Air Quality Assessment

10 Evelina Road

December, 2020

Toucan Property Ltd

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Document Control Sheet

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Report Prepared By

DustScanAQ
Griffin House
Market Street
Charlbury
Oxford OX7 3PJ
United Kingdom
Tel: + 44 (0) 1608 810110
E-mail: info@dustscan.co.uk

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Glossary of Terms

Term	Definition
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Strategy
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMP	Dust Management Plan
EPUK	Environmental Protection UK
EU	European Union
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LBL	London Borough of Lewisham
LBS	London Borough of Southwark
LNR	Local Nature Reserve
MBA	Milan Babic Architects
NAQS	National Air Quality Strategy
NO	Nitric oxide
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NRMM	Non-road Mobile Machinery
PM	Particulate Matter
Ramsar Sites	Designated Wetland
SAC	Special Areas of Conservation
SPA	Special Protection Areas
SPG	Supplementary Planning Guidance
SSSI	Sites of Special Scientific Interest
TPL	Toucan Property Ltd
WHO	World Health Organisation

1 Introduction

Toucan Property Ltd (TPL) are seeking planning permission for a proposed residential development at 10 Evelina Road, London, SE15 2DX. Hereafter referred to as the 'proposed development', it consists of:

> *"Demolition of existing main building and rear outbuilding and construction of part two, part three, part four storey building to create 8 C3 residential units (3 x two bedroom, 3 x one bedroom flats and 2 x studios) including associated roof top amenity, bike storage and refuse area."*

DustScanAQ (DS) have been instructed by TPL, via Milan Babic Architects (MBA), to produce an Air Quality Assessment to support the planning application. The planning application will be determined by the London Borough of Southwark (LBS).

The potential air quality impacts arising as a result of the proposed development have been assessed using the latest planning guidance from Environmental Protection UK (EPUK), the Institute of Air Quality Management (IAQM)[1] and the Department for Environment, Food and Rural Affairs (Defra)[2].

1.1 Objectives

This report provides an assessment on the following key issues associated with the construction and operational phases of the proposed development:

- Nuisance, loss of amenity and health impacts associated with the construction phase of the proposed development on sensitive receptors;
- Characterisation of the baseline conditions at the site using monitored pollutant data from LBS and background concentrations from Defra background maps;
- Assessment of the suitability of the proposed development for the introduction of new residential receptors;
- Establish if the proposed development is 'air quality neutral' or better; and
- If required, make recommendations for mitigation measures.

1.2 Proposed Development Location

The proposed development is located along Evelina Road, in an area dominated by commercial and residential use (see Figure 1.1). The site is bounded to the west, north and east by commercial and residential properties, with Evelina Road to the south.

The proposed development just lies within the LBS Air Quality Management Area (AQMA), declared by LBS for the whole borough on 1st June 2003 for exceedances of the NO_2 annual mean and PM_{10} 24-hour mean objectives.

[1] IAQM (2017): 'Land Use Planning and Development Control: Planning for Air Quality v1.2'.
[2] Defra (2016): 'Local Air Quality Management – Technical Guidance (TG16)'.

There are no nationally designated ecological sites, such as Site of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC) Special Protection Areas (SPA) or designated wetlands (Ramsar Sites) within close proximity of the proposed development site. The nearest nationally designated ecological site is Gilberts Pit SSSI, approximately 6.6 km north east of the proposed development site.

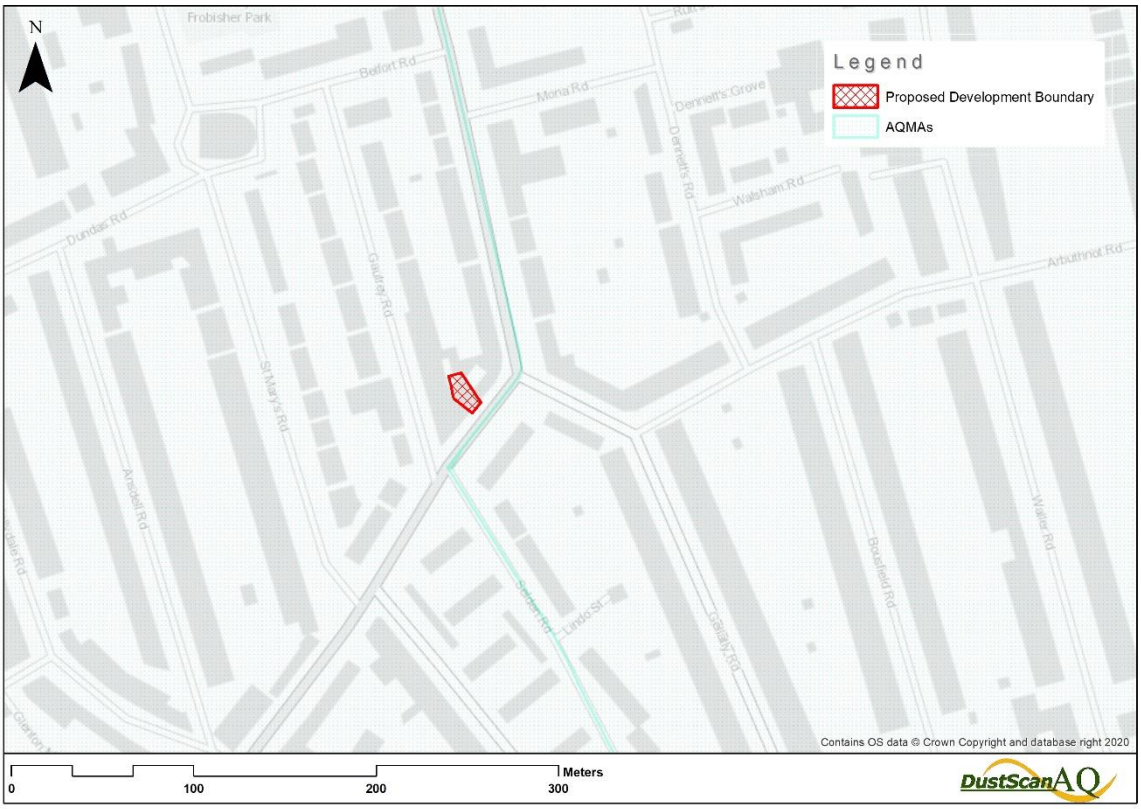

Figure 1.1: Proposed development site location

1.3 Key Pollutants

The key pollutant associated with the construction phase of the project will be 'disamenity' or 'nuisance' dust. Nitrogen dioxide (NO_2) and particulate matter ($PM_{2.5}$ and PM_{10}) may also be associated with emissions from non-road mobile machinery (NRMM) and construction related traffic.

The key pollutants associated with the operational phase of the proposed development will be road traffic emissions including NO_2 and particulate matter ($PM_{2.5}$ and PM_{10}). These pollutants are therefore considered as part of this assessment.

Further details of the key pollutants are presented below.

1.3.1 Nitrogen Dioxide (NO_2)

NO_2 and nitric oxide (NO) are collectively referred to as oxides of nitrogen (NO_x). During fuel combustion, atmospheric nitrogen combines with oxygen to form NO, which is not considered harmful. Through a chemical reaction with ozone (O_3), NO further combines with oxygen to create NO_2 which can be harmful to human health and vegetation. The foremost

sources of NO_2 in the UK are combustion activities, mainly road transport and power generation.

1.3.2 Particulate Matter

Particulate matter as a term refers to a mixture of solid particles and liquid droplets suspended in the air. These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, such as dust, dirt, soot or smoke, are large or dark enough to be seen with the naked eye. Others can be so small that they can only be detected using an electron microscope. Fine dust, essentially particles up to 10 microns (µm), is commonly referred to as PM_{10}.

