

Report

Land to the South of Longsight Road, Langho

## **Air Quality Assessment**

For Hallam Land Management Ltd

25 February 2025

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<b>Prepared By:</b>	Isabel Stanley
<b>Reviewed By:</b>	Dr Denise Evans (Technical Director)

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Registered Office: 3rd Floor St Augustine's Court, 1 St. Augustine's Place Bristol BS1 4UD Tel: +44(0)117 974 1086

24 Greville Street, Farringdon, London, EC1N 8SS Tel: +44(0)20 3873 4780

First Floor, Patten House, Moulders Lane, Warrington WA1 2BA Tel: +44(0)1925 937 195

8-9 Ship St, Brighton and Hove, Brighton BN1 1AD Tel: +44(0)20 3873 4780

Avenue du Port, 86c Box 204, 1000 Bruxelles Tel: +44(0)20 3873 47840

## Executive Summary

The air quality impacts associated with the proposed residential development of land to the south of Longsight Road (A59) in Langho have been assessed. The proposed development involves the construction of up to 300 new homes.

The homes within the proposed development are set back from local roads, principally Longsight Road, and the assessment has demonstrated that future residents will experience acceptable air quality, with pollutant concentrations well below the air quality objectives. Further, there is no risk of an objective exceedance within the proposed development as a result of emission from trains using the adjacent railway lines.

The proposed development will generate additional traffic on the local road network, but the assessment has shown that there will be no significant effects at any existing, sensitive receptor.

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

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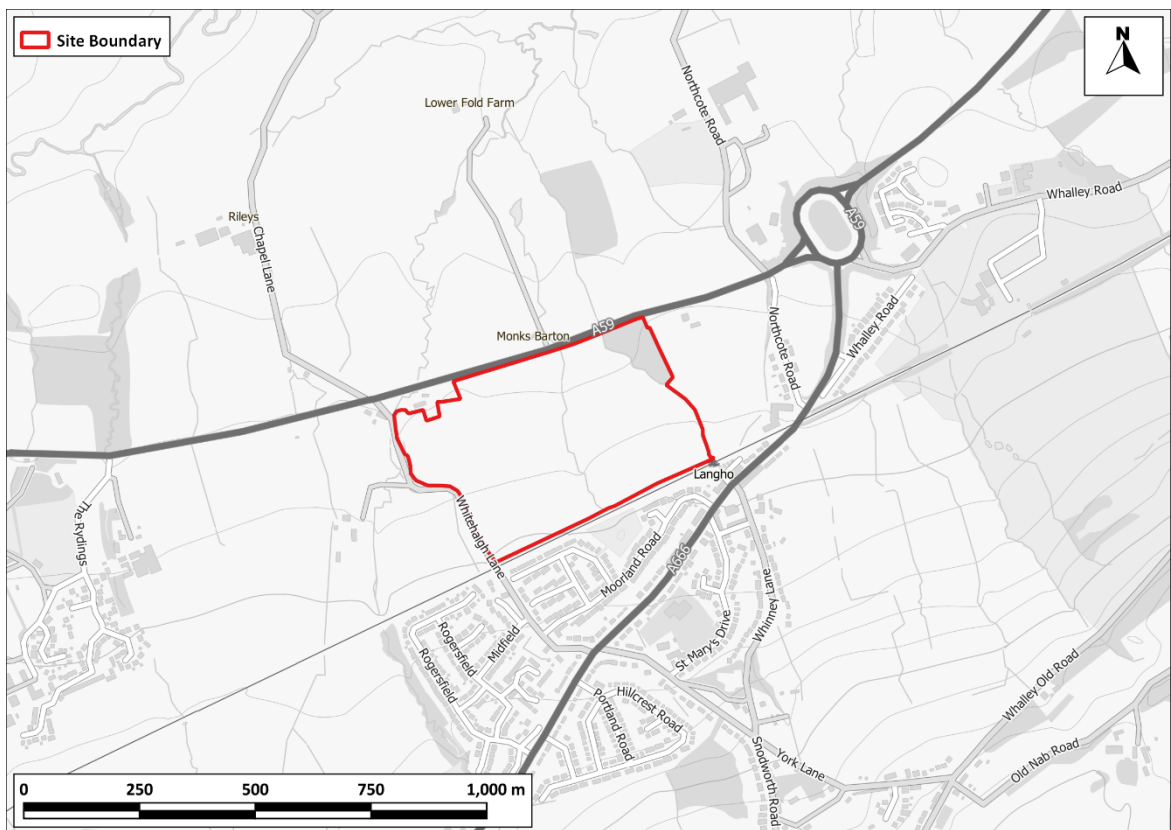
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# 1 Introduction

- 1.1 This report describes the potential air quality impacts associated with the proposed residential development of land to the south of Longsight Road (A59), Langho. The proposed development will consist of up to 300 new homes.
- 1.2 The proposed development will generate additional traffic on local roads, which may impact on air quality at existing residential properties along the affected road network, thus, an air quality assessment is required. The proposed development is also located adjacent to the busy A59 and an assessment of air quality conditions that future residents will experience is therefore included. The main air pollutants of concern related to road traffic emissions are nitrogen dioxide (NO<sub>2</sub>) and fine particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>).
- 1.3 The location of the proposed development is shown in Figure 1-1.



**Figure 1-1: Location of the Proposed Development**

Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v3.0.

- 1.4 There will be no centralised combustion plant and thus no significant point sources of emissions within the proposed development.
- 1.5 This report describes existing local air quality conditions, and the predicted air quality in the future assuming that the proposed development does, or does not proceed. The assessment of traffic-related impacts focuses on 2026, which is the anticipated year of first occupation of any of the new homes.

- 1.6 This report has been prepared taking into account all relevant local and national guidance and regulations, and follows a methodology agreed with Ribble Valley Borough Council (RVBC).

## 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 Air Quality Management Area (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, likely beyond the scale of reductions forecast in the tools utilised in carrying out this air quality assessment.

## Environment Act 2021

- 2.7 The UK's new legal framework for protection of the natural environment, the Environment Act (2021) passed into UK law in November 2021. The Act gives the Government the power to set long-term, legally binding environmental targets. It also establishes an Office for Environmental Protection (OEP), responsible for holding the Government to account and ensuring compliance with these targets.
- 2.8 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (SI 2023 No. 96) sets two new targets for future concentrations of PM<sub>2.5</sub>. These targets are described in Paragraph 0.

## Environmental Improvement Plan 2023

- 2.9 Defra published its 25 Year Environment Plan in 2018 (Defra, 2018a). 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<sub>2.5</sub>. These targets, which are described in more detail in Paragraph 0, 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) (2024) 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 187 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 and water quality, taking into account relevant information such as river basin management plans”.*

- 2.14 Paragraph 198 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 199 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 Policies

2.22 The RVBC’s Core Strategy (RVBC, 2014) was adopted in 2014 and forms the central document of the Local Development Framework (LDF). It sets out the strategic planning policy framework to guide development in the borough up to 2028. It also includes development management policies to assist in the determination of individual planning applications. Policy DMG1: General Considerations states that:

*“In determining planning applications, all development must:.....*

*AMENITY.....*

*4. Consider air quality and mitigate adverse impacts where possible.”*

## Building Standards

2.23 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<sup>1</sup>, to ensure adequate ventilation is provided to building occupants.

2.24 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 3.8, 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.

2.25 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.

2.26 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

2.27 Defra has produced an Air Quality Plan to tackle roadside nitrogen dioxide concentrations in the UK (Defra, 2017); a supplement to the 2017 Plan (Defra, 2018b) 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 to produce local

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<sup>1</sup> 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.

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

### Local Air Quality Action Plan

- 2.28 RVBC has not declared any AQMAs in the vicinity of the proposed development and thus there are no Air Quality Action Plans relevant to the study area.

