



Air Quality Assessment: Harefield Road, Uxbridge, Hillingdon

December 2023



Experts in air quality
management & assessment

Document Control

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Contents

1	Introduction.....	3
2	Policy Context.....	6
3	Assessment Criteria	17
4	Assessment Approach	21
5	Baseline Conditions	27
6	Construction Phase Impact Assessment.....	30
7	Operational Phase Impact Assessment	31
8	‘Air Quality Neutral’	32
9	Mitigation	33
10	Residual Impacts.....	34
11	Conclusions	35
12	References.....	36
13	Glossary	39
14	Appendices.....	41
A1	London-Specific Policies and Measures.....	42
A2	Construction Dust Assessment Procedure.....	46
A3	EPUK & IAQM Planning for Air Quality Guidance.....	53
A4	Professional Experience	59
A5	Modelling Methodology	60
A6	London Vehicle Fleet Projections	61
A7	‘Air Quality Neutral’	63
A8	Construction Mitigation.....	64

Tables

Table 1:	Air Quality Criteria for Nitrogen Dioxide, PM ₁₀ and PM _{2.5}	19
Table 2:	Air Quality Impact Descriptors for Individual Receptors for All Pollutants ^a	24
Table 3:	Summary of Annual Mean NO ₂ Monitoring (2016-2021) (µg/m ³).....	27
Table 4:	Estimated Annual Mean Background Pollutant Concentrations in 2019 and 2024 (µg/m ³).....	29
Table A2.1:	Examples of How the Dust Emission Magnitude Class May be Defined....	47
Table A2.2:	Principles to be Used When Defining Receptor Sensitivities	49
Table A2.3:	Sensitivity of the Area to Dust Soiling Effects on People and Property	50
Table A2.4:	Sensitivity of the Area to Human Health Effects	51

Table A2.5: Sensitivity of the Area to Ecological Effects	51
Table A2.6: Defining the Risk of Dust Impacts.....	52

Figures

Figure 1: Proposed Development Setting in the Context of Air Quality	4
Figure 2: Monitoring Locations	28

1 Introduction

- 1.1 This report describes the potential air quality impacts associated with the proposed retail development on land off Harefield Road, in Uxbridge, Hillingdon. The proposed development involves the redevelopment and change of use of the existing retail properties to provide floorspace for food retail usage.
- 1.2 **This is an interim report for planning validation. A final report will be issued when final traffic data is available.**
- 1.3 The proposed development lies within an Air Quality Management Area (AQMA) declared by the London Borough (LB) of Hillingdon for exceedances of the annual mean nitrogen dioxide (NO₂) objective. The southern part of the site is also within one of the Greater London Authority's (GLA's) air quality Focus Areas; these are locations with high levels of human exposure where the annual mean limit value for nitrogen dioxide is exceeded. The proposed development will generate additional traffic on local roads, which may impact on air quality at existing residential properties along the affected road network. The main air pollutants of concern related to road traffic emissions are nitrogen dioxide and fine particulate matter (PM₁₀ and PM_{2.5}).
- 1.4 The location and setting of the proposed development are shown in Figure 1, along with the nearby AQMA and Focus Area.

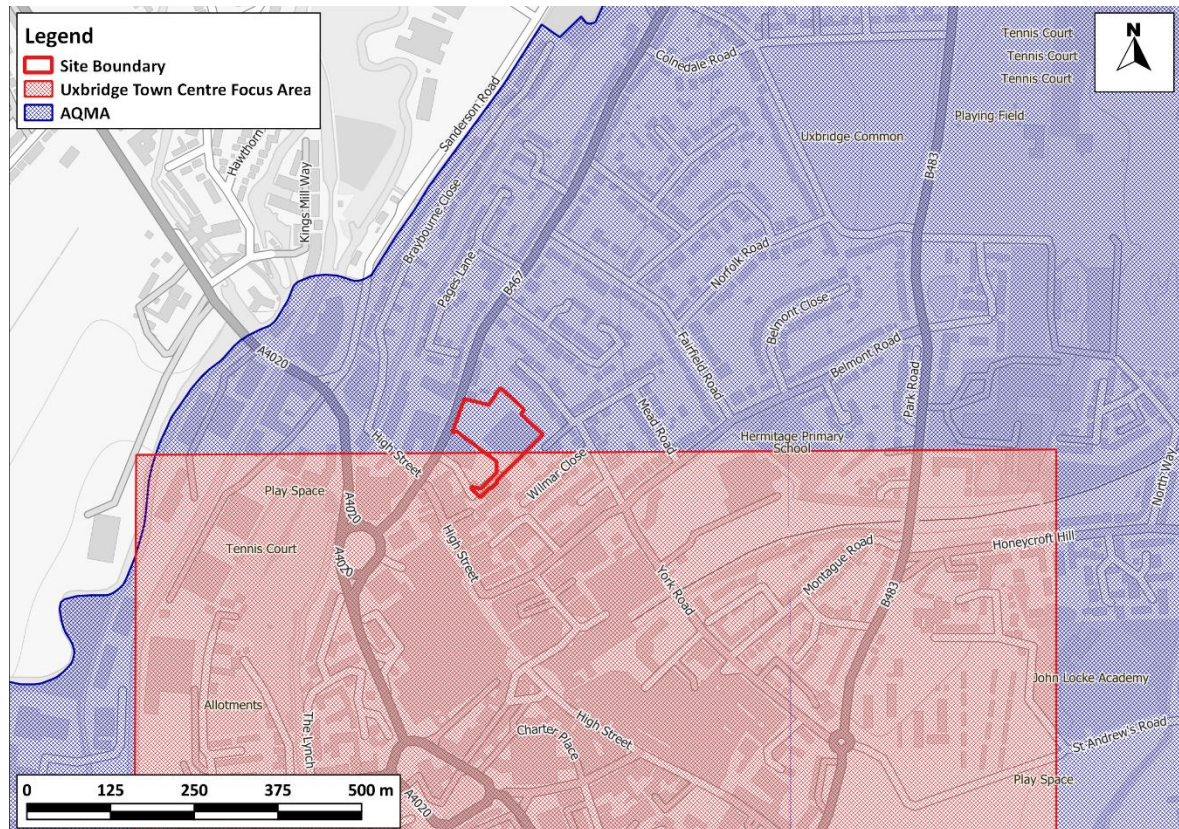


Figure 1: Proposed Development Setting in the Context of Air Quality

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- 1.5 The proposed development will be provided with heat and hot water through an all-electric energy strategy; there will be no centralised combustion plant and thus no significant point sources of emissions within the proposed development.
- 1.6 The Greater London Authority's (GLA's) London Plan (GLA, 2021) requires new developments to be air quality neutral. The air quality neutrality of the proposed development will be assessed following the methodology provided in the latest GLA's London Plan Guidance (Air Quality Neutral) (GLA, 2023).
- 1.7 The GLA has also released Supplementary Planning Guidance on the Control of Dust and Emissions from Construction and Demolition (GLA, 2014b). The SPG outlines a risk assessment approach for construction dust assessment and helps determine the mitigation measures that will need to be applied. A construction dust assessment will be undertaken and the appropriate mitigation will be set out.
- 1.8 This report describes existing local air quality conditions (base year 2019; 2020 and 2021 were not used due to the impacts of the Covid-19 pandemic, discussed further in Paragraphs 4.18 and 4.19),

and the predicted air quality in the future assuming that the proposed development does, or does not proceed. The assessment of traffic-related impacts focuses on 2024, which is the anticipated year of opening of the proposed development. The assessment of construction dust impacts focuses on the anticipated duration of the works.

- 1.9 This report has been prepared taking into account all relevant local and national guidance and regulations.

2 Policy Context

- 2.1 All European legislation referred to in this report is written into UK law and remains in place.

Air Quality Strategy 2007

- 2.2 The Air Quality Strategy (Defra, 2007) published by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives. Local authorities are seen to play a particularly important role. The strategy describes the Local Air Quality Management (LAQM) regime that has been established, whereby every authority has to carry out regular reviews and assessments of air quality in its area to identify whether the objectives have been, or will be, achieved at relevant locations, by the applicable date. If this is not the case, the authority must declare an AQMA, and prepare an action plan which identifies appropriate measures that will be introduced in pursuit of the objectives.

Air Quality Strategy 2023

- 2.3 The Air Quality Strategy: Framework for Local Authority Delivery 2023 (Defra, 2023a) sets out the strategic air quality framework for local authorities and other Air Quality Partners in England. It sets out their powers and responsibilities, and actions the government expects them to take. It does not replace other air quality guidance documents relevant to local authorities.

Clean Air Strategy 2019

- 2.4 The Clean Air Strategy (Defra, 2019) sets out a wide range of actions by which the UK Government will seek to reduce pollutant emissions and improve air quality. Actions are targeted at four main sources of emissions: Transport, Domestic, Farming and Industry. At this stage, there is no straightforward way to take account of the expected future benefits to air quality within this assessment.

Reducing Emissions from Road Transport: Road to Zero Strategy

- 2.5 The Office for Low Emission Vehicles (OLEV) and Department for Transport (DfT) published a Policy Paper (DfT, 2018) in July 2018 outlining how the government will support the transition to zero tailpipe emission road transport and reduce tailpipe emissions from conventional vehicles during the transition. This paper affirms the Government's pledge to end the sale of new conventional petrol and diesel cars and vans by 2040, and states that the Government expects the majority of new cars and vans sold to be 100% zero tailpipe emission and all new cars and vans to have significant zero tailpipe emission capability by this year, and that by 2050 almost every car and van should have

zero tailpipe emissions. It states that the Government wants to see at least 50%, and as many as 70%, of new car sales, and up to 40% of new van sales, being ultra-low emission by 2030.

- 2.6 The paper sets out a number of measures by which Government will support this transition but is clear that Government expects this transition to be industry and consumer led. The Government has recently announced that 80% of new cars and 70% of new vans sold in Great Britain must be zero emission by 2030, increasing to 100% by 2035. If these ambitions are realised then road traffic-related NO_x emissions can be expected to reduce significantly over the coming decades, likely beyond the scale of reductions forecast in the tools utilised in carrying out this air quality assessment.

