



Air Quality Assessment

22nd September 2022

**30-36 Clarendon Road
London
N8 0DJ**

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1.0 Executive Summary

An assessment has been undertaken to quantify the potential impacts on local air quality associated with the construction and operation of the proposed redevelopment of the existing buildings at 30-36 Clarendon Road, London N8 0DJ

The redevelopment proposal is for the demolition of the existing buildings and construction of a residential lead mixed used scheme of ground floor and basement level commercial spaces and 51 new flats at 1st to 10th floor.

Based on the results of the assessment, it is considered that redevelopment of the site would not cause a significant impact on local air quality.

During the construction phase, the site has the potential to generate dust nuisance beyond the application boundary. However, through the implementation of a Dust Management Plan, the impacts will be effectively minimised and are unlikely to be significant.

Traffic generated by the development is very limited and the project has been demonstrated to be air quality neutral for both transport and building emissions – by default

Heat and hot water will be supplied to the development via fully electrical systems, with heat pump driven heating and hot water.

2.0 Introduction

This report presents an assessment of the potential impact on local air quality of the construction and operation of a proposed residential lead mixed use development at 30-36 Clarendon Road.

The existing site is occupied by the Jessica Buttons Factory; a pitched roof brick structure.

The proposal is for a mixed-use development comprising ground floor and basement level commercial space (circa 548m²) and 51 new flats arranged over 10 upper floors.

The location of the proposed development site is presented in Figure 1.



Fig 1. Site Location

The site falls within the London Borough of Haringey's Borough Wide Air Quality Management Area (AQMA) which was designated due to measured and modelled exceedances of the air quality objectives for nitrogen dioxide (NO₂) and particulate matter (as PM₁₀). Most of the air pollution in the Haringey AQMA is caused by road traffic.

The AQMA was identified within Haringey's Air Quality Action Plan 2019-2024, produced in recognition of the legal requirement on the Council to work towards air quality objectives; as required under Part IV of the Environment Act 1995 and the relevant air quality regulations.

Figure 1 shows the 2013 LAEI baseline annual mean NO₂ concentrations in Haringey. The changes in colours show how the pollution gradient changes, with distance, away from the heavier traffic.

The map shows that much of the borough has pollution levels below the target limit. The highest concentrations of NO₂ which breach the legal limits are found on the busiest main roads in the borough however pollution levels quickly reduce with distance from the pollution source.

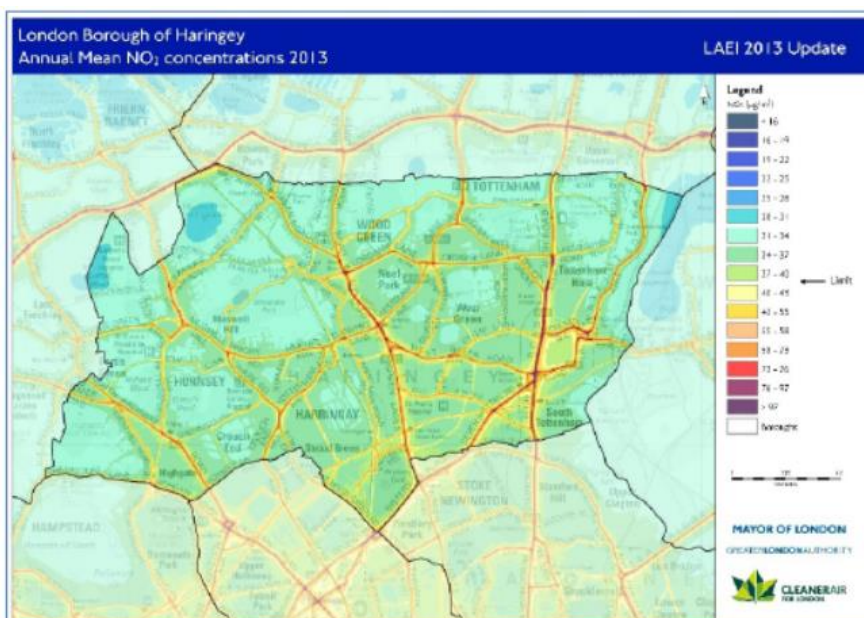


Fig 2. – Modelled NO₂ concentrations in Haringey (2013)

3.0 Policy Context

An overview of the relevant policy drivers for the assessment is provided in the following section.

3.1 European Legislation

Air quality legislation and regulation in the United Kingdom is largely shaped by a series of directives introduced at European level to control levels of the pollutants considered harmful to human health and ecosystems. In 1996, a framework directive on ambient air quality assessment and management set out the basic principles of assessing and managing air quality in European Union (EU) Member States. This directive also listed the pollutants for which air quality standards and objectives were to be developed. This was subsequently followed by daughter directives, which set limit values for each pollutant.

In June 2008, EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe entered into force. The Directive simplified existing EU legislation by consolidating previous air quality directives and frameworks into a single directive.

The EU limit values have been adopted into UK law via the Air Quality Standards Regulations 2010.

