area (AQMA) covering the whole borough for annual average concentrations of nitrogen dioxide (NO_2). The declaration of an AQMA does not necessarily mean that all locations within it exceed the AQS objectives. LBC has determined that the AQS objectives for the remaining pollutants are met at all locations where there is relevant exposure.

4.3 Due to the entire Borough being declared as an AQMA the proposed development lies within an AQMA.

Monitoring Locations

4.4 LBC operates continuous automatic monitoring at four locations across the Borough. These are illustrated in Figure 4.1 below.

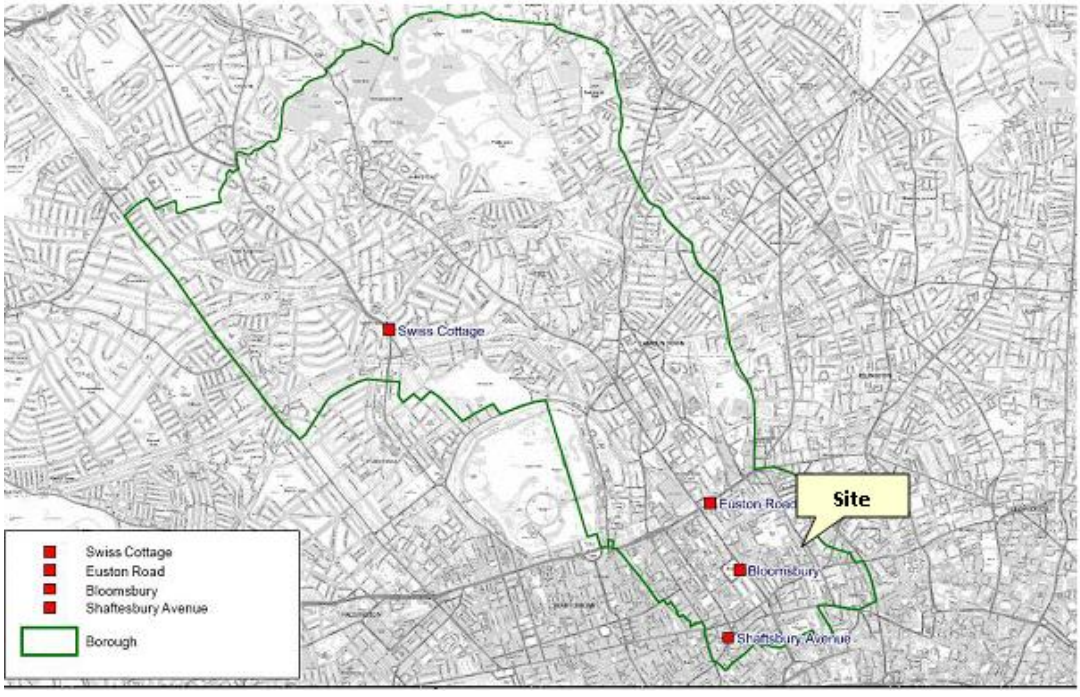

Figure 4.1: Camden Automatic Monitoring Locations

4.5 The closest automatic monitoring site to the proposed development is London Bloomsbury. However this location is an urban background location. The closest roadside automatic monitoring site is Euston Road, located approximately 1km northwest of the proposed site. However, this position is located on the kerb of the very busy A501 and therefore not representative of the proposed site conditions.

4.6 Caution should therefore be employed when using this automatic monitoring location to predict pollutant concentrations on the proposed site as they will most likely result in overestimation.

4.7 A summary of the latest monitored data for Euston Road is presented below.

NO_2

Monitoring Position	Site Coordinates (X, Y)	Location	Annual Mean Concentration (μg m^{-3})		Number of exceedences of Hourly Means > 200 μg m^{-3} – Only 18 are permitted	
			2012	2013	2012	2013
CD9 – Euston Road	529878, 182648	Roadside	**106**	**106**	**295**	**296**

Note – Exceedences of the AQS National Objectives shown in bold.

Table 4.1: 2012 and 2013 NO_2 concentrations for closest Automatic Monitoring Station

4.8 The above table demonstrates that monitored values are above both the annual and hourly objectives.

PM_{10}

4.9 PM_{10} data is not collected at this station. However none of the 3 automatic monitoring stations that analyse PM_{10} (LB, SC and SA) have registered concentrations above the annual or hourly objectives.

