3 - 6 Spring Place

Spring Place Ltd

Air Quality Assessment Report

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October 2016

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3-6 SPRING PLACE

AIR QUALITY ASSESSMENT

Spring Place Limited

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1 INTRODUCTION

1.1.1 WSP | Parsons Brinckerhoff has been commissioned by Brockton Capital LLP to carry out an assessment of the air quality impacts associated with the proposed development at 3-6 Spring Place, Kentish Town, London - hereafter referred to as the 'Proposed Development' or 'Application Site'.

1.1.2 The Application Site lies within the administrative boundary of London Borough of Camden (LBC) and is situated to between Spring Place and Grafton Road. The Application Site is bordered on all sides by existing office space and industrial uses, with the London Overground operating directly through the centre of the Application Site. The land currently comprises the Addison Lee servicing garage. The Applicant is seeking planning permission for the demolition of the existing single-storey, double-height servicing garage and a redevelopment to provide a new office building of up to six storeys, with flexible A1/A3 floorspace and event space.

1.1.3 The Proposed Development is without parking provision and is considered to be 'car-free'. There will be no on-site combustion plant for building heating or energy generation. On this basis, operational air quality impacts will not give rise to a significant effect and are scoped out of the air quality assessment.

1.1.4 This report considers the relevant legislation policy and guidance; presents the assessment scope and methodology; outlines baseline conditions; gives an assessment of the impacts; and provides recommendations for mitigation with consideration of the residual effects.

1.1.5 A glossary of terms used in this report is provided in **Appendix A**.

2 LEGISLATION, POLICY & GUIDANCE

2.1 AIR QUALITY LEGISLATION & POLICY

UK AIR QUALITY STRATEGY

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

2.1.2 The AQS also sets standards and objectives for nine key air pollutants to protect health, vegetation and ecosystems. These are benzene (C_6H_6), 1,3 butadiene (C_4H_6), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), sulphur dioxide (SO_2), ozone (O_3), and polycyclic aromatic hydrocarbons (PAHs). The standards and objectives for the pollutants considered in this assessment are given in **Appendix B**.

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

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

2.1.5 For the pollutants considered in this assessment, there are both long-term (annual mean) and short-term standards. In the case of NO_2, the short-term standard is for a 1-hour averaging period, whereas for PM_{10} it is for a 24-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants, for example temporary exposure on the pavement adjacent to a busy road, compared with the exposure of residential properties adjacent to a road.

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

AIR QUALITY REGULATIONS

2.1.7 Many of the objectives in the AQS have been made statutory in England with the Air Quality (England) Regulations 2000[2] and the Air Quality (England) (Amendment) Regulations 2002[3] for the purpose of Local Air Quality Management (LAQM).

[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

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

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

2.1.9 The Air Quality Standards Regulations 2010[4] transpose the European Union Ambient Air Quality Directive (2008/50/EC)[5] into law in England. This Directive sets legally binding limit values for concentrations in outdoor air of major air pollutants that impact public health such as PM_{10}, $PM_{2.5}$ and NO_2. The limit values for NO_2 and PM_{10} are the same concentration levels as the relevant. AQS objectives, and the limit value for $PM_{2.5}$ introduced in this Directive is a concentration of 25µg/m^3 to apply from 2015.

ENVIRONMENTAL PROTECTION ACT 1990 - CONTROL OF DUST AND PARTICULATES ASSOCIATED WITH CONSTRUCTION

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

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

"Any accumulation or deposit which is prejudicial to health or a nuisance"

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

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

ENVIRONMENT ACT 1995

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

2.2 PLANNING POLICY

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

NATIONAL PLANNING POLICY

[4] The Air Quality Standards Regulations 2010 - Statutory Instrument 2010 No. 1001

[5] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

NATIONAL PLANNING POLICY FRAMEWORK

2.2.2 The Government's overall planning policies for England are described in the National Planning Policy Framework[6]. The core underpinning principle of the Framework is the presumption in favour of sustainable development, defined as:

'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs'

2.2.3 One of the 12 core planning principles in the NPPF is that planning should 'contribute to conserving and enhancing the natural environment and reducing pollution.'

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

- Paragraph 109, which states *'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..';*
- Paragraph 110, which states *'In preparing plans to meet development needs, the aim should be to minimise pollution and other adverse effects on the local and natural environment. Plans should allocate land with the least environmental or amenity values, where consistent with other policies in this Framework.';*
- Paragraph 122, which states *'…local planning authorities should focus on whether the development itself is an acceptable use of the land, and the impact of the use, rather than the control of processes or emissions themselves where these are subject to approval under pollution control regimes. Local planning authorities 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';*
- Paragraph 124, which states *'Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan'; and*
- Paragraph 203, which states *'Local Planning authorities should consider where otherwise unacceptable development could be made acceptable though 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.'*

REGIONAL PLANNING POLICY

THE MAYOR'S AIR QUALITY STRATEGY FOR LONDON

2.2.5 In 2010 the GLA/Mayor of London published a new Mayor's Air Quality Strategy for London[7]. This strategy is focused on improving London's air quality. It also explains the current air quality experienced across London and gives predictions of future levels of pollution. The sources of pollution are outlined and a comprehensive set of policies and proposals are set out that will improve air quality in the London Boroughs.

[6] Department for Communities and Local Government (2012). National Planning Policy Framework.

[7] Mayor of London: Cleaning London's air, The Mayor's Air Quality Strategy (December 2010)

2.2.6 The Strategy sets out a framework for delivering improvements to London's air quality and includes measures aimed at reducing emissions from transport, homes, offices and new developments, promoting smarter more sustainable travel, as well as raising awareness of air quality issues.

2.2.7 The Strategy includes a policy which states: *"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"*.

THE LONDON PLAN: SPATIAL DEVELOPMENT STRATEGY FOR GREATER LONDON (CONSOLIDATED WITH ALTERATIONS SINCE 2011)

2.2.8 Policy 7.14 of the London Plan[8] is specific to the improvement of air quality and states that development proposals should:

- *"minimise increased exposure to existing poor air quality and make provision to address local problems of air quality"*;
- *"promote sustainable design and construction in order 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"*;
- *"ensure that where provision needs to be made to reduce emissions from a development, this is usually made on site"*; and
- *"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."*

LOCAL PLANNING POLICY

CAMDEN CORE STRATEGY 2010-2025

2.2.9 In this document[9], Policy CS16 *Improving Camden's health and well-being* and policy DP32 *Air quality and Camden's Clear Zone* of Camden Development Policies sets out the approach to air quality in the borough, and states that Camden will:

"..recognise the impact of poor air quality on health and implement Camden's Air Quality Action Plan which aims to reduce air pollution levels."

2.2.10 Policy CS11 *Promoting sustainable and efficient travel* aims to improve Camden's air quality through transport measures.

CAMDEN PLANNING GUIDANCE 6- AMENITY

2.2.11 This document[10] is a guidance which supports the policies in Camden's Local Development Framework (LDF). This includes policy DP32- Air Quality and Camden's Clear Zones which states that:

- *" all* developments *are to limit their impact on local air quality";* and

[8] Mayor of London (March 2016) The London Plan: Spatial Development Strategy for Greater London Consolidated with alterations since 2011.

[9] London Borough of Camden (2010) Camden Core Strategy 2010-2025

[10] London Borough of Camden (2010) Camden Planning Guidance 6- Amenity

- *"..overarching aim for Camden Borough Council is for new development to be 'air quality neutral' and not lead to further deterioration of existing poor air quality*"; and
- ".. *(developers) are required to include mitigation and offsetting measures to deal with any negative air quality impacts associated with development proposals."*

CAMDEN CLEAN AIR ACTION PLAN (2016-2018)

2.2.12 The Camden Clean Air Action Plan (CAAP)[11] outlines LBC's commitment to improving local air quality to safe guard public health and the environment. Camden has defined five target areas:

- Working to reduce emissions from their own estate and operations;
- Help residents and visitors reduce emission and exposure;
- Use planning policy to reduce air pollution;
- Lobby for increased financial support for the mitigation of air pollution; and
- Implement innovative projects across the borough to improve air quality.

2.2.13 Camden has produced the CAAP based up on a number of supporting plans and strategies including:

- The Local Plan[12] which sets out a strategy to manage growth and development in the borough;
- Camden's Environmental Sustainability Plan[13] which outlines LBC's position on reducing CO_2 emissions; and
- The Camden Transport Strategy[14] which defines how LBC will implement transport policies to safeguard the environment and limit air pollution.

2.3 GUIDANCE

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

LONDON LOCAL AIR QUALITY MANAGEMENT TECHNICAL GUIDANCE

2.3.2 The Mayor of London has published guidance for use by the London Boroughs in their review and assessment work[15]. This guidance, referred to in this document as LLAQM.TG(16), has been used where appropriate in the assessment presented herein.

LOCAL AIR QUALITY MANAGEMENT REVIEW AND ASSESSMENT TECHNICAL GUIDANCE

2.3.3 The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities outside of their London Boroughs in their review and assessment work[16]. This guidance, referred to in this document as LAQM.TG16, has been used

[11] Camden's Clean Air Action Plan. 2016-2018.

[12] London Borough of Camden – Draft local Plan, 2015.

[13] London Borough of Camden – Environmental and Sustainability Plan, 2011-2020.

[14] London Borough of Camden – Transport Strategy, 2011-2031,

[15] Mayor of London (May 2016) London Local Air Quality Management (LLAQM) Technical Guidance (LLAQM.TG(16))

[16] DEFRA (2016) Part IV The Environment Act 1995 and Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Technical Guidance LAQM.TG16

with respect to the methodology used in the assessment of operational phase effects because LLAQM.TG(16) does not include suitable guidance on the approach that should be taken.

LAND-USE PLANNING & DEVELOPMENT CONTROL: PLANNING FOR AIR QUALITY

2.3.4 In May 2015 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) published updated guidance[17], which offers comprehensive advice on: when an air quality assessment may be required; what should be included in an assessment; how to determine the significance of any air quality impacts associated with a development; and, the possible mitigation measures that may be implemented to minimise these impacts.

GUIDANCE ON THE ASSESSMENT OF DUST FROM DEMOLITION AND CONSTRUCTION

2.3.5 This document[18] published by the IAQM was produced to provide guidance to developers, consultants and environmental health officers on how to assess the impacts arising from construction activities. The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM_{10} impacts on public exposure and impact upon sensitive ecological receptors) and to identify mitigation measures appropriate to the level of risk identified.

NATIONAL PLANNING PRACTICE GUIDANCE – AIR QUALITY

2.3.6 This guidance[19] provides a number of guiding principles on how the planning process can take into account the impact of new development on air quality, and explains how much detail air quality assessments need to include for proposed developments, and how impacts on air quality can be mitigated. It also provides information on how air quality is taken into account by Local Authorities in both the wider planning context of Local Plans and neighbourhood planning, and in individual cases where air quality is a consideration in a planning decision.

LONDON COUNCILS GUIDANCE FOR AIR QUALITY ASSESSMENTS

2.3.7 The London Councils have published guidance[20] for undertaking air quality assessments in the London Boroughs, the majority of which have declared AQMAs. The guidance sets out suggested methods for undertaking such an assessment within the London area and provides a methodology to assist in determining the impacts of a development proposal on air quality. The main message of the document is, as above, that the factor of greatest importance will generally be the difference in air quality as a result of the proposed development.