### 3 Assessment Criteria

- 3.1 The Government has established a set of air quality standards and objectives to protect human health. The 'standards' are set as concentrations below which effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations (2002).
- 3.2 The UK-wide objectives for nitrogen dioxide and PM<sub>10</sub> 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 nitrogen dioxide objective is unlikely to be exceeded at roadside locations where the annual mean concentration is below 60 µg/m<sup>3</sup> (Defra, 2022). Measurements have also shown that the 24-hour mean PM<sub>10</sub> objective could be exceeded at roadside locations where the annual mean concentration is above 32 µg/m<sup>3</sup> (Defra, 2022). The predicted annual mean PM<sub>10</sub> concentrations are thus used as a proxy to determine the likelihood of an exceedance of the 24-hour mean PM<sub>10</sub> objective. Where predicted annual mean concentrations are below 32 µg/m<sup>3</sup> it is unlikely that the 24-hour mean objective will be exceeded.
- 3.3 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. Defra explains where these objectives will apply in its Local Air Quality Management Technical Guidance (Defra, 2022). The annual mean objectives for nitrogen dioxide and PM<sub>10</sub> 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<sub>10</sub> 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 nitrogen dioxide applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.
- 3.4 For PM<sub>2.5</sub>, 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 3.8), originally set at 25 µg/m<sup>3</sup> and currently set at 20 µg/m<sup>3</sup>.

Defra has also recently set two new targets, and two new interim targets, for PM<sub>2.5</sub> concentrations in England. One set of targets focuses on absolute concentrations. The long-term target is to achieve an annual mean PM<sub>2.5</sub> concentration of 10 µg/m<sup>3</sup> by the end of 2040 (referred to as the annual mean concentration target or AMCT), with the interim target being a value of 12 µg/m<sup>3</sup> by the start of 2028<sup>2</sup>. The second set of targets relate to reducing overall population exposure to PM<sub>2.5</sub>. By the end of 2040, overall population exposure to PM<sub>2.5</sub> should be reduced by 35% compared with 2018 levels (referred to as the population exposure reduction target or PERT), with the interim target being a reduction of 22% by the start of 2028 (Table 3-1).

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<sup>2</sup> 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<sup>3</sup> would not exceed the 10 µg/m<sup>3</sup> target.

**Table 3-1: Environment Act PM<sub>2.5</sub> Targets**

Metric	Target	Target year
AMCT	Interim target: 12 µg/m <sup>3</sup>	2028
	Legally binding target: 10 µg/m <sup>3</sup>	2040
PERT	Interim target: 22% reduction in exposure compared to 2018	2028
	Legally binding target: 35% reduction in exposure compared to 2018	2040

3.5 In November 2024 Defra published Interim Planning Guidance on the PM<sub>2.5</sub> targets (Defra, 2024). This states that:

*“The purpose of the targets is to improve air quality by reducing levels of PM<sub>2.5</sub> across the country, therefore improving public health. While achievement of the targets will be assessed at relevant monitoring sites, the targets apply to ambient (outdoor) air throughout England. Applicants and Local Planning Authorities should therefore consider the impact of developments on air quality in all ambient air, whether a monitor is present or not.”*

3.6 In order to address the new targets it is not sufficient to assess solely whether a scheme is likely to lead to an exceedance of a legal limit. Instead, developments need to implement appropriate mitigation measures from the design stage, ensuring the minimum amount of pollution is emitted and that exposure is minimised.

3.7 Pending publication of the new guidance, Defra advises applicants to provide evidence that they have identified key sources of air pollution within the scheme and taken appropriate action to minimise emissions of PM<sub>2.5</sub> and its precursors as far as possible. More detailed assessment is expected for development closer to populations and/or having higher emissions. Defra has posed two questions to be used as prompts to support the interim assessment process:

*“How has exposure to PM<sub>2.5</sub> been considered when selecting the development site?; and*

*What actions and/or mitigations have been considered to reduce PM<sub>2.5</sub> exposure for development users and nearby receptors (houses, hospitals, schools etc.) and to reduce emissions of PM<sub>2.5</sub> and its precursors?”*

3.8 EU Directive 2008/50/EC (The European Parliament and the Council of the European Union, 2008) sets limit values for nitrogen dioxide, PM<sub>10</sub> and PM<sub>2.5</sub>, and is implemented in UK law through the Air Quality Standards Regulations (2010)<sup>3</sup>. The limit values for nitrogen dioxide and PM<sub>10</sub> are the same numerical concentrations as the UK objectives, but achievement of the limit values is a national obligation rather than a local one and concentrations are reported to the nearest whole number. In the UK, only monitoring and modelling carried out by UK Central Government meets the specification required to assess compliance with the limit values. Central Government does not normally recognise local authority monitoring or local modelling studies when determining the likelihood of the limit values being exceeded, unless such studies have been audited and approved by Defra and DfT’s Joint Air Quality Unit (JAQU).

3.9 The relevant air quality criteria for this assessment are provided in Table 3-2.

<sup>3</sup> As amended through The Air Quality Standards (Amendment) Regulations 2016 and The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020.

**Table 3-2: Air Quality Criteria for Nitrogen Dioxide, PM<sub>10</sub> and PM<sub>2.5</sub>**

Pollutant	Time Period	Value
Nitrogen Dioxide	1-hour Mean	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m <sup>3</sup>
PM <sub>10</sub>	24-hour Mean	50 µg/m <sup>3</sup> not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m <sup>3</sup> <sup>a</sup>
PM <sub>2.5</sub>	Annual Mean	20 µg/m <sup>3</sup> <sup>b</sup>

<sup>a</sup> A proxy value of 32 µg/m<sup>3</sup> as an annual mean is used in this assessment to assess the likelihood of the 24-hour mean PM<sub>10</sub> objective being exceeded. Measurements have shown that, above this concentration, exceedances of the 24-hour mean PM<sub>10</sub> objective are possible (Defra, 2022).

<sup>b</sup> There is no numerical PM<sub>2.5</sub> objective for local authorities (see Paragraph 3.4). Convention is to assess against the UK limit value which is currently 20 µg/m<sup>3</sup>.

## Screening Criteria

### Road Traffic

- 3.10 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM)<sup>4</sup> 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<sup>2</sup> 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.
- 3.11 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"*.
- 3.12 While these screening criteria are specifically intended to act as a trigger for a detailed assessment, they can also sometimes be used to identify the extent of the road network that requires assessment. Where the change in traffic on a given road link is less than the relevant screening threshold, it is unlikely that a significant impact would occur, and these links can be disregarded unless there are additional development-related emissions affecting receptors along the link.

### Railway Emissions

- 3.13 Defra guidance (Defra, 2022) advises that large numbers of moving diesel trains can give rise to high levels of nitrogen dioxide close to railway tracks, and outlines where there may be the potential for an exceedance of the nitrogen dioxide objectives as a result of emissions. Residential properties within 30 m of railway lines where there are large numbers of diesel locomotive movements (these

<sup>4</sup> The IAQM is the professional body for air quality practitioners in the UK.

lines are identified in the Defra guidance), and where background annual mean nitrogen dioxide concentrations are greater than  $25 \mu\text{g}/\text{m}^3$ , may be at risk of elevated nitrogen dioxide concentrations. Only locations which meet these criteria require further assessment.

## 4 Assessment Approach

### Consultation

4.1 The assessment follows a methodology agreed with RVBC via email correspondence between the Environmental Health Officer and Air Quality Consultants in November 2024. Specifically, the following key points were communicated:

- baseline conditions will be defined, including identifying monitoring data and existing sources of pollutants in the area;
- detailed modelling, using the ADMS-Roads dispersion model, will be undertaken to quantitatively assess the impact of development generated traffic emissions on existing residential properties; and
- the impacts of existing sources on future residents of the proposed development will be assessed qualitatively for both road traffic and railway emissions.

### Study Area

4.2 The study area for the assessment has been identified using professional judgement, focussing on the areas where impacts are anticipated to be greatest. It includes all of the roads along which the development will lead to a potentially significant change in traffic flows. Specifically, the assessment has focussed on the A59 (Longsight Road) and the Langho Roundabout. Figure 1-1 in Section 1 of this report effectively shows the study area.