PM_{10} is known to arise from a number of sources such as construction sites, road traffic movement, industrial and agricultural activities. Very fine particles ($PM_{0.1}$ – $PM_{2.5}$) are known to be associated with pollutants such as NO_x and sulphur dioxide (SO_2) emitted from power plants, industrial installations and road transport sources.

$PM_{2.5}$ is generally associated with combustion and traffic sources and is more likely to be associated with the operational phase of the proposed development.

1.3.3 Disamenity Dust

'Dust' is generally regarded as particulate matter up to 75 µm in diameter and in an environmental context can be considered in two size categories; coarser dust (particles greater than 10 µm) and fine particulate matter (PM_{10} and $PM_{2.5}$) as described above.

Coarser dust (particles greater than 10 µm) is generally regarded as 'disamenity dust' and can be associated with annoyance, although there are no official standards for dust annoyance[3]. Disamenity dust is more readily described than defined as it relates to the visual impact of short-lived dust clouds and the long-term soiling of surfaces.

Although it is a widespread environmental phenomenon, dust is also generated through many anthropogenic activities including materials handling, construction, demolition and vehicle use. Dust is generally produced by mechanical action on materials and is carried by moving air when there is sufficient energy in the airstream. More energy is required for dust to become airborne than for it to remain suspended.

[3] Note that the expression 'nuisance dust' refers here to 'generally visible particulate matter' rather than specifically and in a legal sense to statutory nuisance, as defined in Section 79 of the Environmental Protection Act 1990.

2 Legislation, Policy and Non-Statutory Guidance

This section summarises all legislation, policy, statutory and non-statutory guidelines relevant to the proposed development. Furthermore, the latest regional and local planning policy guidance specifically applicable to the proposed development has been reviewed.

The UK left the EU on the 31st January 2020. There is now a transition period until the end of 2020 while the UK and EU negotiate additional arrangements. The current rules on trade, travel, and business for the UK and EU will continue to apply during the transition period.

Following exit day on the 31st January 2020, the current framework of air quality legislation was converted into domestic law through the European Union (Withdrawal) Act 2018[4].

2.1 International (European Union)

Whilst the UK has left the EU, it is relevant to understand the source of the current UK legislation. The European Union (EU) sets legally binding limit values for outdoor air pollutants to be met by EU countries by a given date. These limit values are based on the World Health Organisation (WHO) guidelines on outdoor air pollutants. These are legally binding and set out to protect human health and the environment by avoiding, preventing or reducing harmful air pollution effects.

Directive 2008/50/EC[5] on ambient air quality and cleaner air for Europe entered into force in June 2008. This merged the existing 'Daughter' Directives[6,7,8,9] (apart from the fourth Daughter Directive), maintaining existing air quality objectives set out by 'Daughter' Directives for:

- Sulphur dioxide (SO_2);
- Nitrogen dioxide (NO_2);
- Oxides of nitrogen (NO_x);
- Particulate matter ($PM_{2.5}$ and PM_{10});
- Lead (Pb);
- Benzene(C_6H_6);
- Carbon monoxide (CO); and
- Ozone (O_3).

Directive 2008/50/EC also includes related objectives, exposure concentration obligations and exposure reduction targets for $PM_{2.5}$ (fine particles). The 'Daughter' Directives were

[4] European Union. (2018): http://www.legislation.gov.uk/ukpga/2018/16/contents/enacted
[5] European Union. (2008), 'Ambient air quality assessment management', Framework Directive 2008/50/EC.
[6] European Union. (1999), 'Ambient air quality assessment management', Framework Directive 1999/30/EC.
[7] European Union. (2000), 'Ambient air quality assessment management', Framework Directive 2000/3/EC.
[8] European Union. (2002), 'Ambient air quality assessment management', Framework Directive 2002/3/EC.
[9] European Union. (2004), 'Ambient air quality assessment management', Framework Directive 2004/107/EC.

based upon requirements set out in the first EU Ambient Air Quality Framework Directive 96/92/EEC[10].

2.2 National (England)

The 2008 EU ambient air quality directive 2008/50/EC was transposed into English law through the introduction of the Air Quality (Standards) Regulations in 2010[11] which also incorporated the fourth EU Daughter Directive (2004/107/EC) that set target values for certain toxic heavy metals and polycyclic aromatic hydrocar, (PAH).

The UK government has a responsibility to meet its own limit values, which mirror the EU limit values. Part IV of the 1995 Environment Act[12] sets guidelines for protecting air quality in the UK and forms the basis of local air quality management. The Environment Act requires local authorities in the UK to review air quality in their area periodically and designate Air Quality Management Areas (AQMAs) where the objectives are not being achieved or are not likely to be achieved within the relevant period. Where an AQMA is designated, local authorities are also required to produce an 'Air Quality Action Plan' (AQAP) detailing the pollution reduction measures that need to be adopted to achieve the relevant air quality objectives within an AQMA.

As part of the Environment Act, the UK Government was required to publish a National Air Quality Strategy (NAQS) to establish the system of 'local air quality management' (LAQM) for the designation of AQMAs. This led to the introduction of the first Air Quality Strategy in 1997[13] which has since progressed through several revisions until it was replaced by the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007[14]. Each revision introduced strategies and regulations that considered measures for different pollutants by tightening existing objectives and also by introducing new ones to establish a common framework to protect human health and the environment by achieving ambient air quality improvements.

2.2.1 National Planning Policy Framework

The principal national planning policy guidance in respect of the proposed development is the National Planning Policy Framework (NPPF)[15]. The most recent update of the NPPF was published in February 2019 by the Department for Communities and Local Government (DCLG).

The NPPF 2019 contains five sections which are relevant to air quality.

Section 103 states that:

> *"The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which*

[10] European Union. (1996), 'Ambient air quality assessment management', Framework Directive 96/62/EC.
[11] Statutory Instrument. (2010), 'The Air Quality Standards Regulations', No. 1001. Queen's Printer of Acts of Parliament.
[12] Parliament of the United Kingdom. (1990), 'Environmental Protection Act', Chapter 43. Queen's Printer of Acts of Parliament.
[13] Department for Environment Food and Rural Affairs. (1997), 'The United Kingdom National Air Quality Strategy', Cm 3587, Department for Environment Food and Rural Affairs.
[14] Department for Environment Food and Rural Affairs. (2007), 'The Air Quality Strategy for England, Scotland, Wales and Northern Ireland', Cm 7169, Department for Environment Food and Rural Affairs.
[15] National Planning Policy Framework. Accessible at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf

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."

Section 170 (e) states that:

"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…"

Section 180 states that:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development."

Section 181 states that:

"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."

Section 183 states that:

"The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."

2.2.2 National Planning Practice Guidance

The DCLG published a number of supporting web based resources of Planning Practice Guidance (PPG)[16] to supplement the NPPF. With respect to air quality the PPG[17] provides guidance on when air quality is relevant to a planning application. It states that:

> *"Whether 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 have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity."*

The PPG also states that, when deciding whether air quality is relevant to a planning application, the applicant should consider whether the proposal will:

- *"Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield……*
- *Introduce new point sources of air pollution…..,*
- *Expose people to harmful concentrations of air pollutants …..,*
- *Give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations….,*
- *Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value."*

2.2.3 Relevant Air Quality Standards

A summary of the relevant AQO and where they are applicable are presented in Table 2.1 and Table 2.2 respectively. The AQO listed in Table 2.1 are only applicable at locations where a member of the public could be reasonably expected to spend the relevant averaging period. Further examples of this are presented in Table 2.2.