4.10 LBC also operates non-automatic monitoring at a number of sites across the Borough. These are illustrated in Figure 3.2 below.

Figure 4.2: Camden Non-Automatic Monitoring Sites

4.11 The closest non automatic monitoring locations to the proposed site are CA6, 500mwest of the site CA10, approximately 1km West and CA4 which is also approximately 1km Northwest of the site. However CA6 and CA10 are both urban background locations, which leave CA4 – Euston Road. However, as previously discussed, this position is located on the kerb of the very busy A501 and therefore not representative of the proposed site conditions.

4.12 Caution should therefore be employed when using this non-automatic monitoring location to predict pollutant concentrations on the proposed site as it will most likely result in overestimation.

4.13 A summary of the latest published monitored data for CA4 – Euston Road is presented below.

$\underline{NO_2}$

Monitoring Position	Site Coordinates (X, Y)	Location	Annual Mean Concentration (µg m^{-3})	
			2012	2013
CA4 – Euston Road	530110, 182795	Road side (5m from kerb.)	**82.05**	**107.75**

Note – Exceedences of the AQS National Objectives shown in bold.

Table 4.2: 2012 and 2013 NO_2 concentrations for closest Non-Automatic Monitoring Location

4.14 The above table demonstrates that the closest non automatic monitoring location has monitored a NO_2 annual mean concentration which is above the annual mean objective levels.

4.15 Although Euston Road is not considered representative of the air pollution conditions on the proposed site due to its location on the kerb of a very busy A road, analysis of all the automatic and also non-automatic monitoring locations throughout the Borough show these to exceed the NO_2 annual mean objective. Therefore, it can be concluded that the proposed site is likely to be located within an area that is above the AQS annual mean concentration objective (40 µg m^{-3}) for NO_2 .

PM_{10}

4.16 PM_{10} data is not collected by any of the non-automatic monitoring locations.

Background Concentrations

4.17 Background concentrations of NO_x, NO_2, PM_{10} and $PM_{2..5}$ for the site have been obtained from the Defra Background Map tool[20]. Data is available for years 2011 – 2030 and is calibrated against monitoring data collected in 2011.

4.18 The Defra background mapping tool has been used to establish the pollutant background concentration within the corresponding 1 x 1km grid square that the site is located in (x:530500,y:182500). The pollutant background concentrations have been collated for the current year (2015) and the proposed opening year (2017) when the proposed development has been estimated to be completed. These are given in Table 3.3 below.

Pollutant	Current Year (2015) (µg m^{-3})	Opening Year (2017) (µg m^{-3})
NO_x	77.3	70.7
NO_2	44.3	41.2
PM_{10}	24.8	24.3
$PM_{2.5}$	16.7	16.3

Table 4.3: Annual Mean Background Concentrations of NO_x, NO_2, PM_{10} and $PM_{2.5}$

4.19 It is shown that the background concentrations for NO_2 exceed the annual mean objective level but PM_{10} and $PM_{2.5}$ are well within their annual mean objective levels.

[20] Department for Environment, Food and Rural Affairs (2011). Background Concentration Maps. Defra, http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2011

5.0 IDENTIFICATION AND EVALUATION OF POTENTIAL EFFECTS

5.1 Table 5.1 sets out the potential sources of air quality impacts that have been identified with the proposed development.

Stage	Source of Impact
Construction	Demolition and Construction Activities
	Construction Traffic and Plant
Completed Development	Operational Activities

Table 5.1: Sources of Air Quality Impacts

Construction

Construction Dust

5.2 During the demolition, site clearance and construction phases, there is the potential for emissions of dust to cause annoyance/nuisance for sensitive receptors, both human and ecological located close to the site.

5.3 The construction activities associated with the proposed development can be separated into four stages:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

5.4 There are numerous sensitive receptors within close proximity to the site that could potentially be affected by construction dust emissions in relation to any of the above stages.

5.5 The site is located within the Bloomsbury Conservation Area. However, no sensitive ecological receptors have been identified in close proximity to the site. Therefore, the risk has been assessed as negligible.

