



Morgan Sindall Construction & Infrastructure Ltd

Queensmead School, Queens Walk, Ruislip HA4 0LS

Air Quality and Dust Management Plan

Project No: 444009-DMP-01

JULY 2020



RSK GENERAL NOTES

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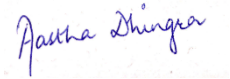
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This work has been undertaken in accordance with the quality management system of RSK Group Limited.

Abbreviations

AQAP	Air Quality Action Plan
AQDMP	Air Quality and Dust Management Plan
AQMA	Air Quality Management Area
AQMP	Air Quality Management Plan
AQO	Air Quality Objectives
CO	Carbon Monoxide
DEFRA	Department for Environment, Food and Rural Affairs
EC	European Commission
EU	European Union
FTE	Full time equivalent
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LBH	London Borough of Hillingdon
NAQS	National Air Quality Strategy
NPPF	National Planning Policy Framework
NO ₂	Nitrogen Dioxide
NO _x	Oxides of Nitrogen
NSP	Nominated Site Person(s)
O ₃	Ozone
PM _{2.5}	Particulate matter of size fraction approximating to <2.5mm diameter
PM ₁₀	Particulate matter of size fraction approximating to <10mm diameter
SO _x	Oxides of Sulphur
SPG	Supplementary Planning Guidance
VOC	Volatile Organic Compounds

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1 INTRODUCTION

RSK Environment Limited (RSK) has been commissioned to prepare an Air Quality and Dust Management Plan (DMP) for the redevelopment of Queensmead School including demolition of the existing Block B (including basement plant room, adjacent canopies and water tower) and the erection of a new 1974sqm two storey school building. The site comes under the jurisdiction of London Borough of Hillingdon (LBH) and approximately centres at 511763, 185530.

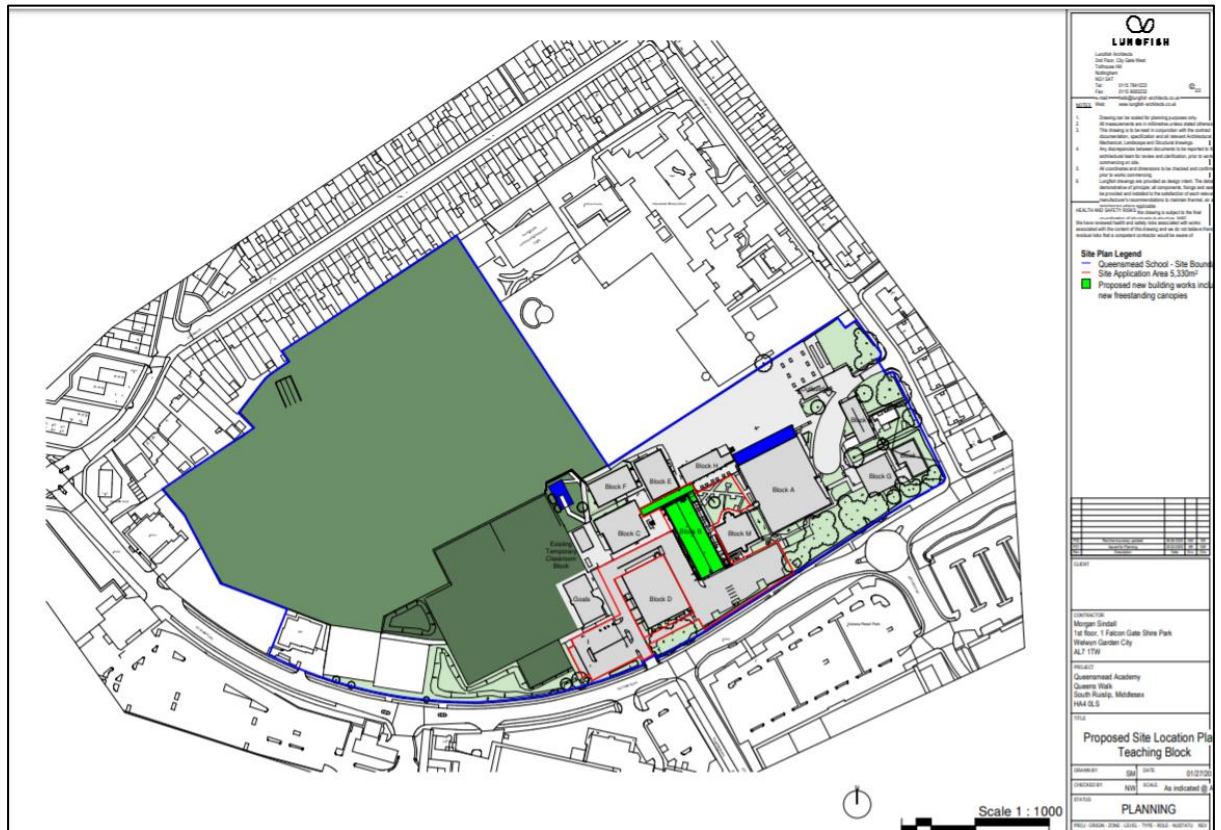
The LBH has declared an Air Quality Management Area due to exceedances of the nitrogen dioxide (NO₂) annual average objective. The site is not located within AQMA.

