# Air Quality Assessment

## Oakley Gardens, 188 Wilmslow Road, Fallowfield

**Client: Greyslow Limited**

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## Executive Summary

Redmore Environmental Ltd was commissioned by Greyslow Limited to undertake an Air Quality Assessment in support of a residential development at Oakley Gardens, Wilmslow Road, Fallowfield.

An Air Quality Assessment was undertaken to:

- Assess potential impacts associated with fugitive dust emissions during the construction phase of the proposed development;
- Assess potential impacts associated with road transport emissions during the operational phase of the proposed development;
- Assess risk of future resident exposure to any existing air quality issues; and,
- Identify any requirement for relevant mitigation measures.

Potential construction phase air quality impacts from fugitive dust emissions were assessed as a result of demolition, earthworks, construction and trackout activities. It is considered that the use of the identified site-specific control measures would provide suitable mitigation for a development of this size and nature and reduce potential impacts to an acceptable level.

Potential impacts during the operational phase of the proposals may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the development. Additionally, future residents may be exposed to any existing air quality issues at the site. Dispersion modelling was therefore undertaken in order to predict pollutant concentrations at sensitive locations as a result of emissions from the highway network both with and without the development in place. Results were subsequently verified using local monitoring data.

Review of the dispersion modelling results indicated that air quality impacts as a result of traffic generated by the development were not predicted to be significant at any sensitive location in the vicinity of the site.

The results of the assessment also demonstrated that predicted pollution levels were below the relevant criteria across the development. As such, the site is considered suitable for the proposed use from an air quality perspective and mitigation is not required.

Based on the assessment results, air quality factors are not considered a constraint to the development.

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# 1.0 INTRODUCTION

## 1.1 Instruction

1.1.1 Redmore Environmental Ltd was commissioned by Greyslow Limited to undertake an Air Quality Assessment in support of a residential development at Oakley Gardens, Wilmslow Road, Fallowfield.

## 1.2 Site Location and Context

1.2.1 The site is located on land off Wilmslow Road, Fallowfield, at approximate National Grid Reference (NGR): 385525, 394319. The relevant Local Authority (LA) is Manchester City Council (MCC). Reference should be made to Figure 1 for a map of the site and surrounding area.

1.2.2 The proposals comprise the partial demolition and refurbishment of existing buildings and new build development to provide 53 residential dwellings (Use class C3), along with associated hard and soft landscaping, access and associated works.

## 1.3 Assessment Scope

1.3.1 The proposals have the potential to cause air quality impacts at sensitive locations. As such, an Air Quality Assessment was undertaken to:

- Assess potential impacts associated with fugitive dust emissions during the construction phase of the development;
- Assess potential impacts associated with road transport emissions during the operational phase of the development;
- Assess risk of future resident exposure to any existing air quality issues; and,
- Identify the requirement for relevant mitigation measures.

1.3.2 This is detailed in the following report.

# 2.0 LEGISLATION AND POLICY

## 2.1 Legislation

2.1.1 The Air Quality Standards Regulations (2010) and subsequent amendments include Air Quality Limit Values (AQLVs) for the following pollutants:

- Nitrogen dioxide ($NO_2$);
- Sulphur dioxide;
- Lead;
- Particulate matter with an aerodynamic diameter of less than 10µm ($PM_{10}$);
- Particulate matter with an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$);
- Benzene; and,
- Carbon monoxide.

2.1.2 Air Quality Target Values were also provided for several additional pollutants. It should be noted that the AQLV for $PM_{2.5}$ stated in the Air Quality Standards Regulations (2010) was amended in the Environment (Miscellaneous Amendments) (EU Exit) Regulations (2020).

2.1.3 The Air Quality Strategy (AQS) was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published on 28th April 2023[1]. The document contains standards, objectives and measures for improving ambient air quality, including a number of Air Quality Objectives (AQOs). These are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

2.1.4 The Environmental Improvement Plan 2025[2] was published in December 2025, providing long term and Interim Targets in order to reduce population exposure to $PM_{2.5}$. The Concentration Target for 2040 was adopted in the Environmental Targets (Fine Particulate Matter) (England) Regulations (2023).

[1] AQS: Framework for Local Authority Delivery, DEFRA, 2023.

[2] Environmental Improvement Plan 2025, DEFRA, 2025.

2.1.5 Table 1 presents the AQOs, Interim Target and Concentration Target for pollutants considered within this assessment.

**Table 1 Air Quality Objectives/ Interim Target/ Concentration Target**

| Pollutant | Air Quality Objective/ Interim Target/ Concentration Target | |
|---|---|---|
| | Concentration (µg/m³) | Averaging Period |
| $NO_2$ | 40 | Annual mean |
| | 200 | 1-hour mean, not to be exceeded on more than 18 occasions per annum |
| $PM_{10}$ | 40 | Annual mean |
| | 50 | 24-hour mean, not to be exceeded on more than 35 occasions per annum |
| $PM_{2.5}$ | 10(a) | Annual mean |
| | 10(b) | Annual mean |

Note: (a) Interim Target to be achieved by 2030.
(b) Concentration Target to be achieved by 2040.

2.1.6 Table 2 summarises the advice provided in DEFRA guidance[3] on where the AQOs for pollutants considered within this report apply.

**Table 2 Examples of Where the Air Quality Objectives Apply**

| Averaging Period | Objective Should Apply At | Objective Should Not Apply At |
|---|---|---|
| Annual mean | All locations where members of the public might be regularly exposed<br>Building façades of residential properties, schools, hospitals, care homes etc. | Building façades of offices or other places of work where members of the public do not have regular access<br>Hotels, unless people live there as their permanent residence<br>Gardens of residential properties<br>Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term |

3 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

| Averaging Period | Objective Should Apply At | Objective Should Not Apply At |
|---|---|---|
| 24-hour mean | All locations where the annual mean objective would apply, together with hotels<br>Gardens of residential properties | Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term |
| 1-hour mean | All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets)<br>Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more<br>Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer | Kerbside sites where the public would not be expected to have regular access |

## 2.2 Local Air Quality Management

2.2.1 LAs are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure, as summarised in Table 2, are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

## 2.3 Dust

2.3.1 The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations (2016) and subsequent amendments, such as construction sites, is that provided in Section 79 of Part III of the Environmental Protection Act (1990). The Act defines nuisance as:

> "any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance."

2.3.2 Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (1990). The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practicable means.

## 2.4 National Planning Policy

2.4.1 The revised National Planning Policy Framework[4] (NPPF) was published in December 2024 and amended in February 2025. The document sets out the Government's planning policies for England and how these are expected to be applied.

2.4.2 The purpose of the planning system is to contribute to the achievement of sustainable development. In order to ensure this, the NPPF recognises three overarching objectives including the following of relevance to air quality:

> "c) 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."

2.4.3 Chapter 15 of the NPPF details objectives in relation to conserving and enhancing the natural environment. It states that:

> "Planning policies and decisions should contribute to and enhance the natural and local environment by:
>
> […]
>
> e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of

[4] NPPF, Ministry of Housing, Communities and Local Government, 2024.

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 […]."

2.4.4 The NPPF specifically recognises air quality as part of delivering sustainable development and states 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."

2.4.5 The implications of the NPPF have been considered throughout this assessment.

## 2.5 National Planning Practice Guidance

2.5.1 The National Planning Practice Guidance[5] (NPPG) web-based resource was launched by the Department for Communities and Local Government to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

1. What air quality considerations does planning need to address?
2. What is the role of plan-making with regard to air quality?
3. Are air quality concerns relevant to neighbourhood planning?
4. What information is available about air quality?
5. When could air quality considerations be relevant to the development management process?
6. What specific issues may need to be considered when assessing air quality impacts?

[5] https://www.gov.uk/guidance/air-quality--3.

7. How detailed does an air quality assessment need to be?
8. How can an impact on air quality be mitigated?

2.5.2 These were reviewed and the relevant guidance considered as necessary throughout the undertaking of this assessment.

## 2.6 Regional Planning Policy

2.6.1 The Places for Everyone Plan (PfEP)[6] was produced by the Greater Manchester Combined Authority (GMCA) and became part of the statutory development plan for each of the relevant LAs on 21st March 2024.

2.6.2 A review of the PfEP indicated the following policies of relevance to air quality that have been considered throughout this assessment:

> "Policy JP:S5: Clean Air
>
> A comprehensive range of measures will be taken to support improvements in air quality, focusing particularly on locations where people live, where children learn and play, where there are impacts on the green infrastructure network and where air quality targets are not being met, including:
>
> 1. Locating and designing development, and focusing transport investment, so as to reduce reliance on forms of transport that generate air pollution;
>
> 2. Determining planning applications having regard to the most recent development and planning control guidance published jointly by the Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK), and the most recent IAQM Guidance on the Assessment of Dust from Demolition and Construction, or relevant successor guidance, including the requirement for developers to submit construction management plans as appropriate;
>
> 3. Requiring applications for developments that could have an adverse impact on air quality to submit relevant air pollution data so that adverse impacts on air

[6] PfEP, GMCA, 2024.

quality can be fully assessed and development only permitted where they are acceptable and/or suitable mitigation can be provided;

4. Restricting developments that would generate significant point source pollution such as some types of industrial activity and energy generation;

5. Significantly expanding the existing commercial network of electric vehicle charging points, both for public and private use, including as part of new developments;

6. Implementing the Clean Air Plan and associated measures;

7. Facilitating the more sustainable distribution of goods within the urban area, including through accommodating urban consolidation centres and urban distribution centres that use ultra-low-emission vehicles, and local delivery facilities to reduce repeat delivery attempts;

8. Designing streets to avoid trapping air pollution at ground level, including through the appropriate location and scale of buildings and trees;

9. Controlling traffic and parking within and around schools, early years sites and other locations that are particularly sensitive to air quality;

10. Promoting actions that help remove pollutants from the air, such as enhancing the green infrastructure network and using innovative building materials that capture air pollutants; and,

11. Development should be located in areas that maximise the use of sustainable travel modes and be designed to minimise exposure to high levels of air pollution, particularly for vulnerable users."