5.6 In February 2014, the IAQM published guidance on how to assess and mitigate the impacts the dust emissions from demolition and construction sites. The guidance superseded the 2012 IAQM guidance on the assessment of the impacts of construction on air quality and the determination of their significance. This approach is broadly replicated within the GLA draft construction dust document (2013) and provides detail for a clear and concise dust assessment.

5.7 This guidance has been followed for the production of a construction dust assessment included in Appendix A. The dust assessment has been completed to satisfy the requirements of Policy 7.14 of the London Plan and Policy 6 of the Mayor's Air Quality Strategy relating to the reduction of emissions from construction and demolition.

5.8 There are a number of human receptors that, due to their location, could potentially suffer a degree of nuisance or annoyance from the emission of construction dust from the site. The proposed construction timescales are estimated to last approximately 18 months, although dust will not be generated throughout the whole of this period. Due to human receptors being located closer than 350m from the site, a dust assessment is required and specific mitigation measures adopted, where appropriate.

5.9 A summary of the dust assessment can be seen below. Further details can be found in Appendix A of this report.

5.10 The background PM_{10} concentration for the site in 2015 derived from Defra background pollutant maps shown in Table 4.5 is 24.8 µg m^{-3}. There are no PM_{10} monitoring locations in close proximity of the site. Camden only collects PM_{10} data at 3 locations within the Borough, one of them being a background location. The latest published PM_{10} data for these 3 locations for 2013 within the 2014 Air Quality Progress Report show the PM_{10} to be between 18 and 29 µg m^{-3}. All 3 of the monitoring locations are well below the AQS annual mean objective of 40 µg m^{-3}. For the completion of the assessment, the monitored PM_{10} concentration of 29 µg m^{-3} will be used as a worst case scenario value.

5.11 Each activity has been assessed individually to determine a Dust Emissions Magnitude in terms of the scale and nature of the works. The level of magnitude is assessed against the sensitivity of the site in order to determine the risk of dust impacts from each activity with no mitigation applied. This is shown in Table 5.2 below:

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	High	High	High	High
Ecological	Negligible	Negligible	Negligible	Negligible

Table 5.2: Summary of Dust Risk (pre-mitigation)

5.12 The above summary demonstrates that the proposed development, pre-mitigation, has the potential to have a high adverse effect upon sensitive receptors from dust soiling associated with demolition activities.

5.13 In addition, it has been estimated that the proposed development will take approximately 18 months from inception to be completed. The risk of impacts will continue throughout most of the duration of the construction phase and have the potential to lower the amenity of receptors close to the site.

5.14 Due to the possibility that PM_{10} levels may increase due to construction activities during the construction period, specific mitigation measures should be employed to lower the significance of the potential impacts.

5.15 The mitigation measures detailed in section 6 have been recommended to ensure that the residual effect of construction dust on the receptors and surrounding area will be temporary and where possible, negligible.

Construction Traffic and Plant

5.16 It is anticipated that, throughout the construction phase of the development, there will be a number of construction vehicles, stationary plant and vehicles used by the construction workforce. These additional units may potentially present an additional source of air pollutants in the vicinity of the site during the construction phase of the proposed development.

5.17 A Construction Management Plan (CMP)[21] has been completed for the proposed development to assess the possible impacts of construction traffic upon the surrounding area and the construction methodology.

5.18 It has been predicted that, due to the size of the proposed development, deliveries might be 1 long wheel based panel van, rigid delivery vehicle (7.5 tonnes), 10m rigid vehicle every 1 to 2 days, parked on the forecourt within the site boundary or on Calthorpe Street if required for 30 minutes maximum for unloading and that waste/demolition materials removal will require 3 to 4 rigid vehicle grab loaders and roll on roll off trucks (up to 20 tonnes) every day, parked on the forecourt within the site boundary or on Calthorpe Street if required for 30 minutes maximum for loading. Any likely pollutant impacts should be addressed through Best Available Techniques (BAT) mitigation measures. Likely BAT are provided in section 6.

Completed Development

Development Traffic

5.19 The proposed development is proposed to be car free and no contribution to local pollution levels is expected as a result of development traffic. Therefore, traffic related air quality impacts are assessed to be negligible and do not require further assessment.

