Air Quality Assessment

Lockcorp House, 75 Norcutt Road, TW2 6SR

For Leek Real Estate (No.1) Limited

www.rpsgroup.com

Quality Management

Prepared by	Fiona Prismall MSc, BSc (Hons), CEnv, FIAQM, MIEnvSc	Technical Director		28/06/2019
Reviewed & checked by	Kathryn Barker MSc, BSc (Hons), AMIEnvSc	Senior Air Quality Consultant		28/06/2019
Authorised by	Jon Pullen PhD, CSci, CChem, MRSC, FIAQM, MIEnvSc	Operational Director		28/06/2019
Date of Issue	25/06/2019		**Revision Number**	Rev 1
Job Number	JAR11043			

Revision History

Rev	Date	Status	Reason for revision	Comments
0	13/6/2019	Draft	-	-
1	25/06/2019	Final		

Calculations or models file name, link and location

Prepared by	Fiona Prismall MSc, BSc (Hons), CEnv, FIAQM, MIEnvSc	Technical Director		28/06/2019
Checked by	Kathryn Barker MSc, BSc (Hons), AMIEnvSc	Senior Air Quality Consultant		28/06/2019

Executive Summary

The proposed residential development at 75 Norcutt Road on the site of Lockcorp House, is located within the administrative area of the London Borough of Richmond upon Thames (LBRT). The entire borough is designated as an Air Quality Management Area (AQMA) due to elevated concentrations of nitrogen dioxide (NO_2) and particulate matter (PM_{10}) attributable to road traffic emissions. This Air Quality Assessment, undertaken to accompany the planning application, considers the air quality impacts from the construction phase and once the Proposed Development is fully operational.

The assessment has been undertaken based upon appropriate information on the Proposed Development provided by Leek Real Estate (No.1) Limited and its project team. In undertaking this assessment, RPS experts have exercised professional skills and judgement to the best of their abilities and have given professional opinions that are objective, reliable and backed with scientific rigour. These professional responsibilities are in accordance with the code of professional conduct set by the Institution of Environmental Sciences for members of the Institute of Air Quality Management (IAQM).

For the construction phase, the most important consideration is dust. Without appropriate mitigation, dust could cause temporary soiling of surfaces, particularly windows, cars and laundry. The mitigation measures provided within this report should ensure that the risk of adverse dust effects is reduced to a minimum.

The operational phase of the Proposed Development is expected to generate fewer vehicle movements using the local road network than the site's existing use and is therefore expected to be beneficial in terms of air quality impacts on the surrounding area.

Pollutant concentrations are predicted to be well within the relevant health-based air quality objectives at the façades of proposed receptors. Therefore, air quality is acceptable at the development site, making it suitable for its proposed uses. Using the criteria adopted for this assessment together with professional judgement, the operational air quality effects are considered 'not significant' overall.

The proposed development does not, in air quality terms, conflict with national or local policies, or with measures set out in the LBRT's Air Quality Action Plan. There are no constraints to the development in the context of air quality.

Contents

Tables, Figures and Appendices

Tables

Figures

Appendices

1 Introduction

1.1 This report details the air quality assessment undertaken for the Proposed Development on the site of Lockcorp House at 75 Norcutt Road in the London Borough of Richmond. The proposal comprises 15 flats located over five floors. The report complements RPS' *'Air Quality Neutral Calculation: Lockcorp House, 75 Norcutt Road'* report. That air quality neutral calculation report quantifies the emissions of atmospheric pollutants from the development at source (i.e. from vehicles and building plant) and compares the emissions with official benchmark levels that define neutrality. In contrast, this report considers the impacts of the development on ambient air quality at the point of exposure (i.e. at sensitive receptor locations) by comparing predicted levels with Air Quality Strategy objectives and EU Limit Values.

1.2 The local planning authority, the London Borough of Richmond upon Thames (LBRT), has designated the entire borough is designated as an Air Quality Management Area (AQMA) due to elevated concentrations of nitrogen dioxide (NO_2) and particulate matter (PM_{10}) attributable to road traffic emissions.

1.3 Once operational, the proposed development is expected to generate fewer vehicle movements than the site's existing use and is therefore expected to be beneficial in terms of air quality impacts on the surrounding area. This air quality assessment therefore covers the:

- Construction phase - an evaluation of the temporary effects from fugitive construction dust and construction-vehicle exhaust emissions; and the
- Operational phase – the impacts on future occupants of the development from their exposure to the prevailing levels of air pollution, which can be a factor in the suitability of the site for its proposed uses.

1.4 This report begins by setting out the policy and legislative context for the assessment. The methods and criteria used to assess potential air quality effects have then been described. The baseline air quality conditions have been established taking into account Defra estimates, local authority documents and the results of any local monitoring. The results of the assessment of air quality impacts have been presented. A conclusion has been drawn on the significance of the residual construction-phase effects and the residual operational-phase effects.

2 Policy and Legislative Context

Ambient Air Quality Legislation and National Policy

The Ambient Air Quality Directive and Air Quality Standards Regulations

2.1 The 2008 Ambient Air Quality Directive (2008/50/EC) [1] aims to protect human health and the environment by avoiding, reducing or preventing harmful concentrations of air pollutants; it sets legally binding concentration-based limit values, as well as target values. There are also information and alert thresholds for reporting purposes. These are to be achieved for the main air pollutants: particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), ozone (O_3), carbon monoxide (CO), lead (Pb) and benzene. This Directive replaced most of the previous EU air quality legislation and in England was transposed into domestic law by the Air Quality Standards Regulations 2010 [2], which in addition incorporates the 4th Air Quality Daughter Directive (2004/107/EC) that sets targets for ambient air concentrations of certain toxic heavy metals (arsenic, cadmium and nickel) and polycyclic aromatic hydrocarbons (PAHs). Member states must comply with the limit values (which are legally binding on the Secretary of State) and the Government and devolved administrations operate various national ambient air quality monitoring networks to measure compliance and develop plans to meet the limit values.

UK Air Quality Strategy

2.2 The Environment Act 1995 established the requirement for the Government and the devolved administrations to produce a National Air Quality Strategy (AQS) for improving ambient air quality, the first being published in 1997 and having been revised several times since, with the latest published in 2007 [3]. The Strategy sets UK air quality standards♦ and objectives# for the pollutants in the Air Quality Standards Regulations plus 1,3-butadiene and recognises that action at national, regional and local level may be needed, depending on the scale and nature of the air quality problem. There is no legal requirement to meet objectives set within the UK AQS except where equivalent limit values are set within the EU Directives.

2.3 The 1995 Environment Act also established the UK system of Local Air Quality Management (LAQM), that requires local authorities to go through a process of review and assessment of air

♦ Standards are concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. Standards, as the benchmarks for setting objectives, are set purely with regard to scientific evidence and medical evidence on the effects of the particular pollutant on health, or on the wider environment, as minimum or zero risk levels.

Objectives are policy targets expressed as a concentration that should be achieved, all the time or for a percentage of time, by a certain date.

quality in their areas, identifying places where objectives are not likely to be met, then declaring Air Quality Management Areas (AQMAs) and putting in place Air Quality Action Plans to improve air quality. These plans also contribute, at local level, to the achievement of EU limit values.

2.4 For the purposes of this assessment, the limit values set out in the Air Quality Standards Regulations 2010 and the objective levels specified under the current UK AQS have been used.

2.5 The limit values and objectives relevant to this assessment are summarised in Table 2.1. Although the EU limit values and the UK AQS objectives are numerically equal, there are some differences in where they apply and who is responsible for their achievement.

