Air Quality CONSULTANTS

Air Quality Assessment:
108 Palatine Road, Manchester

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Experts in air quality management & assessment

Document Control

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Executive Summary

The air quality impacts associated with the proposed residential development at 108 Palatine Road in Manchester have been assessed. The proposed development will consist of 37 dwellings for retirement accommodation.

The proposed development will lead to changes in vehicle flows on the local road network; however, the assessment has shown that these flows will be below recognised screening thresholds and thus the effect of the proposed development upon local air quality will be 'not significant'.

The suitability of the site for its proposed residential use has also been considered. Pollutant concentrations will be below the air quality objectives and air quality for future residents will thus be acceptable.

Overall, the operational air quality effects of the proposed development are judged to be 'not significant'.

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1 Introduction

1.1 This report describes the potential air quality impacts associated with the proposed residential development at 108 Palatine Road in Manchester. The proposed development will consist of 37 dwellings for retirement accommodation.

1.2 It lies adjacent to an Air Quality Management Area (AQMA) declared by the Greater Manchester Combined Authority (GMCA)[1] for exceedances of the annual mean nitrogen dioxide (NO_2) objective. The proposed development will introduce new residential exposure into this area of potentially poor air quality, thus an air quality assessment is required to determine the air quality conditions that future residents will experience. It will also lead to changes in 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 NO_2 and fine particulate matter (PM_{10} and $PM_{2.5}$).

1.3 The proposed development will utilise an all-electric energy strategy; as such, there will be no point sources of emissions within the proposed development.

1.4 The location of the proposed development is shown in Figure 1, along with the nearby GMCA AQMA boundary.

1.5 This report describes existing local air quality conditions in the vicinity of the proposed development and considers air quality conditions in the future year of 2026, which is the anticipated year of first occupation.

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

[1] The GMCA is made up of the ten Greater Manchester councils which are: Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan.

