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Air Quality Assessment

Potters Bar, High Street

Air Quality Assessment

Project: POTTERS BAR, HIGH STREET

Report reference: RP02-25592-R3

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1. EXECUTIVE SUMMARY

1.1 Cass Allen has been instructed by Chase New Homes Limited to assess the potential air quality effects associated with a proposed residential-led development at High Street, Potters Bar in Hertfordshire. The assessment was carried out referencing relevant local and national planning policy and guidance.

1.2 The site is not located within an Air Quality Management Area (AQMA), indicating that air quality in the vicinity is generally acceptable. Pollutant concentrations at the site are primarily influenced by vehicle emissions along the A1000 High Street, B556 Mutton Lane, Tesco Superstore carpark and the local road network.

1.3 Potential construction phase dust soiling and particulate matter (PM: PM_{10}) health effects were assessed qualitatively, resulting in High and Low Risk levels being identified, respectively, in the absence of mitigation. Suitable best practice mitigation measures have been recommended, and no significant residual air quality impacts are expected.

1.4 A detailed atmospheric dispersion model was utilised to predict nitrogen dioxide (NO_2) and PM (PM_{10} and $PM_{2.5}$) concentrations across the site during the operation of the development. The results indicate that pollutant concentrations at the development will be below the relevant Air Quality Objectives (AQOs) during the operational phase, with no requirement for additional mitigation.

1.5 Furthermore, no significant impacts on local air quality are anticipated as a result of the net change in vehicle trips associated with the development, with no requirement for additional assessment or mitigation.

1.6 In summary, it is our view that the site is suitable for the development in terms of air quality and that there are no air quality constraints with respect to planning consent.

2. INTRODUCTION

2.1 Cass Allen has been instructed by Chase New Homes to assess the potential air quality effects associated with a proposed residential-led development at High Street, Potters Bar in Hertfordshire. The assessment has been carried out referencing relevant local and national planning policy and guidance.

2.2 The aim of the assessment is to consider air quality conditions, and their potential to influence the development in terms of its design, scale and layout, taking into account the following aspects:

- Dust and PM emissions generated by construction phase activities;
- Exhaust emissions from construction plant and traffic;
- The exposure of new sensitive receptors to elevated pollutant concentrations; and
- Emissions from traffic generated by the operation of the development.

2.3 Subsequently, where required, appropriate measures are identified to minimise the impacts.

2.4 This report contains technical terminology; a glossary of terms can be found at [redacted]

3. PROJECT DESCRIPTION AND SITE CONTEXT

3.1 The proposal comprises:

> *Partial demolition of existing buildings (with retention of existing two-storey car park and substation) and redevelopment of the site to provide a mixed-use development comprising residential apartments (Class C3) and flexible commercial floorspace (Class E) across 4 Blocks and associated internal roads, parking, drainage, landscaping, amenity space and associated works.*

3.2 The site is not located within an AQMA, the nearest of these, the London Borough of Enfield (LBE) AQMA, being ~1.2km to the southeast at its closest point, declared due to exceedances of the annual mean AQO for NO_2 and the 24-hour mean AQO for PM_{10}.

3.3 The site is located in an urban mixed-use area and currently contains Maple House offices, a row of businesses with residential dwellings above, an outdoor carpark, and a multistorey carpark. The site is bounded to the west by the Tesco Superstore carpark and Potters Bar Bowls Club and to the north by Goodacre Court flats, all of which have the potential to be affected by emissions associated with both the construction and operational phases of the development. The A1000 High Street and the BP / M&S petrol station bound the site to the east, to the south lies the B556 Mutton Lane and to the west the Tesco Superstore car park. All of these land uses have the potential to contribute to pollutant concentrations at the site.

3.4 The site location is shown in Figure 1.

Figure 1 Site Location and Surrounding Area

4. LEGISLATION AND PLANNING POLICY

Air Quality Legislation

4.1 The wider air quality legislation underpinning national, regional and local planning policy, is summarised in Appendix 1.

4.2 The National AQOs and Air Quality Standards Regulations limit and target values for the UK are summarised in the Air Quality Strategy. These limits, for ten key air pollutants, are based on both European Union directives and World Health Organization (WHO) guidelines. They are periodically updated, informed by the latest scientific evidence, to protect public health, vegetation and ecosystems. The Local Air Quality Management (LAQM) regime requires local authorities to regularly evaluate the air quality in their areas based on these AQOs.

4.3 As a regional pollutant, many sources of $PM_{2.5}$ are beyond local authority control therefore, it does not form part of the LAQM regime. However, long-term (2040) targets for ambient $PM_{2.5}$ concentrations are set in 'The Environmental Targets (Fine Particulate Matter) (England) Regulations' (2023), and an interim (2028) target is published in the 'Environmental Improvement Plan' (2023). $PM_{2.5}$ is a key air pollutant for health impacts, and local authorities must monitor progress towards meeting these reduced levels.

4.4 The National AQOs for the pollutants most associated with vehicle emissions, and therefore applicable to this assessment, are detailed in Table 1.

Table 1 UK National Air Quality Objectives

Pollutant	Objective	Averaging Period
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
	200µg/m^3 not to be exceeded more than 18 times per year	1-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
	50µg/m^3 not to be exceeded more than 35 times per year	24-hour mean
Particulate Matter ($PM_{2.5}$)	20µg/m^3	Annual mean

4.5 The above AQOs are typically applied where there is 'relevant exposure', i.e., where members of the public are likely to be present for the relevant averaging periods, or regularly exposed, and not in workplaces where relevant provisions concerning health and safety at work apply.

National Policy

4.6 Outline guidance for the assessment of air quality affecting new developments is given in the 'National Planning Policy Framework' (NPPF) (December 2024; as amended February 2025). Relevant sections in this case are included in Appendix 1.

