

Air Quality Assessment

Trinity International Properties Ltd

FOR THE SITE AT:

157-159 Hornsey Park Road
Wood Green
London
N8 0JX

London Borough of Haringey



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Contents

Executive Summary.....	1
1.0 Introduction	2
1.1 Planning Context.....	4
1.2 Building Regulations Approved Document F: Ventilation	6
2.0 Background Pollution Levels	7
2.1 Air Quality Management Area (AQMA).....	7
2.2 Air Quality Focus Area (AQFA)	8
2.3 External Sources.....	9
2.3.1 Roads	9
2.3.2 Wind.....	10
3.0 Air Quality Assessment	12
3.1 Methodology.....	12
3.1.1 Nitrogen oxides (NO _x and NO ₂) concentrations	16
3.1.2 PM _{2.5} concentrations.....	16
3.1.3 PM ₁₀ concentrations	16
3.1.4 Site variation in emissions.....	17
4.0 Air Quality Neutral	19
4.1 Building Emissions Benchmark (BEB)	19
4.2 Transport Emissions Benchmark (TEB).....	20
4.2.1 TEB Calculation	20
4.3 Calculation of transport emissions.....	21
4.4 Conclusions	22
5.0 Construction and Demolition	24
5.1 Dust Risk Assessment.....	24
5.2 Dust control measures	25
5.2.1 Site management and maintenance	26
5.2.2 Vehicle emissions	26
5.2.3 Operations	26
5.2.4 Waste	26
5.3 Mitigation measures	26
5.4 Site monitoring	26
5.5 Non-road mobile machinery	27
6.0 Any relevant local authority plans or policies	28
7.0 Summary.....	29

Appendix A	TVOCs Emission criteria by product type	31
Appendix B	Air Quality Focus Area.....	32
Appendix C	TRICS data (Velocity Transport Ltd).....	33

Executive Summary

An Air Quality Assessment (AQA) has been produced by SRE Ltd. for the proposed mixed-use development at 157-159 Hornsey Park Road (the Proposed Development) in Wood Green, London, on behalf of Trinity International Properties Ltd (the Client).

The Proposed Development is located within the Haringey Air Quality Management Area (AQMA), which was declared by the London Borough of Haringey in 2001 due to exceedances in Nitrogen dioxide (NO₂) and Particulate Matter (PM₁₀). The development therefore aims to mitigate the risks of any air pollution to all future building users and has modelled this as part of the AQA.

A detailed appraisal has been performed for the Proposed Development to assess the general air quality issues around the proposed site, the site suitability for future building users and the key mitigation measures. The Atmospheric Dispersion Modelling System for small road networks (ADMS-Roads) model suggests that annual mean concentrations of NO_x, NO₂, PM_{2.5} and PM₁₀ are all within the current UK objectives. Based on the result, the local air quality is assessed to be suitable for residents in relation to air quality. By integrating appropriate mitigation measures during the development's design phase, the potential health hazards for future site and building users can be minimised.

The AQA report aligns with GLA planning policy requirement by addressing Air Quality Neutral (AQN). Following the 'Air quality Neutral London Plan Guidance (February 2023)', the Building Emissions Benchmark (BEB) and Transport Emissions Benchmark (TEB) are assessed separately for the Proposed Development and the criteria are met for the Proposed Development to be Air Quality Neutral.

Following the assessment, construction phase and operation phase impacts on the air quality are considered and key mitigation measures are addressed related to the increase traffic, odour, and aerosols from the proposed scheme. The proposed energy strategy does not incorporate gas-fired or solid-/oil-fuelled heating systems and therefore there are no associated Nitrogen Oxides (NO_x) emissions during the operation of the building. The Proposed Development is designed as a car-free development, with only three mandatory accessible/ blue badge parking spaces. The proposal for these to be fitted with electric vehicle (EV) charging points along with the provision of cycle storage also promote sustainable transport to and from the site.

The AQA report addresses external pollution concerns and provides essential mitigation measures to improve the local air quality of the site. Adhering to the suggestions in this report could mitigate any potential negative impacts of the Proposed Development on the local air quality.

1.0 Introduction

As stated by the World Health Organisation (WHO), air pollution '*defines the contamination of indoor or outdoor areas by biological, chemical, or physical particles that modify the natural characteristics of the atmosphere.*'

Depending on the level of exposure, this pollution can provoke a wide range of health effects with the most dangerous forms of air pollution being Particulate Matter (PM_{2.5}/PM₁₀) and Nitrogen Oxides (NO₂/NO_x) due to their high concentration. In the UK, power generators and transport are the largest human-made sources of PM with Nitrogen Oxides also representing a human-made pollutant released through combustion processes such as heating, power generation and vehicle/ship engines¹.

This Air Quality Assessment (AQA) has been written by SRE Ltd. on behalf of Trinity International Properties Ltd (The Client) in order to support the London Borough of Haringey and the Greater London Authority (GLA) planning policy requirements for the new mixed-use development at 157-159 Hornsey Park Road, Wood Green, London (the Proposed Development).

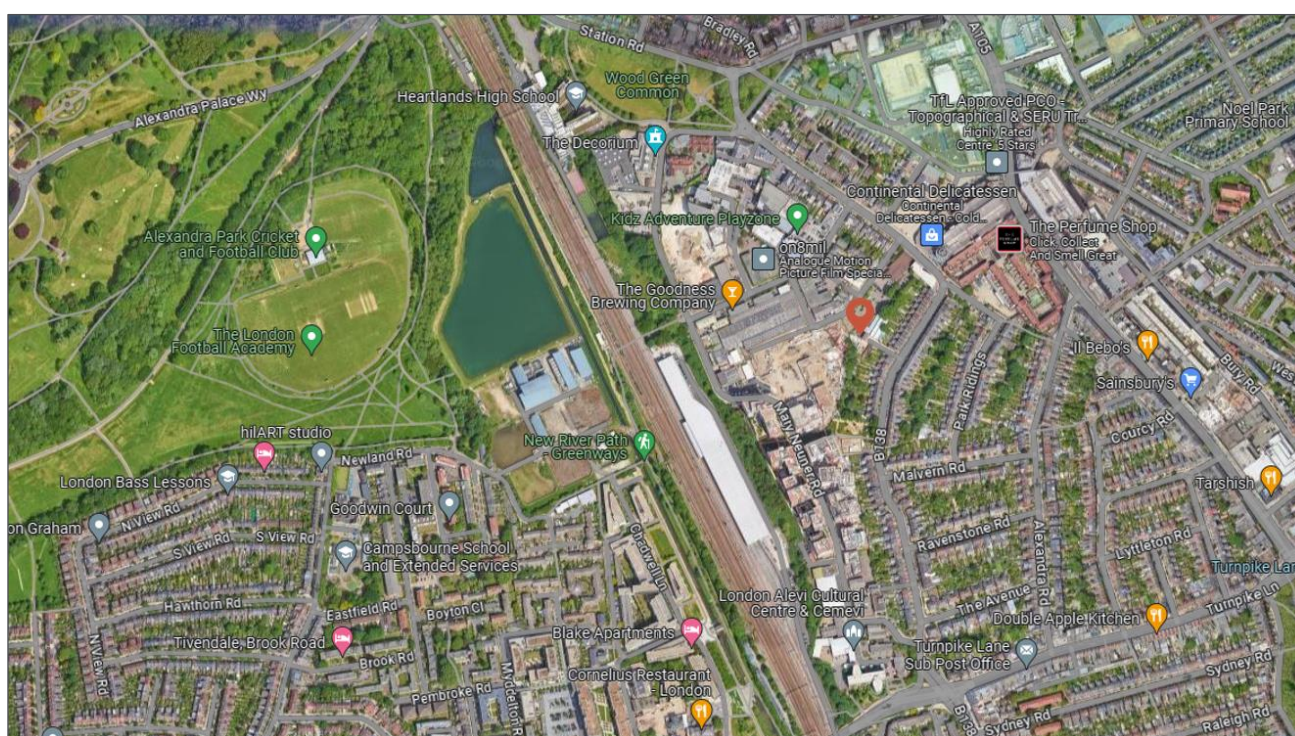


Figure 1 - Location of the site (Google Map)

Located in Wood Green, to the North of Greater London, the site of the Proposed Development is predominantly within a residential area. Two-storey terraced houses line the Southeast boundary, while high-rise apartment blocks are positioned to the South. To the East, High Road, one of the main arterial routes through the Borough is a short walk away, which encompasses local amenities and public transport. West of the site is characterized by extensive parks and green areas situated around a busy rail line.

The site is proposed to be accessed from Hornsey Park Road via an existing accessway between units of terraced houses. Hornsey Park Road extends in a general Northeast-to-South direction, forming an intersection with Mayes Road to the Northeast and linking to Turnpike Lane in the South. This two-way road features a single

¹ Demystifying Air Pollution in London: Full Report, January 2018.

carriageway in each direction and is subject to a speed limit of 32 km/h (20 mph). Serving as a vital thoroughfare, Hornsey Park Road establishes a connection between Wood Green and Hornsey neighbourhoods.

The site locality benefits from convenient access to nearby amenities and green spaces. The promotion of pedestrian and cycle accessibility over car usage further enhances its commitment to sustainability. The area is also well-connected through public transport, with several bus routes available on Mayes Road and Turnpike Lane. Wood Green and Turnpike Lane Underground Stations are within walking distance of the site, providing further accessibility across all London Boroughs. Hornsey Rail Station is situated 850m to the South-West, offering connectivity to key commercial business areas of Central London.

The Proposed Development involves the demolition of the existing commercial structures upon the brownfield site, followed by the construction of two buildings with a maximum height of six storeys. The forthcoming developments will feature a blend of residential units located on both ground and upper floors of Block A. Block B's ground floor will host a single commercial unit along with associated plant rooms and a refuse store. The Proposed Development is designed to be a car-free development, incorporating only three essential accessible/blue badge parking spaces in the external areas along with soft landscaping.