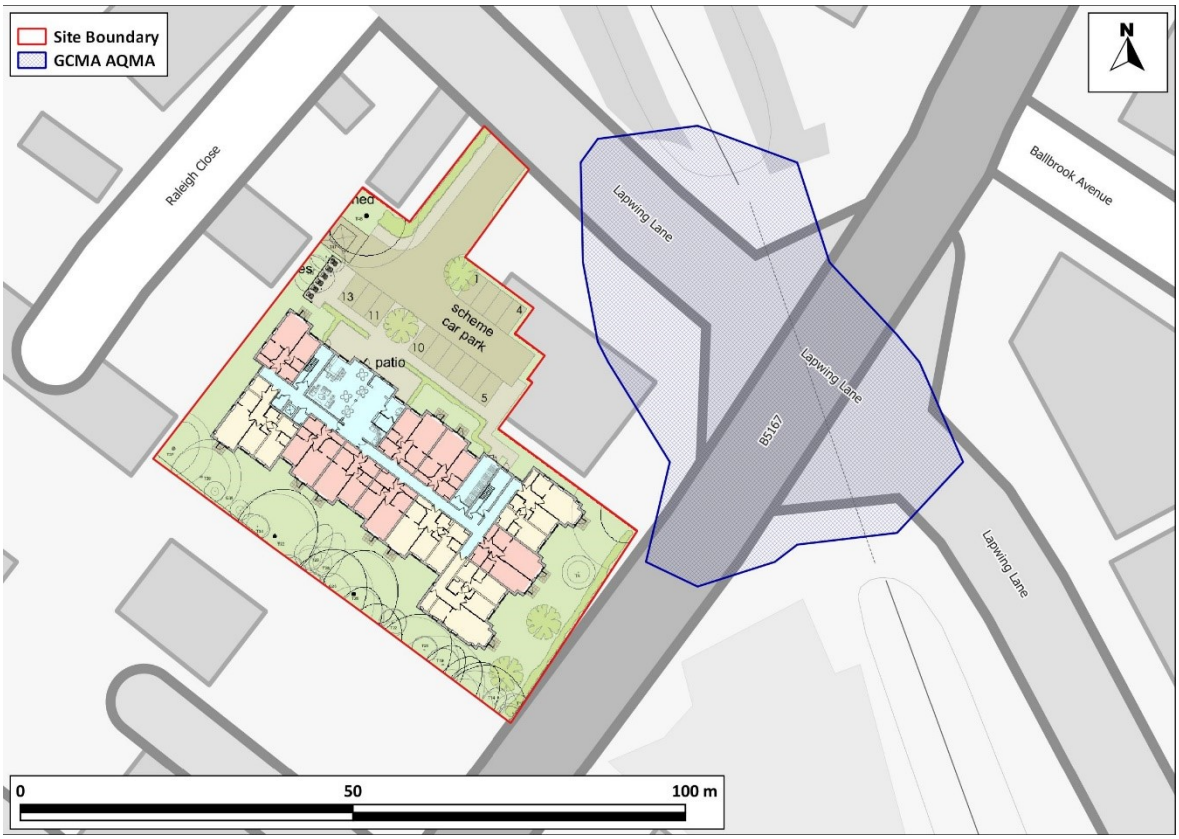

Figure 1: Proposed Development and the GMCA AQMA

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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 NOx emissions can be expected to reduce significantly over the coming decades.

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 (Statutory Instrument 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 DfT 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*".

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".

Local Transport Plan

2.22 The overarching vision of the Greater Manchester Transport Strategy (Transport for Greater Manchester, 2021a) is to provide *"world class connections that support long-term sustainable economic growth and access to opportunity for all"*, while aiming to reach carbon neutrality in the city-region by 2038.

2.23 As part of their environmental responsibility, there is an ambition for *"Greater Manchester to be known for the quality of its urban areas, natural environments with transport emissions reduced to near zero, and new transport schemes delivering environmental enhancements whenever possible".*

2.24 Policies pertinent to air quality include:

- *"Policy 3: We will maintain a programme of interventions encouraging people to make sustainable journeys. We will support this programme through journey planning tools, and information to encourage travel behaviour change and mode shift, in order to make the most efficient use of available capacity (particularly during peak periods)";*
- *"Policy 4: We will work with developers to ensure that new developments are accessible by sustainable modes, and to reduce transport emissions and impacts on the highway network";*
- *"Policy 8: We will work with partners to deliver transport interventions that improve the health of Greater Manchester's residents, including: reducing pollution from motor vehicles; increasing levels of physical activity; improving access to healthcare; and reducing social isolation";*
- *"Policy 9: We will work with partners and key stakeholders to bring nitrogen dioxide (NO2) levels on local roads within legal limits, and to reduce levels of particulate matter";*
- *"Policy 12: We will minimise the impact of transport on the built and natural environment - including townscape, the historic environment, cultural heritage, landscape, habitats and biodiversity, geodiversity, water quality, pollution, flood risk and use of resource - and will deliver environmental enhancements and biodiversity net gain where possible";*
- *"Policy 16: We will work with partners to support a rapid transition towards low emission vehicles in Greater Manchester, including developing a clear strategy on the Electric Vehicle Charging Infrastructure network required to provide greater confidence to residents and businesses to invest in electric vehicles";*
- *"Policy 19: We will work, including through the GM logistics forums, to improve journey times and reliability for deliveries, and to reduce the environmental impact of logistics"; and*
- *"Policy 23: We will work with partners to improve walking and cycling facilities across Greater Manchester, including through the development of a strategic walking and cycling network (the 'Bee Network'), wayfinding and cycle parking, and supporting 'Streets for All' design guidance to ensure consistently high quality standards across the network".*

Local Policies

2.25 The Manchester Core Strategy (MCC, 2012) was adopted in July 2012, and within this Strategy there are three policies which refer to air quality. Policy CC 5 refers to transport and states that Manchester City Council (MCC) will support:

"Proposals…that improve pedestrian safety, improve air quality and increase the scope for accessible public realm improvements".

2.26 In addition to this, Policy EN 16 relates directly to Air Quality and states:

"The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas".

2.27 Finally, Policy DM 1 refers to Development Management, and states that:

"All development should have regard to… Effects on amenity, including privacy, light, noise, vibration, air quality".

2.28 The Manchester Local Plan consists of the above Core Strategy and further supplementary planning documents (SPD). One of these documents outlines a Guide to Development in Manchester (MCC, 2007), stating aims to solve issues such as poor air quality by:

- *"Encouraging the use of Travel Plans*
- *Seeking to reduce the need to use the car, by encouraging walking, cycling and the use of public transport*
- *Requiring developers to demonstrate the accessibility of developments for all, including older people and disabled people*
- *Looking to ensure that employment and amenities such as healthcare, education and shops are easily accessible by the whole of the community".*

2.29 The Air Quality & Planning Technical Guidance for Manchester (MCC, 2022) provides guidance for developments in relation to air quality:

"The following issues should be considered:

- *Compliance with air quality target values, long-term objectives and relevant limit values for concentrations of key air pollutants;*
- *Whether the development will materially affect any air quality action plan or strategy;*
- *Overall changes in air quality as a result of a proposed development; and*
- *Whether the development will introduce new relevant exposure into an area of existing poor air quality."*

Building Standards

2.30 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 work[2], to ensure adequate ventilation is provided to building occupants.