Environment Act 2021

- 2.7 The UK's new legal framework for protection of the natural environment, the Environment Act (2021) passed into UK law in November 2021. The Act gives the Government the power to set long-term, legally binding environmental targets. It also establishes an Office for Environmental Protection (OEP), responsible for holding the government to account and ensuring compliance with these targets.
- 2.8 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (SI 2023 No. 96) sets two new targets for future concentrations of PM_{2.5}. These targets are described in Paragraph 3.5.

Environmental Improvement Plan 2023

- 2.9 Defra published its 25 Year Environment Plan in 2018 (Defra, 2018b). The Environment Act (2021) requires Defra to review this Plan at least every five years. The Environmental Improvement Plan 2023 (Defra, 2023b) is the first revision. This outlines the progress made since 2018 and adds detail to the goals defined in the 2018 Plan, including that of achieving clean air.
- 2.10 The Environmental Improvement Plan 2023 sets out the new air quality targets which have been set for concentrations of PM_{2.5}. These targets, which are described in more detail in Paragraph 3.5, include the long-term targets in the Statutory Instrument described in Paragraph 2.8, and interim targets to be achieved by 2028.
- 2.11 The 2023 Plan outlines the role of local authorities in helping it meet both its targets and existing commitments. It also outlines the respective roles of industry, agricultural sectors, and the Department for Transport in providing the coordinated action required to meet both its new, and pre-existing targets and commitments.

Planning Policy

National Policies

- 2.12 The National Planning Policy Framework (NPPF) (2023) sets out planning policy for England. It states that the purpose of the planning system is to contribute to the achievement of sustainable development, and that the planning system has three overarching objectives, one of which (Paragraph 8c) is an environmental objective:

“to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy”.

- 2.13 To prevent unacceptable risks from air pollution, Paragraph 174 of the NPPF states that:

“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 soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air quality”.

- 2.14 Paragraph 185 states:

“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”.

- 2.15 More specifically, on air quality, Paragraph 186 makes clear that:

“Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan”.

- 2.16 The NPPF is supported by Planning Practice Guidance (PPG) (Ministry of Housing, Communities & Local Government, 2019), which includes guiding principles on how planning can take account of the impacts of new development on air quality. The PPG states that:

“Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with Limit Values. It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified”.

2.17 Regarding plan-making, the PPG states:

“It is important to take into account air quality management areas, Clean Air Zones and other areas including sensitive habitats or designated sites of importance for biodiversity where there could be specific requirements or limitations on new development because of air quality”.

2.18 The role of the local authorities through the LAQM regime is covered, with the PPG stating that a local authority Air Quality Action Plan *“identifies measures that will be introduced in pursuit of the objectives and can have implications for planning”*. In addition, the PPG makes clear that *“Odour and dust can also be a planning concern, for example, because of the effect on local amenity”*.

2.19 Regarding the need for an air quality assessment, the PPG states that:

“Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity”.

2.20 The PPG sets out the information that may be required in an air quality assessment, making clear that:

“Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific”.

2.21 The PPG also provides guidance on options for mitigating air quality impacts, as well as examples of the types of measures to be considered. It makes clear that:

“Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact. It is important that local planning authorities work with applicants to consider appropriate mitigation so as to ensure new development is appropriate for its location and unacceptable risks are prevented”.

London-Specific Policies

- 2.22 The key London-specific policies are summarised below, with more detail provided, where required, in Appendix A1.

The London Plan

- 2.23 The London Plan (GLA, 2021) sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years. The key policy relating to air quality is Policy SI 1 on *Improving air quality*, Part B1 of which sets out three key requirements for developments:

“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”.*

- 2.24 The Policy then details how developments should meet these requirements, stating:

“In order to meet the requirements in Part 1, as a minimum:

- a) development proposals must be at least Air Quality Neutral*
- b) development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retro-fitted mitigation measures*
- c) major development proposals must be submitted with an 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”.*

- 2.25 Part C of the Policy introduces the concept of Air Quality Positive for large-scale development, stating:

“Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating:

- 1) how proposals have considered ways to maximise benefits to local air quality, and*

- 2) *what measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this.*"

2.26 The proposed development is not large-scale development, thus an Air Quality Positive statement is not required.

2.27 Regarding construction and demolition impacts, Part D of Policy SI 1 of the London Plan states:

"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".

2.28 Part E of Policy SI 1 states the following regarding mitigation and offsetting of emissions:

"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".

2.29 The explanatory text around Policy SI 1 of the London Plan states the following with regard to assessment criteria:

"The Mayor is committed to making air quality in London the best of any major world city, which means not only achieving compliance with legal limits for Nitrogen Dioxide as soon as possible and maintaining compliance where it is already achieved, but also achieving World Health Organisation targets for other pollutants such as Particulate Matter.

The aim of this policy is to ensure that new developments are designed and built, as far as is possible, to improve local air quality and reduce the extent to which the public are exposed to poor air quality. This means that new developments, as a minimum, must not cause new exceedances of legal air quality standards, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits. Where limit values are already met, or are predicted to be met at the time of completion, new developments must endeavour to maintain the best ambient air quality compatible with sustainable development principles.

Where this policy refers to ‘existing poor air quality’ this should be taken to include areas where legal limits for any pollutant, or World Health Organisation targets for Particulate Matter, are already exceeded and areas where current pollution levels are within 5 per cent of these limits”¹.

- 2.30 The London Plan includes a number of other relevant policies, which are detailed in Appendix A1.

London Environment Strategy

- 2.31 The London Environment Strategy was published in May 2018 (GLA, 2018a). The strategy considers air quality in Chapter 4; the Mayor’s main objective is to create a “zero emission London by 2050”. Policy 4.2.1 aims to “reduce emissions from London’s road transport network by phasing out fossil fuelled vehicles, prioritising action on diesel, and enabling Londoners to switch to more sustainable forms of transport”. The strategy sets a target to achieve, by 2030, the guideline value for PM_{2.5} which was set by the World Health Organisation (WHO) in 2005. An implementation plan for the strategy has also been published which sets out what the Mayor will do between 2018 and 2023 to help achieve the ambitions in the strategy.

Mayor’s Transport Strategy

- 2.32 The Mayor’s Transport Strategy (GLA, 2018b) sets out the Mayor’s policies and proposals to reshape transport in London over the next two decades. The Strategy focuses on reducing car dependency and increasing active sustainable travel, with the aim of improving air quality and creating healthier streets. It notes that development proposals should “be designed so that walking and cycling are the most appealing choices for getting around locally”.

GLA SPG: Sustainable Design and Construction

- 2.33 The GLA’s SPG on Sustainable Design and Construction (GLA, 2014a) was revoked upon publication of the new London Plan, but it is understood that GLA still expects the emission standards set within it for gas-fired boilers, Combined Heat and Power (CHP) and biomass plant to be met.

GLA SPG: The Control of Dust and Emissions During Construction and Demolition

- 2.34 The GLA’s SPG on The Control of Dust and Emissions During Construction and Demolition (GLA, 2014b) outlines a risk assessment based approach to considering the potential for dust generation from a construction site, and sets out what mitigation measures should be implemented to minimise the risk of construction dust impacts, dependent on the outcomes of the risk assessment. This guidance is largely based on the Institute of Air Quality Management (IAQM²) guidance (IAQM, 2016), and it states that “the latest version of the IAQM Guidance should be used”.

¹ The London Plan was developed based on a World Health Organisation guideline for PM_{2.5} of 10 µg/m³ (see Paragraph 2.31).

² The IAQM is the professional body for air quality practitioners in the UK.

Air Quality Focus Areas

- 2.35 The GLA has identified 160 air quality Focus Areas in London. These are locations that not only exceed the annual mean limit value for nitrogen dioxide, but also have high levels of human exposure. They do not represent an exhaustive list of London's air quality hotspot locations, but locations where the GLA believes the problem to be most acute. They are also areas where the GLA considers there to be the most potential for air quality improvements and are, therefore, where the GLA and Transport for London (TfL) will focus actions to improve air quality. The north section of the proposed development is located within the Uxbridge Town centre air quality Focus Areas.

Local Policies

- 2.36 The Local Plan Part 1: Strategic Policies (LB of Hillingdon, 2012) was adopted by LB of Hillingdon in November 2012 and provides a framework for development in the Borough up to 2026. The Plan includes the two Strategic Objectives (SOs) related to air quality:

- SO10: *"Improve and protect air... quality..."*; and
- SO11: *"...minimise emissions of... local air quality pollutants from new development and transport"*.

- 2.37 The main Policy of relevance to air quality is Policy EM8 'Land, Water, Air and Noise', which states that:

"All development should not cause deterioration in the local air quality levels and should ensure the protection of both existing and new sensitive receptors."

All major development within the Air Quality Management Area (AQMA) should demonstrate air quality neutrality (no worsening of impacts) where appropriate; actively contribute to the promotion of sustainable transport measures such as vehicle charging points and the increased provision for vehicles with cleaner transport fuels; deliver increased planting through soft landscaping and living walls and roofs; and provide a management plan for ensuring air quality impacts can be kept to a minimum."

The Council seeks to reduce the levels of pollutants referred to in the Government's National Air Quality Strategy and will have regard to the Mayor's Air Quality Strategy. London Boroughs should also take account of the findings of the Air Quality Review and Assessments and Action plans, in particular where Air Quality Management Areas have been designated."

The Council has a network of Air Quality Monitoring stations but recognises that this can be widened to improve understanding of air quality impacts. The Council may therefore require new major development in an AQMA to fund additional air quality monitoring stations to assist in managing air quality improvements."

