

Air Quality Assessment

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1 INTRODUCTION

1.1 Scope

GEM Air Quality Ltd has been commissioned to undertake a detailed air quality assessment based on the potential impacts of existing and future air quality on a proposed independent school at 62 London Road in Reading.

The pollutants modelled as part of this assessment are nitrogen oxides (NO_x) and particulate matter (PM₁₀ and PM_{2.5})

The impacts of vehicle emissions have been assessed using the techniques detailed within Volume 11, Section 3 of the Design Manual for Roads and Bridges (DMRB)¹ and the Local Air Quality Management Technical Guidance (TG22)². The impact of road traffic emissions will be assessed using the ADMS-Roads air dispersion model. This model has been devised by Cambridge Environmental Research Consultants (CERC) and is described as a “*comprehensive tool for investigating air pollution problems due to small networks of roads*”.

It should be noted that the short-term impacts of NO₂ and PM₁₀ emissions have not been modelled as dispersion models are inevitably poor at predicting short-term peaks in pollutant concentrations, which are highly variable from year to year, and from site to site. Notwithstanding this, general assumptions have been made about short term concentrations based on the modelled annual mean concentrations.

¹ Design Manual for Roads and Bridges, Vol 11, Section 3, Part 1 – HA207/07, Highways Agency, May 2007

² Part IV of the Environment Act 1995, Local Air Quality Management Technical Guidance (TG22), Defra, August 2022



2 POLLUTANTS & LEGISLATION

2.1 Pollutant Overview

In most urban areas of the UK, traffic generated pollutants have become the most common pollutants. These are nitrogen dioxide (NO₂), fine particulates (PM₁₀), carbon monoxide (CO), 1,3-butadiene and benzene, as well as carbon dioxide (CO₂). This air quality assessment focuses on NO₂ and PM₁₀, as these pollutants are least likely to meet their Air Quality Strategy objectives near roads. Table 1 provides an overview of NO₂ and PM₁₀.

Table 1 – Overview of NO₂ and PM₁₀

Pollutant	Properties	Anthropogenic Sources	Natural Sources	Potential Effects
Particles (PM₁₀)	Tiny particulates of solid or liquid nature suspended in the air	Road transport; Power generation plants; Production processes e.g. windblown dust	Soil erosion; Volcanoes; Forest fires; Sea salt crystals	Asthma; Lung cancer; Cardiovascular problems
Nitrogen Dioxide (NO₂)	Reddish-brown coloured gas with a distinct odour	Road transport; Power generation plants; Fossil fuels – extraction & distribution; Petroleum refining	No natural sources, although nitric oxide (NO) can form in soils	Pulmonary edema; Various environmental impacts e.g. acid rain

2.2 Air Quality Strategy

The UK Government and the devolved administrations published the latest Air Quality Strategy for England, Scotland, Wales and Northern Ireland on 17 July 2007³. The Strategy provides an over-arching strategic framework for air quality management in the UK.

With regards to this assessment, the Air Quality Strategy contains national air quality standards and objectives established by the Government to protect human health. The objectives for nitrogen dioxide and particulates (PM₁₀ and PM_{2.5}) have been set, along with seven other pollutants (benzene, 1,3-butadiene, carbon monoxide, lead, PAHs, sulphur dioxide and ozone). Those which are limit values required by EU Daughter Directives on Air Quality have been transposed into UK law through the Air Quality Standards (Amendment) Regulations 2016, which came into force on 31st December 2016. Table 2 provides the UK Air Quality Objectives for NO₂ and PM₁₀.

³ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Department for Environment, Food and Rural Affairs in partnership with the Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland, July 2007



Table 2 – UK Air Quality Objectives for Nitrogen Dioxide and Particulates

Pollutant	Objective	Concentration measured as	Obligation
Particles (PM₁₀)	50µg/m ³ not to be exceeded more than 35 times a year	24 hour mean	All local authorities
	50µg/m ³ not to be exceeded more than 7 times a year	24 hour mean	Scotland only
	40µg/m ³	Annual mean	All local authorities
	10µg/m ³	Annual mean	Scotland only
Particles (PM_{2.5})	20µg/m ³ ^(a)	Annual Mean	England only (encouraged in Wales)
	10µg/m ³	Annual Mean	Scotland only
Nitrogen Dioxide (NO₂)	200µg/m ³ not to be exceeded more than 18 times a year	1 hour mean	All local authorities
	40µg/m ³	Annual mean	All local authorities
(a) The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 is an amendment to the existing regulations and reduces the threshold for PM _{2.5} from 25 µg/m ³ to 20 µg/m ³ .			