Local Policy

4.7 The Hertsmere Borough Council (HBC) Core Strategy was adopted in January 2013 and is used to inform decisions on planning applications in the borough. The following policies are particularly relevant to this assessment:

> *Policy SP1 Creating sustainable development …*
>
> *All development across the Borough should:…*
>
> *xii) do not create an unacceptable level of risk to occupiers of a site, the local community and the wider environment;…*
>
> *xvi) ensure that pollutants are minimised, including emissions to air…*
>
> *Policy CS16 Environmental impact of development*
>
> *The Council will work with key partners, including the Environment Agency and Natural England, to ensure that development proposals do not create an unacceptable level of risk to occupiers of a site, the local community and the wider environment. Development proposals should take account of the policy recommendations of the Councils SFRA and the guidance set out in the jointly produced guidance of the Hertfordshire Planning Authorities 'Building Futures' the Hertfordshire Guide to Promoting Sustainability in Development.*
>
> *Proposals will be required to incorporate sustainability principles, minimising their impact on the environment and ensuring prudent use of natural resources by measures including:*
> *…*
>
> *iv) ensuring that pollutants are minimised (including emissions to air…)*

4.8 Furthermore, the HBC Site Allocations and Development Management Policies Plan was adopted in November 2016 and is used to inform decisions on planning applications in the borough. The following policies are particularly relevant to this assessment:

> *Policy SADM20 Environmental Pollution and Development*
>
> *Development should not result in any adverse impact to public health or wellbeing, or significantly add to contamination or pollution, taking into account the situation following any mitigation and remediation measures. Development proposals will be judged against the principles below and any future Contaminated Land, Air Quality or Noise and Vibration SPD.*
>
> *Air*
>
> *(i) Development which would significantly exacerbate poor air quality in Air Quality Management Areas will not be permitted.*
>
> *(ii) Sensitive development that is proposed to be located in or adjacent to Air Quality Management Areas will be permitted provided:*
>
> *a. the impacts of poor air quality will not result in an undue impact on health; and*
>
> *b. satisfactory mitigation measures are included alongside the application*

4.9 To address the requirements of the national and local policies, the following key air quality matters have been considered:

- Construction phase fugitive emissions of dust and PM impacts at existing receptors;
- Construction phase plant and vehicle emissions impacts at existing receptors;
- Operational phase vehicle emissions exposure at proposed receptors; and
- Operational phase vehicle emissions impacts at existing receptors.

5. ASSESSMENT METHODOLOGY

5.1 The scope and methodology for this assessment have been determined with regard to:

- Defra 'LAQM Technical Guidance' (May 2025) (LAQM.TG22); and
- Environmental Protection UK (EPUK) & Institute of Air Quality Management (IAQM), 'Land Use Planning & Development Control: Planning for Air Quality' (January 2017) (LUPDC).

5.2 Reference has also been made to other relevant technical guidance, where applicable.

Construction Phase

5.3 The assessment of potential air quality impacts during the construction phase has focused on the generation and dispersion of dust and PM_{10}, following the IAQM 'Guidance on the Assessment of Dust from Demolition and Construction' (January 2024) methodology, summarised as follows:

- Step 1 – screen the need for an assessment: consider impacts to sensitive human and ecological receptors within 250m or 50m of the site boundary, respectively (indicated on Figure 2), and within 50m of a route used by construction vehicles up to 250m from the site entrance.
- Step 2A – estimate the dust emission magnitude for each of the main construction activities – demolition, earthworks, general construction, and trackout.
- Step 2B – determine the sensitivity of the receiving environment, through consideration of factors such as meteorological conditions, number of nearby receptors, their proximity and sensitivity. Other factors to consider are detailed in Box 9 of the guidance. A wind rose for nearby Northolt meteorological station is included in Appendix 2.
- Step 2C – define the risk of impacts.
- Step 3 – identify site-specific mitigation requirements (in addition to basic project controls).

5.4 The IAQM methodology has been used to assess the potential impact of dust and PM_{10} arising from onsite activities. As indicated within the guidance, the use of professional judgment is necessary, due to the diverse range of projects that are subject to dust impact assessment, meaning that it is not possible to be prescriptive as to how to assess the impacts.

5.5 In addition, exhaust emissions from construction vehicles and plant may impact local air quality. The potential for significant effects resulting from these emissions has also been considered with reference to screening and significance criteria in LUPDC.

5.6 A review of the Multi-Agency Geographic Information for the Countryside (MAGIC) website did not identify any statutory designated ecological sites within the relevant screening distances, and therefore these have been excluded from the construction phase assessment.

Operational Phase

5.7 Concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been considered in the operational phase assessment as road traffic is a major source of these pollutants and their concentrations are often close to, or in exceedance of, the relevant AQOs in urban locations.

Development Emissions Impacts

5.8 LUPDC indicates the magnitude of change in traffic flows that is potentially significant, and therefore likely to require further assessment, as follows:

5.9 For roads distant from an AQMA:

- Light Duty Vehicle (LDV) flows of >500 Annual Average Daily Traffic (AADT); and/or
- Heavy Duty Vehicle (HDV) flows of >100 AADT.

5.10 In locations where these thresholds are not exceeded, detailed assessment of air quality impacts is not normally required, and the resulting effect can be considered 'not significant'.

Site Suitability

5.11 However, the development still has the potential to expose future users to elevated pollutant concentrations. As such, an assessment of exposure is required to address planning requirements.

Modelled Receptors

5.12 Cambridge Environmental Research Consultants' (CERC) ADMS-Roads (version 5.1.0.2) atmospheric dispersion model has been used to predict pollutant concentrations with the development in place across a cartesian grid, spanning from 525850, 200850 to 526050, 201150 (grid reference OSGB; 5m spacing), at a height of 1.5m, to represent the average adult breathing zone above floor level and to align with Defra national background modelling used within this assessment. Modelling at 1.5m is considered a robust worst case in this instance, due to the majority of occupants actually proposed to reside from the first floor upwards.

5.13 To assess the site suitability of the development, the following scenarios have been modelled:

- 2024 – Model Verification; and
- 2028 – Assumed Opening Year, With Development.

5.14 The study area, including modelled road links and receptors, is shown in Figure 2.

5.15 Details of the traffic data used in the model are included in Appendix 3, and other model inputs such as emission factors, verification and adjustment, in Appendix 4.