### Receptors

4.3 Concentrations of nitrogen dioxide, PM<sub>10</sub> and PM<sub>2.5</sub> have been predicted at a number of locations within the proposed development. Receptors have been identified to represent a range of exposure, including worst-case locations (these being at the façades of the residential properties closest to the sources). When selecting receptors, particular attention has been paid to assessing impacts close to junctions, where traffic may become congested and where there is a combined effect of several road links, and close to those roads where the traffic increases as a result of the proposed development will be greatest.

4.4 Eight existing residential properties have been identified as receptors for the assessment. These locations are described in Table 4-1 and shown in Figure 4-1. In addition, concentrations have been modelled at the DT9 diffusion tube monitoring site located adjacent to Whalley Road, Read, in order to verify the model outputs (see Appendix A3 for verification method).

**Table 4-1: Description of Receptor Locations**

Receptor	Type	X coordinate	Y coordinate	Heights Modelled (m) <sup>a</sup>
ER1	Residential	369787.8	434487.5	1.5
ER2	Residential	369900.1	434500.7	1.5
ER3	Residential	370144.8	434636.6	1.5
ER4	Residential	370476.5	434693.7	1.5
ER5	Residential	370636.4	434733.9	1.5



- information on existing air quality has been obtained by reviewing the results of monitoring carried out by the local authority;
- background concentrations have been defined using Defra's 2021-based background maps (Defra, 2025b). These cover the whole of the UK on a 1x1 km grid; and
- whether or not there are any exceedances of the annual mean limit value for nitrogen dioxide in the study area has been identified using the maps of roadside concentrations published by Defra (2020; 2025c). These are the maps used by the UK Government, together with the results from national Automatic Urban and Rural Network (AURN) monitoring sites that operate to the required data quality standards, to identify and report exceedances of the limit value. The national maps of roadside PM<sub>10</sub> and PM<sub>2.5</sub> concentrations (Defra, 2025c), which are available for the years up to 2023, show no exceedances of the limit values anywhere in the UK in 2023.

## Road Traffic Impacts

### Screening

- 4.7 The first step in considering the road traffic impacts of the proposed development has been to screen the development and its traffic generation against the criteria set out in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017), as described in Paragraph 3.10 and detailed further in Appendix A1. Where impacts can be screened out there is no need to progress to a more detailed assessment. The following sections describe the approach to dispersion modelling of road traffic emissions, which has been required for this project.

### Modelling Methodology

- 4.8 Concentrations have been predicted using the ADMS-Roads dispersion model, with vehicle emissions derived using Defra's Emission Factor Toolkit (EFT) (v12.1) (Defra, 2025b). Details of the model inputs and the model verification are provided in Appendix A3.

### Assessment Scenarios

- 4.9 Nitrogen dioxide, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations have been predicted for the following scenarios:
- base year 2024;
  - the proposed year of first occupation of the proposed development (2026) without the development; and
  - 2026 with the entire development operational.
- 4.10 The 2026 assessment scenarios include baseline traffic data for 2030. This provides a worst-case assessment, discussed further in Paragraph 4.15.

### Impact Description

- 4.11 The approach developed jointly by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) has been used in describing the modelled impacts. The approach identifies impacts at individual receptors based on the percentage change in concentrations relative to the relevant air quality objective, rounded to the nearest whole number, and the absolute concentration relative to the objective. Table 4-2 sets out the method for determining the impact descriptor for annual mean concentrations at individual receptors, having been adapted from the table presented in the guidance document. For the assessment criterion the term Air Quality Assessment Level or AQAL has been adopted, as it covers all pollutants, i.e. those with and without formal standards. Typically, as is the case for this

assessment, the AQAL will be the air quality objective value. Note that impacts may be adverse or beneficial, depending on whether the change in concentration is positive or negative.

**Table 4-2: Air Quality Impact Descriptors for Individual Receptors for All Pollutants <sup>a</sup>**

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

<sup>a</sup> Values are rounded to the nearest whole number.

<sup>b</sup> This is the “Without Scheme” concentration where there is a decrease in pollutant concentration and the “With Scheme” concentration where there is an increase.

<sup>c</sup> AQAL = Air Quality Assessment Level, which may be an air quality objective, limit or target value, GLA target or an Environment Agency ‘Environmental Assessment Level (EAL)’.

### Uncertainty

- 4.12 There are many components that contribute to the uncertainty of modelling predictions. The road traffic emissions dispersion model used in this assessment is dependent upon the traffic data that have been input, which will have inherent uncertainties associated with them. There are then additional uncertainties, as models are required to simplify real-world conditions into a series of algorithms.
- 4.13 An important stage in the process is model verification, which involves comparing the model output with measured concentrations (see Appendix A3). Because the model has been verified and adjusted, there can be reasonable confidence in the predicted concentrations.
- 4.14 Predicting pollutant concentrations in a future year will always be subject to greater uncertainty. For obvious reasons, the model cannot be verified in the future, and it is necessary to rely on a series of projections provided by DfT and Defra as to what will happen to traffic volumes, background pollutant concentrations and vehicle emissions. Historic versions of Defra’s EFT tended to over-state emissions reductions into the future. However, analyses of the more recent versions of Defra’s EFT carried out by AQC (2020a; 2020b) suggest that, on balance, these versions are unlikely to over-state the rate at which NOx emissions decline in the future at an ‘average’ site in the UK. In practice, the balance of evidence suggests that NOx concentrations are most likely to decline more quickly in the future, on average, than predicted by previous versions of the EFT, especially against a base year of 2016 or later. Whilst such an analysis has not been undertaken by AQC for EFT v12.1, it is considered that using EFT v12.1 for future-year forecasts in this report provides a robust assessment, given that the model has been verified against measurements made in 2023.

### Assumptions

- 4.15 It is necessary to make a number of assumptions when carrying out an air quality assessment; in order to account for some of the uncertainty in the approach, as described above, assumptions made

have generally sought to reflect a realistic worst-case scenario. Key assumptions made in carrying out this assessment include:

- the assumption that the proposed development is complete and fully operational in 2026, and that baseline traffic flows in 2026 correspond to those in 2030. This will have overestimated the traffic emissions and hence the concentrations and impacts in 2026. In reality the development is unlikely to be fully occupied before 2030, thus it will not be generating its full traffic volumes until this year; and
- that the Rochdale meteorological monitoring station appropriately represents conditions in the study area (this is discussed further in Appendix A3).

## Impacts of Road Traffic on Future Residents of the Proposed Development

- 4.16 The impacts of nitrogen dioxide, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations on new residents of the development have been assessed qualitatively, taking account of local air quality monitoring data and proximity to local roads.

## Railway Impacts

- 4.17 The potential for significant impacts as a result of emissions from trains on the lines adjacent to the south of the proposed development has been considered by comparing the specific development scenario to the criteria set out in the Defra guidance (Defra, 2022).

## Assessment of Significance

- 4.18 There is no official guidance in the UK in relation to development control on how to assess the significance of air quality impacts. The approach developed jointly by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) has therefore been used. The overall significance of the air quality impacts is determined using professional judgement, taking account of the impact descriptors; the experience of the consultants preparing the report is set out in Appendix 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 to the north of the village of Langho. It is bounded by Longsight Road to the north, Whitehalgh Lane to the west, railway lines to the south and the Northcote Park residential development to the east. There are existing residential properties located adjacent to Longsight Road and to the south, on the other side of the railway line. The site currently comprises agricultural land.
- 5.2 The location of the proposed development is shown in Figure 1-1.