Figure 2 – Proposed site plan (Stephen Davy Peter Smith Architects Ltd)

1.1 Planning Context

There is growing evidence that air pollution, even when experienced at very low levels, is damaging to human health. Table 1 below represents the current national air quality objectives and targets for the protection of human health from the national DEFRA Air Quality Limits².

Pollutant	Applies	Objective	Concentration measured as	Date to be achieved by (and maintained thereafter)
Particles (PM ₁₀)	UK	50 µg/m ³ not to be exceeded more than 35 times a year	24 hours mean	31 December 2004
	UK	40 µg/m ³	annual mean	31 December 2004
Particles (PM _{2.5}) Exposure Reduction	UK (except Scotland)	20 µg/m ³	annual mean	1 January 2020
	UK urban areas	Target of 15% reduction in concentrations at urban background		Between 2010 and 2020
Particles (PM _{2.5}) (Population Exposure Reduction Target)	England	Target of 35% reduction in population exposure compared with the average population exposure baseline period (2016 – 2018)	population exposure reduction	31 December 2040
Particles (PM _{2.5}) (Annual Mean Concentration Target)	England	10 µg/m ³ not to be exceeded at any relevant monitoring station	annual mean	31 December 2040
Nitrogen dioxide	UK	200 µg/m ³ not to be exceeded more than 18 times a year	1 hour mean	31 December 2005
	UK	40 µg/m ³	annual mean	31 December 2005

Table 1 - National Air Quality Objectives and Targets for the protection of human health

This AQA addresses the GLA planning policy requirement, as per the ‘Air quality Neutral London Plan Guidance (February 2023)³’ concerning general air quality issues around the proposed site. London Plan⁴ Policy SI1 Improving Air Quality requires that “Development Plans, through relevant strategic, site-specific and area-based policies, should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the mayor’s or boroughs’ activities to improve air quality”. The

² DEFRA National Air Quality and European Directive Limit and Target Values for the Protection of Human Health

³ Air quality Neutral London Plan Guidance (February 2023)

⁴ The London Plan Guidance (March 2021)

Haringey Air Quality Action Plan⁵ outlined the action to take to improve air quality in London Borough of Haringey between 2019-2024.

Table 2 below summarises the policy context of the relevant policy.

Planning Policy	Sections	Policy Summary
Air quality Neutral London Plan Guidance (February 2023)	Air Quality Neutral	An Air Quality Neutral development is one that meets, or improves upon, the Air Quality Neutral benchmarks set out in this document. These benchmarks set out the maximum allowable emissions of NOx and particulate matter based on the size and use class of the proposed development. These benchmarks are based on research and evidence carried out by building and transport consultants and are designed to prevent the degradation of air quality from the combined emissions of individual developments. There are two sets of benchmarks, which cover the two main sources of air pollution from new developments: • Building Emissions Benchmark (BEB) – emissions from equipment used to supply heat and energy to the buildings • Transport Emissions Benchmark (TEB) – emissions from private vehicles travelling to and from the development. The Proposed Development must meet both benchmarks in order to be Air Quality Neutral. If one or both benchmarks are not met, appropriate mitigation or offsetting will be required. As the benchmarks are based on evidence and are designed to be challenging but achievable, mitigation or offsetting provisions should be the exception.
The London Plan (March 2021)	Policy SI 1 Improving air quality	B: To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed: 1) Development proposals should not: a) lead to further deterioration of existing poor air quality. b) create any new areas that exceed air quality limits or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits. c) create unacceptable risk of high levels of exposure to poor air quality. 2) In order to meet the requirements in Part 1, as a minimum: a) development proposals must be at least Air Quality Neutral. b) development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of

⁵ [Haringey Air Quality Action Plan 2019-2024](#)

		air quality in preference to post-design or retrofitted mitigation measures. c) major development proposals must be submitted with an Air Quality Assessment. d) development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people should demonstrate that design measures have been used to minimise exposure.
London Borough of Haringey Air Quality Action Plan 2019 - 2024	Air Quality Action Plan	We have developed actions that can be considered under seven broad topics: 1. Monitoring and other core statutory duties: maintaining monitoring networks is critical for understanding where pollution is most acute, and what measures are effective to reduce pollution. There are also several other very important statutory duties undertaken by boroughs, which form the basis of action to improve pollution. 2. Emissions from developments and buildings: emissions from buildings account for about 15% of the Nitrogen Oxides (NO_x) emissions across London so are important in affecting Nitrogen Dioxide (NO₂) concentrations. 3. Public health and awareness raising increasing awareness can drive behavioural change to lower emissions as well as to reduce exposure to air pollution. 4. Delivery servicing and freight: vehicles delivering goods and services are usually light and heavy-duty diesel-fuelled vehicles with high primary NO₂ emissions. 5. Borough fleet actions: our fleet includes light and heavy-duty diesel-fuelled vehicles such as minibuses and refuse collection vehicles with high primary NO₂ emissions. Tackling our own fleet means we will be leading by example. 6. Localised solutions: these seek to improve the environment of neighbourhoods through a combination of measures. 7. Cleaner transport: road transport is the main source of air pollution in London. We need to incentivise a change to walking, cycling and ultra-low emission vehicles (such as electric).

Table 2 – Relevant Planning policy summary

1.2 Building Regulations Approved Document F: Ventilation

The Proposed Development is being designed as a mechanically ventilated building with heat recovery units and will follow the requirements detailed in Building Regulations Approved Document F: Ventilation where applicable. This includes providing suitable ventilation rates to avoid the internal collection of air pollutants, whilst also limiting internal ingress of external pollutants into building.

2.0 Background Pollution Levels

2.1 Air Quality Management Area (AQMA)

Where significant levels of gaseous pollutants such as nitrogen oxides are identified in the outdoor air, as in an Air Quality Management Area (AQMA), the use of appropriate gas phase filtration in the building ventilation system should be considered. Developments where a portion of the site is within a local authority AQMA are automatically considered to be in a high pollution location. The Proposed Development is located within the Air Quality Management Area declared by the London Borough of Haringey in 2001 due to exceedances in Nitrogen dioxide (NO₂) and Particulate Matter (PM₁₀) (Figure 3).

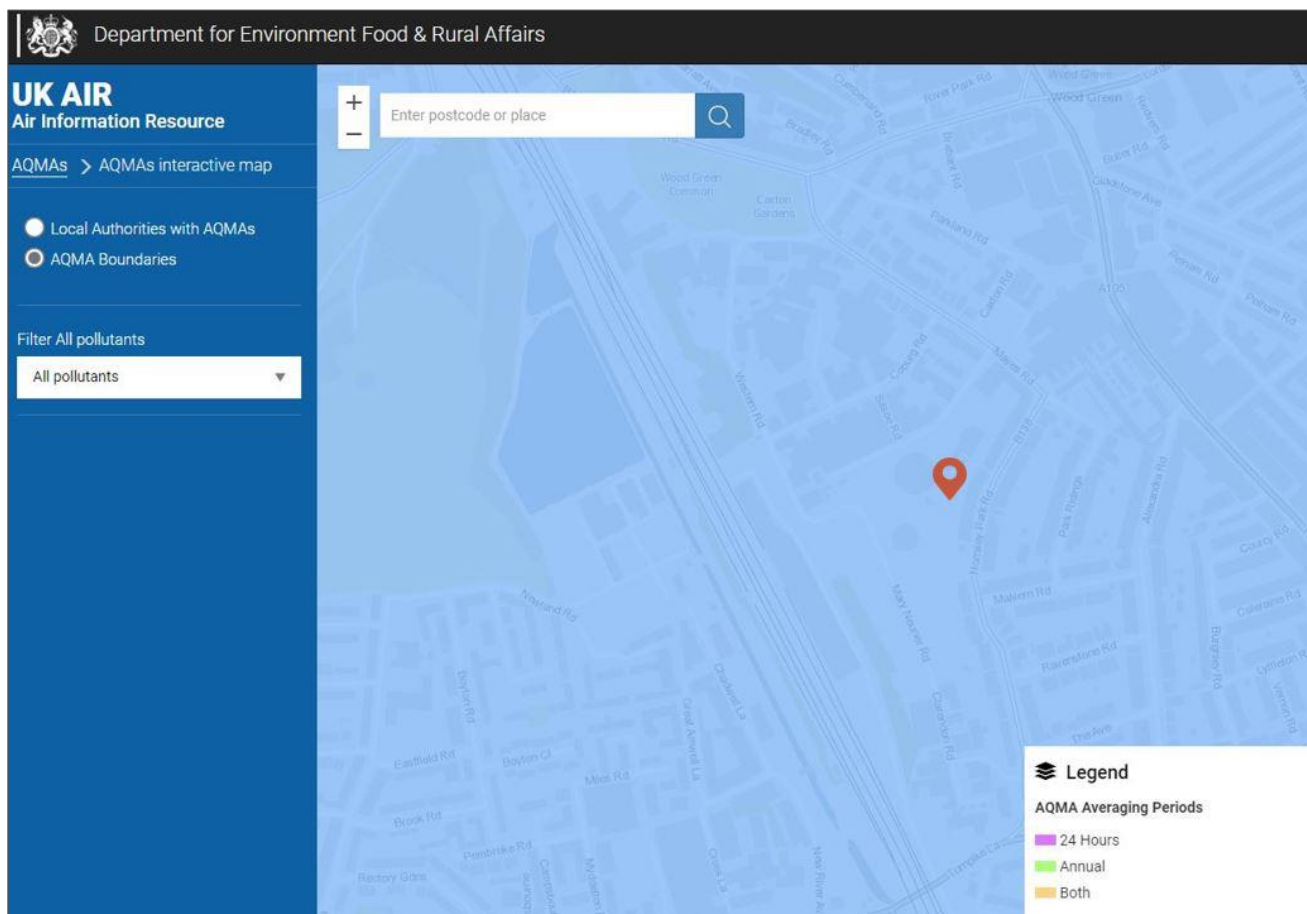
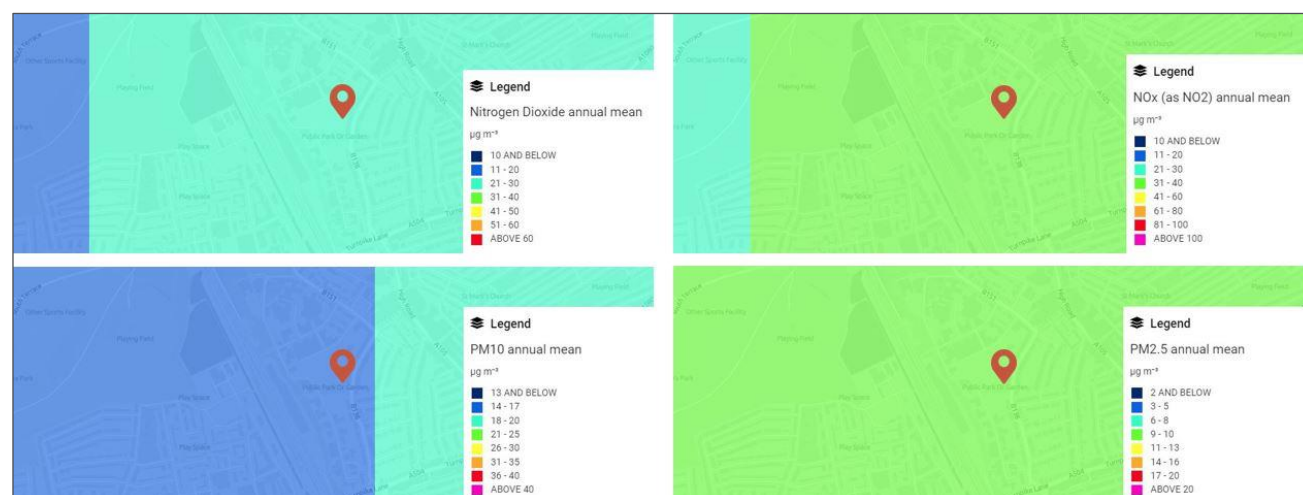