Operational Activities

5.20 The Energy Efficiency Plan produced for the proposed site outlines how the proposed re-development of 51 Calthorpe Street, Camden will meet the energy requirements as specified by the London Plan and the London Borough of Camden's relevant policies.

[21] Create Consulting Engineers (CCE) (2015). 51 Calthorpe Street, London. CCE Norwich

5.21 The Energy Efficiency Plan has been prepared following the principles of the London Plan Energy Hierarchy: 'Be Lean', 'Be Clean' and 'Be Green'. The overriding objective in the formulation of the Energy Efficiency Plan has been to maximise the viable reductions in total carbon dioxide emissions from the development within the framework of the energy hierarchy.

5.22 In addition to the Energy Hierarchy, the Energy Efficiency Plan takes into consideration decentralised energy in development proposals and the supply of renewable energy detailed within Camden planning guidance document CPG 3 - Sustainability.

5.23 'Be Lean': Energy efficiency measures will be applied to the development. The development will meet and exceed all of the building fabric performance standards suggested within Camden guidance document CPG 3 and exceed the minimum requirements of Part L1A and L1B for fabric efficiency standards.

5.24 'Be Clean': The opportunity for the proposed development to link into an existing or planned decentralised energy network has been explored using the London Heat Map tool. In the absence of an existing heat network within a reasonable distance of the proposed development site, the report has assessed the feasibility of incorporating a CHP communal heating system within the development. The installation of the CHP system in combination with the 'Be Lean' measures will reduce the regulated carbon dioxide emissions in comparison to the 2013 Building Regulations compliant case by **20.53%.**

5.25 'Be Green': A feasibility study has been undertaken to establish the most suitable renewable technology for integration at the proposed development. Solar photovoltaic panels are the recommended renewable technology within the constraints of the site and provide the most cost-effective carbon dioxide emission saving for the proposed development. A 22.3 m^2 - 2.97 kWp photovoltaic system mounted on the south orientated tilted roof of the scheme, combined with the 'Be Lean' energy conservation measures and 'Be Clean' CHP system will provide a **25.81%** reduction in the CO_2 emissions over the Building Regulations compliant case.

5.26 The scheme also achieves a reduction in regulated CO_2 emissions compared to the existing building of 73.20%

5.27 Having regard to the operational activities associated with the proposed development, the proposed CHP and the proposed renewable technologies, it is unlikely that there will be a significant impact upon local air quality.

6.0 MITIGATION MEASURES

Construction

Construction Dust

6.1 A construction dust assessment has been completed for the proposed development in accordance with IAQM guidance and is presented in Appendix A. Within the assessment, site specific mitigation measures have been identified that ensure compliance with both the London Plan and the Mayor's Air Quality Strategy.

6.2 The mitigation measures have been recommended because, although the construction magnitude is considered small, the potential for dust soiling and human health effects is considered to be medium.

6.3 The mitigation measures outlined below should make up part of a Construction Environment Management Plan (CEMP) that should be implemented to minimise the potential of adverse construction dust impacts throughout all the relevant construction stages.

Demolition:

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust);
- Wherever reasonably practicable, retain walls and windows while any internal demolition takes place to provide a screen against dust;
- Avoid explosive blasting, using appropriate manual or mechanical alternatives
- Bag and remove any biological debris or damp down such material before demolition; and
- Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is required.

Earthworks:

- Avoid scabbling (roughening of concrete surfaces) if possible;
- Avoid carrying out any earthworks during dry weather if reasonably practicable having regard to programme and contracting arrangements for the relevant works or provide and ensure appropriate use of water to control dust.
- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.

Construction:

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out unless required for a particular process;
- Mix large quantities of cement, grouts and other similar materials in enclosed areas remote from site boundaries and potential receptors;
- 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; and
- For small supplies of fine powder ensure bags are sealed after use and are stored appropriately to prevent dust.

Trackout:

- Ensure any vehicles arriving and leaving site are securely covered to prevent escape of materials during transport;
- Ensure all vehicles switch off engines when stationary, so that there are no idling vehicles;
- Routinely clean public roads and any access routes using wet sweeping methods; and
- Avoid dry sweeping.