We understand the proposal involves the redevelopment of parts of Queensmead School, Queens Walk including demolition of a 2-storey block and constructing a new two-storey classroom block and planning consent has been granted subject to a number of conditions, including the following:

'No development shall commence until a Reducing Emissions from Demolition and Construction Plan has been submitted to, and approved in writing by, the LPA. This must demonstrate compliance (drawn up in accordance with) the GLA Control of Dust and Emissions from Construction and Demolition SPG (or any successor document).' The site plan is shown in Figure 1.1. The green area is for construction scope of works, however the red boundary as shown is for logistics, school parking etc.

This DMP includes best practice, outlining potential steps which can be taken during the construction period to reduce effects of the development on air quality whilst construction related works are undertaken.

Figure 1.1: Site Plan of Proposed New School Block



2 KEY LEGISLATION AND RELEVANT GUIDANCE

2.1 Air Quality Strategy

UK air quality policy is published under the umbrella of the Environment Act 1995, Part IV and specifically Section 80, the National Air Quality Strategy (NAQS). The latest *Air Quality Strategy for England, Scotland, Wales and Northern Ireland – Working Together for Clean Air*, published in July 2007 sets air quality standards and objectives for ten key air pollutants to be achieved between 2003 and 2020.

The European Union (EU) Air Quality Framework Directive (1996) established a framework under which the European Commission (EC) could set limit or target values for specified pollutants. The directive identified several pollutants for which limit or target values have been or will be set in subsequent 'daughter directives'. The framework and daughter directives were consolidated by Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe, which retains the existing air quality standards and introduces new objectives for fine particulates (PM_{2.5}).

2.2 Air Quality Standards

The air quality standards (AQSS) in the United Kingdom are derived from EC directives and are adopted into English law via the Air Quality (England) Regulations 2000 and Air Quality (England) Amendment Regulations 2002. The Air Quality Limit Values Regulations 2003 and subsequent amendments implement the EU Air Quality Framework Directive into English Law. Directive 2008/50/EC was translated into UK law in 2010 via the Air Quality Standards Regulations 2010.

The relevant¹ objectives for England and Wales to protect human health are summarised in Table 2.1.

Table 2.1: Air Quality Objectives Relevant to the Proposed Development

Substance	Averaging period	Exceedances allowed per year	Ground level concentration limit (µg/m ³)
Nitrogen Dioxide (NO ₂)	1 calendar year	-	40
	1 hour	18	200
Fine particles (PM ₁₀)	1 calendar year	-	40
	24 hours	35	50
Fine particles (PM _{2.5})	1 calendar year	N/A	25

¹ Relevance, in this case, is defined by the scope of the assessment.

2.3 The Environment Act

The AQSS are to be used in the review and assessment of air quality by local authorities under Section 82 of the Environment Act (1995). If exceedances are measured or predicted through the review and assessment process, the local authority must declare an Air Quality Management Area (AQMA) under Section 83 of the act and produce an air quality action plan to outline how air quality is to be improved.

2.4 Planning Policy

The land use planning process is a key means of improving air quality, particularly in the long term, through the strategic location and design of new developments. Any air quality concern that relates to land use and its development can, depending on the details of the proposed development, be a material consideration in the determination of planning applications.

2.4.1 National Planning Policy Framework

In February 2019 the revised National Planning Policy Framework (NPPF) was published, superseding the previous versions with immediate effect. The NPPF includes a presumption in favour of sustainable development.

Section 15 of the NPPF deals with Conserving and Enhancing the Natural Environment, and states that the intention is that the planning system should prevent *'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.'*

With specific regard to air quality, the NPPF 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."*

2.4.2 Regional Planning Policy

The London Plan, 2016

Policy 7.14 of the London Plan sets out the following points in relation to how air quality should be considered in relation to planning decisions.