### Industrial Sources

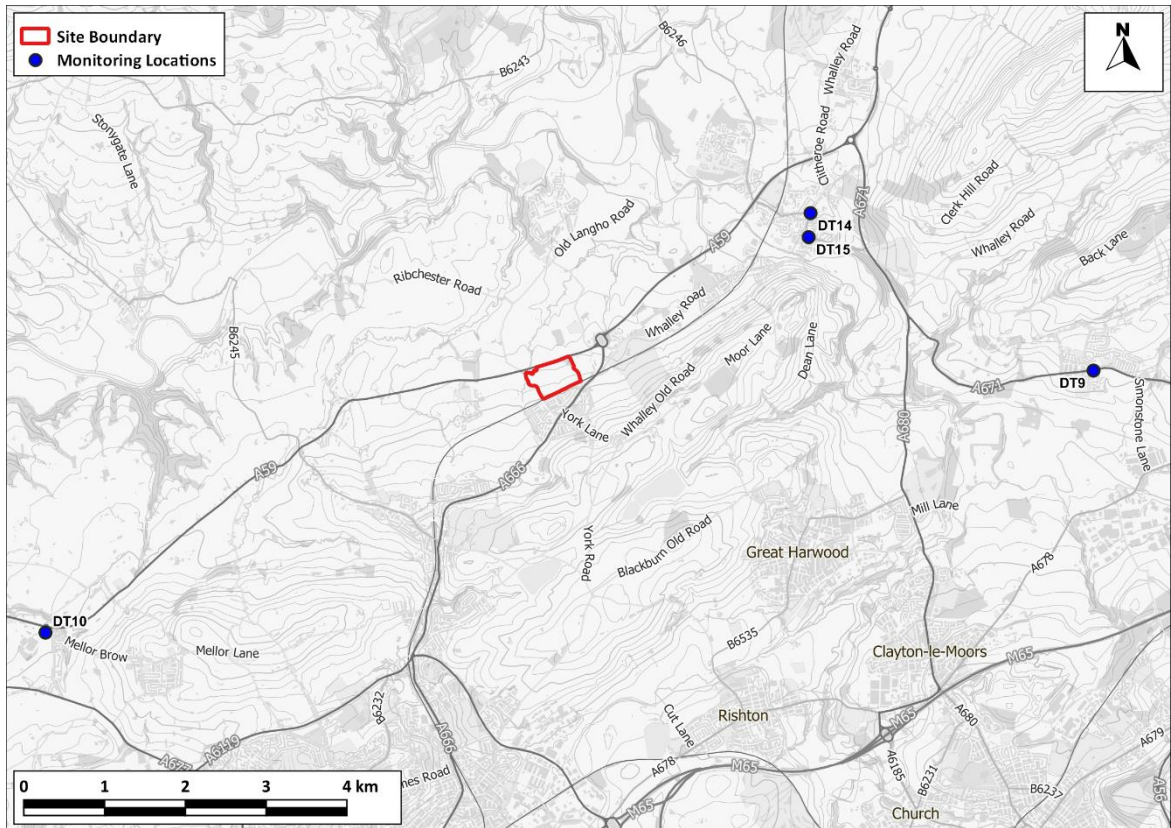
- 5.3 No significant industrial sources have been identified that are likely to affect the proposed development, in terms of air quality.

### Local Air Quality Monitoring

- 5.4 RVBC operates a number of nitrogen dioxide monitoring sites using diffusion tubes prepared and analysed by Gradko Environmental (using the 50% TEA in acetone method). These include four sites within approximately 6.5 km of the proposed development; one site adjacent to the A59 in Mellor Brook, two sites within Whalley and one site adjacent to the A671 (Whalley Road) in Read. Monitoring commenced at these sites in 2021 (DT9) and 2022 (DT10, DT14 and DT15). Annual mean results for the years 2021 to 2023 are summarised in Table 5-1. The monitoring locations are shown in Figure 5-1. The monitoring data have been taken from RVBC’s 2024 Annual Status Report (RVBC, 2024).

**Table 5-1: Summary of Annual Mean NO<sub>2</sub> Monitoring (2021 - 2023) (µg/m<sup>3</sup>)**

Site ID	Site Type	Location	2021	2022	2023
DT9	Roadside	7/9 Whalley Road, Read	22.5	23.6	25.1
DT10	Roadside	Mellor Brook	-	10.9	11.6
DT14	Roadside	2 Clitheroe Road, Whalley	-	19.9	19.4
DT15	Roadside	1-3 Accrington Road, Whalley	-	23.9	23.7
Objective			40		



**Figure 5-1: Monitoring Locations**

Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v3.0.

- 5.5 Measured annual mean nitrogen dioxide concentrations were well below the objective at all monitoring sites between 2021 and 2023. Concentrations were also well below 60 µg/m<sup>3</sup> indicating that the 1-hour mean objective is unlikely to have been exceeded. Monitor DT10 is considered to be most representative of air quality conditions for future residents of the proposed development, as both the monitor and proposed residential properties are set back from the main carriageway of the A59 (Longsight Road) by approximately 40 m.
- 5.6 No monitoring of PM<sub>10</sub> and PM<sub>2.5</sub> is currently undertaken by RVBC.

### Exceedances of Limit Value

- 5.7 There are no AURN (Defra, 2025d) monitoring sites within 1 km of the application site with which to identify exceedances of the annual mean nitrogen dioxide limit value. Defra's roadside annual mean nitrogen dioxide concentrations (Defra, 2025c), which are used to identify and report exceedances of the limit value, do not identify any exceedances within 1 km of the application site in 2023. 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.

### Background Concentrations

- 5.8 Estimated background concentrations in the study area are set out in Table 5-2 and are all well below the objectives. A range of values is presented as the study area covers multiple 1x1 km grid squares.

**Table 5-2: Estimated Annual Mean Background Pollutant Concentrations in 2024 and 2026(µg/m<sup>3</sup>)**

Year	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2024	5.1 – 5.8	8.3 – 8.9	5.0 – 5.4
2026	4.8 – 5.4	8.2 – 8.8	5.0 – 5.2
Objective	40	40	20 <sup>a</sup>

<sup>a</sup> The 20 µg/m<sup>3</sup> PM<sub>2.5</sub> objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

### Baseline Dispersion Model Results

5.9 Baseline concentrations of nitrogen dioxide, PM<sub>10</sub> and PM<sub>2.5</sub> have been modelled at each of the existing receptor locations (see Figure 4-1 and Table 4-1 for receptor locations). The results, which cover both the existing (2024) and future year (2026) baseline (Without Scheme), are set out in Table 5-3 for nitrogen dioxide and Table 5-4 for PM<sub>10</sub> and PM<sub>2.5</sub>. The modelled road components of nitrogen oxides have been increased from those predicted by the model based on a comparison with local measurements (see Appendix A3 for the verification methodology).

**Table 5-3: Modelled Annual Mean Baseline Concentrations of Nitrogen Dioxide (µg/m<sup>3</sup>) at Existing Receptors**

Receptor	2024	2026 Without Scheme
ER1	12.6	11.3
ER2	10.4	9.4
ER3	13.5	12.1
ER4	12.2	10.9
ER5	11.6	10.3
ER6	15.2	13.2
ER7	16.9	14.7
ER8	20.1	17.6
Objective	40	

**Table 5-4: Modelled Annual Mean Baseline Concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> at Existing Receptors (µg/m<sup>3</sup>)**

Receptor	PM <sub>10</sub>		PM <sub>2.5</sub>	
	2024	2026 Without Scheme	2024	2026 Without Scheme
ER1	9.3	9.2	5.5	5.4
ER2	9.1	9.0	5.4	5.3

Receptor	PM <sub>10</sub>		PM <sub>2.5</sub>	
	2024	2026 Without Scheme	2024	2026 Without Scheme
ER3	9.5	9.4	5.7	5.6
ER4	9.4	9.3	5.7	5.6
ER5	9.5	9.4	5.7	5.6
ER6	10.1	10.0	6.0	5.9
ER7	10.3	10.2	6.1	6.0
ER8	9.8	9.8	5.9	5.8
Assessment Criterion	32 <sup>a</sup>		20 <sup>b</sup>	

<sup>a</sup> While the annual mean PM<sub>10</sub> objective is 40 µg/m<sup>3</sup>, 32 µg/m<sup>3</sup> is the annual mean concentration above which an exceedance of the 24-hour mean PM<sub>10</sub> objective is possible, as outlined in LAQM.TG22 (Defra, 2022). A value of 32 µg/m<sup>3</sup> is thus used as a proxy to determine the likelihood of exceedance of the 24-hour mean PM<sub>10</sub> objective, as recommended in EPUK & IAQM guidance (Moorcroft and Barrowcliffe et al, 2017).