Table 2.1: AQO relevant to the proposed development

Pollutant	Averaging Period	AQO (µg/m^3)	Exceedance Allowance	Percentile Equivalent
Nitrogen Dioxide (NO_2)	Annual	40	-	-
	1-hour	200	18 per annum	99.8th
Particulate Matter (as PM_{10})	Annual	40	-	-
	24-hour	50	35 per annum	90.4th

[16] National Planning Practice Guidance web-based resource. Accessible at: http://planningguidance.planningportal.gov.uk/
[17] Paragraph: 005 Ref ID 32-005-20140306, revision date 01.11.2019

Pollutant	Averaging Period	AQO (µg/m^3)	Exceedance Allowance	Percentile Equivalent
Particulate Matter (as $PM_{2.5}$)[(a)]	Annual	25	-	-

Notes: [(a)] This is a target value set for a 15% reduction in concentrations at urban background aimed to achieve between 2010 and 2020

Source: Department for Environment Food and Rural Affairs (2016): 'Local Air Quality Management Technical Guidance' (TG.16).

Table 2.2: Examples of where the AQO should apply

Averaging period	Objectives should apply at	Objectives should not apply at
Annual	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
24 Hour	All locations where the annual mean objective would apply, together with hotels and gardens of residential properties[(a)].	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
1 Hour	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably have expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

Note:

(a) "*Such locations should represent parts of the garden where relevant public exposure to pollutants is likely, for example where there is seating or play areas. It is unlikely that relevant public exposure to pollutants would occur at the extremities of the garden boundary, or in front gardens, although local judgement should always be applied.*"

Source: Department for Environment Food and Rural Affairs (2016): 'Local Air Quality Management Technical Guidance' (TG.16).

2.2.4 Statutory Nuisance

It is recognised that the planning system presents a way of protecting amenity. However, in cases where planning conditions are not applicable to a development/installation, the requirements of the Environmental Protection Act 1990 still apply. Under Part III of the Environmental Protection Act 1990, local authorities have a statutory duty to investigate any complaints of:

- *"any premises in such a state as to be prejudicial to health or a nuisance*
- *smoke emitted from premises so as to be prejudicial to health or a nuisance*
- *fumes or gases emitted from premises so as to be prejudicial to health or a nuisance*
- *any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance*
- *any accumulation or deposit which is prejudicial to health or a nuisance"*

Where the local authority establishes any one of these issues constitutes a statutory nuisance and believes it to be unreasonably interfering with the use or enjoyment of someone's premises and/or is prejudicial to health, an abatement notice will be served on the person responsible for the offence or the owner / occupier. Failure to comply with the notice could lead to a prosecution. However, it is considered as a defence if the best practicable means to prevent or to counteract the effects of the nuisance are employed.

2.3 Regional (London)

2.3.1 London Plan

The London Plan[18] is the spatial development strategy for London which was first published by then-Mayor Ken Livingstone in 2004. The document has gone through number of alterations and the with most recent alterations published in March 2016.

The London Local Plan sets out the overall strategic plan for London with an integrated approach for economic, environmental, transport and social framework for the development of London over the next 20–25 years and covers a number of strategies including transport and environmental issues such as climate change and air quality.

The supporting text of Policy 3.2 *"Improving Health and Addressing Health Inequalities"* states:

- *"The policies in this Plan are intended to enable Londoners to live in well designed, high quality homes…limiting…exposure to poor air quality."*

Policy 5.1 *"Climate Change Mitigation"* states:

[18] Greater London Authority. (2016), 'The London Plan: Spatial Development Strategy for London Consolidated with Alterations Since 2011'.

- *"The Mayor seeks to achieve an overall reduction in London's carbon dioxide emissions of 60 per cent (below 1990 levels) by 2025. It is expected that the GLA Group, London boroughs and other organisations will contribute to meeting this strategic reduction target, and the GLA will monitor progress towards its achievement annually."*

The supporting text for this policy states:

- *"The Mayor…has also produced other strategies related to…Air Quality…The Mayor will ensure that policies in this Plan are complemented by those in other mayoral strategies (particularly the Mayor's Transport Strategy, which sets carbon dioxide reduction targets to be achieved in the transport system)."*

Policy 5.3 *"Sustainable design and Construction"* states:

- *"Minimising carbon dioxide emissions across the site, including the building and services (such as heating and cooling systems)"*
- *"Minimising pollution (including…air)"*

Policy 7.14 *"Improving Air Quality"* states that:

- *"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…;*
- *Promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practice guidance in the GLA and London Councils' 'The control of dust and emissions from construction and demolition';*
- *Be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as Air Quality Management Areas (AQMAs);*
- *Ensure that where provision needs to be made to reduce emissions from a development, this is usually made on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, and that it is possible to put in place measures having clearly demonstrated equivalent air quality benefits, planning obligations or planning conditions should be used as appropriate to ensure this, whether on a scheme by scheme basis or through joint area based approaches*
- *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."

2.3.2 New London Plan

A draft of the new London Plan[19] was first published in 2017, with the latest 'intend to publish' London Plan released in December 2019. Though not yet adopted, the new London Plan is a material consideration in the planning decision process; once adopted, the new London Plan will supersede all previous versions. The new London Plan *"seeks to develop an approach tailored for London to reflect the particular circumstances in the capital, and it will act as the key document shaping planning decisions across Greater London"*.

The new London Plan includes one policy that is specifically related to air quality: "*Policy SI 1: Improving air quality*". Policy SI 1 states:

"A Development plans, through relevant strategic, site specific and area-based policies should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality.

B To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed:

1 Development proposals should not:

a) lead to further deterioration of existing poor air quality

b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits

c) create unacceptable risk of high levels of exposure to poor air quality.

2 In order to meet the requirements in Part 1, as a minimum:

a) Development proposals must be at least air quality neutral

b) Development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retrofitted mitigation measures

c) Major development proposals must be submitted with an Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of B1

d) Development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people, should demonstrate that design measures

[19] Greater London Authority. (2019), 'The London Plan – Intend to Publish Version December 2019'.

have been used to minimise exposure. Draft London Plan – consolidated changes version – Clean July 2019

C *Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating:*

a) How proposals have considered ways to maximise benefits to local air quality, and

b) What measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this.

D *In order to reduce the impact on air quality during the construction and demolition phase development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance.*

E *Development proposals should ensure that where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of development on local air quality acceptable, this is done on-site. Where it can be demonstrated that emissions cannot be further reduced by on-site measures, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated within the area affected by the development."*

Within the new London Plan several other policies also make reference to air quality. The relevant aspects of these polices which are pertinent to this proposed development are reproduced below.

"Policy D1: London's form, character and capacity for growth" states:

"A Boroughs should undertake area assessments to define the characteristics, qualities and value of different places within the plan area to develop an understanding of different areas' capacity for growth. Area assessments should cover the elements listed below:

…..

5) air quality and noise levels"

"Policy D3: Optimising site capacity through the design-led approach" states:

"A All development must make the best use of land by following a design led approach that optimises the capacity of sites, including site allocations. The design-led approach requires consideration of design options to determine the most appropriate form of development that responds to a site's context and capacity for growth, and existing and planned supporting infrastructure capacity (as set out in Policy D2), and that best delivers the requirements set out in Part B.

B Development proposals should:

….

9) help prevent or mitigate the impacts of noise and poor air quality"

"Policy SI3: Energy Infrastructure" states:

"D Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system:

2) CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that they meet the requirements in Part B of Policy SI 1 Improving air quality."

"Policy T6: Car Parking" states:

"G Where car parking is provided in new developments, provision should be made for infrastructure for electric or other Ultra-Low Emission vehicles in line with Policy T6.1 Residential parking, Policy T6.2 Office parking, Policy T6.3 Retail parking, and Policy T6.4 Hotel and leisure uses parking….."