2.3 Clean Air Strategy

The Clean Air Strategy⁴ was published in January 2019 and sets out the comprehensive action that is required from across all parts of government and society to tackle all sources of air pollution. New legislation will create a stronger and more coherent framework for action to tackle air pollution. This will be underpinned by new England-wide powers to control major sources of air pollution, in line with the risk they pose to public health and the environment, plus new local powers to take action in areas with an air pollution problem. These will support the creation of Clean Air Zones to lower emissions from all sources of air pollution, backed up with clear enforcement mechanisms.

2.4 Local Air Quality Management

At the core of LAQM delivery are three pollutant objectives; these are: nitrogen dioxide (NO₂), particulate matter (PM₁₀) and sulphur dioxide (SO₂). All current Air Quality Management Areas (AQMAs) across the UK are declared for one or more of these pollutants, with NO₂ accounting for the majority. It is a statutory requirement for local authorities to regularly review and assess air quality in their area and take action to improve air quality when objectives set out in regulation cannot be met.

⁴ Clean Air Strategy 2019, Department for Environment, Food and Rural Affairs, January 2019



2.4.1 Reading Borough Council

The Council has declared an Air Quality Management Area (AQMA). The AQMA encompasses Reading Town Centre, areas along the major radial road routes into Reading (including J11 of the M4) and along the railway lines where they pass through built-up areas. The proposed development is located within the AQMA.



3 PLANNING POLICY & GUIDANCE

3.1 National Planning Policy & Guidance

3.1.1 National Planning Policy Framework

On a national level, air quality can be a material consideration in planning decisions. The updated National Planning Policy Framework (NPPF) for England, released in July 2021, is considered a key part of the Governments reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth.

Paragraph 105 within the NPPF states that the *“The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making”*.

It goes on to state in paragraph 186 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”*.

3.1.2 Planning Practice Guidance (PPG)

The NPPF is supported by the national Planning Practice Guidance (PPG), which includes guiding principles on how planning can take account of the impacts of new development on air quality (updated November 2019). The PPG states that *“Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with EU Limit Values”* and *“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”*. The role of the local authorities is covered by the LAQM regime, with the PPG stating that local authority Air Quality Action Plans *“identify measures that will be introduced in pursuit of the objectives”*. The PPG makes clear that *“Odour and dust can also be a planning concern, for example, because of the effect on local amenity”*.



The PPG also 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”*.

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”*. It 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”*.

3.1.3 Land-Use Planning & Development Control

In January 2017, Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) produced guidance to ensure that air quality is adequately considered in the land-use planning and development control processes⁵.

The guidance document is particularly applicable to assessing the effect of changes in exposure of members of the public resulting from residential and mixed-use developments, especially those within urban areas where air quality is poorer. It is also relevant to other forms of development where a proposal could affect local air quality and for which no other guidance exists.

⁵ Land-Use Planning & Development Control: Planning for Air Quality. Guidance from Environmental Protection UK and the Institute of Air Quality Management for the consideration of air quality within the land-use planning and development control processes. EPUK & IAQM. January 2017



4 ASSESSMENT METHODOLOGY

4.1 Operational Phase (Traffic Emissions)

4.1.1 Modelled Scenarios

Two scenarios have been modelled as part of this assessment. These are as follows:

- **Scenario 1 (2022)** – existing levels of air quality / model verification; and
- **Scenario 2 (2025)** – future impact of traffic emissions on the proposed development i.e. introduction of new exposure.

A future year has been chosen (2025) representing the earliest full year when the development is likely to be completed and occupied.

4.1.2 ADMS-Roads

Modelling the impact of traffic emissions on the proposed development will be undertaken using the latest version of the ADMS-Roads model⁶. ADMS-Roads is significantly more advanced than that of most other air dispersion models in that it incorporates the latest understanding of the boundary layer structure, and goes beyond the simplistic Pasquill-Gifford stability categories method with explicit calculation of important parameters. The model uses advanced algorithms for the height-dependence of wind speed, turbulence and stability to produce improved predictions.