"Policy JP-P1 Sustainable Places

We aim to become one of the most liveable city regions in the world, consisting of a series of beautiful, healthy and varied places, each having the following key attributes that all development, wherever appropriate, should be consistent with:

[…]

15. Comfortable and inviting, with indoor and outdoor environments:

A. Offering a high level of amenity that minimises exposure to pollution; and,

[…]."

2.6.3 The above policies were considered as necessary throughout the undertaking of the assessment.

## 2.7 Local Planning Policy

2.7.1 The Manchester Local Development Framework consists of a series of planning documents of which the Core Strategy Development Plan Document (DPD)[7] is central. This was adopted by MCC on 11th July 2012.

2.7.2 Review of the Core Strategy DPD indicated the following policies of relevance to the assessment:

"Policy DM 1

Development Management
All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:

[…]

Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise."

[7] Core Strategy DPD, MCC, 2012.

"Policy EN 16

Air Quality

The Council will seek to improve the air quality within Manchester."

2.7.3 It should be noted that MCC issued an addendum to the Core Strategy[8] in 2024. This confirms that the remaining text of Policy EN16 have been superseded by PfE Policy JP-S5, as referenced in Section 2.6.

2.7.4 MCC has also produced the 'Air Quality & Planning Technical Guidance' Document[9] which provides guidance on assessing the impact of proposed development on air quality.

2.7.5 The above policies and guidance were taken into consideration throughout the undertaking of the assessment.

## 2.8 Greater Manchester Clear Air Plan

2.8.1 The UK Government has instructed a number of LAs to take rapid action to reduce harmful roadside levels of $NO_2$ within their areas of jurisdiction in the quickest possible timeframe. The GMCA and Transport for Greater Manchester (TfGM) have collaborated to develop a Clean Air Plan (CAP) to ensure Greater Manchester achieves compliance with the relevant AQOs for $NO_2$ by 2026 at the latest. The initial CAP proposal included implementation of a Class C charging Clean Air Zone. The GMCA has subsequently updated the CAP proposals[10] to comprise an investment-led, non-charging approach. This was approved by the UK Government on 23rd January 2025. The implications of the CAP were taken into account during the undertaking of this assessment.

8 Addendum to Manchester Core Strategy 2024, MCC, 2024.

9 Air Quality & Planning Technical Guidance, MCC, 2022.

10 Case for a New GM Clean Air Plan, GMCA and TfGM, 2022.

# 3.0 METHODOLOGY

## 3.1 Introduction

3.1.1 The proposed development has the potential to cause air quality impacts during the construction and operational phases, as well as expose future residents to elevated pollution levels. These factors were assessed in accordance with the following methodology.

## 3.2 Construction Phase Assessment

3.2.1 There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction V2.2'[11].

3.2.2 Activities on the proposed construction site have been divided into four types to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and,
- Trackout.

3.2.3 The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and,
- The risk of health effects due to a significant increase in exposure to $PM_{10}$.

3.2.4 The assessment steps are detailed below.

[11] Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

**Step 1 - Screen the Need for an Assessment**

3.2.5 Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 250m from the boundary or 50m from the construction vehicle route up to 250m from the site entrance, then the assessment proceeds to Step 2. Additionally, should ecological receptors be identified within 50m of the site or the construction vehicle route up to 250m from the site entrance, then the assessment also proceeds to Step 2.

3.2.6 Should sensitive receptors not be present within the relevant distances then **negligible** impacts would be expected and further assessment is not necessary.

**Step 2 - Assess the Risk of Dust Impacts**

3.2.7 Step 2 assesses the risk of potential dust impacts. A site is allocated a risk category based on two factors:

- The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large (Step 2A); and,
- The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (Step 2B).

3.2.8 The two factors are combined in Step 2C to determine the risk of dust impacts without mitigation applied.

3.2.9 Step 2A defines the potential magnitude of dust emission during the construction phase. The relevant criteria are summarised in Table 3.

**Table 3 Construction Dust - Magnitude of Emission**

| Magnitude | Activity | Criteria |
|---|---|---|
| Large | Demolition | • Total volume of building to be demolished greater than 75,000m$^3$<br>• Potentially dusty construction material (e.g. concrete)<br>• On-site crushing and screening<br>• Demolition activities more than 12m above ground level |

| Magnitude | Activity | Criteria |
|---|---|---|
| | Earthworks | • Total site area greater than 110,000m$^2$<br>• Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size)<br>• More than 10 heavy earth moving vehicles active at any one time<br>• Formation of bunds greater than 6m in height |
| | Construction | • Total building volume greater than 75,000m$^3$<br>• On site concrete batching<br>• Sandblasting |
| | Trackout | • More than 50 Heavy Duty Vehicle (HDV) trips per day<br>• Potentially dusty surface material (e.g. high clay content)<br>• Unpaved road length greater than 100m |
| Medium | Demolition | • Total volume of building to be demolished between 12,000m$^3$ and 75,000m$^3$<br>• Potentially dusty material (e.g. concrete)<br>• Demolition activities 6 to 12m above ground level |
| | Earthworks | • Total site area 18,000m$^2$ to 110,000m$^2$<br>• Moderately dusty soil type (e.g. silt)<br>• 5 to 10 heavy earth moving vehicles active at any one time<br>• Formation of bunds 3m to 6m in height |
| | Construction | • Total building volume 12,000m$^3$ to 75,000m$^3$<br>• Potentially dusty construction material (e.g. concrete)<br>• On site concrete batching |
| | Trackout | • 20 to 50 HDV trips per day<br>• Moderately dusty surface material (e.g. high clay content)<br>• Unpaved road length 50m to 100m |
| Small | Demolition | • Total volume of building to be demolished less than 12,000m$^3$<br>• Construction material with low potential for dust release (e.g. metal cladding or timber)<br>• Demolition activities less than 6m above ground level<br>• Demolition activities during wetter months |
| | Earthworks | • Total site area less than 18,000m$^2$<br>• Soil type with large grain size (e.g. sand)<br>• Less than 5 heavy earth moving vehicles active at any one time<br>• Formation of bunds less than 3m in height |

| Magnitude | Activity | Criteria |
|---|---|---|
| | Construction | • Total building volume less than 12,000m$^3$<br>• Construction material with low potential for dust release (e.g. metal cladding or timber) |
| | Trackout | • Less than 20 HDV trips per day<br>• Surface material with low potential for dust release<br>• Unpaved road length less than 50m |

3.2.10 Step 2B defines the sensitivity of the area around the development to potential dust impacts. The sensitivities of specific receptors are shown in Table 4.

**Table 4 Construction Dust - Sensitivities of Human and Ecological Receptors**

| Receptor Sensitivity | Examples | |
|---|---|---|
| | Human Receptors | Ecological Receptors |
| High | • Users expect high levels of amenity<br>• High aesthetic or value property<br>• People expected to be present continuously for extended periods of time<br>• Locations where members of the public are exposed over a time period relevant to the AQO for $PM_{10}$. e.g. residential properties, hospitals, schools and residential care homes | • Internationally or nationally designated site e.g. Special Area of Conservation |
| Medium | • Users would expect to enjoy a reasonable level of amenity<br>• Aesthetics or value of their property could be diminished by soiling<br>• People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work | • Nationally designated site e.g. Sites of Special Scientific Interest |
| Low | • Enjoyment of amenity would not reasonably be expected<br>• Property would not be expected to be diminished in appearance<br>• Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, farmland, short term car parks and roads | • Locally designated site e.g. Local Nature Reserve |

3.2.11 The criteria for determining the sensitivity of the area to dust soiling effects on people and property is summarised in Table 5.

**Table 5 Construction Dust - Sensitivity of the Area to Dust Soiling Effects on People and Property**

| Receptor Sensitivity | Number of Receptors | Distance from the Source (m) | | | |
|---|---|---|---|---|---|
| | | Less than 20 | Less than 50 | Less than 100 | Less than 250 |
| High | More than 100 | High | High | Medium | Low |
| | 10 - 100 | High | Medium | Low | Low |
| | 1 - 10 | Medium | Low | Low | Low |
| Medium | More than 1 | Medium | Low | Low | Low |
| Low | More than 1 | Low | Low | Low | Low |

3.2.12 Table 6 outlines the criteria for determining the sensitivity of the area to human health impacts.

**Table 6 Construction Dust - Sensitivity of the Area to Human Health Impacts**

| Receptor Sensitivity | Background Annual Mean $PM_{10}$ Concentration | Number of Receptors | Distance from the Source (m) | | | |
|---|---|---|---|---|---|---|
| | | | Less than 20 | Less than 50 | Less than 100 | Less than 250 |
| High | Greater than 32µg/m$^3$ | More than 100 | High | High | High | Medium |
| | | 10 - 100 | High | High | Medium | Low |
| | | 1 - 10 | High | Medium | Low | Low |
| | 28 - 32µg/m$^3$ | More than 100 | High | High | Medium | Low |
| | | 10 - 100 | High | Medium | Low | Low |
| | | 1 - 10 | High | Medium | Low | Low |
| | 24 - 28µg/m$^3$ | More than 100 | High | Medium | Low | Low |
| | | 10 - 100 | High | Medium | Low | Low |
| | | 1 - 10 | Medium | Low | Low | Low |
| | Less than 24µg/m$^3$ | More than 100 | Medium | Low | Low | Low |
| | | 10 - 100 | Low | Low | Low | Low |

| Receptor Sensitivity | Background Annual Mean $PM_{10}$ Concentration | Number of Receptors | Distance from the Source (m) | | | |
|---|---|---|---|---|---|---|
| | | | Less than 20 | Less than 50 | Less than 100 | Less than 250 |
| | | 1 - 10 | Low | Low | Low | Low |
| Medium | Greater than 32µg/m³ | More than 10 | High | Medium | Low | Low |
| | | 1 - 10 | Medium | Low | Low | Low |
| | 28 - 32µg/m³ | More than 10 | Medium | Low | Low | Low |
| | | 1 - 10 | Low | Low | Low | Low |
| | 24 - 28µg/m³ | More than 10 | Low | Low | Low | Low |
| | | 1 -10 | Low | Low | Low | Low |
| | Less than 24µg/m³ | More than 10 | Low | Low | Low | Low |
| | | 1 - 10 | Low | Low | Low | Low |
| Low | - | 1 or more | Low | Low | Low | Low |