2.38 LB of Hillingdon adopted the Local Plan Part 2: Development Management Policies (LB of Hillingdon, 2020) in January 2020, which delivers the detail of the strategic policies set out in the Local Plan Part 1: Strategic Policies. Together the documents form a comprehensive development strategy for the Borough up to 2026. The Local Plan Part 2 includes the following policies that relate to air quality and the proposed development:

- *Policy DMEI 14 'Air Quality' states that:*

"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".*

- *Policy DMT 1 'Managing Transport Impacts' states that "...In order for developments to be acceptable they are required to... have no significant adverse transport or associated air quality... impacts on the local and wider environment, particularly on the strategic road network..."; and*
- *Policy DMT 2 'Highways Impacts' states that "Development proposals must ensure that... they do not contribute to the deterioration of air quality...".*

2.39 The LB of Hillingdon has also adopted a Supplementary Planning Document (SPD) on Planning Obligations (LB of Hillingdon, 2014), which states that:

"Obligations may be sought to ensure no detrimental impacts on air quality and/or to ensure compliance with the objective of the AQMA. The following circumstances may establish a requirement for planning obligations:

- *As a recommendation of an air quality assessment;*
- *To mitigate the impacts from emissions from new development where these cannot be resolved through other means such as planning conditions, travel plans or statutory licenses;*
- *To mitigate impacts on new development where floor space is to be occupied for significant parts of the day, such as residential, where located in an area of poor air quality; and*

- *To mitigate air quality impacts during the construction phase where these cannot be controlled through conditions or other statutory licenses.”*

Building Standards

- 2.40 Part F(1) of Schedule 1 of the Building Regulations 2010 as amended June 2022 (Ministry of Housing, Communities & Local Government, 2022) places a duty on building owners, or those responsible for relevant building work³, to ensure adequate ventilation is provided to building occupants.
- 2.41 Approved Document F (HM Government, 2021a), which accompanies the Building Regulations, explains that care should be taken to minimise entry of external air pollutants. Specific steps should be taken to manage ventilation intakes where the building is near to a significant source of emissions, or if local ambient concentrations exceed values set in the Air Quality Standards Regulations 2010 (see Paragraph 3.11, later). These steps include maximising the distance between emission source and air intake, considering likely dispersion patterns, and considering the timing of pollution releases when designing the ventilation system.
- 2.42 Part S(1) of Schedule 1, and Regulation 44D, of the Building Regulations 2010 (Ministry of Housing, Communities & Local Government, 2022) define a requirement for the provision of infrastructure for charging electric vehicles. Precise requirements are explained further within Approved Document S (HM Government, 2021b) and depend on the overall number of parking spaces provided and the average financial cost of installation.
- 2.43 Compliance with the Building Regulations is not required for planning approval, but it is assumed that the Regulations will be complied with in the completed development.

Air Quality Action Plans

National Air Quality Plan

- 2.44 Defra has produced an Air Quality Plan to tackle roadside nitrogen dioxide concentrations in the UK (Defra, 2017); a supplement to the 2017 Plan (Defra, 2018a) was published in October 2018 and sets out the steps Government is taking in relation to a further 33 local authorities where shorter-term exceedances of the limit value were identified. Alongside a package of national measures, the 2017 Plan and the 2018 Supplement require those identified English Local Authorities (or the GLA in the case of London Authorities) to produce local action plans and/or feasibility studies. These plans and feasibility studies must have regard to measures to achieve the statutory limit values within the shortest possible time, which may include the implementation of a Clean Air Zone (CAZ). There is currently no straightforward way to take account of the effects of the 2017 Plan or 2018

³ Building work is a legal term for work covered by the Building Regulations. With limited exemptions, the Regulations apply to all significant building work, including erecting or extending a building.

Supplement in the modelling undertaken for this assessment; however, consideration has been given to whether there is currently, or is likely to be in the future, a limit value exceedance in the vicinity of the proposed development. This assessment has principally been carried out in relation to the air quality objectives, rather than the limit values that are the focus of the Air Quality Plan.

Local Air Quality Action Plan

2.45 The LB of Hillingdon has declared an AQMA for nitrogen dioxide covering the south of the borough, defined by the A40 corridor from the western borough boundary, east to the intersection with the Yeading Brook and north until its intersection with the Chiltern-Marylebone railway line. The proposed development is located within this AQMA. The Council has developed an Air Quality Action Plan (LB of Hillingdon, 2019). This plan identifies the Council's objectives to:

"a) improve the areas of poorer air quality as soon as possible;

b) to continue to improve air quality across the borough and reduce public exposure to air pollution, especially for vulnerable groups within our communities such as the young, the old and those already suffering with associated respiratory illnesses".

2.46 With these objectives in mind, LB of Hillingdon will prioritise the following actions:

- *"Lead by example;*
- *Prioritise reducing public exposure and improving air quality around schools;*
- *Prioritise the implementation of improvement strategies in the AQ Focus Areas;*
- *Ensure the integration of the Healthy Streets approach in relevant council work programmes;*
- *Ensure the planning system supports the achievement of air quality improvements in relation to new developments;*
- *Raise awareness via targeted campaigns;*
- *Promote the use of greener walking and cycling routes to help the delivery of the Council's transport objective of an increased mode share for walking and cycling; and*
- *Work with external stakeholders."*

3 Assessment Criteria

- 3.1 The Government has established a set of air quality standards and objectives to protect human health. The 'standards' are set as concentrations below which effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations (2002).
- 3.2 The UK-wide objectives for nitrogen dioxide and PM₁₀ were to have been achieved by 2005 and 2004 respectively, and continue to apply in all future years thereafter. Measurements across the UK have shown that the 1-hour nitrogen dioxide objective is unlikely to be exceeded at roadside locations where the annual mean concentration is below 60 µg/m³ (Defra, 2022). Therefore, 1-hour nitrogen dioxide concentrations will only be considered if the annual mean concentration is above this level. Measurements have also shown that the 24-hour mean PM₁₀ objective could be exceeded at roadside locations where the annual mean concentration is above 32 µg/m³ (Defra, 2022). The predicted annual mean PM₁₀ concentrations are thus used as a proxy to determine the likelihood of an exceedance of the 24-hour mean PM₁₀ objective. Where predicted annual mean concentrations are below 32 µg/m³ it is unlikely that the 24-hour mean objective will be exceeded.
- 3.3 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. The GLA explains where these objectives will apply in London (GLA, 2019). The annual mean objectives for nitrogen dioxide and PM₁₀ are considered to apply at the façades of residential properties, schools, hospitals and care homes etc., the gardens of residential properties, school playgrounds and the grounds of hospitals and care homes. The 24-hour mean objective for PM₁₀ is considered to apply at the same locations as the annual mean objective, as well as at hotels. The 1-hour mean objective for nitrogen dioxide applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.
- 3.4 For PM_{2.5}, the objective set by Defra for local authorities is to work toward reducing concentrations without setting any specific numerical value. In the absence of a numerical objective, it is convention to assess local air quality impacts against the limit value (see Paragraph 3.11), originally set at 25 µg/m³ and currently set at 20 µg/m³.
- 3.5 Defra has also recently set two new targets, and two new interim targets, for PM_{2.5} concentrations in England. One set of targets focuses on absolute concentrations. The long-term target is to achieve an annual mean PM_{2.5} concentration of 10 µg/m³ by the end of 2040, with the interim target being a

value of $12 \mu\text{g}/\text{m}^3$ by the start of 2028⁴. The second set of targets relate to reducing overall population exposure to $\text{PM}_{2.5}$. By the end of 2040, overall population exposure to $\text{PM}_{2.5}$ should be reduced by 35% compared with 2018 levels, with the interim target being a reduction of 22% by the start of 2028.

3.6 Defra will assess compliance with the population exposure targets by averaging concentrations measured at its own background monitoring stations. This will not consider small changes over time to precisely where people are exposed (such as would relate to exposure introduced by a new development). Furthermore, as explained in Paragraph 2.11, all four new targets provide metrics against which central Government can assess its own progress. While local authorities have an important role delivering the required improvements, these are expected to relate to controlling emissions and not to directly assessing $\text{PM}_{2.5}$ concentrations against the targets.

3.7 In March 2023, the Department for Levelling Up, Housing and Communities (DLUHC, 2023) explained that the new $\text{PM}_{2.5}$ targets will:

“need to be integrated into the planning system, and in setting out planning guidance for local authorities and businesses, we will consider the specific characteristics of $\text{PM}_{2.5}$. The guidance will be forthcoming in due course, until then we expect local authorities to continue to assess local air quality impacts in accordance with existing guidance.”

3.8 Defra has also provided advice (Defra, 2023g) which explains that there is no current requirement to consider the new $\text{PM}_{2.5}$ targets in planning decisions and that guidance to local planning authorities will be forthcoming before this position changes. In the future, when planning decisions do need to consider the new targets, the expectation is that this will focus on reducing emissions from new development rather than there being a direct requirement for planning-related air quality assessments to predict $\text{PM}_{2.5}$ concentrations.

3.9 For the time being, therefore, no assessment is required, and indeed no robust assessment is possible, in relation to the new $\text{PM}_{2.5}$ targets and they are not considered further.

3.10 As explained in Paragraph 2.31, the GLA has set a target to achieve an annual mean $\text{PM}_{2.5}$ concentration of $10 \mu\text{g}/\text{m}^3$ by 2030. This target was derived from an air quality guideline set by WHO in 2005. In 2021, WHO updated its guidelines, but the London Environment Strategy (GLA, 2018a) considers the 2005 guideline of $10 \mu\text{g}/\text{m}^3$. While there is no explicit requirement to assess against the GLA target of $10 \mu\text{g}/\text{m}^3$, it has nevertheless been included within this assessment.

3.11 EU Directive 2008/50/EC (The European Parliament and the Council of the European Union, 2008) sets limit values for nitrogen dioxide, PM_{10} and $\text{PM}_{2.5}$, and is implemented in UK law through the Air

⁴ Meaning that it will be assessed using measurements from 2027. The 2040 target will be assessed using measurements from 2040. National targets are assessed against concentrations expressed to the nearest whole number, for example a concentration of $10.4 \mu\text{g}/\text{m}^3$ would not exceed the $10 \mu\text{g}/\text{m}^3$ target.