Figure 3 - AQMA Boundaries of the Proposed Development (AQMA's interactive map)

Within the local area of Haringey AQMA, background concentrations of Particulate Matter (PM₁₀/PM_{2.5}) and Nitrogen Oxides (NO₂/NO_x) are shown within the current UK objectives listed in Table 1 above, including the area in which the Proposed Development is located (as evidenced in Figure 4). Background pollutant concentrations are selected from the year of 2022 in order to illustrate pollution data during a year of normalised emissions rates.

As shown in Figure 4 below, the annual mean concentration for Nitrogen Dioxide was 21.20 µg/m³, NO_x (as NO₂) was 31.94 µg/m³, PM₁₀ was 17.39 µg/m³, and PM_{2.5} was 9.71 µg/m³. As these pollutants are damaging to health at any level, they remain pollutants of concern. It is recommended that suitable mitigation measures should be implemented during the design of the development to reduce health risks to the future site and building users.

Figure 4 - 2022 Background Concentrations of NO_x, NO₂, PM₁₀, PM_{2.5} (DEFRA UK)

2.2 Air Quality Focus Area (AQFA)

Air Quality Focus Areas (AQFA) are locations that not only exceed the EU annual mean limit value for nitrogen dioxide (NO₂) but are also locations with high human exposure. AQFAs are not the only areas with poor air quality but they have been defined to identify areas where currently planned measures to reduce air pollution may not fully resolve poor air quality issues. Appendix B presents all the AQFAs currently across London. The list of AQFAs is updated from time to time as the London Atmospheric Emissions Inventory (LAEI) is reviewed and the latest list in the London Datastore should always be checked.

In accordance with the LAEI 2019⁶, revised in April 2023, Figure 5 illustrates the AQFA Borough map for Haringey. Specifically, No. 68 (ID 2019), represents the Wood Green High Road and Turnpike Lane NO₂ Focus Areas, as detailed in the LAEI 2019, with the Focus Area lists updated in November 2022.

The Proposed Development is located at the boundary of AQFA No. 68, approximately 400 meters away from it. Therefore, this report includes a detailed appraisal (see section 3.0) for the Proposed Development to assess the wide range of air quality issues associated with the proposed site, and the suitability for future building users.

⁶ LAEI 2019 is the latest version of the London Atmospheric Emissions Inventory and replaces previous versions of the inventory.

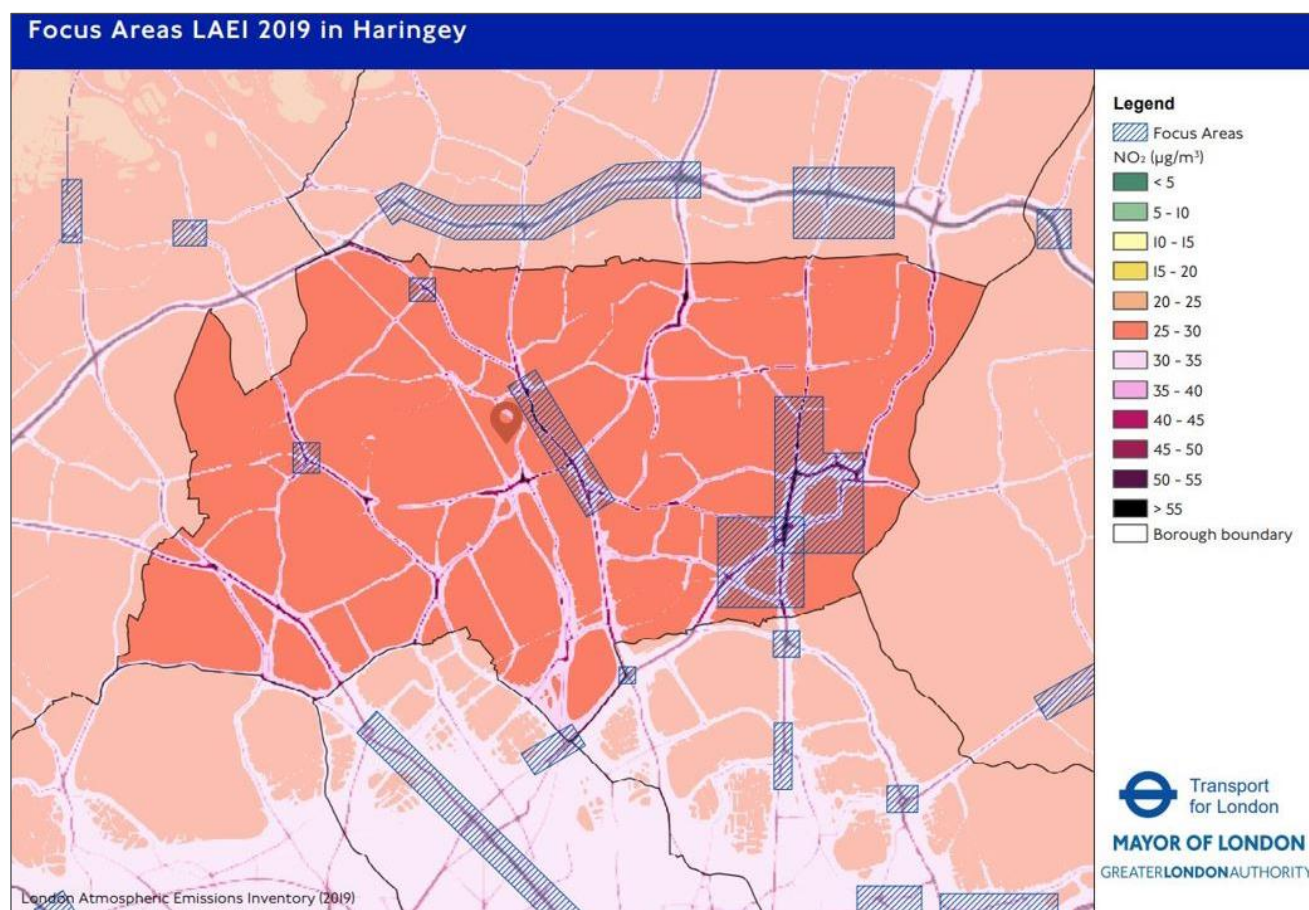


Figure 5 – Haringey AQFA (LAEI 2019)

2.3 External Sources

2.3.1 Roads

Situated in Wood Green, Haringey, the Proposed Development is accessible from the East via Hornsey Park Road (B138). This road runs generally northeast to south, with terraced houses lining both sides. It intersects with Mayes Road to the northeast and links to Turnpike Lane (A504) in the south. The Wood Green High Road (A105), located within the No. 68 AQFA, is a mere 400 meters away from the site.

As seen from Figure 6 below, Hornsey Park Road (B138) shows no significant air quality concerns related to roadside pollution. High Road (A105) and Turnpike Lane (A504) experiences higher level of pollutants. The roadside concentrations from High Road (A105) in 2022 was Nitrogen Dioxide (26.96 µg/m³), NO_x as NO₂ (55.78 µg/m³), PM₁₀ (21.50 µg/m³), and PM_{2.5} (11.14 µg/m³). The roadside concentrations from Turnpike Lane (A504) in 2022 was Nitrogen Dioxide (23.55 µg/m³), NO_x as NO₂ (46.31 µg/m³), PM₁₀ (20.11 µg/m³), and PM_{2.5} (10.59 µg/m³). The roadside NO_x (as NO₂) emissions from both High Road (A105) and Turnpike Lane (A504) were all exceeds the current national air quality objectives and targets (40 µg/m³).

A detailed Air Quality Assessment (AQA) is carried out (see section 3.0) to calculate the concentrations of pollutants at specified receptor points at the Proposed Development, to therefore determine the site's suitability for future occupation.

