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Air Quality Assessment

The Barn Hotel, Ruislip

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Air Quality Assessment

Project: THE BARN HOTEL, RUISLIP

Report reference: RP02-22530-R2

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1	31 July 2023	Hazel Swinfen BSc (Hons), AMIEnvSc, Air Quality Consultant	Paul Hayward, BSc (Hons) MSc MIAQM MIEnvSc, Technical Director - Air Quality	Revised following comments
2	22 July 2024	Hazel Swinfen BSc (Hons), AMIEnvSc, Senior Air Quality Consultant	Paul Hayward, BSc (Hons) MSc MIAQM MIEnvSc, Technical Director - Air Quality	Revised following design change

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1. EXECUTIVE SUMMARY

1.1 Cass Allen has been instructed by Chase New Homes to assess the potential air quality effects associated with a proposed residential development at The Barn Hotel, Ruislip in London Borough of Hillingdon (LBH).

1.2 The assessment was carried out in accordance with relevant local and national planning policy and guidance and the LBH pre-application response (ref: 7969/PRC/2024/23; 12 July 2024).

1.3 The site is located within Ruislip Town Centre Air Quality Focus Area (AQFA) number 104, which is identified as having high levels of exposure to poor air quality. It is also located approximately 540m north-east of the Hillingdon Air Quality Management Area (AQMA), which was declared due exceedances of the annual mean Air Quality Objective (AQO) for nitrogen dioxide (NO_2). Air quality in the vicinity is primarily influenced by vehicle emissions along the A4180 West End Road and the local road network.

1.4 Emissions of construction phase dust and particulate matter (PM_{10}) were assessed in accordance with Institute of Air Quality Management (IAQM) guidance. A Medium Risk of dust soiling and a Low Risk of PM_{10} health effects have been identified, respectively, in the absence of mitigation. Suitable best practice mitigation measures have been recommended and no significant residual air quality impacts are expected.

1.5 A detailed atmospheric dispersion model was utilised to predict NO_2 and particulate matter (PM_{10} and $PM_{2.5}$) concentrations at relevant sensitive receptor locations within the study area during the operation of the development. This followed Department for Environment, Food and Rural Affairs (Defra) and Environmental Protection UK (EPUK) & IAQM guidance.

1.6 The results indicate that pollutant concentrations at proposed sensitive receptors are expected to be below the relevant AQOs and within London Air Pollution Exposure Criteria (APEC) Category A during the operational phase, with no requirement for additional mitigation and no requirement for windows to be fixed shut. Furthermore, no significant impacts on local air quality as a result of development-generated traffic are anticipated. Accordingly, the overall effect of the proposed development is considered 'not significant' with regard to air quality.

1.7 An Air Quality Neutral Assessment was undertaken following Mayor of London / GLA guidance. This indicated that the development is likely to generate trips in excess of the relevant benchmark. However, the development meets the aspirations of the NPPF with regard to projects in sustainable locations and, taking into account Travel Plan and other intrinsic emissions mitigation measures, it is judged that the development will comply with Air Quality Neutral criteria, without the requirement for additional mitigation or an offsetting payment.

1.8 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 development at The Barn Hotel, Ruislip in Hillingdon, London.

2.2 The assessment has been carried out in accordance with relevant local and national planning guidance and is intended to accompany the planning application (ref: 7969/APP/2023/1473).

2.3 The aims of the assessment were to consider potential impacts on local air quality, resulting from:

- Dust and particulate matter emissions generated by construction phase activities;
- Exhaust emissions from construction plant and traffic; and
- The exposure of new sensitive receptors to elevated pollutant concentrations.

2.4 Subsequently, where required, appropriate measures have been identified to minimise the impacts.

2.5 This report contains technical terminology; a glossary of terms can be found at www.cassallen.co.uk/glossary.

3. PROJECT DESCRIPTION AND SITE CONTEXT

3.1 The site currently contains multiple hotel buildings, a restaurant and carparking and is located in a primarily residential area. To the north of the site is Ruislip Underground Station, to the east and south are existing dwellings and to the west is a retirement housing complex, which have the potential to be affected by emissions generated by the development.

3.2 The site location is shown in Figure 1.

Figure 1 Site Location and Surrounding Area

3.3 The proposal is to redevelop the previous hotel site into a 79-dwelling residential development.

3.4 With regard to air quality, the site is located within Ruislip Town Centre AQFA number 104, which is identified as having high levels of exposure to poor air quality. It is also located approximately 540m north-east of the Hillingdon AQMA, which was declared due exceedances of the annual mean AQO for NO_2. Air quality in the vicinity is primarily influenced by vehicle emissions along the A4180 West End Road and the local road network. These sources have the potential to influence air quality conditions at the site.

4. PLANNING POLICY

Air Quality Legislation

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

4.2 Within the UK Air Quality Strategy (2007), standards and objectives are set for nine key air pollutants to protect health, vegetation and ecosystems. These were revised in the Air Quality Standards Regulations 2010 to include a reduced target for $PM_{2.5.}$ The national air quality objectives (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

4.3 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.

National Policy

4.4 Outline guidance for the assessment of air quality affecting new developments is given in the National Planning Policy Framework (NPPF). Relevant sections in this case are highlighted below:

> *109. 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.*
>
> *180. 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 or noise pollution.*

191. 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.

192. 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.

194. 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.

Regional Policy

4.5 London air quality policy is outlined in Appendix 1.

Local Policy

4.6 LBH planning policy relevant to air quality is summarised in Appendix 1.

Summary

4.7 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 particulate matter at nearby existing receptors;
- Construction phase plant and vehicle emissions at existing receptors; and
- Vehicle emissions exposing proposed receptors to elevated pollutant concentrations.