2.31 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 3.10, 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.

2.32 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.

2.33 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

2.34 Defra has produced an Air Quality Plan to tackle roadside NO_2 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 Greater London Authority 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 Supplement in 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.

[2] 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.

Local Air Quality Action Plan

2.35 The GMCA's Air Quality Action Plan (GMCA, 2016) sets out a series of measures by which the Combined Authorities will seek to achieve the air quality objectives in their respective AQMAs. None of the policies are especially relevant to this assessment, being general and overarching in nature, however they include the following:

- *"Air quality across Greater Manchester will improve;*
- *Low-emissions behaviours will have become embedded into the culture of our organisations and lifestyles by 2025; and*
- *We will support the UK Government in meeting and maintaining all EU thresholds for key pollutants at the earliest date to reduce ill-health in Greater Manchester."*

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 NO_2 and PM_{10} 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 mean NO_2 objective is unlikely to be exceeded at roadside locations where the annual mean concentration is below 60 µg/m^3 (Defra, 2022). Therefore, 1-hour mean NO_2 concentrations will only be considered if the annual mean concentration is above this level. Measurements have also shown that the 24-hour mean PM_{10} objective could be exceeded at roadside locations where the annual mean concentration is above 32 µg/m^3 (Defra, 2022).

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. Defra explains where these objectives will apply in its LAQM Technical Guidance (Defra, 2022). The annual mean objectives for NO_2 and PM_{10} are considered to apply at the façades of residential properties, schools, hospitals etc.; they do not apply at hotels. The 24-hour mean objective for PM_{10} is considered to apply at the same locations as the annual mean objective, as well as in gardens of residential properties and at hotels. The 1-hour mean objective for NO_2 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 3.10), originally set at 25 µg/m^3 and currently set at 20 µg/m^3.

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/m^3 by the end of 2040, with the interim target being a value of 12 µg/m^3 by the start of 2028[3]. The second set of targets relate to reducing overall population

[3] 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 µg/m^3 would not exceed the 10 µg/m^3 target.

exposure to $PM_{2.5}$. By the end of 2040, overall population exposure to $PM_{2.5}$ 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 $PM_{2.5}$ concentrations against the targets.

3.7 In March 2023, the Department for Levelling Up, Housing and Communities (DLUHC, 2023) explained that the new $PM_{2.5}$ 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 $PM_{2.5}$. 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, 2023f) which explains that there is no current requirement to consider the new $PM_{2.5}$ 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 $PM_{2.5}$ concentrations.

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

3.10 EU Directive 2008/50/EC (The European Parliament and the Council of the European Union, 2008) sets limit values for NO_2, PM_{10} and $PM_{2.5}$, and is implemented in UK law through the Air Quality Standards Regulations (2010)[4]. The limit values for NO_2 and PM_{10} 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).

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

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

Table 1: Air Quality Criteria for NO_2, PM_{10} and $PM_{2.5}$

Pollutant	Time Period	Value
NO_2	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
$PM_{2.5}$	Annual Mean	20 µg/m^3 [a]

[a] 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/m^3.

Screening Criteria for Road Traffic Assessments

3.12 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM)[5] 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 A1, first considers the size and parking provision of a development; if the development 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 m^2 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.

3.13 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 A1) 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"*.

[5] The IAQM is the professional body for air quality practitioners in the UK.

4 Assessment Approach

Existing Conditions

4.1 Existing sources of emissions and baseline air quality conditions within the study area have been defined using a number of approaches:

- industrial and waste management sources that may affect the area have been identified using Defra's Pollutant Release and Transfer Register (Defra, 2023d);
- local sources have been identified examination of the GMCA's Air Quality Review and Assessment reports;
- information on existing air quality has been obtained by collating the results of monitoring carried out by GMCA; and
- whether or not there are any exceedances of the annual mean limit value for NO_2 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, to identify and report exceedances of the limit value. The national maps of roadside PM_{10} 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.