MAYOR OF LONDON'S SUPPLEMENTARY PLANNING GUIDANCE FOR THE CONTROL OF DUST AND EMISSIONS DURING CONSTRUCTION AND DEMOLITION

2.3.8 This Supplementary Planning Guidance[21] (SPG) builds on the voluntary guidance published in

[17] Environmental Protection UK and Institute of Air Quality Management (2015). Land Use Planning & Development Control: Planning for Air Quality

[18] Institute of Air Quality Management (Version 1.1 Updated June 2016). Guidance on the Assessment of Dust from Demolition and Construction

[19] Department of Communities and Local Government (DCLG) (March 2014). National Planning Practice Guidance

[20] London Councils (January 2007): Air Quality and Planning Guidance – Revised version

[21] Mayor of London (July 2014): The control of dust and emissions during construction and demolition – Supplementary Planning Guidance.

2006 by the London Councils to establish best practice in mitigating impacts on air quality during construction and demolition work. The SPG incorporates more detailed guidance and best practice, and seeks to address emissions from Non-Road Mobile Machinery (NRMM) through the use of a Low Emission Zone, which was introduced in September 2015.

2.3.9 The SPG provides a methodology for assessing the potential impact of construction and demolition activities on air quality following the same procedure as set out in the IAQM guidance. It then identifies the relevant controls and mitigation measures that should be put in place to minimise any adverse impacts, which need to be set out, in draft, in an air quality assessment report submitted with the planning application, and then formalised post submission as an Air Quality and Dust Management Plan. Details of site air quality monitoring protocols are also provided with varying requirements depending on the size of the site and the potential risk of adverse impacts.

GREATER LONDON AUTHORITY: SUSTAINABLE DESIGN AND CONSTRUCTION SUPPLEMENTARY PLANNING GUIDANCE

2.3.10 Section 4.3 of this SPG provides guidance on the when a developer will be required to undertake an air quality assessment, looks at how design and transport measures can be used to minimise emissions to air, and sets out emissions standards for combustion plant.

2.3.11 The SPG also contains guidance on assessing the air quality neutrality of a Proposed Development in order to comply with the London Plan and the Mayor's Air Quality Strategy. Air Quality neutral benchmarks for both transport and buildings NO_x and PM_{10} emissions are provided within the SPG.

2.3.12 Developments that do not exceed these benchmarks (considered separately) will be considered to be 'air quality neutral', whilst developments that exceed the benchmarks after appropriate on-site mitigation measures have been incorporated will be required to off-set any excess in emissions off site. This can be achieved by providing NO_x and PM abatement measures in the vicinity of the development, such as: green planting/walls and screens, with special consideration given to planting that absorbs or supresses pollutants; upgrade or abatement work to combustion plant; retro-fitting abatement technology for vehicles and flues; and exposure reduction. These measures can be secured by condition or Section 106 contribution. Air quality monitoring is not eligible for funding as it is not considered to contribute to actual air quality improvements.

AIR QUALITY NEUTRAL PLANNING SUPPORT GUIDANCE

2.3.13 The Air Quality Neutral Planning Support guidance[22] provides a methodology for assessing the air quality neutrality of Proposed Developments in London.

[22] AQC and ENVIRON UK Ltd (2014). Air Quality Neutral Planning Support.

3 SCOPE & METHODOLOGY

3.1 SCOPE

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

- Consultation with the Environmental Health Officer (EHO) at LBC to agree the scope of the assessment and the methodology to be applied[23];
- Review of air quality information and data for the local area as published by LBC[24], Defra[25], the Environment Agency (EA)[26], London Air (Kings College London)[27] and the GLA's London Atmospheric Emissions Inventory (LAEI)[28];
- A desk study to confirm the locations of sensitive nearby existing receptors that may be sensitive to changes in air quality, and a review of the plans for the Proposed Development to establish the location of new sensitive receptors;
- Review of the Transport Assessment undertaken by Transport Planning Practice (TPP); and
- Review of the Sustainability and Energy statement undertaken by MTT Consulting.

3.1.2 The scope includes assessment of air quality impacts at existing receptors resulting from:

- Dust and particulate matter generated by on-site activities during the construction phase; and
- Exhaust emissions from construction traffic and non-road mobile machinery (NRMM).

3.1.3 The potential exposure of future users of the Proposed Development to poor air quality is also considered.

3.2 METHODOLOGY

CONSTRUCTION PHASE

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

3.2.2 The smaller particles of dust (less than 10µm in aerodynamic diameter) are known as particulate matter (PM_{10}) and represent only a small proportion of total dust released; this includes a finer fraction, known as $PM_{2.5}$ (with an aerodynamic diameter less than 2.5µm). As these particles are

[23] Email correspondence with Ana Lopez (LBC Sustainability Officer) 10th and 11th October 2016

[24] London Borough of Camden. 2015 Updating and Screening Assessment Report.

[25] DEFRA Local Air Quality Management (LAQM) Support Pages. Available at: http://laqm.defra.gov.uk/. Accessed on 13/10/2016

[26] Environment Agency. http://maps.environment-agency.gov.uk. Accessed on 13/10/2016.

[27] London Air Website. Available at: http://www.londonair.org.uk/LondonAir/Default.aspx. Accessed on 13/10/2016.

[28] London Atmospheric Emissions Inventory (LAEI). Available at: https://data.london.gov.uk/dataset/london-atmospheric-emissions-inventory-2013. Accessed 13/10/2016.

at the smaller end of the size range of dust particles they remain suspended in the atmosphere for a longer period of time than the larger dust particles, and can therefore be transported by wind over a wider area. PM_{10} and $PM_{2.5}$ are small enough to be drawn into the lungs during breathing, which in sensitive members of the public could have a potential impact on health.

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

3.2.4 The IAQM methodology assesses the risk of potential dust and PM_{10} impacts from the following four sources: demolition; earthworks; general construction activities and track-out. It takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM_{10} levels to assign a level of risk. Risks are described in terms of there being a low, medium or high risk of dust impacts. Once the level of risk has been ascertained, then site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined. A summary of the IAQM assessment methodology is provided in **Appendix C**.

3.2.5 In addition to impacts on local air quality due to on-site construction activities, exhaust emissions from construction vehicles and plant may have an impact on local air quality adjacent to the routes used by these vehicles to access the Application Site and in the vicinity of the Application Site itself. As information on the number of vehicles and plant associated with the construction phase was not available at the time of writing, a qualitative assessment of their impact on local air quality has been undertaken using professional judgement and by considering the following:

- The number and type of construction traffic and plant likely to be generated by this phase of the Development;
- The number and proximity of sensitive receptors to the Application Site and along the likely routes to be used by construction vehicles; and
- The likely duration of the construction phase and the nature of the construction activities undertaken.

OPERATIONAL PHASE

3.2.6 Following consultation with the Transport Consultant (TPP) and a review of the Transport Assessment it was determined that the Proposed Development would not breach the indicative criteria for requiring an air quality assessment as given Table 6.2 of the EPUK and IAQM Planning Guidance. A detailed road traffic assessment has been scoped out.

3.2.7 Furthermore, following consultation with the Sustainability and Energy Consultant (MTT) and a review of the Sustainability and Energy Statement it has been confirmed that the Proposed Development does not include gas fired boilers, a Combined Heat and Power (CHP) unit or diesel fired back-up generators. An assessment of energy centre emissions has been scoped out.

SELECTION OF SENSITIVE RECEPTORS

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

CONSTRUCTION PHASE

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

3.3 SIGNIFICANCE CRITERIA

CONSTRUCTION PHASE

3.3.1 The IAQM assessment methodology recommends that significance criteria is only assigned to the identified risk of dust impacts occurring from a construction activity with appropriate mitigation measures in place. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.

3.3.2 For the assessment of the impact of exhaust emissions from plant used on-site and construction vehicles accessing and leaving the Site on local concentrations of NO_2 and particulate matter, the significance of residual effects have been determined using professional judgement and the principles outlined in the EPUK/IAQM guidance, which are described below.

AIR QUALITY NEUTRAL POLICY

3.3.3 The air quality neutral assessment follows GLA guidance. This sets out NO_x and PM_{10} building and transport emissions benchmarks for different land use classes. The relevant benchmarks are given in **Table 1**. The Proposed Development does not include any combustion plant, therefore there will be no building emissions and this aspect is scoped out.

Table 1: Emission Benchmarks

LAND USE CLASS	BENCHMARK CATEGORY	NO_x BENCHMARK	PM_{10} BENCHMARK
A1	Transport Emissions	27.6	4.9
B1		44.1	7.9

3.3.4 The annual development trips by land use class are presented in **Table 2** below:

Table 2: Parameters used in the Air Quality Neutral Assessment

LAND USE CLASS	ANNUAL TWO-WAY TRIPS
A1	1,830
B1	20,435

3.3.5 For transport, total benchmarked values are calculated according to gross floor areas and number of residential dwellings (**Table 2**). The GLA guidance gives emissions benchmarks for use classes A1, B1 and C3. Annual vehicle emissions of NO_x and PM_{10} are then determined according to the number of trips expected for each use class (**Table 2**). If annual emissions do not exceed the total benchmarked values the development can be deemed to be air quality neutral. Conversely, if the total benchmarked values are exceeded then the development is not air quality

neutral and direct or indirect (offsetting) mitigation is required.

3.3.6 The total benchmarked values for transport emissions of NO_x and PM_{10} are given in **Table 3**.

Table 3 – Total Benchmarked Values for Transport Emissions

CATEGORY	NO_x (KG/ANNUM)	PM_{10} (KG/ANNUM)
Transport Emissions	71.7	12.9

3.4 LIMITATIONS & ASSUMPTIONS

CONSTRUCTION STAGE

3.4.1 Assumptions have been made regarding the material volume and type at each stage of construction based on professional judgement.

OPERATIONAL STAGE

3.4.2 The traffic information provided by the Transport Consultant is accurate and the requirement for a detailed road traffic assessment is not required.

4 BASELINE CONDITIONS

4.1 LBC'S REVIEW & ASSESSMENT OF AIR QUALITY

4.1.1 LBC has designated the whole borough an Air Quality Management Area (AQMA) for exceedances of the long term objective for NO_2 and the short and long term objectives for PM_{10} as a consequence of their Review and Assessment work.

4.1.2 LBC published its Clean air Action Plan (CAAP) in 2016. This details a number of measures proposed to improve ambient air quality within the borough and outlines a number of measures aimed at reducing NO_2, PM_{10} and $PM_{2.5}$ emissions. These measures include:

- Monitoring Air Quality;
- Reducing emissions from buildings and new developments;
- Reducing emissions from transport;
- Raising awareness of air quality; and
- Lobbying and partnership working.

4.2 LOCAL EMISSION SOURCES

4.2.1 The Application Site is located in an area where air quality is mainly influenced by emissions from road transport using Spring Place and Grafton Road. However, running directly through the centre of Application Site is the London Overground railway line, which has the potential to be a source of emission if any diesel powered locomotives operate on the line.