"Policy T6.1: Residential parking" states:

"C All residential car parking spaces must provide infrastructure for electric or Ultra-Low Emission vehicles. At least 20 per cent of spaces should have active charging facilities, with passive provision for all remaining spaces."

2.3.3 The Mayor of London Environment Strategy

The Mayor of London Environment Strategy[20], published on 31st May 2018, integrates every aspect of London's environment into different categorised areas. The document includes several transport and non-transport related policy measures outlined in Chapter 4, highlighting the need for improvement in London's air quality.

Policy 4.2 states:

- *"Reduce emissions from London's road transport network by phasing out fossil fuelled vehicles, prioritising action on diesel, and enabling Londoners to switch to more sustainable forms of transport."*
- *"Reduce emissions from non-road transport sources, including by phasing out fossil fuels."*

Proposals for this policy include the phasing out of fossil fuels for private and public transport, as well as from freight vehicles, prioritising action on diesel fuels and implementing the switch to zero emission technologies. The reduction in emission from NRMM, construction and demolition sites, homes and workplaces and large-scale generators is proposed for this policy.

[20] Greater London Authority. (2018), 'London Environment Strategy'.

Policy 4.3 states:

- *"The Mayor will establish new targets for $PM_{2.5}$ and other pollutants where needed. The Mayor will seek to meet these targets as soon as possible, working with government and other partners."*
- *"The Mayor will encourage the take up of ultra low and zero emission technologies to make sure London's entire transport system is zero emission by 2050 to further reduce levels of pollution and achieve WHO air quality guidelines."*
- *"Phase out the use of fossil fuels to heat, cool and maintain London's buildings, homes and urban spaces, and reduce the impact of building emissions on air quality."*
- *"Work to reduce exposure to indoor air pollutants in the home, schools, workplace and other enclosed spaces."*

Proposals for this policy include the switching of fleet vehicles to zero emission capability, implementation of local zero emission zones from 2020, ensure all new large-scale developments are 'Air Quality Neutral' and maintain Air Quality Neutral requirements for all developments. The reduction in emissions from wood and other solid fuel burning, using the planning system to reduce indoor exposure though design measures, preventing poor air quality entering the building and ensuring CO_2 and pollution targets are achieved are also proposals included for this policy.

2.3.4 The Mayor of London Transport Strategy

In March 2018 the Mayor of London published the Mayors Transport Strategy[21], setting out the Mayor's policies and proposals, enabling transport in London to be reshaped over the next 20 years.

The key themes within the strategy are; healthy streets and healthy people, good public transport experiences, new homes and jobs.

Chapter 3, section C "*Improving air quality and the environment*" includes policies 6 and 7 which relate to transport and air quality.

Policy 6 states:

> *"The Mayor, through TfL and the boroughs, and working with stakeholders, will take action to reduce emissions – in particular diesel emissions – from vehicles on London's streets, to improve air quality and support London reaching compliance with UK and EU legal limits as soon as possible. Measures may include retrofitting vehicles with equipment to reduce emissions, promoting electrification, road charging, the imposition of parking charges/ levies, responsible procurement, the making of traffic restrictions/ regulations and local actions."*

[21] Greater London Authority. (2018), 'Mayor's Transport Strategy'.

Policy 7 states:

> *"The Mayor, through TfL and the boroughs, and working with stakeholders, will seek to make London's transport network zero emission by 2050, contributing towards the creation of a zero carbon city, and also to deliver further improvements in air quality to help meet tighter air quality standards, including achieving a health-based target of 10 µg/m^3 for $PM_{2.5}$ by 2030. London's streets and transport infrastructure will be transformed to enable zero emission operation, and the switch to ultra low and zero emission technologies will be supported and accelerated."*

2.4 Local London Borough of Southwark)

2.4.1 Southwark Plan 2007

The Southwark Plan 2007[22] sets out a vision for the development of Southwark. Much of the Southwark Plan 2007 has been superseded by the Core Strategy 2011 but the policy relating to air quality is unchanged. Policy 3.6 related directly to air quality and states:

> *"Planning permission will not be granted for development that would lead to a reduction in air quality."*

2.4.2 New Southwark Plan

LBS is currently in the process of developing the New Southwark Plan (NSP)[23] which will outline borough-wide planning and regeneration strategy up to 2033. The formal consultation for the proposed submission version of the NSP was concluded on 27/02/18. Amendments to some policies are to be considered by the council on 22/01/19.

Policy P66 in the NSP is specifically for air quality. P66 states:

> *"P66: Improving air quality*
>
> *Development must:*
>
> *1.1 Achieve or exceed air quality neutral standards (see Annex 2); and*
>
> *1.2 Address the impacts of poor air quality on building occupiers and public realm users by reducing exposure to and mitigating the effects of poor air quality. This must be achieved through design solutions that include:*
>
> *i. Orientation and layout of buildings, taking into account vulnerable building occupiers, and public realm and amenity space users; and*
>
> *ii. Ventilation systems; and*
>
> *iii. Urban greening appropriate for providing air quality benefits proportionate to the scale of the development;*
>
> *iv. 'Ultra low' NOx boilers where the development is not connected to a decentralised energy network; or*

[22] London Borough of Southwark. (2007), 'Southwark Plan'.
[23] London Borough of Southwark. (2017), 'New Southwark Plan: Proposed Submission Version'.

v. Appropriate abatement technologies to bring emissions within the equivalent of 'ultra low' NOx boiler emissions levels where decentralised energy networks are implemented or utilised

2 Where air quality neutral standards are not met for buildings or transport, measures to offset any 90 New Southwark Plan Proposed Submission Version shortfall will be required, according to the following hierarchy:

i. On-site measures; then
ii. Off-site measures; then
iii. Financial contributions to provide measures"

2.4.3 Air Quality Strategy & Action Plan

The LBS Air Quality Strategy & Action Plan 2017-2022[24], published in April 2017, outlines 113 actions that LBS will undertake to improve air quality across the borough. These actions are grouped into eight strategic aims. The strategic aims are to:

- Manage local air quality;
- Reduce emissions from buildings;
- Increase public awareness;
- Reduce emissions from road traffic;
- Reduce carbon emissions;
- Regulation;
- Support the GLA; and
- Support the Public Health Framework Objectives

[24] London Borough of Southwark. (2017), 'Air quality Strategy & Action Plan'.

3 Methodology

This section sets out the approach taken to assess the potential impacts on air quality during the construction and operational phases of the proposed development.

3.1 Scope of the Assessment

The assessment is based on the following scope of work presented in Table 3.1:

Table 3.1: Scope of Work

Scope	Consideration
Spatial	The assessment considers the impact of NO_2, PM_{10} and $PM_{2.5}$ emissions from the local roads on the proposed development site.
Temporal	The construction phase impacts resulting from the proposed development have been considered for the earliest anticipated construction year (2021). The operational phase impacts resulting from the proposed development have been considered for the earliest possible year of occupation (2022).

3.2 Construction Phase

The proposed development has the potential to generate dust during the construction phase of the project. Although there are no standards (such as AQO) for dust disamenity or annoyance, various 'customs and practice' criteria have become established.

For the purposes of this assessment, IAQM's 2016 Construction Dust Risk guidance[25] has been used to carry out a construction dust risk assessment. The IAQM guidance provides a methodology (Appendix B) to evaluate potential risk of dust generation for a development and the level of mitigation required. The impact of the development is described using one of the following three categories: 'Low Risk', 'Medium Risk' and 'High Risk'. Based on the risk level, appropriate mitigation measures can be considered to minimise any risk of dust impacts from the construction phase.