Figure 6 below represents the impact of solely roadside emissions on the air quality of the area to gauge the influence of roads upon local air quality (2022).

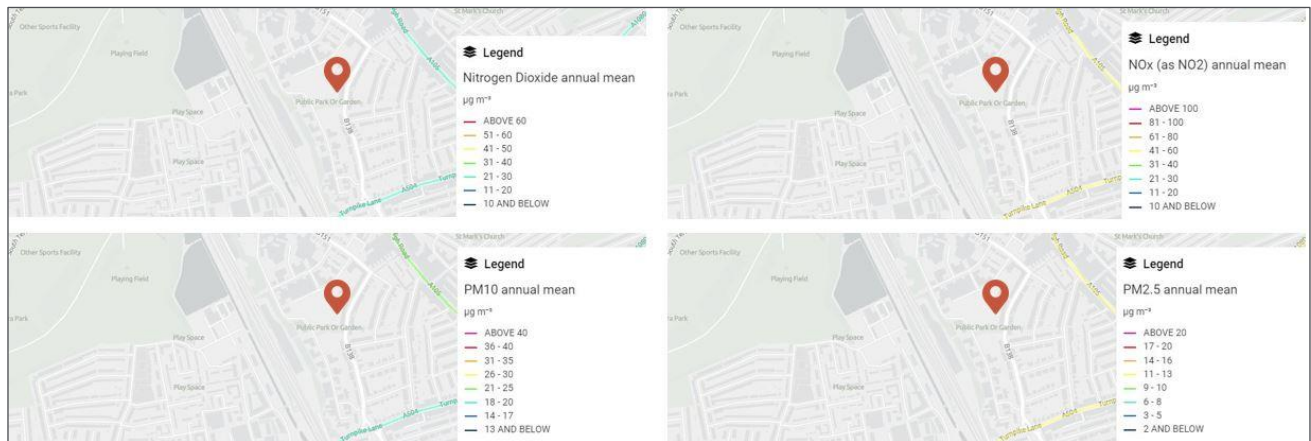


Figure 6 - Roadside concentrations near the Proposed Development (DEFRA UK, 2022)

2.3.2 Wind

Wind plays a vital role in the dispersion of pollutant particles across long distances dependent on the speed and direction of the prevailing wind. Whilst assisting in the removal of pollutants from certain areas, it simultaneously acts to worsen air quality in other areas to which the airmass is transported.

The wind rose below (Figure 7) shows how many hours per year the wind blows from the indicated direction for the area. Air pollution produced from the site is likely to be blown from South-West (SW) to North-East (NE), the natural prevailing wind direction across UK. To the North-East of the site there are a combination of commercial and residential buildings (Wood Green High Road), therefore pollution produced by the Proposed Development during construction and operation phases should be minimised to reduce pollution impacts to these surrounding areas.

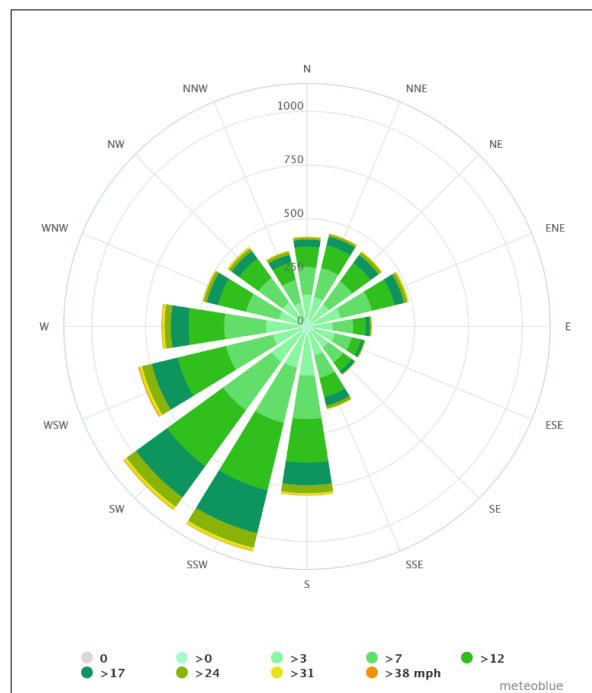


Figure 7 - Wind rose for the Proposed Development (Meteoblue)

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Air Quality Assessment

3.0 Air Quality Assessment

In address of Planning policies concluded in Table 2, a detailed Air Quality Assessment (AQA) should be performed for the Proposed Development. A full AQA is carried out in order to calculate the concentrations of pollutants at specified receptor points at the Proposed Development, to therefore determine the site's suitability for future occupation.

Site suitability refers to the exposure of building occupants to potentially harmful pollutants, specifically NO_x , NO_2 , PM_{10} and $\text{PM}_{2.5}$ which affect the site's potential for occupation. The Atmospheric Dispersion Modelling System for small road networks model (ADMS-Roads) is used to analyse the concentrations of these pollutants at specified receptor points around the Proposed Development. These concentrations can then be compared to the current national air quality objectives and targets stated in Table 1, to assess the suitability of the site for the occupation of building users and the level of air quality mitigation measures required.

3.1 Methodology

ADMS-Roads Air Quality Modelling system is used to model the concentration of pollutants at the site of the Proposed Development.

The software models specified roads and associated pollutants. The road geometry, incorporating Hornsey Park Road (B138), High Road (A105) and Turnpike Lane (A504) have been integrated into the mapper (Figure 8) due to their proximity to the Proposed Development site and their experience of notably high levels of traffic flow.

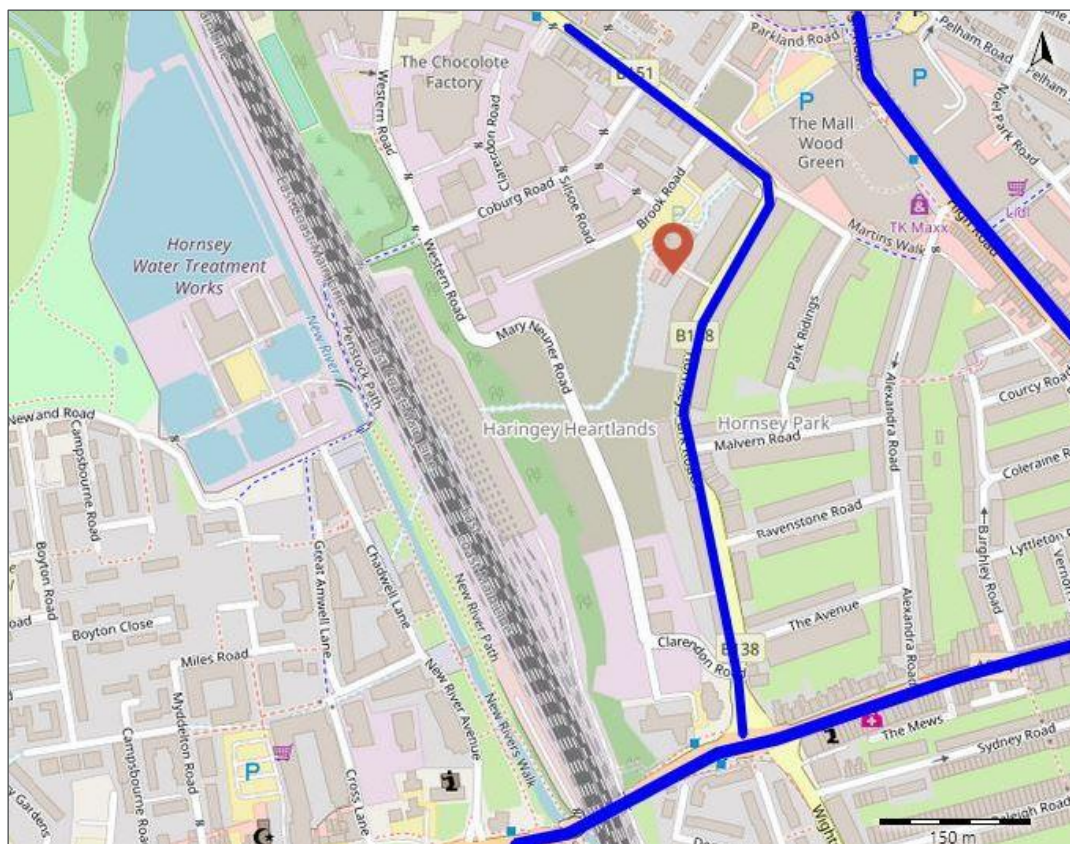


Figure 8 - The road geometry modelled in blue on the mapper (ADMS-Roads)

For each road, emissions are calculated using traffic flow data and emission factors for 'London (outer)' which is defined by The London Plan. The UK Government Department for Transport (DfT) provides traffic data for roads across the UK with flow data provided up to 2022.

Also inputted into the ADMS-Roads software is the proportion of traffic that consists of heavy-duty and light-duty vehicles. This is also included in the dataset produced by the DfT. Table 3 below states the traffic flow data applied to the roads in the ADMS-Roads model for the Proposed Development.

Road	Speed Limits (km/h)	Light duty vehicles per hour	Heavy duty vehicles per hour
Hornsey Park Road (B138)	32	1234	45
High Road (A105)	48	1273	295
Turnpike Lane (A504)	48	968	77

Table 3 - Traffic flow data input into the ADMS-Roads model for the Proposed Development

The final boundary condition that is included in the ADMS-Roads model is the meteorology of the site. This is required as temperature, wind and precipitation all have the ability to affect the concentrations of pollutants at the site of the Proposed Development.

A typical meteorological year (TMY) weather data file from Heathrow Airport is used for the model in-line with best practice for developments in cities and large towns areas. This weather data is then transposed on to the local area of the Proposed Development by applying the parameter changes stated in Table 4.