4.2.2 Located to the north of the Application Site is an existing industrial building which is understood to be associated with Veolia Environmental Services. It is unclear what this building is used for; however there is a number of flue stacks located at roof level, and therefore this is considered as a potential emission source. Given the location of this industrial building (upwind of the Proposed Development) and the nature of the proposals, it is unlikely that there would be any significant impact at the Application Site.

4.2.3 **Appendix D** illustrates estimated emissions taken from the LAEI for 2013, 2020, 2025 and 2030 for each emission source in LBC. The LAEI forecasts that total estimated NO_x; PM_{10} and $PM_{2.5}$ emissions will fall after 2020.

4.3 BACKGROUND AIR QUALITY DATA

4.3.1 **Table 4** summarises the 2015 Defra modelled background NO_2, PM_{10} and $PM_{2.5}$ concentrations in the vicinity of the Proposed Development site. The annual mean background concentrations of all three air pollutants are well below the relevant Air Quality Standard objectives.

Table 4: Defra Modelled Background Concentrations (µg/m^3) for 2015

GRID SQUARE (CENTRE ON O.S. GRID REFERENCE)	NO_2 (µg/m^3)	PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)
528500, 185500	31.8	19.2	13.8

4.4 LOCAL AUTHORITY AIR QUALITY MONITORING DATA

4.4.1 There are currently four continuous air quality air quality monitoring stations operational in the LBC area. **Table 5** and **Table 6** present summaries of the NO_2 and PM_{10} statistics (respectively) for these locations.

4.4.2 The first monitor (London Bloomsbury) is classified as an urban background location, the second (Swiss Cottage) - kerbside, and the third and fourth (Shaftsbury Avenue and Euston Road) are classified as roadside locations.

Table 5: Local Authority Air Quality Automatic Monitoring Data (NO_2)

Site Name	Site Type	Annual Mean NO_2 Concentration ($\mu g/m^3$)*				
		2010	2011	2012	2013	2014
LB: London Bloomsbury	Urban Background	**55**	**50**	**55**	**44**	**45**
CD1 Swiss Cottage	Kerbside	**82**	**71**	**70**	**63**	**66**
CD3: Shaftesbury Avenue	Roadside	**89**	**76**	**71**	**74**	**69**
CD9: Euston Road	Roadside	**-**	**122**	**106**	**106**	**98**

* London Borough of Camden 2015 Updating and Screening Assessment.
****Bold indicates exceedance AQS Objective for NO_2**

Table 6: Local Authority Air Quality Automatic Monitoring Data (PM_{10})

Site Name	Site Type	Annual Mean NO_2 Concentration ($\mu g/m^3$)*				
		2010	2011	2012	2013	2014
LB: London Bloomsbury	Urban Background	18	22	19	18	20
CD1 Swiss Cottage	Kerbside	26	27	23	21	22
CD3: Shaftesbury Avenue	Roadside	29	32	29	29	25
CD9: Euston Road	Roadside	-	-	-	-	29

* London Borough of Camden 2015 Updating and Screening Assessment.

4.4.3 Trend analysis has been undertaken for both NO_2 and PM_{10} measured at both monitoring locations. For NO_2 between 2010 and 2014 the data indicates a reduction in measured concentrations.

4.4.4 The results from the urban background site at London Bloomsbury indicate that the annual mean NO_2 concentrations are above the annual mean objective of $40\mu g/m^3$.

4.4.5 There are no exceedances of the annual mean PM_{10} objective between 2010 and 2014, at any monitoring location.

4.4.6 In addition to the measurements from the four automatic air quality monitoring stations, fourteen NO_2 diffusion tubes are have been located throughout the LBB area. The data from 2010-2014 are presented in **Table 7**.

Table 7: Local Authority NO_2 Diffusion Tube Data

Site Name	Site Type	Annual Mean NO_2 Concentration ($\mu g/m^3$)*				
		2010	2011	2012	2013	2014
Euston Road	Roadside	**82**	**93.1**	**82**	**107.7**	**89.7**
Wakefield Gardens	Urban Background	**3**4	**45.6**	39.2	**40.3**	**36.4**
Frognal Way	Urban Background	29	31.4	28.8	31.9	28.5
Tavistock Gardens	Urban Background	**52**	**47.5**	**40.1**	**49.3**	**46.5**
Tottenham Court Road	Kerbside	**92**	**91.6**	**83.3**	**88**	**86.7**
Swiss Cottage	Kerbside	**71**	**73.1**	**72.6**	**83**	**74.3**
Kentish Town Road	Roadside	**74**	**57.1**	**58.9**	**65.3**	**57.8**
47 Fitzjohn's Road	Roadside	**73**	**58.3**	**61.2**	**65.2**	**60.3**
Brill Place	Roadside	**54**	**50.7**	**50**	**49.3**	**52.3**
Bloomsbury Street	Roadside	**41**	**76.7**	**71.6**	**76**	**80.8**
Camden Road	Roadside	**84**	**72.2**	**67.4**	**77.8**	**72.2**
Chetwynd Road	Roadside	**68**	**44.1**	**43.6**	**47.7**	**44.7**
Emmanuel Primary	Roadside	**-**	**41.5**	**45.9**	**57.9**	**48.3**
Wittanhurst Lane	Roadside	**-**	**-**	**-**	**53.1**	**48.2**

* Review and Assessment of air Quality. Updating and Screening Assessment 2015. Action Plan Progress Report
****Bold indicates exceedance AQS Objective for NO_2**

4.4.7 The diffusion tube data collected between 2010 and 2014 indicates that a number roadside and urban centre monitoring locations exceeded the annual mean air quality objective of 40µg/m^3. Elevated NO_2 concentrations are expected at these types of locations.

4.4.8 Monitoring location Kentish Town Road is closest monitoring site to the Proposed Development site (approximately 0.5km to the east) and the data collected indicates NO_2 concentrations in 2014 are above the AQS objective. This monitoring site is shown in relation to the Proposed Development site in **Figure 1**

4.4.9 Trend analysis of the 2010-14 diffusion tube data shows no significant trend.

4.5 LAEI MODELLED CONCENTRATIONS

4.5.1 The LAEI provides modelled estimates for the whole of London for 2013, 2020, 2025 and 2030. The dataset provides an indication of baseline concentrations which incorporates background concentrations and existing pollution sources. The estimated baseline concentrations for NO_2, PM_{10} and $PM_{2.5}$ for 2013 and 2020 at ground level in vicinity of the Application Site are illustrated in **Figure 2** to **Figure 7**.

4.5.2 **Figure 2** shows the 2013 LAEI modelled baseline NO_2 concentrations in the vicinity of the Proposed Development site are in excess of 40µg/m^3 and therefore exceed the NO_2 AQS Objective.

4.5.3 **Figures 3** and **4** indicate that in 2013 LAEI modelled baseline PM_{10} and $PM_{2.5}$ are generally below 30µg/m^3 and 17µg/m^3, respectively; and therefore well below the AQS objectives.

4.5.4 **Figures 5, 6** and **7** indicate that in 2020 within the Application Site concentrations of NO_2, PM_{10} and $PM_{2.5}$ are generally below 40µg/m^3, 24µg/m^3 and 15µg/m^3, respectively, and therefore below the AQS objectives.

4.5.5 **Figures 8** and **9** indicate that in the 2013 and 2020 LAEI modelled baseline NO_2 concentrations are well below 60µg/m^3. Therefore, it is unlikely that the short term AQS objective would be breached.

4.6 SUMMARY

4.6.1 Across LBC, exceedances of the NO_2 AQS objective are measured at kerbside, roadside and urban background locations. All four automatic monitors and a large number of roadside diffusion tube locations exceed the AQS objective of 40µg/m^3 year on year. However, measured data from the automatic monitors between 2010 and 2014 indicate improvements in NO_2 concentrations.

4.6.2 Concentrations of PM_{10} are well below the AQS objective of 40µg/m^3 at all monitoring locations.

4.6.3 Based on the LAEI baseline data provided by the GLA for 2013 and 2020, concentrations of NO_2, PM_{10} and $PM_{2.5}$ within the Application Site are generally below the AQS objectives, with the exception of NO_2 in 2013 which is predicted to exceed 40µg/m^3.

4.6.4 Furthermore, based on the 2013 and 2020 LAEI modelled baseline data it is unlikely that the short term AQS objective would be breached in 2013 and 2020

5 ASSESSMENT OF IMPACTS

5.1 CONSTRUCTION PHASE

DUST AND PM_{10} ARISING FROM ON-SITE ACTIVITIES

5.1.1 Construction activities that have the potential to generate and/or re-suspend dust and PM_{10}. include:

- Site clearance and preparation including demolition activities;
- Preparation of temporary access/egress to the Application Site and haulage routes;
- Earthworks;
- Materials handling, storage, stockpiling, spillage and disposal;
- Movement of vehicles and construction traffic within the Application Site (including excavators and dumper trucks);
- Use of crushing and screening equipment/plant;
- Exhaust emissions from site plant, especially when used at the extremes of their capacity and during mechanical breakdown;
- Construction of buildings, roads and areas of hardstanding alongside fabrication processes;
- Internal and external finishing and refurbishment; and
- Site landscaping after completion.

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

ASSESSMENT OF POTENTIAL DUST EMISSION MAGNITUDE

5.1.3 The IAQM assessment methodology has been used to determine the potential dust emission magnitude for the following four different dust and PM_{10} sources: demolition; earthworks; construction; and, trackout. The findings of the assessment are presented below.

DEMOLITION

5.1.4 Total volume of buildings to be demolished on site is estimated to be between 20,000m^3 and 50,000m^3, with potentially dusty construction material, and with demolition activities occurring up to 10m above ground level. Therefore, the potential dust emission magnitude is considered to be **medium** for demolition activities.

EARTHWORKS

5.1.5 The total area of the Application Site is approximately 4,000m^2, which falls within the IAQM range for medium sites (2,500 to 10,000m^2), the soil type is assumed to be moderately dusty. It is also estimated that between 5 and 10 heavy earth moving vehicles will be active at any one time. Therefore, the potential dust emission magnitude is considered to be **medium** for earthwork activities.

CONSTRUCTION

5.1.6 The total volume of buildings to be constructed on the Application Site will be between 25,000m^3 and 100,000m^3 with potentially dusty construction materials being used. Therefore, the potential dust emission magnitude is considered to be **medium** for construction activities.

TRACKOUT

5.1.7 Based on the traffic information provided by TTP, there will be between 10 and 50 HDV (>3.5t) outward movements in any one day travelling on moderately dusty surface materials. Due to the size of the site, it is also assumed that the length of unpaved roads within Application Site will be less than 50m. Therefore, the potential dust emission magnitude is considered to be **medium** for trackout.

5.1.8 **Table 8** provides a summary of the potential dust emission magnitude determined for each construction activity considered.

Table 8: Potential Dust Emission Magnitude

ACTIVITY	DUST EMISSION MAGNITUDE
Demolition	Medium
Earthworks	Medium
Construction Activities	Medium
Trackout	Medium

ASSESSMENT OF SENSITIVITY OF THE STUDY AREA

5.1.9 A windrose generated using the 2015 meteorological data from London City Airport, which is considered the most representative site in relation to the Proposed Development, is provided in **Appendix E.** This shows that the prevailing wind direction is from the southwest, which is typical for the UK as a whole. Therefore, receptors located to northeast of the Site are more likely to be affected by dust and particulate matter emitted and re-suspended during the construction stage of the Proposed Development.