3.2.13 Table 7 outlines the criteria for determining the sensitivity of the area to ecological impacts.

**Table 7 Construction Dust - Sensitivity of the Area to Ecological Impacts**

| Receptor Sensitivity | Distance from the Source (m) | |
|---|---|---|
| | Less than 20 | Less than 50 |
| High | High | Medium |
| Medium | Medium | Low |
| Low | Low | Low |

3.2.14 Step 2C combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts.

3.2.15 Table 8 outlines the risk category from demolition activities.

**Table 8 Construction Dust - Dust Risk Category from Demolition Activities**

| Receptor Sensitivity | Dust Emission Magnitude | | |
|---|---|---|---|
| | Large | Medium | Small |
| High | High | Medium | Medium |
| Medium | High | Medium | Low |
| Low | Medium | Low | Negligible |

3.2.16 Table 9 outlines the risk category from earthworks, construction and trackout activities.

**Table 9 Construction Dust - Dust Risk Category from Earthworks, Construction and Trackout Activities**

| Receptor Sensitivity | Dust Emission Magnitude | | |
|---|---|---|---|
| | Large | Medium | Small |
| High | High | Medium | Low |
| Medium | Medium | Medium | Low |
| Low | Low | Low | Negligible |

**Step 3 - Site-specific Mitigation**

3.2.17 Step 3 requires the identification of site-specific mitigation measures within the IAQM guidance[12] to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with **negligible** risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

**Step 4 - Determine Significance**

3.2.18 Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. For almost all construction activity, the aim should be to control effects through the use of

12 Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be **not significant**.

3.2.19 The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. The IAQM guidance suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix 2.

## 3.3 Operational Phase Assessment

3.3.1 The development has the potential to affect air quality as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site, as well as expose future residents to any existing air quality issues. Potential impacts have therefore been defined by predicting pollutant concentrations at sensitive locations using dispersion modelling for the following scenarios:

- 2024 - Verification.
- Opening year Do-Minimum (DM) (predicted traffic flows in 2028 should the proposals not proceed); and,
- Opening year Do-Something (DS) (predicted traffic flows in 2028 should the proposals be completed).

3.3.2 Reference should be made to Appendix 1 for assessment input data and details of the verification process.

### Potential Development Impacts

3.3.3 Locations sensitive to potential changes in off-site pollutant concentrations were identified within 200m of the highway network in accordance with National Highways guidance[13] on the likely limits of pollutant dispersion from road sources. The criteria provided within DEFRA guidance[14] on where the AQOs apply, as summarised in Table 2, was utilised to determine worst-case receptor positions in the vicinity of links likely to be affected by changes in traffic flows as a result of the development.

[13] LA 105: Air Quality (vertical barriers), National Highways, 2024.

[14] Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

3.3.4 The significance of predicted air quality impacts was determined in accordance with the guidance provided within the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'[15]. Using this methodology impacts were defined based on the interaction between the predicted pollutant concentration from the DS scenario and the magnitude of change between the DM and DS scenarios, as outlined in Table 10.

**Table 10 Significance of Operational Phase Road Vehicle Exhaust Emission Impacts**

| Concentration at Receptor in Assessment Year | Predicted Concentration Change as Proportion of AQO/ Concentration Target (%) | | | |
|---|---|---|---|---|
| | 1 | 2 - 5 | 6 - 10 | > 10 |
| 75% or less of AQO/ Concentration Target | Negligible | Negligible | Slight | Moderate |
| 76 - 94% of AQO/ Concentration Target | Negligible | Slight | Moderate | Moderate |
| 95 - 102% of AQO/ Concentration Target | Slight | Moderate | Moderate | Substantial |
| 103 - 109% of AQO/ Concentration Target | Moderate | Moderate | Substantial | Substantial |
| 110% or more of AQO/ Concentration Target | Moderate | Substantial | Substantial | Substantial |

3.3.5 The matrix shown in Table 10 is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which makes it clearer which cell the impact falls within. It should be noted that changes of 0%, i.e. less than 0.5%, are described as **negligible**.

3.3.6 Following the prediction of impacts at discrete receptor locations, the IAQM document[16] provides guidance on determining the overall air quality impact significance of the operation of a development. The following factors are identified for consideration by the assessor:

- The existing and future air quality in the absence of the development;
- The extent of current and future population exposure to the impacts; and,

15 Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

16 Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

3.3.7 The IAQM guidance states that an assessment must reach a conclusion on the likely significance of the predicted impact. Where the overall effect is **moderate** or **substantial**, the effect is likely to be considered **significant**, whilst if the impact is **slight** or **negligible**, the impact is likely to be considered **not significant**. It should be noted that this is a binary judgement of either it is **significant** or it is **not significant**.

3.3.8 The determination of significance relies on professional judgement and reasoning has been provided as far as practicable. The IAQM guidance[17] suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix 2.

**Potential Future Exposure**

3.3.9 The proposals have the potential to expose future residents to any existing air quality issues. In order to assess $NO_2$, $PM_{10}$ and $PM_{2.5}$ concentrations across the development site, detailed dispersion modelling was undertaken. The results were subsequently compared with the relevant AQOs and Concentration Target to determine any potential areas of exceedence and associated constraints to the proposed land use. Reference should be made to Appendix 1 for a full description of the assessment input data.

17 Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

# 4.0 BASELINE

## 4.1 Introduction

4.1.1 Existing air quality conditions in the vicinity of the proposed development site were identified in order to provide a baseline for assessment. These are detailed in the following Sections.

## 4.2 Local Air Quality Management

4.2.1 As required by the Environment Act (1995), as amended by the Environment Act (2021), MCC has undertaken Review and Assessment of air quality within its area of jurisdiction. This process has indicated that annual mean concentrations of $NO_2$ are above the AQO within the city. As such, a number of roads within Manchester have been included within the GMCA AQMA. This is described as follows:

> "This is the part of the Greater Manchester Combined Authority AQMA located within the Manchester City Council area."

4.2.2 The development is partially located within AQMA. As such, there is the potential for emissions associated with the development to increase pollution levels in this sensitive area, as well as the exposure of future residents to poor air quality. This has been considered throughout the assessment.

4.2.3 MCC have concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs. As such, no further AQMAs have been designated.

## 4.3 Air Quality Monitoring

4.3.1 Monitoring of pollutant levels is undertaken by MCC throughout its area of jurisdiction. Data has also been collected by the GMCA to inform the CAP. Recent $NO_2$ concentrations recorded in the vicinity of the development, as provided in GMCA's '2024

Air Quality Annual Status Report (ASR)'[18] and 'CAP $NO_2$ Diffusion Tube Results 2011-2024'[19], are shown in Table 11. Exceedences of the AQO are shown in **bold**.

**Table 11 Monitoring Results**

| Monitoring Site | | Monitored $NO_2$ Concentration (µg/m³) | | |
|---|---|---|---|---|
| | | 2022 | 2023 | 2024 |
| CAP_MANC_125 | A6 Stockport Road | **51.4** | **48.0** | **47.5** |
| CAP_MANC_126 | A6 Stockport Road | **41.1** | **42.4** | **40.7** |
| MA75NO | Stockport Road | 38.8 | 39.6 | 37.2 |
| MA80NO | 80 | 25.7 | 25.3 | -(a) |
| MA81NO | Peaceville Road | 18.8 | 17.0 | 16.3 |

Note: (a) Monitor decommissioned in 2024.

4.3.2 As shown in Table 11, annual mean $NO_2$ concentrations were above the AQO of 40µg/m³ at CAP_MANC_125 and CAP_MANC_126 in recent years. As these monitors are located at roadside positions within an AQMA, elevated results are to be expected. Concentrations were below the AQO at all other monitoring locations in recent years. Reference should be made to Figure 2 for a map of the survey positions.

4.3.3 MCC do not undertake $PM_{10}$ or $PM_{2.5}$ monitoring in the vicinity of the site.

## 4.4 Background Pollutant Concentrations

4.4.1 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located in grid square NGR: 385500, 394500. Data for this location was downloaded from the DEFRA website[20] for the purpose of the assessment and is summarised in Table 12.

18 2024 Air Quality ASR, GMCA, 2024.

19 Greater Manchester LAQM and CAP $NO_2$ Diffusion Tube Results 2011-2024, GMCA, 2024.

20 http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021.

**Table 12 Background Pollutant Concentration Predictions**

| Pollutant | Predicted Background Pollutant Concentration (µg/m³) | | |
|---|---|---|---|
| | 2024 | 2026 | 2028 |
| $NO_2$ | 14.45 | 13.40 | 12.33 |
| $PM_{10}$ | 12.93 | 12.83 | 12.71 |
| $PM_{2.5}$ | 7.66 | 7.54 | 7.43 |

4.4.2 As shown in Table 12, predicted background concentrations are below the relevant AQOs and Concentration Target at the development site.

## 4.5 Sensitive Receptors

4.5.1 A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a development. These have been defined for dust and road vehicle exhaust emission impacts in the following Sections.

### Construction Phase Sensitive Receptors

4.5.2 Receptors sensitive to potential dust impacts during demolition, earthworks and construction were identified from a desk-top study of the area up to 250m from the development boundary. These are summarised in Table 13.