“Development proposals should:

- minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within Air Quality Management Areas (AQMAs) or where development is likely to be used by large numbers of those particularly vulnerable to poor air quality, such as children or older people) through design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plans;*
- recognise that emissions should be attempted to be reduced during construction phases following best practice issued in the MOL and London Councils’ ‘The control of dust and emissions from construction and demolition’;*
- be at least ‘air quality neutral’ and not lead to any further deterioration of existing poor air quality;*
- ensure that where provision needs to be made to reduce emissions from a development, these usually are 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.”*

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

The Control of Dust and Emissions during Construction and Demolition is Supplementary Planning Guidance (Mayor of London, 2014) (‘the MOL SPG’) and replaces previous guidance published jointly by London Council’s and the Mayor in 2006. The MOL SPG aims to provide more detailed guidance on the implementation of relevant air quality policies in London. It sets out a methodology for assessing air quality impacts of the construction phase of development and identifies good practice for mitigating and managing any identified impacts.

2.4.3 Guidance on the Assessment of Dust from Demolition and Construction

The Institute of Air Quality Management (IAQM) published a guidance document in 2016 on the assessment of demolition and construction phase impacts. In order to assess the potential impacts, construction activities are divided into four types:

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

The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM₁₀ impacts on public exposure (i.e. human health) and impact upon sensitive ecological receptors) and to identify mitigation measures appropriate to the level of risk identified.

2.4.4 Guidance on Monitoring in the Vicinity of Demolition and Construction Sites

The IAQM published a guidance document in 2018 (Moorcroft et al., 2018) which details the approach used to devise an air quality monitoring strategy for particulate matter and dust at demolition/construction sites. It highlights the advantages and disadvantages of various monitoring techniques, in order to assist in the selection of the most appropriate for the risk level of the site (as determined using the 2014 IAQM guidance above).

2.4.5 Land-Use Planning & Development Control: Planning for Air Quality

Environmental Protection UK (EPUK) and the IAQM jointly published a revised version of the guidance note 'Land-Use Planning & Development Control: Planning for Air Quality' in 2017 (herein the 'EPUK-IAQM' guidance) to facilitate the consideration of air quality in the land-use planning and developmental control process. It provides a framework for air quality considerations within local development control processes, promoting a consistent approach to the treatment of air quality issues within development control decisions.

3 BASELINE AIR QUALITY CHARACTERISATION

Existing or baseline air quality refers to the concentrations of relevant substances that are already present in ambient air. These substances are emitted by various sources, including road traffic, industrial, domestic, agricultural and natural sources. Baseline air quality data employed in this study have been obtained from continuous and diffusion tube monitoring stations maintained by London Borough of Hillingdon and the LAQM Support website operated by the Department for Environment, Food and Rural Affairs (DEFRA).

3.1 Emissions Sources and Key Air Pollutants

Transport-related emissions are one of the main sources of air pollution in urban areas. The principal pollutants relevant to this assessment are considered to be NO₂, PM₁₀, and PM_{2.5}, generally regarded as the three most significant air pollutants released by vehicular combustion processes, or subsequently generated by vehicle emissions in the atmosphere through chemical reactions. These pollutants are generally considered to have the greatest potential to result in human health impacts and are the substances of most concern in terms of existing levels in the area, as discussed below.

3.2 Baseline Monitoring Data

According to the latest Air Quality Annual Status Report (2019) publicly available from London Borough of Hillingdon, they undertook automatic monitoring at 11 sites and non-automatic (passive) monitoring of nitrogen dioxide at 39 sites during 2018. Out of which one automatic monitor and four diffusion tubes are within 2km of the development site.

The annual average NO₂ concentrations for the nearby diffusion tube sites for the years 2016-2018 are reproduced in Table 3.1. One out of four diffusion tubes measured exceedances of the NO₂ annual mean AQS. The nearest diffusion tube (HD73) to the site has not recorded exceedances of the annual mean NO₂ AQS in 2016-2018. The automatic monitoring location nearest to the site also did not record any exceedance in 2018.

Table 3.1: Annual Average Measured NO2 Concentrations in 2016-2018

Site ID	Site Name	Approximate Distance from site (km)	X OS Grid Ref	Y OS Grid Ref	2016	2017	2018
Non-automatic monitoring locations							
HD46	South Ruislip Monitoring Station West End Road	1.1	510821	184923	40.2	46.7	43.4
HD73	Queensmead School South Ruislip (lamp-post opposite Jubilee Drive) (outside AQMA)	0.1	511825	185655	32.8	27.7	25.4
HD74	Field End Road/Field End School S.Ruislip 3rd Lamp-post south of school entrance (outside AQMA)	1.0	511889	186563	24.0	24.4	26.9
HD75	Sidmouth Drive South Ruislip (2nd lamppost from West End Road outside Nursery) (outside AQMA)	1.7	510125	186144	22.8	26.9	25.8
Automatic monitoring station							
HI1	Hillingdon 1 - South Ruislip	1.1	510857	184917	42.9	46	36
Annual Mean AQS					40		

Estimated background air quality data are available from the LAQM (Support website operated by Defra, using a base year of 2017. The website provides estimated annual average background concentrations of nitrogen oxides (NO_x), NO₂, PM₁₀ and PM_{2.5} on a 1 km² grid basis.