In the context of the proposed development, the primary pollutants of concern are NO₂, PM₁₀ and PM_{2.5} from traffic on roads close to the site. A summary of the European limit values for the protection of human health for these pollutants is presented in Table 1.

Table 1: European Limit Values for the Protection of Human Health

Pollutant	Averaging Period	Limit Value (µg/m ³)	Comments
NO ₂	1 Hour	200	Not to be exceeded more than 18 times per calendar year (equivalent to the 99.8th percentile of 1-hour means)
	Calendar Year	40	
PM ₁₀	24 Hour	50	Not to be exceeded more than 35 times per year (equivalent to the 90.4th percentile of 24-hour means)
	Calendar Year	40	
PM _{2.5}	Calendar Year	25	Stage 1 LV (to be met by 01/01/15)
	Calendar Year	20	Stage 2 LV (to be met by 01/01/20)

It should be noted that the commercial uses are not required to comply with the annual mean air quality objectives (see extract from the LAQM.TG(09)) below.

However, given the long term occupancy patterns of commercial spaces, the applicants consider it best practice to consider the annual mean pollutant levels and will report accordingly.

Box 1.4: Examples of where the air quality objectives should/should not apply		
Averaging Period	Objectives should apply at:	Objectives should generally not apply at:
Annual mean	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 mean and 8-hour mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties ⁷ .	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 mean	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 be expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15-min mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	

Fig 2 – LAQM Box 1.4

3.2 National Legislation

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland

The Air Quality Strategy for England, Wales and Northern Ireland was published in 2007 and sets out policy targets (objectives) for SO₂, NO₂, C₆H₆, CO, Pb, PM₁₀, PM_{2.5}, 1,3-butadiene (C₄H₆) and PAH. These objectives are generally in line with those set by the European Directives, although more stringent particulate and benzene objectives apply in Scotland (and in Northern Ireland for benzene).

The Air Quality Objectives (AQO) for NO₂, PM₁₀ and PM_{2.5} in England do not differ from those presented in Table 1.

Local Air Quality Management

The framework for Local Air Quality Management (LAQM) in the UK was introduced by the Environment Act 1995. Local Authorities are required to regularly review and assess air quality to establish whether there are any locations where pollutant concentrations exceed the relevant air quality objectives or EU limit values.

Where an exceedance is identified the local authority is obliged to declare an Air Quality Management Area (AQMA) and prepare an Action Plan setting out measures to improve air quality and achieve compliance with the objective(s).

The National Planning Policy Framework

The National Planning Policy Framework (NPPF 2021) sets out the Government's policies for planning and how these should be applied. With regard to air quality, the NPPF states that:-

para. 186.

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.

3.3 Regional Policy

The London Plan (March 2021)

Chapter 9 deals with Sustainable Infrastructure:-

Policy SI1 Improving air quality

London's air quality should be significantly improved and exposure to poor air quality, especially for vulnerable people, should be reduced:

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) reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality
- d) create unacceptable risk of high levels of exposure to poor air quality.

5) Air Quality Assessments (AQAs) should be submitted with all major developments, unless they can demonstrate that transport and building emissions will be less than the previous or existing use.

The Mayor of London's Air Quality Strategy (2010)

The Mayor of London's Air Quality Strategy outlines the Mayor's commitment to improving air quality in London. The objective of the plan is to significantly reduce NO₂ and PM₁₀ concentrations through a number of measures including:

- Ensuring all buses meet Euro IV emission standards;
- Introducing age limits for taxis and Private Hire Vehicles to remove older, more polluting vehicles from the roads;
- Including large vans and minibuses in the Low Emission Zone (LEZ); Introducing a new NO_x standard in the LEZ; and
- Working with Borough to implement traffic management strategies to reduce congestion.

An additional guidance document was issued in November 2021, which provides guidance on the implementation of the 'air quality neutral' policy.

3.5 Local Plan Policy

Haringey's Local Plan Development Management DPD (Adopted July 2017) has specific policy on air quality:-

Policy DM23: Environmental Protection

Air Quality

A All development proposals should consider air quality and be designed to:

- a Improve or mitigate the impact on air quality in the Borough; and
- b Improve or mitigate the impact on air quality for the occupiers of the building or users of the development.

B Air quality assessments will be required for all major development and other development proposals, where appropriate.

C Where necessary, adequate mitigation must be provided

4.0 Methodology

This section outlines the assessment methodology, taking into account all relevant national and local policies and technical guidance relating to air quality.

4.1 Construction Dust

The potential impact of dust generated during site enabling, earthworks and construction works at the proposed development has been undertaken in accordance with the Mayor of London's SPG for the control of dust and emissions during construction and demolition, which is closely aligned with the Institute of Air Quality Management (IAQM) construction dust guidance. A full description of the construction dust methodology is provided in **Appendix A – IAQM Construction Dust Methodology**.