<sup>b</sup> The 20 µg/m<sup>3</sup> PM<sub>2.5</sub> objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

5.10 The predicted annual mean concentrations of nitrogen dioxide, PM<sub>10</sub> and PM<sub>2.5</sub> are well below the annual mean objective in both 2024 and 2026. The annual mean nitrogen dioxide concentrations are also well below 60 µg/m<sup>3</sup> at every receptor in both years; it is, therefore, unlikely that the 1-hour mean nitrogen dioxide objective will be exceeded (see Paragraph 3.2). The annual mean PM<sub>10</sub> concentrations are below 32 µg/m<sup>3</sup> and it is, therefore, unlikely that the 24-hour mean PM<sub>10</sub> objective will be exceeded.

## 6 Impact Assessment

### Impacts at Existing Receptors

6.1 The proposed development will generate traffic volumes that exceed the EPUK/IAQM screening thresholds, thus a detailed assessment is required.

#### Nitrogen Dioxide

6.2 Predicted annual mean concentrations of nitrogen dioxide in 2026 for existing receptors are set out in Table 6-1 for both the “Without Scheme” and “With Scheme” scenarios. The impact at each receptor is also described using the impact descriptors given in Table 4-2.

**Table 6-1: Predicted Impacts on Annual Mean Nitrogen Dioxide Concentrations in 2026 ( $\mu\text{g}/\text{m}^3$ )**

Receptor	Without Scheme	With Scheme	% Change <sup>a</sup>	Impact Descriptor
ER1	11.3	11.5	1	Negligible
ER2	9.4	9.6	1	Negligible
ER3	12.1	12.4	1	Negligible
ER4	10.9	11.2	1	Negligible
ER5	10.3	10.6	1	Negligible
ER6	13.2	13.5	1	Negligible
ER7	14.7	15.0	1	Negligible
ER8	17.6	17.9	1	Negligible
Objective	40		-	-

<sup>a</sup> % changes are relative to the objective and have been rounded to the nearest whole number.

6.3 The annual mean nitrogen dioxide concentrations are well below the objective at all receptors. The changes in concentrations are 1% (when rounded) at all receptors and the impacts are described as *negligible*.

6.4 The annual mean nitrogen dioxide concentrations are below  $60 \mu\text{g}/\text{m}^3$  at every receptor; it is, therefore, unlikely that the 1-hour mean nitrogen dioxide objective will be exceeded.

#### PM<sub>10</sub> and PM<sub>2.5</sub>

6.5 Predicted annual mean concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> in 2026 for existing receptors are set out in Table 6-2 for both the “Without Scheme” and “With Scheme” scenarios. The impacts at each receptor are also described using the impact descriptors given in Table 4-2.

**Table 6-2: Predicted Impacts on Annual Mean PM<sub>10</sub> and PM<sub>2.5</sub> Concentrations in 2026**

Receptor	Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> )				Annual Mean PM <sub>2.5</sub> (µg/m <sup>3</sup> )			
	Without Scheme	With Scheme	% Change <sup>a</sup>	Impact Descriptor	Without Scheme	With Scheme	% Change <sup>a</sup>	Impact Descriptor
ER1	9.2	9.2	0	Negligible	5.4	5.4	0	Negligible
ER2	9.0	9.1	0	Negligible	5.3	5.3	0	Negligible
ER3	9.4	9.4	0	Negligible	5.6	5.6	0	Negligible
ER4	9.3	9.3	0	Negligible	5.6	5.6	0	Negligible
ER5	9.4	9.4	0	Negligible	5.6	5.6	0	Negligible
ER6	10.0	10.0	0	Negligible	5.9	5.9	0	Negligible
ER7	10.2	10.2	0	Negligible	6.0	6.0	0	Negligible
ER8	9.8	9.8	0	Negligible	5.8	5.9	0	Negligible
Criterion	32 <sup>b</sup>		-	-	20 <sup>c</sup>		-	-

<sup>a</sup> % changes are relative to the criterion and have been rounded to the nearest whole number.

<sup>b</sup> While the annual mean PM<sub>10</sub> objective is 40 µg/m<sup>3</sup>, 32 µg/m<sup>3</sup> is the annual mean concentration above which an exceedance of the 24-hour mean PM<sub>10</sub> objective is possible, as outlined in LAQM.TG22 (Defra, 2022). A value of 32 µg/m<sup>3</sup> is thus used as a proxy to determine the likelihood of exceedance of the 24-hour mean PM<sub>10</sub> objective, as recommended in EPUK & IAQM guidance (Moorcroft and Barrowcliffe et al, 2017).

<sup>c</sup> The PM<sub>2.5</sub> objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

- 6.6 The annual mean PM<sub>10</sub> and PM<sub>2.5</sub> concentrations are well below the relevant criteria at all receptors, with or without the proposed development. The changes in concentrations are 0% at all receptors for both PM<sub>10</sub> and PM<sub>2.5</sub> and the impacts are described as *negligible*.
- 6.7 Furthermore, as the annual mean PM<sub>10</sub> concentrations are below 32 µg/m<sup>3</sup>, it is unlikely that the 24-hour mean PM<sub>10</sub> objective will be exceeded at any of the receptors.
- 6.8 As explained in Paragraph 3.7, a different assessment approach is required to determine whether the proposed development complies with the requirement to deliver achievement of the AMCT and PERT. This is considered in Section 8.

### Impacts of Existing Sources on Future Residents of the Development

- 6.9 Defra guidance (Defra, 2022) outlines that there is only the potential for an exceedance of the annual mean nitrogen dioxide objective where there is long-term exposure within 30 m of railway lines, these lines see a high volume of diesel passenger trains and the annual mean background concentration of nitrogen dioxide is above 25 µg/m<sup>3</sup>. The application site falls outside these criteria; while there will be exposure within 30 m of the railway lines, the background concentration is well below 25 µg/m<sup>3</sup>

(see Table 5-2), and these specific railway lines are not identified in the Defra guidance as having a high volume of diesel trains. It can, therefore, be concluded that there is no risk of an objective exceedance within the proposed development as a result of emission from trains using the adjacent railway lines.

- 6.10 The residential properties within the proposed development are located well away from local roads, being set back from Longsight Road by at least 40 m, in an area where pollutant concentrations would be expected to be close to background levels. Background concentrations at the site are well below the objectives (see Table 5-2). Furthermore, modelled concentrations at receptors ER2 and ER4, which are around 25 m closer to Longsight Road than the proposed residential properties, are predicted to be well below the objective in 2026 (see Table 6-1 and Table 6-2).
- 6.11 It can, thus, be concluded that future residents will experience acceptable air quality, and there is no need for more detailed assessment.

### Significance of Operational Air Quality Effects

- 6.12 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:
- pollutant concentrations within the proposed development will all be well below the objectives, thus future residents will experience acceptable air quality;
  - there is no risk of an exceedance of the objectives as a result of the emissions from the adjacent railway line; and
  - pollutant concentrations at all of the selected worst-case existing receptors along the local road network will be well below the air quality objectives, and all of the impacts are predicted to be negligible.

## 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. The proposed development incorporates the following good design and best practice measures:

- setting back of the development buildings from the A59 by at least 40 m;
- setting back of the development buildings from the railway lines by at least 12 m;
- provision of an outline Travel Plan setting out measures to encourage sustainable means of transport (public transport, cycling and walking);
- provision of pedestrian and cycle access to the new development, including secure cycle parking at each dwelling and a new uncontrolled pedestrian crossing on Longsight Road; and
- provision of two new bus stops on Longsight Road and upgrades to two of the existing bus stops on Whalley Road.

### Recommended Mitigation

7.2 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 further mitigation measures for this development.