**Table 13 Demolition, Earthworks and Construction Dust Sensitive Receptors**

| Distance from Site Boundary (m) | Approximate Number of Human Receptors | Approximate Number of Ecological Receptors |
|---|---|---|
| Up to 20 | 10 - 100 | 0 |
| Up to 50 | More than 100 | 0 |
| Up to 100 | More than 100 | - |
| Up to 250 | More than 100 | - |

4.5.3 Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 250m of the site access. These are summarised in Table 14.

**Table 14 Trackout Dust Sensitive Receptors**

| Distance from Site Access Route (m) | Approximate Number of Human Receptors | Approximate Number of Ecological Receptors |
|---|---|---|
| Up to 20 | More than 100 | 0 |
| Up to 50 | More than 100 | 0 |

4.5.4 There are no ecological receptors within 50m of the development boundary or the access route within 250m of the site entrance. As such, ecological impacts have not been assessed further within this report.

4.5.5 Based on the criteria shown in Table 4, the sensitivity of the receiving environment to potential dust impacts was determined as a **high**. This was because the identified receptors included residential properties.

**Operational Phase Sensitive Receptors**

4.5.6 Locations sensitive to potential operational phase road vehicle exhaust emission impacts were identified from a desk-top study. These are summarised in Table 15. Receptor heights were selected based on the location of residential units to allow for less sensitive land uses, such as retail, at ground level.

**Table 15 Operational Phase Road Vehicle Exhaust Emission Sensitive Receptor Locations**

| Receptor | | NGR (m) | | Height (m) |
|---|---|---|---|---|
| | | X | Y | |
| R1 | Student Accommodation - Wilmslow Road | 385617.7 | 394026.5 | 1.5 |
| R2 | Residential - Wilmslow Road | 385572.2 | 394083.1 | 4.5 |
| R3 | Student Accommodation - Wilmslow Road | 385621.5 | 394125.8 | 1.5 |
| R4 | Residential - Wilmslow Road | 385587.8 | 394198.8 | 4.5 |
| R5 | Student Accommodation - Wilmslow Road | 385634.3 | 394281.8 | 1.5 |
| R6 | Student Accommodation - Wilmslow Road | 385568.4 | 394547.9 | 1.5 |
| R7 | Residential - Wilmslow Road | 385499.5 | 394535.5 | 1.5 |
| R8 | Residential - Wilmslow Road | 385511.9 | 394640.8 | 1.5 |

4.5.7 Reference should be made to Figure 3 for a map of road vehicle exhaust emission sensitive receptor locations.

# 5.0 CONSTRUCTION PHASE ASSESSMENT

## 5.1 Introduction

5.1.1 There is the potential for air quality impacts as a result of the construction of the proposed development. These are assessed in the following Sections.

## 5.2 Step 1 - Screen the Need for an Assessment

5.2.1 The undertaking of activities such as demolition, excavation, groundworks, cutting, concrete batching, construction and storage of materials has the potential to result in fugitive dust emissions throughout the construction phase. Vehicle movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul roads and highway surfaces.

5.2.2 The potential for impacts at sensitive locations depends significantly on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.

5.2.3 The desk-study undertaken to inform the baseline identified a number of sensitive receptors within 250m of the site boundary. As such, a detailed assessment of potential dust impacts was required.

## 5.3 Step 2a - Define the Potential Dust Emission Magnitude

**Demolition**

5.3.1 Demolition will be undertaken at the start of the construction phase and will involve clearance of the existing building on site. It is estimated that the building volume to be demolished is less than 12,000m$^3$. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from demolition is therefore **small.**

**Earthworks**

5.3.2 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. The area of the proposed development site is less

than 18,000m$^2$. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from earthworks is therefore **small.**

**Construction**

5.3.3 Due to the size of the development, the total building volume is estimated to be between 12,000m$^3$ and 75,000m$^3$. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from construction is therefore **medium.**

**Trackout**

5.3.4 Based on the site area and provision of existing hard standing, it is anticipated that the unpaved road length will be less than 50m. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from trackout is therefore **small.**

## 5.4 Step 2b - Define the Sensitivity of the Area

**Dust Soiling**

5.4.1 Table 13 shows that there are between 10 and 100 **high** sensitivity receptors within 20m of the site boundary. The sensitivity of the area with respect to dust soiling from demolition, earthworks and construction, as defined using the criteria summarised in Table 5, is therefore considered to be **high.**

5.4.2 Table 14 shows that there are more than 100 **high** sensitivity receptors within 20m of the road network within 250m of the site access. The sensitivity of the area with respect to dust soiling from trackout, as defined using the criteria summarised in Table 5, is therefore considered **high.**

**Human Health**

5.4.3 Table 12 shows the annual mean $PM_{10}$ background concentration at the site is 12.83µg/m$^3$. As shown in Table 6, where the background annual mean $PM_{10}$ concentration is below 24µg/m$^3$ and there are between 10 and 100 **high** sensitivity receptors within 20m of the site boundary, the sensitivity of the area with respect to human health from demolition, earthworks and construction is considered to be **low**.

5.4.4 There are more than 100 **high** sensitivity receptors within 20m of the road network within 250m of the site access. The sensitivity of the area with respect to human health from trackout, as defined using the criteria summarised in Table 6, is therefore considered to be **medium.**

## 5.5 Step 2c - Define the Risk of Dust Impacts

5.5.1 The derived dust emission magnitude for each activity was combined with the sensitivity of the area to determine the risk of unmitigated impacts in line with the methodology set out in Table 8 and Table 9. A summary of the risk from each dust generating activity is provided in Table 16.

**Table 16 Summary of Potential Unmitigated Dust Risks**

| Potential Impact | Activity | Step 2A - Dust Emission Magnitude | Step 2B - Sensitivity of the Area | Step 2C - Risk |
|---|---|---|---|---|
| Dust Soiling | Demolition | Small | High | Medium |
| | Earthworks | Small | High | Low |
| | Construction | Medium | High | Medium |
| | Trackout | Small | High | Low |
| Human Health | Demolition | Small | Low | Negligible |
| | Earthworks | Small | Low | Negligible |
| | Construction | Medium | Low | Low |
| | Trackout | Small | Medium | Low |

5.5.2 As indicated in Table 16, the potential risk of dust soiling is **medium** from demolition and construction and **low** from earthworks and trackout. The potential risk of human health impacts is **low** from construction and trackout and **negligible** from demolition and earthworks.

5.5.3 It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location. Risk was predicted based on a worst-case scenario of works being undertaken at the site boundary closest to each

sensitive area. Therefore, actual risk is likely to be lower than that predicted during the majority of the construction phase.

## 5.6 Step 3 - Site-specific Mitigation

5.6.1 The IAQM guidance[21] provides potential mitigation measures to reduce impacts as a result of fugitive dust emissions during the construction phase. These have been adapted for the development site as summarised in Table 17. These may be reviewed prior to the commencement of construction works and incorporated into a Construction Environmental Management Plan or similar if required by the LA.

**Table 17 Fugitive Dust Emission Mitigation Measures**

| Issue | Control Measure |
|---|---|
| Communications | • Develop and implement a stakeholder communications plan that includes community engagement before work commences on site<br>• Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary<br>• Display the head or regional office contact information<br>• Develop and implement a Dust Management Plan, which may include measures to control other emissions, approved by the LA |
| Site management | • Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken<br>• Make the complaints log available to the LA upon request<br>• Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book |
| Monitoring | • Carry out regular site inspections, record inspection results, and make an inspection log available to the LA upon request<br>• Increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions |

[21] Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

| Issue | Control Measure |
|---|---|
| Site preparation | • Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible<br>• Erect solid screens or barriers around dusty activities or the site<br>• Fully enclose site or specific operations where there is a high potential for dust production and they are active for an extensive period<br>• Avoid site runoff of water or mud<br>• Keep site fencing, barriers and scaffolding clean using wet methods<br>• Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used<br>• Cover, seed or fence stockpiles to prevent wind whipping |
| Operating vehicle/machinery and sustainable travel | • Ensure all vehicles switch off engines when stationary, no idling vehicles<br>• Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. |
| Operations | • Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques<br>• Ensure an adequate water supply on the site for effective dust suppression, using non-potable water where possible and appropriate<br>• Use enclosed chutes and conveyors and covered skips<br>• Minimise drop heights and use fine water sprays wherever appropriate<br>• Ensure equipment is available to clean any dry spillages, and clean up spillages as soon as reasonably practicable using wet cleaning methods |
| Waste management | • Avoid bonfires or burning of waste materials |
| Demolition | • Ensure effective water suppression is used during demolition operations<br>• Avoid explosive blasting<br>• Bag and remove and biological debris or damp down such as material before demolition |
| Construction | • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out<br>• Avoid scabbling, if possible |
| Trackout | • Use water-assisted dust sweepers on the access and local roads, if required<br>• Avoid dry sweeping of large areas<br>• Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport<br>• Implement a wheel washing system, if necessary |

## 5.7 Step 4 - Determine Significance

5.7.1 Assuming the relevant mitigation measures outlined in Table 17 are implemented, the residual impacts from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance[22].

[22] Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

# 6.0 OPERATIONAL PHASE ASSESSMENT

## 6.1 Introduction

6.1.1 The development has the potential to increase concentrations of $NO_2$, $PM_{10}$ and $PM_{2.5}$ as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site during the operational phase. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site, as well as consider potential exposure of future residents to AQO and Concentration Target exceedences.

6.1.2 The assessment considered the following scenarios:

- 2024 - Verification;
- 2028 - DM; and,
- 2028 - DS.

6.1.3 The DM scenario (i.e. without development) included baseline traffic data, inclusive of anticipated growth, for the relevant assessment year. The DS scenario (i.e. with development) included baseline traffic data, inclusive of anticipated growth, in addition to predicted vehicle trips associated with the operation of the proposals.

6.1.4 For the purpose of the assessment traffic data for 2028 was utilised as the development opening year. Air quality is predicted to improve in the future. However, in order to provide a robust assessment, emissions factors and background concentrations for 2024 were utilised within the dispersion model. The use of 2028 traffic data and 2024 emission factors is considered to provide a robust scenario and therefore a sufficient level of confidence can be placed within the predicted pollution concentrations.