Table 2.1 Summary of Relevant Air Quality Limit Values and Objectives

Pollutant	Averaging Period	Objectives/ Limit Values	Not to be Exceeded More Than	Target Date
Nitrogen Dioxide (NO_2)	1 hour	200 µg.m^{-3}	18 times per calendar year	-
	Annual	40 µg.m^{-3}	-	-
Particulate Matter (PM_{10})	24 Hour	50 µg.m^{-3}	35 times per calendar year	-
	Annual	40 µg.m^{-3}	-	-
Particulate Matter ($PM_{2.5}$)	Annual	25 µg.m^{-3}	-	01.01.2020 (a)
				01.01.2015 (b)

(a) Target date set in UK Air Quality Strategy 2007
(b) Target date set in Air Quality Standards Regulations 2010

2.6 In July 2017, Defra published the *'UK plan for tackling roadside nitrogen dioxide concentrations'.* This describes the Government's plan for bringing roads with NO_2 concentrations above the EU Limit Value back into compliance within the shortest possible time, covering five cities, the GLA and 23 other local authorities. A Supplement to the plan was published in October 2018, which sets out measures to bring forward compliance in a further 33 local authorities that had not been covered by actions in the July 2017 plan because they had been projected to comply with the EU Limit Value by 2021.

2.7 On 14 January 2019, Defra published the *'Clean Air Strategy 2019'.* The report sets out actions that the Government intends to take to reduce emissions from transport, in the home, from farming and from industry.

National Planning Policy

National Planning Policy Framework

2.8 The National Planning Policy Framework (NPPF) [4] is a material consideration for local planning authorities and decision-takers in determining applications. At the heart of the NPPF, is a presumption in favour of sustainable development, subject to caveats where a plan or project affects a habitats site. For determining planning applications, this means approving development proposals if they accord with an up-to-date local development plan, unless material considerations indicate otherwise. If the development plan does not contain relevant policies, or the policies are out of date, then planning permission should be granted unless the application of policies in the NPPF that protect areas or assets of particular importance provides a clear reason for refusing the development, or any adverse impacts would significantly outweigh the benefits.

2.9 The NPPF sets out three overarching objectives to achieve sustainable development. The relevant objective in the context of this air quality assessment is:

"**an environmental objective** – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution and adapting to climate change, including moving to a low carbon economy" (Paragraph 8c)

2.10 Under the heading 'Promoting sustainable transport', the NPPF states:

"The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making." (Paragraph 103)

2.11 Under the heading 'Conserving and enhancing the natural environment', the NPPF states:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

…

Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; …" (Paragraph 170)

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan." (Paragraph 181)

National Planning Practice Guidance

2.12 The National Planning Practice Guidance (NPPG) was issued on-line in March 2014 and is updated periodically by government as a live document. The Air Quality section of the NPPG describes the circumstances when air quality, odour and dust can be a planning concern, requiring assessment.

2.13 The NPPG advises that whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate air quality impact in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation (including that applicable to wildlife).

2.14 The NPPG states that when deciding whether air quality is relevant to a planning application, considerations could include whether the development would:

"Significantly affect traffic in the immediate vicinity of the proposed development site or further afield. This could be by generating or increasing traffic congestion; significantly changing traffic volumes, vehicle speed or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; adds to turnover in a large car park; or result in construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more.

Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; or extraction systems (including chimneys) which require approval under pollution control legislation or biomass boilers or biomass-fuelled CHP plant; centralised boilers or CHP plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area;

Expose people to existing sources of air pollutants. This could be by building new homes, workplaces or other development in places with poor air quality.

Give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations.

Affect biodiversity. In particular, is it likely to result in deposition or concentration of pollutants that significantly affect a European-designated wildlife site, and is not directly connected with or necessary to the management of the site, or does it otherwise affect biodiversity, particularly designated wildlife sites."

2.15 The NPPG provides advice on how air quality impacts can be mitigated and notes *"Mitigation options where necessary will be locationally specific, will depend on the proposed development and should be proportionate to the likely impact. It is important therefore that local planning authorities work with applicants to consider appropriate mitigation so as to ensure the new development is appropriate for its location and unacceptable risks are prevented. Planning conditions and obligations can be used to secure mitigation where the relevant tests are met."*

Regional Policy Guidance – The London Plan

2.16 The Mayor of London is responsible for all strategic planning in London. Amongst the Mayor's duties is the requirement to develop a Spatial Development Strategy for London, known as the London Plan [5]. The current version of the London Plan was published in March 2016 and incorporates Further Alterations to the London Plan published in July 2011. The Plan acts as an integrating framework for a set of strategies, including improvements to air quality.

2.17 The key policy relating to air quality is Policy 7.14: Improving Air Quality:

"Strategic

A. 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 minimise public exposure to pollution.

Planning decisions

B Development proposals should:

a. 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 plans (see Policy 6.3)

b. 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'

c. 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))

d. 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

e. 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.

2.18 The Mayor's Air Quality Strategy (MAQS) [6], referred to in Policy 7.14, sets out policies and proposals seeking to improve London's air quality to the point where air pollution no longer poses a significant risk to human health.

2.19 In April 2014, the Greater London Authority (GLA) published Supplementary Planning Guidance (SPG) Sustainable Design and Construction [7]. The SPG reinforces the existing need for a *'conventional'* Air Quality Assessment where pollutant concentrations, at the point of human exposure, are compared with the relevant national objectives; however, the SPG also details how major developments must demonstrate they are achieving the Mayor of London's *'Air Quality Neutral'* Policy 7.14. The Air Quality Neutral calculations have been undertaken for the Proposed Development and are provided in a separate report.

Local Planning Policy

2.20 The LBRT Local Plan was adopted in July 2018. This document sets out policies and guidance for development of the borough over the next 15 years. The following policies are relevant to this assessment:

*"**Policy LP 8 Amenity and Living Conditions***

All development will be required to protect the amenity and living conditions for occupants of new, existing, adjoining and neighbouring properties. The Council will:

…

4. *ensure there is no harm to the reasonable enjoyment of the use of buildings, gardens and other spaces due to increases in traffic, servicing, parking, noise, light, disturbance, air pollution, odours or vibration or local micro-climate effects.*

…"

*"**Policy LP 10 Local Environmental Impacts, Pollution and Land Contamination***

A. *The Council will seek to ensure that local environmental impacts of all development proposals do not lead to detrimental effects on the health, safety and the amenity of existing and new users or occupiers of the development site, or the surrounding land. These potential impacts can include, but are not limited to, air pollution, noise and vibration, light pollution, odours and fumes, solar glare and solar dazzle as well as land contamination.*

Developers should follow any guidance provided by the Council on local environmental impacts and pollution as well as on noise generating and noise sensitive development. Where necessary, the Council will set planning conditions to reduce local environmental impacts on adjacent land uses to acceptable levels.

Air Quality

B. *The Council promotes good air quality design and new technologies. Developers should secure at least 'Emissions Neutral' development. To consider the impact of introducing new developments in areas already subject to poor air quality, the following will be required:*
   1. *an air quality impact assessment, including where necessary, modelled data;*
   2. *mitigation measures to reduce the development's impact upon air quality, including the type of equipment installed, thermal insulation and ducting abatement technology;*
   3. *measures to protect the occupiers of new developments from existing sources;*
   4. *strict mitigation for developments to be used by sensitive receptors such as schools, hospitals and care homes in areas of existing poor air quality; this also applies to proposals close to developments used by sensitive receptors."*

3 Assessment Methodology

3.1 Neither the NPPF nor the NPPG is prescriptive on the methodology for assessing air quality effects or describing significance; practitioners continue to use guidance provided by Defra and non-governmental organisations, including Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM). However, the NPPG does advise that "*Assessments should be proportionate to the nature and scale of development proposed and the level of concern about air quality, and because of this are likely to be locationally specific. The scope and content of supporting information is therefore best discussed and agreed between the local planning authority and applicant before it is commissioned."* It lists a number of areas that might be usefully agreed at the outset.