5.1.10 Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source. In the vicinity of the Proposed Development, there a number of highly sensitive receptors, including existing residential units to the north (within 20m), south east and south west, plus a number of less sensitive receptors such as office space in the immediate vicinity.

5.1.11 It is anticipated that the main construction route would be along Spring Place, Grafton Street and Holmes Road, given that there are a small number of existing residential units along this road there is potential for trackout activities to have a potential impact. Given the distance to the closest highly sensitive receptors and the background PM_{10} concentrations (19.2µg/m^3), the area is considered to be of low sensitivity.

5.1.12 Taking the above into account and following the IAQM assessment methodology, the sensitivity of the area to changes in dust and PM_{10} has been derived for each of the construction activities considered. The results are shown in **Table 9**.

Table 9: Sensitivity of the Study Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Low	Low	Low	Low
Ecological	N/A	N/A	N/A	N/A

RISK OF IMPACTS

5.1.13 The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. **Table 10** below provides a summary of the risk of dust impacts for the Proposed Development. The risk category identified for each construction activity has been used to determine the level of mitigation required.

Table 10: Summary Dust Risk Table to Define Site Specific Mitigation

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

5.1.14 Based on the criteria detailed in the Mayor of London's SPG for the control of dust and emissions during construction and demolition the Application Site would be categorised as medium risk.

CONSTRUCTION VEHICLES & PLANT

5.1.15 The greatest impact on air quality due to emissions from vehicles and plant associated with the construction phase will be in the areas immediately adjacent to the site access. It is anticipated that construction traffic will access the site via Spring Place, Grafton Street and Holmes Road.

5.1.16 Final details of the exact plant and equipment likely to be used on Application Site will be determined by the appointed contractor, it is considered likely to comprise dump trucks, tracked excavators, diesel generators, compressors, piling rigs and cranes. The number of plant and their location within the Application Site are likely to be variable over the construction period.

5.1.17 Based on the current local air quality in the area, the proximity of sensitive receptors to the roads likely to be used by construction vehicles, and the likely numbers of construction vehicles and plant that will be used, the impacts are therefore considered to be of **slight adverse** significance according to the significance criteria published by EPUK/IAQM (May 2015) without the implementation of appropriate mitigation.

AIR QUALITY NEUTRAL ASSESSMENT

5.1.18 Performance against the TEB policy standards was found to be compliant in respect of NO_x and PM_{10}. A summary of the findings of this assessment are presented in **Table 11**.

Table 11: Summary of Air Quality Neutral Assessments

CATEGORY	PARAMETER	NO_X (kg/annum)	PM_{10} (kg/annum)
Transport Emissions	Benchmark	71.7	12.9
	Proposed Development	62.2	11.2
	Category Difference	**-9.5**	**-1.7**

5.1.19 Taking into account the transport emissions, the development is ‘air quality neutral’.

6 MITIGATION & RESIDUAL EFFECTS

6.1 CONSTRUCTION PHASE

6.1.1 Based on the assessment results, mitigation will be required. Recommended mitigation measures are given below.

GENERAL COMMUNICATION

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

GENERAL DUST MANAGEMENT

- A Dust Management Plan (DMP), which may include measures to control other emissions, in addition to the dust and PM_{10} mitigation measures given in this report, should be developed and implemented, and approved by the Local Authority. In London, additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include a requirement for monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.

SITE MANAGEMENT

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

MONITORING

- Regular site inspections to monitor compliance with the DMP should be carried out, inspection results recorded, and an inspection log made available to the local authority when asked.
- The frequency of site inspections should be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations should be agreed with the Local Authority. Where possible baseline monitoring should start at least three months before work commences on site or, if it a large site, before work on a phase commences.

PREPARING AND MAINTAINING THE SITE

- Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Where practicable, erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Where practicable, fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.

- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover appropriately.
- Where practicable, cover, seed or fence stockpiles to prevent wind whipping.

OPERATING VEHICLE/MACHINERY AND SUSTAINABLE TRAVEL

- Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable. Standards to be adhered to at all times unless manoeuvring within the existing road system requires a specific vehicle.
- Ensure all vehicle operators switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- A Construction Logistics Plan should be produced to manage the sustainable delivery of goods and materials.
- A Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing) should be considered.

OPERATIONS

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

WASTE MANAGEMENT

- Avoid bonfires and burning of waste materials.

MEASURES SPECIFIC TO DEMOLITION

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
- Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.)

MEASURES SPECIFIC TO EARTHWORKS

- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.

- Where practicable, only remove the cover in small areas during work and not all at once.
- Stockpile surface areas should be minimised (subject to health and safety and visual constraints regarding slope gradients and visual intrusion) to reduce area of surfaces exposed to wind pick-up.
- Where practicable, windbreak netting/screening should be positioned around material stockpiles and vehicle loading/unloading areas, as well as exposed excavation and material handling operations, to provide a physical barrier between the Application Site and the surroundings.
- Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive properties, taking account of the prevailing wind direction.
- During dry or windy weather, material stockpiles and exposed surfaces should be dampened down using a water spray to minimise the potential for wind pick-up.

MEASURES SPECIFIC TO CONSTRUCTION

- Avoid scabbling (roughening of concrete surfaces) if possible.
- 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.
- 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.
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
- All construction plant and equipment should be maintained in good working order and not left running when not in use.

MEASURES SPECIFIC TO TRACKOUT

- 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 in frequent use.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Where practicable, hard surfaced haul routes should be installed, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10m from receptors where possible.

RESIDUAL EFFECTS

6.1.2 The residual effects due to dust and particulates generated by construction activities following the application of the mitigation measures described above and good site practice are **not significant**.

6.1.3 The residual effects due to emissions to air from construction vehicles and plant on local air quality are **not significant**.

6.2 OPERATIONAL PHASE

MITIGATION

6.2.1 According to the GLA's LAEI model, future NO_2 concentrations will be below 40µg/m^3 in the vicinity of the Proposed Development therefore no mitigation should be required.

7 CONCLUSIONS

7.1.1 A qualitative assessment of the potential impacts on local air quality from construction activities has been carried out for this phase of the Proposed Development using the IAQM methodology. This identified that there is a Low Risk of dust soiling impacts and a Medium Risk of increases in particulate matter concentrations due to construction activities. Through good site practice and the implementation of suitable mitigation measures, the effect of dust and particulate releases would be significantly reduced. The residual effects due to dust and particulates generated by construction activities on air quality are **not significant**. The residual effects due to emissions to air from construction vehicles and plant on local air quality are **not significant**.

7.1.2 Across the borough, exceedances of the annual mean NO_2 AQS objective have been experienced at kerbside, roadside and urban background locations in recent years. However, monitoring between 2010 and 2014 indicate improvements in NO_2 concentrations. Annual mean concentrations of PM_{10} are well below the AQS objective of 40µg/m^3 at all monitoring locations.

7.1.3 According to the GLA's LAEI model, future NO_2 concentrations will be below 40µg/m^3 in the vicinity of the Proposed Development therefore, it is unlikely that both the short and long term AQS objective would be breached, therefore no mitigation should be required.

7.1.4 The Proposed Development has been assessed as air quality neutral.

7.1.5 The Proposed Development complies with national and local air quality policy.

FIGURES & APPENDICES

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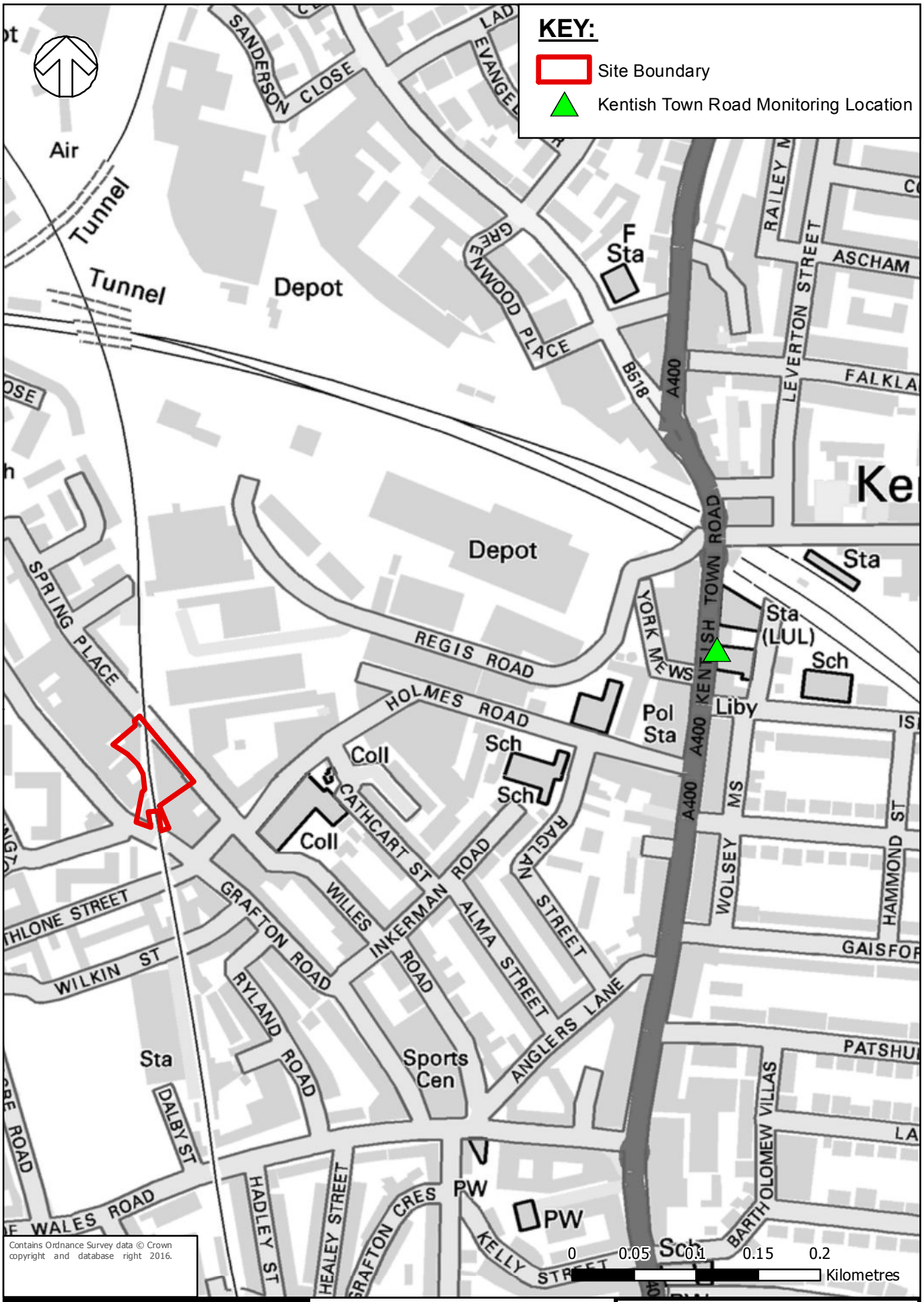

WSP | PARSONS BRINCKERHOFF

TITLE:

3-6 SPRING PLACE, CAMDEN

FIGURE No:

FIGURE 1 - LOCAL AUTHORITY MONITORING LOCATION

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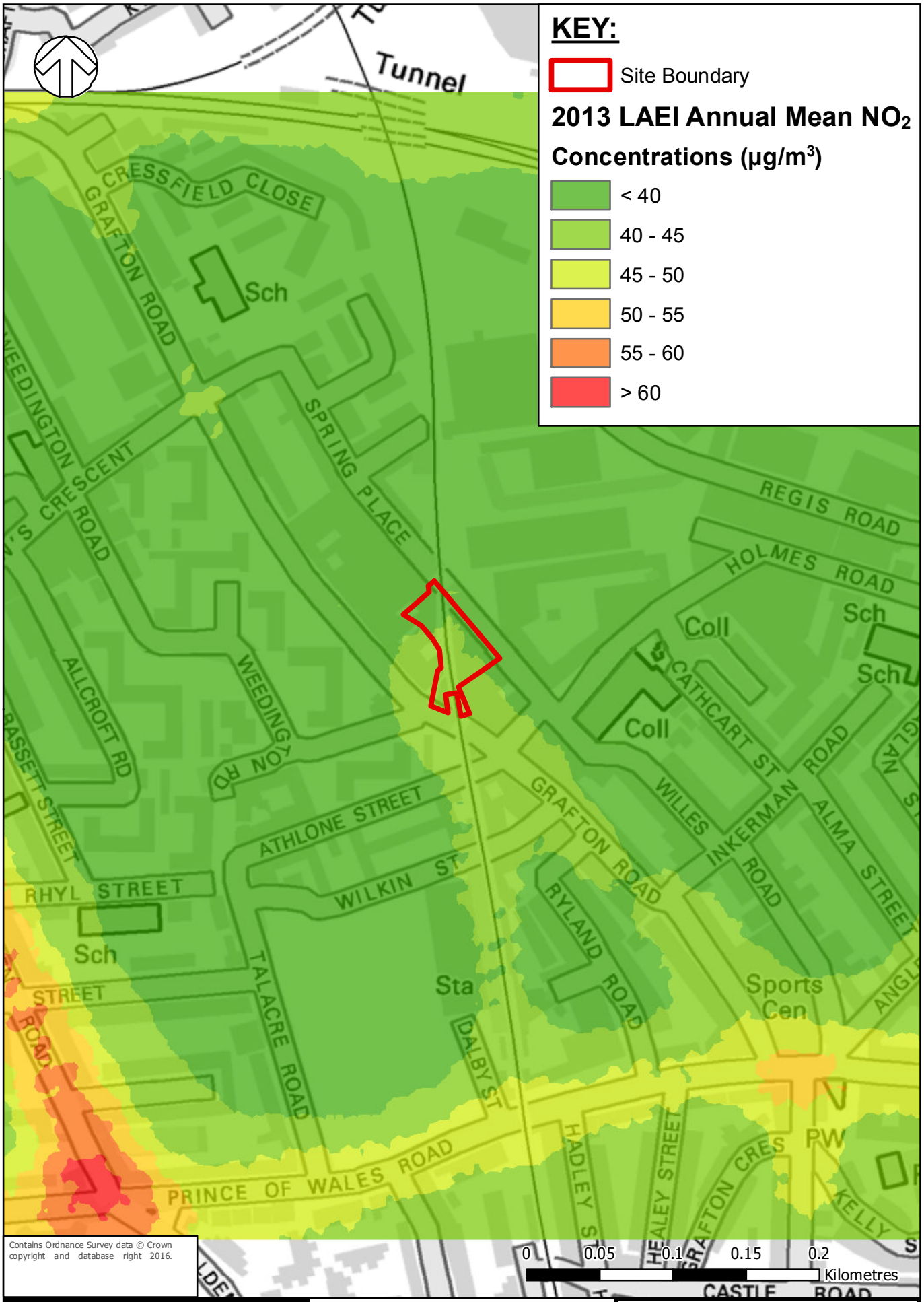

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TITLE:

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FIGURE No:

FIGURE 2 - 2013 LAEI ANNUAL MEAN NO_2 CONCENTRATIONS (µG/M^3)

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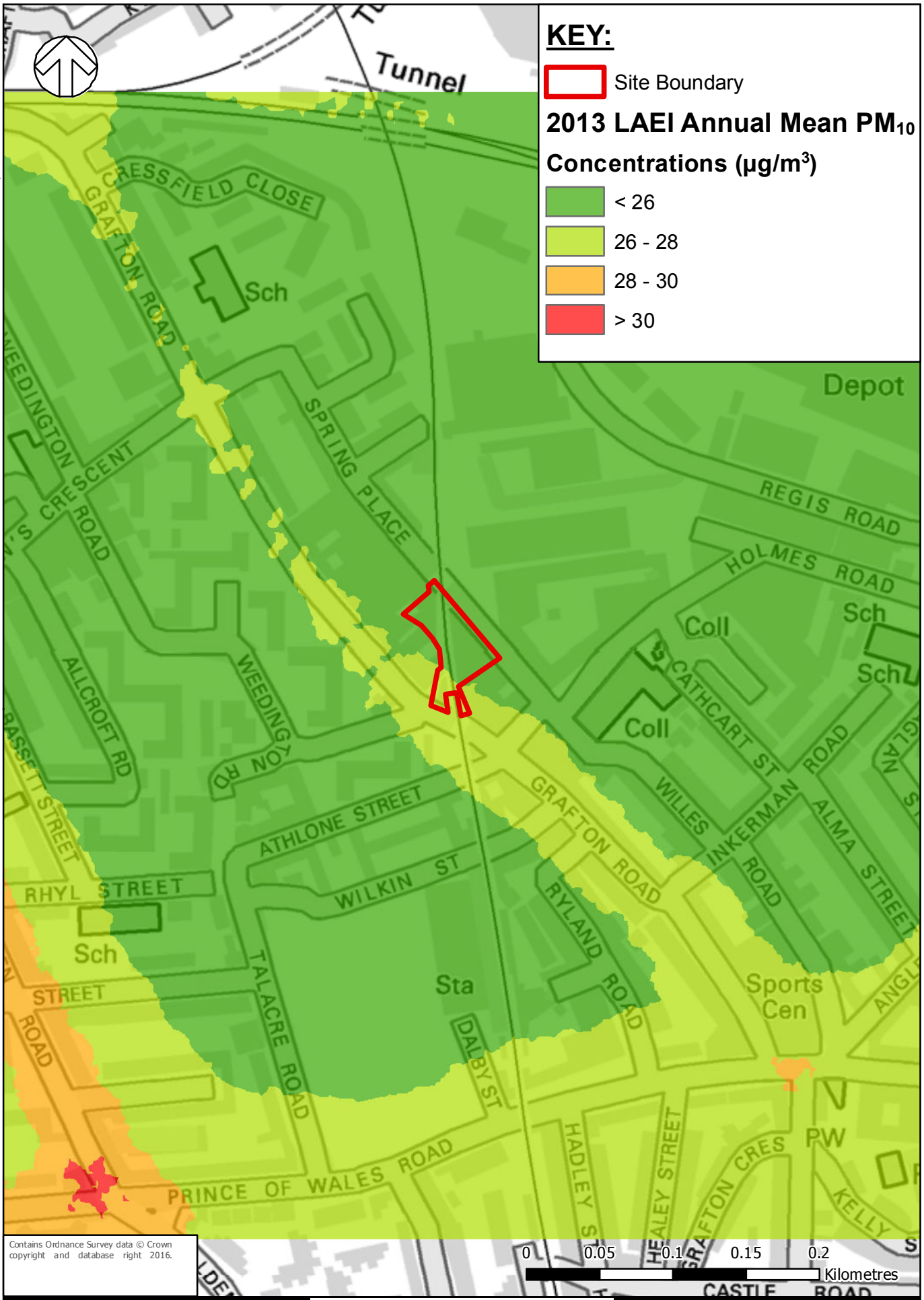

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FIGURE No:

FIGURE 3 - 2013 LAEI ANNUAL MEAN PM_{10} CONCENTRATIONS (µG/M^3)

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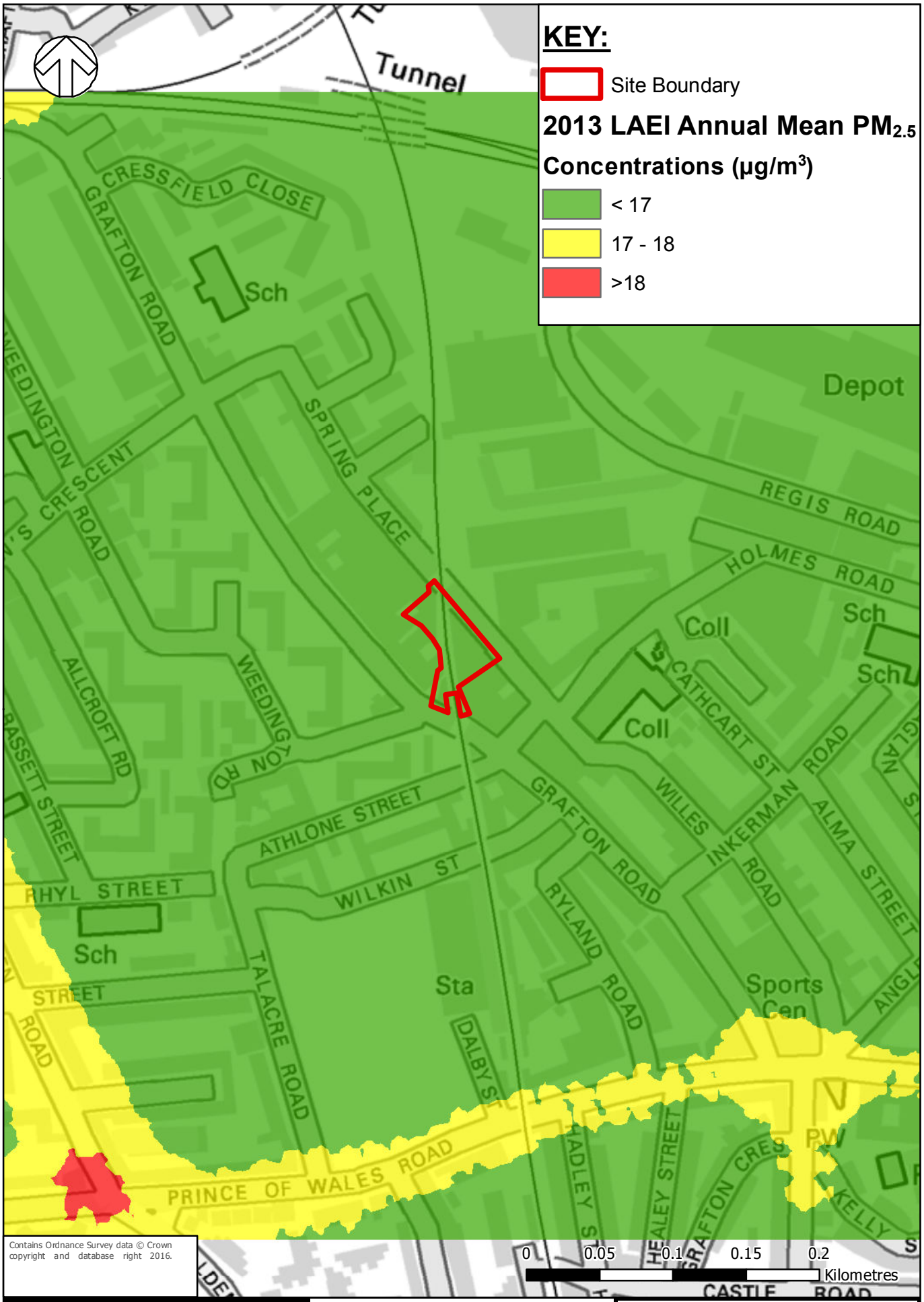