$PM_{2.5}$ Targets

5.16 Additionally, Defra's '$PM_{2.5}$ Targets: Interim Planning Guidance' (October 2024), prompts developers to consider:

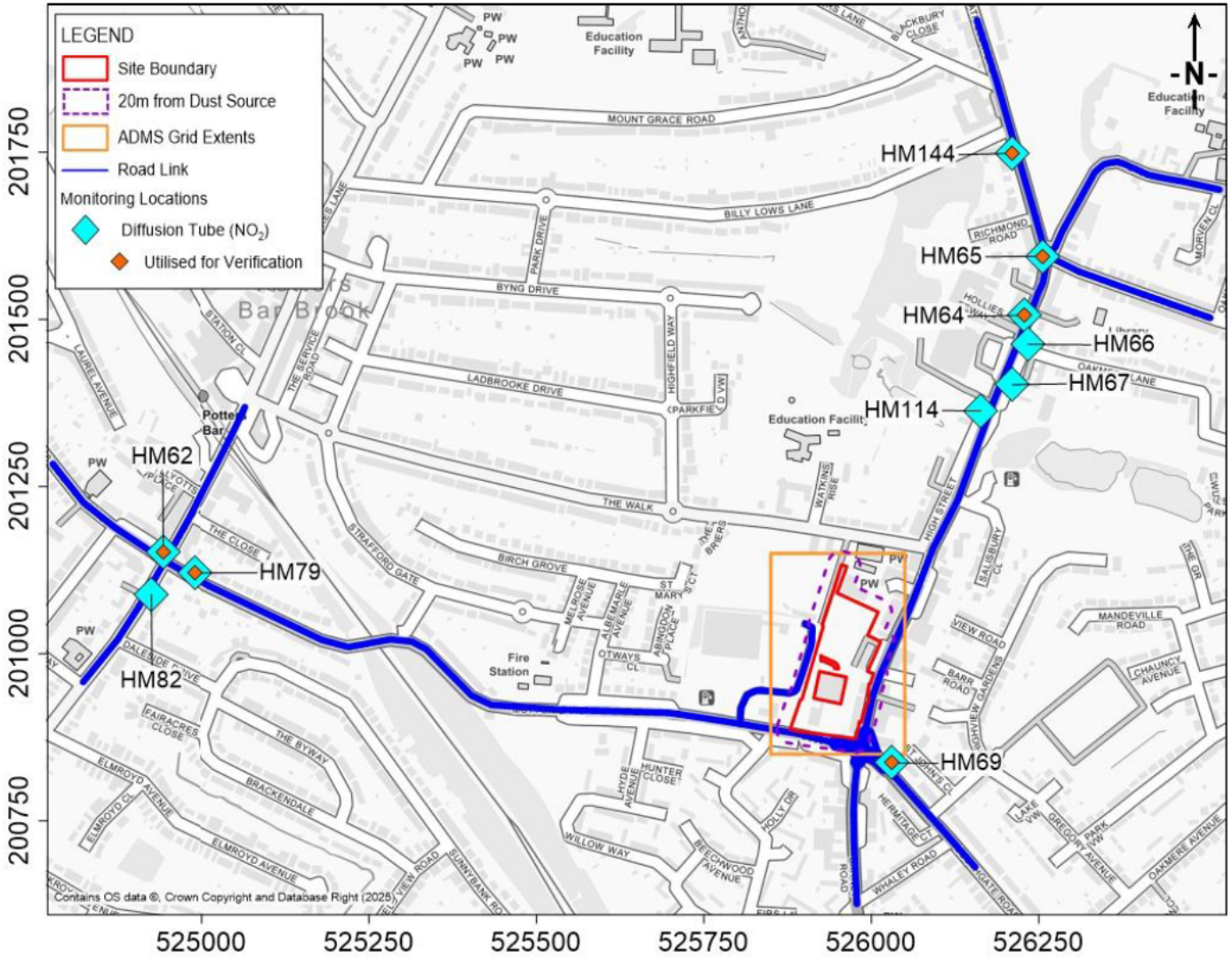
1. *How has exposure to $PM_{2.5}$ been considered when selecting the development site?*
2. *What actions and/or mitigations have been considered to reduce $PM_{2.5}$ exposure for development users and nearby receptors (houses, hospitals, schools etc.) and to reduce emissions of $PM_{2.5}$ and its precursors?*

5.17 Accordingly, these aspects are also considered in the operational phase assessment.

Assessment Criteria

5.18 Predicted pollutant concentrations across the modelled grid have been compared to the relevant AQOs to determine the potential for exceedance, and therefore, the suitability of the site for the proposed use.

Figure 2 Study Area



6. BASELINE CONDITIONS

6.1 Air quality conditions in the vicinity of the site have been reviewed to provide a baseline for consideration. The closest collected data are included in the tables below and were obtained from HBC and Defra. Monitoring locations are indicated on Figure 2.

Table 2 HBC Monitored Concentrations Across Study Area – NO_2

ID	Location	Type	Distance to site (m)	Monitored Annual Mean (µg/m³)				
				2020	2021	2022	2023	2024
HM62	24 The Broadway, Mutton Lane / Darkes Lane	Roadside	970	29.1	26.8	30.7	25.8	23.5
HM64	Hollies House, 230 High Street	Roadside	460	36.2	31.0	35.4	28.7	26.5
HM65	250-252 High Street	Roadside	550	36.8	33.9	35.3	27.6	26.1
HM66	169-171 High Street (Oakmere Lane)	Roadside	430	31.3	28.4	30.8	24.6	23.2
HM67	149 High Street	Roadside	370	29.5	27.0	28.9	21.6	19.0
HM69	Rear of Flats 8-12 St Johns Close (Nr Abbey House, Southgate Road)	Roadside	070	**40.7**	34.0	**40.2**	32.2	28.9
HM79	223-225 Mutton Lane	Roadside	920	27.8	23.0	28.0	23.6	20.7
HM82	10 Baker Street	Kerbside	980	26.1	22.5	25.7	21.4	20.8
HM114	Parkside Flats, High Street	Roadside	310	27.2	26.6	29.7	24.5	21.1
HM144	Hatfield Road / Hertford Mews	Roadside	670	23.1	21.0	25.6	17.7	16.0

Note: **Bold** denotes exceedance of the AQO. Data obtained from HBC 2025 Air Quality Annual Status Report (ASR) (2025). 2020 / 2021 results are likely to be atypical due to COVID-19 travel restrictions.