A detailed assessment of dust impacts is required where there are human or ecological receptors within:

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

The IAQM/ SPG methodology allows the potential risk of dust soiling and human health effects to be determined, based primarily on the sensitivity of nearby receptors (human and ecological) and the anticipated magnitude of the dust emission due to:

- Demolition; Earthworks;
- Construction; and
- Track-out (re-suspended dust from vehicle movements).

The assessment of dust risk is also based on professional judgement taking into account factors such as the prevailing wind direction, the proposed construction phasing, the likely duration of dust raising activities, local topography and existing air quality.

A range of best practice mitigation measures are provided within the guidance, which are dependent on the level of dust risk attributed to the site. It is recommended that these measures are incorporated into a Dust Management Plan (DMP) for the proposed development.

The significance of the residual impacts following appropriate mitigation is determined by professional judgement.

Best Practice Guidance for dust control will be implemented, as appropriate, during the construction phase through the Dust Management Plan (DMP) for the proposed development.

The risk of dust soiling and human health impacts from the site has been assessed as medium:-

- Development of between 1,000 and 15,000 square metres of land and;
- Development of between ten to 150 properties and;
- Potential for emissions and dust to have an intermittent or likely impact on sensitive receptors.

Prior to mitigation, therefore in accordance with the IAQM guidance it is recommended that the measures detailed in the table below are incorporated into the DMP. The significance of dust impacts on nearby receptors following the implementation of appropriate and best practice mitigation is considered to be negligible.

4.3 Construction Traffic

Construction traffic will contribute to existing traffic levels on the surrounding road network.

However, a project specific construction management plan will ensure that the temporary increase in traffic will be kept to a minimum and is considered unlikely to be significant in terms of total flow or construction duration.

All non-road mobile machinery (NRMM) should use fuel equivalent to ultra-low sulphur diesel (ULSD), especially where a bunkered fuel supply is available.

The impact of vehicular emissions of NO₂ and PM₁₀ from construction traffic and on-site machinery on local air quality is considered to be negligible.

4.4 Operational Traffic

The Environmental Protection UK (EPUK)/ IAQM planning guidance states that for developments within or near an AQMA, a detailed assessment of traffic-related impacts is required where:

- There is a change in the annual average daily traffic (AADT) flow of light goods vehicles (LGV) of more than 100 vehicles; and/or
- There is a change in the AADT flow of heavy goods vehicles (HGV) of more than 25 vehicles; and/or There is a change in the road re-alignment by more than 5m; and/or
- A new junction is introduced, which will significantly alter vehicle speeds.

The project at the Clarendon Road site does not trigger any of the above requirements.

This car free development in this highly accessible location is expected to have minimal impact on the local highways network.

However, dispersion modelling of baseline traffic on the surrounding major road network has been undertaken to predict pollutant concentrations at the proposed development site to determine whether the site is suitable for the proposed uses noted above.

The input parameters for the modelling are detailed in **Appendix B – ADMS-Roads Input Parameters**.

4.5 Emission Factors

Concentrations of NO_x, PM₁₀ and PM_{2.5} have been predicted using vehicle emission factors from version 10.1 of the Emissions Factor Toolkit. The emission factors predict a gradual decline in pollution levels over time due to improvements in emissions abatement technologies and the gradual renewal of the vehicle fleet. However, monitoring carried out in urban areas throughout the UK have found that NO₂ concentrations are not declining as rapidly as predicted and in some locations, roadside concentrations have increased.

The predicted NO_x concentrations have been converted to NO₂ using version 8.1 of the NO_x to NO₂ calculator, available from the Defra air quality website. It should be noted that version 8.1 should only be used with the 2018 reference year background maps and the Emissions Factors Toolkit v10.1 onwards.

It should be noted that the Emission Factors Toolkit V11.0 was released in November 2021, but the corresponding NO_x to NO₂ calculator is not yet available to enable assessments to be undertaken.

The baseline dispersion modelling has been based on the year **2019**, with background emissions, traffic data selected accordingly.

4.6 Meteorological Data

The assessment has used hourly sequential meteorological data from Heathrow Airport, which is approximately 27km south west of the proposed development.

4.7 Sensitive Receptors

Pollutant concentrations have been predicted across the development site using a Cartesian receptor grid of 5m resolution.

4.8 Verification

There is an inherent level of uncertainty associated with any assessment process; however, the methodology presented has been developed to minimise errors where possible. Potential errors in predicted concentrations due to uncertainties in the assessment source activity data (e.g. traffic flows and emission factors) and the estimated background concentration are minimised by the verification of modelled concentrations using local monitoring data.

The 2016 Local Air Quality Management Technical Guidance (LAQM.TG16) recommends that modelled concentrations should be within 25% of monitored concentrations, ideally within 10%. Where there is a large discrepancy between modelled and measured concentrations, it is considered necessary to adjust the model results to more accurately reflect local air quality.

The modelled NO₂ concentrations have been verified using 2018 data from an roadside monitoring site on Green Lanes, just 1km north west of the proposed development site. Full details of the model verification process are presented in **Appendix C – Model Verification**.