5. ASSESSMENT METHODOLOGY

5.1 The scope and methodology for this assessment has been determined with regard to Defra 'Local Air Quality Technical Guidance', (August 2022) (TG22), Mayor of London 'London Local Air Quality Management Technical Guidance', 2019 (LLAQM.TG(19)), EPUK & IAQM 'Land Use Planning & Development Control: Planning for Air Quality' (January 2017) (LUPDC) and the LBH pre-application response (ref: 7969/PRC/2024/23; 12 July 2024). Reference has also been made to other relevant technical guidance, where applicable.

Construction Phase

5.2 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: impacts to sensitive human and ecological receptors should be considered where they are located within 250m or 50m of the site boundary, respectively (as shown on Figure 2). These receptors should also be considered if they are 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, the number of nearby receptors, their proximity and their sensitivity. Other factors to consider are detailed in Box 9 of the guidance. A wind rose for nearby Northolt meteorological station is in Appendix 2.
- Step 2C – define the risk of impacts.
- Step 3 – identify site-specific mitigation requirements (in addition to basic project controls).

5.3 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.

Operational Phase

5.4 LUPDC indicates that a change in Light Duty Vehicle (LDV - cars and small vans <3.5t gross vehicle weight) flows of 500 Annual Average Daily Traffic (AADT) and/or Heavy Duty Vehicle (HDV - goods vehicles + buses >3.5t gross vehicle weight) flows of 100 AADT or more is potentially significant, and likely to require further assessment. This also applies to a change in LDV flows of 100 AADT and/or HDV flows of 25 AADT or more on routes through or close to an AQMA. Where these thresholds are not exceeded, a detailed assessment of air quality impacts is not normally required, and the resulting effect is normally considered 'not significant'.

5.5 The project's transport consultant (Paul Basham Associates) has indicated that the development is expected to generate a traffic flow of approximately 140 AADT, which are expected to disperse rapidly onto the road network and therefore, no significant impacts are anticipated at existing receptors, and these are excluded from further assessment.

5.6 The development is located within an AQFA but outside of any AQMAs. This is unusual because AQFAs are typically declared in areas where exceedances of AQOs have been recorded and as such, are within declared AQMAs. Whilst the assessment of pollutant concentrations at proposed receptors within this AQFA may not strictly be required, it is recognised that the development has the potential to expose future occupants to elevated pollutant concentrations and therefore, detailed dispersion modelling has been undertaken as part of an overall robust approach.

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. Cambridge Environmental Research Consultants' (CERC) ADMS-Roads (version 5.0.1.3) atmospheric dispersion model has been used to predict pollutant concentrations at the proposed receptor (PR) locations detailed in Table 2.

Table 2 Modelled Receptor Locations

ID	Description	Grid Reference (OSGB)	Height (m)
PR1	East of site access road	509441.5, 186868.7	1.5
PR2		509454.6, 186882.2	
PR3		509457.7, 186896.9	
PR4	Western site boundary	509449.9, 186944.4	
PR5		509451.2, 186951.2	
PR6		509452.6, 186958.7	

5.8 To assess the development impact on local air quality, the following scenarios have been modelled:

- 2019 – Model Verification;
- 2027 – Anticipated Opening Year, With Development.

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

5.10 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.

Assessment Criteria

5.11 For proposed receptors, the potential for elevated pollutant concentrations is considered with respect to the relevant AQOs and the London APEC, as detailed in Table 3, to determine the suitability of the site for the proposed use and the requirement for mitigation.

Table 3 London Air Pollution Exposure Criteria

Category	Applicable Range (NO_2)	Applicable Range (PM_{10})	Recommendation
APEC - A	>5% below AQO (<38µg/m^3)	Annual mean: >5% below AQO (<38µg/m^3) 24-hour mean: >1 day below AQO (<34 days per year)	No air quality grounds for refusal; mitigation of any emissions should be considered.
APEC - B	Between 5% below or above AQO (38-42µg/m^3)	Annual mean: Between 5% below or above AQO (38-42µg/m^3) 24-hour mean: Between 1 day above or below AQO (34-36 days per year)	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered (site layout and ventilation).
APEC - C	>5% above AQO (>42µg/m^3)	Annual mean: >5% above AQO (>42µg/m^3) 24-hour mean: >1 day above AQO (>36 days per year)	Refusal on air quality grounds should be anticipated, unless the Local Authority has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated. Worker exposure in commercial/industrial land uses should be considered further. Mitigation measures must be presented with air quality assessment, detailing anticipated outcomes.

Note: derived from London Councils Air Quality and Planning Guidance, 2007.