6.2 As indicated in Table 2, annual mean NO_2 concentrations in the vicinity of the site were below the AQOs during the most recent monitoring year, 2024. The general trend shows air quality conditions in the area improving over time, and this is illustrated in Figures A.2.A – A.5.D of the HBC ASR.

Table 3 Mapped Background Annual Mean Concentrations Across Study Area (µg/m³)

2024				2028			
*NO_x	NO_2	PM_{10}	$PM_{2.5}$	NO_x	NO_2	PM_{10}	$PM_{2.5}$
15.1 - 18.4	11.4 - 13.7	13.4 - 15.1	7.8 - 8.1	12.6 - 14.7	9.7 - 11.2	13.0 - 14.8	7.5 - 7.7

Note: Data obtained from https://uk-air.defra.gov.uk/data/laqm-background-home. A range is given as the study area spans multiple grid squares. * Nitrogen oxides (nitric oxide (NO) & NO_2).

6.3 No monitoring of PM_{10} or $PM_{2.5}$ is undertaken in the vicinity of the site. However, Defra-predicted background concentrations for 2024 and 2028 are 'well below' (defined by the IAQM as <75% of) the relevant AQOs and are expected to reduce further in future years. These background concentrations are later combined with roadside modelling results to provide total predicted environmental concentrations at receptor locations.

7. CONSTRUCTION PHASE ASSESSMENT

7.1 Sensitive receptors were identified within the relevant IAQM screening distances, therefore, the assessment progressed to Step 2, which has been summarised in the tables below.

Table 4 Step 2A – Dust Emission Magnitude for Construction Activities

Activity	Magnitude	Explanation
Demolition	Medium	Total building volume 12,000m^3 – 75,000m^3, demolition activities 6-12m above ground level.
Earthworks	Medium	Total site area 18,000m^2 – 110,000m^2, 5-10 heavy earth moving vehicles active at any one time.
Construction	Large	Total building volume >75,000m^3.
Trackout	Small	<20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

Table 5 Step 2B – Sensitivity of the Area

Potential Impact	Details	Construction Activity			
		Demolition	Earthworks	Construction	Trackout
Dust Soiling: Amenity	10-100 High sensitivity receptors within 20m of site boundary	High	High	High	High
PM_{10}: Health	As above and low background PM_{10} concentration	Low	Low	Low	Low

Table 6 Step 2C – Summary of Impact Risks to Define Site-Specific Mitigation

Potential Impact	Construction Activity			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	High	Low
Human Health	Low	Low	Low	Negligible

7.2 It should be noted that the prevailing winds are south-westerly (as shown in Appendix 2) and thus, locations to the north-east, downwind of the site, are most at risk of construction dust impacts. As a robust case, the development is considered High Risk for dust soiling effects and Low Risk for PM_{10} health effects, in the absence of mitigation. Following implementation of the recommended mitigation measures for the relevant activities' risk levels in Appendix 5, it is anticipated that the residual effect of the construction phase will be not significant.

7.3 With regard to construction traffic, the construction phase flows are not expected to exceed the criteria detailed in paragraph 5.9 and therefore, significant residual effects are not anticipated.

8. OPERATIONAL PHASE ASSESSMENT

Site Suitability

8.1 To consider the suitability of the site for the proposed use, the potential for future occupants of the development to be exposed to exceedances of the relevant AQOs has been assessed.

8.2 Contour plots have been produced to illustrate the pattern of dispersion of NO_2, PM_{10}, and $PM_{2.5}$ across the site, these are included in Figure 3. As shown in Figure 3, pollutant concentrations were predicted to be well below the relevant annual mean AQOs across the development site. The highest predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations within the development boundary were 20.0µg/m^3, 18.0µg/m^3, and 9.5µg/m^3, respectively.

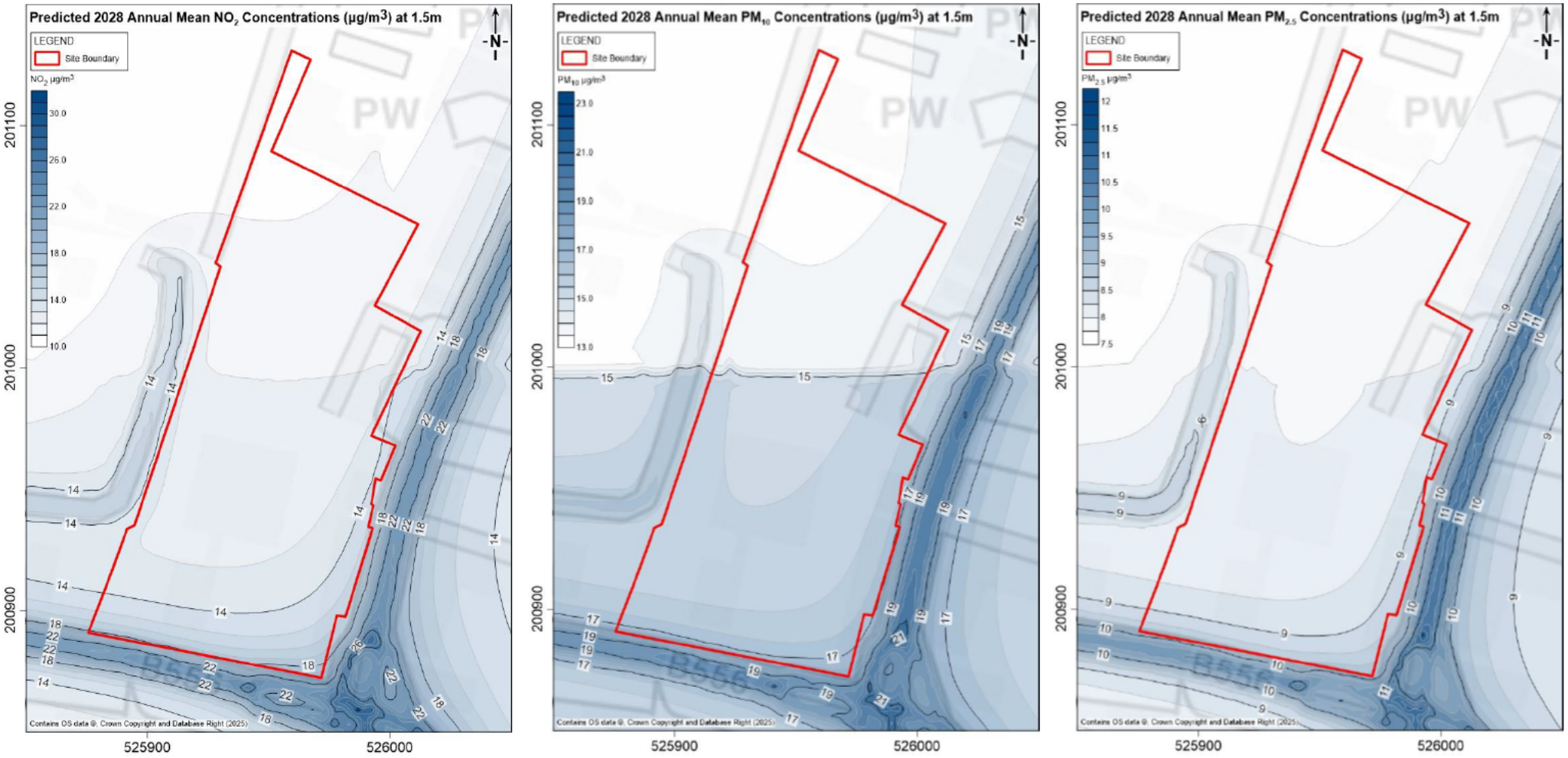
8.3 The annual mean NO_2 concentrations predicted by the model were all below 60µg/m^3. As indicated in LAQM.TG22, a breach of the hourly mean AQO for NO_2 is unlikely where this is the case. Exceedances of the 24-hour mean AQO for PM_{10} are not anticipated at the site, as all predicted annual mean concentrations fall below the 32µg/m^3 proxy value.