6.1.5 Reference should be made to Appendix 1 for full assessment input details.

## 6.2 Potential Development Impacts

### Predicted Concentrations

6.2.1 Annual mean $NO_2$ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 18.

**Table 18 Predicted Annual Mean $NO_2$ Concentrations**

| Receptor | | Predicted Annual Mean $NO_2$ Concentration (µg/m³) | | |
|---|---|---|---|---|
| | | DM | DS | Change |
| R1 | Student Accommodation - Wilmslow Road | 22.15 | 22.18 | 0.03 |
| R2 | Residential - Wilmslow Road | 21.36 | 21.40 | 0.04 |
| R3 | Student Accommodation - Wilmslow Road | 19.68 | 19.70 | 0.02 |
| R4 | Residential - Wilmslow Road | 20.31 | 20.35 | 0.04 |
| R5 | Student Accommodation - Wilmslow Road | 20.18 | 20.21 | 0.03 |
| R6 | Student Accommodation - Wilmslow Road | 20.98 | 21.03 | 0.05 |
| R7 | Residential - Wilmslow Road | 18.11 | 18.13 | 0.02 |
| R8 | Residential - Wilmslow Road | 20.43 | 20.47 | 0.04 |

6.2.2 As indicated in Table 18, predicted annual mean $NO_2$ concentrations were below the AQO of 40µg/m³ at all sensitive receptors in both scenarios.

6.2.3 Reference should be made to Figures 4 and 5 for graphical representations of annual mean $NO_2$ concentrations across the assessment area for the DM and DS scenarios, respectively.

6.2.4 Annual mean $PM_{10}$ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 19.

**Table 19 Predicted Annual Mean $PM_{10}$ Concentrations**

| Receptor | | Predicted Annual Mean $PM_{10}$ Concentration (µg/m³) | | |
|---|---|---|---|---|
| | | DM | DS | Change |
| R1 | Student Accommodation - Wilmslow Road | 14.91 | 14.92 | 0.01 |
| R2 | Residential - Wilmslow Road | 14.56 | 14.57 | 0.01 |
| R3 | Student Accommodation - Wilmslow Road | 14.09 | 14.09 | 0.01 |
| R4 | Residential - Wilmslow Road | 14.35 | 14.36 | 0.01 |
| R5 | Student Accommodation - Wilmslow Road | 14.26 | 14.27 | 0.01 |
| R6 | Student Accommodation - Wilmslow Road | 14.61 | 14.62 | 0.01 |
| R7 | Residential - Wilmslow Road | 13.57 | 13.58 | 0.00 |
| R8 | Residential - Wilmslow Road | 14.41 | 14.43 | 0.01 |

6.2.5 As indicated in Table 19, predicted annual mean $PM_{10}$ concentrations were below the AQO of 40µg/m³ at all sensitive receptors in both scenarios.

6.2.6 Reference should be made to Figures 6 and 7 for graphical representations of annual mean $PM_{10}$ concentrations across the assessment area for the DM and DS scenarios, respectively.

6.2.7 Annual mean $PM_{2.5}$ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 20.

**Table 20 Predicted Annual Mean $PM_{2.5}$ Concentrations**

| Receptor | | Predicted Annual Mean $PM_{2.5}$ Concentration (µg/m³) | | |
|---|---|---|---|---|
| | | DM | DS | Change |
| R1 | Student Accommodation - Wilmslow Road | 8.97 | 8.97 | 0.01 |
| R2 | Residential - Wilmslow Road | 8.78 | 8.79 | 0.01 |
| R3 | Student Accommodation - Wilmslow Road | 8.52 | 8.53 | 0.00 |
| R4 | Residential - Wilmslow Road | 8.67 | 8.67 | 0.01 |
| R5 | Student Accommodation - Wilmslow Road | 8.62 | 8.63 | 0.01 |

| Receptor | | Predicted Annual Mean $PM_{2.5}$ Concentration (µg/m³) | | |
|---|---|---|---|---|
| | | DM | DS | Change |
| R6 | Student Accommodation - Wilmslow Road | 8.80 | 8.81 | 0.01 |
| R7 | Residential - Wilmslow Road | 8.25 | 8.25 | 0.00 |
| R8 | Residential - Wilmslow Road | 8.70 | 8.71 | 0.01 |

6.2.8 As indicated in Table 20, predicted annual mean $PM_{2.5}$ concentrations were below the Concentration Target of 10µg/m³ at all sensitive receptors in both scenarios.

6.2.9 Reference should be made to Figures 8 and 9 for graphical representations of annual mean $PM_{2.5}$ concentrations across the assessment area for the DM and DS scenarios, respectively.

**Predicted Impacts**

6.2.10 Predicted impacts on annual mean $NO_2$ concentrations at the sensitive receptor locations are summarised in Table 21.

**Table 21 Predicted Impacts - $NO_2$**

| Receptor | | Predicted Annual Mean $NO_2$ Concentration | Predicted Concentration Change as Proportion of AQO (%) | Impact Significance |
|---|---|---|---|---|
| R1 | Student Accommodation - Wilmslow Road | Below 75% of AQO | 0 | Negligible |
| R2 | Residential - Wilmslow Road | Below 75% of AQO | 0 | Negligible |
| R3 | Student Accommodation - Wilmslow Road | Below 75% of AQO | 0 | Negligible |
| R4 | Residential - Wilmslow Road | Below 75% of AQO | 0 | Negligible |
| R5 | Student Accommodation - Wilmslow Road | Below 75% of AQO | 0 | Negligible |
| R6 | Student Accommodation - Wilmslow Road | Below 75% of AQO | 0 | Negligible |
| R7 | Residential - Wilmslow Road | Below 75% of AQO | 0 | Negligible |

| Receptor | | Predicted Annual Mean $NO_2$ Concentration | Predicted Concentration Change as Proportion of AQO (%) | Impact Significance |
|---|---|---|---|---|
| R8 | Residential - Wilmslow Road | Below 75% of AQO | 0 | Negligible |

6.2.11 As indicated in Table 21, impacts on annual mean $NO_2$ concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

6.2.12 Predicted impacts on annual mean $PM_{10}$ concentrations at the sensitive receptor locations are summarised in Table 22.

**Table 22 Predicted Impacts - $PM_{10}$**

| Receptor | | Predicted Annual Mean $PM_{10}$ Concentration | Predicted Concentration Change as Proportion of AQO (%) | Impact Significance |
|---|---|---|---|---|
| R1 | Student Accommodation - Wilmslow Road | Below 75% of AQO | 0 | Negligible |
| R2 | Residential - Wilmslow Road | Below 75% of AQO | 0 | Negligible |
| R3 | Student Accommodation - Wilmslow Road | Below 75% of AQO | 0 | Negligible |
| R4 | Residential - Wilmslow Road | Below 75% of AQO | 0 | Negligible |
| R5 | Student Accommodation - Wilmslow Road | Below 75% of AQO | 0 | Negligible |
| R6 | Student Accommodation - Wilmslow Road | Below 75% of AQO | 0 | Negligible |
| R7 | Residential - Wilmslow Road | Below 75% of AQO | 0 | Negligible |
| R8 | Residential - Wilmslow Road | Below 75% of AQO | 0 | Negligible |

6.2.13 As indicated in Table 22, impacts on annual mean $PM_{10}$ concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

6.2.14 Predicted impacts on annual mean $PM_{2.5}$ concentrations at the sensitive receptor locations are summarised in Table 23.

**Table 23 Predicted Impacts - $PM_{2.5}$**

| Receptor | | Predicted Annual Mean $PM_{2.5}$ Concentration | Predicted Conc. Change as Proportion of Concentration Target (%) | Impact Significance |
|---|---|---|---|---|
| R1 | Student Accommodation - Wilmslow Road | 76 - 94% of Concentration Target | 0 | Negligible |
| R2 | Residential - Wilmslow Road | 76 - 94% of Concentration Target | 0 | Negligible |
| R3 | Student Accommodation - Wilmslow Road | 76 - 94% of Concentration Target | 0 | Negligible |
| R4 | Residential - Wilmslow Road | 76 - 94% of Concentration Target | 0 | Negligible |
| R5 | Student Accommodation - Wilmslow Road | 76 - 94% of Concentration Target | 0 | Negligible |
| R6 | Student Accommodation - Wilmslow Road | 76 - 94% of Concentration Target | 0 | Negligible |
| R7 | Residential - Wilmslow Road | 76 - 94% of Concentration Target | 0 | Negligible |
| R8 | Residential - Wilmslow Road | 76 - 94% of Concentration Target | 0 | Negligible |

6.2.15 As indicated in Table 23, impacts on annual mean $PM_{2.5}$ concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

## 6.3 Potential Future Exposure

6.3.1 The proposed development has the potential to cause the exposure of future residents to elevated pollution levels. Dispersion modelling was therefore undertaken with the inputs described in Appendix 1 to quantify air quality conditions at the site. Reference should be made to Figures 4 to 9 for graphical representations of annual mean $NO_2$, $PM_{10}$ and $PM_{2.5}$ concentrations.

6.3.2 As shown in Figure 5, annual mean $NO_2$ concentrations were predicted to be below the AQO of 40µg/m$^3$ across the site. The maximum level was 30.32µg/m$^3$.

6.3.3 As shown in Figure 7, annual mean $PM_{10}$ concentrations were predicted to be below the AQO of 40µg/m$^3$ across the site. The maximum level was 16.74µg/m$^3$.

6.3.4 As shown in Figure 9, annual mean $PM_{2.5}$ concentrations were predicted to be below the Concentration Target of 10µg/m$^3$ across the site. The maximum level was 9.92µg/m$^3$.

6.3.5 Based on the assessment results, future residents are not predicted to be exposed to pollutant concentrations above the AQOs and Concentration Target. As such, the site is considered suitable for the proposed use from an air quality perspective.