3.2 This air quality assessment covers the elements recommended in the NPPG. The approach is consistent with the EPUK & IAQM *Land-Use Planning & Development Control: Planning For Air Quality* document [8], the Mayor of London's *Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance* [9], the IAQM *Guidance on the assessment of dust from demolition and construction* [10] and, where relevant, the Mayor of London's *Local Air Quality Management Technical Guidance: LLAQM.TG16* [11].

3.3 Once operational, the proposed development is expected to generate fewer vehicle movements than the site's existing use. The proposals do not make provision for an energy centre and there is no centralised on-site source of emissions to air associated with the provision of heat and power.

3.4 The development is therefore expected to be beneficial in terms of air quality impacts on the surrounding area. This air quality assessment therefore includes the key elements listed below:

- assessment of the existing air quality in the study area (existing baseline) and prediction of the future air quality, using official government estimates from Defra, publicly available air quality monitoring data for the area, and relevant Air Quality Review and Assessment (R&A) documents;
- a qualitative assessment of likely construction-phase impacts with mitigation and controls in place; and
- a semi-quantitative prediction of the future operational-phase air quality impact with the development in place (with any necessary mitigation), encompassing the impacts on future occupants of the development from their exposure to the prevailing levels of air pollution, which can be a factor in the suitability of the site for its proposed uses.

3.5 In line with the guidance set out in the NPPG, the scope and methodology for this assessment was agreed with the Senior Environmental Health Pollution Practitioner (Air Quality) for the London Boroughs of Richmond upon Thames, Merton and Wandsworth.

3.6 Air quality guidance advises that the organisation engaged in assessing the overall risks should hold relevant qualifications and/or extensive experience in undertaking air quality assessments. The RPS air quality team members involved at various stages of this assessment have professional affiliations that include Fellow and Member of the Institute of Air Quality Management, Chartered Chemist, Chartered Scientist, Chartered Environmentalist and Member of the Royal Society of Chemistry and have the required academic qualifications for these professional bodies. In addition, the Director responsible for authorising all deliverables has over 25 years' experience.

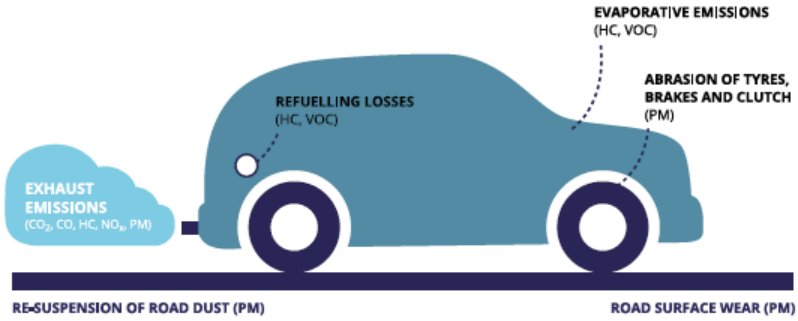
Summary of Key Pollutants Considered

3.7 For the operational phase of the Proposed Development, the main pollutants from road traffic with potential for local air quality impacts are nitrogen oxides (NO_x) and particulate matter (PM_{10}).

3.8 Emissions of total NO_x from combustion sources comprise nitric oxide (NO) and NO_2. The NO oxidises in the atmosphere to form NO_2. The assessment of suitability therefore focuses on NO_2 and PM_{10} concentrations. Fine particulate matter, known as $PM_{2.5}$ (a subset of PM_{10}) concentrations has also been considered.

Figure 3.1 Types of Vehicle Emissions

The different types of emissions from vehicles, and a comparison of the relative amounts of selected pollutants released by the latest Euro 6 petrol and diesel vehicles



Source: European Environment Agency (2016) Explaining Road Transport Emissions: A Non-technical Guide

3.9 For the construction phase of the Proposed Development the key pollutant is dust, covering both the PM_{10} fraction that is suspended in the air that can be breathed, and the deposited dust that

has fallen out of the air onto surfaces and which can potentially cause temporary annoyance effects.

3.10 Regarding exhaust emissions from construction-related vehicles (contractors' vehicles and Heavy Goods Vehicles (HGVs), diggers, and other diesel-powered vehicles), these are unlikely to have a significant impact on local air quality [10] except for large, long-term construction sites: the EPUK & IAQM *Land-Use Planning & Development Control: Planning For Air Quality* document [8] indicates that air quality assessments should include developments increasing annual average daily Heavy Duty Vehicle (HDV) traffic flows by more than 25 within or adjacent to an AQMA and more than 100 elsewhere.

3.11 No information is available in relation to the number of HGVs generated by construction activities. At this stage, it is considered unlikely that the EPUK & IAQM thresholds would be exceeded for any individual road during the construction phase of this project; therefore, construction-vehicle exhaust emissions have not been assessed specifically.

Construction Phase - Methodology

3.12 Dust is the generic term used to describe particulate matter in the size range 1-75 µm in diameter [12]. Particles greater than 75 µm in diameter are termed grit rather than dust. Dusts can contain a wide range of particles of different sizes. The normal fate of suspended (i.e. airborne) dust is deposition. The rate of deposition depends largely on the size of the particle and its density; together these influence the aerodynamic and gravitational effects that determine the distance it travels and how long it stays suspended in the air before it settles out onto a surface. In addition, some particles may agglomerate to become fewer, larger particles; whilst others react chemically.

3.13 The effects of dust are linked to particle size and two main categories are usually considered:

- PM_{10} particles, those up to 10 µm in diameter, remain suspended in the air for long periods and are small enough to be breathed in and so can potentially impact on health; and
- Dust, generally considered to be particles larger than 10 µm which fall out of the air quite quickly and can soil surfaces (e.g. a car, window sill, laundry). Additionally, dust can potentially have adverse effects on vegetation and fauna at sensitive habitat sites.

3.14 The IAQM Guidance on the assessment of dust from demolition and construction sets out 350 m as the distance from the site boundary and 50 m from the site traffic route(s) up to 500 m of the entrance, within which there could potentially be nuisance dust and PM_{10} effects on human receptors. These distances are set to be deliberately conservative.

3.15 Concentration-based limit values and objectives have been set for the PM_{10} suspended particle fraction, but no statutory or official numerical air quality criterion for dust annoyance has been set at a UK, European or World Health Organisation (WHO) level. Construction dust assessments

have tended to be risk based, focusing on the appropriate measures to be used to keep dust impacts at an acceptable level.

3.16 The Mayor of London's Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance [9] (hereafter referred to as the Construction and Demolition SPG) provides information relating to the approach to the assessment, recommended mitigation measures and appropriate monitoring strategies. In particular, the Construction and Demolition SPG states that the assessment methodology provided in the current version of the Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction should be used.

3.17 The IAQM dust guidance aims to estimate the impacts of both PM_{10} and dust through a risk-based assessment procedure. The IAQM dust guidance document states: "*The impacts depend on the mitigation measures adopted. Therefore the emphasis in this document is on classifying the risk of dust impacts from a site, which will then allow mitigation measures commensurate with that risk to be identified.*"

3.18 The IAQM dust guidance provides a methodological framework, but notes that professional judgement is required to assess effects: *"This is necessary, because the diverse range of projects that are likely to be subject to dust impact assessment means that it is not possible to be prescriptive as to how to assess the impacts. Also a wide range of factors affect the amount of dust that may arise, and these are not readily quantified."*

3.19 Consistent with the recommendations in the IAQM dust guidance, a risk-based assessment has been undertaken for the development, using the well-established source-pathway-receptor approach:

- The dust impact (the change in dust levels attributable to the development activity) at a particular receptor will depend on the magnitude of the dust source and the effectiveness of the pathway (i.e. the route through the air) from source to receptor.
- The effects of the dust are the results of these changes in dust levels on the exposed receptors, for example annoyance or adverse health effects. The effect experienced for a given exposure depends on the sensitivity of the particular receptor to dust. An assessment of the overall dust effect for the area as a whole has been made using professional judgement taking into account both the change in dust levels (as indicated by the Dust Impact Risk for individual receptors) and the absolute dust levels, together with the sensitivities of local receptors and other relevant factors for the area.