Quality Standards Regulations (2010)⁵. The limit values for nitrogen dioxide and PM₁₀ are the same numerical concentrations as the UK objectives, but achievement of the limit values is a national obligation rather than a local one and concentrations are reported to the nearest whole number. In the UK, only monitoring and modelling carried out by UK Central Government meets the specification required to assess compliance with the limit values. Central Government does not normally recognise local authority monitoring or local modelling studies when determining the likelihood of the limit values being exceeded, unless such studies have been audited and approved by Defra and DfT's Joint Air Quality Unit (JAQU).

3.12 The relevant air quality criteria for this assessment are provided in Table 1.

Table 1: Air Quality Criteria for Nitrogen Dioxide, PM₁₀ and PM_{2.5}

Pollutant	Time Period	Value
Nitrogen Dioxide	1-hour Mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m ³
PM ₁₀	24-hour Mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m ³ ^a
PM _{2.5}	Annual Mean	20 µg/m ³ ^b
		10 µg/m ³ by 2030

^a A proxy value of 32 µg/m³ as an annual mean is used in this assessment to assess the likelihood of the 24-hour mean PM₁₀ objective being exceeded. Measurements have shown that, above this concentration, exceedances of the 24-hour mean PM₁₀ objective are possible (Defra, 2022).

^b There is no numerical PM_{2.5} objective for local authorities (see Paragraph 3.4). Convention is to assess against the UK limit value which is currently 20 µg/m³.

Construction Dust Criteria

3.13 There are no formal assessment criteria for dust. In the absence of formal criteria, the approach developed by the IAQM (2016) has been used (the GLA's SPG (GLA, 2014b) recommends that the assessment be based on the latest version of the IAQM guidance). Full details of this approach are provided in Appendix A2.

Road Traffic Screening Criteria

3.14 Environmental Protection UK (EPUK) and the IAQM recommend a two-stage screening approach (Moorcroft and Barrowcliffe et al, 2017) to determine whether emissions from road traffic generated by a development have the potential for significant air quality impacts. The approach, as described in Appendix A3, first considers the size and parking provision of a development; if the development

⁵ As amended through The Air Quality Standards (Amendment) Regulations 2016 and The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020.

is residential and is for fewer than ten homes or covers less than 0.5 ha, or is non-residential and will provide less than 1,000 m² of floor space or cover a site area of less than 1 ha, and will provide ten or fewer parking spaces, then there is no need to progress to a detailed assessment.

- 3.15 The second stage then compares the changes in vehicle flows on local roads that a development will lead to against specified screening criteria. The screening thresholds (described in full in Appendix A3) inside an AQMA are a change in flows of more than 25 heavy duty vehicles (HDVs) or 100 light duty vehicles (LDVs) per day; outside of an AQMA the thresholds are 100 HDVs or 500 LDVs. Where these criteria are exceeded, a detailed assessment is likely to be required, although the guidance advises that *“the criteria provided are precautionary and should be treated as indicative”*, and *“it may be appropriate to amend them on the basis of professional judgement”*.
- 3.16 While these screening criteria are specifically intended to act as a trigger for a detailed assessment, they can also sometimes be used to identify the extent of the road network that requires assessment. Where the change in traffic on a given road link is less than the relevant screening threshold, it is unlikely that a significant impact would occur, and these links can be disregarded unless there are additional development-related emissions affecting receptors along the link.

4 Assessment Approach

Consultation

- 4.1 To be completed.

Study Area

- 4.2 The study area for the assessment has been identified using professional judgement, focussing on the areas where impacts are anticipated to be greatest. It includes the application site itself and all of the roads along which the development will lead to a potentially significant change in traffic flows.
- 4.3 The construction dust assessment considers the potential for impacts within 350 m of the site boundary, or within 50 m of roads used by construction vehicles within 500m of the site. The specific areas considered are detailed in Section 6.

Receptors

- 4.4 Concentrations of nitrogen dioxide, PM₁₀ and PM_{2.5} have been predicted at a number of locations close to the proposed development. When selecting receptors, particular attention has been paid to assessing impacts close to junctions, where traffic may become congested and where there is a combined effect of several road links, and close to those roads where the traffic increases as a result of the proposed development will be greatest.
- 4.5 **Specific receptors TBC.**
- 4.6 Selected receptors may be representative of air quality conditions at a number of properties; consideration has been given to how many sensitive locations each modelled receptor represents when considering the impacts of the proposed development and the overall significance of effects.
- 4.7 The construction dust risk assessment approach does not require specific receptors to be identified; instead, the numbers of different types of receptors within given distance bands are counted. These receptor counts are provided in Section 6.

Existing Conditions

- 4.8 Existing sources of emissions and baseline air quality conditions within the study area have been defined using a number of approaches:
- information on existing air quality has been obtained by collating the results of monitoring carried out by the local authority;
 - background concentrations have been defined using Defra's 2018-based background maps (Defra, 2023c). These cover the whole of the UK on a 1x1 km grid. The background annual mean nitrogen dioxide maps for 2019 have been calibrated against concurrent

measurements from national monitoring sites (AQC, 2020a). The calibration factor calculated has also been applied to future year backgrounds. Mapped background concentrations of PM₁₀ and PM_{2.5} have not been adjusted; and

- whether or not there are any exceedances of the annual mean limit value for nitrogen dioxide in the study area has been identified using the maps of roadside concentrations published by Defra (2020) (2023e). These are the maps used by the UK Government, together with the results from national Automatic Urban and Rural Network (AURN) monitoring sites that operate to the required data quality standards, to identify and report exceedances of the limit value. The national maps of roadside PM₁₀ and PM_{2.5} concentrations (Defra, 2023e), which are available for the years 2009 to 2019, show no exceedances of the limit values anywhere in the UK in 2019.

Construction Impacts

- 4.9 The construction dust assessment considers the potential for impacts within 350 m of the site boundary, or within 50 m of roads used by construction vehicles. The assessment methodology follows the GLA's SPG on the Control of Dust and Emissions During Construction and Demolition (GLA, 2014b), which is based on that provided by IAQM (2016). This follows a sequence of steps. Step 1 is a basic screening stage, to determine whether the more detailed assessment provided in Step 2 is required. Step 2a determines the potential for dust to be raised from on-site works and by vehicles leaving the site. Step 2b defines the sensitivity of the area to any dust that may be raised. Step 2c combines the information from Steps 2a and 2b to determine the risk of dust impacts without appropriate mitigation. Step 3 uses this information to determine the appropriate level of mitigation required to ensure that there should be no significant impacts. Appendix A2 explains the approach in more detail.

Road Traffic Impacts

Screening

- 4.10 The first step in considering the road traffic impacts of the proposed development has been to screen the development and its traffic generation against the criteria set out in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017), as described in Paragraph 3.14 and detailed further in Appendix A3. Where impacts can be screened out there is no need to progress to a more detailed assessment. The following sections describe the approach to dispersion modelling of road traffic emissions, which has been required for this project.

Modelling Methodology

- 4.11 Concentrations have been predicted using the ADMS-Roads dispersion model, with vehicle emissions derived using Defra's Emission Factor Toolkit (EFT) (v12.0) (Defra, 2023c). Details of the model inputs and the model verification are provided in Appendix A5.

Assessment Scenarios

- 4.12 Nitrogen dioxide, PM₁₀ and PM_{2.5} concentrations have been predicted for the following scenarios:
- base year 2019;
 - the proposed year of opening (2024) without the development; and
 - 2024 with the development.
- 4.13 Predictions for 2024 are based on a return to 'typical' activity levels and assume no impact as a result of the Covid-19 pandemic in this year, to ensure a worst-case assessment (as the influence of the pandemic has generally been to reduce concentrations of the pollutants considered in this assessment); see Paragraphs 4.18 and 4.19.

Impact Description

- 4.14 The approach developed jointly by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) will be used in describing the modelled impacts. The approach identifies impacts at individual receptors based on the percentage change in concentrations relative to the relevant air quality objective, rounded to the nearest whole number, and the absolute concentration relative to the objective. Table 2 sets out the method for determining the impact descriptor for annual mean concentrations at individual receptors, having been adapted from the table presented in the guidance document. For the assessment criterion the term Air Quality Assessment Level or AQAL has been adopted, as it covers all pollutants, i.e. those with and without formal standards. Typically, as is the case for this assessment, the AQAL will be the air quality objective value or the GLA target. Note that impacts may be adverse or beneficial, depending on whether the change in concentration is positive or negative.

Table 2: Air Quality Impact Descriptors for Individual Receptors for All Pollutants ^a

Long-Term Average Concentration At Receptor In Assessment Year ^b	Change in concentration relative to AQAL ^c				
	0%	1%	2-5%	6-10%	>10%
75% or less of AQAL	Negligible	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Negligible	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Negligible	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Negligible	Moderate	Substantial	Substantial	Substantial

^a Values are rounded to the nearest whole number.

^b This is the "Without Scheme" concentration where there is a decrease in pollutant concentration and the "With Scheme" concentration where there is an increase.

^c AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, GLA target or an Environment Agency 'Environmental Assessment Level (EAL)'.

Uncertainty

- 4.15 There are many components that contribute to the uncertainty of modelling predictions. The road traffic emissions dispersion model used in this assessment is dependent upon the traffic data that have been input, which will have inherent uncertainties associated with them. There are then additional uncertainties, as models are required to simplify real-world conditions into a series of algorithms.
- 4.16 An important stage in the process is model verification, which involves comparing the model output with measured concentrations (see Appendix A5). Because the model has been verified and adjusted, there can be reasonable confidence in the prediction of base year (2019) concentrations.
- 4.17 Predicting pollutant concentrations in a future year will always be subject to greater uncertainty. For obvious reasons, the model cannot be verified in the future, and it is necessary to rely on a series of projections provided by DfT and Defra as to what will happen to traffic volumes, background pollutant concentrations and vehicle emissions. Historic versions of Defra's EFT tended to over-state emissions reductions into the future. However, analyses of the most recent versions of Defra's EFT carried out by AQC (2020b) (2020c) suggest that, on balance, these versions are unlikely to over-state the rate at which NO_x emissions decline in the future at an 'average' site in the UK. In practice, the balance of evidence suggests that NO_x concentrations are most likely to decline more quickly in the future, on average, than predicted by the current EFT, especially against a base year of 2016 or later. Using EFT v12.0 for future-year forecasts in this report thus provides a robust assessment, given that the model has been verified against measurements made in 2019.
- 4.18 Forecasts of future-year concentrations are usually based on measurements made during a recent year. They then take account of projected changes over time to factors such as the composition of the vehicle fleet and the uptake of other new technologies, as well as population increases etc.. In

early 2020, activity in the UK was disrupted by the COVID-19 pandemic. As a result, concentrations of traffic-related air pollutants fell appreciably (Defra Air Quality Expert Group, 2020). While the pandemic may cause long-lasting changes to travel activity patterns, it is reasonable to expect a return to more typical activity levels in the future. 2020 is thus likely to present as an atypically low pollution year for roadside pollutant concentrations, as is 2021.