4.9 Building-related Emissions

Heat and hot water will be provided to the development by electrical only heat-pump driven systems for heating and hot water - generating zero local emissions.

5.0 Baseline Air Quality

Through an analysis of local monitoring data, a description of existing air quality in the vicinity of the proposed development is provided.

5.1 Local Air Quality Monitoring

Haringey operated 2 automated monitoring stations in the Borough during 2021, 1 x roadside and 1 x urban background station.

They measure pollutants in real time which means that the pollution levels are constantly being measured and the results recorded; this report has identified the most relevant in terms of roadside and background monitoring - details of these sites are provided in Table 2.

Table 2: Automatic Monitoring Sites

Site Name	Type	Easting	Northing	Pollutants Monitored
639 High Road	Roadside	533894	190707	NO ₂
Priory Park	Urban Background	529987	188917	NO ₂

Annual mean NO₂ and PM₁₀ concentrations measured at the above locations between 2017 and 2021 have been obtained from the London Borough of Haringey Air Quality Annual Status Report for 2021 (May 2022) and are summarised in Tables 3 & 4, together with the number of measured exceedances of the short-term AQO's.

Table 3: Roadside NO₂, PM₁₀ concentrations measured at the Bowes Road monitoring site

Criteria	2017	2018	2019	2020	2021
Annual Mean NO ₂ (µg/m ³)	40	39	37	33	32
Number of Predicted Exceedances of the 1-Hour Mean AQO of 200 µg/m ³ (b)	5	0	0	0	0

Table 4: Urban Background NO₂ concentrations measured at the Bush Hill Park monitoring site

Criteria	2017	2018	2019	2020	2021
Annual Mean NO ₂ (µg/m ³)	24	23	22	16	18
Number of Predicted Exceedances of the 1-Hour Mean AQO of 200 µg/m ³ (b)	0	0	0	0	0

5.1.2 Non-automatic Data

Annual mean NO₂ concentrations are measured by Haringey via a network of 16 passive diffusion tubes.

The most relevant monitoring station to the proposed development site is located on Green Lanes. Annual Mean NO₂ (µg/m³) concentrations for the Green Lanes site are noted below:-

Table 5: Roadside NO₂, PM₁₀ concentrations measured at the Bowes Road monitoring site

Criteria	2017	2018	2019	2020	2021
HR27, The Old Surgery, Green Lanes	33	31	36.4	29.0	32.7

The data noted in Tables 2-5 indicate that annual mean NO₂ concentrations at the development site have potential to exceed the air quality standard of 40 µg/m³ at ground floor level or above.

Measurements across the UK have shown that the 1-hour mean AQO for NO₂ may also be exceeded where the annual mean concentration is greater than 60µg/m³.

The data therefore indicates that an exceedance of the short-term objective would be much less of a concern, but this will also be assessed as part of overall consideration of all traffic generated and background data given.

5.1.3 DEFRA Mapped Background Concentrations

For comparison with the background monitoring data for NO₂ and PM₁₀ and in the absence of local PM_{2.5} data, concentrations have been obtained from the Defra UK Background Air Pollution maps. These 1km grid resolution maps are derived from a complex modelling exercise that takes into account emissions inventories and measurements of ambient air pollution from both automated and non-automated sites.

A summary of the mapped and measured annual mean background concentrations for the proposed development site is presented in Table 6, together with the concentrations assumed for the purposes of the assessment.

Table 6: Defra Mapped, Measured and Assessment Background Pollutant Concentrations ($\mu\text{g}/\text{m}^3$)

Pollutant	2019 Mapped	2019 Measured	Assessment	AQO/EAL
NO ₂	24.19	22.00	24.19	40
PM ₁₀	18.39	n/a	18.39	40
PM _{2.5}	11.87	n/a	11.87	25

6.0 Potential Impacts

The potential impacts and significance of these impacts on air quality during the construction phase of the development are identified in this section. Suggested mitigation measures are outlined in a subsequent section of the report.

6.1 Construction Dust

6.1.1 Sensitivity of the Area to Dust Impacts

The assessment of dust impacts is dependent on the proximity of the most sensitive receptors to the site boundary. The site is located within a residential setting, with residences to the north, west, south and the significant Westpoint block of flats directly to the west.

Figure 4 below, would suggest receptors of **HIGH** sensitivity with 100m of the site.

Accordingly, it can clearly be assumed that, with 100+ High Sensitivity Receptors within 50m of the site boundary, the sensitivity of the area to dust soiling effects on people and property could be considered **HIGH**.

However, for the range of sensitive receptors in the range 100+ within 50m of the development site, and with the background PM levels less than $24\mu\text{g}/\text{m}^3$, sensitivity of the area to human health impacts would be considered **LOW**



Figure 4 – Local sensitive receptors - **Proposed development site** – **Sensitive Receptors**

The precise behaviour of the dust, its residence time in the atmosphere and the distance it may travel before being deposited, will depend upon a number of factors. These include wind direction and strength, local topography and the presence of intervening structures (buildings, etc.) that may intercept dust before it reaches sensitive locations. Furthermore, dust would be naturally suppressed by rainfall.