8.4 As noted in paragraph 5.12, the development is expected to situate the majority of dwellings from the first floor upwards in the buildings nearest to the A1000 High Street and B556 Mutton Lane, with the ground floor proposed as amenity and commercial space where residents are not expected to spend significant periods of time. Road-generated air pollutant concentrations are known to reduce with height, as such, lower concentrations are anticipated on floors above those modelled, with no exceedances of the AQO expected.

8.5 Accordingly, it is not anticipated that proposed receptors would be exposed to exceedances of the relevant AQOs; therefore, the site is considered suitable for the proposed use, with no requirement for additional mitigation.

8.6 In addition to the above, Defra guidance also requires consideration of how a development will reduce exposure to $PM_{2.5}$. In terms of selecting this development site, which is in an area where $PM_{2.5}$ concentrations are expected to be well below the AQO and where there is no requirement to reduce exposure further, exposure to $PM_{2.5}$ has been considered. Furthermore, blocks B and D have been designed to reduce exposure by situating sensitive uses from the first floor upwards, allocating less sensitive commercial use to the ground floor, adjacent to the most significant pollution source in the vicinity (the A1000 High Street junction).

Figure 3 Contour Plots of 2028 Modelled Pollutant Concentrations at Ground Floor Level



Development Emissions Impacts

8.7 The project's Transport Consultant (Paul Basham Associates) has confirmed that the development is expected to lead to a net increase of 100 AADT, compared to the existing use, which is below the relevant LUPDC screening criteria (detailed in paragraph 5.9). Therefore, the effect of the development's operational phase vehicle trips on existing sensitive receptors in the vicinity is expected to be not significant, with no requirement for further assessment of operational phase impacts.

8.8 Based on the nature of the development and baseline air quality conditions in the vicinity of the site, no significant operational phase air quality impacts are anticipated.

8.9 Nonetheless, Defra guidance requires consideration of how a development will reduce emissions of $PM_{2.5}$. The site is surrounded by local amenities and benefits from access to sustainable transport modes, including regular bus services along A1000 High Street and B556 Mutton Lane, as well as the Potters Bar train station, located within 15 minutes walking distance west of the site access point. Collectively, these measures will help reduce reliance on private car use and, in turn, associated $PM_{2.5}$ emissions.

9. CONCLUSIONS

9.1 Cass Allen was instructed by Chase New Homes Limited to assess the potential air quality effects associated with a proposed residential-led development at High Street, Potters Bar in Hertfordshire. The assessment was carried out referencing relevant local and national planning policy and guidance.

9.2 Potential construction phase dust soiling and PM_{10} health effects were assessed qualitatively, resulting in High and Low Risk levels being identified, respectively, in the absence of mitigation. Suitable best practice mitigation measures have been recommended, and no significant residual air quality impacts are expected.

9.3 A detailed atmospheric dispersion model was utilised to predict NO_2, PM_{10} and $PM_{2.5}$ concentrations at the development during its operation. The results indicate that pollutant concentrations across the site will be below the relevant AQOs during the operational phase.

9.4 Furthermore, no significant impacts on local air quality are anticipated as a result of the net change in vehicle trips associated with the development, with no requirement for additional assessment or mitigation.

9.5 In summary, it is our view that the site is suitable for the development in terms of air quality and that there are no air quality constraints with respect to planning consent.

Appendix 1 Air Quality Legislation and Policy

Legislation

Defra and the Devolved Administrations (2007) - The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2):

The Air Quality Strategy provides a framework for reducing air pollution in the UK, with the aim of meeting the requirements of European Union (EU) legislation. This has been brought into UK law via the EU (Withdrawal) Act 2018 (as amended) and is referred to as 'retained EU law'.

The air quality standards set within the Air Quality Strategy are recommended by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO), based on current scientific knowledge regarding the effects of each pollutant on health and the environment.

The AQOs are medium-term policy-based targets set by the government, taking into account economic efficiency, practicability, feasibility and timescales. Whilst some of the AQOs correspond with the EPAQS / WHO limits, others have a margin of tolerance, by specifying a number of permitted exceedances of the standard over a given period.

Many of the AQOs in the Air Quality Strategy have been made statutory in England via The Air Quality (England) Regulations, 2000,The Air Quality (England) Amendment Regulations, 2002 and The Air Quality Standards (Amendment) Regulations, 2016 – Statutory Instrument 2016 No. 1184.