Parameter	Heathrow Airport	Site location
Surface Roughness	0.75	1
Surface Albedo	0.23	0.23
Min. Monin-Obukhov length (m)	1	30
Priestley-Taylor parameter	1	1
Precipitation factor	n/a	1

Table 4 - Meteorological parameters used when transposing TMY file to site location

In order to distinguish different areas for pollutant analysis, individual receptor points are specified around the site of the Proposed Development, with a grid being selected to cover the entire site to ensure all areas of occupancy are included within the assessment. The receptor points are selected at various points across the Proposed Development to give a clear indication of the pollutant concentrations throughout the site. For each given height, 5 no. receptor points are modelled. This is done at heights of 0m, 5m, 10m, 15m and 20m. The receptor locations chosen are therefore well distributed across the site of the Proposed Development. Figure 9 shows the grid being selected and Figure 10 shows the locations of the receptors within the model.

The ADMS-Roads model was then run with concentrations of NO_x , NO_2 , PM_{10} and $\text{PM}_{2.5}$ calculated at the specified receptor points and across the grid for each hour of the day for 365 days of the year. The annual mean concentrations of these pollutants were then calculated.



Figure 9 - Grid specified for measuring pollutant concentrations (ADMS-Roads)



Figure 10 - Specified receptor points for the ADMS-Roads model

Table 5 states the annual mean concentrations of NO_x, NO₂, PM₁₀ and PM_{2.5} calculated for specified receptor points, which are compared to the current national air quality objectives and targets stated in Table 1 above.

Receptor	Annual mean NO _x (µg m ⁻³)	Annual mean NO ₂ (µg m ⁻³)	Annual mean PM _{2.5} (µg m ⁻³)	Annual mean PM ₁₀ (µg m ⁻³)
R1	33.75	21.69	9.86	17.65
R2	34.26	21.82	9.90	17.73
R3	33.86	21.71	9.87	17.67
R4	33.23	21.54	9.82	17.58
R5	33.17	21.53	9.81	17.57
R6	33.54	21.63	9.84	17.62
R7	33.98	21.74	9.88	17.69
R8	33.67	21.66	9.85	17.64
R9	33.14	21.52	9.81	17.57
R10	33.08	21.50	9.81	17.56
R11	33.11	21.51	9.81	17.56
R12	33.38	21.58	9.83	17.60
R13	33.24	21.54	9.82	17.58
R14	32.91	21.46	9.79	17.53
R15	32.86	21.45	9.79	17.53
R16	32.72	21.40	9.78	17.51
R17	32.85	21.44	9.79	17.53
R18	32.80	21.43	9.78	17.52
R19	32.65	21.39	9.77	17.50
R20	32.62	21.38	9.77	17.49
R21	32.45	21.33	9.75	17.47
R22	32.50	21.35	9.76	17.48
R23	32.48	21.34	9.76	17.47
R24	32.43	21.33	9.75	17.46
R25	32.41	21.32	9.75	17.46

Table 5 - Annual mean concentrations of NO_x, NO₂, PM₁₀ and PM_{2.5} at specified receptor points calculated using ADMS-Roads software

Figure 11 shows the contour plot of NO_x , NO_2 , PM_{10} and $\text{PM}_{2.5}$ concentrations based on the grid specified. This is to give an indication of how the pollutants vary across the site of the Proposed Development.



Figure 11 - Contour map showing how annual mean concentrations of NO_x varies across the site (ADMS-Roads)

3.1.1 Nitrogen oxides (NO_x and NO_2) concentrations

The current national air quality objective for Nitrogen oxides (NO_x , NO_2) concentrations is an annual mean of $<40 \mu\text{g m}^{-3}$, with a permitted exceedance of up to $200 \mu\text{g m}^{-3}$ for 18 no. 1-hour periods each year. After analysing the short-term output files, there are no periods where the concentration exceeds $200 \mu\text{g m}^{-3}$ for any of the receptors. In addition, at all receptor locations, the annual mean concentration of NO_2 and NO_x is below the target of $40 \mu\text{g m}^{-3}$, indicating the Proposed Development is suitable for resident occupancy in relation to NO_2 and NO_x emissions.

3.1.2 $\text{PM}_{2.5}$ concentrations

The current national air quality objective for $\text{PM}_{2.5}$ concentrations is an annual mean of $<20 \mu\text{g m}^{-3}$ in UK (except Scotland). $\text{PM}_{2.5}$ concentrations are targeted to be reduced by 15% in UK urban areas. At all receptor locations, the annual mean concentration of $\text{PM}_{2.5}$ is below this target, indicating the Proposed Development is suitable for occupants in relation to $\text{PM}_{2.5}$ emissions.

3.1.3 PM_{10} concentrations

The current national air quality objective for PM_{10} concentrations is an annual mean of $<40 \mu\text{g m}^{-3}$, with a permitted exceedance of up to $50 \mu\text{g m}^{-3}$ for 35 no. 24-hour average periods each year. After analysing the short-term output files, there are no periods where the concentration exceeds $50 \mu\text{g m}^{-3}$ for any of the

receptors. In addition, at all receptor locations, the annual mean concentration of PM₁₀ is below the target of 40 µg m⁻³, indicating the Proposed Development is suitable for the building users in relation to PM₁₀ emissions.

3.1.4 Site variation in emissions

The contour maps in Figure 11 shows the NO_x emissions level variance across the immediate surrounding area of the Proposed Development. The contours demonstrate the influence the adjacent roads have on nearby air quality. The NO_x emissions level of approximately 30 µg m⁻³ covers the entirety of the site.

In summary, the pollutant concentrations of NO_x, NO₂, PM₁₀ and PM_{2.5} at all receptors are lower than the current national air quality objectives. It can be said that no matter what receptors are chosen, the pollutant concentrations will be within the UK limits, indicating the Proposed Development is suitable for residential and commercial occupancy with regards to air quality.

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Air Quality Neutral

4.0 Air Quality Neutral

An Air Quality Neutral (AQN) development is one that meets, or improves upon, the Air Quality Neutral benchmarks. These benchmarks set out the maximum allowable emissions of NO_x and particulate matters based on the size and use class of the Proposed Development. These benchmarks are based on research and evidence carried out by building and transport consultants (Velocity Transport Ltd) and are designed to prevent the degradation of air quality from the combined emissions of individual developments.

There are two sets of benchmarks, which cover the two main sources of air pollution from new developments:

- Building Emissions Benchmark (BEB) – emissions from equipment used to supply heat and energy to the buildings.
- Transport Emissions Benchmark (TEB) – emissions from private vehicles travelling to and from the development.

A development must meet both benchmarks separately in order to be Air Quality Neutral. If one or both benchmarks are not met, appropriate mitigation or offsetting will be required. In addition, all developments in London are expected to meet the Air Quality Neutral benchmarks.

4.1 Building Emissions Benchmark (BEB)

For the Proposed Development, the Design Team has confirmed that the space heating and hot water system will be provided via a fully electrical communal heat pump system, with no gas boilers being used. According to Air Quality Neutral London Plan Guidance (February 2023)⁷ section 3.1.4, most non-combustion heat sources such as electric panel heaters and heat pumps (including air source and ground source heat pumps) are assumed to have zero heat-related NO_x emissions. Therefore, no building emissions calculation can be defined (Table 6). Consequently, the Proposed Development is within BEBs and 'Air Quality Neutral' requirements concerning building emissions with no further abatement required.

Land Use Class	Floor Area (m ²) /Dwellings	NO _x Benchmark (g/m ² /annum)	Total NO _x Building Emission Benchmark (g/annum)	Total NO _x Building Emission Benchmark (kg NO _x /annum)
Commercial (Use class E) ⁸	96.7	0	0	0
Residential (Use class C3)	32	0	0	0
Total NO_x BEB (kg/annum)				0

Table 6 - Calculation of Building Emissions Benchmark for NO_x

⁷ Air quality Neutral London Plan Guidance (February 2023), section 3.1.4

⁸ Air quality Neutral London Plan Guidance (February 2023), table 3.1 and table 4.1 – Here refer to restaurants and bars/Cafes.

4.2 Transport Emissions Benchmark (TEB)

For most developments, the key driver of transport emissions is the provision of car parking spaces. Therefore, a condition or legal agreement restricting car parking spaces to a specified maximum (not exceeding the amount assumed for the Air Quality Neutral calculation) should be applied.

Car parking should be restricted in line with levels of existing and future public transport accessibility and connectivity. The site is well-served by public transportation, including bus routes that run along High Road and Turnpike Lane. Hornsey overground rail station is nearby, along with Wood Green and Turnpike Lane underground, providing access to Central London and other areas. The Proposed Development is located in outer London with good access to a range of services within walking distance.

The Design Team has confirmed that the Proposed Development will be a car free development, incorporating only three essential accessible/blue badge parking spaces. The proposal involves the installation of 1 no. active electric vehicle charging points, and 2 no. passive electric vehicle charging points, to facilitate future needs. The proposed cycle parking includes 2 no. short stay (public realm) and 55 no. long stay (internal secure facility) spaces for residential cycle parking, and 1 no. short stay and 1 no. long stay spaces for commercial cycle parking.

4.2.1 TEB Calculation

The TEB is defined as the predicted number of single trips per m² of floorspace (GIA) over a year (trips/m²/year) for non-residential use, or the anticipated number of single trips per dwelling (trips/dwelling/year) for residential use. An outward and return journey to and from a location therefore counts as two trips. Trip rate benchmarks⁹ are based on data from the Trip Rate Information Computer System (TRICS)¹⁰ and are defined for different land uses and different areas of London. The TEB per year are calculated in Table 7.

Land Use Class	Floor Area (m ²) /Dwellings	Annual trips per m ² (GIA) Per Dwelling	Total Benchmark Trip Rate (trips/year)
Commercial (Use class E)	96.7	170	16,439
Residential (Use class C3)	32	447	14,304
Total Transport Emission Benchmark			30,743

Table 7 – Total Transport Emission Benchmark

The TEB only estimates car or light van trips undertaken directly by the development occupiers (residents, businesses etc and their staff / customers). The TEB does not include 'operational' trips generated by the developments. Deliveries and servicing, taxis or heavy vehicle movements from non-occupiers' assessment of these trips, for example, should therefore be excluded from TEB calculations.