6.1.2 Dust Emission Magnitude

The risk of dust arising in sufficient quantities to cause annoyance and/or health and/or ecological impacts should be determined using four risk categories: negligible, low, medium and high risk.

A development is allocated to a risk category based on two factors:

- the scale and nature of the works, which determines the potential dust emission
 - magnitude as small, medium or large (see Table 7);
- and
- the sensitivity of the area to dust impacts, which is defined as low, medium or high sensitivity.

Table 7 – Dust emission risk categories

Activity	Dust Emission Class		
	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 – 50 000m 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 <10m 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 – 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 <10,000 tonnes, earthworks during wetter months
Construction	Total building volume >100,000 m ³ , piling, on site concrete batching; sandblasting	Total building volume 25,000 m ³ – 100,000 m ³ , potentially dusty construction material (e.g. concrete), piling, 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) trips in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m	10 – 50 HDV (>3.5t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100 m;	<10 HDV (>3.5t) trips in any one day, surface material with low potential for dust release, unpaved road length <50 m.

These factors are combined to determine the risk of dust impacts with no mitigation applied. The risk category assigned to the development can be different for each of the four potential activities (demolition, earthworks, construction and trackout).

Demolition - The existing site is occupied by 2/3 storey brick structures. Demolition would amount to circa 1,600m² and be at less than 10m above ground level.

However, taking into account the amount of dusty materials and the potential for on-site screening, the magnitude of the dust emission is considered to be 'small'.

Earthworks – The site area is circa 775m². Works will include the creation of a single floor basement across two thirds of the site and there is sufficient space on site to accommodate earth moving vehicles, but very unlikely to be over 5 units of heavy plant at any one time.

The total tonnage of material to be moved will be much less than 10,000t, so dust emissions are expected to be "small"

Construction - Dust emissions during construction will depend on the scale of the works, method of construction, construction materials and duration of build. The proposed development will be of a clad concrete frame with significant piling; as such, there will certainly be concrete batching being undertaken on site

Based on the scale of the proposed works (circa 14,000m³), the height of works, and the proposed construction methods, the magnitude of the emission during construction is considered to be 'medium'.

Trackout – the site area will enable vehicles to enter the site, however, the site is very shallow and machinery and delivery lorries need not run on un-made roads for more than 50m..

There is potential for vehicle movements to exceed 10 per day, accordingly, dust emissions magnitude related to track out is assumed to be "medium"

Table 8: Risk of Dust Impacts Prior to Mitigation

Dust Source	Emissions Magnitude
Demolition	Small
Earthworks	Small
Construction	Medium
Track Out	Medium

6.1.3 Assessment of Dust Risk Prior to Mitigation

Referring to Chapter 7 of the IAQM "Assess the Risk of Dust Impacts" – tables 3 – 9; a summary of the potential risk of dust impacts prior to mitigation, based on the low sensitivity of the area to dust soiling and human health impacts is presented in Table 9.

Table 9: Risk of Dust Impacts Prior to Mitigation

Dust Source	Emissions Magnitude	Human Health Risk	Dust Soiling Risk
Demolition	Small	Negligible	Low
Earthworks	Small	Negligible	Low
Construction	Medium	Low	Medium
Track Out	Medium	Low	Medium

6.2 Baseline Traffic - 2019

Predicted annual mean NO₂ concentrations have been considered for the proposed commercial and residential development at Clarendon Road.

Predicted annual mean NO₂, PM₁₀ and PM_{2.5} concentrations are presented at contour plots – Figures 5-7.

The contour plots suggest that due to the low traffic levels on Clarendon Road and the remote position away from the busy Turnpike Lane/B138 junction, Levels are well within the annual AQO levels at ground floor level (and by definition, the floors above as the pollutants disperse).

Short term concentrations of NO₂ and PM₁₀ were modelled at the proposed development façade closest to the Turnpike Lane/B138 junction (grid reference 530939-189548) at ground floor level, to assess the short term pollutant levels for the occupiers of the proposed commercial spaces – max short term NO₂ levels were predicted to be 136.58 µg/m³ with no exceedances, while PM₁₀ levels do not exceed 19.34 µg/m³, both figures well within AQO.



Figure 5 – NO₂ concentrations – Ground Floor



Figure 6 - PM₁₀ concentrations – Ground Floor



Figure 7 – PM_{2.5} Concentrations – Ground Floor

7.0 Air Quality Neutral Assessment

Policy SI 1 of the London Plan includes requirements for new development to be Air Quality Neutral. This section presents an air quality neutral assessment in accordance with The London Plan Guidance Air Quality Neutral Consultation Draft (Nov 2021).

'Air Quality Neutral' (AQN) is a term for developments that do not contribute to air pollution beyond allowable benchmarks. The benchmarks, set out in this guidance, are based on research and evidence carried out by building and transport consultants.