- 4.19 It is not currently possible to make robust predictions of the rate at which travel activity patterns will return to historically-normal levels; or the extent of any long-lasting changes to travel behaviour. The most robust approach to making future-year projections is thus to base these on measurements made during 2019, and to use activity forecasts made before the impact of the pandemic was understood, which is the approach that has been taken in this assessment.
- 4.20 This assessment has also considered the GLA target for PM_{2.5}. Whilst the overall approach is essentially unchanged from an assessment against the objectives, it must be recognised that there is increased uncertainty as the criterion is numerically reduced. By way of example a 0.5% increase in a PM₁₀ concentration with regard to the objective is 0.2 µg/m³, whereas a 0.5% increase in a PM_{2.5} concentration with regard to the GLA target is just 0.05 µg/m³. While such increases can be predicted (as the model will generate outputs to many decimal places), such small increases must be treated with increased caution.

Assumptions

- 4.21 It is necessary to make a number of assumptions when carrying out an air quality assessment; in order to account for some of the uncertainty in the approach, as described above, assumptions made have generally sought to reflect a realistic worst-case scenario. A key assumption made in carrying out this assessment is that the Northolt meteorological monitoring station appropriately represents conditions in the study area (this is discussed further in Appendix A5).

Assessment of Significance

Construction Dust Significance

- 4.22 Guidance from IAQM (2016) is that, with appropriate mitigation in place, the effects of construction dust will be 'not significant'. This is the latest version⁶ of the guidance upon which the assessment methodology set out in the GLA guidance (GLA, 2014b) is based (the GLA guidance advises that the latest version of the IAQM guidance should always be used). The assessment thus focuses on determining the appropriate level of mitigation so as to ensure that effects will normally be 'not significant'.

⁶ The IAQM issued revised guidance in August 2023, however the guidance includes a number of errors and inconsistencies. Based on discussions with the IAQM, a corrected version of the guidance is anticipated shortly. To avoid being subject to these errors, this assessment has been based on the 2016 version.

Operational Significance

- 4.23 There is no official guidance in the UK in relation to development control on how to assess the significance of air quality impacts. The approach developed jointly by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) has therefore been used. The overall significance of the air quality impacts is determined using professional judgement, taking account of the impact descriptors; the experience of the consultants preparing the report is set out in Appendix A4. Full details of the EPUK/IAQM approach are provided in Appendix A3.

‘Air Quality Neutral’

- 4.24 The GLA’s London Plan Guidance (Air Quality Neutral) (GLA, 2023) sets out guidance on how an ‘air quality neutral’ assessment should be undertaken. It also provides a methodology for calculating an offsetting payment if a development is not ‘air quality neutral’ and it is not possible to identify or agree appropriate and adequate mitigation.
- 4.25 Appendix A7 sets out the emissions benchmarks from the guidance. The approach has been to calculate the emissions from the development and to compare them with these benchmarks.

5 Baseline Conditions

Relevant Features

- 5.1 The proposed development is located on the southeastern side of Harefield Road and the surrounding area is characterised by a mix of uses, services, and facilities including residential, retail, civic and commercial uses. The application site is bordered by residential properties to the northeast and northwest.
- 5.2 The proposed development is located within an AQMA and an air quality Focus Area, as highlighted in Figure 1.

Local Air Quality Monitoring

- 5.3 LB of Hillingdon operates 12 automatic monitoring stations within its area, however, none of these are within the study area. The Council also operates a number of nitrogen dioxide monitoring sites using diffusion tubes prepared and analysed by Gradko International (using the 50% TEA in acetone method). These include monitors HILL02, HILL23 and HILL24, which are within approximately 1 km of the site. Annual mean results for the years 2016 to 2021 are summarised in Table 3. Exceedances of the objectives are shown in bold. The monitoring locations are shown in Figure 2. The monitoring data have been taken from LB of Hillingdon's 2021 Annual Status Report (LB of Hillingdon, 2022).

Table 3: Summary of Annual Mean NO₂ Monitoring (2016-2021) (µg/m³)

Site No.	Site Type	Location	2016	2017	2018	2019	2020	2021
HILL02	Roadside	Uxbridge Day Nursery, Park Road (on wire fence)	42.8	40.1	40.7	36.9	28.9	30.9
HILL23	Background	Harefield Road, Uxbridge	34.8	34.2	35.1	29.3	22.1	23.8
HILL24	Roadside	Hillingdon Road, Uxbridge	35.5	40.0	36.9	34.7	27.6	32.0
Objective			40					

^a Exceedances of the annual mean objectives are shown in bold

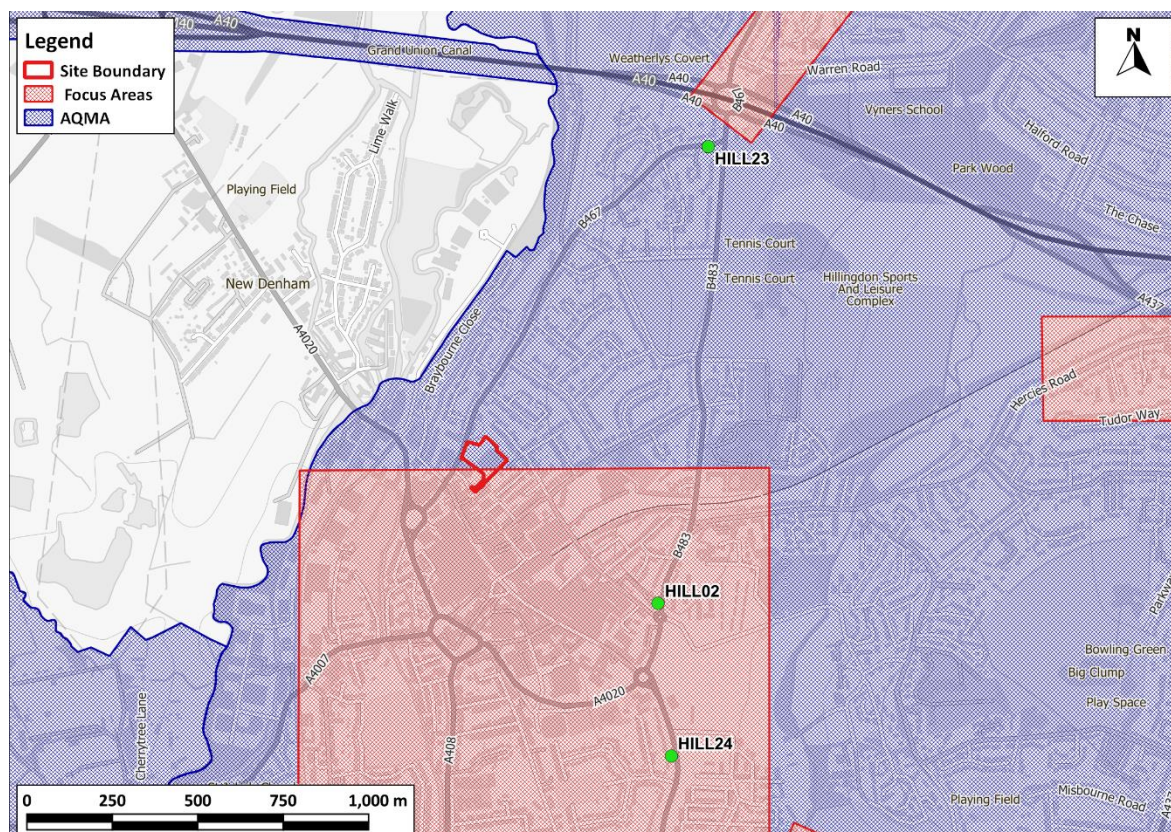


Figure 2: Monitoring Locations

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- 5.4 The annual mean nitrogen objective was exceeded from 2016 to 2018 at the HILL02 diffusion tube monitoring location, however the annual mean concentrations have remained below the objective since 2019. There have been no exceedances of the objective recorded at diffusion tubes HILL23 or HILL24.
- 5.5 Since the annual mean concentrations are below $60 \mu\text{g}/\text{m}^3$, the 1-hour nitrogen dioxide objective is unlikely to have been exceeded.
- 5.6 While 2020 and 2021 results have been presented in this Section for completeness, they are not relied upon in any way as they will not be representative of 'typical' air quality conditions due to the considerable impact of the Covid-19 pandemic on traffic volumes and thus pollutant concentrations.
- 5.7 No monitoring of PM_{10} or $\text{PM}_{2.5}$ is undertaken within 5 km of the proposed development.

Exceedances of Limit Value

- 5.8 There are several AURN monitoring sites within the Greater London Urban Area that have measured exceedances of the annual mean nitrogen dioxide limit value (Defra, 2023f). Furthermore, Defra's roadside annual mean nitrogen dioxide concentrations (Defra, 2023e), which are used to identify and report exceedances of the limit value, identify exceedances of this limit value in 2019 along many roads in London, including the A40 1.1 km north of the proposed development. The Greater London Urban Area has thus been reported as exceeding the limit value for annual mean nitrogen dioxide concentrations. Defra's predicted concentrations for 2024 (Defra, 2020) do not identify any exceedances along the A40 or anywhere within 1 km of the application site. As such, there is considered to be no risk of a limit value exceedance in the vicinity of the proposed development by the time that it is operational.
- 5.9 Defra's Air Quality Plan requires the GLA to prepare an action plan that will "*deliver compliance in the shortest time possible*", and the 2015 Plan assumed that a CAZ was required. The GLA has already implemented an LEZ and a ULEZ, thus the authority has effectively already implemented the required CAZ. These have been implemented as part of a package of measures including 12 Low Emission Bus Zones, Low Emission Neighbourhoods, the phasing out of diesel buses and taxis and other measures within the Mayor's Transport Strategy.