Road Traffic Impacts

4.2 The proposed development traffic generation has been screened against the criteria set out in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017), as described in Paragraph 3.12 and detailed further in Appendix A1. Where impacts can be screened out there is no need to progress to a more detailed assessment.

Impacts of Existing Sources on Future Residents of the Proposed Development

4.3 The impacts of concentrations of NO_2, PM_{10} and $PM_{2.5}$ concentrations on future residents of the development have been assessed semi-qualitatively. The assessment considers air quality conditions within the site, taking account of local air quality monitoring data available from GMCA, Defra's Roadside NO_2 projection factors (2023c), and the proximity of the site to local road traffic.

Assessment of Significance

4.4 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 the IAQM (Moorcroft and Barrowcliffe et al, 2017) has therefore been used. The overall significance of the air quality impacts is determined using professional judgement; the experience of the consultants preparing

the report is set out in Appendix A2. Full details of the EPUK/IAQM approach are provided in Appendix A1.

5 Baseline Conditions

Relevant Features

5.1 The proposed development is located approximately 6 km to the south of Manchester city centre. The application site is bounded by Lapwing Lane to the north, B5167 Palatine Road to the east and Raleigh Close to the west. There are residential properties located to the south of the site. The site is currently occupied by a car park which served the adjacent former public house.

5.2 The proposed development is located near to an AQMA, as highlighted in Figure 1.

Industrial Sources

5.3 No significant industrial or waste management sources have been identified that are likely to affect the proposed development, in terms of air quality.

Local Air Quality Monitoring

5.4 MCC operates three automatic monitoring stations within its area; however, none of these are located within the vicinity of the proposed development. GMCA also operates a number of NO_2 monitoring sites using diffusion tubes prepared and analysed by Staffordshire Scientific Services (using the 20% TEA in water method). The nearest diffusion tube monitoring sites to the proposed development include six roadside monitors deployed along the A5103 Princess Parkway.

5.5 Annual mean results for the years 2018 to 2022 are summarised in Table 2 and the locations of the monitoring sites with respect to the proposed development are shown in Figure 2. Exceedances of the objectives are shown in bold. Data have been taken from the GMCA's 2022 Annual Status Report (ASR) (GMCA, 2023) and from Clean Air Greater Manchester's air quality data hub (Clean Air Greater Manchester, 2023).

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 impact of the Covid-19 pandemic on traffic volumes and thus pollutant concentrations.

Table 2: Summary of Annual Mean NO_2 Monitoring (2018-2022) (µg/m^3) [a]

Site ID / Ref	Site Type	Location	2018	2019	2020	2021	2022
CAP_MANC_031	Roadside	A5103 (Princess Parkway)	34.6	35.7	22.6	24.3	27.5
CAP_MANC_032	Roadside	A5103 (Princess Parkway)	34.9	35.8	24.3	26.0	29.5
CAP_MANC_033	Roadside	A5103 (Princess Parkway)	**49.6**	**50.1**	34.0	35.7	**41.9**
CAP_MANC_034	Roadside	A5103 (Princess Parkway)	**43.5**	-	28.7	30.2	31.9
CAP_MANC_035	Roadside	A5103 (Princess Parkway)	**42.7**	**41.1**	28.5	31.2	33.7
MA37NO	Roadside	A5103	39.3	38.7	26.9	29.5	32.1
Objective			**40**				

[a] Exceedances of the objectives are shown in **bold**.

5.7 There have been measured exceedances of the annual mean NO_2 objective at three of the roadside monitoring sites over the presented monitoring period; however, by 2022, only one monitoring site (CAP_MAN_033) recorded an exceedance. This monitoring site is located 2 m from the kerb of the A5103 Princess Parkway.

5.8 Annual mean concentrations at all six sites reduced overall between 2018 and 2022.

5.9 As the annual mean NO_2 concentrations in Table 2 are all below 60 µg/m^3, it is unlikely that the 1-hour mean NO_2 objective will have been exceeded.

5.10 MCC monitor PM_{10} concentrations at each of the three automatic monitoring sites within their area, and $PM_{2.5}$ concentrations at two of the sites; measured concentrations have been well below the relevant objectives in all recent years.