7.1 Excluded Developments

Developments, including major developments which do not include additional emissions sources are assumed to be Air Quality Neutral and do not need an Air Quality Neutral assessment. This would include, for example, developments that have no additional motor vehicle parking, do not lead to an increase in motor vehicle movements, and do not include new combustion plant such as gas-fired boilers.

The project at Clarendon Road does provide on site parking, but only in the form of 2 x blue badge parking spaces.

The development is proposed to use electrical HVAC systems only.

7.2 Building Emissions

In accordance with the Air Quality Neutral Guidance document (AQNG), the project is air quality neutral by default, as it does not introduce any new fossil fuel combustion plant

7.3 Transport Emissions

The provision of only 2 x blue badge parking spaces and no other on-site provision meets the definition of a Car Free development under the Mayor's Air quality neutral guidance.

The development is air quality neutral for transport emissions by default.

8.0 Mitigation

The following mitigation measures will be required during the construction and operational phases in order to minimise the air quality impacts arising from the development.

8.1 Construction Phase

London Best Practice Guidance for dust control will be implemented, as appropriate, during the construction phase through the Dust Management Plan (DMP) for the proposed development.

The risk of dust soiling and human health impacts from the site has been assessed as “medium” prior to mitigation, therefore in accordance with the IAQM guidance it is recommended that the measures detailed in Table 14 are incorporated into the DMP. The significance of dust impacts on nearby receptors following the implementation of appropriate and best practice mitigation is considered to be negligible.

Table 14 Recommended Mitigation Measures

Description	Mitigation Measure
General	- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary; this may be the environment manager/engineer or the site Manager. - Display the head or regional office contact information.
Site management	- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. - Make the complaints log available to the local authority when asked. - Record any exceptional incidents that cause dust and/or air emissions, either on or offsite, and the action taken to resolve the situation in the logbook.
Monitoring	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.

	• Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. • Agree dust deposition, dust flux, or real-time PM₁₀ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction
Preparing and maintaining the Site	• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. • Erect solid screens or barriers around dusty activities or at the site boundary that is at least as high as any stockpiles on site. • Fully enclose the site or specific operations where there is a high potential for dust production and the site is active for an extensive period • Avoid site runoff of water or mud. • Keep site fencing, barriers and scaffolding clean using wet methods. • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. • Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicle & machinery and sustainable travel	• 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 practicable. • Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. • Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.

Commented [N11]:

	• Use enclosed chutes and conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste management	• Avoid bonfires and burning of waste materials
Demolition	• Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. • Avoid explosive blasting, using appropriate manual or mechanical alternatives. • Bag and remove any biological debris or damp down such material before demolition.
Construction	• Ensure sand and other aggregates are stored in bundled 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.
Track out	• Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are 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). • Access gates to be located at least 10m from receptors where possible.

8.1.1 Method Statement

A method statement should cover all phases of the development and take account of all contractors or sub-contractors. It should be submitted to the local planning authority (LPA) prior to any works being carried out and include a timetable of dust generating activities accompanied with proposed dust control measures.

The content of a Method Statement will be determined by a site specific evaluation but typical features to include are outlined below:-

- summary of work to be carried out
- description of site layout and access – including proposed haul routes, location of site equipment including supply of water for damping down, source of water (wherever possible from dewatering or extraction), drainage and enclosed areas
- inventory and timetable of all dust generating activities
- list of all dust and emission control methods to be used
- details of any fuel stored on site
- Identification of an authorised responsible person on-site for air quality. Ideally this person needs to have knowledge of pollution control and vehicle emissions;
- summary of monitoring protocols and agreed procedure of notification to the local authority nominated person(s)
- a site logbook to record details and action taken in response to exceptional incidents or dust-causing episodes. It should also be used to record the results of routine site inspections.

8.2 Operational Phase

The residential elements of the proposed development are brought forward as car-free (aside from disabled parking) and will be subject to a permit-free agreement secured via the Section 106 Agreement to prevent future residents from obtaining a permit to park within the local Controlled Parking Zone.

A Framework Travel Plan has been prepared as part of the transport documents for the planning application. The primary objective of Travel Plan is to set out a long-term strategy to facilitate and encourage modes of travel to the Site by means other than the private car, which reflects current central Government policy.

The initiatives and measures that form part of the Travel Plan will be a mixture of 'hard' and 'soft' measures. The 'hard' measures include the provision of facilities such as safe and secure cycle parking and cycle repair hub facilities. The 'soft' measures include initiatives such as Travel Information Packs, identifying cycle training courses, and providing information on public transport services, walking and cycling routes.

Detailed dispersion modelling of local traffic flows indicates that long term and short term NO₂ levels, PM₁₀ and PM_{2.5} concentrations at the site are likely to be well within the relevant air quality standards for the project.

The proposed use of zero emission electrical only HVAC solutions are also compliant with London plan requirements.

9.0 Summary and Conclusions

The following summarises the outcomes of the assessment and provide details of any air quality constraints to the development of the site.

An assessment has been undertaken to assess the potential impacts on local air quality associated with the construction and operation of the proposed development.