4.1.3 Emission Factors

Defra and the Devolved Administrations have provided an updated Emission Factors Toolkit (Version 12.0.1) which incorporates updated NO_x emissions factors and vehicle fleet information⁷. These emission factors have been integrated into the latest ADMS-Roads modelling software.

The Institute for Air Quality Management (IAQM) released a position statement in July 2018 relating to uncertainties in vehicle NO_x emissions within air quality assessments. It states the following:

“It has been known since around 2011 that nitrogen oxides (NO_x) emissions from diesel vehicles have not declined as expected despite the introduction of increasingly more stringent European Union (EU) emission limits since the early 1990s. This, together with an increase in numbers of diesel cars and the use of emission control devices that increase the proportion of the nitrogen dioxide (NO₂) in the exhaust NO_x, has resulted in annual mean concentrations of NO₂ remaining high, particularly at roadside locations”.

⁶ Model Version: 5.0.0.1. Interface Version 5.0.0.5313 (16/03/2020)

⁷ https://iaqm.defra.gov.uk/wp-content/uploads/2023/12/EFT2023_v12.0.1.xlsb



However, the IAQM position statement has now been withdrawn and the following statement has been published by the IAQM:

“There is a growing body of evidence to suggest that the latest COPERT vehicle emission factors, which feed into the EFT (v9 and onwards), reflect the real-world NOx emissions more accurately.

It is judged that an exclusively vehicle emissions-based sensitivity test is no longer necessary.

On this basis, the EFT may be used for future year modelling with greater confidence when considering the per vehicle emission, provided that the assessment is verified against measurements made in the year 2016 or later”.

As such, Scenario 2 has been modelled with vehicle emission factors for 2025 derived from the latest Emission Factors Toolkit.

4.1.4 Traffic Data

Baseline flows along the A4 London Road are available from the Department for Transport (DfT)⁸. Baseline (2022) data from the DfT has been projected to 2025. Projection of traffic data has been undertaken using growth factors specific to Reading Borough Council, obtained from TEMPro⁹. The projected flow rates are provided in Table 3. It is assumed that the percentage HDV and speed will remain unchanged in future years. The A329 Kings Road has been modelled for the purposes of model verification.

Table 3 – Annual Average Daily Traffic Flows, Percentage HDV and Speeds for Modelled Roads, 2022 and 2025

Link Name	AADT 2022	AADT 2025	HDV (%)	Speed (kph)
A4 London Road	11,550	12,148	3.7%	48
A329 Kings Road	17,236	18,129	6.2%	48

For the modelled speeds, the figures provided above have been used. However, where a link approaches a junction a speed of 20 kph has been modelled to represent queuing traffic at a junction.

4.1.5 Street Canyons

A street canyon may be defined as a relatively narrow street with buildings on both sides, where the height of the buildings is generally greater than the width of the road. Street canyons may result in elevated pollutant concentrations from road traffic emissions due to a

⁸ <http://www.dft.gov.uk/traffic-counts/>

⁹ TEMPro (Trip End Model Presentation Program) version 7.2, Department for Transport



reduced likelihood of the pollutants becoming dispersed in the atmosphere. Street canyons have not been modelled as part of this assessment.

4.2 Background Concentrations

Background NO_x, NO₂ and PM₁₀ concentrations have been obtained from Defra¹⁰. These 1 km x 1 km grid resolution maps are derived from a base year of 2018 (for NO_x, NO₂, PM₁₀ and PM_{2.5} only), which are the projected to the relevant years (2022 and 2025). Background concentrations of NO_x, NO₂ and PM₁₀ derived from Defra are provided in Table 4.

Table 4 – Background NO_x, NO₂ and PM Concentrations

Pollutant	X	Y	2022	2025
NO ₂	472500	173500	21.6	20.2
NO _x			32.3	29.9
PM ₁₀			16.4	15.9
PM _{2.5}			11.4	10.9

4.3 Surface Roughness

A surface roughness of 1.0 metre has been used in the model. This value is provided by ADMS-Roads as a typical roughness length for a city. This value has been used across the modelled domain.