Table 3.2 identifies estimated annual average background NO₂, PM₁₀ and PM_{2.5} concentrations for 2019-2021. The site falls within the grid references 511763, 185530 therefore Defra background concentrations have been included for both. The estimated background concentrations for NO₂, PM₁₀ and PM_{2.5} are below the relevant annual Air Quality objectives and show a decreasing trend.

Table 3.2: Estimated Background Annual Average NO₂, PM₁₀ and PM_{2.5} Concentrations at Proposed Development Site (2019-2021)

Grid Reference	Assessment Year	Estimated Annual Average Pollutant Concentrations Derived from the LAQM Website (µg/m ³)		
		NO ₂	PM ₁₀	PM _{2.5}
511763, 185530	2019	19.71	15.41	10.81
	2020	18.64	15.18	10.62
	2021	17.90	15.02	10.49
Air Quality Objective		40	40	25

Based on Tables 3.1 & 3.2, it is considered probable that the site is located in an area where the background annual mean concentrations are below the relevant Air Quality objectives.

4 CONSTRUCTION PHASE IMPACT ASSESSMENT

4.1 Methodology

In accordance with the 'Guidance on the assessment of dust from demolition and construction' (Institute of Air Quality Management, 2014) ('the IAQM 2014 guidance'), which is recommended to be used to assess dust risks within the 'The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance' (Mayor of London, 2014) ('the MOL SPG'), the risk of dust and particulate emissions affecting sensitive receptors in the area around the proposed development site was assessed based on the 'area sensitivity' and the magnitude of emissions from each of the following types of construction activity:

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

For each activity, the risk of site-derived dust and particulate emissions affecting local sensitive receptors is determined as either negligible, low, medium or high risk. The risk category may differ for each of the activities and depends on the potential emissions magnitude and the sensitivity of the area. Three different types of impact are considered:

- Disamenity due to dust soiling;
- Impacts on sensitive ecological receptors; and
- The risk of health effects due to an increase in exposure to PM₁₀.

Fugitive dust arising from construction and demolition activities is mainly of a particle size greater than the PM₁₀ fraction (that which has the greatest potential impact upon human health), however construction activities may contribute to local PM₁₀ concentrations. Appropriate dust control measures can be highly effective for controlling emissions from the activities identified above, and adverse effects can be greatly reduced or eliminated. The assessment is used to define the appropriate level of mitigation required.

4.2 Exhaust Emissions from Plant and Vehicles

The operation of vehicles and equipment powered by internal combustion engines results in the emission of exhaust gases containing NO_x, PM₁₀, volatile organic compounds and carbon monoxide (CO). The quantities emitted depend on factors such as engine type, service history, pattern of usage and fuel composition.

Vehicle and plant movements will result in emissions to atmosphere of exhaust gases, but such emissions are unlikely to be significant as vehicle movements to and from the site will be on a temporary basis, and plant emissions are unlikely to be significant when

compared to background NO₂ and PM₁₀ concentrations. Mitigation measures have also been included within Section 5 of this assessment.

4.2.1 Potential Dust Emission Magnitude

With reference to the IAQM 2014 guidance criteria, the dust emissions magnitudes for demolition, earthworks, construction and track out activities are summarised in Tables 4.1 to 4.4, below.

4.2.2 Demolition

Demolition works are proposed during September-October 2020 and to be less than 20,000m³. On-site crushing and screening are not proposed.

On this basis, and with regard to the criteria suggested by the IAQM guidance and summarised in Table 4.1 below, the dust emission magnitude of the demolition activities was assessed as '**Small**'.

Table 4.1: Summary of Dust Emissions Magnitude of Demolition Activities (Before mitigation)

Demolition Criteria	Dust Emissions Class	Basis of Classification
Total volume of building to be demolished	Small	<20,000 m ²
On site screening and crushing	Small	On-site crushing and screening are not proposed
Height of demolition activities above ground	Small	<10m
Any potential dusty demolition materials on site	Medium	Concrete
Overall Rating	Small	

4.2.3 Earthworks

The site is less than 2,500m² in area and the soil is likely to include a significant clay and silt content. It is anticipated that fewer than five heavy duty vehicle (HDV)/plant will be active any one time.

The site is expected to have stockpiled materials of less than 4m and the estimated mass of the material to be moved is estimated to be less than 20,000 tonnes. The main earthworks are expected to be undertaken during wetter periods of the year.