An assessment of the potential impacts during the construction phase has been carried out in accordance with the latest Institute of Air Quality Management guidance; this has shown that releases of dust and PM₁₀ are likely to occur during site activities. The risk of dust soiling and health impacts at neighbouring properties has been assessed as medium. Through good site practice and the implementation of suitable mitigation measures, the impact of dust and PM₁₀ releases may be effectively mitigated and the resultant impacts are considered to be negligible.

The transport assessment submitted with the planning application confirms that the project seeks to actively encourage transport to and from the development via modes other than private cars; indeed a net decrease in vehicle movements to/from the site as existing is expected to result.

However detailed dispersion modelling of the local road network has been undertaken to assess whether the site is suitable for the residential use, as proposed. The modelling indicates that long and short term pollution levels are well within the required air quality standards.

The main heating and DHW systems for the project will be 100% electrical – in line with the latest London Plan and GLA guidance.

Building related emissions and transport related emissions from the site have also been assessed as air quality neutral.

This report concludes that air quality issues have no detrimental effect on the redevelopment of the Clarendon Road site for the uses as proposed.

Appendix A

IAQM CONSTRUCTION DUST METHODOLOGY

Factors defining the sensitivity of a receptor to dust impacts are presented in Table A1.

Table A1: Receptor Sensitivity

Receptor Sensitivity	Human Health	Dust Soiling	Ecological
High	- Locations where members of the public are exposed over a time period relevant to the air quality objectives for PM₁₀ (a) - Examples include residential dwellings, hospitals, schools and residential care homes.	- Regular exposure - High level of amenity expected. - Appearance, aesthetics or value of the property would be affected by dust soiling. - Examples include residential dwellings, museums, medium and long-term car parks and car showrooms.	- Nationally or Internationally designated site with dust sensitive features (b) - Locations with vascular species (c)
Medium	- Locations where workers are exposed over a time period relevant to the air quality objectives for PM₁₀ (a) - Examples include office and shop workers (d)	- Short-term exposure - Moderate level of amenity expected - Possible diminished appearance or aesthetics of property due to dust soiling - Examples include parks and places of work	- Nationally designated site with dust sensitive features (b) - Nationally designated site with a particularly important plant species where dust sensitivity is unknown
Low	- Transient human exposure - Examples include public footpaths, playing fields, parks and shopping streets	- Transient exposure - Enjoyment of amenity not expected. - Appearance and aesthetics of property unaffected - Examples include playing fields, farmland (e), footpaths, short-term car parks and roads	Locally designated site with dust sensitive features (b)
a) In the case of the 24-hour objective, a relevant location would be one where individuals may be exposed for eight hours or more in a day. b) Ecosystems that are particularly sensitive to dust deposition include lichens and acid heathland (for alkaline dust, such as concrete). c) Cheffing C. M. & Farrell L. (Editors) (2005). The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee. d) Does not include workers' exposure to PM₁₀ as protection is covered by Health and Safety at Work legislation. e) Except commercially sensitive horticulture.			

The sensitivity of the area as a whole is dependent on the number of receptors within each sensitivity class and their distance from the source. Human health impacts are also dependent on the existing PM₁₀ concentrations in the area.

Table A2 and Table A3 summarise the criteria for determining the overall sensitivity of the area to dust soiling and health impacts respectively. The sensitivity of the area to ecological impacts is presented in Table A4.

Table A2: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source			
		<20m	<50m	<100m	<350m
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 Health Impacts from Dust

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

Table A4: Sensitivity of the Area to Ecological Impacts from Dust

Receptor Sensitivity	Distance from the Source	
	<20m	<50m
High	High	Medium
Medium	Medium	Low
Low	Low	Low

The magnitude of the dust impacts for demolition, earthworks, construction and trackout is classified as small, medium or large depending on the scale of the proposed works as detailed in Table A5.

Table A5: Dust Emission Magnitude

Receptor Sensitivity	Large	Medium	Small
Demolition	- Total building volume >50,000m³ - Potentially dusty material (e.g. concrete) - On site crushing and screening - Demolition activities >20m above ground level.	- Total building volume 20,000 - 50,000m³ - Potentially dusty material - Demolition activities 10 - 20m above ground level.	- Total building volume <20,000m³ - Construction material with low potential for dust release - Demolition activities <10m above ground level - Demolition during wetter months
Earthworks	- 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	- Total site area 2,500 - 10,000m² - Moderately dusty soil type (e.g. silt) - 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	- 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 <20,000 tonnes - Earthworks during wetter months
Construction	- Total building volume >100,000m³ - On site concrete batching - Sandblasting	- Total building volume 25,000 - 100,000m³ - Potentially dusty construction material (e.g. concrete) - On site concrete batching	- Total building volume <25,000m³ - Material with low potential for dust release (e.g. metal cladding or timber)
Trackout	- >50 HGV movements in any one day (a) - Potentially dusty surface material (e.g. high clay content) - Unpaved road length >100m	- 10 - 50 HGV movements in any one day (a) - Moderately dusty surface material (e.g. silt) - Unpaved road length 50 - 100m	- <10 HGV movements in any one day (a) - Surface material with low potential for dust release - Unpaved road length <50m

a) HGV movements refer to outward trips (leaving the site) by vehicles of over 3.5 tonnes

For each dust emission source, the worst-case area sensitivity is used in combination with the dust emission magnitude to determine the risk of dust impacts prior to mitigation as illustrated in Tables A6 and A7.