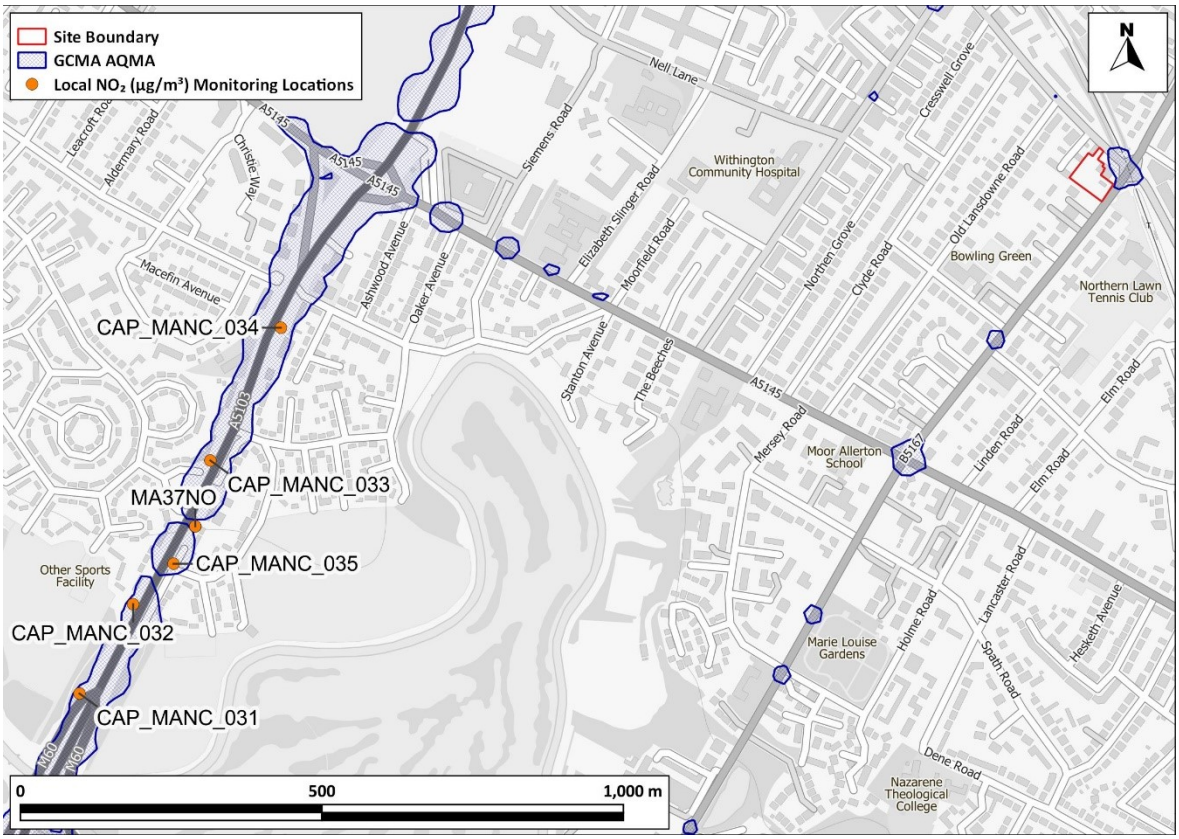

Figure 2: Diffusion Tube Monitoring Locations and the Proposed Development

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Exceedances of Limit Value

5.11 There are no AURN (Defra, 2023g) monitoring sites within 1 km of the proposed development with which to identify exceedances of the annual mean NO_2 limit value (Table 2). Defra's roadside annual mean NO_2 concentrations (Defra, 2023e), which are used to identify and report exceedances of the limit value, do not identify any exceedances within 1 km of the proposed development in 2022. 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.

5.12 As discussed in Paragraph 2.34, Defra has produced an Air Quality Plan (Defra, 2017) to tackle roadside NO_2 concentrations in the UK. Within this Plan, MCC (which forms part of the GMCA) is listed as an authority upon which the Government has placed legal duties to *"develop and implement a plan designed to deliver compliance in the shortest time possible"*. MCC is on this list due to exceedances of the limit value being identified beyond 2020 alongside the A5103 Princess Parkway. However, as this road is located over 1 km from the proposed development, future limit value exceedances are unlikely to be affected by the proposed development. Nonetheless, MCC was required to produce a local action plan by the end of 2018; the Greater Manchester Clean Air Plan

(Clean Air Greater Manchester, 2021) has subsequently been developed and the actions outlined within it are being jointly delivered by the ten local authorities comprising the GMCA.