On this basis, and with regard to the criteria suggested by the IAQM guidance and summarised in Table 4.2 below, the dust emission magnitude of the earthworks was assessed as '**Small**'.

Table 4-2: Summary of Dust Emissions Magnitude of Earthworks Activities (Before mitigation)

Earthworks Criteria	Dust Emissions Class	Basis of Classification
Total site area	Small	<2,500m ²
Soil type	Medium	Clay/ Silt
Earth moving plant	Small	<5
Height of stockpiles	Small	<4m
Total material moved	Small	<20,000 tonnes
Work times	Small	Works will be undertaken during autumn
Overall Rating	Small	

4.2.4 Construction

The building volume is estimated to be less than 25,000m³ and there is no on-site concrete batching or concrete sandblasting proposed. With regard to the criteria suggested by the IAQM guidance and summarised in Table 4.3 below, the dust emission magnitude of the construction was assessed as '**Small**'.

Table 4.3: Summary of Dust Emissions Magnitude of Construction Activities (Before mitigation)

Construction Criteria	Dust Emissions Class	Evaluation
Total building volume	Small	<25,000 m ³
On-site concrete batching or sandblasting proposed	Small	None proposed
Dust potential of construction materials	Small	Potentially dusty construction materials will not be on site.
Overall Rating	Small	

4.2.5 Trackout

Trackout refers to the transfer of mud and site materials on the wheels of construction vehicles onto the public road network, where it may become available for suspension in air, and contribute to airborne dust and PM₁₀ concentrations.

The number of HDV movements related to the proposed development is estimated to be less than 10 a day, and the unpaved road length within the site is likely to be less than 50m.

On this basis, and with regard to the criteria suggested by the IAQM guidance and summarised in Table 4.4 below, the dust emission magnitude due to trackout was assessed as 'Small'.

Table 4.4: Summary of Dust Emissions Magnitude of Trackout Activities (Before mitigation)

Trackout Criteria	Dust Emissions Class	Evaluation of the Effects
Number of HDV>3.5t per day	Small	<10
Surface type of the site	Small	The trackout surface type is tarmac.
Length of unpaved road	Small	<50m
Overall Rating	Small	

4.2.6 Sensitivity of the Receiving Environment

The IAQM 2014 guidance indicates that the 'area sensitivity' can be determined based on the following factors:

- The sensitivity of individual receptors in the area;
- The proximity and number of those receptors;
- In the case of PM₁₀, the local background concentration (assumed to be best represented by those presented in Tables 3.1 and 3.2); and
- Site specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

Consideration is given to human and ecological receptors near to the construction works site boundary and the trackout route proposed which is assumed to be along Victoria Road. Human receptors can include dwellings (including houseboats), sensitive industrial units, hospitals, schools and care homes. There are human receptors within 50m of the proposed development site. Also, the school would remain operational during the proposed demolition and construction activities. The residential properties close to the boundaries of the site are estimated to represent 10-100 high sensitivity receptors for dust sensitivity and 10-100 high sensitivity receptors for the purposes of human health for a worst-case scenario.

The DEFRA Magic Maps website was used to identify individual statutory ecological receptors near the proposed development site area. There are no designated ecological receptors within 350m of the proposed development site.

As per the IAQM guidance, demolition, earthworks and construction activities are relevant up to 350m from the area in which these activities may occur (in this case the site boundary), whereas trackout is considered relevant up to 50m from the edge of all roads along which HDVs may use to reach site. The buffers for demolition, earthworks and construction activities are shown in Figure 4.1.

Trackout has been considered for 50m along all roads as it is understood to be used for HGV routes to and from the site. The distance was measured from the site exit. The 50m distance was used as trackout has been classed as small. The buffers for trackout activities are shown in Figure 4.2.

The number of receptors has been used to determine the sensitivity of the area. Table 4.5 presents the boundaries used as per the IAQM guidance for defining the sensitivity of the area.

Table 4.5: Sensitivity of the area

Potential Impact		Sensitivity of the surrounding area			
		Demolition	Earthworks	Construction	Trackout
Dust soiling	Receptor sensitivity	High	High	High	High
	Number of receptors	10-100	10-100	10-100	10-100
	Distance from the source	<50m	<50m	<50m	<50m
	Sensitivity of the area	Medium	Medium	Medium	Medium
Human health	Receptor sensitivity	High	High	High	High
	Annual mean PM ₁₀ concentration	<24µg/m ³	<24µg/m ³	<24µg/m ³	<24µg/m ³
	Number of receptors	10-100	10-100	10-100	10-100
	Distance from the source	<50m	<50m	<50m	<50m
	Sensitivity of the area	Low	Low	Low	Low
Ecological	Receptor sensitivity	No designated sites within 50m of proposed demolition, construction activity area and trackout route.			No sites within 50m
	Distance from the source				
	Sensitivity of the area	Negligible	Negligible	Negligible	Negligible

Figure 4.1: Demolition, Construction and Earthworks Activities Buffer Map



Figure 4.2: Trackout Activities Buffer Map



4.2.7 Overall Dust Risks

Combining the dust emissions magnitude and the sensitivity of the relevant receptors, the overall dust risks associated with the proposed development were identified and are reproduced in the Table 4.6, below.