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3-6 SPRING PLACE, CAMDEN

FIGURE No:

FIGURE 4 - 2013 LAEI ANNUAL MEAN PM_{25} CONCENTRATIONS (µG/M^3)

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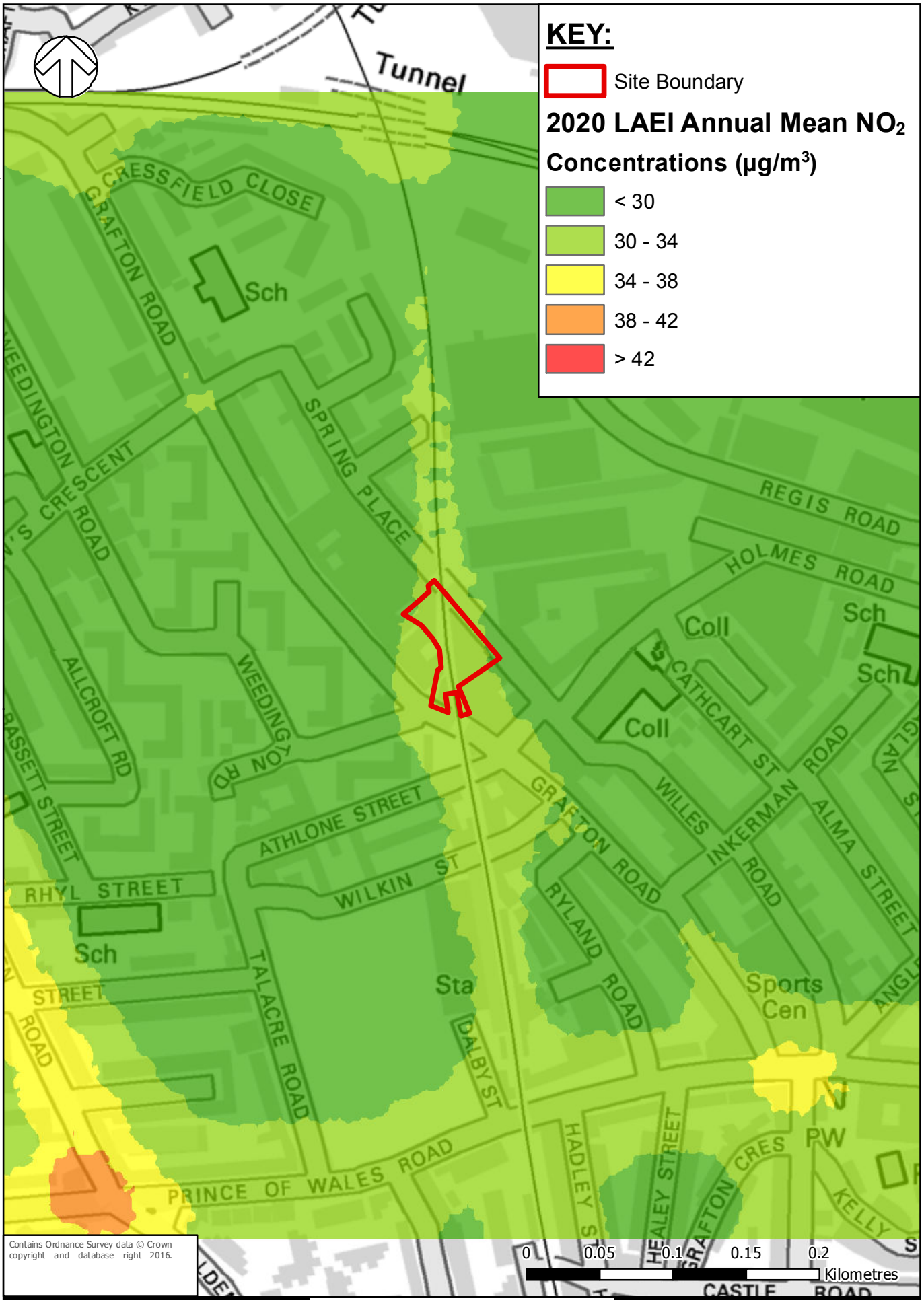

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3-6 SPRING PLACE, CAMDEN

FIGURE No:

FIGURE 5 - 2020 LAEI ANNUAL MEAN NO_2 CONCENTRATIONS (µG/M^3)

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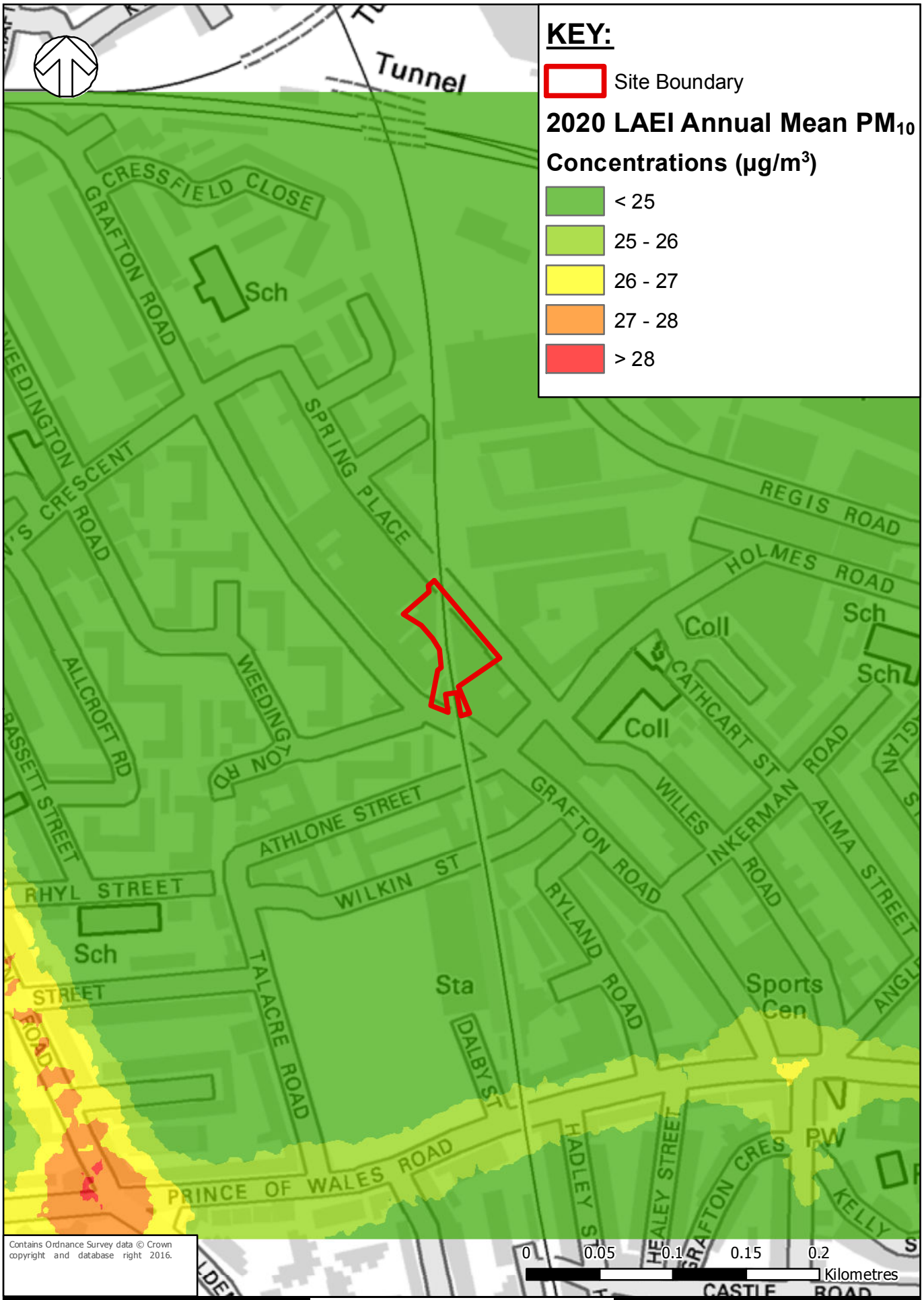

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TITLE:

3-6 SPRING PLACE, CAMDEN

FIGURE No:

FIGURE 6 - 2020 LAEI ANNUAL MEAN PM_{10} CONCENTRATIONS (µG/M^3)

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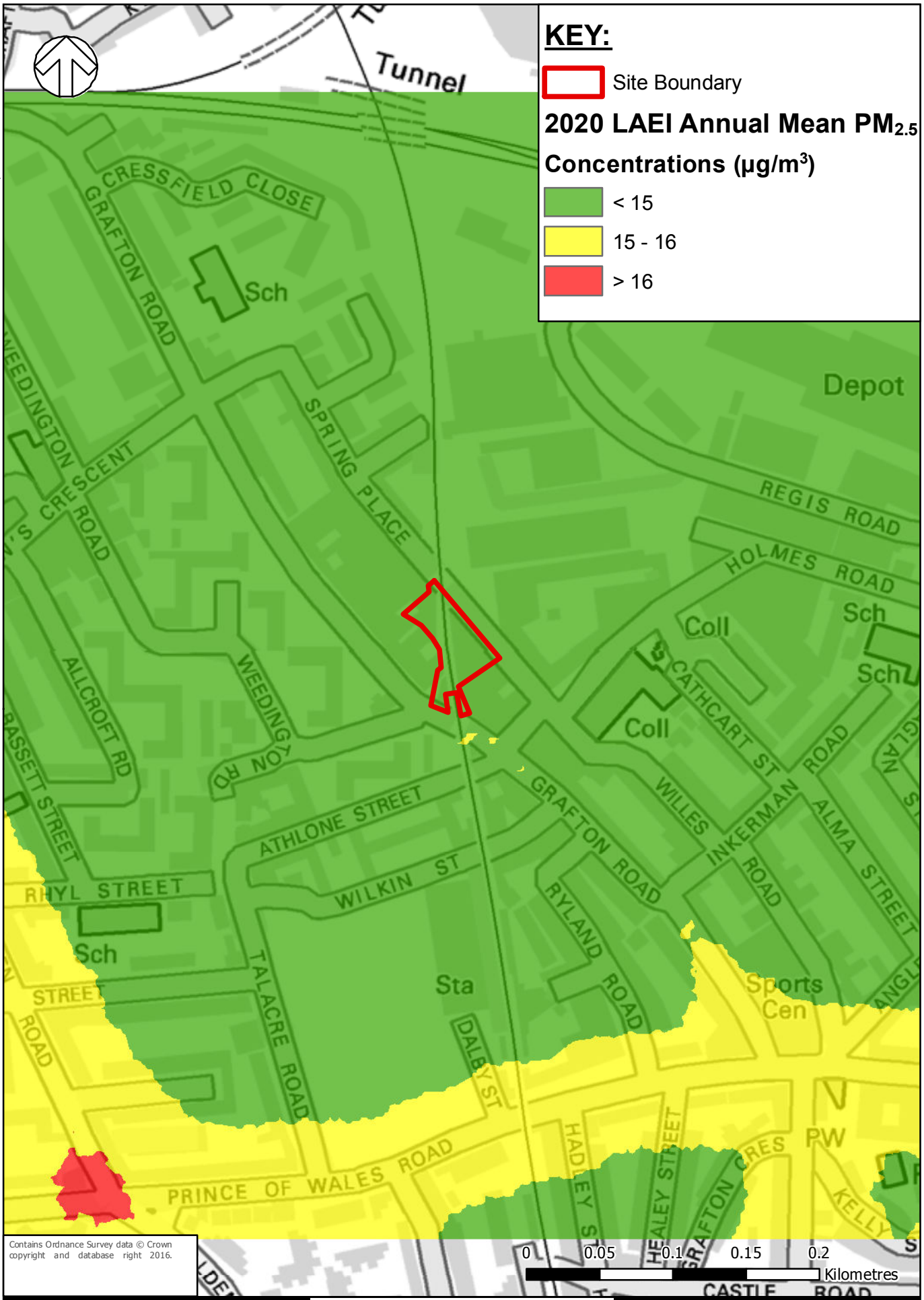