General Mitigation Measures:

- Ensure regular cleaning of hardstanding surfaces using wet sweeping methods;
- Display the head or regional office contact information, and the name and contact details of person(s) accountable for air quality on the site boundary;
- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Log all air quality complaints, identify the cause(s), take appropriate measures to reduce emissions in a timely manner, and record all measures taken. Make the complaints log available to the Local Authority when requested;
- Carry out regular on-site and off-site inspections to monitor dust soiling effects, with cleaning to be provided if necessary. Increase the frequency of inspections when activities with a high potential to produce dust are being carried out;
- Erect barriers around the site, any dusty activities and stockpiles (the last of which should be covered);
- Screen areas of the building, where dust producing activities are taking place, with debris screens or sheeting;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Remove materials that have a potential to produce dust as soon as possible, unless they are being re-used. If they are to be re-used, on site covers should be used;

- Ensure all vehicles switch off engines when stationary, so that there are no idling vehicles;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine sprays on such equipment wherever possible;
- Avoid bonfires and the burning of waste materials; and
- Special provisions will apply for any materials containing asbestos. The safety method statement should outline the control measures necessary to minimise the risks to an acceptable level and all statutory notices will be placed with the Health and Safety Executive (HSE).

6.4 It is important that attention is paid to any construction activity that takes place in close proximity to the site boundary, potentially at the closest location to sensitive receptors.

6.5 The implementation of the specific mitigation measures given above within a CEMP will ensure that the potential adverse impacts from construction dust during all construction stages are avoided. It is noted by the IAQM that, through the use of effective mitigation, the effects of dust from construction activity will normally not be considered significant.

Construction Traffic and Plant

6.6 As previously stated, there is potential for air pollutant impacts to arise from construction plant and vehicles associated with the scheme. Currently the number of construction vehicles is estimated to be between 4-5 per day. The construction plant has not been confirmed. However, the following BAT should still be implemented during the demolition and construction phases.

6.7 The construction traffic and plant mitigation measures recommended are as follows:

- All vehicles should switch off engines when stationary, so that there are no idling vehicles;
- On-road vehicles should comply with the requirements of the Low Emission Zone and the London NRMM standards, where applicable;
- All non-road mobile machinery (NRMM) should use ultra low sulphur diesel (ULSD) where available;
- The movement of construction traffic around the site should be minimised;
- Efficiency should be maximised (this may include alternative modes of transport, maximising vehicle utilisation by ensuring full loading and efficient routing);
- All vehicles and machinery should be well maintained and kept in a high standard of working order;
- The use of diesel or petrol powered generators should be avoided by using mains electricity or battery powered equipment where possible; and
- Machinery should be located as far away as possible from boundaries close to residential properties.

Operational

Operational Traffic

6.8 The assessment has demonstrated that air quality impacts associated with the proposed development traffic are unlikely. Therefore, it is not anticipated that mitigation measures will be required.

Operational Plant

6.9 The assessment has demonstrated that air quality impacts associated with the proposed operational plant as described in both the Energy Efficiency and Sustainability plans are unlikely. Therefore it is not anticipated that mitigation measures will be required.

Suitability of the site for proposed use

6.10 The proposed development is located in an area where the prevailing air quality at ground level exceeds the AQS objectives for annual average concentrations of nitrogen dioxide (NO_2) at ground level.

6.11 The Defra estimated annual average background concentration of nitrogen dioxide (NO2) in 2015 is 44.3µg m^3,reducing to 41.2µgm^3 by 2017.

6.12 When considering the suitability of the location for its proposed use, account should be taken of the fact that pollutant concentrations reduce considerably with height. The estimates of background concentrations are at ground level.

6.13 The actual reduction in pollutant concentration with height is difficult to predict and very limited measured data are available, none of which are representative of the proposed site.

6.14 Given that the location of the proposed development is where air quality background levels for NO_2 exceed the national objectives, there would be very little improvement to indoor air quality from the use of mechanical ventilation. Even if air were to be drawn in from the rear of the property, it would have very similar pollutant concentrations as air at the front of the building.