7.3 Measures to reduce pollutant emissions 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 Achieving Compliance with the PM<sub>2.5</sub> Targets

- 8.1 The annual mean PM<sub>2.5</sub> concentrations are well below the AMCT target to be met by 2040 at all receptors, with or without the proposed development.
- 8.2 Defra have set out in their Interim Planning Guidance (Defra, 2024) two questions designed to consider whether a development supports the AMCT and PERT PM<sub>2.5</sub> targets.
- 8.3 The first question is “*How has exposure to PM<sub>2.5</sub> been considered when selecting the development site?*”. As explained in Section 7, exposure to PM<sub>2.5</sub> has been considered in the design of the development as the site is in a rural area away from large populations of people and in an area where PM<sub>2.5</sub> concentrations are below the target of 10 µg/m<sup>3</sup> both with and without the proposed development (see Table 6-2).
- 8.4 The second question is “*What actions and/or mitigations have been considered to reduce PM<sub>2.5</sub> exposure for development users and nearby receptors (houses, hospitals, schools etc.) and to reduce emissions of PM<sub>2.5</sub> and its precursors?*”. Residential properties within the proposed development are set back from local roads by at least 40 m and railway lines by 12 m, in an area where pollutant concentrations are close to background levels. The proposed development also includes a number of measures with the aim to minimise private car usage, including provision of new bus stops, improvements to existing bus stops and safe pedestrian and cycle access.
- 8.5 It is considered that the development complies with the requirements to deliver achievement of the AMCT and PERT by 2040 as appropriate action has been taken to minimise emissions of PM<sub>2.5</sub> and its precursors as far as is reasonably practicable.

## 9 Conclusions

- 9.1 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.

### Impacts

- 9.2 Air quality conditions for future residents of the proposed development have been shown to be acceptable, with concentrations well below the air quality objectives throughout the site.
- 9.3 The assessment has demonstrated that pollutant concentrations will be well below the objectives at all existing receptors in 2026, with or without the proposed development, and that the emissions from the additional traffic generated by the proposed development will have a negligible impact on air quality conditions at all existing receptors.
- 9.4 The overall operational air quality effects of the proposed development are judged to be 'not significant'.

### Policy Implications

- 9.5 Taking into account these conclusions, it is judged that the proposed development is consistent with Paragraph 198 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 199, as it will not affect compliance with relevant limit values or national objectives. Reword as necessary.
- 9.6 The proposed development is also consistent with Policy DMG1 of RVBC's Core Strategy, as air quality impacts have been assessed and found to be negligible, as the scheme has been designed to minimise impacts.
- 9.7 It is considered that the development complies with the requirements to deliver achievement of the AMCT and PERT by 2040 as appropriate action has been taken to minimise emissions of PM<sub>2.5</sub> and its precursors as far as is reasonably practicable.

## 10 References

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## 11 Glossary

AADT	Annual Average Daily Traffic
ADMS-Roads	Atmospheric Dispersion Modelling System model for Roads
AMCT	Annual Mean Concentration Target (for PM <sub>2.5</sub> )
AQAL	Air Quality Assessment Level
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
EFT	Emission Factor Toolkit
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
kph	Kilometres Per hour
LAQM	Local Air Quality Management
LDF	Local Development Framework
LDV	Light Duty Vehicles (<3.5 tonnes)
µg/m <sup>3</sup>	Microgrammes per cubic metre
NO	Nitric oxide
NO <sub>2</sub>	Nitrogen dioxide
NO <sub>x</sub>	Nitrogen oxides (taken to be NO <sub>2</sub> + 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
PERT	Population Exposure Reduction Target (for PM <sub>2.5</sub> )
PM <sub>10</sub>	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
PM <sub>2.5</sub>	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
PPG	Planning Practice Guidance
RVBC	Ribble Valley Borough Council
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

## 12 Appendices

## 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<sup>2</sup> 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<sup>2</sup> of commercial floorspace. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made available;
- Where development generates significant additional traffic, provision of a detailed travel plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety;
- All gas-fired boilers to meet a minimum standard of <40 mgNO<sub>x</sub>/kWh;
- Where emissions are likely to impact on an AQMA, all gas-fired CHP plant to meet a minimum emissions standard of:
  - Spark ignition engine: 250 mgNO<sub>x</sub>/Nm<sup>3</sup>;
  - Compression ignition engine: 400 mgNO<sub>x</sub>/Nm<sup>3</sup>;
  - Gas turbine: 50 mgNO<sub>x</sub>/Nm<sup>3</sup>.
- A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of 275 mgNO<sub>x</sub>/Nm<sup>3</sup> and 25 mgPM/Nm<sup>3</sup>.

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<sup>2</sup> 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 On combustion processes (including standby emergency generators and shipping) where there is a risk of impacts at relevant receptors, the guidance states that:

*“Typically, any combustion plant where the single or combined NO<sub>x</sub> emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. As a guide, the 5 mg/s criterion equates to a 450 kW ultra-low NO<sub>x</sub> gas boiler or a 30kW CHP unit operating at <95mg/Nm<sup>3</sup>.”*

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

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

A1.12 Should none of the above apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area, provided that professional judgement is applied; the guidance importantly states the following:

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

A1.13 Even if a development cannot be screened out, the guidance is clear that a detailed assessment is not necessarily required:

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

A1.14 The guidance also outlines what the content of the air quality assessment should include, and this has been adhered to in the production of this report.

## Assessment of Significance

- A1.15 There is no official guidance in the UK in relation to development control on how to describe the nature of air quality impacts, nor how to assess their significance. The approach within the EPUK/IAQM guidance has, therefore, been used in this assessment. This approach involves a two stage process:
- a qualitative or quantitative description of the impacts on local air quality arising from the development; and
  - a judgement on the overall significance of the effects of any impacts.
- A1.16 The guidance recommends that the assessment of significance should be based on professional judgement, with the overall air quality impact of the development described as either 'significant' or 'not significant'. In drawing this conclusion, the following factors should be taken into account:
- the existing and future air quality in the absence of the development;
  - the extent of current and future population exposure to the impacts;
  - the influence and validity of any assumptions adopted when undertaking the prediction of impacts;
  - the potential for cumulative impacts and, in such circumstances, several impacts that are described as 'slight' individually could, taken together, be regarded as having a significant effect for the purposes of air quality management in an area, especially where it is proving difficult to reduce concentrations of a pollutant. Conversely, a 'moderate' or 'substantial' impact may not have a significant effect if it is confined to a very small area and where it is not obviously the cause of harm to human health; and
  - the judgement on significance relates to the consequences of the impacts; will they have an effect on human health that could be considered as significant? In the majority of cases, the impacts from an individual development will be insufficiently large to result in measurable changes in health outcomes that could be regarded as significant by health care professionals.
- A1.17 The guidance is clear that other factors may be relevant in individual cases. It also states that the effect on the residents of any new development where the air quality is such that an air quality objective is not met will be judged as significant. For people working at new developments in this situation, the same will not be true as occupational exposure standards are different, although any assessment may wish to draw attention to the undesirability of the exposure.
- A1.18 A judgement of the significance should be made by a competent professional who is suitably qualified. A summary of the professional experience of the staff contributing to this assessment is provided in Appendix A2.

## A2 Professional Experience

### Dr Denise Evans, BSc (Hons) PhD MEnvSc MIAQM

Dr Evans is a Technical Director with AQC, with more than 25 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.

### Isabel Stanley, MSci (Hons) AMEnvSc AMIAQM

Miss Stanley is a Senior Consultant with AQC, having joined the company in October 2019. Prior to joining AQC she completed an MSci degree in Geology at the University of Bristol, where her studies included modules focusing on GIS, dispersion modelling and environmental geochemistry. She has undertaken numerous air quality assessments, including road traffic and plant emissions modelling, as well as indoor air quality plans and construction dust risk assessments.

## A3 Modelling Methodology

### Model Inputs

A3.1 Predictions have been carried out using the ADMS-Roads dispersion model (v5). The model requires the user to provide various input data, including emissions from each section of road and the road characteristics (such as road width). Vehicle emissions have been calculated based on vehicle flow, composition and speed data using the EFT (Version 12.1) published by Defra (2025b). Model input parameters are summarised in Table A3-1 and, where considered necessary, discussed further below.