  The detail of the dust assessment methodology is provided in Appendix A.

3.20 The dust risk categories that have been determined for each of the four activities (demolition, earthworks, construction and trackout) have been used to define the appropriate site-specific

mitigation measures based on those described in the Mayor of London's SPG. The Mayor of London's SPG states that with the recommended dust mitigation measures in place the residual impact will be "minimised".

3.21 This assessment does not consider the air quality impacts of dust from any contaminated land or buildings. If contaminated land is identified on the Application Site, the impacts will be assessed in other technical discipline reports.

Operational Phase - Methodology

Significance Criteria for New Population Exposure (Site Suitability)

3.22 The EPUK & IAQM guidance considers an exceedance of an air quality objective at a building façade to be significant adverse effect unless provision is made to reduce the resident's or occupant's exposure by some means.

3.23 In addition, the London Councils' Air Quality and Planning Guidance [13] provides Air Pollution Exposure Criteria (APEC) for assessing the significance on exposure to air pollution and the levels of mitigation required when considering site suitability. Table 3.1 provides a summary of the criteria.

Table 3.1 Summary of Air Pollution Exposure Criteria (APEC)

Criteria	Applicable Range NO_2 Annual-Mean	Applicable Range PM_{10}	Recommendation
APEC-A	> 5% below national objective	Annual-Mean >5% below national objective 24-Hour >1-day less than national objective	No air quality grounds for refusal; however mitigation of any emissions should be considered.
APEC-B	Between 5% below or above national objective	Annual-Mean Between 5% above or below national objective 24-Hour Between 1-day above or below national objective	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered, e.g. maximise distance from pollutant source, proven ventilation systems, parking considerations, winter gardens, internal layout considered and internal pollutant emissions minimised.
APEC-C	>5% above national objective	Annual-Mean >5% above national objective 24-Hour >1-day more than national objective	Refusal on air quality grounds should be anticipated, unless the Local Authority has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated. Worker exposure in commercial/industrial land uses should be considered further. Mitigation measures must be

Criteria	Applicable Range NO_2 Annual-Mean	Applicable Range PM_{10}	Recommendation
			presented with air quality assessment, detailing anticipated outcomes of mitigation measures.

3.24 Concentrations have been predicted at proposed receptors to determine the APEC category that would apply.

Short-Term Pollutant Predictions

3.25 To predict the likelihood of exceedances of the hourly-mean AQS objectives for NO_2 and the daily-mean AQS objective for PM_{10}, the following relationships between the short-term and the annual-mean values at each receptor have been considered.

Hourly-Mean AQS Objective for NO_2

3.26 Research undertaken in support of LLAQM.TG16 has indicated that the hourly-mean limit value and objective for NO_2 is unlikely to be exceeded at a roadside location where the annual-mean NO_2 concentration is less than 60 $\mu g.m^{-3}$. The threshold of 60 $\mu g.m^{-3}$ NO_2 has been used the guideline for considering a likely exceedance of the hourly-mean nitrogen dioxide objective.

Daily-Mean AQS Objective for PM_{10}

3.27 The number of exceedances of the daily-mean AQS objective for PM_{10} of 50 $\mu g.m^{-3}$ may be estimated using the relationship set out in LLAQM.TG16:

*Number of Exceedances of Daily Mean of 50 $\mu g.m^{-3}$ = -18.5 + 0.00145 * (Predicted Annual-mean $PM_{10})^3$ + 206 / (Predicted Annual-mean PM_{10} Concentration)*

3.28 The EPUK & IAQM guidance considers an exceedance of an air quality objective at a building façade to be significant adverse effect unless provision is made to reduce the resident's or occupant's exposure by some means.

Uncertainty

3.29 All air quality assessment tools, whether models or monitoring measurements, have a degree of uncertainty associated with the results.

3.30 The main components of uncertainty in the total predicted concentrations, made up of the background concentration and the modelled fraction, include those summarised in Table 3.2.

Table 3.2 Approaches to Dealing with Uncertainty used Within the Assessment

Concentration	Source of Uncertainty	Approach to Dealing with Uncertainty	Comments
Background Concentration	Characterisation of current baseline air quality conditions	The background concentration selected for the assessment is the most conservative value from a comparison of measured and Defra mapped concentration estimate.	The conservative assumptions adopted ensure that the background concentration used within the model contributes to the result being towards the top of the uncertainty range, rather than a central estimate.
	Characterisation of future baseline air quality (i.e. the air quality conditions in the future assuming that the development does not proceed)	The future background concentration used in the assessment is the same as the current background concentration and no reduction has been assumed. This is a conservative assumption as, in reality, background concentrations are likely to reduce over time as cleaner vehicle technologies form an increasing proportion of the fleet.	

4 Baseline Air Quality Conditions

Overview

4.1 The background concentration often represents a large proportion of the total pollution concentration, so it is important that the background concentration selected for the assessment is realistic. National Planning Practice Guidance and EPUK & IAQM guidance highlight public information from Defra and local monitoring studies as potential sources of information on background air quality. LLAQM.TG16 recommends that Defra mapped concentration estimates are used to inform background concentrations in air quality modelling and states that: "*Where appropriate these data can be supplemented by and compared with local measurements of background, although care should be exercised to ensure that the monitoring site is representative of background air quality*".

4.2 For this assessment, the background air quality has been characterised by drawing on information from the following public sources:

- Defra maps [14], which show estimated pollutant concentrations across the UK in 1 km grid squares; and
- published results of local authority Review and Assessment (R&A) studies of air quality, including local monitoring and modelling studies.

4.3 A detailed description of how the baseline air quality has been derived for this Proposed Development site is summarised in the following paragraphs.

Review and Assessment Process

4.4 The LBRT has designated the entire borough as an AQMA due to elevated concentrations of NO_2 and PM_{10} attributable to road traffic emissions. Furthermore, the site is located approximately 570 m from an Air Quality Focus Area (AQFA) covering Twickenham Town Centre. AQFAs are areas where air quality is poor and the population density is high.

4.5 In September 2017, the LBRT published an updated Air Quality Action Plan (AQAP). This document replaces the previous action plan which ran from 2002 to 2017 and outlines the action that the LBRT will take to improve air quality in the borough between 2017 and 2022.

4.6 The AQAP lists several measures to improve air quality:

- For developments and buildings, enforcement of Non-Road Mobile Machinery (NRMM) air quality policies.

- Develop South London Low Emission Construction Partnership in line with London LEAP (LLEAP). LLEAP objectives are:
  - Help the construction industry to understand its impact on local air quality.
  - Encourage the uptake of 'best in class' pollution reduction (abatement) measures.
  - Improve pollution monitoring and make this data available for construction sites in London.
  - Help to fund 'best in class' abatement measures at construction sites.
  - Evaluate the cost effectiveness of pollution abatement techniques.
- For developments and buildings, enforcement of CHP (combined heat and power) and biomass air quality policies.
- For developments and buildings, enforce air quality neutral requirement through planning condition/ enforcement.

Local Urban Background Monitoring

4.7 Monitors at urban background locations measure concentrations away from the local influence of emission sources and are therefore broadly representative of residential areas within large conurbations. Monitoring at local urban background locations is considered an appropriate source of data for the purposes of describing baseline air quality for this Proposed Development site.