5.13 The Greater Manchester Clean Air Plan (Clean Air Greater Manchester, 2021) included a Greater Manchester-wide Category C CAZ, which was due to come into place on 30th May 2022. It has since been agreed with the UK government that the charging CAZ would not be introduced on 30th May 2022. The updated air quality modelling undertaken to support the Greater Manchester Clean Air Plan indicates no exceedances of the annual mean NO_2 objective in the vicinity of the proposed development in 2026, even without the CAZ in place (Transport for Greater Manchester, 2021b).

6 Impact Assessment

Impacts of the Proposed Development at Existing Receptors

6.1 The project transport consultant (Paul Basham Associates) has advised that the proposed development will generate a total of 81 two-way vehicle movements as an Annual Average Daily Traffic (AADT) flow on the surrounding road network. It is anticipated that 10% of these movements will be HDVs.

6.2 These development-generated flows are below the screening criteria published by EPUK and the IAQM for use within an AQMA. As such, the proposed development-generated road traffic impacts can thus be considered 'not significant'.

Impacts of Existing Sources on Future Residents of the Proposed Development

Concentrations of PM_{10} and $PM_{2.5}$

6.3 There is no monitoring of PM_{10} or $PM_{2.5}$ concentrations undertaken in close proximity to the proposed development; however, measured concentrations within MCC have been well below the relevant objectives in recent years. It is therefore reasonable to assume that concentrations of PM_{10} and $PM_{2.5}$ will also be well below the objectives at the proposed development.

Concentrations of NO_2

6.4 As presented in Section 5, there is no air quality monitoring undertaken within the immediate vicinity of the site. The closest monitoring sites to the proposed development are located approximately 1.5 km to the southwest, along the A5103 Princess Parkway (see Figure 2).

6.5 Whilst 2022 monitoring data are available, given that there is still some uncertainty as to whether activity patterns have returned to 'normal' (i.e. pre-pandemic activity levels), a conservative approach has been adopted which utilises 2019 concentrations, as these are higher than those recorded in 2022.

Locations of Relevant Exposure

6.6 The diffusion tube monitors along the A5103 Princess Parkway are all located between 1.1 and 3.0 m of the kerb. NO_2 concentrations reduce rapidly with increasing distance from roads (Defra, 2022). The façade of the proposed development is, however, set back more than 10 m from the nearest kerb. As such, future occupants will experience air quality concentrations much lower than those measured at the diffusion tube monitoring sites.

Reductions in NO_2 Concentrations Over Time

6.7 Concentrations of NO_2 in most parts of the UK have fallen rapidly over recent years and are continuing to fall (Figure 3). This pattern appears to be reflected in the local measurements in Table 2, but as previously discussed, there is still some uncertainty as to whether 2022 activity patterns have returned to 'normal' levels (i.e. pre-pandemic levels). 2019 represents the most recent full calendar year prior to the pandemic. In 2019, the measured annual mean NO_2 concentrations at the roadside monitoring sites along the A5103 Princess Parkway ranged between 35.7 µg/m^3 and 50.1 µg/m^3 (see Table 2).