Air Quality Neutral Assessment

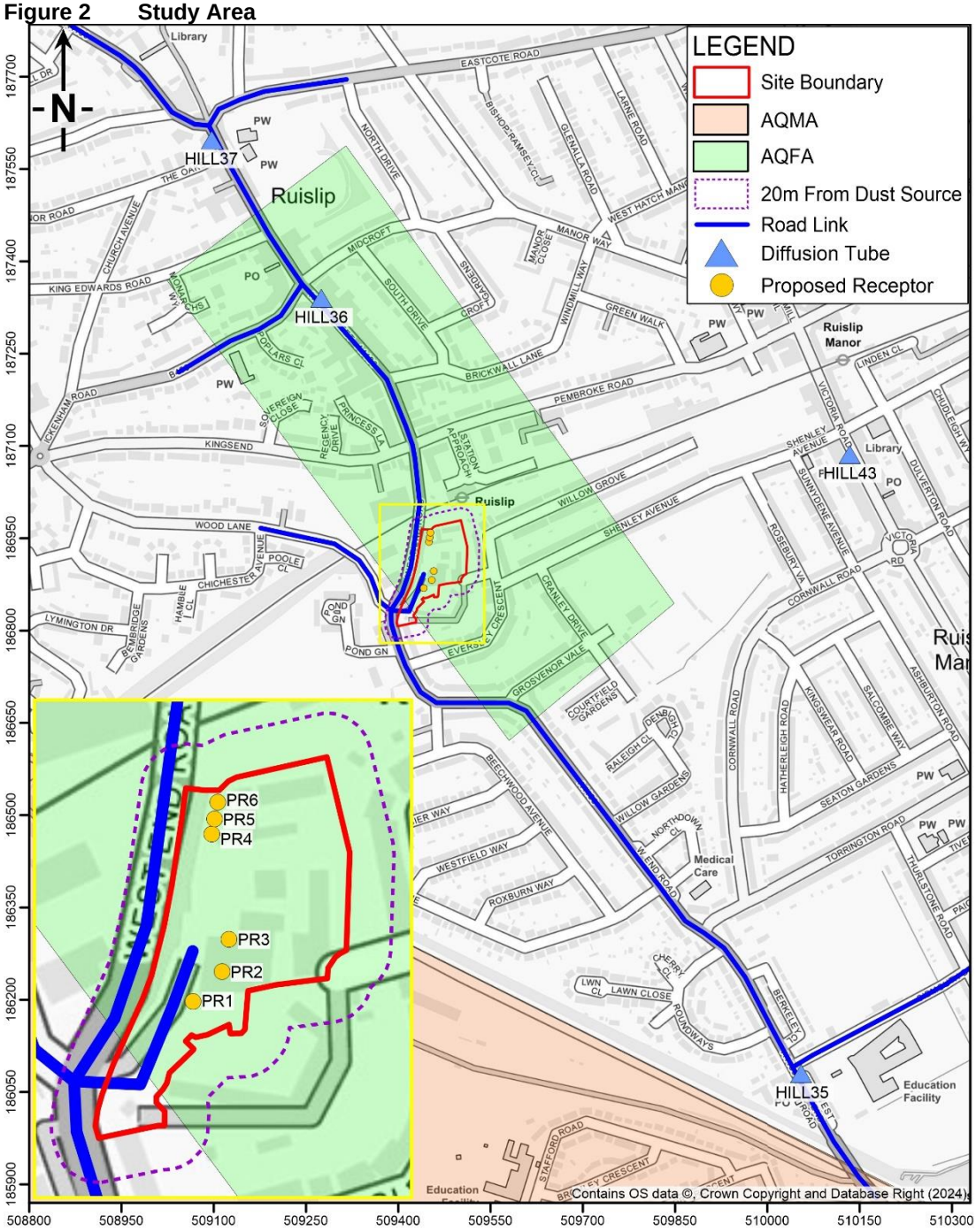
5.12 An Air Quality Neutral (AQN) Assessment has also been undertaken in line with the Mayor of London / GLA London Plan Guidance – Air Quality Neutral, February 2023, and considers the total (gross) emissions of nitrogen oxides (NO_x) and $PM_{2.5}$ from road transport.

5.13 Applicable data for the Development are included in Table 4.

Table 4 Input Data for Air Quality Neutral Calculations

Parameter	Value
Energy and Heat generation plant	Electrically powered system – no new combustion sources
Number of dwellings	79
Development trips	140 AADT

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 collected data are included in the tables below and were obtained from LBH and Defra. Monitoring locations are indicated on Figure 2.

Table 5 LBH Monitored Concentrations across Study Area– NO_2

ID	Location	Type	Distance to site (m)	Annual Mean (µg/m³)			
				2019	2020	2021	2022
HILL35	Grey lamppost, West End Road, to the south of Sidmouth Drive, outside Aroma House Chinese. HA4 6LR	Roadside	965	36.9	28.9	28.0	27.2
HILL36	Lamppost outside Vodafone, 69 High Street Ruislip. HA4 8JB	Roadside	410	38.5	28.1	31.6	32.7
HILL37	2/6 High St. Ruislip lamppost with Parking and church sign. HA4 7AW	Roadside	720	39.9	28.1	30.4	31.7
HILL43	Lamppost outside tattoo and Five Star nail parlours, No 60, Victoria Road. HA4 0AH	Roadside	640	39.4	29.1	28.2	28.6

Note: Data obtained from LBH Air Quality Annual Status Report, 2023. Results from 2020 and 2021 are likely to be atypical due to COVID-19 travel restrictions.

Table 6 Mapped Background Annual Mean Concentrations across Study Area (µg/m³)

2022				2027			
NO_x	NO_2	PM_{10}	$PM_{2.5}$	NO_x	NO_2	PM_{10}	$PM_{2.5}$
19.9 - 23.3	14.6 - 16.7	14.3 - 15.5	9.8 - 10.7	16.7 - 19.5	12.4 - 14.2	13.8 - 14.9	9.4 - 10.3

Note: Data obtained from https://uk-air.defra.gov.uk/data/laqm-background-home.

6.2 As indicated in Table 5 above, NO_2 concentrations in the vicinity of the site were below the annual mean AQO during the four most recent monitoring years, 2019-2022. Whilst no monitoring of PM_{10} or $PM_{2.5}$ is currently undertaken in the vicinity, Defra-predicted background concentrations for 2022 and 2027 are well below (defined by the IAQM as less than 75% of) the relevant annual mean AQOs for all pollutants.

7. CONSTRUCTION PHASE ASSESSMENT

7.1 The IAQM methodology has been used to assess the potential impact of dust and PM_{10} arising from on-site 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.

7.2 As sensitive receptors were identified within the relevant IAQM screening distances, the assessment progressed to Step 2, which has been summarised in the tables below.

Table 7 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	Small	Total site area <18,000m^2.
Construction	Medium	Total building volume between 12,000m^3-75,000m^3.
Trackout	Small	Nominal unpaved road length. <20 HDV outward movements10 in any one day.