4.8 There are no local monitoring stations where urban background concentrations are measured using continuous automatic instruments; however, the LBRT monitors at two suburban monitoring locations. The most recently measured annual-mean concentrations are presented in Table 4.1.

Table 4.1 Automatically Monitored Suburban Annual-Mean Concentrations

Monitor Name	Approximate Distance from the Application Site (km)	Pollutant	Concentration (µg.m^{-3})							
			2011	2012	2013	2014	2015	2016	2017	2018
RI2 Wetlands Centre, Barnes	8.3	NO_2	26	25	24	25	21	25	21	20
		PM_{10}	22	18	20	18	17	16	15	N/A
TD0 NPL Teddington AURN	2.8	NO_2	21	36	21	27	19	22	N/A	N/A

N/A = Not available

4.9 In addition, the LBRT manually monitors NO_2 concentrations at several urban background locations using passive diffusion tubes and the most recently measured annual-mean concentrations are presented in Table 4.2

Table 4.2 Passively Monitored Urban Background Annual-Mean NO_2 Concentrations

Monitor Name	Approx Distance from the Application Site (km)	x	y	Concentration (µg.m^{-3})							
				2011	2012	2013	2014	2015	2016	2017	2018
28 Holly Lodge, Richmond Park	4.1	519467	173993	20	22	21	18	17	21	17	18
37 Wetland Centre, Barnes	8.3	522989	176727	26	25	25	22	21	25	20	21

All concentrations have been adjusted for bias

Defra Mapped Concentration Estimates

4.10 Defra's total annual-mean NO_2 concentration estimates have been collected for the 1 km grid squares of the monitoring sites and the Proposed Development and are summarised in Table 4.3

Table 4.3 Defra Mapped Annual-Mean Background NO_2 Concentration Estimates

Monitor Name	Approximate Distance from the Application Site (km)	Concentration (µg.m^{-3})	
		Range of Monitored	Estimated Defra Mapped
RI2 Wetlands Centre, Barnes	8.3	20 - 26	23.4
TD0 NPL Teddington AURN	2.8	19 – 36	19.1
28 Holly Lodge, Richmond Park	4.1	17 - 22	17.9
37 Wetland Centre, Barnes	8.3	20 - 26	23.4
Application Site	-	-	23.4

4.11 Similarly, the Defra total annual-mean PM_{10} concentration estimates have been collected for the grid square of the monitoring sites and the Proposed Development and are summarised in Table 4.4

Table 4.4 Defra Mapped Annual-Mean Background PM_{10} Concentration Estimates

Monitor Name	Approximate Distance from the Application Site (km)	Concentration (µg.m^{-3})	
		Range of Monitored	Estimated Defra Mapped
RI2 Wetlands Centre, Barnes	8.3	15 – 22	16.6
Application Site	-	-	16.8

Appropriate Background Concentrations for the Development Site

4.12 For NO_2 and PM_{10}, the Defra mapped concentration estimates are within the range of the results from monitoring indicating that the Defra mapped background concentration estimates for both pollutants at the Application Site are representative.

4.13 In the absence of $PM_{2.5}$ monitoring, the background annual-mean concentration at the Application Site has been derived from the Defra mapped background concentration estimate.

4.14 Historically the view has been that background traffic-related NO_2 concentrations in the UK would reduce over time, due to the progressive introduction of improved vehicle technologies and increasingly stringent limits on emissions. However, the results of recent monitoring across the UK suggest that background annual-mean NO_2 concentrations have not decreased in line with expectations. Inspection of the results of local monitoring presented here indicates that there is some evidence of a trend over time in concentrations of NO_2 and PM_{10}.

4.15 To ensure that the assessment presents conservative results, no reduction in the background is assumed for future years.

4.16 Table 4.5 summarises the annual-mean background concentrations for NO_2, PM_{10} and $PM_{2.5}$ at the Application Site. The concentrations are below the respective AQS objectives.

Table 4.5 Summary of Background Annual-Mean (Long-term) Concentrations used in the Assessment

Pollutant	Data Source	Concentration (µg.m^{-3})	Air Quality Strategy Objective (µg.m^{-3})
NO_2	Defra maps (2017)	23.4	40
PM_{10}		16.8	40
$PM_{2.5}$		11.8	25

5 Assessment of Construction-Phase Air Quality Impacts

Construction Dust

5.1 Whilst no detailed construction phase information is currently available, the type of activities that could cause fugitive dust emissions are: demolition; earthworks; handling and disposal of spoil; wind-blown particulate material from stockpiles; handling of loose construction materials; and movement of vehicles, both on and off site.

5.2 The level and distribution of construction dust emissions will vary according to factors such as the type of dust, duration and location of dust-generating activity, weather conditions and the effectiveness of suppression methods.

5.3 The main effect of any dust emissions, if not mitigated, could be annoyance due to soiling of surfaces, particularly windows, cars and laundry. However, it is normally possible, by implementation of proper control, to ensure that dust deposition does not give rise to significant adverse effects, although short-term events may occur (for example, due to technical failure or exceptional weather conditions). The following assessment, using the IAQM methodology, predicts the risk of dust impacts and the level of mitigation to minimise air quality impacts.

Risk of Dust Impacts

Source

5.4 The volume of the buildings on site that would be demolished is below 20,000 m^3 and the dust emission magnitude for the demolition phase is classified, using the IAQM dust guidance, as small.

5.5 The site area is less than 2,500 m^2 and the dust emission magnitude for the earthworks phase is classified as small.

5.6 The total volume of the buildings to be constructed would be below 25,000 m^3 and the dust emission magnitude for the construction phase is classified as small.

5.7 Assuming that the maximum number of outwards movements in any one day is between 10 and 50 HDVs, the dust emission magnitude for trackout would be classified as medium.

Table 5.1 Dust Emission Magnitude for Demolition, Earthworks, Construction and Trackout

Demolition	Earthworks	Construction	Trackout
Small	Small	Small	Medium

Pathway and Receptor - Sensitivity of the Area

5.8 All demolition, earthworks and construction activities are assumed to occur within the site boundary. As such, receptors at distances within 20 m, 50 m, 100 m, 200 m and 350 m of the site boundary have been identified. The sensitivity of the area has been classified and the results are provided in Table 5.2 below.

Table 5.2 Sensitivity of the Surrounding Area for Demolition, Earthworks and Construction

Potential Impact	Sensitivity of the Surrounding Area	Reason for Sensitivity Classification
Dust Soiling	High	Block of flats to the south, industrial buildings to the west and grid substation to the east. Estimate 10 – 100 high sensitivity receptors located within 20 m of the site boundary (Table A.4)
Human Health	Low	10 – 100 high sensitivity receptors located within 20 m of the site boundary and PM_{10} concentrations below 24 $\mu g.m^{-3}$ (Table A.5)

5.9 The Dust Emission Magnitude for trackout is classified as medium and trackout may occur on roads up to 200 m from the site. The major routes within 200 m of the site are Norcutt Road and Edwin Road. The sensitivity of the area has been classified and the results are provided in Table 5.3

Table 5.3 Sensitivity of the Surrounding Area for Trackout

Potential Impact	Sensitivity of the Surrounding Area	Reason for Sensitivity Classification
Dust Soiling	High	Estimate between 10 to 100 residential properties aligning Norcutt Road and Edwin Road. (Table A.4)
Human Health	Low	Estimate between 10 to 100 residential properties aligning Norcutt Road and Edwin Road and PM_{10} concentrations below 24 $\mu g.m^{-3}$ (Table A.5)

Overall Dust Risk

5.10 The Dust Emission Magnitude has been considered in the context of the Sensitivity of the Area (Tables A.4 and A.5) to give the Dust Impact Risk. Table 5.4 summarises the Dust Impact Risk for the four activities.