## 6.4 Interim Planning Guidance for $PM_{2.5}$

6.4.1 Interim Planning Guidance[23] on the consideration of the $PM_{2.5}$ targets identified in the Environment Act (2021) in planning decisions has been produced by DEFRA. This requires evidence that the key sources of air pollution within a development have been identified and appropriate action to minimise emissions of $PM_{2.5}$ and its precursors as far as is reasonably practicable be provided in support of planning applications. To assist the process, two questions and associated considerations are provided. These are summarised in Table 24, along with the development response.

**Table 24 Interim Planning Guidance Questions**

| Question | Response |
|---|---|
| How has exposure to $PM_{2.5}$ been considered when selecting the development site?<br>Factors to consider include:<br>• Site proximity to people (particularly large populations and/or vulnerable groups, e.g. schools, hospitals, care homes, areas of deprivation) and the impact of the development on these<br>• Site proximity to pollution sources and the impact of these on users of the development<br>• Exposure and emissions during both construction and in-use | The site is located in the vicinity of schools and residential dwellings. However, the results of the assessment indicated that air quality impacts associated with the proposed development are predicted to be **not significant**<br>The site is adjacent to the A6010 and associated road vehicle exhaust emissions. However, the results of the assessment, as outlined in Section 6.3, show that $PM_{2.5}$ concentrations were below the Concentration Target across the development<br>As outlined in Table 17, a number of mitigation measures will be used throughout the construction phase in order to reduce fugitive dust emissions as far as practicable. This will control potential exposure at off-site locations |

23 https://uk-air.defra.gov.uk/pm25targets/planning.

| Question | Response |
|---|---|
| What actions and/or mitigations have been considered to reduce $PM_{2.5}$ exposure for development users and nearby receptors and to reduce emissions of $PM_{2.5}$ and its precursors?<br>Factors to consider include:<br>• Site layout<br>• The development's design<br>• Technology used in the construction or installed for use in the development<br>• Construction and future use of the development | Mitigation measures have been incorporated into the design of the scheme in order to reduce $PM_{2.5}$ emissions. This includes the following:<br>• Provision of Electric Vehicle (EV) charging points to encourage the use of low emission vehicles<br>• Provision of secure cycle storage<br>Further to the above, in order to reduce emissions during the construction phase, a number of mitigation measures, as outlined in Table 17, will be used to minimise dust generation from associated activities |

6.4.2 Based on the responses provided in Table 24 and the results of the assessment, as outlined in Section 5.0 and 6.0, it is considered that the development has identified key sources of air pollution and taken appropriate action to minimise emissions of $PM_{2.5}$.

## 6.5 Overall Impact Significance

6.5.1 The overall significance of operational phase road traffic emissions was determined as **negligible**. This was based on the overall predicted impact at discrete receptor locations and the considerations outlined previously. Further justification is provided in Table 25.

**Table 25 Overall Impact Significance of Road Vehicle Exhaust Emission Impacts**

| Guidance | Comment |
|---|---|
| The existing and future air quality in the absence of the development | Predicted annual mean $NO_2$, $PM_{10}$ and $PM_{2.5}$ concentrations were below the relevant AQOs and Concentration Target at all sensitive locations in the DM and DS scenarios<br>It is considered unlikely that future air quality conditions will change significantly in the absence of the development given the relatively established nature of the area |
| The extent of current and future population exposure to the impacts | The development is not predicted to affect the population exposed to exceedences of the AQOs or Concentration Target |

| Guidance | Comment |
|---|---|
| The influence and validity of any assumptions adopted when undertaking the prediction of impacts | It was assumed that vehicle exhaust emission rates and background concentrations will not reduce in future years. This provides conservative results when compared with DEFRA and National Highways methodologies<br>Due to the adopted assumptions it is considered the presented results are sufficiently robust for an assessment of this nature |

6.5.2 The IAQM guidance[24] states that only if the impact is greater than **slight**, the effect is considered **significant**. As impacts were predicted to be **negligible**, overall effects are considered **not significant**, in accordance with the stated methodology.

[24] Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

# 7.0 MITIGATION

7.1.1 A number of mitigation measures have been included within the development to encourage the use of sustainable transport modes, manage vehicle flow and reduce pollution around the site. These are in accordance with MCC's 'Air Quality and Planning Technical Guidance'[25], which is based upon the Good Practice Design Principles outlined in the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'[26]. Table 26 describes the good practice principles along with how each has been addressed with regards to the proposals.

**Table 26 Overall Road Vehicle Exhaust Emissions Impact Significance**

| Phase | Principle | Action |
|---|---|---|
| Design Phase | New developments should not contravene the Council's AQAP[27], or render any of the measures unworkable | It is confirmed that the proposals will not contravene MCC's AQAP, or render any of the measures unworkable |
| | Wherever possible, new developments should not create a new "street canyon", or a building configuration that inhibits effective pollution dispersion | The development will not create a new street canyon or a building configuration that inhibits effective dispersion |
| | Delivering sustainable development should be the key theme of any application | The proposals have been designed to encourage sustainable behaviours, such as active and public transport due to its proximity to public transport and amenities |
| Operational Phase | The provision of at least 1 EV "rapid charge" point per 10 residential dwellings and/or 1,000m$^2$ of commercial floor space. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made | EV charging will be included within the development. This can be secured via planning condition, if required |

25 Air Quality & Planning Technical Guidance, MCC, 2022.

26 Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

27 Greater Manchester AQAP 2016-2021, GMCA, 2016.

| Phase | Principle | Action |
|---|---|---|
| | 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 | A Travel Plan can be secured via condition, if required by MCC |
| | All gas-fired boilers to meet a minimum standard of <40mgNOx/kWh | Any boilers to be included in the development will be provisioned in accordance with the relevant requirements |

7.1.2 It is considered the above methods would further reduce potential impacts associated with the scheme. Specific mitigation suited to the proposals may be stipulated as a planning condition if deemed necessary by the LA.

## 8.0 CONCLUSION

8.1.1 Redmore Environmental Ltd was commissioned by Greyslow Limited to undertake an Air Quality Assessment in support of a residential development at Oakley Gardens, Wilmslow Road, Fallowfield.

8.1.2 The proposals have the potential to cause air quality impacts at sensitive locations during the construction and operational phases, as well as expose future residents to any existing air quality issues at the site. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions, consider location suitability for the proposed end-use and assess potential effects as a result of the scheme.

8.1.3 During the construction phase of the development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Site-specific dust control measures were subsequently determined based on the identified risk ratings. Subject to implementation, potential air quality impacts from dust generated by demolition, earthworks, construction and trackout activities are predicted to be **not significant**.

8.1.4 Potential impacts during the operational phase of the proposals may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the development. Additionally, future residents may be exposed to any existing air quality issues at the site. Dispersion modelling was therefore undertaken in order to predict pollutant concentrations at sensitive locations as a result of emissions from the highway network both with and without the development in place. Results were subsequently verified using local monitoring data.

8.1.5 Review of the dispersion modelling results indicated that impacts on annual mean $NO_2$, $PM_{10}$ and $PM_{2.5}$ concentrations as a result of traffic generated by the development were predicted to be **negligible** at all receptor locations.

8.1.6 The results of the dispersion modelling assessment also indicated that predicted annual mean $NO_2$, $PM_{10}$ and $PM_{2.5}$ concentrations were below the relevant AQOs and Concentration Target across the development. The site is therefore considered suitable for the proposed use from an air quality perspective.

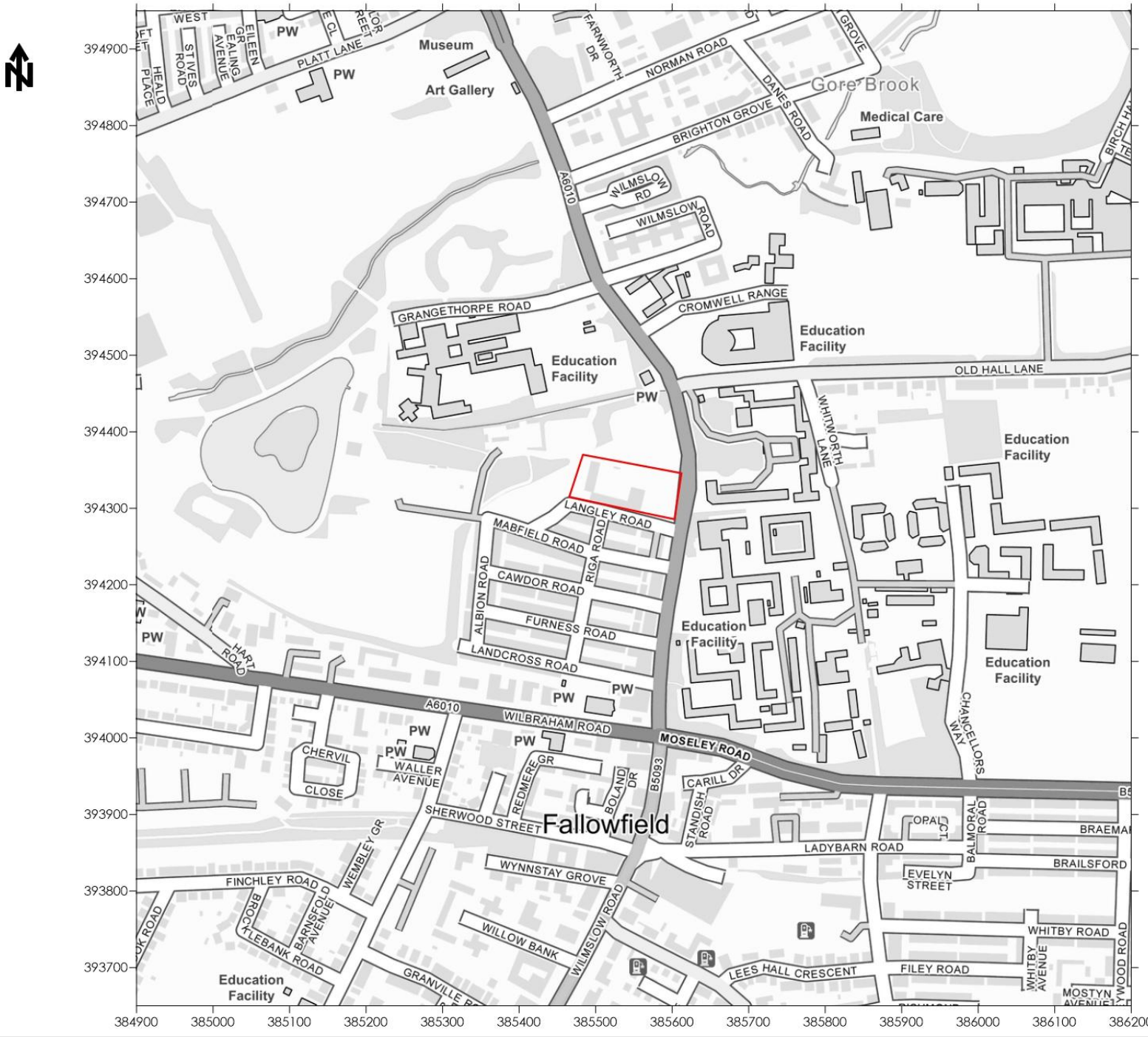
8.1.7 Following consideration of the relevant issues, residual impacts as a result of the operation of the development were considered to be **not significant**, in accordance with the IAQM guidance.