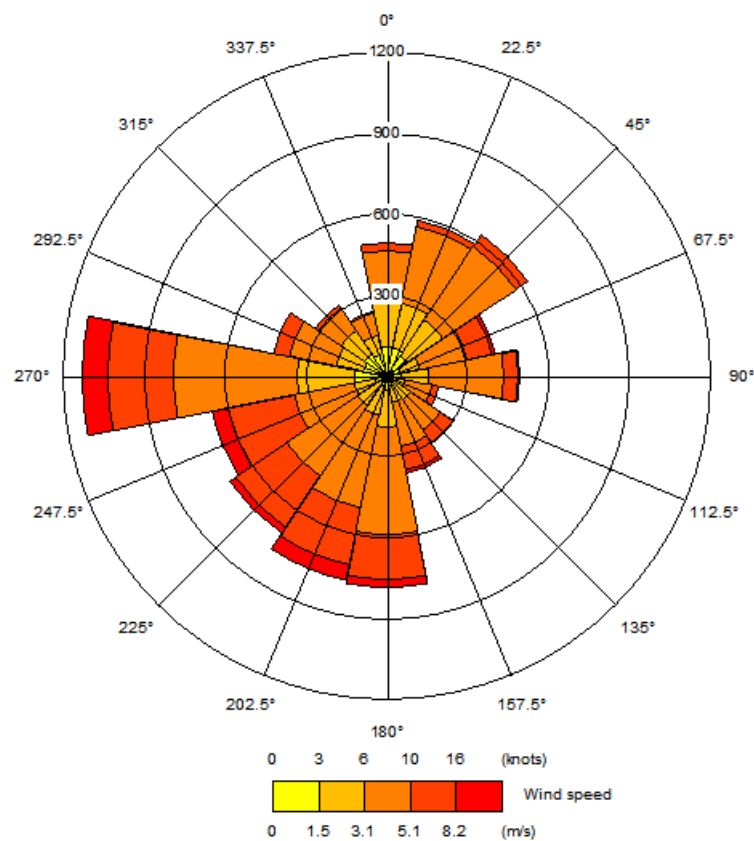
¹⁰ <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>



4.4 Meteorological Data

Hourly sequential meteorological data from the London Heathrow Airport meteorological station has been used. Wind speed and direction data from the London Heathrow Airport meteorological station has been plotted as a wind rose in Figure 1.

Figure 1 – Wind Speed and Direction Data, London Heathrow Airport (2022)



4.5 Model Output

4.5.1 NO_x/NO₂ Relationship

The most NO_x to NO₂ calculator¹¹ has been used to determine NO₂ concentrations for this assessment, based on predicted NO_x concentrations using ADMS-Roads. Converted NO₂ concentrations are initially compared against local monitoring data to verify the model output. If the model performance is considered unacceptable then the NO_x concentrations are adjusted before conversion to NO₂.

4.5.2 Predicted Short Term Concentrations

As discussed in the introduction, it has not been possible to model the short-term impacts of NO₂ and PM₁₀. Research¹² has indicated that the hourly NO₂ objective is unlikely to be exceeded at a roadside location where the annual mean NO₂ concentration is less than 60 µg/m³. A concentration of 60 µg/m³ has therefore been used to screen the likelihood of exceedance of the hourly mean NO₂ objective.

For PM₁₀, a relationship between the annual mean and the number of 24-hour mean exceedences has been devised and is as follows:

- No. 24-hour mean exceedences = $-18.5 + 0.00145 \times \text{annual mean}^3 + (206/\text{annual mean})$

This relationship has been applied to the modelled annual mean concentrations to estimate the number of 24-hourly exceedences.

4.5.3 Model Verification

The Council undertakes monitoring of NO₂ along the A329 Kings Road. These are the closest roadside monitoring sites to the proposed development. The location of the verification sites is provided in Table 5. Given that the performance of ADMS-Roads improves with increased distance from a road source and at lower measured concentrations the monitoring site located at 276 Kings Road has not been included as part of the model verification process.

Table 5 – Modelled Verification Locations

Site ID	Location	X	Y	Height (m)
V1	181 Kings Road	472513	173281	2.3
V2	Charles Place, 246 Kings Road	472592	173253	2.3

¹¹ https://laqm.defra.gov.uk/documents/NOx_to_NO2_Calculator_v8.1.xlsm

¹² Analysis of Relationship between 1-Hour and Annual Mean Nitrogen Dioxide at UK Roadside and Kerbside Monitoring Sites, Laxen and Marner, 2003



4.5.4 Receptor Locations

To assess the potential impact of the traffic emissions from the local road network, several receptors have been identified representing the different facades of the proposed development. The location of these receptors, together with their height above ground level is provided in Table 6 and represented in Figure 2.