Table 5.4 Dust Impact Risk for Demolition, Earthworks, Construction and Trackout

Source	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Low	Low	Medium
Human Health	Negligible	Negligible	Negligible	Low
Risk	Medium	Low	Low	Medium

5.11 Taking the site as a whole, the overall risk is deemed to be low. The mitigation measures appropriate to a level of risk for the site as a whole and for each of the phases are set out in Section 7.

5.12 Provided this package of mitigation measures is implemented, the residual construction dust effects will not be significant. The IAQM dust guidance states that "*For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'.*" The IAQM dust guidance recommends that significance is only assigned to the effect after the activities are considered with mitigation in place.

6 Assessment of Operational-Phase Air Quality Impacts

Assessment of New Population Exposure (Site Suitability)

6.1 This section of the report establishes the likely pollutant concentrations at the facades of the proposed development. The long-term and short-term objectives apply at the Proposed Development.

6.2 The nearest major roads are the A305 The Green (330 m away) and the A316 Chertsey Road (530 m away). The contribution from emissions from vehicles using these roads is unlikely to be distinguishable from the background concentration at the Application Site. Based on that, urban background monitoring is likely to be indicative of concentrations at the Application Site.

6.3 Table 4.5 sets out the long-term urban background concentrations. i.e. the concentrations away from the local influence of emission sources. The concentrations are all below the respective long-term AQS objectives.

NO_2

6.4 The Defra mapped concentration of 23.4 $\mu g.m^{-3}$ at the Application Site is well below the AQS objective of 40$\mu g.m^{-3}$. Furthermore, Table 4.3 shows that the maximum concentration measured at a suburban location is 36 $\mu g.m^{-3}$. i.e. 90% of the AQS objective.

6.5 The annual-mean NO_2 concentration at the Application Site is therefore highly likely to be more than *5% below the national objective* and would be classified as APEC-A for which the London Council's guidance recommends that there are *"No air quality grounds for refusal; however, mitigation of any emissions should be considered"*.

6.6 There are no APEC classifications for short-term NO_2 impacts; however, as the annual-mean NO_2, concentration is also less than 60 $\mu g.m^{-3}$, the short-term (hourly-mean) AQS objective is expected to be met.

PM_{10}

6.7 The Defra mapped concentration of 16.8 $\mu g.m^{-3}$ at the Application Site is well below the AQS objective of 40 $\mu g.m^{-3}$. Furthermore, Table 4.4 shows that the maximum concentration measured at a suburban location is 22 $\mu g.m^{-3}$. i.e. 55% of the AQS objective.

6.8 The annual-mean PM_{10} concentration at the Application Site is therefore highly likely to be more than *5% below the national objective* and would be classified as APEC-A for which the London

Council's guidance recommends that there are *"No air quality grounds for refusal; however, mitigation of any emissions should be considered"*.

6.9 Using the highest measured concentration of 22 $\mu g.m^{-3}$, the estimated number of daily-mean exceedances of a daily-mean PM_{10} concentration of 50 $\mu g.m^{-3}$ is 6. As this is more than 1 day below the 35, the site would be classified as APEC-A for which the London Council's guidance recommends that there are *"No air quality grounds for refusal; however, mitigation of any emissions should be considered"*.

$PM_{2.5}$

6.10 The Defra mapped concentration of 11.8 $\mu g.m^{-3}$ at the Application Site is well below the AQS objective of 25 $\mu g.m^{-3}$.

Significance of Effects

6.11 It is generally considered good practice that, where possible, an assessment should communicate effects both numerically and descriptively. Professional judgement by a competent, suitably qualified professional is required to establish the significance associated with the consequence of the impacts.

6.12 The impacts predicted at individual receptors and the geographical extent over which such impacts occur, can be used to inform the judgement on the impact on the surrounding area as a whole, and whether the resulting overall effect is significant or not. The IAQM guidance states, *"Whilst it may be that there are 'slight', 'moderate', or 'substantial' impacts at one or more receptors, the overall effect may not necessarily be judged as being significant in some circumstances."* and *"…a 'moderate' or 'substantial' impact may not have a significant effect if it is confined to a very small area and where it is not obviously the cause of harm to human health."*

6.13 The AQS objectives for NO_2, PM_{10} and $PM_{2.5}$ are likely to be met at the facades of the Proposed Development. On that basis, future occupants of the development should be exposed to acceptable air quality and the site is deemed suitable for its proposed future in this respect.

6.14 Using professional judgement, the resulting air quality effect is considered to be 'not significant' overall.

Sensitivity and Uncertainty

6.15 Section 3 provided an analysis of the sources of uncertainty in the results of the assessment. Based on an analysis of available baseline data for the Application Site, the effects are not considered to be significant. This is a conservative assumption as, in reality, background

concentrations are likely to reduce over time as cleaner vehicle technologies form an increasing proportion of the fleet.

7 Mitigation

Mitigation During Construction

7.1 The Mayor of London's Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance lists mitigation measures for low, medium and high dust risks.

7.2 As summarised in Table 5.4, the predicted Dust Impact Risk is classified as medium for Demolition and Trackout, low for Earthworks and Construction. The general site measures described as 'highly recommended' for low risks are listed below. The 'highly recommended' measures specific to medium risk demolition sites are also listed.

Site Management
• Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. • Display the head or regional office contact information • Record and respond to all dust and air quality pollutant emissions complaints. • Make the complaints log available to the local authority when asked. • Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the local authority when asked. • Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions • issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. • Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book.
Preparing and maintaining the site
• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. Use screening intelligently where possible – e.g. locating site offices between potentially dusty activities and the receptors. • Erect solid screens or barriers around dust activities or the site boundary that are, at least, as high as any stockpiles on site. • Avoid site runoff of water or mud.
Operating vehicle/machinery and sustainable travel
• Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone. • Ensure all non-road mobile machinery (NRMM) comply with the standards set within this guidance. • Ensure all vehicles 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 possible. • Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
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. • Use enclosed chutes, 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.

Waste management
• Reuse and recycle waste to reduce dust from waste materials. • Avoid bonfires and burning of waste materials.
Medium risk measures specific to demolition
• Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. • Avoid explosive blasting, using appropriate manual or mechanical alternatives. • Bag and remove any biological debris or damp down such material before demolition.
Medium risk measures specific to trackout
• Regularly use a water-assisted dust sweeper on the access and local roads, as necessary, to remove any material tracked out of the site. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport. • Record all inspections of haul routes and any subsequent action in a site log book. • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems and regularly cleaned. • Inspect haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable; • 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.

7.3 The Mayor of London's SPG states that with the recommended dust mitigation measures in place the residual impact will be *"minimised"*, and recommends the mitigation is secured by for a condition or Section 106 agreement as appropriate.

Mitigation for New Population Exposure (Site Suitability)

7.4 The pollutant concentrations at proposed sensitive receptors are below the relevant AQS objectives. As such, the air quality effect of exposure on future occupants is considered to be "not significant". On that basis, no mitigation measures are considered necessary.

8 Conclusions

8.1 This assessment has considered dust effects during the construction phase and the air quality impacts during the operational phase of the 75 Norcutt Road residential development.

8.2 Impacts during the construction of the 75 Norcutt Road development, such as dust generation and plant vehicle emissions, are predicted to be of short duration and only relevant during the construction phase. The results of the risk assessment of construction dust impacts undertaken using the Mayor of London's guidance indicates that before the implementation of mitigation and controls, the risk of dust impacts will be low. Implementation of the highly-recommended mitigation measures described in the Mayor of London's Supplementary Planning Guidance *"should ensure the air quality impacts of construction and demolition are minimised and any mitigation measures employed are effective"*.