3.3 Operational Phase

3.3.1 Road Source Emissions

The IAQM and EPUK planning guidance (Appendix A) which informs this assessment contains indicative criteria on when to proceed to a Detailed Air Quality Assessment (AQA). The criteria relating to changes in traffic flow are as follows:

A change of LDV flows of:

[25] Institute of Air Quality Management (2016): 'Guidance on the Assessment of Dust from Demolition and Construction'

- more than 100 AADT within or adjacent to an AQMA; and
- more than 500 AADT elsewhere.

A change of HDV flows of:

- more than 25 AADT within or adjacent to an AQMA; and
- more than 100 AADT elsewhere.

As the proposed development is within an AQMA, the more stringent criteria are applicable. MBA have confirmed that the proposed development will not introduce any additional parking and is considered to be car free. A detailed assessment of road source emissions can therefore be scoped out.

3.3.2 Point Source Emissions

The proposed development will not use any central plant (CHP/boiler) with associated flue stacks. Any domestic boilers installed will be ultra-low NOx, meeting the GLA requirements. The assessment of operational point source emissions can therefore be scoped out.

3.3.3 Air Quality Neutral Assessment

For the purposes of this assessment, the updated Air Quality Neutral Planning Support[26] document, which accompanies the Greater London Authority's (GLA) Sustainable Design and Construction Supplementary Planning Guidance (SPG)[27], has been used to carry out an air quality neutral assessment. The document provides a methodology to undertake an air quality neutral assessment, with emission benchmarks for buildings and transport. These benchmarks can be directly compared against predicted values for the proposed development to establish if it is 'air quality neutral' or better. Based upon the outcome of the assessment, mitigation measures can be considered and implemented to minimise the development's impact on existing poor air quality.

[26] Air Quality Consultants (2014): 'Air Quality Neutral Planning Support Update: GLA 80371'
[27] Mayor of London (2014): 'Sustainable Design and Construction Supplementary Planning Guidance'

4 Baseline Conditions

The following section sets out the baseline conditions in relation to air quality at the proposed development site. For the purpose of this assessment, data has been obtained from the LBS Annual Status Report for 2019[28] (ASR), the London Borough of Lewisham (LBL) Annual Status Report for 2019[29] and the Defra air quality resource website[30].

4.1 Automatic Monitoring

In 2019, LBS undertook automatic monitoring at three locations and LBL at four locations. Figure 4.1 illustrates the monitors located within 2 km of the proposed development site.

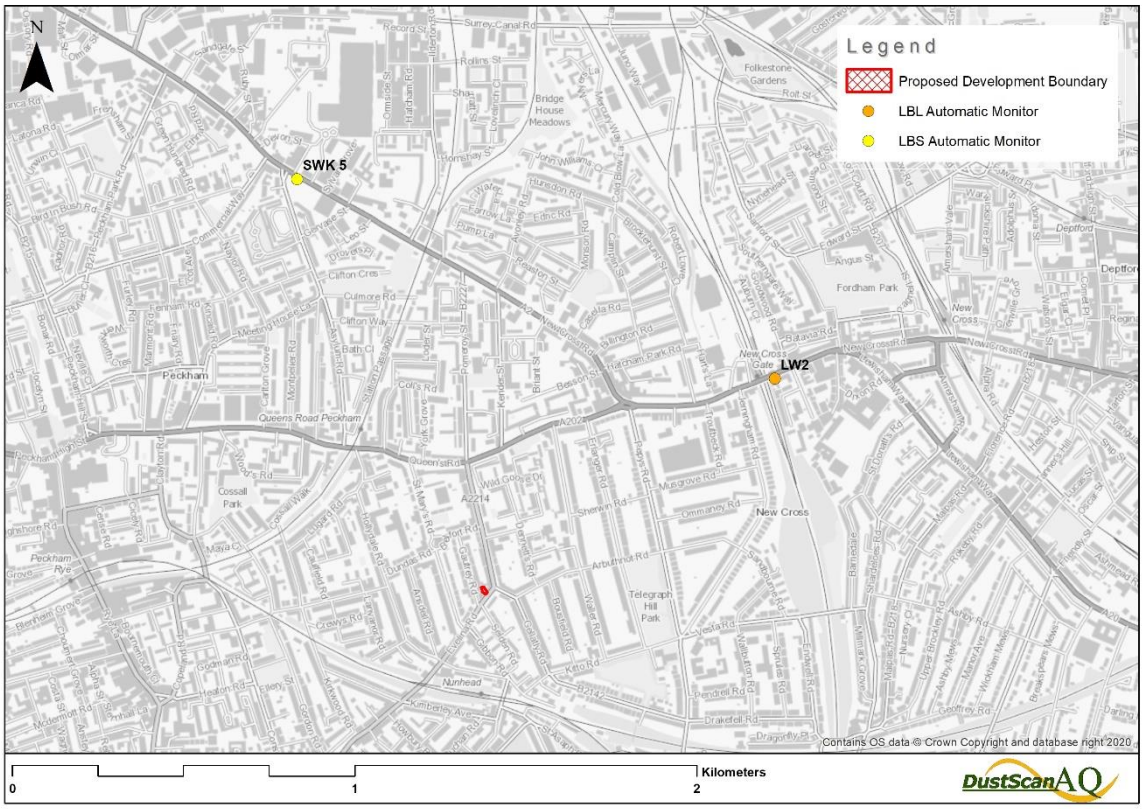

Figure 4.1: Automatic Monitor Locations

Monitored NO_2, PM_{10} and $PM_{2.5}$ concentrations at these monitors for the latest three years of available data are presented below in Table 4.1 to Table 4.5.

[28] London Borough of Southwark (2020). 'London Borough of Southwark Air Quality Annual Status Report'
[29] London Borough of Lewisham (2020). 'London Borough of Lewisham Air Quality Annual Status Report'
[30] Department for Environmental Food and Rural Affairs. Accessible at: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018

Table 4.1: Automatic Monitoring NO_2 Annual Mean Concentrations (µg/m^3)

Site ID	Site Classification	Annual mean NO_2 Concentration (µg/m^3)		
		2017	2018	2019
SWK 5	Roadside	**42**	**41**	35
LW2	Roadside	**48.9**	**42.1**	37.9

Notes: Exceedance of the NO_2 annual mean AQO of 40 µg m^{-3} are shown in **bold.**

NO_2 annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in **bold** and **underlined.**

Table 4.2: Automatic Monitoring NO_2 1-Hour Mean Exceedances

Site ID	Site Classification	NO_2 1-Hour Means > 200 µg/m^3		
		2017	2018	2019
SWK 5	Roadside	0	0	0
LW2	Roadside	0	0	0

Notes: Exceedance of the NO_2 short term AQO of 200 µg m^{-3} over the permitted 18 hours per year are shown in **bold.**

Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Table 4.3: Automatic Monitoring PM_{10} Annual Mean Concentrations (µg/m^3)

Site ID	Site Classification	Annual mean PM_{10} Concentration (µg/m^3)		
		2017	2018	2019
SWK 5	Roadside	22	22	24
LW2	Roadside	22.8	21.2	19.8

Notes: Exceedance of the PM_{10} annual mean AQO of 40 µg m^{-3} are shown in **bold.**

Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%.

Table 4.4: Automatic Monitoring PM_{10} 24-Hour Mean Exceedances

Site ID	Site Classification	PM_{10} 1-Hour Means > 50 µg/m^3		
		2017	2018	2019
SWK 5	Roadside	19	8	2
LW2	Roadside	11	4	9

Notes: Exceedance of the PM_{10} short term AQO of 50 µg m^{-3} over the permitted 35 days per year or where the 90.4th percentile exceeds 50 µg m^{-3} are shown in bold. Where the period of valid data is less than 85% of a full year, the 90.4th percentile is shown in brackets after the number of exceedances.