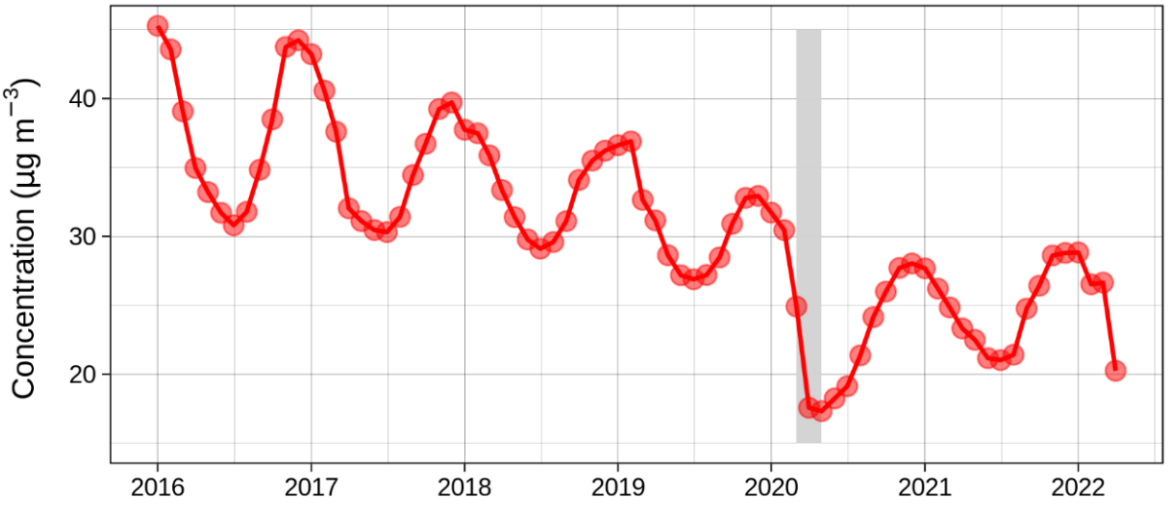

Figure 3: Average Monthly Weather-adjusted Mean NO_2 Concentrations from Jan 2016 to April 2022 at 129 UK Roadside Monitoring Sites (grey line shows the period when the first UK-wide Covid-19 lockdown was enforced) (AQC, 2022).

6.8 Defra provides factors for projecting roadside NO_2 concentrations to future years (Defra, 2023c). The anticipated opening year of the proposed development is assumed to be 2026, and the concentration in this opening year can be estimated utilising the following:

- the maximum 2019 measured concentration from the roadside monitoring sites along the A5103 Princess Parkway (50.1 µg/m^3 at CAP_MANC_033);
- the 2019 roadside projection factor for 'Rest of UK (HDV >10%)' of 0.942; and
- the 2026 roadside projection factor for 'Rest of UK (HDV > 10%)' of 0.637.

6.9 The projected concentration for 2026 is calculated by:

2019 NO_2 Concentration x ('Rest of UK (HDV > 10%)' 2026 NO_2 Projection Factor / 'Rest of UK (HDV > 10%) 2019 Projection Factor)

50.1 µg/m^3 x (0.637 / 0.942) = **33.9 µg/m^3**

6.10 The calculated 2026 annual mean NO_2 concentration of 33.9 µg/m^3 [6] is below the annual mean NO_2 objective of 40 µg/m^3.

6.11 This estimated 2026 annual mean NO_2 concentration assumes that the B5167 Palatine Road experiences the same volumes of traffic as the A5103 Princess Parkway. The A5103 Princess Parkway experiences AADT flows of around 77,000 vehicles, whereas the B5167 Palatine Road experiences AADT flows of around 11,000 vehicles (DfT, 2023). As such, concentrations at 2 m from Palatine Road will be lower than that estimated above.

6.12 Additionally, as discussed in Paragraph 6.6, the proposed development façade will be located at least 10 m from the kerb of the B5167 Palatine Road, where concentrations would be expected to be lower.

6.13 Taking these aspects into account, it is anticipated that future residents of the proposed development will experience acceptable air quality.

Significance of Operational Air Quality Effects

The operational air quality effects without mitigation are judged to be 'not significant'. This professional judgement is made in accordance with the methodology set out in Appendix A1, and takes account of the assessment that:

- the proposed development will generate traffic flows below recognised industry screening criteria; and
- pollutant concentrations within the proposed development will all be below the objectives in the opening year, thus future residents will experience acceptable air quality.

[6] Undertaking the same calculation based on the 2022 measured concentration at CAP_MAN_033 (41.9 µg/m^3) and using a calculated projection factor of 0.811 (2026 factor of 0.637 / 2022 projection factor of 0.785) gives a very similar estimated 2026 concentration of 34.0 µg/m^3.

7 Mitigation

Good Design and Best Practice

7.1 The EPUK/IAQM guidance advises that good design and best practice measures should be considered, whether or not more specific mitigation is required.

7.2 The proposed development incorporates the following good design and best practice measures, which have been accounted for in the assessment as far as is possible:

- setting back of the development buildings from roads by at least 10 m;
- provision of active electric vehicle charging points for every car parking space;
- provision of pedestrian and mobility scooter access to the new development, including a covered store for mobility scooter parking; and
- use of electric heating to avoid the need for on-site combustion.

Recommended Mitigation

7.3 The assessment has demonstrated that the overall air quality effect of the proposed development will be 'not significant'; it will not introduce any new exposure into areas of unacceptable air quality, nor will the development-generated traffic emissions have a significant impact on local air quality. It is, therefore, not considered appropriate to propose mitigation measures for this development.

7.4 Measures to reduce pollutant concentrations from road traffic are principally being delivered in the longer term by the introduction of more stringent emissions standards, largely via European legislation (which is written into UK law).

8 Conclusions

8.1 The assessment has considered the impacts of the proposed development on local air quality in terms of emissions from road traffic generated by the completed and occupied development. It has also identified the air quality conditions that future residents will experience.