Table 8 Step 2B – Sensitivity of the Area

Potential Impact	Details	Construction Activity			
		Demolition	Earthworks	Construction	Trackout
Dust Soiling	10-100 high sensitivity receptors within 20m of site	High	High	High	High
Human Health (PM_{10} inhalation)	10-100 high sensitivity receptors within 20m of site; low background PM_{10} concentration	Low	Low	Low	Low
Ecological (dust smothering)	No designated sites within the relevant screening distances	N/A	N/A	N/A	N/A

Table 9 Step 2C – Summary of Impact Risks to Define Site-Specific Mitigation

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

7.3 Overall, the development is considered Medium Risk for dust soiling effects and Low Risk for PM_{10} health effects, in the absence of mitigation. Following implementation of the applicable 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.

7.4 With regard to construction traffic, the construction phase flows are not expected to exceed the criteria detailed in paragraph 5.4 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 development to be exposed to exceedances of the relevant AQOs has been assessed. Modelled predicted pollutant concentrations at proposed receptors are detailed in Table 10.

Table 10 Predicted Pollutant Concentrations at the Development in 2026

Receptor	Annual Mean Concentration (µg/m^3)		
	NO_2	PM_{10}	$PM_{2.5}$
APEC Category A Threshold	***38***	***38***	***19***
PR1	15.1	15.1	10.1
PR2	14.7	15.0	10.1
PR3	14.6	15.0	10.1
PR4	14.8	15.2	10.2
PR5	14.8	15.2	10.2
PR6	14.7	15.2	10.2

Note: Results are reported to the nearest 0.1µg/m^3. Any apparent discrepancies are due to rounding.

8.2 The data in Table 10 show that pollutant concentrations were predicted to be below the relevant annual mean AQOs at all proposed receptor locations. The highest predicted NO_2 concentration was 15.1µgm^3 at PR1. The highest predicted PM_{10} and $PM_{2.5}$ concentrations were 15.2µg/m^3 and 10.2µg/m^3, respectively, at receptors PR4-6.

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

8.4 All predicted pollutant concentrations were more than 5% below the relevant AQOs, classified as APEC Category A. It is therefore not anticipated that proposed receptors would be exposed to exceedances of the relevant AQOs and as such, the site is considered to be suitable for the proposed use, without the requirement for additional mitigation such as unopenable windows.

9. AIR QUALITY NEUTRAL ASSESSMENT

Building Emissions

9.1 It is understood that the Development will utilise an electrically powered heating system, such as air/ground source heat pumps. Accordingly, there will be no local building emissions and the Development is considered Air Quality Neutral in terms of building emissions, with respect to the Mayor of London / GLA guidance.

Transport Emissions

9.2 An AQN Assessment has been undertaken for the total traffic generation, as summarised in Table 11, with key inputs detailed in Table 12.

Table 11 Summary of Air Quality Neutral Assessment

Parameter	Value
Residential benchmark trip rate (Outer London)	447 trips per dwelling per annum
Development Transport Emissions Benchmark (TEB)	79 dwellings × 447 trips = 35,313 trips per annum
Actual development trips	140 AADT × 365 days = 51,100 trips per annum
Difference (Actual - TEB)	+15,787 trips per annum
Air Quality Neutral?	No

9.3 The calculation in Table 11 indicates that, in the absence of mitigation, the development will not be Air Quality Neutral, based on the gross development trip assumptions. Where this is the case, the guidance states that intrinsic transport *'mitigation measures should exceed the minimum requirements in the London Plan policies'*.

9.4 According to the development Framework Travel Plan (Paul Basham Associates Ltd, 2024) the parking provision on site (27 spaces) falls below the maximum allowance in the London Plan (39-59 spaces) thus exceeding *the minimum requirements* as stated above. Furthermore, the provision of active electric vehicle (EV) charging points to 100% of spaces within the development will also *exceed the minimum requirements in the London Plan policies* (20%). Moreover, the Framework Travel Plan outlines a number of hard and soft emissions mitigation measures including:

- Provision of 162 secure long stay cycle parking spaces;
- Liaise with local cycle shops to discuss discounts and vouchers;
- Appoint a Travel Plan Coordinator (TPC);
- TPC to produce Resident Welcome Pack including:
    - Details of the TPC
    - Walking and cycling routes;
    - Bus stop locations, prices and times;
    - Rail Station information;
    - Electric charging information;
    - Car sharing information and benefits; and
    - Personalised Travel Planning Advice;
- Establishment of a dedicated Travel Plan website; and
- Surveys, monitoring and feedback to ensure targets are met.

9.5 The final cost of these measures cannot be confirmed until exact quantities and specifications are determined, and suppliers are identified. However, these aspects are expected to benefit air quality during the operation of the development and therefore, meet the requirements of paragraph 5.1.4 of the AQN LPG.

9.6 It is important to highlight that the selected site naturally encourages sustainable travel, as per NPPF Section 109, as it is located at a transport interchange with easy access to the town centre amenities via tubes and buses, with an associated Public Transport Accessibility Level (PTAL) of 4. Additionally, intrinsic design measures detailed in the Design & Access Statement, such as the conversion of an existing road into an attractive pedestrian access to town (including the nearby underground station), will further facilitate the transition to more sustainable modes of transport.

9.7 Accordingly, taking into account the emissions mitigation measures included in the Framework Travel Plan (Paul Basham Associates Ltd, 2024), it is judged that the development will meet Air Quality Neutral criteria.

Offsetting Cost

9.8 In line with the Air Quality Neutral London Plan Guidance (AQN LPG), if a development is not deemed to be air quality neutral and cannot implement appropriate emissions mitigation, an emissions cost calculation may be undertaken to evaluate the level of offsetting cost that is applicable to the development, as a last resort.