Table 4.5: Automatic Monitoring $PM_{2.5}$ Annual Mean Concentrations (µg/m^3)

Site ID	Site Classification	Annual mean $PM_{2.5}$ Concentration (µg/m^3)		
		2017	2018	2019
LW2	Roadside	15.5	15.0	15.0

Notes: Exceedance of the PM_{10} annual mean AQO of 25 µg m^{-3} are shown in **bold.**

Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%.

4.2 Non-Automatic (Diffusion Tube) Monitoring

In 2019, LBS undertook diffusion tube monitoring at 83 sites and LBL at 50 sites. As illustrated in Figure 4.2, five of these sites are located within 1 km of the proposed development site.

Table 4.6 presents the monitored NO_2 annual mean concentrations recorded at these sites for the latest three-year period of available data.

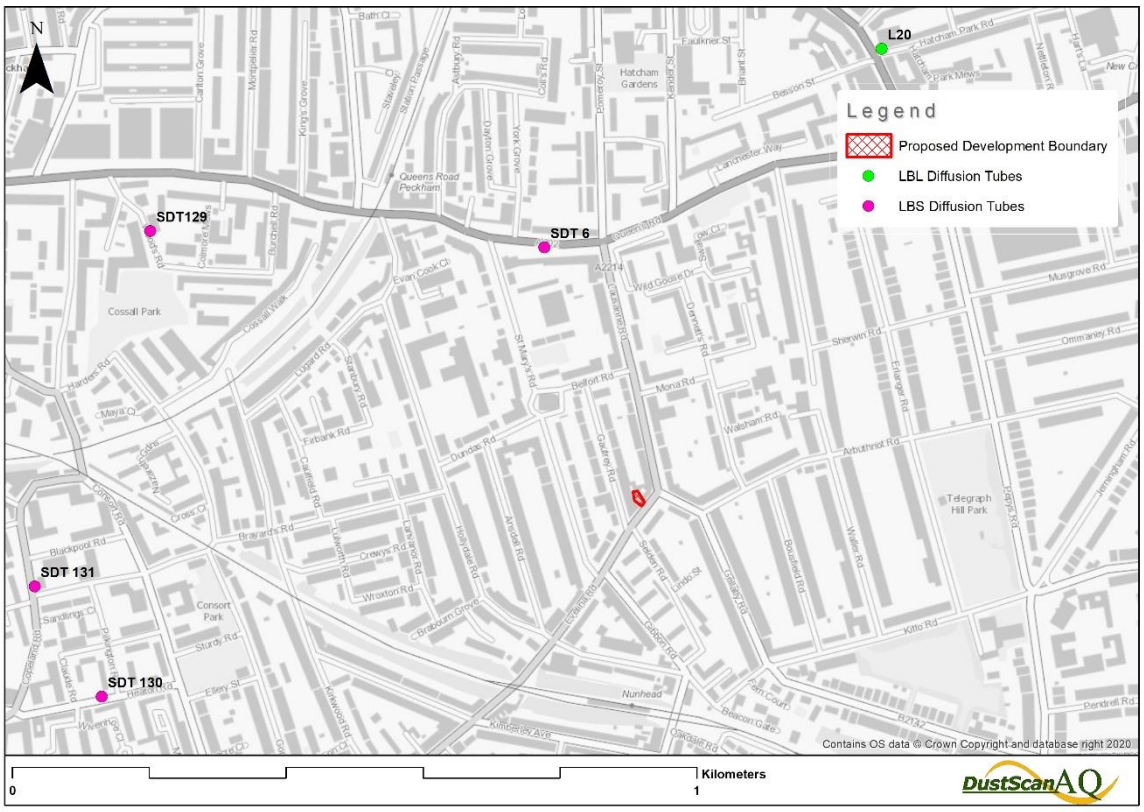

Figure 4.2: Diffusion tube locations

Table 4.6: Diffusion Tube NO_2 Annual Mean Concentrations

Diffusion Tubes				
Site ID	Site Classification	Annual mean NO_2 Concentration (µg/m^3)		
		2017	2018	2019
L20	Roadside	38.6	37.7	34.3
SDT 6	Roadside	**42.0**	39.4	36.7
SDT 129	Roadside	N/A	N/A	35.4
SDT 131	Roadside	N/A	N/A	36.7
SDT 130	Roadside	N/A	N/A	32.7

Notes: Exceedance of the NO_2 annual mean AQO of 40 µg m^{-3} are shown in **bold.**

NO_2 annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO_2 hourly mean objective are shown in **bold** and **underlined.**

Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

4.3 Defra Modelled Background Pollution Concentrations

Defra provides background pollution concentration estimates to assist local authorities in undertaking their 'Review and Assessment' work. This data is available to download from the Defra air quality resource website for NOx, NO_2, PM_{10} and $PM_{2.5}$ for every 1 km X 1 km grid square for all local authorities. The current dataset is based on 2018 background data and future year projections are available for 2018 to 2030. The background dataset provides breakdown of pollution concentrations by different sources (both road and non-road sources).

Table 4.7 presents the predicted background concentrations for the latest year of available monitoring data (2019) from LBS and LBL and the earliest anticipated year of occupation (2022).

Table 4.7: Defra Projected Background Concentrations at proposed development

Year	Annual mean Concentration (µg/m^3)		
	NO_2	PM_{10}	$PM_{2.5}$
2019	25.0	19.3	12.7
2022	21.8	18.4	12.1

Note: Data presented within the table are derived from the following ordinance survey grid square: 535500, 176500.

4.4 Baseline Summary

As discussed in this section, there are two roadside automatic monitors within 2 km of the proposed development site and five roadside diffusion tubes within 1 km.

No one monitoring location can be considered representative of the proposed development site, but in combination they indicate roadside concentrations within the general area.

5 Potential Impacts

5.1 Construction Phase

The earliest construction year is likely to be 2021, subject to planning. The impacts from demolition, earthworks construction and trackout have all been considered. To assess the worst-case scenario, it has been assumed that all activities will be carried out for the duration of the construction period. Figure 5.1 shows the construction dust assessment study area based on the recommended distances by IAQM.