Environmental Protection Act (1990):

Section 79 of the Environmental Protection Act 1990 defines statutory nuisance relevant to dust and particles as:

> *Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance…*
>
> *Any accumulation or deposit which is prejudicial to health or a nuisance.*

Furthermore, Section 80 states that where a statutory nuisance is shown to exist, the Local Authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the Local Authority may abate the nuisance and recover expenses. However, there are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist and nuisance is a subjective concept, its perception being highly dependent upon the existing conditions and the change which has occurred.

Environment Act (2021):

The Act mandates that local authorities review and document local air quality within their jurisdiction by way of staged appraisals and respond accordingly, with the aim of meeting the AQOs defined in the Regulations. There is a requirement for local authorities to identify relevant sources of emissions that are likely to be responsible for any failure to achieve the AQOs, or to identify relevant sources within neighbouring authorities' areas. Where the objective(s) are not likely to be achieved within the relevant period(s), the authority is required to designate an AQMA. For each AQMA the Local Authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality, in order to work towards achieving air quality standards in the future.

Defra (2019) Clean Air Strategy:

The UK Government's Clean Air Strategy sets out the comprehensive actions required to improve air quality, required from all parts of government and society.

The primary focus of previous iterations of the Clean Air Strategy has been NO_2, and its principal source – road traffic. The 2019 Strategy broadens the focus into other areas, including actions on clean growth and pollutant emissions from other sources such as industry, agriculture, and domestic wood-burning stoves.

Policy

National

NPPF sections relevant to air quality are stated below for planning policy context:

110. *…Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health.*

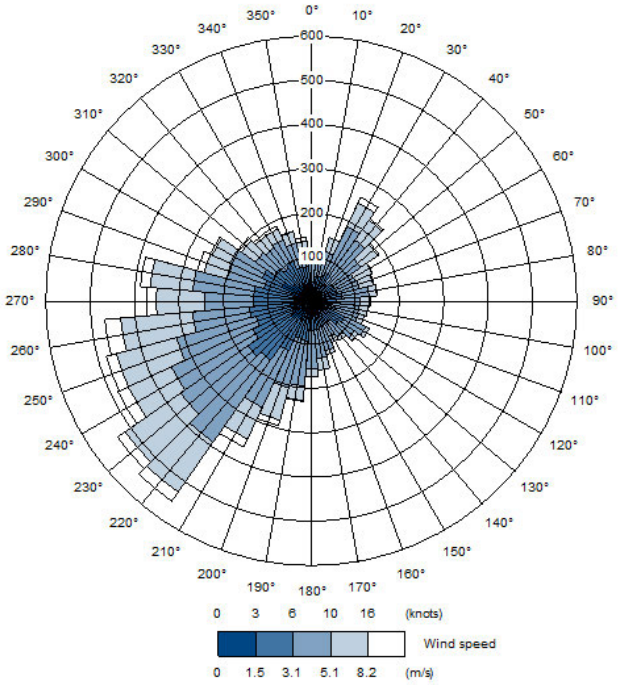
187. *Planning policies and decisions should contribute to and enhance the natural and local environment by: … preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of … air … pollution. Development should, wherever possible, help to improve local environmental conditions such as air … quality.*

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

199. *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.*

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

Appendix 2 Wind Rose for Northolt (2024)



Appendix 3 Traffic Data

Traffic data for the dispersion model were obtained from Paul Basham Associates. Where necessary, traffic data were converted to the appropriate assessment years using a robust factor derived from Defra Trip End Model Presentation Program (TEMPro) (version 8.1).

Road Link Details

Link ID	Description	Road Type	Speed (km/h)
1	Baker Street, north of Daleside Drive bus stop (southbound), south of B556 Mutton Lane, traffic light junction	Urban (not London)	15
2	B556 Mutton Lane, east of The Drive, west of Baker Street / Darkes Lane, traffic light junction		15
3	Darkes Lane, south of The Close, north of B556 Mutton Lane, traffic light junction		15
4	B556 Mutton Lane, west of Darke Lane bus stop (westbound), east of Baker Street / Darkes Lane, traffic light junction		15
5	B556 Mutton Lane		30
6	B556 Mutton Lane, east of Tesco bus stop, west of Tesco entrance, traffic light junction		15
7	B556 Mutton Lane, east of Tesco entrance, west of Maple House entrance		15
8	B556 Mutton Lane, east of Maple House entrance, west of A1000 High Street / A111 Southgate Road / A1000 Barnet Road / B556 Mutton Lane, traffic light junction		15
9	A1000 Barnet Road, north of Whaley Road, south of Whaley Road bus stop (northbound)		30
10	A111 Southgate Road, south of Highview Gardens		30
11	A1000 Hatfield Road, north of Richmond Road		30
12	A1000 Hatfield Road, south of Richmond Road, north of A1000 High Street / B156 The Causeway, traffic light junction		15
13	B156 The Causeway, north of A1000 Hatfield Road / Cotton Road, traffic light junction		15
14	Cotton Road, east of A1000 High Street / B156 The Causeway, traffic light junction		15
15	A1000 High Street, north of Hollies Way, south of A1000 Hatfield Road / Cotton Road, traffic light junction		15
16	A1000 High Street, south of Hollies Way, north of Bus Garage bus stop		25
17	A1000 High Street, south of Bus Garage bus stop, north of Cask & Stillage Public House bus stop (southbound)		25
18	A1000 High Street, south of Cask & Stillage Public House bus stop (southbound), north of A1000 High Street / A111 Southgate Road / A1000 Barnet Road / B556 Mutton Lane, traffic light junction		30
19	A1000 High Street / A111 Southgate Road / A1000 Barnet Road / B556 Mutton Lane traffic light junction (See Figure 4)		15