8.1.8 Based on the assessment results, air quality factors are not considered a constraint to the development.

## 9.0 ABBREVIATIONS

| | |
|---|---|
| AADT | Annual Average Daily Traffic |
| ADM | Atmospheric Dispersion Modelling |
| AQAP | Air Quality Action Plan |
| AQLV | Air Quality Limit Value |
| AQMA | Air Quality Management Area |
| AQO | Air Quality Objective |
| AQS | Air Quality Strategy |
| ASR | Annual Status Report |
| CAP | Clean Air Plan |
| CERC | Cambridge Environmental Research Consultants |
| DEFRA | Department for Environment, Food and Rural Affairs |
| DfT | Department for Transport |
| DM | Do-Minimum |
| DPD | Development Plan Document |
| DS | Do-Something |
| EV | Electric Vehicle |
| GMCA | Greater Manchester Combined Authority |
| HDV | Heavy Duty Vehicle |
| IAQM | Institute of Air Quality Management |
| LA | Local Authority |
| LAQM | Local Air Quality Management |
| MCC | Manchester City Council |
| NGR | National Grid Reference |
| $NO_2$ | Nitrogen dioxide |
| $NO_x$ | Oxides of nitrogen |
| NPPF | National Planning Policy Framework |
| NPPG | National Planning Practice Guidance |
| PfEP | Places for Everyone Plan |
| $PM_{10}$ | Particulate matter with an aerodynamic diameter of less than 10µm |
| $PM_{2.5}$ | Particulate matter with an aerodynamic diameter of less than 2.5µm |
| SP | Slow Phase |
| TfGM | Transport for Greater Manchester |
| $z_0$ | Roughness length |

# Figures




**Legend**

Site Boundary

**Title**
Figure 1 - Site Location Plan

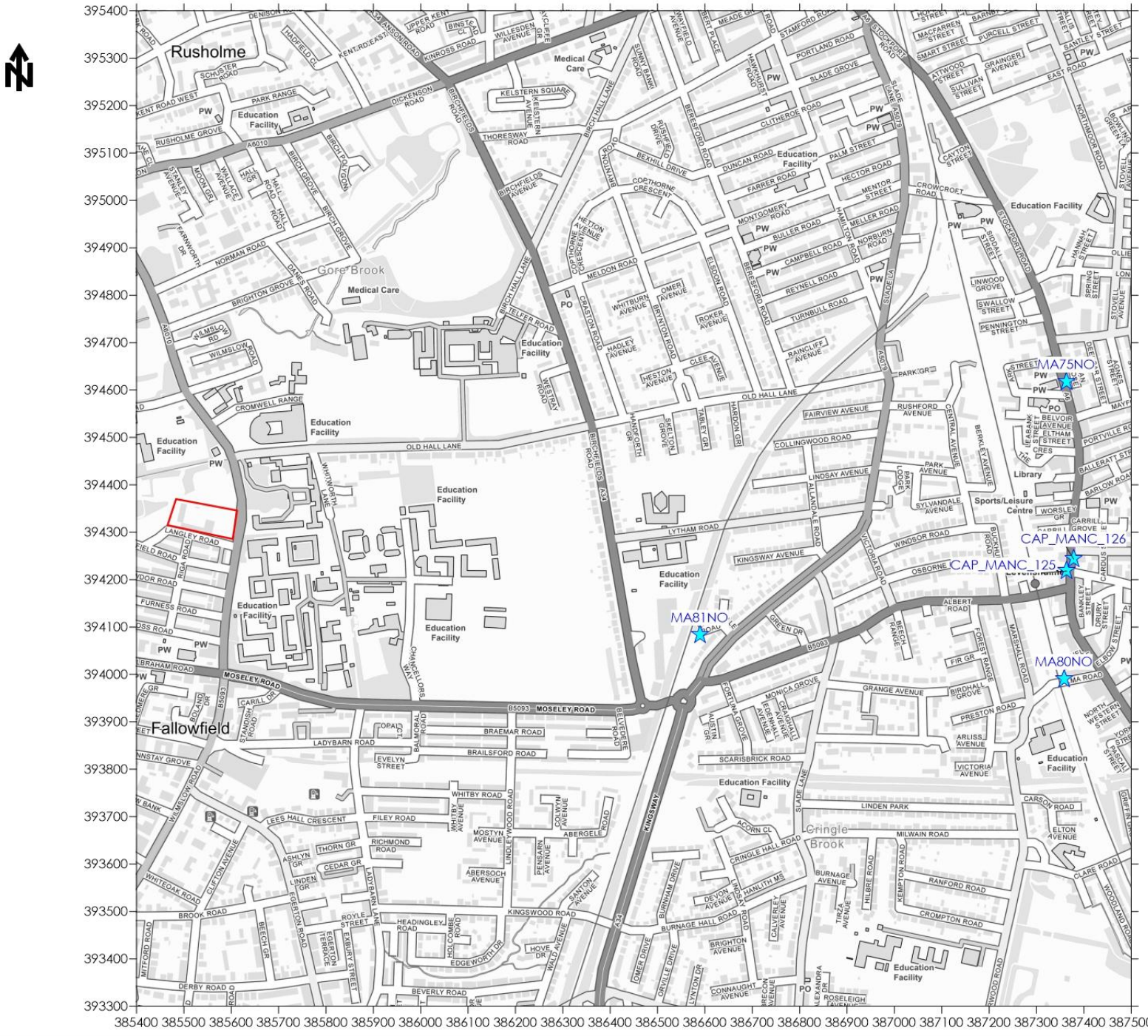
**Project**
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Wilmslow Road, Fallowfield

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**Legend**

Site Boundary

Monitors

**Title**
Figure 2 - Monitoring Locations

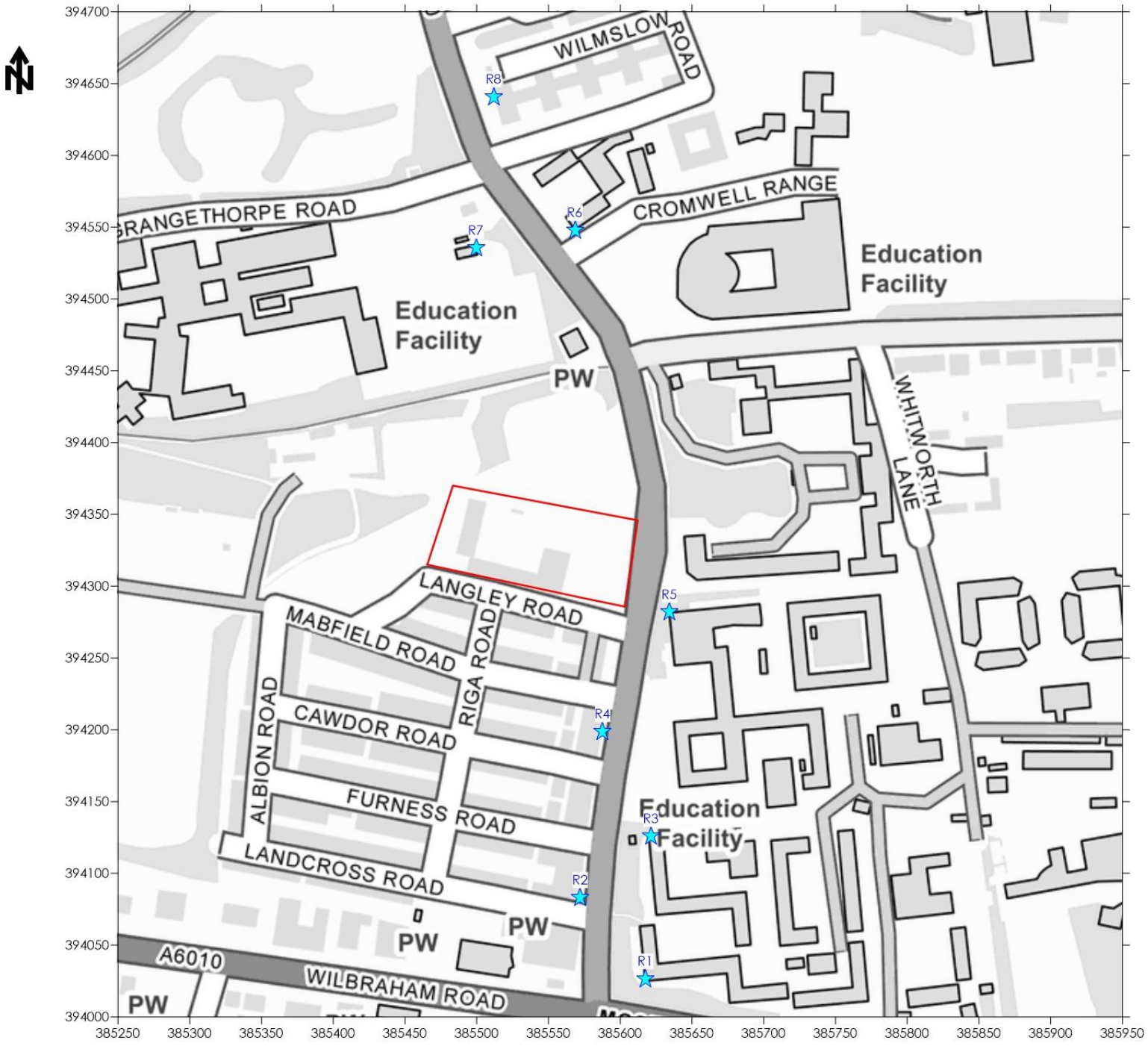
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Site Boundary