Background Concentrations

- 5.10 Estimated background concentrations at the proposed development are set out in Table 4 and are all well below the objectives. The annual mean PM_{2.5} concentration marginally exceeds the GLA target, as is commonplace throughout Greater London.

Table 4: Estimated Annual Mean Background Pollutant Concentrations in 2019 and 2024 (µg/m³)

Year	NO ₂	PM ₁₀	PM _{2.5}
2019	23.5	16.6	11.3
2024	19.2	15.4	10.4
Objective / GLA target	40	40	20/10 ^a

^a The 20 µg/m³ PM_{2.5} objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it. 10 µg/m³ is the GLA target for annual mean PM_{2.5}; again, there is no requirement for local authorities to meet this.

Baseline Dispersion Model Results

- 5.11 To be completed.

6 Construction Phase Impact Assessment

6.1 To be completed.

7 Operational Phase Impact Assessment

7.1 To be completed.

8 'Air Quality Neutral'

8.1 To be completed.

9 Mitigation

9.1 To be completed.

10 Residual Impacts

10.1 To be completed.

11 Conclusions

11.1 To be completed.

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13 Glossary

AADT	Annual Average Daily Traffic
ADMS-Roads	Atmospheric Dispersion Modelling System model for Roads
AQAL	Air Quality Assessment Level
AQC	Air Quality Consultants
AQMA	Air Quality Management Area
AURN	Automatic Urban and Rural Network
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EFT	Emission Factor Toolkit
EPUK	Environmental Protection UK
EV	Electric Vehicle
Exceedance	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
Focus Area	Location that not only exceeds the annual mean limit value for NO ₂ but also has a high level of human exposure
GLA	Greater London Authority
HDV	Heavy Duty Vehicles (> 3.5 tonnes)
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LB	London Borough
LDV	Light Duty Vehicles (<3.5 tonnes)
NO₂	Nitrogen dioxide
NPPF	National Planning Policy Framework
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
OLEV	Office for Low Emission Vehicles

PM₁₀	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
PM_{2.5}	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
PPG	Planning Practice Guidance
TEA	Triethanolamine – used to absorb nitrogen dioxide

14 Appendices

A1	London-Specific Policies and Measures.....	42
A2	Construction Dust Assessment Procedure.....	46
A3	EPUK & IAQM Planning for Air Quality Guidance.....	53
A4	Professional Experience	59
A5	Modelling Methodology	60
A6	London Vehicle Fleet Projections	61
A7	‘Air Quality Neutral’	63
A8	Construction Mitigation.....	64

A1 London-Specific Policies and Measures

London Plan

Design-led Approach

- A1.1 Policy D3 on optimising site capacity through the design-led approach states that “*development proposals should...help prevent or mitigate the impacts of noise and poor air quality*”. The explanatory text around this Policy states the following:

“Measures to design out exposure to poor air quality and noise from both external and internal sources should be integral to development proposals and be considered early in the design process. Characteristics that increase pollutant or noise levels, such as poorly-located emission sources, street canyons and noise sources should also be designed out wherever possible. Optimising site layout and building design can also reduce the risk of overheating as well as minimising carbon emissions by reducing energy demand”.

Development Plans

- A1.2 Policy SI 1 of the London Plan (GLA, 2021) states the following regarding strategic development plans:

“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.”

Preliminary Air Quality Assessment

- A1.3 The London Plan sets out expectations around the consideration of air quality in the design of all major developments:

“For major developments, a preliminary Air Quality Assessment should be carried out before designing the development to inform the design process. The aim of a preliminary assessment is to assess:

- *The most significant sources of pollution in the area*
- *Constraints imposed on the site by poor air quality*
- *Appropriate land uses for the site*
- *Appropriate design measures that could be implemented to ensure that development reduces exposure and improves air quality.*

Further assessments should then be carried out as the design evolves to ensure that impacts from emissions are prevented or minimised as far as possible, and to fully quantify the expected effect of any proposed mitigation measures, including the cumulative effect where other nearby developments are also underway or likely to come forward”.

London Environment Strategy

A1.4 The air quality chapter of the London Environment Strategy sets out three main objectives, each of which is supported by sub-policies and proposals. The Objectives and their sub-policies are set out below:

“Objective 4.1: Support and empower London and its communities, particularly the most disadvantaged and those in priority locations, to reduce their exposure to poor air quality.

- Policy 4.1.1 Make sure that London and its communities, particularly the most disadvantaged and those in priority locations, are empowered to reduce their exposure to poor air quality*
- Policy 4.1.2 Improve the understanding of air quality health impacts to better target policies and action*

Objective 4.2: Achieve legal compliance with UK and EU limits as soon as possible, including by mobilising action from London Boroughs, government and other partners

- Policy 4.2.1 Reduce emissions from London’s road transport network by phasing out fossil fuelled vehicles, prioritising action on diesel, and enabling Londoners to switch to more sustainable forms of transport*
- Policy 4.2.2 Reduce emissions from non-road transport sources, including by phasing out fossil fuels*
- Policy 4.2.3 Reduce emissions from non-transport sources, including by phasing out fossil fuels*
- Policy 4.2.4 The Mayor will work with the government, the London boroughs and other partners to accelerate the achievement of legal limits in Greater London and improve air quality*
- Policy 4.2.5 The Mayor will work with other cities (here and internationally), global city and industry networks to share best practice, lead action and support evidence based steps to improve air quality*

Objective 4.3: Establish and achieve new, tighter air quality targets for a cleaner London by transitioning to a zero emission London by 2050, meeting world health organization health-based guidelines for air quality

- *Policy 4.3.1 The Mayor will establish new targets for PM_{2.5} and other pollutants where needed. The Mayor will seek to meet these targets as soon as possible, working with government and other partners*
- *Policy 4.3.2 The Mayor will encourage the take up of ultra low and zero emission technologies to make sure London's entire transport system is zero emission by 2050 to further reduce levels of pollution and achieve WHO air quality guidelines*
- *Policy 4.3.3 Phase out the use of fossil fuels to heat, cool and maintain London's buildings, homes and urban spaces, and reduce the impact of building emissions on air quality*
- *Policy 4.3.4 Work to reduce exposure to indoor air pollutants in the home, schools, workplace and other enclosed spaces"*

A1.5 While the policies targeting transport sources are significant, there are less obvious ones that will also require significant change. In particular, the aim to phase out fossil-fuels from building heating and cooling and from NRMM will demand a dramatic transition.

Low Emission Zone (LEZ)

A1.6 The LEZ was implemented as a key measure to improve air quality in Greater London. It entails charges for vehicles entering Greater London not meeting certain emissions criteria, and affects diesel-engined lorries, buses, coaches, large vans, minibuses and other specialist vehicles derived from lorries and vans. Since 1 March 2021, a standard of Euro VI has applied for HGVs, buses and coaches, while a standard of Euro 3 has applied for large vans, minibuses and other specialist diesel vehicles since 2012.

Ultra Low Emission Zone (ULEZ)

A1.7 London's ULEZ was introduced on 8 April 2019 and expanded in August 2023. The ULEZ currently operates 24 hours a day, 7 days a week across all London Boroughs. All cars, motorcycles, vans and minibuses are required to meet exhaust emission standards (ULEZ standards) or pay an additional daily charge to travel within the zone. The ULEZ standards are Euro 3 for motorcycles, Euro 4 for petrol cars, vans and minibuses and Euro 6 for diesel cars, vans and minibuses. The ULEZ does not include any requirements relating to heavy vehicle (HGV, coach and bus) emissions, as these are addressed by the amendments to the LEZ described in Paragraph A1.6.

Other Measures

A1.8 Since 2018, all taxis presented for licencing for the first time had to be zero emission capable (ZEC). This means they must be able to travel a certain distance in a mode which produces no air pollutants, and all private hire vehicles (PHVs) presented for licensing for the first time had to meet Euro 6 emissions standards. Since January 2020, all newly manufactured PHVs presented for licensing for

the first time had to be ZEC (with a minimum zero emission range of 10 miles). The Mayor's aim is that the entire taxi and PHV fleet will be made up of ZEC vehicles by 2033.

A1.9 The Mayor has also proposed to make sure that TfL leads by example by cleaning up its bus fleet, implementing the following measures:

- TfL will procure only hybrid or zero emission double-decker buses from 2018;
- a commitment to providing 3,100 double decker hybrid buses by 2019 and 300 zero emission single-deck buses in central London by 2020;
- introducing 12 Low Emission Bus Zones by 2020;
- investing £50m in Bus Priority Schemes across London to reduce engine idling; and
- retrofitting older buses to reduce emissions (selective catalytic reduction (SCR) technology has already been fitted to 1,800 buses, cutting their NOx emissions by around 88%).

A2 Construction Dust Assessment Procedure

A2.1 The criteria developed by IAQM (2016), upon which the GLA's guidance is based, divide the activities on construction sites into four types to reflect their different potential impacts. These are:

- demolition;
- earthworks;
- construction; and
- trackout.

A2.2 The assessment procedure includes the four steps summarised below:

STEP 1: Screen the Need for a Detailed Assessment

A2.3 An assessment is required where there is a human receptor within 350 m of the boundary of the site and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s), or where there is an ecological receptor within 50 m of the boundary of the site and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

A2.4 Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is *negligible* and that any effects will be 'not significant'. No mitigation measures beyond those required by legislation will be required.

STEP 2: Assess the Risk of Dust Impacts

A2.5 A site is allocated to a risk category based on two factors:

- the scale and nature of the works, which determines the potential dust emission magnitude (Step 2A); and
- the sensitivity of the area to dust effects (Step 2B).