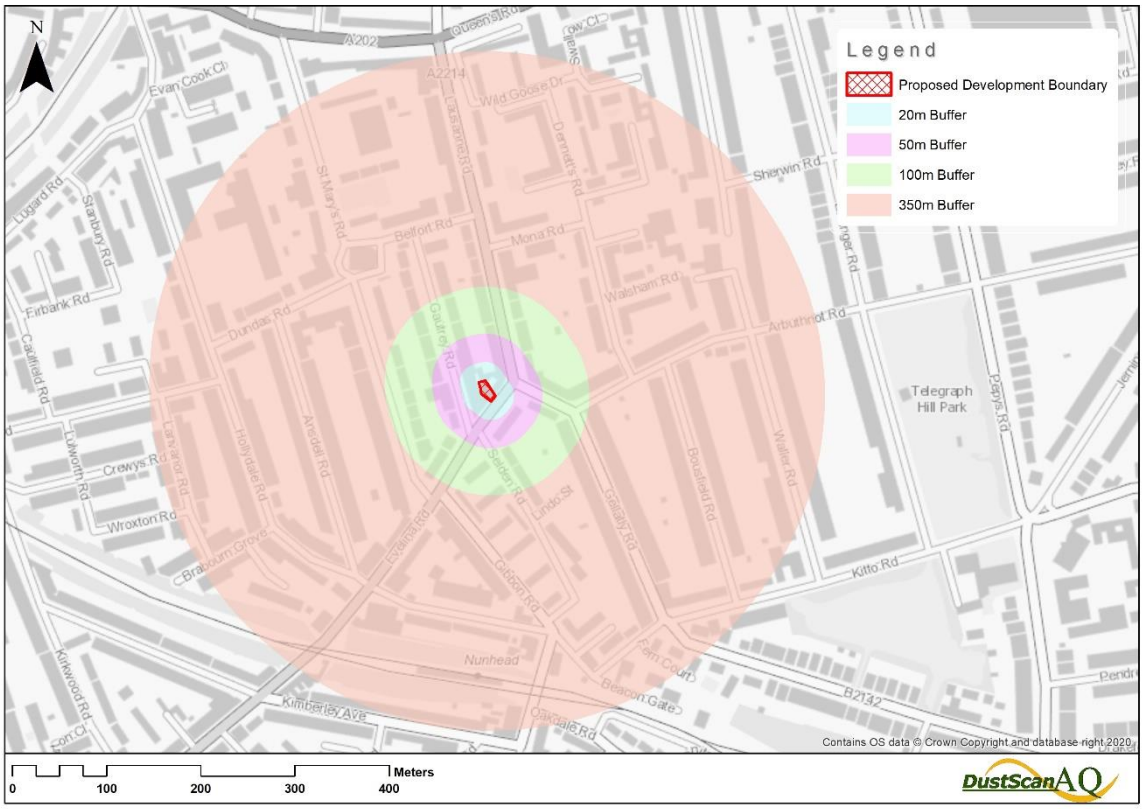

Figure 5.1: Construction Dust Risk Assessment Buffers

Magnitude and sensitivity descriptors that have been applied to assess the overall impact of the construction phase are presented in Appendix B.

The dust emission magnitude for demolition is expected to be 'Small', with the total building volume to be demolished expected to be less than 20,000 m^3

The dust emission magnitude for earthworks is expected to be 'Small', with the total site area less than 2000 m^2.

The dust emission magnitude for construction is expected to be 'Small', with the total building volume expected to be less than 25,000 m^3.

It is anticipated that the outward daily peak HGV movements will be fewer than 10 per day, therefore the dust emission magnitude for trackout has been assigned as 'Small'.

There are no ecological receptors within 50 m of the site, therefore the risk of construction dust impacts on ecological receptors are considered to be negligible and are not considered further within the construction dust risk assessment.

Table 5.1: Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	Small
Earthworks	Small
Construction	Small
Trackout	Small

It is considered that the residential receptors have a 'High' sensitivity to dust soiling and human health impacts. Table 5.2 presents the sensitivity of the surrounding area to effects caused by construction activities and is based on the criteria presented in Appendix B.

Table 5.2: Sensitivity of 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

The overall risk of dust soiling and human health impacts to high sensitivity receptors are presented in Table 5.3. The risk is based on the criteria presented in Appendix B.

Table 5.3: Summary of the Risk of Construction Dust Effects

Sensitivity of Area	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	Low Risk	Low Risk	Low Risk
Human Health	Negligible	Negligible	Negligible	Negligible

Based upon the above, the risk associated with dust soiling from construction activities and trackout is classified as 'Medium'. With respect to human health impacts the risk is no greater than 'Negligible'.

Mitigation measures appropriate for the proposed development have been presented in Appendix C.

Following the implementation of these mitigation measures, the impacts from the construction phase of the proposed development on dust soiling and human health are considered to be not significant.

5.2 Operational Phase

5.2.1 Residential Suitability

The proposed development is between 5 and 6 m back from Evelina Road, the closest pollutant source.

All of the monitoring data presented in Section 4 shows compliance with the relevant air quality objectives, at locations located within 5 m of the kerbside of busier roads.

The relevant air quality objectives are therefore anticipated to meet the AQO at all the residential units in the earliest opening year of 2022.

5.2.2 Air Quality Neutral Assessment

Policy within the London Plan requires developments to be 'air quality neutral', the aim of which is to bring forward developments that are air quality neutral or better and that do not degrade air quality in areas where air quality objectives are not currently being achieved.

The Sustainable Design and Construction Supplementary Planning Guidance (SPG) provides typical emission rates of NO_x and PM_{10} for transport and building emissions for each land-use class. The Transport Emission Benchmarks (TEB) are location dependant: as per the guidance typical emission rates have been applied for a development within Outer London. The Buildings Emissions Benchmark (BEB) is not location dependant.

5.2.2.1 Building Emissions

The proposed development will utilise electricity and is therefore gas free. The proposed development is considered air quality neutral with regards to building emissions.

5.2.2.2 Transport Emissions

The proposed development is car free, with no additional car parking spaces to be introduced. There will be minimal trip generation relating to refuse collection and deliveries. No further assessment of transport emissions is required.

5.2.2.3 Conclusion

The proposed development is air quality neutral with regard to both building and transport emissions.

6 Mitigation Measures

6.1 Operational Phase

According to the London Councils Air Quality and Planning Guidance, the Air Pollution Exposure Criteria (APEC) for the proposed development is APEC-A. This guidance suggests "*no air quality grounds for refusal; however mitigation of any emissions should be considered.*"

6.1.1 Travel Plan

A travel plan could be provided to future occupants to raise awareness of low carbon methods of travel.

7 Conclusion

This report provides an assessment on the following key issues associated with the construction and operational phases of the proposed development at 10 Evelina Road, London, SE15 2DX:

- Nuisance, loss of amenity and health impacts associated with the construction phase of the proposed development on sensitive receptors;
- Characterisation of the baseline conditions at the site using monitored pollutant data and background concentrations from Defra background maps;
- Assessment of the suitability of the proposed development for the introduction of new residential receptors;
- Establish if the proposed development is 'air quality neutral' or better; and
- If required, make recommendations for mitigation measures.

An assessment of the construction and operational air quality impact has been undertaken for the proposed development.

A qualitative assessment of the construction phase activities has been carried out. The largest risk of these activities with respect to dust soiling was considered to be 'Medium', while that towards human health was considered to be 'Negligible'. Following proper implementation of the measures recommended in Appendix C, the impact of emissions during construction of the proposed development are likely to be 'Negligible' and therefore 'Not Significant'.

The proposed development can be considered air quality neutral with regards to both building and traffic emissions.

NO_2, PM_{10} and $PM_{2.5}$ concentrations are forecast to meet their respective long and short term AQO for the anticipated earliest year of occupation. The proposed development is considered suitable for the introduction of new residential receptors.

It can therefore be concluded that the proposed development is not considered to conflict with national, regional and local air quality planning guidance.

Appendix A: Operational Impact Assessment

Methodology

The EPUK & IAQM guidance refers to the Town and Country Planning (Development Management Procedure) Order (England) 2010 [(Wales) 2012] for a definition of a 'major' development when scoping assessments required for the planning process. Based on the guidance, a 'major' development is such development where:

- The number of dwellings is 10 or above;
- The residential development is carried out of a site of more than 0.5ha where the number of dwellings is unknown;
- The provision of more than 1,000 m^2 commercial floorspace; or,
- Development carried out on land of 1ha or more.

It is recommended that consideration should be given to reduce impacts from any 'major' developments by considering:

- The impact of existing sources in the local area on the proposed development; and
- The impacts of the proposed development on the local area.

The assessment process involves two stages where:

Stage 1 scope out the need for an air quality assessment and **Stage 2** provide guidance of determining the level of assessment required for a project.

Table A 1 below sets out the Stage 1 criteria to determine the need to assess impacts arising from small developments and **Table A 2** provides more specific guidance as to when an air quality assessment is likely to be required to assess the impacts of the proposed development on the local area.