Table 4.6: Summary of the Dust Risk from all Construction Activities

Potential Impact	Dust Risk Impact			
	Demolition	Earthworks	Construction	Trackout
Dust soiling	Low Risk	Low Risk	Low Risk	Negligible Risk
Human health	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk
Ecological	Negligible Risk	Negligible Risk	Negligible Risk	Negligible Risk

The risk of dust soiling impacts has been assessed as a maximum of 'low risk' during earthworks, construction and trackout.



The risk of health impacts been assessed as a maximum of 'negligible'. The risk of ecological impacts is negligible for all works.

The aim of this AQDMP is to specify appropriate mitigation such that, provided the mitigation is effectively applied, no significant effects are anticipated. Mitigation measures to reduce potential impacts, based on this assessment, are defined in Section 5.

5 CONTROL MEASURES AND MITIGATION

5.1 Mitigation measures

Mitigation measures recommended in the MOL SPG are divided into 'general measures', applicable to all sites and measures specific to demolition, earthworks and trackout. Depending on the level of risk assigned to each site, different mitigation is recommended.

For those mitigation measures that are general, the highest risk assessed has been applied. In this case, the '**low risk**' site mitigation measures have been applied, as determined by the dust risk assessment in Section 2. Two categories of mitigation measure are described in the MOL SPG – 'highly recommended' and 'desirable', which are indicated according to the dust risk level identified in the section 4. Desirable mitigation is noted in *italics*.

Site management

- Develop a Dust Management Plan (this document).
- 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 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 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.

Preparing and maintaining the site

- 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 hoarding, 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.*

Operating vehicle/machinery and sustainable travel

- Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone (and when introduced, the Ultra Low Emissions Zone).
- Ensure all non-road mobile machinery comply with the standards set within the MOL SPG, i.e. the emissions standards set under prevailing legislation and to ensure that NRMM are registered in accordance with the planning consent for the development. These standards will be based upon engine emissions standards set in EU Directive 97/68/EC and its subsequent amendments.
- NRMM used on the site of any major development within Greater London will be required to meet Stage IIIA of the Directive as a minimum.
- Ensure all vehicles switch off engines when stationary – vehicles should not idle for more than one minute.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where possible.

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 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.*

Waste management

- Reuse and recycle waste to reduce dust from waste materials
- No bonfires or burning of waste materials.

Specific to Demolition

- *Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).*
- Ensure 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.

Specific to Construction

- 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.
- *Avoid scabbling (roughening of concrete surfaces) if possible.*

Specific to Trackout

No specific mitigation required as negligible risk.

This AQDMP provides a robust suite of control and mitigation measures for the earthworks, construction and trackout. The measures aim to control dust and general pollution from site operations, and this AQDMP includes details of visual and continuous monitoring activities that will be undertaken. Controls should be applied throughout the earthworks period to ensure that emissions are mitigated.

The dust emitting activities beforementioned can be effectively controlled by implementing the appropriate dust control measures detailed and any adverse effects can be greatly reduced or eliminated. As noted within the 2014 IAQM guidance, with the use of effective mitigation it is normally possible to minimise impacts and therefore the residual effect will normally be 'not significant'. With the implementation of the proposed control / mitigation measures, the residual impacts have therefore been considered to be **negligible**.

5.1.1 Emissions from plant (Non-Road Mobile Machinery (NRMM))

NRMM is defined as any mobile machine, item of transportable industrial equipment, or vehicle - with or without bodywork - that is:

- Not intended for carrying passengers or goods on the road; or,
- Installed with a combustion engine - either an internal spark ignition petrol engine, or a compression ignition diesel engine.

The MOL SPG requires that plant used at the proposed development site meet Stage IIIA of the NO_x, PM and CO emissions standards specified in the EU Directive 97/68/EC and subsequent amendments as a minimum, where they have net power of between 37kW and 560kW. The emissions standards vary depending on the net power the engine

produces. The nominated site person(s) (NSP) will be required to maintain a record to confirm that equipment used on-site complies with these standards; further information is available at www.nrmm.london.