6.15 Where practical the proposed development will include tree planting and a green wall, both of which have been shown to improve air quality.

6.16 The residents and occupants of the proposed development should be made aware of the air pollution monitoring services available in London, the free services providing text messages and information relating to air quality as shown in Table 6.1.

Name of Service	Website	Service Provided
airText	www.airtext.info	Free text message service providing air quality alerts for Greater London.
London Air	www.londonair.org.uk	Free downloadable air quality app providing real time air quality index across London, in addition LAQM data for London Boroughs is available.

Table 6.1: London Air Quality Services

7.0 RESIDUAL EFFECTS AND CONCLUSIONS

Baseline

7.1 This assessment demonstrates that the proposed development is situated within an AQMA designated by LBC in 2000 for the entire Borough made on the basis that levels of NO_2 and PM_{10} would not meet the AQS national objectives.

7.2 Automatic and non-automatic NO_2 monitoring is undertaken at several locations within the Borough. However none of these locations are considered representative of the air quality environment at the proposed site.

7.3 The Defra estimated annual average background concentration for the nitrogen dioxide (NO_2) at the proposed site e currently exceed the annual objectives, (44.3µg m^3 in 2015 then reducing to 41.2µgm^3 by 2017).

Construction Phase

7.4 A construction dust assessment has been undertaken for the demolition and construction phase associated with the proposed development in accordance with IAQM and GLA guidance on the assessment of dust from demolition and construction (Appendix A).

7.5 Mitigation measures have been proposed for construction traffic and stationary plant associated with the proposed development.

7.6 A Construction Management Plan (CMP) has been completed for the development. In addition a Dust Management Plan (DMP) is recommended. This should cover all stages of construction and incorporate appropriate mitigation measures for dust management and control of traffic and plant emissions as per section 6 of this report.

7.7 Following the successful implementation of the CMP and DMP, the residual effects of construction dust and emissions from construction plant/vehicles upon the local area and sensitive receptors although adverse, will be temporary and not significant.

Operational Phase (Built and Occupied)

7.8 The proposed development is proposed to be car free. Therefore, it has not been considered necessary to quantify traffic exhaust emissions as a result of the operation of the proposed development.

7.9 As per the Energy Efficiency Plan, the London Heat Map tool indicates that there is no proposed decentralised heat network within proximity of the site. However to facilitate future connection to an energy network in the future, the development will include a central energy generation centre to deliver the space and hot water demand through the use of gas

Combined Heat and Power (CHP) heat generator systems in sequence with communal gas boilers. The design and layout of the building's plant room will be such that it will facilitate the possible future connection of the development to an energy network.

7.10 A feasibility study has been undertaken to establish the most suitable renewable energy technology for integration at the proposed development. Due to the constraints of the site, a photovoltaic's array on the south orientated, unshaded, tilted part of the roof of the scheme is considered the most viable and practical option for the scheme.

7.11 The scheme also achieves a reduction in regulated CO_2 emissions compared to the existing building of 73.20%

7.12 In accordance with London Plan Policy 7.14 and The Mayor's Air Quality Strategy Policy 7, based on the above assessment, it is considered unlikely, that the proposed development will result in further deterioration of the existing air quality environment. On that basis it can be classed as 'air quality neutral'.

8.0 DISCLAIMER

8.1 Create Consulting disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report.

8.2 The copyright of this report is vested in Create Consulting Engineers Ltd and Mr Simon Firth. The Client, or his appointed representatives, may copy the report for purposes in connection with the development described herein. It shall not be copied by any other party or used for any other purposes without the written consent of Create Consulting Engineers Ltd or Mr Simon Firth.

8.3 Create Consulting Engineers Ltd accepts no responsibility whatsoever to other parties to whom this report, or any part thereof, is made known. Any such other parties rely upon the report at their own risk.

APPENDICES

APPENDIX A

CONSTRUCTION DUST ASSESSMENT

CONSTRUCTION DUST ASSESSMENT

A.1 The construction dust assessment has been completed in accordance with 2014 IAQM guidance and follows the procedure as outlined in Section 3 of this report.