The forecast Proposed Development's trip generation per day for all land-use classes (one-way) has been provided by Velocity Transport Ltd (Appendix C). The residential mode share for the Proposed Development has

⁹ Air quality Neutral London Plan Guidance (February 2023), table 4.1

¹⁰ TRICS

been adjusted to reduce car driver / passenger trips to 0% due to it being car-free, with the trips distributed onto the other modes proportionally. The forecast no. daily residential travel demand for arrivals is 74, for all transport modes excluding walking and cycling.

The trip rates are multiplied to provide an annual projection of generated trips, rather than daily. Table 8 illustrates the calculation of the total development trip rate annually.

Land Use Class	Daily Trips/ One way	Annual Trip rate (trips/year)
Commercial (Use class E)	8	2,920
Residential (Use class C3)	74	27,010
Total Development Trip Rate		29,930

Table 8 – Total Development Trip Rate

The Proposed Development's trip rate (29,930 trips/year) includes all trips other than pedestrians and cyclists closely aligns with the Benchmark trip rate (30,743 trips/year) set by GLA. The associated number of trips does not exceed the benchmark and as a result, the Proposed Development achieves Air Quality Neutral and does not require further abatement with regards to transport emissions.

4.3 Calculation of transport emissions

To calculate the transport emissions, the predicted trip rates will need to be multiplied by a trip length and an emission factor. Table 9 provides the trip length and emission factor, and Table 10 shows the total annual transport emission. Based on the calculation, the annual NO_x Emissions amount to 111.91 kg, and the annual PM_{2.5} Emissions stand at 8.95 kg.

Land Use Class	Average distance (km) travelled by car per trip	NO _x Emission factors per vehicle-km (g/veh-km)	PM _{2.5} Emission factors per vehicle-km (g/veh-km)
Commercial (Use class E)	5.4	0.35	0.028
Residential (Use class C3)	11.4		

Table 9 – Outer London Average distance (km) travelled by car per trip and emission factors per vehicle

Land Use Class	Annual Trip rate (trips/year)	Annual NO _x Emissions (kg)	Annual PM _{2.5} Emissions (kg)
Commercial (Use class E)	2,920	5.52	0.44
Residential (Use class C3)	27,010	107.77	8.62
Total Development Transport Emissions (kg)		113.29	9.06

Table 10 – Calculation of transport emissions

4.4 Conclusions

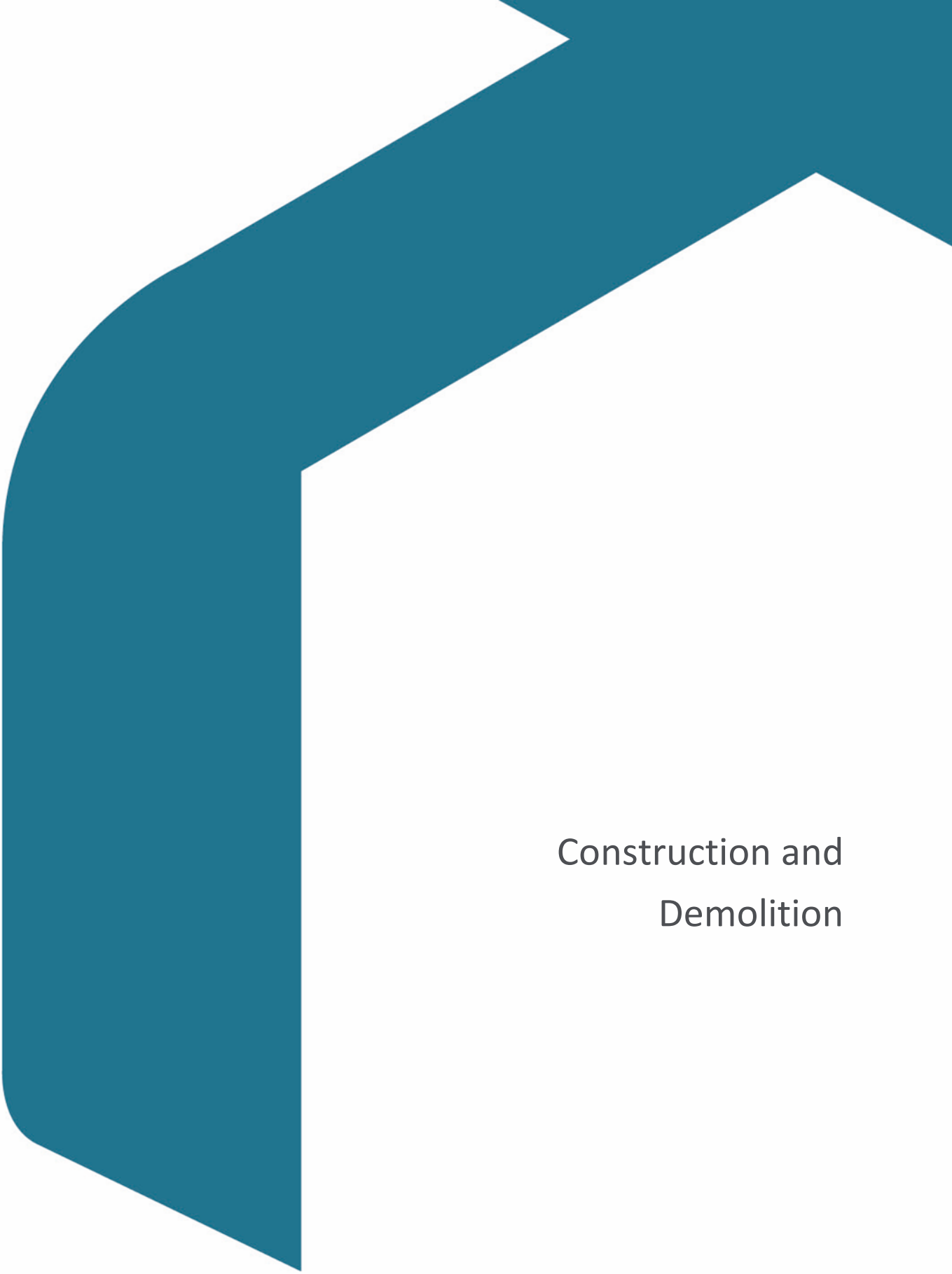
To summarise, the Proposed Development can be qualified as Air Quality Neutral (AQN), as both benchmarks (BEB and TEB) are met.

Additionally, the number of associated trips calculated in Section 4.2.1 encompasses all trips by public transport or motorcycle, not car-only which the TEB is designed for, to limit personal or private vehicle usage.

The transport emissions calculated in Section 4.3 is based upon emissions factors associated with car trips. Public transport and motorcycle options would represent a smaller proportion of emissions. In conclusion of the above, the actual emissions are likely to be much less than the reported value.

Furthermore, with regards to building emissions, details of the specific appliance that will be installed in the completed development are not always known at the planning application stage. Even when an appliance is assumed at planning application stage, for many reasons, this may be different to the appliance that is installed in the completed development. It is therefore strongly advised that a condition requiring approval of the appliance details is used to ensure that the installed system is as good as, or better than, that used in the AQN Assessment.

For larger and more complex systems, abatement equipment may be needed to minimise emissions. Where abatement is required, the installation, use and maintenance of the abatement equipment should similarly be required by condition.

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Construction and Demolition

5.0 Construction and Demolition

Demolition will take place in order to prepare the site for the new construction. In the case of material breakup and removal, the following impacts should be considered.

- Visible dust plumes.
- Dust deposition.
- Elevated PM₁₀ and PM_{2.5} concentrations.
- Increased concentrations of nitrogen oxides.

Air pollutants can result from on-site dust-generating activities such as the breaking-up of materials and the clearing of the existing site, as well as from the exhaust of diesel-powered vehicles and both static and non-road mobile machinery. Vehicles and people accessing and travelling across the site can also generate dust.

It is therefore important that the creation or release of air pollutants is minimised as far as possible, so that both external air pollution levels are not significantly elevated as a result of the construction works carried out on the Proposed Development.

5.1 Dust Risk Assessment

A Dust Risk Assessment¹¹ will be produced to assess the risk of each phase of work, as well as evaluate and identify suitable mitigation measures for each risk. As per the Institute of Air Quality Management's (IAQM) Guidance, the following four categories will be used to guide the risk assessment: demolition, earthworks, construction and track out. Figure 12 summarises the steps that must be taken to produce the Dust Risk Assessment.