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TITLE:

3-6 SPRING PLACE, CAMDEN

FIGURE No:

FIGURE 7 - 2020 LAEI ANNUAL MEAN PM_{25} CONCENTRATIONS (µG/M^3)

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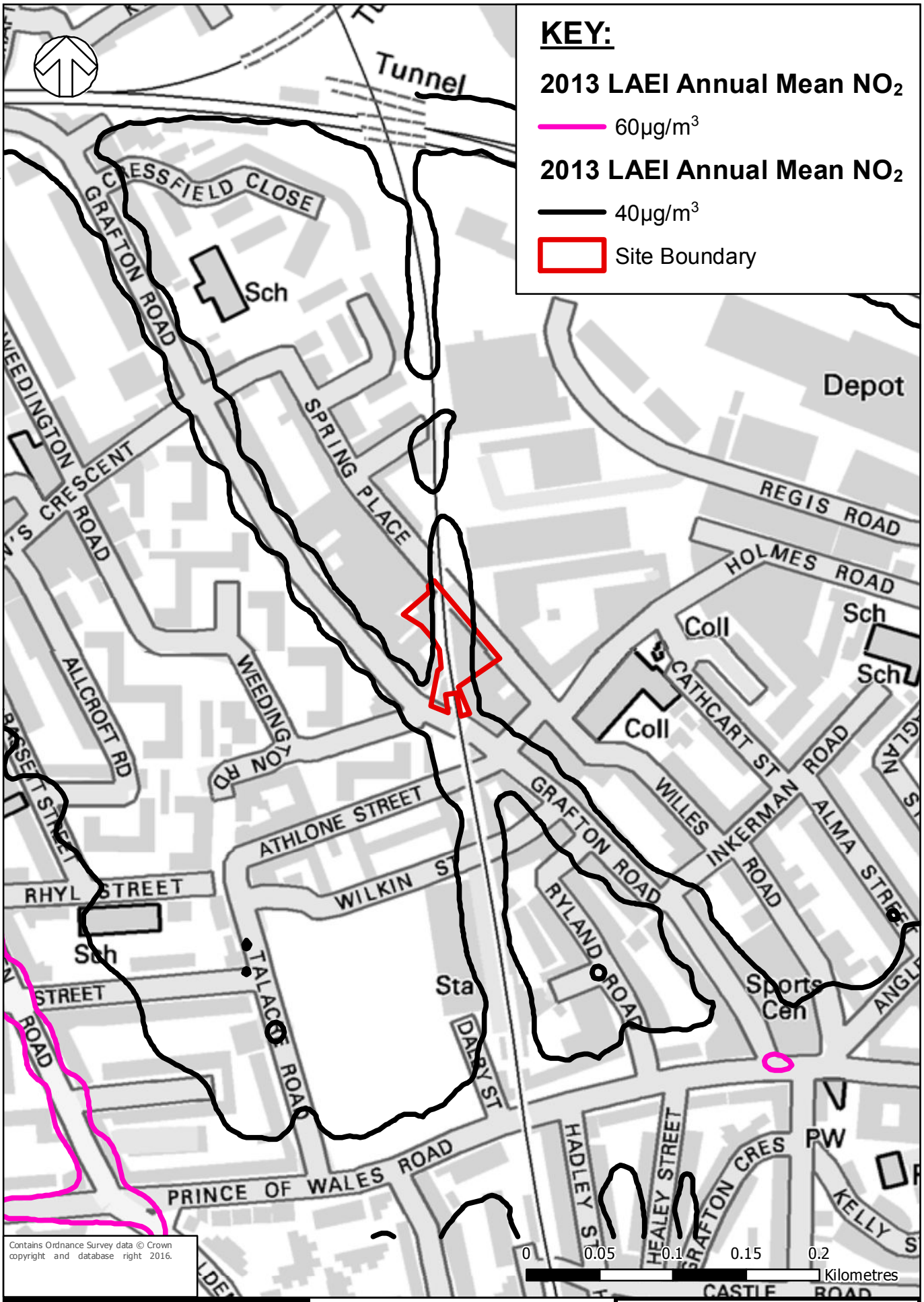

WSP | PARSONS BRINCKERHOFF

TITLE:

3-6 SPRING PLACE, CAMDEN

FIGURE No:

FIGURE 8 - 2013 LAEI ANNUAL MEAN NO_2 CONCENTRATIONS (µG/M^3) EXCEEDANCE CONTOUR PLOT

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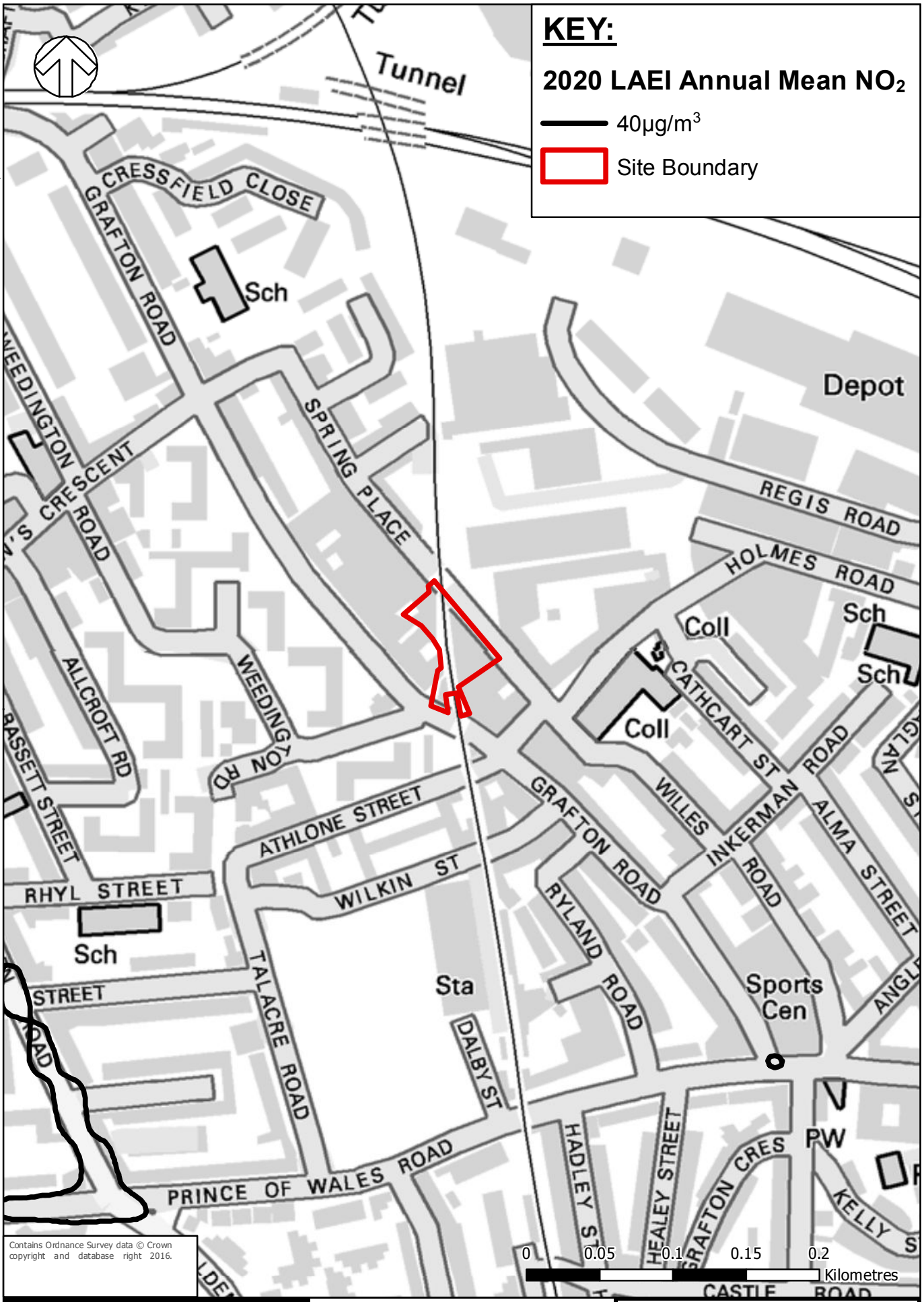

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TITLE:

3-6 SPRING PLACE, CAMDEN

FIGURE No:

FIGURE 9 - 2020 LAEI ANNUAL MEAN NO_2 CONCENTRATIONS (µG/M^3) EXCEEDANCE CONTOUR PLOT

Appendix A

GLOSSARY

TERM	DEFINITION
AADT Annual Average Daily Traffic	A daily total traffic flow (24 hrs), expressed as a mean daily flow across all 365 days of the year.
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.
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 micrometres (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.
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 1ug/m^3 means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

Appendix B

RELEVANT UK AIR QUALITY STRATEGY OBJECTIVES

National Air Quality Objectives and European Directive Limit Values for the protection of human health						
Pollutant	Applies to	Objective	Measured as	Date to be achieved by and maintained thereafter	European Obligations	Date to be achieved by and maintained thereafter
Nitrogen dioxide (NO_2)	UK	200µg/m^3 not to be exceeded more than 18 times a year	1 hour mean	31.12.2005	200µg/m^3 not to be exceeded more than 18 times a year	01.01.2010
	UK	40µg/m^3	annual mean	31.12.2005	40µg/m^3	01.01.2010
Particulate Matter (PM_{10}) (gravimetric)[A]	UK (except Scotland)	40µg/m^3	annual mean	31.12.2004	40µg/m^3	01.01.2005
	UK (except Scotland)	50µg/m^3 not to be exceeded more than 35 times a year	24 hour mean	31.12.2004	50µg/m^3 not to be exceeded more than 35 times a year	01.01.2005
Particulate Matter ($PM_{2.5}$)	UK (except Scotland)	25µg/m^3	annual mean	2020	Target value 25µg/m^3	2010