A2.6 These two factors are combined in Step 2C, which is to determine the risk of dust impacts with no mitigation applied. The risk categories assigned to the site may be different for each of the four potential sources of dust (demolition, earthworks, construction and trackout).

Step 2A – Define the Potential Dust Emission Magnitude

A2.7 Dust emission magnitude is defined as either 'Small', 'Medium', or 'Large'. The IAQM guidance explains that this classification should be based on professional judgement, but provides the examples in Table A2.1.

Table A2.1: Examples of How the Dust Emission Magnitude Class May be Defined

Class	Examples
Demolition	
Large	Total building volume >50,000 m ³ , potentially dusty construction material (e.g. concrete), on site crushing and screening, demolition activities >20 m above ground level
Medium	Total building volume 20,000 m ³ – 50,000 m ³ , potentially dusty construction material, demolition activities 10-20 m above ground level
Small	Total building volume <20,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10 m above ground, demolition during wetter months
Earthworks	
Large	Total site area >10,000 m ² , potentially dusty soil type (e.g. clay, which will be prone to suspension when dry to due small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes
Medium	Total site area 2,500 m ² – 10,000 m ² , moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m – 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes
Small	Total site area <2,500 m ² , soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <20,000 tonnes, earthworks during wetter months
Construction	
Large	Total building volume >100,000 m ³ , piling, on site concrete batching; sandblasting
Medium	Total building volume 25,000 m ³ – 100,000 m ³ , potentially dusty construction material (e.g. concrete), piling, on site concrete batching
Small	Total building volume <25,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber)
Trackout ^a	
Large	>50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m
Medium	10-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m
Small	<10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m

^a These numbers are for vehicles that leave the site after moving over unpaved ground.

Step 2B – Define the Sensitivity of the Area

A2.8 The sensitivity of the area is defined taking account of a number of factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;
- in the case of PM₁₀, the local background concentration; and
- site-specific factors, such as whether there are natural shelters to reduce the risk of wind-blown dust.

- A2.9 The first requirement is to determine the specific sensitivities of local receptors. The IAQM guidance recommends that this should be based on professional judgment, taking account of the principles in Table A2.2. These receptor sensitivities are then used in the matrices set out in Table A2.3, Table A2.4 and Table A2.5 to determine the sensitivity of the area. Finally, the sensitivity of the area is considered in relation to any other site-specific factors, such as the presence of natural shelters etc., and any required adjustments to the defined sensitivities are made.

Step 2C – Define the Risk of Impacts

- A2.10 The dust emission magnitude determined at Step 2A is combined with the sensitivity of the area determined at Step 2B to determine the *risk* of impacts with no mitigation applied. The IAQM guidance provides the matrix in Table A2.6 as a method of assigning the level of risk for each activity.

STEP 3: Determine Site-specific Mitigation Requirements

- A2.11 The IAQM guidance provides a suite of recommended and desirable mitigation measures which are organised according to whether the outcome of Step 2 indicates a low, medium, or high risk. The list provided in the IAQM guidance will be used as the basis for the requirements set out in Appendix A8.

STEP 4: Determine Significant Effects

- A2.12 The IAQM guidance does not provide a method for assessing the significance of effects before mitigation, and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant'.
- A2.13 The IAQM guidance recognises that, even with a rigorous dust management plan in place, it is not possible to guarantee that the dust mitigation measures will be effective all of the time, for instance under adverse weather conditions. The local community may therefore experience occasional, short-term dust annoyance. The scale of this would not normally be considered sufficient to change the conclusion that the effects will be 'not significant'.

Table A2.2: Principles to be Used When Defining Receptor Sensitivities

Class	Principles	Examples
Sensitivities of People to Dust Soiling Effects		
High	users can reasonably expect enjoyment of a high level of amenity; or the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land	dwellings, museum and other culturally important collections, medium and long term car parks and car showrooms
Medium	users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or the appearance, aesthetics or value of their property could be diminished by soiling; or the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land	parks and places of work
Low	the enjoyment of amenity would not reasonably be expected; or there is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land	playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads
Sensitivities of People to the Health Effects of PM₁₀		
High	locations where members of the public may be exposed for eight hours or more in a day	residential properties, hospitals, schools and residential care homes
Medium	locations where the people exposed are workers, and where individuals may be exposed for eight hours or more in a day.	may include office and shop workers, but will generally not include workers occupationally exposed to PM ₁₀
Low	locations where human exposure is transient	public footpaths, playing fields, parks and shopping streets
Sensitivities of Receptors to Ecological Effects		
High	locations with an international or national designation and the designated features may be affected by dust soiling; or locations where there is a community of a particularly dust sensitive species	Special Areas of Conservation with dust sensitive features
Medium	locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or locations with a national designation where the features may be affected by dust deposition	Sites of Special Scientific Interest with dust sensitive features
Low	locations with a local designation where the features may be affected by dust deposition	Local Nature Reserves with dust sensitive features

Table A2.3: Sensitivity of the Area to Dust Soiling Effects on People and Property ⁷

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

⁷ For demolition, earthworks and construction, distances are taken either from the dust source or from the boundary of the site. For trackout, distances are measured from the sides of roads used by construction traffic. Without mitigation, trackout may occur from roads up to 500 m from sites with a *large* dust emission magnitude for trackout, 200 m from sites with a *medium* dust emission magnitude and 50 m from sites with a *small* dust emission magnitude, as measured from the site exit. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

Table A2.4: Sensitivity of the Area to Human Health Effects ⁷

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

Table A2.5: Sensitivity of the Area to Ecological Effects ⁷

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

Table A2.6: Defining the Risk of Dust Impacts

Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

A3 EPUK & IAQM Planning for Air Quality Guidance

- A3.1 The guidance issued by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) is comprehensive in its explanation of the place of air quality in the planning regime. Key sections of the guidance not already mentioned above are set out below.

Air Quality as a Material Consideration

“Any air quality issue that relates to land use and its development is capable of being a material planning consideration. The weight, however, given to air quality in making a planning application decision, in addition to the policies in the local plan, will depend on such factors as:

- *the severity of the impacts on air quality;*
- *the air quality in the area surrounding the proposed development;*
- *the likely use of the development, i.e. the length of time people are likely to be exposed at that location; and*
- *the positive benefits provided through other material considerations”.*

Recommended Best Practice

- A3.2 The guidance goes into detail on how all development proposals can and should adopt good design principles that reduce emissions and contribute to better air quality management. It states:

“The basic concept is that good practice to reduce emissions and exposure is incorporated into all developments at the outset, at a scale commensurate with the emissions”.

- A3.3 The guidance sets out a number of good practice principles that should be applied to all developments that:

- include 10 or more dwellings;
- where the number of dwellings is not known, residential development is carried out on a site of more than 0.5 ha;
- provide more than 1,000 m² of commercial floorspace;
- are carried out on land of 1 ha or more.

- A3.4 The good practice principles are that:

- New developments should not contravene the Council's Air Quality Action Plan, or render any of the measures unworkable;
- Wherever possible, new developments should not create a new “street canyon”, as this inhibits pollution dispersion;

- Delivering sustainable development should be the key theme of any application;
- New development should be designed to minimise public exposure to pollution sources, e.g. by locating habitable rooms away from busy roads;
- The provision of at least 1 Electric Vehicle (EV) “rapid charge” point per 10 residential dwellings and/or 1000 m² of commercial floorspace. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made available;
- Where development generates significant additional traffic, provision of a detailed travel plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety;
- All gas-fired boilers to meet a minimum standard of <40 mgNO_x/kWh;
- Where emissions are likely to impact on an AQMA, all gas-fired CHP plant to meet a minimum emissions standard of:
 - Spark ignition engine: 250 mgNO_x/Nm³;
 - Compression ignition engine: 400 mgNO_x/Nm³;
 - Gas turbine: 50 mgNO_x/Nm³.
- A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of 275 mgNO_x/Nm³ and 25 mgPM/Nm³.

A3.5 The guidance also outlines that offsetting emissions might be used as a mitigation measure for a proposed development. However, it states that:

“It is important that obligations to include offsetting are proportional to the nature and scale of development proposed and the level of concern about air quality; such offsetting can be based on a quantification of the emissions associated with the development. These emissions can be assigned a value, based on the “damage cost approach” used by Defra, and then applied as an indicator of the level of offsetting required, or as a financial obligation on the developer. Unless some form of benchmarking is applied, it is impractical to include building emissions in this approach, but if the boiler and CHP emissions are consistent with the standards as described above then this is not essential”.

A3.6 The guidance offers a widely used approach for quantifying costs associated with pollutant emissions from transport. It also outlines the following typical measures that may be considered to offset emissions, stating that measures to offset emissions may also be applied as post assessment mitigation:

- Support and promotion of car clubs;
- Contributions to low emission vehicle refuelling infrastructure;
- Provision of incentives for the uptake of low emission vehicles;
- Financial support to low emission public transport options; and
- Improvements to cycling and walking infrastructures.

Screening

Impacts of the Local Area on the Development

“There may be a requirement to carry out an air quality assessment for the impacts of the local area’s emissions on the proposed development itself, to assess the exposure that residents or users might experience. This will need to be a matter of judgement and should take into account:

- the background and future baseline air quality and whether this will be likely to approach or exceed the values set by air quality objectives;*
- the presence and location of Air Quality Management Areas as an indicator of local hotspots where the air quality objectives may be exceeded;*
- the presence of a heavily trafficked road, with emissions that could give rise to sufficiently high concentrations of pollutants (in particular nitrogen dioxide), that would cause unacceptably high exposure for users of the new development; and*
- the presence of a source of odour and/or dust that may affect amenity for future occupants of the development”.*

Impacts of the Development on the Local Area

A3.7 The guidance sets out two stages of screening criteria that can be used to identify whether a detailed air quality assessment is required, in terms of the impact of the development on the local area. The first stage is that you should proceed to the second stage if any of the following apply:

- 10 or more residential units or a site area of more than 0.5 ha residential use; and/or
- more than 1,000 m² of floor space for all other uses or a site area greater than 1 ha.