The following actions will be taken to enable compliance:

- Reorganising the fleet;
- Replacing equipment if required;
- Installing retrofit abatement technology (such as by diesel particulate filters in existing NRMM); and,
- 'Re-engining'.

Where equipment complying with the emissions standards is unavailable or a comprehensive refit of existing equipment is not feasible, the site operator and/or their appointed contractors would need to ensure that NRMM exempt from the policy are utilised.

6 MONITORING PROTOCOL

This section contains appropriate information regarding the monitoring programme proposed for the site.

6.1 Visual Inspection

The Site Manager should undertake regular visual inspection/ observation of visible dust as is practicable or where they suspect high levels of dust-generating activities may have occurred and should undertake a visual inspection whenever a complaint regarding dust generation is received. The extent of the inspection will generally be on-site but should be extended to the trackout routes, especially on days with heavy traffic movements in and out of the site.

The findings of visual inspections should be documented, and mitigation measures reviewed and implemented as appropriate. The logbook entry should include:

- Time & date;
- Reason for inspection (e.g. complaint received, regular inspection);
- Confirmation of any visible dust emissions;
- Remedial actions taken if emissions observed; and
- Wind direction and strength (a weather station, wind sock or knowledge of the Beaufort Scale would assist in this).

It is important that all site personnel are aware of the requirement for the control of environmental impacts, and appropriate training should be given to all site personnel, covering:

- Health and environmental impacts of emissions to air;
- The benefits of controlling emissions to air;
- Emission control measures;
- Method statements; and
- Importance of good communication

The monitoring should be kept under review, and where the Local Authority requests it, or where significant dust is frequently observed, or complaints indicate that fugitive emissions may be inadequately controlled, then additional monitoring would be recommended.

7 IMPLEMENTATION AND MANAGEMENT

7.1 Implementation of AQDMP

The NSP shall be responsible for the control of environmental impacts of construction activities. The NSP shall be provided with appropriate training so that they are aware of how dust and PM can be generated on site, are aware of the requirements of the AQDMP (including visual dust inspections) and are aware of the routine and emergency procedures designed to control dust emissions.

It is recommended that new members of staff are provided with dust awareness training, covering the sources of dust and PM on site, the health and environmental impacts of emissions to air, general emissions control measures being utilised on site, and the role they can play in controlling dust and emissions. Refresher training or toolbox talks should be provided where appropriate.

The NSP will keep a site logbook documenting the maintenance of effective emissions control methods and details of any complaints or incidents, and actions taken.

Emissions control procedures and equipment will only work satisfactorily if carried out or used appropriately. The responsible person shall maintain good housekeeping and ensure that all equipment is well maintained and used appropriately.

It may be appropriate to temporarily suspend particularly dusty site activities where dust concentrations are high for example during abnormal circumstances, where dust suppression equipment malfunctions, or 'emergency' circumstances. It may be appropriate to temporarily stop work until dust concentrations return to acceptable levels.

7.2 Reactive Mitigation Measures

The NSP should be responsible for ensuring that appropriate steps are taken to minimise the impacts of the dust event. Appropriate mitigation may include but not necessarily be limited to the following:

- Erect solid screens or barriers around the activities generating the elevated dust/ PM concentrations that are at least as high as the dust-generating activity;
- Cover or dampen stockpiles or other sources of dust to reduce fugitive dust;
- Ensure that site personnel have switched off machinery when not in use and that all personnel are driving at an appropriate speed;
- Ensure an adequate water supply on the site for effective dust/particulate matter mitigation (using recycled water where possible);
- Ensure that the other mitigation methods identified are complied with by undertaking visual inspections; and,
- Clean up any dry spillages using wet cleaning methods.



Other potentially appropriate measures are provided in Section 5.1.

8 REFERENCES

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APPENDIX A

CONSTRUCTION DUST ASSESSMENT METHODOLOGY

This appendix contains the construction dust assessment methodology used in the assessment.

To assess the potential impacts, construction activities are divided into demolition, earthworks, construction and trackout. The descriptors included in this section are based upon the MOL SPG which itself is based on the IAQM 2014 guidance. The assessment follows the steps recommended in the guidance.

Step 1: Screen the requirement for assessment

The first step is to screen out the requirement for a construction dust assessment; this is usually a somewhat conservative level of screening. An assessment is usually required where there is:

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

Step 2A: Defining the Potential Dust Emission Magnitude

Demolition

The dust emission magnitude category for demolition is varied for each site in terms of timing, building type, duration and scale. Examples of the potential dust emission classes are provided in the guidance as follows:

- **Large:** Total building volume >50,000m³, potentially dusty construction material, on-site crushing and screening, demolition activities >20m above ground level;
- **Medium:** Total building volume 20,000m³ – 50,000m³, potentially dusty construction material, demolition activities 10m – 20m above ground level; and
- **Small:** Total building volume <20,000m³, construction material with low potential for dust release, demolition activities <10m above ground, demolition during wetter months.