[A] Measured using the European gravimetric transfer sampler or equivalent

µg/m^3 = microgram per cubic metre

Appendix C

IAQM CONSTRUCTION ASSESSMENT METHODOLOGY

STEP 1 – SCREENING THE NEED FOR A DETAILED ASSESSMENT

An assessment will normally be required where there are:

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

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

STEP 2A – DEFINE THE POTENTIAL DUST EMISSION MAGNITUDE

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

Table 2A: Examples of Human Receptor Sensitivity to Construction Phase Impacts

DUST EMISSION MAGNITUDE	ACTIVITY
Large	**Demolition** >50,000m^3 building demolished, dusty material (e.g. concrete), on-site crushing/screening, demolition >20m above ground level
	Earthworks >10,000m^2 site area, dusty soil type (e.g. clay), >10 earth moving vehicles active simultaneously, >8m high bunds formed, >100,000 tonnes material moved
	Construction >100,000m^3 building volume, on site concrete batching, sandblasting
	Trackout >50 HDVs out / day, dusty surface material (e.g. clay), >100m unpaved roads
Medium	**Demolition** 20,000 - 50,000m^3 building demolished, dusty material (e.g. concrete) 10-20m above ground level
	Earthworks 2,500 - 10,000m^2 site area, moderately dusty soil (e.g. silt), 5-10 earth moving vehicles active simultaneously, 4m - 8m high bunds, 20,000 -100,000 tonnes material moved
	Construction 25,000 - 100,000m^3 building volume, dusty material e.g. concrete, on site concrete batching
	Trackout 10 - 50 HDVs out / day, moderately dusty surface material (e.g. clay), 50 -100m unpaved roads
Small	**Demolition** <20,000m^3 building demolished, non-dusty material (e.g metal cladding), <10m above ground level,

Dust Emission Magnitude	Activity
	work during wetter months
	Earthworks <2,500m^2 site area, soil with large grain size (e.g. sand), <5 earth moving vehicles active simultaneously, <4m high bunds, <20,000 tonnes material moved, earthworks during wetter months
	Construction <25,000m^3, non-dusty material (e.g. metal cladding or timber)
	Trackout <10 HDVs out / day, non-dusty soil, < 50m unpaved roads

STEP 2B – DEFINE THE SENSITIVITY OF THE AREA

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

Table 2Ba: Sensitivity of the Area to Dust Soiling Effects

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

Table 2Bb: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration ($\mu g/m^3$)	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table 2Bc: Sensitivity of the Area to Ecological Impacts

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

STEP 2C – DEFINE THE RISK OF IMPACTS

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

Table 2C: Risk of Dust Impacts

Sensitivity of surrounding area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks and Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

STEP 3 –SITE SPECIFIC MITIGATION

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

STEP 4 – DETERMINE SIGNIFICANT EFFECTS

Once the risk of dust impacts has been determined in Step 2C and the appropriate dust mitigation measures identified in Step 3, the final step is to determine whether there are significant effects arising from the construction phase. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.

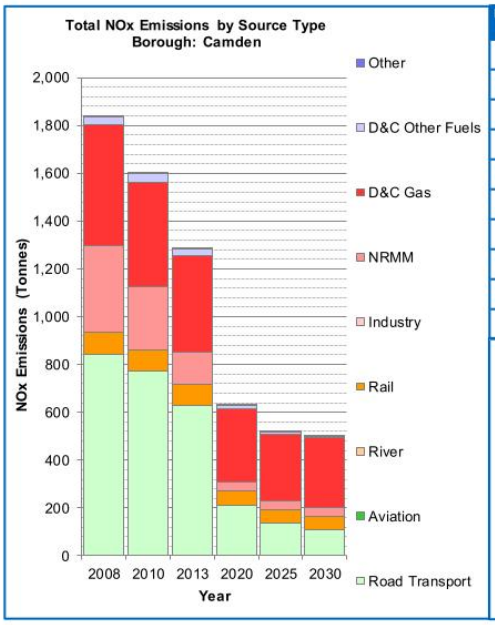
Appendix D

LONDON ATMOSPHERIC EMISSIONS INVENTORY (LAEI)
EMISSION SOURCES FOR LONDON BOROUGH OF CAMDEN

LAEI EMISSION SOURCES FOR LONDON BOROUGH OF CAMDEN

London Atmospheric Emissions Inventory

NOx Emissions - Camden



Emissions (Tonnes) by	2008	2010	2013	2020	2025	2030
Road Transport	844	771	629	211	135	107
Aviation	0	0	0	0	0	0
River	0	0	0	0	0	0
Rail	93	90	88	59	59	59
Industry	0	0	0	0	0	0
NRMM	359	266	133	36	35	35
D&C Gas	505	437	404	309	278	292
D&C Other Fuels	36	34	27	11	8	7
Other	2	2	2	2	1	2
Total	1,839	1,599	1,283	629	517	502

Notes:

(D&C = Domestic and Commercial)

The summary graph represents emissions from each source stacked on top of one another, with the total stack height equalling the total emissions from all sources.

The numbers in the table are those used to plot the graph and represent the tonnes of pollution emitted into the atmosphere in that year (T/y).

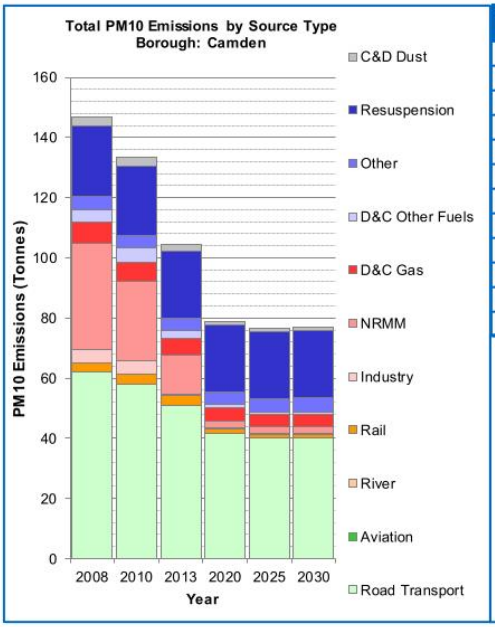
The emissions are combined into reasonably self explanatory "Source Types".

However, the categories: "Industry", "NRMM" and "Other" require further explanation:

- **Industry:** is the total emission from Part A and Part B industrial processes, combined.
- **Non-Road Mobile Machinery (NRMM):** is the total emissions from construction and industrial off road machines, combined.
- **Other:** is the total emission from a number of small sources including: agriculture, outdoor fires, garden emissions, forests, waste and waste transfer sites, combined.

London Atmospheric Emissions Inventory

PM10 Emissions - Camden



Emissions (Tonnes) by	2008	2010	2013	2020	2025	2030
Road Transport	61.9	58.0	51.1	41.7	40.1	40.1
Aviation	0.0	0.0	0.0	0.0	0.0	0.0
River	0.0	0.0	0.0	0.0	0.0	0.0
Rail	3.3	3.3	3.2	1.3	1.3	1.3
Industry	4.4	4.4	0.3	0.3	0.3	0.3
NRMM	35.3	26.5	12.9	2.3	2.3	2.3
D&C Gas	7.0	6.3	5.9	4.4	4.0	4.1
D&C Other Fuels	4.1	4.6	2.6	1.1	0.7	0.5
Other	4.6	4.3	3.8	4.3	4.4	4.8
Resuspension	23.3	23.1	22.3	22.3	22.4	22.4
C&D Dust	3.0	2.9	2.3	1.1	1.1	1.1
Total	146.9	133.4	104.5	78.9	76.6	77.0

Notes:

(D&C = Domestic and Commercial – C&D = Construction and Demolition)

The summary graph represents emissions from each source stacked on top of one another, with the total stack height equalling the total emissions from all sources.

The numbers in the table are those used to plot the graph and represent the tonnes of pollution emitted into the atmosphere in that year (T/y).

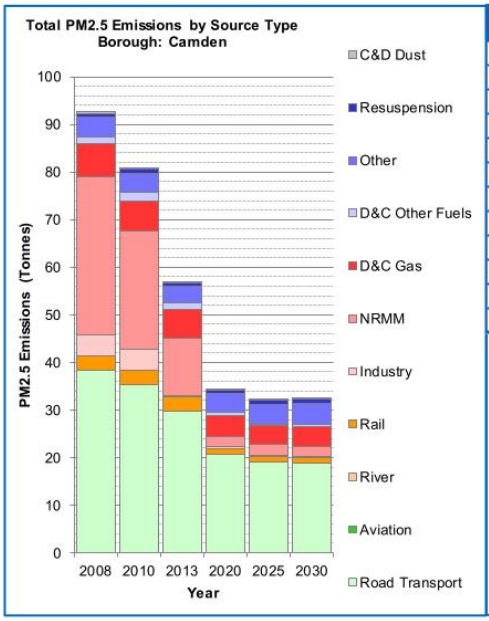
The emissions are combined into reasonably self explanatory "Source Types".

However, the categories: "Industry", "NRMM" and "Other" require further explanation:

- **Industry:** is the total emission from Part A and Part B industrial processes, combined.
- **Non-Road Mobile Machinery (NRMM):** is the total emissions from construction and industrial off road machines, combined.
- **Other:** is the total emission from a number of small sources including: agriculture, outdoor fires, garden emissions, forests, waste and waste transfer sites, combined.

London Atmospheric Emissions Inventory

PM2.5 Emissions - Camden



Emissions (Tonnes) by	2008	2010	2013	2020	2025	2030
Road Transport	38.4	35.4	29.8	20.8	19.0	18.8
Aviation	0.0	0.0	0.0	0.0	0.0	0.0
River	0.0	0.0	0.0	0.0	0.0	0.0
Rail	3.0	2.9	2.9	1.2	1.2	1.2
Industry	4.4	4.4	0.3	0.3	0.3	0.3
NRMM	33.2	24.9	12.2	2.2	2.2	2.2
D&C Gas	7.0	6.3	5.9	4.4	4.0	4.1
D&C Other Fuels	1.3	1.8	1.4	0.6	0.4	0.3
Other	4.2	4.0	3.6	4.0	4.1	4.5
Resuspension	0.9	0.8	0.8	0.8	0.8	0.8
C&D Dust	0.3	0.3	0.2	0.1	0.1	0.1
Total	92.6	80.9	57.0	34.4	32.1	32.3

Notes:

(D&C = Domestic and Commercial – C&D = Construction and Demolition)

The summary graph represents emissions from each source stacked on top of one another, with the total stack height equalling the total emissions from all sources.

The numbers in the table are those used to plot the graph and represent the tonnes of pollution emitted into the atmosphere in that year (T/y).

The emissions are combined into reasonably self explanatory "Source Types".

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- **Other:** is the total emission from a number of small sources including: agriculture, outdoor fires, garden emissions, forests, waste and waste transfer sites, combined.

Appendix E

WINDROSE FOR LONDON CITY AIRPORT (2015)

WIND ROSE FOR LONDON CITY AIRPORT (2015)