9.9 Whilst such a calculation is not necessarily required for a development of this scale and nature, a 'Planning Specialist Observations' document (dated 20 June 2023) was received following planning submission for the original scheme, indicating that an S106 payment should be made to offset pollutant emissions associated with the development. It is not clear from which department this originates, and details of the methodology for the calculation in the document are limited, but an updated calculation has been undertaken, below, to evaluate this cost. This has followed the methodologies outlined in the AQN LPG and Defra IGCB guidance.

Table 12 Offsetting Cost Calculation Inputs

Input	Value
Trips over the benchmark	15,787 / 365 = 43 AADT (0% HDV)
Average speed	20km/hr
Emissions year	2027
Area / road type	London / London - Outer
Defra road transport cost per tonne ('outer London') from updated 2023 damage costs	NO_x: £33,064 $PM_{2.5}$: £246,942
Development vehicle emissions from EFT (Defra Emissions Factors Toolkit v12.1.0)	NO_x: 0.020 tonnes/year $PM_{2.5}$: 0.004 tonnes/year

9.10 The results of the emissions cost calculation are shown in Table 13, which includes the 2% uplift per year specified in the AQN LPG.

Table 13 Emissions Cost Calculation Outputs

Emissions Year	Calculated Cost by Pollutant	
	NO_x	$PM_{2.5}$
2027	£651.36	£1,086.54
2028	£664.39	£1,108.28
2029	£677.68	£1,130.44
2030	£691.23	£1,153.05
2031	£705.05	£1,176.11
2032	£719.15	£1,199.63
2033	£733.54	£1,223.63
2034	£748.21	£1,248.10
2035	£763.17	£1,273.06
2036	£778.44	£1,298.52
2037	£794.01	£1,324.49
2038	£809.89	£1,350.98
2039	£826.08	£1,378.00
2040	£842.60	£1,405.56
2041	£859.46	£1,433.67
2042	£876.65	£1,462.35
2043	£894.18	£1,491.59
2044	£912.06	£1,521.43
2045	£930.30	£1,551.85
2046	£948.91	£1,582.89
2047	£967.89	£1,614.55
2048	£987.25	£1,646.84
2049	£1,006.99	£1,679.78
2050	£1,027.13	£1,713.37
2051	£1,047.67	£1,747.64
2052	£1,068.63	£1,782.59
2053	£1,090.00	£1,818.24
2054	£1,111.80	£1,854.61
2055	£1,134.03	£1,891.70
2056	£1,156.72	£1,929.53
Total Cost		**£70,503.49**

9.11 The calculated emissions cost value in Table 13 gives an indication of the potential total cost of the development to local air quality over a 30-year period and is considerably lower than that calculated in the council's document for the previous (larger) scheme (£223,094). As stated above it is not clear how this number was reached and when compared to Example 1 set out in Appendix 1 of the AQN LPG, it would appear to be improbable and excessive.

9.12 In addition, this document and the LBH pre-application response state that the application site is 'within an Air Quality Management Area' to justify the implementation of strict air quality criteria. However, as discussed above, the site is within an AQFA and not an AQMA. Furthermore, these documents imply that the development must be Air Quality Positive (AQP), however, as per the Air Quality Positive London Plan Guidance, an AQP assessment is usually only required for 'large-scale development proposals subject to an EIA'.

9.13 There has been no indication from the Council at this stage as to what the financial contributions sought would be spent on, which is the principle of a Section 106 legal agreement and required as per paragraph 5.1.4 of the AQN LPG. Without this information, it cannot be determined whether the planning conditions are 'necessary, directly related to the development and fairly and reasonably related in scale and kind to the development' as per Section 57 of the NPPF and paragraph 122 of the Community Infrastructure Levy (CIL) Regulations (2010). Thus, an assessment of compliance against the above criteria cannot be undertaken for the conditions laid out in the 'Planning Specialist Observations' document.

9.14 Furthermore, it should be noted that the proposed ban on the sale of new vehicles with tail-pipe emissions by 2035, and the expansion of the Ultra Low Emission Zone across all London boroughs in August 2023, which has come into place since the AQN guidance was published, are likely to reduce the development's operational emissions and associated offsetting cost significantly. As such, the provision of a 30-year cost is considered to be unrealistic.

9.15 Regardless, according to paragraph 2.1.2 within the AQN LPG, the payment of an offsetting cost should be the exception not the rule and experience indicates that it is always preferrable to London Councils that neutrality is achieved through intrinsic mitigation and that the payment of a lump sum is a last resort. Accordingly, it is our view that the proposed mitigation measures, in the context of a site which is ideally situated for public transport use, should be sufficient to offset the calculated emissions cost without the requirement for additional mitigation or an offsetting payment.

10. CONCLUSIONS

10.1 Cass Allen was instructed by Chase New Homes to assess the potential air quality effects associated with a proposed residential development at The Barn Hotel, Ruislip in Hillingdon, London.

10.2 The assessment was carried out in accordance with relevant local and national planning policy and guidance and the LBH pre-application response (ref: 7969/PRC/2024/23; 12 July 2024).

10.3 Emissions of construction phase dust and PM_{10} were assessed in accordance with IAQM guidance. A Medium Risk of dust soiling and a Low Risk of PM_{10} health effects have been identified, in the absence of mitigation. Suitable best practice mitigation measures have been recommended and no significant residual air quality impacts are expected.

10.4 A detailed atmospheric dispersion model was utilised to predict NO_2, PM_{10} and $PM_{2.5}$ concentrations at relevant sensitive receptor locations within the study area during the operational phase. This followed Defra TG22 and EPUK and IAQM LUPDC guidance.