Link ID	Description	Road Type	Speed (km/h)
20	A111 Southgate Road, north of Highview gardens, east of A1000 High Street / A111 Southgate Road / A1000 Barnet Road / B556 Mutton Lane, traffic light junction	Urban (not London)	30
21	A1000 Barnet Road, north of Whaley Road bus stop (northbound), south of A1000 High Street / A111 Southgate Road / A1000 Barnet Road / B556 Mutton Lane, traffic light junction		30
22	A1000 High Street / A111 Southgate Road / A1000 Barnet Road / B556 Mutton Lane, traffic light junction (See Figure 4)		10
23			10
24			10
25			10
26			10
27			10
28			10
29			10
30			10
31			10
32			10
33			10
34			10
35			10
36			10
37			10
38			10
39			10
40	Cotton Road, west of Oakmere Close		25
41	Darkes Lane, north of The Close, south of The Walk		30
42	B556 Mutton Lane, west of The Drive		30
43	Baker Street, south of Daleside Drive bus stop (southbound), north of Heather Way		30
44	B156 The Causeway, west of Morven Close		30
45	Tesco entrance, north of B556 Mutton Lane, west of pedestrian crossing		10
46	Tesco entrance, east of pedestrian crossing, up to HGV loading entrance		10

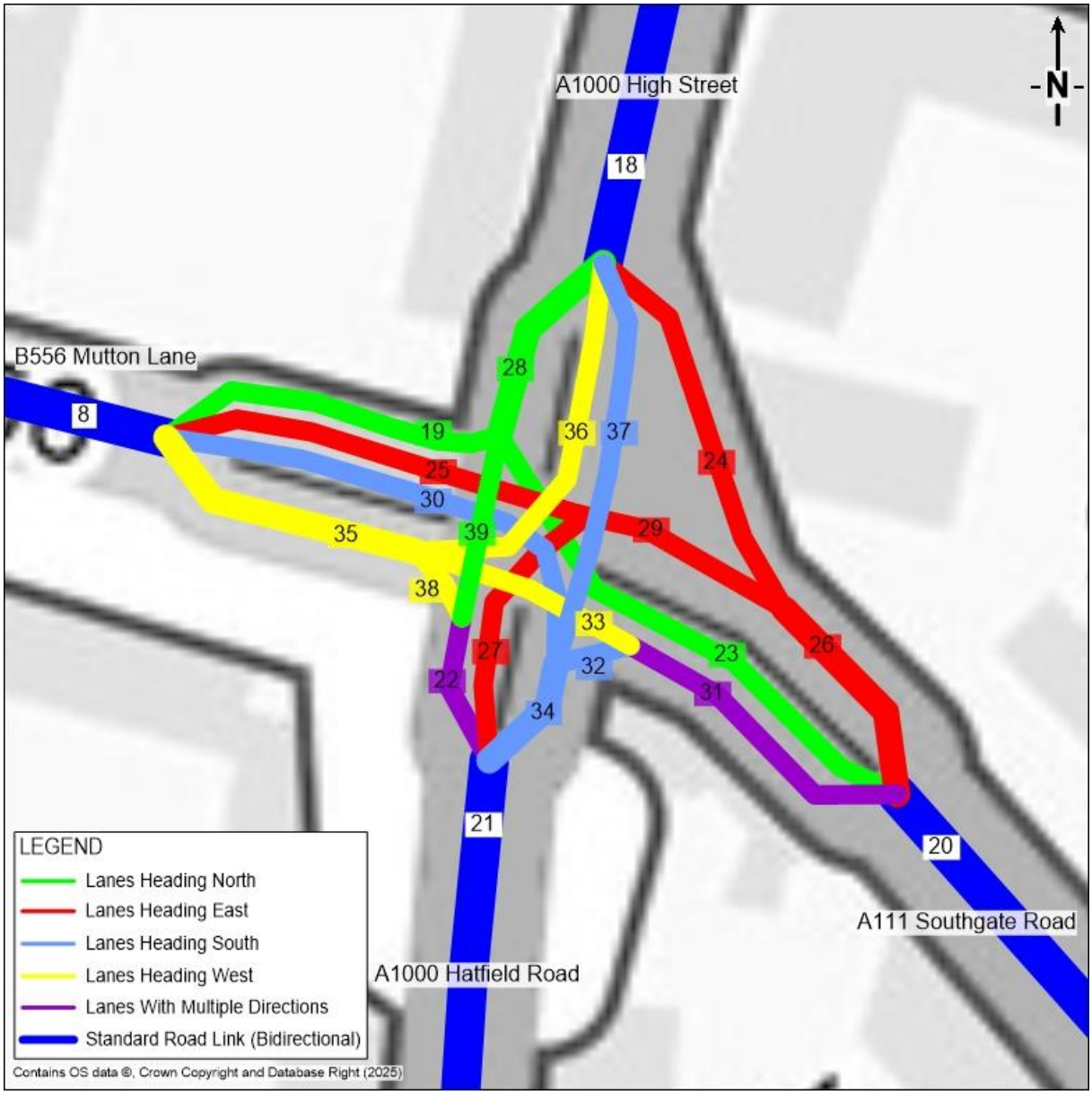
Traffic Data

Link ID	2024 Model Verification		2028 With Development	
	AADT	%HDV	AADT	%HDV
1	11,392	1.22	11,695	1.22

Link ID	2024 Model Verification		2028 With Development	
	AADT	%HDV	AADT	%HDV
2	16,323	2.87	16,757	2.87
3	17,147	3.47	17,603	3.47
4	12,547	4.75	12,897	4.75
5	12,547	4.75	12,897	4.75
6	12,547	4.75	12,897	4.75
7	13,649	4.92	14,028	4.92
8	13,649	4.92	14,028	4.92
9	10,608	2.15	10,923	2.15
10	16,919	3.52	17,407	3.52
11	12,837	1.28	13,178	1.28
12	12,837	1.28	13,178	1.28
13	10,785	2.82	11,072	2.82
14	1,318	0.00	1,353	0.00
15	19,085	1.93	19,605	1.93
16	19,085	1.93	19,605	1.93
17	18,059	2.53	18,551	2.53
18	18,059	2.53	18,551	2.53
19	1,762	8.00	1,809	8.00
20	16,919	3.52	17,407	3.52
21	10,608	2.15	10,923	2.15
22	4,081	2.08	4,190	2.08
23	4,182	3.00	4,293	3.00
24	3,675	2.00	3,773	2.00
25	4,436	4.00	4,554	4.00
26	8,580	3.10	8,808	3.10
27	469	3.00	481	3.00
28	9,175	2.90	9,419	2.90
29	4,905	3.90	5,035	3.90
30	1,647	2.00	1,691	2.00
31	4,157	4.91	4,268	4.91
32	355	4.00	364	4.00
33	3,802	5.00	3,903	5.00
34	6,058	2.09	6,219	2.09
35	5,804	5.46	5,958	5.46
36	1,153	3.00	1,184	3.00
37	4,055	2.00	4,163	2.00