¹¹ Guidance on the assessment of dust from demolition and construction V2.2, January 2024

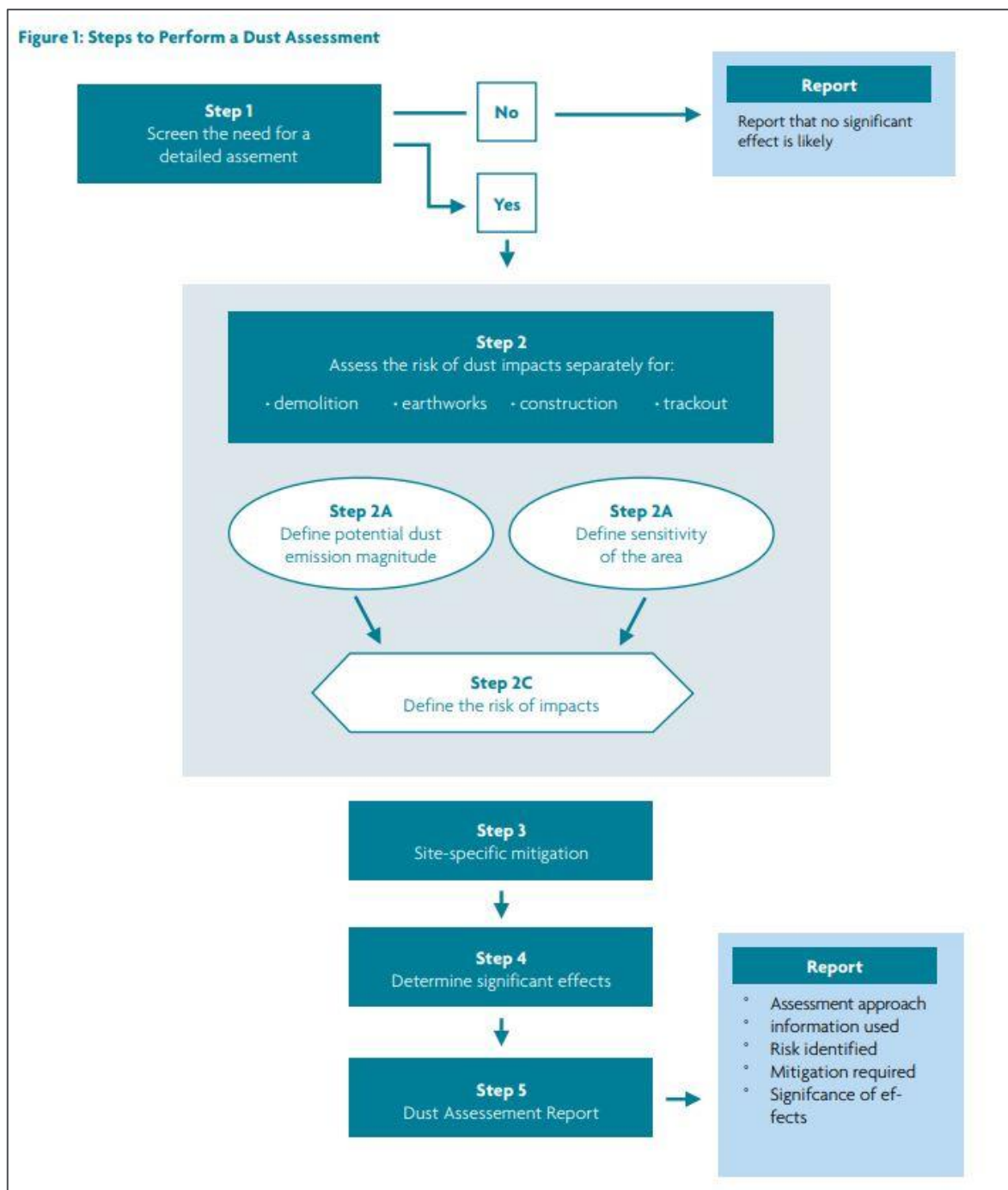


Figure 12 - Summary of Dust Risk Assessment process (Guidance on the assessment of dust from demolition and construction V2.2)

5.2 Dust control measures

As the construction of the Proposed Development will be undertaking localised site clearance and construction activities, the contractors will need to follow the details of: *The control of dust and emissions during construction and demolition SPG*¹² so that the release of emissions of gaseous and particulate pollutants into the atmosphere is limited. A brief summary of the requirements is outlined below, addressing key measures for dust control.

¹² *The control of dust and emissions during construction and demolition SPG*, July 2014.

5.2.1 Site management and maintenance

Responsible site management is imperative during any site clearance and the following construction phase, which require stakeholder engagement and regular site inspections. The application site must also be prepared through an effective site layout and implementation of green infrastructure while also maintaining runoff, cleaning, and soiling, and effectively dealing with spillages.

5.2.2 Vehicle emissions

The construction site will involve the use of vehicles and machinery which can significantly contribute to local air pollution. Therefore, all mobile vehicles should comply with the latest low emissivity targets; vehicle idling should be discouraged, and deliveries should be managed by a Construction Logistic Plan to effectively deliver and remove items from the site.

Workers and future building users of the Proposed Development and public areas will be encouraged to use public transport and/or cycle routes as alternatives to single-occupancy cars. Plant items for the site will be from renewable or battery sources where possible to reduce the higher levels of particulate matter and NO_x emitted from petrol- or diesel-powered equipment.

5.2.3 Operations

Cutting, grinding, and sawing should be limited on-site and managed by dampening with water to reduce excessive dust generation. If mobile crushing and concrete bashing occur on-site, London Borough of Haringey must be notified, and best practice procedures should be followed. Skips, chutes, and conveyors should be covered to limit dust escaping. Plant items for the site will be operated from renewable or battery sources where possible, to reduce the higher levels of PM and NO_x emitted from petrol- or diesel-powered equipment.

5.2.4 Waste

Bonfires are forbidden, and the recycling or reuse of materials will be encouraged. A Pre-Demolition Waste Audit for the Proposed Development *should* be taken into consideration so that the amount of demolition (site clearance) and construction waste can be assessed and monitored.

5.3 Mitigation measures

Any site clearance activities should use either soft stripping or water suppression to damp down dust. During construction, cement, sand, fine aggregates, and other fine powders should be sealed after use and if necessary stored in enclosed or banded containers or silos. Hard surfaces or paving should be used for all haul routes and routes should be swept and dampened regularly. Subject to the ground conditions the vehicle wheels should be washed down before leaving the site and all vehicles carrying dusty materials should be securely covered when in transit. Dust suppressants (calcium magnesium acetate) could be used on roadsides if needed.

5.4 Site monitoring

It is important to continually monitor the site to manage the generation of PM and NO_x during construction and demolition. The Proposed Development should take regular energy and water meter readings during the construction phases and transport will be recorded for all deliveries to and from the site. Quantities and types of waste should also be monitored.

5.5 Non-road mobile machinery

Pre - 1st September 2020, any non-road mobile machinery (NRMM) used on a site was required to meet Stage IIIB of the EU Directive 97/968/EC as a minimum. Although not a legal requirement, it is good practice to ensure this is achieved by reorganising the NRMM fleet, replacing equipment to meet the policy (where there are non-compliant NRMM), retrofitting abatement technologies or via re-engineering. Using the Considerate Constructors Scheme will assist in monitoring compliance with the NRMM policy, albeit this is not a mandatory requirement for the site.

6.0 Any relevant local authority plans or policies

The current Air Quality Action Plan (AQAP) produced by the Council as part of the duty to London Local Air Quality Management outlines the action that will be taken to improve air quality in London Borough of Haringey between 2019-2024.

Haringey is committed to reducing the exposure of people in the Borough to poor air quality in order to improve health. Actions outlined within the AQAP fall under seven broad topics including:

- **Monitoring and other core statutory duties:** maintaining monitoring networks is critical for understanding where pollution is most acute, and what measures are effective to reduce pollution. There are also several other very important statutory duties undertaken by boroughs, which form the basis of action to improve pollution.
- **Emissions from developments and buildings:** emissions from buildings account for about 15% of the Nitrogen Oxides (NOX) emissions across London so are important in affecting Nitrogen Dioxide (NO2) concentrations.
- **Public health and awareness raising** increasing awareness can drive behavioural change to lower emissions as well as to reduce exposure to air pollution.
- **Delivery servicing and freight:** vehicles delivering goods and services are usually light and heavy-duty diesel-fuelled vehicles with high primary NO2 emissions.
- **Borough fleet actions:** our fleet includes light and heavy-duty diesel-fuelled vehicles such as minibuses and refuse collection vehicles with high primary NO2 emissions. Tackling our own fleet means we will be leading by example.
- **Localised solutions:** these seek to improve the environment of neighbourhoods through a combination of measures.
- **Cleaner transport:** road transport is the main source of air pollution in London. We need to incentivise a change to walking, cycling and ultra-low emission vehicles (such as electric).

The council review the Air Quality Action Plan each year to make sure it meets the needs of those who live and work in Haringey and report on progress in the annual status reports¹³ as part of their London local air quality management duties.

¹³ [Air quality annual status report for 2022 \(London borough of Haringey\)](#)