A3.8 Coupled with any of the following:

- the development has more than 10 parking spaces; and/or
- the development will have a centralised energy facility or other centralised combustion process.

A3.9 If the above do not apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area. If they do apply then you proceed to stage 2, which sets out indicative criteria for requiring an air quality assessment. The stage 2 criteria relating to vehicle emissions are set out below:

- the development will lead to a change in LDV flows of more than 100 AADT within or adjacent to an AQMA or more than 500 AADT elsewhere;
- the development will lead to a change in HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere;
- the development will lead to a realigning of roads (i.e. changing the proximity of receptors to traffic lanes) where the change is 5m or more and the road is within an AQMA;
- the development will introduce a new junction or remove an existing junction near to relevant receptors, and the junction will cause traffic to significantly change vehicle acceleration/deceleration, e.g. traffic lights or roundabouts;
- the development will introduce or change a bus station where bus flows will change by more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere; and
- the development will have an underground car park with more than 100 movements per day (total in and out) with an extraction system that exhausts within 20 m of a relevant receptor.

A3.10 The criteria are more stringent where the traffic impacts may arise on roads where concentrations are close to the objective. The presence of an AQMA is taken to indicate the possibility of being close to the objective, but where whole authority AQMAs are present and it is known that the affected roads have concentrations below 90% of the objective, the less stringent criteria are likely to be more appropriate.

A3.11 On combustion processes (including standby emergency generators and shipping) where there is a risk of impacts at relevant receptors, the guidance states that:

“Typically, any combustion plant where the single or combined NO_x emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. As a guide, the 5 mg/s criterion equates to a 450 kW ultra-low NO_x gas boiler or a 30kW CHP unit operating at <95mg/Nm³.

In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates.

Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable”.

- A3.12 Should none of the above apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area, provided that professional judgement is applied; the guidance importantly states the following:

“The criteria provided are precautionary and should be treated as indicative. They are intended to function as a sensitive ‘trigger’ for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. This possibility will, self-evidently, not be realised in many cases. The criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement, bearing in mind that the objective is to identify situations where there is a possibility of a significant effect on local air quality”.

- A3.13 Even if a development cannot be screened out, the guidance is clear that a detailed assessment is not necessarily required:

“The use of a Simple Assessment may be appropriate, where it will clearly suffice for the purposes of reaching a conclusion on the significance of effects on local air quality. The principle underlying this guidance is that any assessment should provide enough evidence that will lead to a sound conclusion on the presence, or otherwise, of a significant effect on local air quality. A Simple Assessment will be appropriate, if it can provide this evidence. Similarly, it may be possible to conduct a quantitative assessment that does not require the use of a dispersion model run on a computer”.

- A3.14 The guidance also outlines what the content of the air quality assessment should include, and this has been adhered to in the production of this report.

Assessment of Significance

- A3.15 There is no official guidance in the UK in relation to development control on how to describe the nature of air quality impacts, nor how to assess their significance. The approach within the EPUK/IAQM guidance has, therefore, been used in this assessment. This approach involves a two stage process:

- a qualitative or quantitative description of the impacts on local air quality arising from the development; and
- a judgement on the overall significance of the effects of any impacts.

- A3.16 The guidance recommends that the assessment of significance should be based on professional judgement, with the overall air quality impact of the development described as either ‘significant’ or ‘not significant’. In drawing this conclusion, the following factors should be taken into account:

- the existing and future air quality in the absence of the development;
- the extent of current and future population exposure to the impacts;
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts;
- the potential for cumulative impacts and, in such circumstances, several impacts that are described as '*slight*' individually could, taken together, be regarded as having a significant effect for the purposes of air quality management in an area, especially where it is proving difficult to reduce concentrations of a pollutant. Conversely, a '*moderate*' or '*substantial*' impact may not have a significant effect if it is confined to a very small area and where it is not obviously the cause of harm to human health; and
- the judgement on significance relates to the consequences of the impacts; will they have an effect on human health that could be considered as significant? In the majority of cases, the impacts from an individual development will be insufficiently large to result in measurable changes in health outcomes that could be regarded as significant by health care professionals.

A3.17 The guidance is clear that other factors may be relevant in individual cases. It also states that the effect on the residents of any new development where the air quality is such that an air quality objective is not met will be judged as significant. For people working at new developments in this situation, the same will not be true as occupational exposure standards are different, although any assessment may wish to draw attention to the undesirability of the exposure.

A3.18 A judgement of the significance should be made by a competent professional who is suitably qualified. A summary of the professional experience of the staff contributing to this assessment is provided in Appendix A4.

A4 Professional Experience

Martin Peirce, BSc (Hons), MSc, MIEncSci, MIAQM

Mr Peirce is an Associate Director with AQC and has some thirty years' experience in environmental modelling and assessment, most relating to air quality and carbon and greenhouse gases (GHGs). He has extensive experience in the calculation of emissions to air and compiling emission inventories, for both local air quality assessments and carbon footprinting. For air quality, he also has extensive expertise in modelling the atmospheric dispersion of pollutants for comparison against regulatory limits and for assessment of health and environmental impacts. He has prepared assessments in support of Environmental Impact Assessments (EIA), permit applications and planning applications (under both Town and Country Planning Act (TCPA) and Development Consent Order (DCO) regimes), and has acted as expert witness. He has particular experience in modelling aviation and transport sources, non-road mobile machinery, construction and industrial sources.

Dr Imogen Heard, BSc (Hons) MSc PhD

Dr Heard is an Associate of AQC with over 12 years' experience in the field of air quality. She has been involved in numerous development projects including road schemes, energy from waste facilities, urban extensions and energy centres. These have included the use of ADMS-5 and ADMS-Roads dispersion models to study the impacts of a variety of pollutants, including nitrogen dioxide, PM₁₀ and PM_{2.5}, and the preparation of air quality assessment reports and air quality chapters for Environmental Statements. She also has experience in undertaking construction dust risk assessments, Air Quality Neutral assessments and human health risk assessments, as well as in preparing local authority reports. Prior to joining AQC she worked as a scientist in the Atmospheric Dispersion and Air Quality area at the UK Met Office for four years, modelling the dispersion of a range of pollutants over varying spatial and temporal scales.

Dr Wale Abiye, MIENVSC MIAQM

Dr Abiye is an Assistant Consultant with AQC and joined the company in 2022. Prior to joining the company, he worked as a Research Fellow in Nigeria. He obtained his master's and PhD degrees from Obafemi Awolowo University, Ile-Ife, Nigeria. He is experienced in monitoring urban air pollution and analysing its chemical constituents, as well as using dispersion modelling to assess air quality. He is nominated to the United Nations Framework Convention on Climate Change's Rosters of Experts.

A5 Modelling Methodology

A5.1 To be completed.

A6 London Vehicle Fleet Projections

- A6.1 TfL has published an Integrated Impact Assessment (Jacobs, 2017) setting out the impacts of the changes to the LEZ and ULEZ described in Paragraphs A1.6. The assessment predicts that the changes will reduce overall NO_x emissions from vehicles in London by 28% in 2021 (32% in Inner London and 27% in Outer London) and by 21% in 2025 (24% in Inner London and 21% in Outer London). The percentage reduction reduces with time due to the natural turnover of the fleet that would have occurred regardless of the introduction of the proposed changes. The proposed changes will not significantly affect emissions in Central London, where the ULEZ will already be implemented, but concentrations here will still reduce due to the lower emissions in surrounding areas.
- A6.2 The report projects that the changes will reduce exposure to exceedances of the annual mean nitrogen dioxide objective by 40% and 21% in Central London in 2021 and 2025, respectively; by 4% and 0% in Inner London in 2021 and 2025, respectively; and by 23% and 27% in Outer London in 2021 and 2025, respectively, when compared to the baseline scenario.
- A6.3 The changes are not projected to have a significant effect on PM₁₀ and PM_{2.5} concentrations, although a small reduction is predicted.
- A6.4 AQC's report on the performance of Defra's EFT (AQC, 2020b) also highlighted that the EFT's assumptions regarding future fleet composition in London and across the UK may be over-pessimistic in terms of NO_x emissions (and no changes to the fleet mix within London were made between versions 9 and 10 of the EFT). The future fleet projection derived from the EFT for Outer London, for example, shows a very small reduction in the proportion of diesel cars between 2016 and 2030, and a very limited uptake of electric cars. The AQC report highlights that this contrasts with the expectations of many observers, as well as the most recent trends publicised by the media. When considered alongside the future requirements of the LEZ and ULEZ, these future fleet projections seem all the more unrealistic (i.e. worst-case in terms of emissions), as the changes to the LEZ and ULEZ would reasonably be expected to significantly increase the uptake of lower emissions vehicles in London.
- A6.5 The changes to the LEZ and ULEZ announced by the Mayor of London in June 2018 are not reflected in Defra's latest EFT and thus have not been considered in this assessment. The potentially over-pessimistic fleet projections built in to the EFT have not been addressed in this report either. Paragraphs A6.1 and A6.2 highlight that the changes to the LEZ and ULEZ will result in significant reductions in vehicle nitrogen oxides emissions and resultant nitrogen dioxide concentrations. The changes might reasonably also be expected to expedite the uptake of cleaner vehicles well beyond that projected in the EFT's fleet projections for London. As such, while the results presented in this report represent a reasonably conservative reflection of likely concentrations and impacts in the

absence of the changes to the LEZ and ULEZ, they almost certainly represent an unrealistically worst-case assessment of likely concentrations and impacts bearing in mind the implementation of these changes.

A7 'Air Quality Neutral'

- A7.1 The GLA's London Plan Guidance; Air Quality Neutral (GLA, 2023) provides an approach to assessing whether a development is air quality neutral. The approach is to compare the expected emissions from the building's energy use and vehicle trips against defined benchmarks for buildings and transport in London. This assessment will be undertaken and results presented.

A8 Construction Mitigation

A8.1 To be completed.