Link ID	2024 Model Verification		2028 With Development	
	AADT	%HDV	AADT	%HDV
38	849	10.00	872	10.00
39	3,232	0.00	3,318	0.00
40	1,318	0.00	1,353	0.00
41	17,147	3.47	17,603	3.47
42	16,323	2.87	16,757	2.87
43	11,392	1.22	11,695	1.22
44	10,785	2.82	11,072	2.82
45	3,749	1.00	3,849	1.00
46	3,749	1.00	3,849	1.00

Figure 4 A1000 High Street / A111 Southgate Road / A1000 Barnet Road / B556 Mutton Lane, Traffic Light Junction Modelled Road Links By Direction



Appendix 4 Dispersion Model Details

Model Details and Input Parameters

Parameter	Value
Emissions Factors	Defra Emissions Factors Toolkit v13.1 using the traffic data in Appendix 3
Emissions Year	2024 for verification, 2028 for future scenario
Background Concentrations	Defra 2021 background maps – 2024 for verification, 2028 for future scenario
Surface Roughness	Dispersion site – 0.7m; Meteorological Station – 0.5m
Monin-Obukhov Length	Dispersion site – 30m; Meteorological Station – 30m
Meteorological Data	Hourly sequential, Northolt (2024)
Road-contribution Adjustment Factor	2.4 – see Model Verification, below
NO_x to NO_2 conversion	Defra NO_x to NO_2 Calculator v9.1 and Defra-mapped background concentrations
Street Canyon	Not applicable to this study area
Gradient	Not applicable to this study area

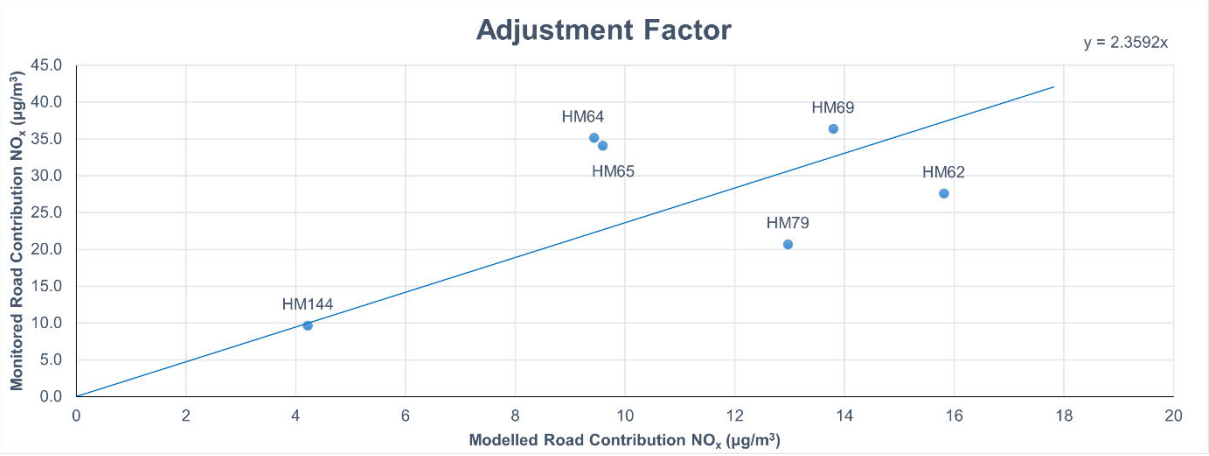
Model Verification

The model has been verified using the LAQM.TG22 methodology. The model has been used to predict 2024 annual mean road-NO_x contributions at roadside monitoring locations within the study area. The modelled road-NO_x concentrations have been compared with the measured road-NO_x utilising the Defra NO_x to NO_2 Calculator. Due to the lack of local PM monitoring data, the adjustment factor for NO_2 was also applied to PM_{10} and $PM_{2.5}$ results, following the LAQM.TG22 methodology.

Model Verification (all concentrations in µg/m^3)

Monitor ID	Monitored NO_2	Background NO_2	Monitored Road NO_x	Modelled Road NO_x	Ratio
HM62	23.5	11.4	27.6	15.8	1.744
HM64	26.5	11.5	35.1	9.4	3.723
HM65	26.1	11.5	34.1	9.6	3.552
HM69	28.9	13.7	36.4	13.8	2.635
HM79	20.7	11.4	20.7	13.0	1.595
HM144	16.0	11.5	9.6	4.2	2.284

Comparison of Measured Road-NO_x with Modelled Road NO_x



Calculation of Model Uncertainty

To assess model uncertainty, the Root Mean Square Error (RMSE) of the above data was calculated to provide an estimate of the average error of the model. The overall weighted RMSE value calculated following model verification was 3.63µg/m^3 (9.08%), which is within the acceptable range specified in LAQM.TG22.

Appendix 5 Recommended Construction Phase Mitigation

Highly Recommended Mitigation Measures for High-Risk Sites

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before work commences onsite.
- 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, where applicable.
- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this Appendix. Further, 'desirable' measures from IAQM guidance should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.

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 complaints log available to the Local Authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on or offsite should be recorded, and the action taken to resolve the situation, in the logbook.
- Hold regular liaison meetings with other major / high risk construction sites within 250m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the offsite transport/deliveries which might be using the same strategic road network routes.

Monitoring

- Undertake daily onsite and offsite inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of site boundary, with cleaning to be provided if necessary.
- 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 onsite 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 PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences onsite 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 the 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 the site boundary that are at least as high as any stockpiles onsite.
- Fully enclose 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 reused onsite. If they are being reused onsite cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicle/Machinery and Sustainable Travel

- Where construction vehicles travel through the neighbouring London Boroughs, ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.
- Ensure all vehicle operators 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.
- Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).

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 is available on the site for effective dust/PM suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes/conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available onsite 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.

Measures Specific to Demolition (Medium Risk)

- 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.

Measures Specific to Construction (High Risk)

- Avoid scabbling (roughening of concrete surfaces), if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case make sure that that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.

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