**Table A3-1: Summary of Model Inputs**

Model Parameter	Value Used
Terrain Effects Modelled?	No
Variable Surface Roughness File Used?	No
Urban Canopy Flow Used?	No
Advanced Street Canyons Modelled?	No
Noise Barriers Modelled?	No
Meteorological Monitoring Site	Rochdale
Meteorological Data Year	2023
Dispersion Site Surface Roughness Length (m)	0.2
Dispersion Site Minimum MO Length (m)	10
Met Site Surface Roughness Length (m)	0.3
Met Site Minimum MO Length (m)	30
Verification Site Surface Roughness Length (m)	0.5
Verification Site Minimum MO Length (m)	10
Gradients?	No

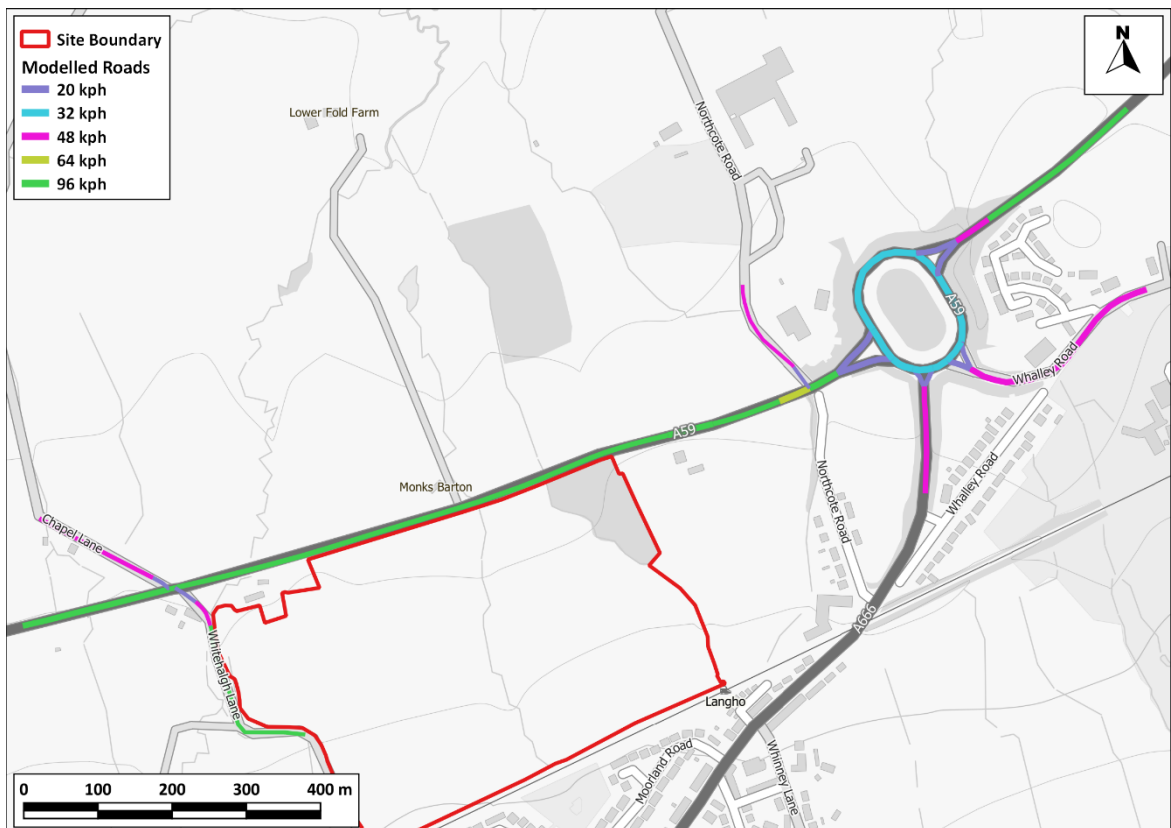
A3.2 AADT flows and the proportions of HDVs have been provided by Hydrock Fore, who have undertaken the transport assessment work for the proposed development. Traffic speeds have been estimated based on professional judgement, taking account of the road layout, speed limits and the proximity to a junction. The traffic data used in this assessment are summarised in Table A3-2. Diurnal and monthly flow profiles for the traffic have been derived from the national profiles published by DfT (2023).

**Table A3-2: Summary of Traffic Data used in the Assessment**

Road Link	2024		2026 (Without Scheme)		2026 (With Scheme)	
	AADT	%HDV	AADT	%HDV	AADT	%HDV
A59 Longsight Road (E of roundabout)	21,103	5.4	22,714	5.0	23,335	4.9

Road Link	2024		2026 (Without Scheme)		2026 (With Scheme)	
	AADT	%HDV	AADT	%HDV	AADT	%HDV
Whalley Road	8,140	3.0	8,140	3.0	8,307	2.9
A666	13,115	2.8	13,115	2.8	13,490	2.7
A59 Longsight Road (W of roundabout)	18,062	5.9	19,673	5.5	20,835	5.2
Northcote Road	3,041	3.3	3,041	3.4	3,128	3.3
A59 Longsight Road (E of Northcote Road)	18,310	5.9	19,921	5.4	21,084	5.1
A59 Longsight Road (W of Northcote Road)	15,484	6.6	17,095	6.0	18,344	5.7
Chapel Lane	1,707	1.3	1,707	1.3	1,794	1.3
A59 Longsight Road (E of Whitehalgh Lane)	15,744	6.2	17,355	5.6	18,195	5.4
Whitehalgh Lane	1,679	0.7	1,679	0.7	2,054	0.6
A59 Longsight Road (W of Whitehalgh Lane)	17,298	5.7	18,910	5.2	19,288	5.1

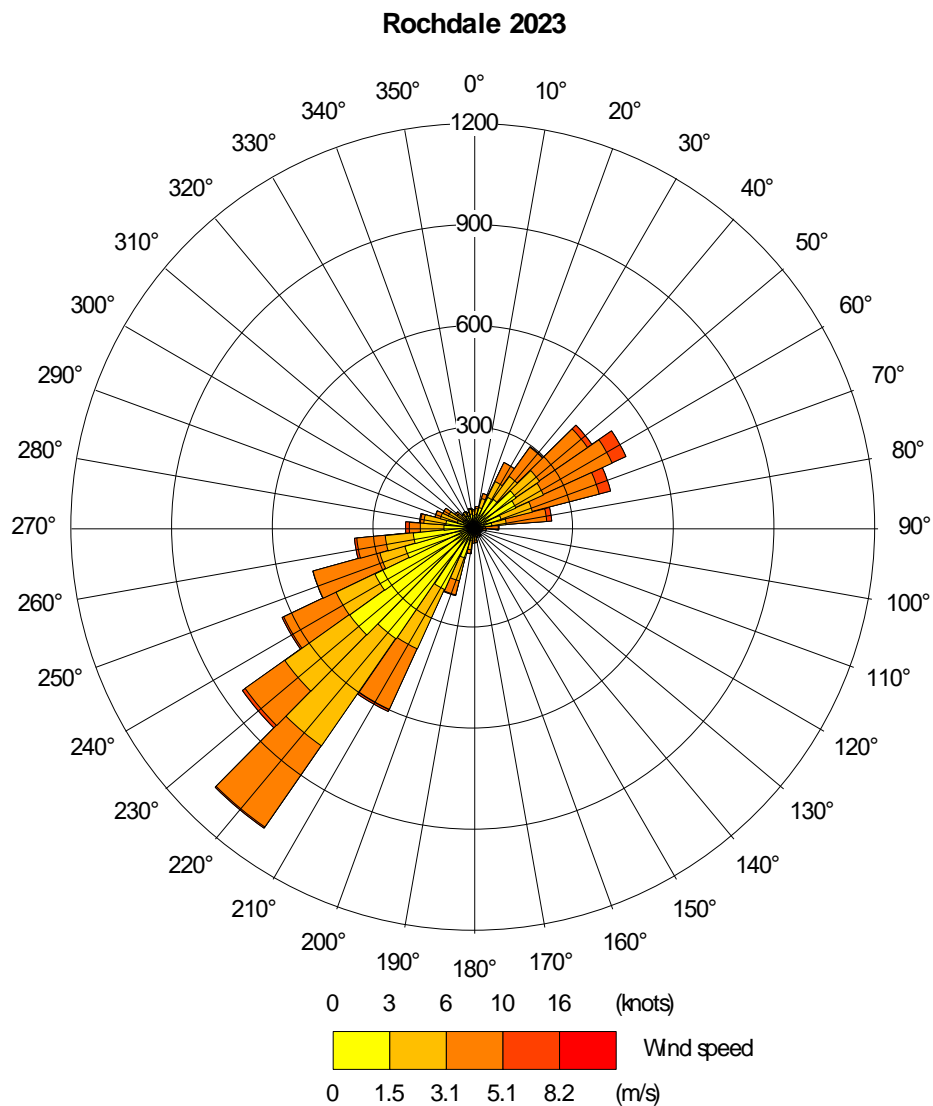
A3.3 Figure A3-1 shows the road network included within the model, along with the speed at which each link was modelled.