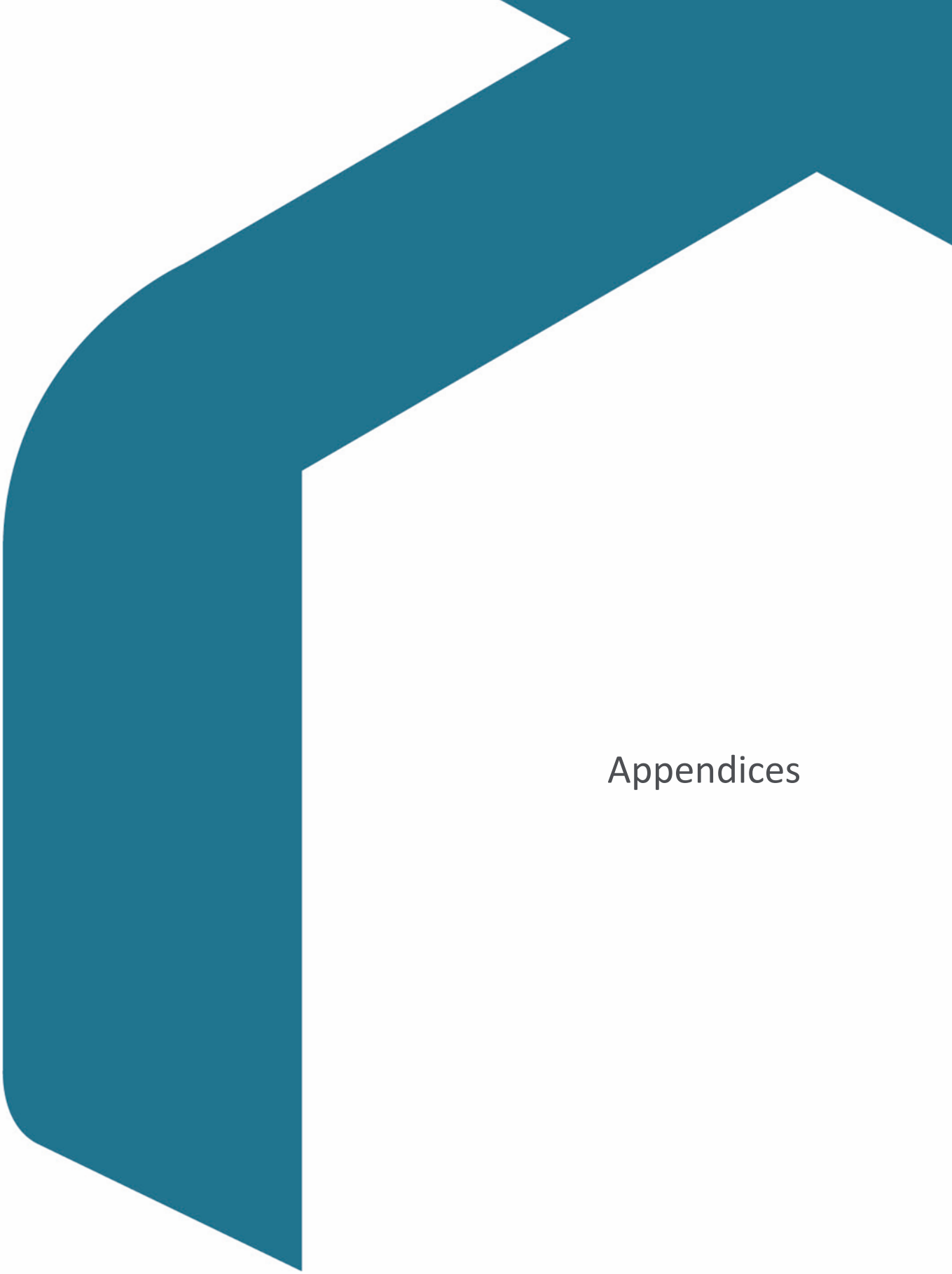
7.0 Summary

This AQA address the GLA planning policy requirement for the Proposed Development at 157-159 Hornsey Park Road in Wood Green, London. As required in London Plan Guidance (February 2023), an Air Quality Neutral (AQN) assessment has been completed and the Proposed Development is qualified to be AQN.

The Proposed Development is located within an AQMA declared by the London Borough of Haringey in 2001, therefore, a detailed AQA has been performed for the Proposed Development to assess the general air quality issues around the proposed site, and the site suitability for future building users. The Atmospheric Dispersion Modelling System for small road networks (ADMS-Roads) model suggests that annual mean concentrations of NO_x, NO₂, PM_{2.5} and PM₁₀ are all within the current UK objectives. Therefore, the local air quality is assessed to be suitable for residents in relation to air quality.

Construction and demolition/fabric removal on site will be carried out in line with the *Control of Dust and Emissions during Construction and Demolition SPG* as a best practice guidance document, to minimise air pollution derived from building construction. The proposed energy strategy does not incorporate gas-fired or solid-/oil-fuelled heating systems and therefore there are no associated Nitrogen Oxides (NO_x) emissions during the operation of the building. The target to provide both active and passive electric vehicle (EV) charging points and cycle storage also promotes sustainable transport to the site.

In summary, the Proposed Development has addressed the planning policy requirements regarding air quality and is thought to have a limited impact on future air quality. By following the guidance within this AQA, the Proposed Development will have the most limited impact on the local air quality as possible.

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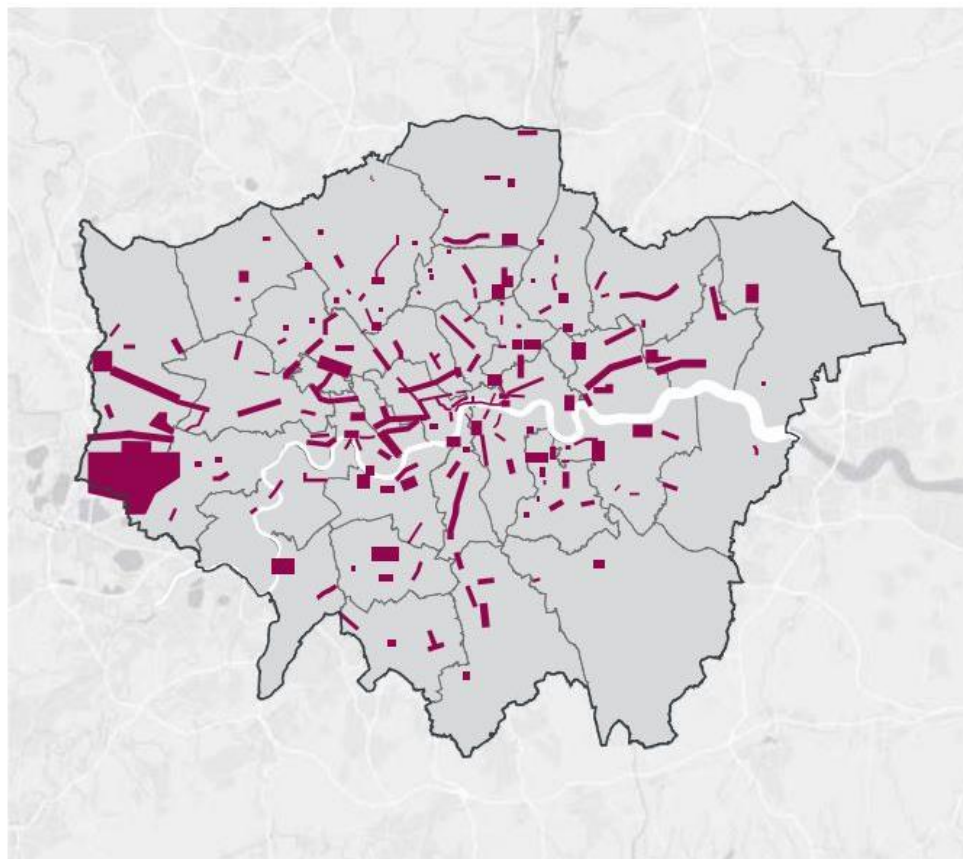
Appendices

Appendix A TVOCs Emission criteria by product type

Emission limit			Testing
Formaldehyde	Total volatile organic compounds (TVOC)	Category 1A and 1B carcinogens	Requirement
Interior paints and coatings			
$\leq 0.06 \text{ mg/m}^3$	$\leq 1.0 \text{ mg/m}^3$	$\leq 0.001 \text{ mg/m}^3$	EN 16402 / ISO 16000-9 / CEN/TS 16516 / CDPH Standard Method v1.1
Additional requirements Meet TVOC content limits. Paints used in wet areas (e.g. bathrooms, kitchens, utility rooms) should protect against mould.			
Wood-based products (including wood flooring)			
$\leq 0.06 \text{ mg/m}^3$ (non-MDF) $\leq 0.08 \text{ mg/m}^3$ (MDF)	$\leq 1.0 \text{ mg/m}^3$	$\leq 0.001 \text{ mg/m}^3$	ISO 16000-9 / CEN/TS 16516 / CDPH Standard Method v1.1/ EN 717-1 (formaldehyde emissions only)
Flooring materials (including floor levelling compounds and resin flooring)			
$\leq 0.06 \text{ mg/m}^3$	$\leq 1.0 \text{ mg/m}^3$	$\leq 0.001 \text{ mg/m}^3$	ISO 10580/ ISO 16000-9/ CEN/TS 16516 / CDPH Standard Method v1.1
Ceiling, wall and acoustic and thermal insulation materials			
$\leq 0.06 \text{ mg/m}^3$	$\leq 1.0 \text{ mg/m}^3$	$\leq 0.001 \text{ mg/m}^3$	N/A
Interior adhesives and sealants (including flooring adhesives)			
$\leq 0.06 \text{ mg/m}^3$	$\leq 1.0 \text{ mg/m}^3$	$\leq 0.001 \text{ mg/m}^3$	EN 13999 (Parts 1-4) / ISO 16000-9 / CEN/TS 16516 / CDPH Standard Method v1.1
* Compliance with emission limits shall be demonstrated after 28 days in an emission test chamber or earlier as stipulated by the relevant testing requirements standard.			

Appendix B Air Quality Focus Area

Figure 9.1 - Air Quality Focus Areas



London's Air Quality Focus Areas

● Air Quality Focus Area (AQFA)

Source: GLA
Environment

Contains OS data ©
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Appendix C TRICS data (Velocity Transport Ltd)

Table 4-6: Forecast Residential Travel Demand

MODE	AM PEAK			PM PEAK			DAILY		
	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total
Underground	2	11	13	7	3	10	47	50	98
Train	0	1	1	1	0	1	4	4	8
Bus	1	5	6	3	1	5	22	23	45
Taxi	0	0	0	0	0	0	0	0	0
Motorcycle	0	0	0	0	0	0	1	1	2
Driving a car or van	0	0	0	0	0	0	0	0	0
Passenger in a car or van	0	0	0	0	0	0	0	0	0
Bicycle	0	1	1	1	0	1	4	4	8
On foot	0	2	3	2	1	2	10	11	21
Other	0	0	0	0	0	0	0	0	0
Total	3	20	24	13	6	19	89	94	183

Table 4-7: Forecast Employee Travel Demand

MODE	AM PEAK			PM PEAK			DAILY		
	In	Out	Total	In	Out	Total	In	Out	Total
Underground	3	1	3	1	3	3	5	5	10
Train	0	0	0	0	0	0	1	1	1
Bus	1	0	1	0	1	1	2	2	5
Taxi	0	0	0	0	0	0	0	0	0
Motorcycle	0	0	0	0	0	0	0	0	0
Driving a car or van	0	0	0	0	0	0	0	0	0
Passenger in a car or van	0	0	0	0	0	0	0	0	0
Bicycle	0	0	0	0	0	0	0	0	1
On foot	1	0	1	0	1	1	1	1	2
Other	0	0	0	0	0	0	0	0	0
Total	5	1	6	1	5	6	10	10	19



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