Table 6 – Modelled Receptor Locations

AQA ID	X	Y	Description	Height (m)
1	472667	173050	Proposed Ground Floor Receptors	1.5
2	472675	173054		
3	472683	173053		
4	472673	173037		
5	472687	173045		
6	472685	173031		

Figure 2 – Modelled Receptor Locations



4.6 Significance Criteria

4.6.1 Operational Phase

The significance of emissions will be determined by comparing the predicted results to the Air Pollution Exposure Criteria (APEC) detailed in the *Air Quality and Planning Guidance* written by the London Air Pollution Planning and the Local Environment (APPLE) working group¹³. The Air Pollution Exposure Criteria is considered appropriate to describe the significance of the impacts predicted, together with an indication as to the level of mitigation required in order for the development to be approved. The APEC table is provided below.

Table 7 – Air Pollution Exposure Criteria (APEC)

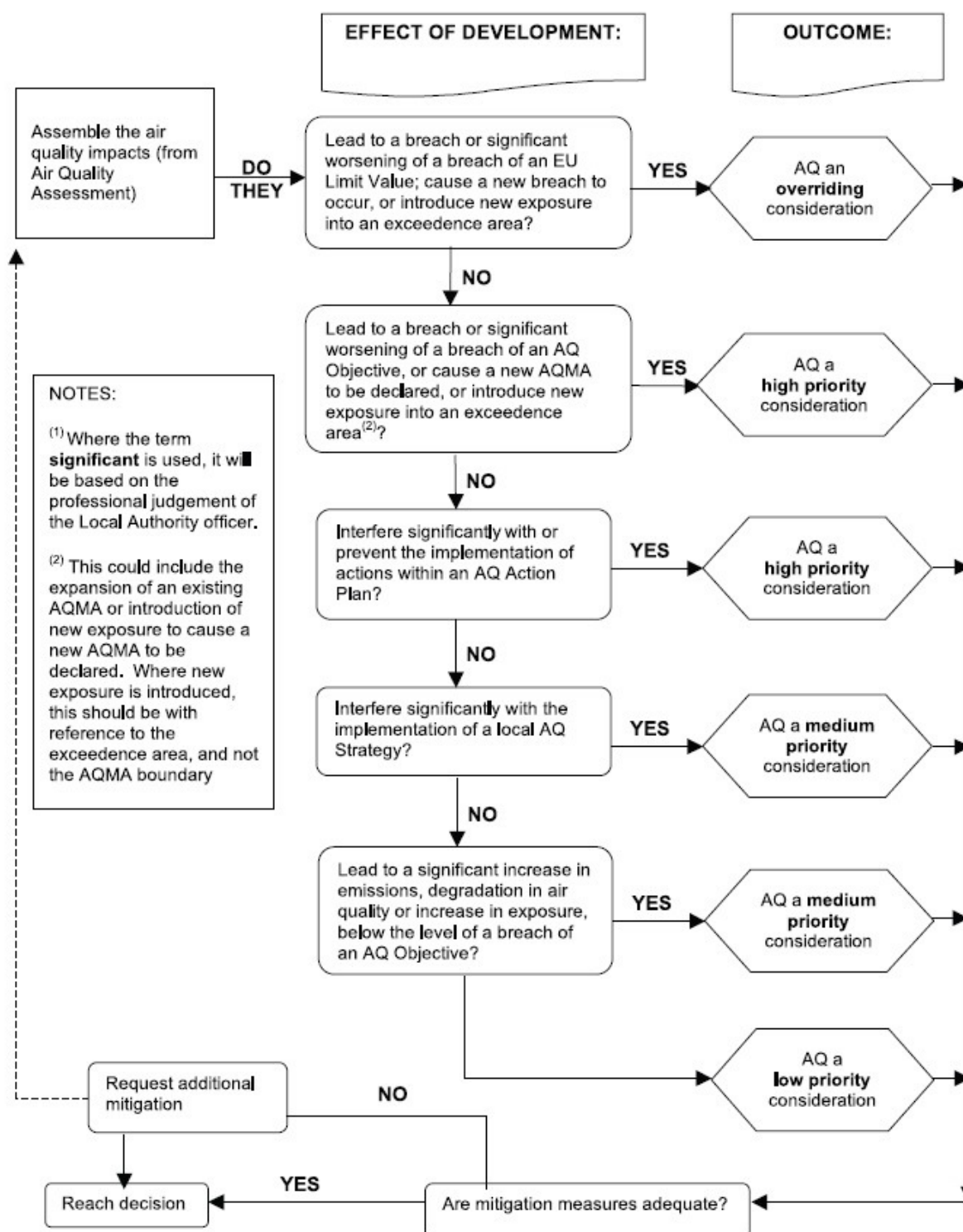
APEC Category	NO ₂	PM ₁₀	Recommendations
A	>5% below national annual mean objective	>5% below national annual mean objective >1-day less than national 24-hour objective	No air quality grounds for refusal; however mitigation of any emissions should be considered.
B	Between 5% below or above national annual mean objective	Between 5% above or below national annual mean objective Between 1-day above or below national 24-hour objective	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered
C	>5% above national annual mean objective	>5% above national annual mean objective >1-day more than national 24-hour objective	Refusal on air quality grounds should be anticipated, unless the Local Authority has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated

Furthermore, the guidance released by Environmental Protection UK also provides steps for a Local Authority to follow to assess the significance of air quality impacts of a development proposal. This procedure, shown in Figure 4, has also been applied to the modelled results.

¹³ Air Quality and Planning Guidance, written by the London Air Pollution Planning and the Local Environment (APPLE) working group, January 2007



Figure 3 – Assessing the Significance of Air Quality Impacts of a Development Proposal



5 AIR QUALITY ASSESSMENT

5.1 Impact of Vehicle Emissions

5.1.1 Model Verification

Using the guidance provided in Local Air Quality Management (LAQM) Technical Guidance (TG22), the modelled output has been verified against the monitoring data obtained from the sites listed in Table 5. The following tables provide a summary of the model verification process for NO_x/NO₂ concentrations.

Table 8 – Comparison of Modelled and Monitored NO₂ Concentrations (µg/m³), 2022

Site ID	Modelled Concentration	Monitored Concentration	Difference [(modelled - monitored)/monitored] x100
V1	24.7	32.7	-24.6%
V2	24.0	32.1	-25.1%

As described in the Technical Guidance (TG22), to provide more confidence in the model predictions and the decisions based on these, the majority of results should be within ±25% (ideally ±10%) of the monitored concentrations. To improve the confidence in modelled concentrations across the modelled domain the model output has been adjusted. This is described further in the next section.

5.1.2 Model Adjustment

To undertake model adjustment, it is first necessary to derive the monitored and modelled road contributions of NO_x (excluding background). The modelled road contribution NO_x is taken directly from the ADMS-Roads output before it has been converted to NO₂ using the NO_x to NO₂ calculator described in Section 4.6.1. The NO_x to NO₂ calculator can also be used to derive monitored road contributions of NO_x from NO₂ diffusion tube results. A summary of these calculations is provided in Table 9.



Table 9 – Monitored NO_x and NO₂ concentrations

Site ID	Monitored Total NO ₂	Defra Background NO ₂	Monitored road contribution NO ₂ (total – background)	Monitored road contribution NO _x (total – background)	Modelled road contribution NO _x (excludes background)	Ratio of monitored road contribution NO _x / modelled road contribution NO _x
V1	32.7	21.6	11.1	22.1	5.9	3.8
V2	32.1	21.6	10.5	20.9	4.7	4.5
Average						4.11

Once the monitored and modelled road contributions of NO_x (excluding background) have been derived the contributions of NO_x are compared and a ratio derived. In this case the ratio is 4.11 and this factor has been used to adjust the modelled road contribution of NO_x. This is shown in Table 10.