8.2 The assessment has demonstrated that the incremental changes to traffic flows on the local road network are below recognised screening thresholds, and that the effects of road traffic on existing residential properties will be insignificant.

8.3 The assessment has also shown that air quality conditions for future residents of the proposed development will be acceptable, with concentrations below the air quality objectives.

8.4 Taking into account these conclusions, it is judged that the proposed development is consistent with Paragraph 185 of the NPPF, being appropriate for its location both in terms of its effects on the local air quality environment and the air quality conditions for future residents. It is also consistent with Paragraph 186, as it will not affect compliance with relevant limit values or national objectives.

8.5 The proposed development is also consistent with MCC's local policies as it will not materially affect air quality and will not affect the Council's ability to implement Policy EN 16 of its Core Strategy.

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10 Glossary

AADT	Annual Average Daily Traffic
AQC	Air Quality Consultants
AQMA	Air Quality Management Area
AURN	Automatic Urban and Rural Network
CAZ	Clean Air Zone
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EPUK	Environmental Protection UK
EU	European Union
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
HDV	Heavy Duty Vehicles (> 3.5 tonnes)
HMSO	Her Majesty's Stationery Office
IAQM	Institute of Air Quality Management
JAQU	Joint Air Quality Unit
LAQM	Local Air Quality Management
LDV	Light Duty Vehicles (<3.5 tonnes)
LGV	Light Goods Vehicle
µg/m^3	Microgrammes per cubic metre
NO	Nitric oxide
NO_2	Nitrogen dioxide
NOx	Nitrogen oxides (taken to be NO_2 + NO)
NPPF	National Planning Policy Framework
OEP	Office for Environmental Protection
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
PM_{10}	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
SPD	Supplementary Planning Document
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
TEA	Triethanolamine – used to absorb nitrogen dioxide

11 Appendices

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A1 EPUK & IAQM Planning for Air Quality Guidance

A1.1 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

A1.2 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".

A1.3 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 m^2 of commercial floorspace;
- are carried out on land of 1 ha or more.

A1.4 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 m^2 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 mgNOx/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 mgNOx/Nm^3;
    - Compression ignition engine: 400 mgNOx/Nm^3;
    - Gas turbine: 50 mgNOx/Nm^3.
- 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 mgNOx/Nm^3 and 25 mgPM/Nm^3.

A1.5 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".

A1.6 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

A1.7 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 m^2 of floor space for all other uses or a site area greater than 1 ha.

A1.8 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.

A1.9 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.

A1.10 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.

A1.11 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".

A1.12 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".

A1.13 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

A1.14 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.

A1.15 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.

A1.16 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.

A1.17 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 A2.

A2 Professional Experience

Dr Denise Evans, BSc (Hons) PhD MIEnvSc MIAQM

Dr Evans is an Associate Director with AQC, with more than 24 years' relevant experience. She has prepared air quality review and assessment reports for local authorities, and has appraised local authority air quality assessments on behalf of the UK governments, and provided support to the Review and Assessment helpdesk. She has extensive modelling experience, completing air quality and odour assessments to support applications for a variety of development sectors including residential, mixed use, urban regeneration, energy, commercial, industrial, and road schemes, assessing the effects of a range of pollutants against relevant standards for human and ecological receptors. Denise has acted as an Expert Witness and is a Member of the Institute of Air Quality Management.

Samantha Barber, MChem (Hons) AMIEnvSc AMIAQM

Miss Barber is a Senior Consultant with AQC, having joined the company in November 2017. She has carried out assessments of air quality impacts for a range of projects, including EIA schemes, residential, commercial and mixed-use schemes, energy centres and power generation schemes. Miss Barber has also prepared construction dust risk assessments, Air Quality Neutral assessments, local authority Annual Status Reports (ASRs) and odour assessments. She has carried out numerous passive nitrogen dioxide monitoring surveys, and construction dust monitoring, at sites across Greater London

Ben Collier, BSc (Hons)

Mr Collier is an Assistant Consultant with AQC and joined the company in 2023. Throughout his BSc Environmental Science degree at the University of the West of England, he developed an interest in planetary processes and impacts, in particular those in relation to air quality. During his studies, Mr Collier completed several atmospheric-related projects, with topics varying from the impact of urban air pollution to the potential of renewable energy to improve air quality; many of these included GIS based analysis.