Screen the Need for a Detailed Assessment

A.2 The following screening criterion has been applied to the assessment: an assessment will normally be required where there is:

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

A.3 Although here are a number of human receptors within 350m of the site boundary, there are no ecological receptors within 50m of the site. Accordingly, a dust assessment is required.

Assess the Risk of Dust Impacts

A.4 The assessment of the risk of dust impacts was completed in two stages:

- Determine the potential dust emission magnitude; and
- Determine the sensitivity of the area to dust impacts.

Magnitude

A.5 The potential dust emission magnitude for all four of the construction activities will be determined to be Small, Medium or Large in accordance with the criteria presented in Table A1 below.

Construction Activity	Dust Emission Magnitude Scale		
	Small	Medium	Large
Demolition	Total building volume <20,000m^3, construction material with low potential for dust release, demolition activities <10m above ground, works during wetter months.	Total building volume 20,000-50,000m^3, potentially dusty construction material, demolition activities 10-20m above ground level.	Total building volume >50,000m^3, potentially dusty material, on-site crushing and screening, activities >20m above ground level.

Earthworks	Total site area <2,500m^2, soil type with large grain size, <5 heavy earth moving vehicles active at one time, bunds <4m high, total material moved <20,000t, works during wetter months.	Total site area 2,500-10,000m^2, moderately dusty soil type, 5-10 heavy earth moving vehicles active at one time, bunds 4-8m high, total material moved 20,000-100,000t.	Total site area >10,000m^2, potentially dusty soil type, >10 heavy earth moving vehicles active at one time, bunds >8m high, total material moved >100,000t.
Construction	Total building volume <25,000m^3, construction material with low potential for dust release.	Total building volume 25,000-100,000m^3, potentially dusty construction material, on site concrete batching.	Total building volume >100,000m^3, on site concrete batching, sandblasting.
Trackout	<10 HDV* outwards movements in any one day, surface material with low potential for dust release, unpaved road length <50m.	10-50 HDV outward movements in any one day, moderately dusty surface material, unpaved road length 50-100m.	>50 HDV outward movements in any one day, potentially dusty surface material, unpaved road length >100m.
* HDV – Heavy Duty Vehicle (>3.5t), Note – In each case, not all the criteria need to be met, and that other criteria may be used if justified.			

Table A1: Dust Emission Magnitude Criteria

A.6 The completed assessment of Dust Emission Magnitude is shown in Table A2 below.

Construction Activity	Dust Emission Magnitude	Justification
Demolition	small	Existing building to be demolished has been estimated to have a total volume of <20,000m^3
Earthworks	small	Total site area has been estimated to be <2,500m^2 and no earth moving vehicles will be required on site.
Construction	small	The proposed building volume has been estimated to be <25,000m^3, construction material with low potential for dust release.
Trackout	small	4 to 5 heavy vehicles per day associated with deliveries and waste /construction material removal parked on the forecourt within the site boundary or on Calthorpe Street if required for 30 minutes maximum.

Table A2: Dust Emission Magnitude Assessment

Sensitivity

A.7 The sensitivity of the area has been assessed in relation to a number of factors such as; the specific sensitivities of receptors in the area, the proximity and number of those receptors and in the case of PM_{10}, the local background concentration and also following the significance criteria in Tables A3, A4 and A5 below.

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

Table A3: Sensitivity of the Area to Dust Soiling Effects of People and Property

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the source (m)				
			<20	<50	<100	<200	<350
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	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table A4: Sensitivity of the Area to Human Health Impacts

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

Table A5: Sensitivity of the Area to Ecological Impacts

A.8 In addition to Tables A3, A4 and A5 any site specific factors have been taken into account when defining the sensitivity of the area:

- any history of dust generating activities in the area;
- the likelihood of concurrent dust generating activity on nearby sites;
- any pre-existing screening between the source and the receptors; and
- the duration of the potential impact, as a receptor may become more sensitive over time.

A.9 The completed pre-mitigation impact risk assessment incorporating the sensitivity of the area and the dust emissions magnitude for the four construction activities is shown below.

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

Table A6: Summary of Dust Risk (pre-mitigation)

Site-specific Mitigation

A.10 From the identification of the of the risk of impacts with no mitigation applied in Table A7, it is possible to determine the specific mitigation measures that can be applied in relation to the level of risk associated with the construction activity. The mitigation measures described below are suggested as measures that should be included in a site specific Construction Environmental Management Plan (CEMP).