Table A 1: Stage 1 Criteria to Proceed to Stage 2

Criteria to Proceed to Stage 2	
A	If any of the following apply: • 10 or more residential units of a site area of more than 0.5ha • More than 1,000m^2 of floor space for all other uses or a site area greater than 1ha
B	Coupled with any of the following: • The development has more than 10 parking spaces • The development will have a centralised energy facility or other centralised combustion process

Table A 2: Indicative Criteria for Requiring an Air Quality Assessment

The development will	Indicative Criteria to Proceed to an Air Quality Assessment
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans <3.5t gross vehicle weight).	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
3. Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA.
4. Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
5. Introduce or change a bus station.	Where bus flows will change by: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
6. Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20 m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
7. Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors. NB. this includes combustion plant associated with standby emergency generators (typically associated with centralised energy centres) and shipping.	Typically, any combustion plant where the single or combined NO_x emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates. Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.

Appendix B: Construction Dust Risk Assessment Criteria

IAQM guidance framework on assessing the risk of dust proposes the construction phase should be split into phases dependent on their potential impacts, determining the risk for each individually. Therefore, this assessment has determined the risk of the four construction categories put forward by the IAQM guidance:

- Demolition;
- Earthworks;
- Construction; and
- Track out (transport of dust and dirt onto the public road network).

The IAQM guidance framework states that the risk of dust impacts from the four categories can be defined as 'negligible', 'low risk', 'medium risk' or 'high risk' depending upon the scale and nature of the construction activity and the sensitivity and proximity of receptors to the construction site boundary. This categorisation is used to put forward appropriate mitigation measures, reducing the level of effects from the dust impacts so they are not significant.

The assessment of dust impacts using the IAQM guidance considers three separate effects from dust:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to significant increase in exposure to PM_{10}.

Step 1 of the assessment is set out to screen for the requirement for a more detailed assessment for the proposed development. The screening criteria states:

A 'human receptor' within:

- 350 m of the boundary of the application site; or
- 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

An 'ecological receptor' within:

- 50 m of the boundary of the application site; or
- 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

Where there are no receptors and the level of risk is deemed 'negligible', there is no need for further assessment.

Step 2A of the assessment enables the overall dust emission magnitude (small, medium or large) from each dust source (demolition, earthworks, construction and trackout) to be identified in relation with the criteria outlined in Table B.1.

Table B.1: Dust emission magnitude

Source	Large	Medium	Small
Demolition	Total building volume >50,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level.	Total building volume 20,000 m^3 – 50,000 m^3, potentially dusty construction material, demolition activities <10 – 20 m above ground level.	Total building volume <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 wetter months.
Earthworks	Total site area >10,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes.	Total site area 2,500 m^2 – 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 m – 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes.	Total site area <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 <20,000 tonnes, earthworks during wetter months.
Construction	Total building volume >100,000 m^3, on site concrete batching or sandblasting.	Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching.	Total building volume <25,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).
Track out	>50 HDV (>3.5t) outward movements[a] in any one day[b], potentially dusty surface material (e.g. high clay content), unpaved road length >100 m.	10-50 HDV (>3.5t) outward movements[a] in any one day[b], moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m.	<10 HDV (>3.5t) outward movements[a] in any one day[b], surface material with low potential for dust release, unpaved road length <50 m.

Notes:
[a] Vehicle movement is a one-way journey. i.e. from A to B, and excludes the return journey.
[b] HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average.

Step 2B allows for the sensitivity of the area (high, medium or low) to be assessed and takes into account a number of factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of PM_{10}, the existing local background concentration; and
- Site specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

Receptor sensitivity has been based on the highest of any criteria being met thus, the assessment is considered as robust. The sensitivity of the area is further determined for dust soiling, human health and ecosystem effects by considering the criteria presented in Table B.2.

Table B.2: Magnitude of Receptor Sensitivity

Source	High	Medium	Low
Sensitivities of people to dust soiling effects	• 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 include dwellings, museums and other culturally important collections, medium and long term car parks[b] and car showrooms.	• Users would expect[a] to enjoy a reasonable level of amenity, but would not reasonably expect[a] 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[a] to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. • Indicative examples include parks and places of work.	• The enjoyment of amenity would not reasonably be expected[a]; or • Property would not reasonably be expected[a] 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 include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks[b] and roads.
Sensitivities of people to health effects of PM_{10}	• Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).[c]	• Locations where the people exposed are workers[d], and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).	• Locations where human exposure is transient.[e] • Indicative examples include public footpaths, playing fields, parks and shopping streets.

Source	High	Medium	Low
	• Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	• Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.	
Sensitivities of receptors to ecological effects	• Locations with an international or national designation and the designated features may be affected by dust soiling; or • Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain. • Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.	• Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or • Locations with a national designation where the features may be affected by dust deposition. • Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.	• Locations with a local designation where the features may be affected by dust deposition. • Indicative example is a local Nature Reserve with dust sensitive features.

Notes:
[a] People's expectations will vary depending on the existing dust deposition in the area, see Section 4.2.
[b] Car parks can have a range of sensitivities depending on the duration and frequency that people would be expected to park their cars there, and the level of amenity they could reasonably expect whilst doing so. Car parks associated with work place or residential parking might have a high level of sensitivity compared to car parks used less frequently and for shorter durations, such as those associated with shopping. Cases should be examined on their own merits.
[c] This follows Defra guidance as set out in LAQM.TG (09).
[d] Notwithstanding the fact that the air quality objectives and limit values do not apply to people in the workplace, such people can be affected to exposure of PM_{10}. However, they are considered to be less sensitive than the general public as a whole because those most sensitive to the effects of air pollution, such as young children are not normally workers. For this reason workers have been included in the medium sensitivity category.
[e] There are no standards that apply to short-term exposure, e.g. one or two hours, but there is still a risk of health impacts, albeit less certain.
[f] Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.

The final step, Step 2C allows for the risk of impacts to be defined. The dust emission magnitude derived in Step 2A is combined with the sensitivity of the area defined in step 2B to determine the risk of effects on:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to an increase in exposure to PM_{10}.

The criteria for each of the dust sources are presented in

Table B.3, Table B.4, Table B.5 and Table B.6.

Table B.3: 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 B.4: 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 B.5: 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 B.6: Track out

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

Appendix C: Construction Phase Mitigation Measures

The mitigation measures set out below are from IAQM's 2016 guidance for construction dust and are appropriate for the mitigation of the risk determined. The points below can be formerly adopted into a construction dust management plan.

Mitigation Measures:

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Develop a Dust Management Plan.
- Display the name and contact details of person(s) accountable for air quality pollutant emissions 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 a complaints log available to the LBS 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 when activities with a high potential to produce dust and emissions and dust are being carried out, and during prolonged dry or windy conditions.
- Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and the action taken to resolve the situation is recorded in the log book.
- Plan site layout: machinery and dust causing activities should be located away from receptors.
- Erect solid screens or barriers around dust activities or the site boundary that are, at least, as high as any stockpiles on site.
- Fully enclosure site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Install green walls, screens or other green infrastructure to minimise the impact of dust and pollution.

- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials from site as soon as possible.
- Cover, seed or fence stockpiles to prevent wind whipping.
- Carry out regular dust soiling checks of buildings within 100m of site boundary and cleaning to be provided if necessary.
- Agree monitoring locations with the LBS.
- Where possible, commence baseline monitoring at least three months before phase begins.
- Put in place real-time dust and air quality pollutant monitors across the site and ensure they are checked regularly.
- 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.
- Impose and signpost a maximum-speed-limit of 10mph on surfaced haul routes and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
- 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 mitigation (using recycled 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.
- 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.
- Reuse and recycle waste to reduce dust from waste materials.
- Avoid bonfires and burning of waste materials.
- 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 water suppression is used during demolition operations.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.
- 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.
- 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.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).