Earthworks

The dust emission magnitude category for earthworks is varied for each site in terms of timing, geology, topography and duration. Examples of the potential dust emission classes are provided in the guidance as follows:

- **Large:** Total site area >10,000m², potentially dusty soil type (e.g. clay), >10 heavy earth moving vehicles active at any one time, formation of bunds >8m in height, total material moved >100,000 tonnes;
- **Medium:** Total site area 2,500 – 10,000m², moderately dusty soil type (e.g. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8m in height, total material moved 20,000 – 100,000 tonnes; and
- **Small:** Total site area < 2,500m², soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4m in height, total material moved <10,000 tonnes, earthworks during wetter months.

Construction

The dust emission magnitude category for construction is varied for each site in terms of timing, building type, duration, and scale. Examples of the potential dust emissions classes are provided in the guidance as follows:

- **Large:** Total building volume >100,000m³, piling, on site concrete batching;
- **Medium:** Total building volume 25,000 – 100,000m³, potentially dusty construction material (e.g. concrete), piling, on site concrete batching; and
- **Small:** Total building volume <25,000m³, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout

Factors which determine the dust emission magnitude class of trackout activities are vehicle size, vehicle speed, vehicle number, geology and duration. Examples of the potential dust emissions classes are provided in the guidance as follows:

- **Large:** >50 HDV (>3.5t) trips in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- **Medium:** 10 – 50 HDV (>3.5t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 – 100m; and
- **Small:** <10 HDV (<3.5t) trips in any one day, surface material with low potential for dust release, unpaved road length <50m.

Step 2B: Defining the Sensitivity of the Area

The sensitivity of the area is defined for dust soiling, human health and ecosystems. The sensitivity of the area takes into account the following factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of PM₁₀, the 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.

Table A1 has been used to define the sensitivity of different types of receptors to dust soiling, health effects and ecological effects.

Table A1: Sensitivity of Individual receptors in the area surrounding the Site

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
High	- Users can reasonably expect a enjoyment of a high level of amenity. - 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. - Examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.	- Locations where members of the public are exposed over a time period relevant to the air quality objective for PM₁₀ (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) - 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.	- Locations with an international or national designation <i>and</i> the designated features may be affected by dust soiling. - 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. - 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.
Medium	- 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. - The appearance, aesthetics or value of their property could be diminished by soiling. - 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. - Examples include parks and places of work.	- Locations where the people exposed are workers and exposure is over a time period relevant to the air quality objective for PM₁₀ (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). - Examples include office and shop workers, but will generally not include workers occupationally exposed to PM₁₀, as protection is covered by Health and Safety at Work legislation.	- Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown. - Locations with a national designation where the features may be affected by dust deposition. - Example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
Low	- The enjoyment of amenity would not reasonably be expected. - Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling. - 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. - Examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.	- Locations where human exposure is transient. - Indicative examples include public footpaths, playing fields, parks and shopping streets.	- Locations with a local designation where the features may be affected by dust deposition. - Example is a local Nature Reserve with dust sensitive features.

Based on the sensitivities assigned of the different types of receptors surrounding the site and numbers of receptors within certain distances of the site, a sensitivity classification for the area can be defined for each. Tables A2 to A4 indicate the method used to determine the sensitivity of the area for dust soiling, human health and ecological impacts, respectively.

For trackout, as per the guidance, it is only considered necessary to consider trackout impacts up to 50m from the edge of the road.

Table A2: Sensitivity of the area to dust soiling effects on people and property

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

Table A3: Sensitivity of the area to Human Health Impacts (from the IAQM 2014 guidance)

Receptor Sensitivity	Annual Mean PM ₁₀ Conc.	Number of Receptors	Distances from the Source (m)				
			<20	<50	<100	<200	<350
High	>32µg/m ³	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32µg/m ³	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28µg/m ³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m ³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32µg/m ³	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32µg/m ³	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table A4: Sensitivity of the area to Ecological Impacts

Receptor Sensitivity	Distances from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Step 2C: Defining the Risk of Impacts

The final step is to use both the dust emission magnitude classification with the sensitivity of the area, to determine a potential risk of impacts for each construction activity, before the application of mitigation. Tables A5 to A7 indicate the method used to assign the level of risk for each construction activity.

Table A5: Risk of Dust Impacts from 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 A6: Risk of Dust Impacts from Earthworks/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 A7: Risk of Dust Impacts from Trackout

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