Demolition:

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust);
- Wherever reasonably practicable, retain walls and windows while the rest of the building is demolished to provide a screen against dust;
- Bag and remove any biological debris or damp down such material before demolition; and
- Ensure effective water suppression is used during demolition operations, hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is required.

Earthworks:

- Avoid scabbling (roughening of concrete surfaces) if possible;
- Avoid carrying out any earthworks during dry weather if reasonably practicable having regard to programme and contracting arrangements for the relevant works or provide and ensure appropriate use of water to control dust.
- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.

Construction:

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out unless required for a particular process;
- Mix large quantities of cement, grouts and other similar materials in enclosed areas remote from site boundaries and potential receptors;

- 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; and
- For small supplies of fine powder ensure bags are sealed after use and are stored appropriately to prevent dust.

Trackout:

- Ensure any vehicles entering and leaving sites are securely covered to prevent escape of materials during transport;
- Ensure all vehicles switch off engines when stationary, that there are no idling vehicles; and
- Ensure any vehicles entering and leaving sites are securely covered to prevent escape of materials during transport;
- Routinely clean public roads and access routes using wet sweeping methods; and
- Avoid dry sweeping.

General Mitigation Measures:

- Ensure regular cleaning of hardstanding surfaces using wet sweeping methods;
- Display the head or regional office contact information, and the name and contact details of person(s) accountable for air quality on the site boundary;
- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Log all air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record all measures taken. Make the complaints log available to the Local Authority when asked;
- Carry out regular on-site and off-site inspections to monitor dust soiling effects, with cleaning to be provided if necessary. Increase the frequency of inspections when activities with a high potential to produce dust are being carried out;
- Erect barriers around the site, any dusty activities and stockpiles (to be covered);
- Screen areas of the building, where dust producing activities are taking place, with debris screens or sheeting;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Remove materials that have a potential to produce dust as soon as possible, unless being re-used. If they are to be re-used, on site covers should be used;
- Ensure all vehicles switch off engines when stationary, no idling vehicles;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine sprays on such equipment wherever possible; and
- Avoid bonfires and the burning of waste materials; and
- Special provisions will apply for any materials containing asbestos. The safety method statement should outline the control measures necessary to minimise the

risks to an acceptable level and all statutory notices will be placed with the Health and Safety Executive (HSE).

A.11 It is important that attention is paid to any construction activity that takes place in close proximity to the site boundary, potentially at the closest location to sensitive receptors.

A.12 The implementation of the specific mitigation measures given above within the CEMP will ensure that the potential adverse impacts from construction dust during all construction stages are avoided. It is noted by the IAQM that through the use of effective mitigation, the effects of dust from construction activity will normally not be significant.

Determine Significant Effects

A.13 Prior to the implementation of any mitigation measures the highest significance of adverse effects was 'medium risk' for all activities associated with the development. The mitigation measures listed have been chosen due to their suitability to the site and to reduce the risk of adverse effects from the four stages of construction.

A.14 The implementation of the site specific mitigation measures, (which are designed to mitigate potential dust impact, will ensure that potential significant adverse dust effects will not occur and the residual effect will normally be 'not significant'.

Conclusions of Construction Dust Assessment

A.15 The completion of the construction dust assessment has shown that the residual effect of the proposed development in the context of construction dust emissions will be 'not significant'. This conclusion has been made based on the assumption that the suggested mitigation measures will be implemented and is relevant for all sensitive receptors within 350m of the site.

A.16 However, it should be noted that, even with a rigorous CEMP in place, it is not possible to guarantee that all mitigation measures will be effective at all times. If there is an interruption in the water supply used for dust suppression or adverse weather conditions are experienced that exacerbate dust emissions, the receptors may experience occasional, short term dust annoyance.

A.17 However, the likely scale of this would not normally be considered sufficient to change the conclusion that with mitigation the effects will not be significant. It is therefore important to consider all mitigation measures and provide a frequent review and assessment procedure for each when in place to ensure that they continue to provide a full level of mitigation.