Table 10 – Adjustment of Modelled NO_x Contributions

Site ID	Adjustment factor for modelled road contribution	Adjusted modelled road contribution NO _x	Modelled total NO ₂ (based on empirical NO _x /NO ₂ relationship)	Monitored total NO ₂	% Difference [(modelled – monitored) / monitored] x 100
V1	4.11	24.1	33.7	32.7	2.9%
V2	4.11	19.2	31.3	32.1	-2.4%

Following adjustment of the modelled NO_x concentrations by a factor of 4.11 the total NO₂ concentration at the model verification location has been calculated using the method described in Section 4.6.1. The revised NO₂ concentration, shown in Table 10, indicates a more acceptable model performance when compared against the monitored NO₂ concentrations. As such, an adjustment factor of 4.11 has been applied to all modelled NO_x concentrations across the model domain before conversion to NO₂.



5.1.3 Nitrogen Dioxide

Predicted annual mean concentrations for NO₂ in 2022 and 2025 are provided in Table 11. As mentioned in Section 4.6.1, NO₂ concentrations have been calculated from the predicted NO_x concentrations using the latest NO_x-NO₂ conversion spreadsheet available from the Air Quality Archive.

Table 11 – Predicted NO₂ Concentrations, Annual Mean (µg/m³)

Receptor ID	2022	2025
1	25.5	23.2
2	25.8	23.4
3	25.5	23.2
4	24.4	22.3
5	24.7	22.5
6	23.9	22.0
Objective	40.0	

The ADMS predictions for annual mean NO₂ concentrations in 2022 and 2025 indicate that the annual mean objective (40 µg/m³) would be achieved at all modelled receptors.

Nitrogen dioxide also has an hourly objective of 200 µg/m³ not to be exceeded more than 18 times in one year. However, the hourly mean concentration has not been calculated directly by ADMS Roads. This is as a result of an evaluation of continuous monitoring data from across the UK that revealed that the relationship between the annual mean and hourly mean NO₂ concentrations was very weak. Nonetheless, research undertaken in 2003¹⁴ has indicated that the hourly NO₂ objective is unlikely to be exceeded at a roadside location where the annual mean NO₂ concentration is less than 60 µg/m³. Given that predicted NO₂ concentrations in 2022 and 2025 are below 60 µg/m³ the short-term objective for NO₂ is unlikely to be exceeded.

¹⁴ Analysis of Relationship between 1-Hour and Annual Mean Nitrogen Dioxide at UK Roadside and Kerbside Monitoring Sites, Laxen and Marner, 2003



5.1.4 Particulate Matter

Predicted annual mean concentrations for PM₁₀ in 2022 and 2025 are provided in Table 12.

Table 12 – Predicted PM₁₀ Concentrations, Annual Mean (µg/m³)

Receptor ID	2022	2025
1	16.7	16.2
2	16.7	16.2
3	16.7	16.2
4	16.6	16.1
5	16.6	16.1
6	16.6	16.1
Objective	40.0	

The ADMS predictions for annual mean PM₁₀ concentrations in 2022 and 2025 indicate that the annual mean objective (40 µg/m³) would be achieved at all the modelled receptor locations. In addition, the maximum number of days when PM₁₀ concentrations are more than 50 µg/m³ is 1, less than the 35 exceedences allowed in the regulations.

Predicted annual mean concentrations for PM_{2.5} in 2022 and 2025 are provided in Table 13. The ADMS predictions for annual mean PM_{2.5} concentrations in 2022 and 2025 indicate that the annual mean objective (20 µg/m³) would be achieved at all the modelled receptor locations.

Table 13 – Predicted PM_{2.5} Concentrations, Annual Mean (µg/m³)

Receptor ID	2022	2025
1	11.5	11.0
2	11.6	11.1
3	11.5	11.0
4	11.5	11.0
5	11.5	11.0
6	11.5	11.0
Objective	20.0	



6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Impact of Vehicle Emissions

The predicted concentrations of NO₂ and PM in all modelled years are below the relevant objectives. Predicted concentrations at all the modelled receptors fall within APEC Category A, which states that there are “no air quality grounds for refusal, however, mitigation of any emissions should be considered”. Overall, using the flow chart presented in Figure 4, air quality is a low priority consideration at the modelled locations in each of the modelled years.

6.1.1 Building Mitigation

Based on the results and discussion above there is no need to consider building mitigation, such as mechanical ventilation.

6.2 Overall Conclusion

Based on the outcome of this assessment the current proposals are considered acceptable in terms of the potential air quality impacts across the development.