8.3 Regarding suitability of air quality at the site for introducing new occupants, pollutant concentrations at the façades of proposed residential receptors are expected to fall within the London Council's APEC-A banding and the residual air quality exposure effects on new occupants may be expected to be 'not significant'.

8.4 Using professional judgement, the resulting air quality effect of the 75 Norcutt Road development is considered to be 'not significant' overall.

8.5 At the heart of the NPPF is a presumption in favour of sustainable development, subject to caveats where a plan or project affects a habitats site. For determining planning applications, this means approving development proposals if they accord with the local development plan, unless material considerations indicate otherwise. If the development plan is absent, silent or the policies are out of date, then planning permission should be granted unless any adverse impacts would significantly outweigh the benefits, or specific policies in the NPPF indicate development should be restricted.

8.6 The NPPG advises that in considering planning permission, the relevant question for air quality is *"will the proposed development (including mitigation) lead to an unacceptable risk from air pollution, prevent sustained compliance with EU limit values or national objectives for pollutants or fail to comply with the requirements of the Habitats Regulations?"* The proposed development will not.

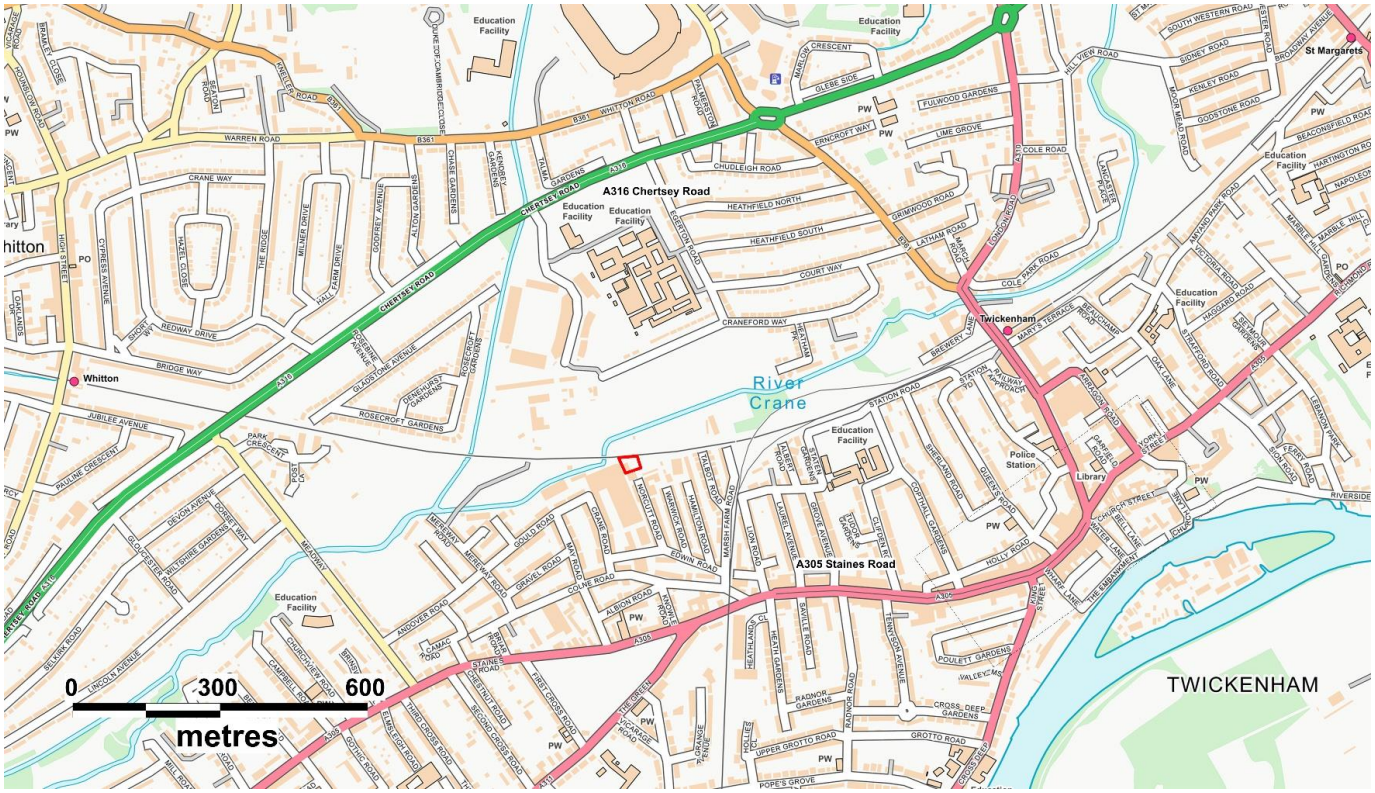
8.7 The 75 Norcutt Road development does not, in air quality terms, conflict with national or local policies, or with measures set out in the LBRT's Air Quality Action Plan. There are no constraints to the development in the context of air quality.

Glossary

AADT	Annual Average Daily Traffic Flow
ADMS	Atmospheric Dispersion Modelling System
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
Deposited Dust	Dust that has settled out onto a surface after having been suspended in air
DMP	Dust Management Plan
Dust	Solid particles suspended in air or settled out onto a surface after having been suspended in air
Effect	The consequences of an impact, experienced by a receptor
EPUK	Environmental Protection UK
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
Impact	The change in atmospheric pollutant concentration and/or dust deposition. A scheme can have an 'impact' on atmospheric pollutant concentration but no effect, for instance if there are no receptors to experience the impact
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
R&A	Review and Assessment
Receptor	A person, their land or property and ecologically sensitive sites that may be affected by air quality
Risk	The likelihood of an adverse event occurring
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

Figures

Site Boundary



Notes
1. This drawing has been prepared in accordance with the scope of RPS' appointment with its client and is subject to the terms and conditions of that appointment. RPS accepts no liability for any use of this document other than by its client and only for the purposes for which it was prepared and provided.
2. If received electronically it is the recipient's responsibility to print to correct scale. Only written dimensions should be used.

MAKING COMPLEX EASY

6-7 Lovers Walk
Brighton East Sussex BN1 6AH

T 01273 546800 F 01273 546801
E rpsbn@rpsgroup.com W rpsgroup.com

Client: For Leek Real Estate (No.1) Limited (No.1) Limited	
Project: Lockcorp House, 75 Norcutt Road, TW2 6SR	
Job Ref: JAR11043	
File location:	
Date:	Rev:
Drawn: FP	Checked:

Figure 1: Application Site

rpsgroup.com/uk

Appendices

Appendix A: Detailed Construction Dust Assessment Methodology

Source

A.1 The IAQM dust guidance gives examples of the dust emission magnitudes for demolition, earthworks and construction activities and trackout. These example dust emission magnitudes are based on the site area, building volume, number of HDV movements generated by the activities and the materials used. These example magnitudes have been combined with details of the period of construction activities to provide the ranking for the source magnitude that is set out in Table A.1.