10.5 The results indicate that pollutant concentrations at proposed sensitive receptors are expected to be below the relevant AQOs during the operational phase. As the predicted pollutant concentrations are within London APEC Category A, no additional mitigation is required, and windows are not required to be fixed shut. Furthermore, no significant impacts on local air quality as a result of development-generated traffic are anticipated. Based on the extent of predicted population exposure to NO_2, PM_{10} and $PM_{2.5}$ impacts, the overall effect of the development is considered to be 'not significant', with regard to air quality, with no requirement for additional mitigation.

10.6 An Air Quality Neutral Assessment was undertaken following Mayor of London / GLA guidance. This indicated that the development is likely to generate trips in excess of the relevant benchmark. However, the development is in line with the aspirations of the NPPF with regard to development in sustainable locations and, taking into account Travel Plan and other intrinsic emissions mitigation measures, it is judged that the development will comply with Air Quality Neutral criteria, without the requirement for additional mitigation or an offsetting payment.

10.7 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'; and
>
> '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.

Regional Policy

The Greater London Authority (GLA) and Mayor of London Mayor's Air Quality Strategy, 2010, sets out a framework for delivering improvements to London's air quality. It includes measures to reduce emissions from transport, homes, offices and new developments, as well as promoting sustainable travel and raising awareness of air quality issues. Of relevance to this assessment are:

> *Policy 6 – Reducing emissions from construction and demolition sites*
>
> *…The Mayor will work with London boroughs, the GLA group and the construction industry.*
>
> *Policy 7 - Using the planning process to improve air quality*
>
> *…The Mayor will ensure that new developments in London shall as a minimum be 'air quality neutral' through the adoption of best practice in the management and mitigation of emissions.*

The Mayor's London Plan, 2021, sets out the integrated economic, environmental, transport and social framework for development in London over the next 20-25 years, and forms part of the development plan for Greater London. Of relevance to this assessment are:

> *Policy D3 Optimising site capacity through the design-led approach*
>
> *…D Development proposals should*
>
> *…9) help prevent or mitigate the impacts of noise and poor air quality.*
>
> *Policy SI 1 Improving air quality*
>
> *A Development Plans, through relevant strategic, site-specific and area-based policies, should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality.*
>
> *B To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed:*
>
> *1) Development proposals should not:*
>
> *a) lead to further deterioration of existing poor air quality*
>
> *b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits*
>
> *c) create unacceptable risk of high levels of exposure to poor air quality.*
>
> *2) In order to meet the requirements of Part 1, as a minimum:*
>
> *a) development policies must be at least Air Quality Neutral*
>
> *b) development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retro-fitted mitigation measures*
>
> *c) major development proposals must be submitted with and Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of B1*

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

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

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

Local Planning Policy

The two sections of the Hillingdon Local Plan form the council's future development strategy for the borough and set out a framework and detailed policies to guide planning decisions. The Local Plan Part 2 comprises Development Management Policies, Site Allocations and Designations and the Policies Map, which deliver the detail of the strategic policies set out in the Local Plan Part 1. With regard to air quality, the following is applicable:

Policy DMEI 14: Air Quality

A) Development proposals should demonstrate appropriate reductions in emissions to sustain compliance with and contribute towards meeting EU limit values and national air quality objectives for pollutants.

B) Development proposals should, as a minimum:

i) be at least "air quality neutral";

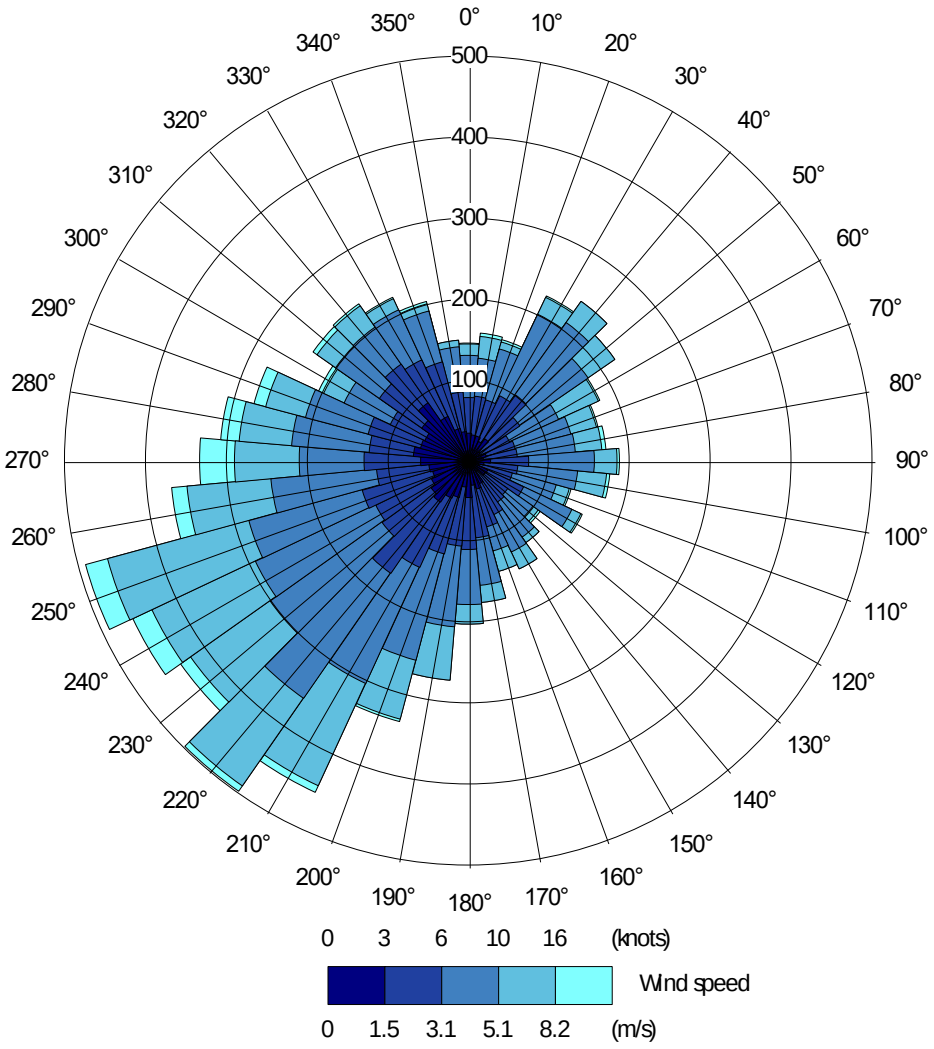
ii) include sufficient mitigation to ensure there is no unacceptable risk from air pollution to sensitive receptors, both existing and new; and