**Figure A3-1: Modelled Road Network & Speed**

Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v3.0.

A3.4 Hourly sequential meteorological data in sectors of 10 degrees from Rochdale for 2023 have been used in the model. The Rochdale meteorological monitoring station is located in Rochdale, approximately 28 km to the southeast of the proposed development. Both the application site and the Rochdale meteorological monitoring station are located in the northwest of England where they will be influenced by the effects of inland meteorology over flat-lying topography. The topography of the model domain is similar to that around the meteorological monitoring station and measurements from this site are considered to provide the most robust basis to predict meteorology within the model domain. A wind rose for the site for the year 2023 is provided in Figure A6-5. Raw data were provided by the Met Office and processed by AQC for use in ADMS.



**Figure A3-2: Wind Rose**

### Model Verification

A3.5 Evidence collected over many years has shown that, in most urban areas, dispersion modelling relying upon Defra’s EFT has tended to systematically under-predict roadside nitrogen dioxide concentrations. To account for this, it is necessary to adjust the model against local measurements. The model has been run to predict annual mean nitrogen dioxide concentrations during 2023 at the DT9 diffusion tube monitoring site adjacent to Whalley Road, Read. This site has been selected because it is in a roadside location adjacent to an A-Road with a similar daily traffic flow to roads adjacent to modelled receptors.

#### Background Concentrations

A3.6 The background annual mean nitrogen dioxide concentration used in the model verification was 6.3 µg/m³, having been derived from the national maps (Defra, 2025b).

#### Traffic Data

A3.7 AADT flows, and the proportions of HDVs, for the Whalley Road, Read adjacent to the monitoring site, have been determined from the interactive web-based map provided by the DfT (DfT, 2024). Traffic data used in the model verification are summarised in Table A3-3.

**Table A3-3: 2023 AADT Traffic Data used in the Model Verification**

Road Link	AADT	%HDV
Whalley Road, Read	14,155	4.0

A3.8 For the purposes of modelling, it has been assumed that verification site DT9 is within a street canyon formed by buildings adjacent to Whalley Road. This road has a number of canyon-like features, which reduce dispersion of traffic emissions, and can lead to concentrations of pollutants being higher here than they would be in areas with greater dispersion. Whalley Road, Read has, therefore, been modelled as a street canyon using ADMS-Roads’ advanced canyon module, with appropriate input parameters determined from local mapping. The modelled road network and canyon are shown in Figure A3-3.



**Figure A3-3: Modelled Road Network and Canyons for Verification**

Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v3.0.

*Nitrogen Dioxide*

- A3.9 Most nitrogen dioxide (NO<sub>2</sub>) is produced in the atmosphere by reaction of nitric oxide (NO) with ozone. It is therefore most appropriate to verify the model in terms of primary pollutant emissions of nitrogen oxides (NO<sub>x</sub> = NO + NO<sub>2</sub>). The model has been run to predict the annual mean NO<sub>x</sub> concentrations during 2023 at diffusion tube monitoring site DT9. Concentrations have been modelled at 2.3 m, the height of the monitor.
- A3.10 The model output of road-NO<sub>x</sub> (i.e. the component of total NO<sub>x</sub> coming from road traffic) has been compared with the 'measured' road-NO<sub>x</sub>. Measured road-NO<sub>x</sub> has been calculated from the measured NO<sub>2</sub> concentration and the predicted background NO<sub>2</sub> concentration using the NO<sub>x</sub> from NO<sub>2</sub> calculator (Version 8.1) available on the Defra LAQM Support website (Defra, 2025b).
- A3.11 An adjustment factor has been determined as the ratio of the 'measured' road contribution and the model derived road contribution. This factor has then been applied to the modelled road-NO<sub>x</sub> concentration for each receptor to provide adjusted modelled road-NO<sub>x</sub> concentrations. The total nitrogen dioxide concentrations have then been determined by combining the adjusted modelled road-NO<sub>x</sub> concentrations with the predicted background NO<sub>2</sub> concentration within the NO<sub>x</sub> to NO<sub>2</sub> calculator (Defra, 2025b).
- A3.12 The data used to calculate the adjustment factor are provided below:
  - Measured NO<sub>2</sub>: 25.1 µg/m<sup>3</sup>

- Background NO<sub>2</sub>: 6.3 µg/m<sup>3</sup>
- 'Measured' road-NO<sub>x</sub> (using NO<sub>x</sub> from NO<sub>2</sub> calculator): 43.6 µg/m<sup>3</sup>
- Modelled road-NO<sub>x</sub>: 17.4 µg/m<sup>3</sup>
- Road-NO<sub>x</sub> adjustment factor:  $43.6/17.4 = 2.51^5$

A3.13 The factor implies that the unadjusted model is under-predicting the road-NO<sub>x</sub> contribution. This is a common experience with this and most other road traffic emissions dispersion models.

A3.14 The predicted road-NO<sub>x</sub> concentrations at each receptor location have been adjusted using the adjustment factor set out above, which, along with the background NO<sub>2</sub>, has been processed through the NO<sub>x</sub> to NO<sub>2</sub> calculator available on the Defra LAQM Support website (Defra, 2025b). The traffic mix within the calculator has been set to "All UK traffic", which is considered suitable for the study area. The calculator predicts the component of NO<sub>2</sub> based on the adjusted road-NO<sub>x</sub> and the background NO<sub>2</sub>.

#### *PM<sub>10</sub> and PM<sub>2.5</sub>*

A3.15 The approach described above for NO<sub>x</sub> and nitrogen dioxide determines the road increment of concentrations by subtracting the predicted local background from the roadside measurements. This works well for NO<sub>x</sub> because the differences between roadside and background concentrations typically represent a large proportion of the total measured value. The same is not true for PM<sub>10</sub> and PM<sub>2.5</sub> concentrations, which are dominated by non-road emissions, even at the roadside. In practice, the influence of a local road on concentrations can often be smaller than the uncertainty in the mapped background concentration. As an example of this, 31% of all roadside and kerbside sites in London which measured PM<sub>2.5</sub> in 2019 with >75% data capture, recorded an annual mean concentration lower than the equivalent Defra mapped background value. Using measured background concentrations does not provide any significant benefit, owing largely to the spatial resolution of available measurements, but also because of measurement uncertainty. For example, hourly-mean PM<sub>2.5</sub> concentrations measured at roadside sites are often lower than those measured at nearby urban background sites, while concentrations at urban background sites are often lower than those measured at rural sites.

A3.16 For these reasons, it is not appropriate to calculate the annual mean road-increment to PM<sub>10</sub> and PM<sub>2.5</sub> concentrations by subtracting either the mapped background or a local measured background concentration. This, in turn, means that the approach to model adjustment which is described for NO<sub>x</sub> and NO<sub>2</sub> is not appropriate for PM<sub>10</sub> and PM<sub>2.5</sub>. Historically, many studies have derived a model adjustment factor for NO<sub>x</sub> and applied this to PM<sub>10</sub> and PM<sub>2.5</sub>. This is also not appropriate, since there is no reason to expect the same bias in emissions of NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>.

A3.17 While there is very strong evidence that EFT-based models have consistently under-predicted road-NO<sub>x</sub> concentrations in urban areas, there is no equivalent evidence for PM<sub>10</sub> and PM<sub>2.5</sub>. There is currently no strong basis for applying any adjustment to the model outputs. Predicted concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> have thus not been adjusted.

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<sup>5</sup> Based on un-rounded values.



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