Table A6: Risk of Dust Impacts from Demolition, Earthworks and Construction

Area Sensitivity	Distance from the Source		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible Risk

Table A7: Risk of Dust Impacts from Trackout

Area Sensitivity	Distance from the Source		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible Risk
Low	Low Risk	Low Risk	Negligible Risk

Appendix B

ADMS-ROADS INPUT PARAMETERS

ADMS-Roads Input Parameters

Table B1: Summary of ADMS-Roads Input Parameters

Parameter	Value
ADMS-Roads Model Version	5.0.0.1
Vehicle Emission Factors	EFT v10.01
Meteorological Data	Hourly sequential data from London Heathrow Airport
Surface Roughness	1.0m
Monin-Obukhov Length	75m

Table B2: Summary of Traffic Data

Road Link	2019 AADT (Hourly)	HGV (%)	Average Speed (kph)
Turn Pike Lane	548	2.5	Modelled east bound and west bound; 10 – pulling away from junction. 5 – stopped at lights
B138 (north)	841	2.0	Modelled north bound and south bound; 10 – taking slip road. 5 – stopped at lights in 3 lanes
B138 South	579	0.6	5 – stopped at junction
Clarendon Road	60	1.0	10 – lightly trafficked road

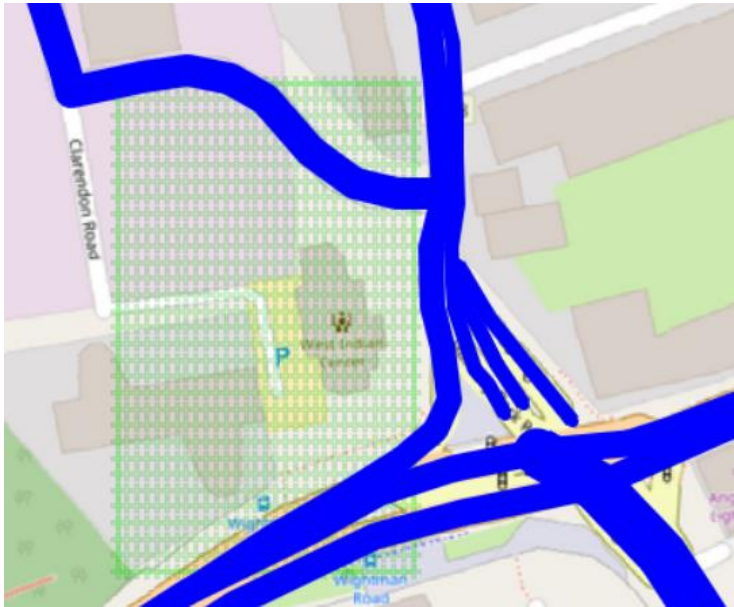


Figure 8 – Monitoring Points relative to development site

Appendix C

MODEL VERIFICATION

Predicted annual mean NO₂ concentrations have been compared with the 2019 annual mean concentrations measured by the roadside monitoring site HR27 on Green Lanes; the station sits approximately 950m south east of the Clarendon Road site, and offers a very similar level of traffic flows, travelling at circa 5-10kph between traffic lit junctions.

Most nitrogen dioxide (NO₂) is produced in the atmosphere by the reaction of nitric oxide (NO) with ozone. It is therefore most appropriate to verify the model in terms of primary pollutant emissions. Verification of concentrations predicted by the ADMS-Roads model has followed the methodology presented in LAQM.TG16.

The modelled NO_x concentration has been converted into an equivalent Road-NO₂ (i.e. the component of total NO₂ coming from road traffic) concentrations using the Defra NO_x to NO₂ calculator.

The ratio of the measured and modelled Road-NO₂ contributions provides an adjustment factor for the modelled Road-NO₂ concentrations. This factor is then applied to the modelled road NO_x concentrations, before they are converted to Road-NO₂ using the Defra NO_x to NO₂ calculator and added to the background NO₂ concentration for to produce a total adjusted modelled NO₂ concentration.

The model verification calculation is presented in Table C1; the adjustment factors have been applied to the modelled Road-NO₂, Road-PM₁₀ and Road-PM_{2.5} as per the verification calculations in accordance with the guidance.

Table C1: Verification Calculations

Parameter	Value
Measured NO ₂ Concentration (2019)	36.4 µg/m ³
Modelled NO ₂ Concentration*	33.94 µg/m ³
Adjustment Factor	7.2%

*Using the DEFRA NO_x to NO₂ Convert



Figure 9 - Location of roadside monitoring station () ■