iii) actively contribute towards the improvement of air quality, especially within the Air Quality Management Area.

The LBH Air Quality Action Plan, 2019-2024, published May 2019, implements actions which will gain improvements where the pollution levels are the highest, and across the whole borough, to bring about health benefits from better air quality. According to this document, LBH have developed actions in under seven broad themes:

- *Monitoring and other core statutory duties;*
- *Emissions from developments and buildings;*
- *Public health and awareness raising;*
- *Delivery servicing and freight;*
- *Borough fleet actions;*
- *Localised solutions; and*
- *Cleaner transport.*

Appendix 2 Wind Rose for Northolt (2022)



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Appendix 3 Traffic Data

Traffic data for the dispersion model were obtained from the Department for Transport (DfT) Traffic Counts and supplemented by additional data from the London Atmospheric Emissions Inventory (LAEI) and the project's Transport Consultant. Where necessary, traffic data were converted to the appropriate assessment year using a robust factor derived from Defra Trip End Model Presentation Program (TEMPro) program (version 8.1).

2022 Model Verification

ID	Description	Road Type	Speed (km/h)	AADT	%HDV
1	Site access Rd, off A4180 West End Rd	London - Outer	-	-	-
2	A4180 West End Rd, north of site access Rd, mini-roundabout approach/exit	London - Outer	5	16,276	3.05
3	A4180 West End Rd	London - Outer	21	16,276	3.05
4	A4180 West End Rd, south of Kingsend/Pembroke Rd, traffic light junction approach/exit	London - Outer	5	16,276	3.05
5	A4180 High Street, north of Kingsend/Pembroke Rd, traffic light junction approach/exit	London - Outer	5	16,276	3.05
6	A4180 High Street	London - Outer	23	16,276	3.05
7	A4180 High Street, south of B466 Ickenham Rd/Midcroft, traffic light junction approach/exit	London - Outer	5	16,276	3.05
8	A4180 High Street, north of B466 Ickenham Rd/Midcroft, traffic light junction approach/exit	London - Outer	5	31,769	6.33
9	A4180 High Street, south of The Oaks	London - Outer	26	31,769	6.33
10	A4180 High Street, north of The Oaks, mini-roundabout approach/exit	London - Outer	5	26,737	7.26
11	B466 Eastcote Rd, east of A4180 High Street, west of St Martins Approach, mini-roundabout approach/exit	London - Outer	5	23,758	4.28
12	B466 Eastcote Rd, east of St Martins Approach, west of North Drive	London - Outer	32	23,758	4.28
13	A4180 Bury Street, west of High Street, south of Sharps Lane, mini-roundabout approach/exit	London - Outer	5	22,790	4.36
14	A4180 Bury Street, north of Sharps Lane, south of Mill Drive, mini-roundabout approach/exit	London - Outer	45	21,751	4.38
15	A4180 West End Rd, south of site access Rd, north of Pond Green, mini-roundabout approach/exit	London - Outer	5	20,495	5.64
16	A4180 West End Rd, south of Pond Green, west of Grosvenor Vale	London - Outer	24	17,109	6.48
17	A4180 West End Rd, south of Grosvenor Vale, north of Torrington Rd	London - Outer	31	17,060	6.35
18	A4180 West End Rd, south of Torrington Rd, north of Sidmouth Drive	London - Outer	24	20,124	5.93
19	A4180 West End Rd, south of Sidmouth Drive, north of Bedford Rd	London - Outer	28	20,124	5.93
20	Sidmouth Drive, east of A4180 West End Rd, junction approach/exit	London - Outer	5	6,786	1.31
21	Sidmouth Drive, west of Dartmouth Rd	London - Outer	15	6,786	1.31
22	Wood Lane, west of A4180 West End Rd, mini-roundabout approach/exit	London - Outer	5	7,631	0.96

ID	Description	Road Type	Speed (km/h)	AADT	%HDV
23	Wood Lane, east of Chichester Avenue	London - Outer	23	7,631	0.96
24	B466 Midcroft, west of A4180 High Street, junction approach/exit	London - Outer	5	18,102	6.78
25	B466 Midcroft onto Ickenham Rd	London - Outer	26	18,102	6.78