Table A.1 Risk Allocation – Source (Dust Emission Magnitude)

Features of the Source of Dust Emissions	Dust Emission Magnitude
Demolition - building over 50,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities > 20 m above ground level. **Earthworks** – total site area over 10,000 m^2, potentially dusty soil type (e.g. clay), >10 heavy earth moving vehicles active at any one time, formation of bunds > 8 m in height, total material moved > 100,000 tonnes. **Construction** - total building volume over 100,000 m^3, activities include piling, on-site concrete batching, sand blasting. Period of activities more than two years. **Trackout** – 50 HDV outwards movements in any one day, potentially dusty surface material (e.g. High clay content), unpaved road length > 100 m.	Large
Demolition - building between 20,000 to 50,000 m^3, potentially dusty construction material and demolition activities 10 - 20 m above ground level. **Earthworks** – total site area between 2,500 to 10,000 m^2, moderately dusty soil type (e.g. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 4 - 8 m in height, total material moved 20,000 to 100,000 tonnes. **Construction** - total building volume between 25,000 and 100,000 m^3, use of construction materials with high potential for dust release (e.g. concrete), activities include piling, on-site concrete batching. Period of construction activities between one and two years. **Trackout** – 10 - 50 HDV outwards movements in any one day, moderately dusty surface material (e.g. High clay content), unpaved road length 50 – 100 m.	Medium
Demolition - building less than 20,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities < 10 m above ground, demolition during winter months. **Earthworks** – total site area less than 2,500 m^2. Soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4 m in height, total material moved < 10,000 tonnes earthworks during winter months. **Construction** - total building volume below 25,000 m^3, use of construction materials with low potential for dust release (e.g. metal cladding or timber). Period of construction activities less than one year.	Small

Features of the Source of Dust Emissions	Dust Emission Magnitude
Trackout – < 10 HDV outwards movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.	

Pathway and Receptor - Sensitivity of the Area

A.2 Pathway means the route by which dust and particulate matter may be carried from the source to a receptor. The main factor affecting the pathway effectiveness is the distance from the receptor to the source. The orientation of the receptors to the source compared to the prevailing wind direction is a relevant risk factor for long-duration construction projects; however, short-term construction projects may be limited to a few months when the most frequent wind direction might be quite different, so adverse effects can potentially occur in any direction from the site.

A.3 As set out in the IAQM dust guidance, a number of attempts have been made to categorise receptors into high, medium and low sensitivity categories; however there is no unified sensitivity classification scheme that covers the quite different potential effects on property, human health and ecological receptors.

A.4 Table A.2 and Table A.3 sets out the IAQM basis for categorising the sensitivity of people and property to dust and PM_{10} respectively.

Table A.2 Sensitivities of People and Property Receptors to Dust

Receptor	Sensitivity
Principles:- • Users can reasonably expect enjoyment of a high level of amenity; or • the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods as part of the normal pattern of use of the land. Indicative Examples:- • Dwellings. • Museums and other culturally important collections. • Medium and long-term car parks and car showrooms.	High
Principles:- • Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or • the appearance, aesthetics or value of their property could be diminished by soiling; or • the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.	Medium

Receptor	Sensitivity
Indicative Examples:- • Parks. • Places of work.	
Principles:- • the enjoyment of amenity would not reasonably be expected; or • there is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or • there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Indicative Examples:- • Playing fields, farmland (unless commercially-sensitive horticultural). • Footpaths and roads. • Short-term car parks.	Low

Table A.3 Sensitivities of People and Property Receptors to PM_{10}

Receptor	Sensitivity
Principles:- • Locations where members of the public are exposed over a time period relevant to the air quality objective (in the case of the 24-hour objective for PM_{10}, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Indicative Examples:- ▪ Residential properties. ▪ Schools, hospitals and residential care homes.	High
Principles:- • Locations where the people exposed are workers and exposure is over a time period relevant to the air quality objective (in the case of the 24-hour objective for PM_{10}, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Indicative Examples:- ▪ Office and shop workers (but generally excludes workers occupationally exposed to PM_{10} as protection is covered by Health and Safety at Work legislation).	Medium
Principles:- • Locations where human exposure is transient exposure. Indicative Examples:- • Public footpaths. • Playing fields, parks. • Shopping streets.	Low

A.5 The IAQM methodology combines consideration of the pathway and receptor to derive the 'sensitivity of the area'. Table A.4 and Table A.5 show how the sensitivity of the area has been derived for this assessment.

Table A.4 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors [a]	Distance from the Source (m) [b]			
		<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

The sensitivity of the area has been derived for demolition, construction, earthworks and trackout.

a The total number of receptors within the stated distance has been estimated. Only the highest level of area sensitivity from the table has been recorded.

b For trackout, the distances have been measured from the side of the roads used by construction traffic. Without site-specific mitigation, trackout may occur from roads up to 500 m from large sites, 200 m from medium sites and 50 m from small sites, as measured from the site exit. The impact declines with distance from the site, and trackout impacts have only been considered up to 50 m from the edge of the road.

Table A.5 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration [a]	Number of Receptors [b, c]	Distance from the Source (m) [d]				
			<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

Receptor Sensitivity	Annual Mean PM_{10} Concentration [a]	Number of Receptors [b, c]	Distance from the Source (m) [d]				
			<20	<50	<100	<200	<350
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	> 32 µg.m^{-3}	>10	High	Medium	Low	Low	Low
		1 – 10	Medium	Low	Low	Low	Low
	28 – 32 µg.m^{-3}	> 10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	< 28 µg.m^{-3}	>1	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

The sensitivity of the area has been derived for demolition, construction, earthworks and trackout.

a This refers to the background concentration derived from the assessment of baseline conditions later in this report. The concentration categories listed in this column apply to England, Wales and Northern Ireland but not to Scotland.

b The total number of receptors within the stated distance has been estimated. Only the highest level of area sensitivity from the table has been recorded.

c For high sensitivity receptors with high occupancy (such as schools or hospitals), the approximate number of occupants has been used to derive an equivalent number of receptors.

d For trackout, the distances have been measured from the side of the roads used by construction traffic. Without site-specific mitigation, trackout may occur from roads up to 500 m from large sites, 200 m from medium sites and 50 m from small sites, as measured from the site exit. The impact declines with distance from the site, and trackout impacts have only been considered up to 50 m from the edge of the road.

A.6 The IAQM dust guidance lists the following additional factors that can potentially affect the sensitivity of the area and, where necessary, professional judgement has been used to adjust the sensitivity allocated to a particular 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;
- any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which the works will take place;
- any conclusions drawn from local topography;
- duration of the potential impact, as a receptor may become more sensitive over time; and
- any known specific receptor sensitivities which are considered go beyond the classifications given in the table above.

A.7 The matrices in Table A.6, Table A.7, Table A.8 and Table A.9 have been used to assign the risk for each activity to determine the level of mitigation that should be applied. For those cases where the risk category is 'negligible', no mitigation measures are required beyond those mandated by legislation.

Table A.6 Risk of Dust Impacts – Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table A.7 Risk of Dust Impacts – Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table A.8 Risk of Dust Impacts – Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table A.9 Risk of Dust Impacts – Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

References

1 Council Directive 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe.

2 Defra, 2010, The Air Quality Standards Regulations.

3 Defra, 2007, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Volume 2.

4 Communities and Local Government, February 2019, National Planning Policy Framework

5 GLA, March 2016, The London Plan – Spatial Development Strategy for London Consolidated with Alterations since 2011.

6 GLA, December 2010, The Mayor's Air Quality Strategy.

7 GLA, April 2014, Supplementary Planning Guidance: Sustainable Design and Construction

8 EPUK & IAQM (January 2017) Land-Use Planning & Development Control: Planning For Air Quality

9 Mayor of London (July 2014) The Control of Dust and Emissions During Construction and Demolition

10 IAQM (2014) Guidance on the assessment of dust from demolition and construction

11 Mayor of London (2016) London Local Air Quality Management Technical Guidance, 2016 (LLAQM.TG16)

12 British Standard Institute (1983) BS 6069:Part 2:1983, ISO 4225-1980 Characterization of air quality. Glossary

13 London Councils' Air Quality and Planning Guidance, Revised Version January 2007

14 Drawn from Defra Maps at http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017

Contact

Fiona Prismall
Technical Director
RPS Consulting Services Ltd
6-7 Lovers Walk
Brighton
BN1 6AH
T: +44(0) 1237 546 800
E: PrismallF@rpsgroup.com