2027 With Development

ID	Description	Speed (km/h)	AADT	%HDV
1	Site access Rd, off A4180 West End Rd	5	140	0.00
2	A4180 West End Rd, north of site access Rd, mini-roundabout approach/exit	5	17,489	3.05
3	A4180 West End Rd	21	17,489	3.05
4	A4180 West End Rd, south of Kingsend/Pembroke Rd, traffic light junction approach/exit	5	17,489	3.05
5	A4180 High Street, north of Kingsend/Pembroke Rd, traffic light junction approach/exit	5	17,419	3.05
6	A4180 High Street	23	17,419	3.05
7	A4180 High Street, south of B466 Ickenham Rd/Midcroft, traffic light junction approach/exit	5	17,419	3.05
8	A4180 High Street, north of B466 Ickenham Rd/Midcroft, traffic light junction approach/exit	5	33,999	6.33
9	A4180 High Street, south of The Oaks	26	33,999	6.33
10	A4180 High Street, north of The Oaks, mini-roundabout approach/exit	5	28,614	7.26
11	B466 Eastcote Rd, east of A4180 High Street, west of St Martins Approach, mini-roundabout approach/exit	5	25,426	4.28
12	B466 Eastcote Rd, east of St Martins Approach, west of North Drive	32	25,426	4.28
13	A4180 Bury Street, west of High Street, south of Sharps Lane, mini-roundabout approach/exit	5	24,390	4.36
14	A4180 Bury Street, north of Sharps Lane, south of Mill Drive, mini-roundabout approach/exit	45	23,278	4.38
15	A4180 West End Rd, south of site access Rd, north of Pond Green, mini-roundabout approach/exit	5	22,004	5.64
16	A4180 West End Rd, south of Pond Green, west of Grosvenor Vale	24	18,380	6.48
17	A4180 West End Rd, south of Grosvenor Vale, north of Torrington Rd	31	18,328	6.35
18	A4180 West End Rd, south of Torrington Rd, north of Sidmouth Drive	24	21,607	5.93
19	A4180 West End Rd, south of Sidmouth Drive, north of Bedford Rd	28	21,537	5.93
20	Sidmouth Drive, east of A4180 West End Rd, junction approach/exit	5	7,262	1.31
21	Sidmouth Drive, west of Dartmouth Rd	15	7,262	1.31
22	Wood Lane, west of A4180 West End Rd, mini-roundabout approach/exit	5	8,167	0.96
23	Wood Lane, east of Chichester Avenue	23	8,167	0.96
24	B466 Midcroft, west of A4180 High Street, junction approach/exit	5	19,373	6.78
25	B466 Midcroft onto Ickenham Rd	26	19,373	6.78

Appendix 4 Dispersion Model Details

Model Details and Input Parameters

Parameter	Value
Emissions Factors	Defra Emissions Factors Toolkit v12.0.1 using the traffic data in Appendix 3
Emissions Year	2022 for verification, 2027 for future scenario
Background Concentrations	Defra maps – 2022 for verification, 2027 for future scenario
Surface Roughness	Site – 0.5m; Meteorological Station – 0.2m
Monin-Obukhov Length	Site – 30m; Meteorological Station – 10m
Meteorological Data	Northolt (2022)
Road-contribution Adjustment Factor	1.15 – see Model Verification, below
NO_x to NO_2 conversion	Defra's NO_x to NO_2 Calculator v8.1 and Defra mapped background concentrations
Canyon	Not applicable to this study area
Gradient	Not applicable to this study area

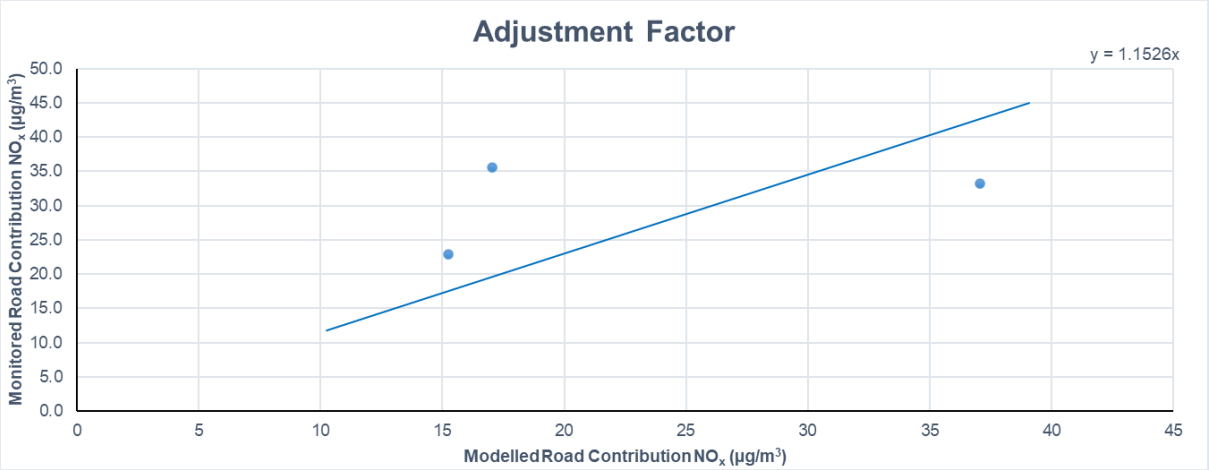
Model Verification

The model has been verified using the TG22 methodology. The model has been used to predict 2022 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.

Model Verification (all concentrations in µg/m³)

Monitor ID	2022 Monitored NO_2	2022 Background NO_2	2022 Monitored Road NO_x	2022 Modelled Road NO_x	Ratio
HILL35	27.2	16.2	22.9	15.2	1.501
HILL36	32.7	16.2	35.6	17.0	2.088
HILL37	31.7	16.2	33.2	37.1	0.896

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 4.85µgm³, which is within the acceptable range specified in TG22.

Appendix 5 Recommended Construction Phase Mitigation

Highly Recommended Mitigation Measures for Medium Risk Sites

General Communication

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- Display the head or regional office contact information, 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. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. 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 on request.
- Record any exceptional incidents that cause dust and/or air emissions, either on or off-site should be recorded, and the action taken to resolve the situation, in the logbook.

Monitoring

- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.

Preparing and Maintaining the Site

- Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on-site.
- 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 re-used on-site. If they are being reused on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicle/Machinery and Sustainable Travel

- 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.

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 on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

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 (Medium Risk)

- 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.