Receptors

**Title**
Figure 3 - Operational Phase
Road Vehicle Exhaust Emissions
Sensitive Receptor Locations

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Wilmslow Road, Fallowfield

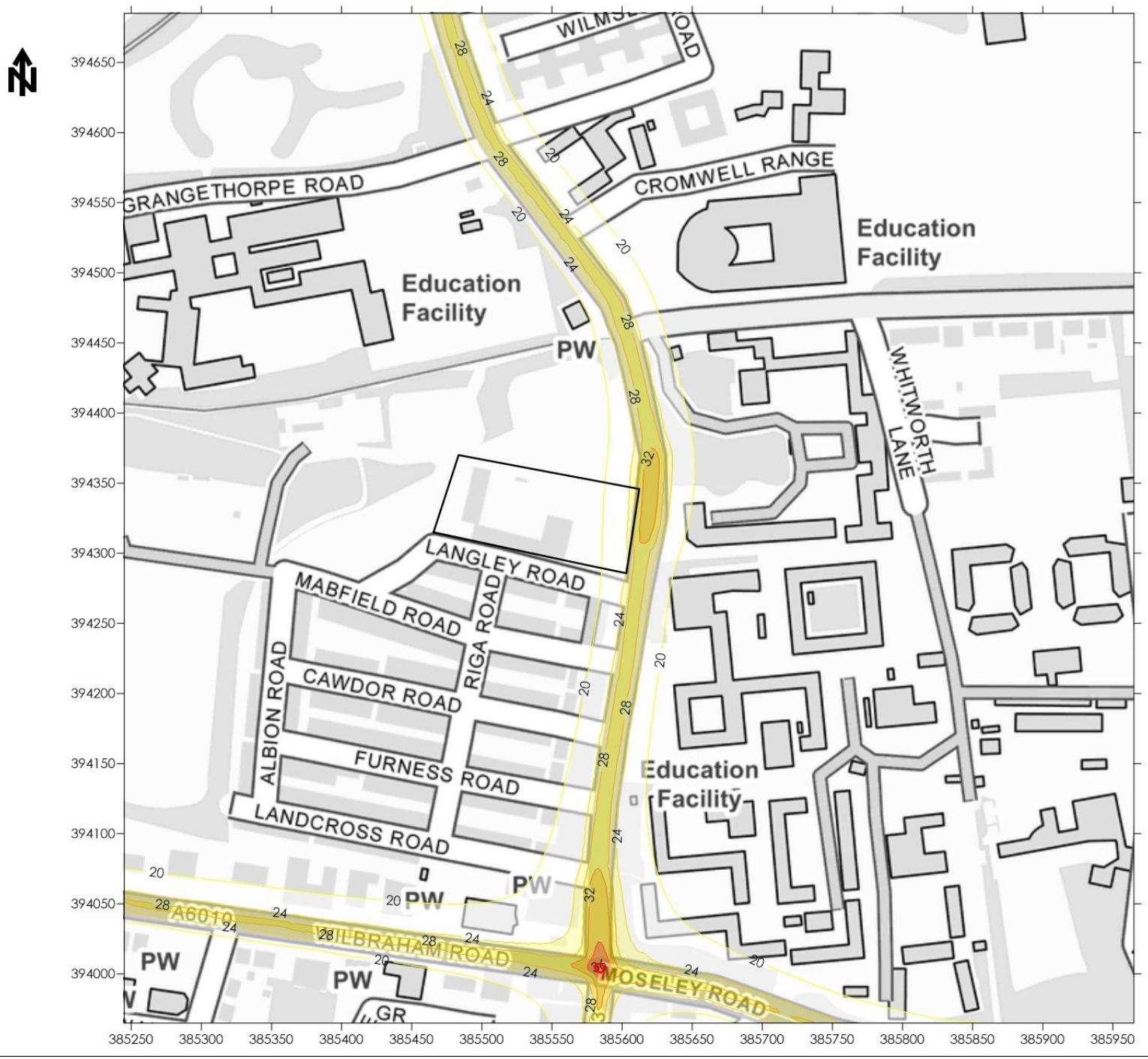
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Site Boundary

Annual Mean $NO_2$ Concentration ($\mu g/m^3$)

40
36
32
28
24
20

**Title**
Figure 4 - Predicted Annual Mean $NO_2$ Concentrations ($\mu g/m^3$) Do-Minimum

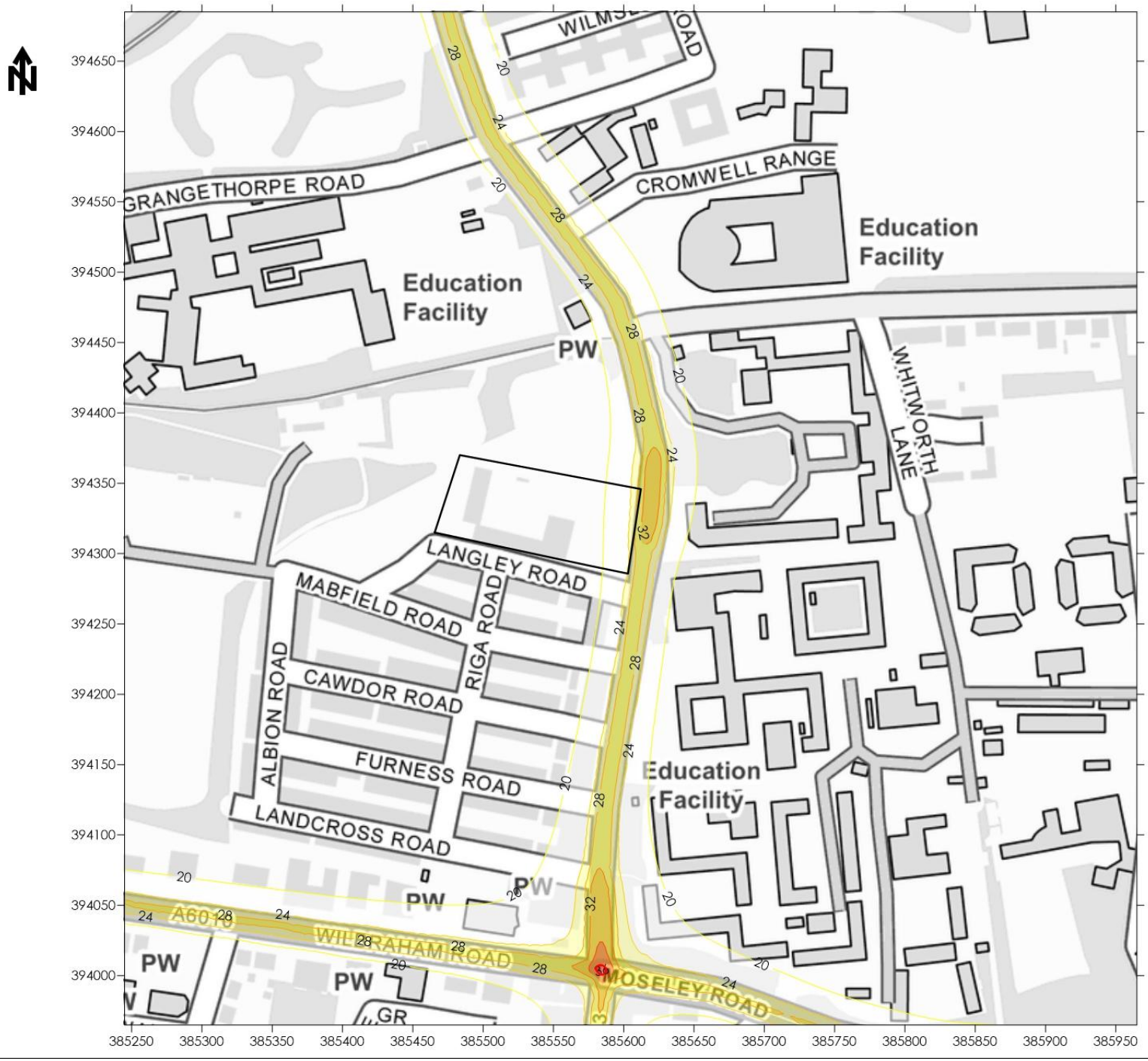
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Site Boundary

Annual Mean $NO_2$ Concentration ($\mu g/m^3$)

40
36
32
28
24
20

**Title**
Figure 5 - Predicted Annual Mean $NO_2$ Concentrations ($\mu g/m^3$) Do-Something

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Site Boundary

Annual Mean $PM_{10}$ Concentration ($\mu g/m^3$)

23
22
21
20
19
18
17
16
15
14

**Title**

Figure 6 - Predicted Annual Mean $PM_{10}$ Concentrations ($\mu g/m^3$) Do-Minimum

**Project**

Air Quality Assessment
Wilmslow Road, Fallowfield

**Project Reference**

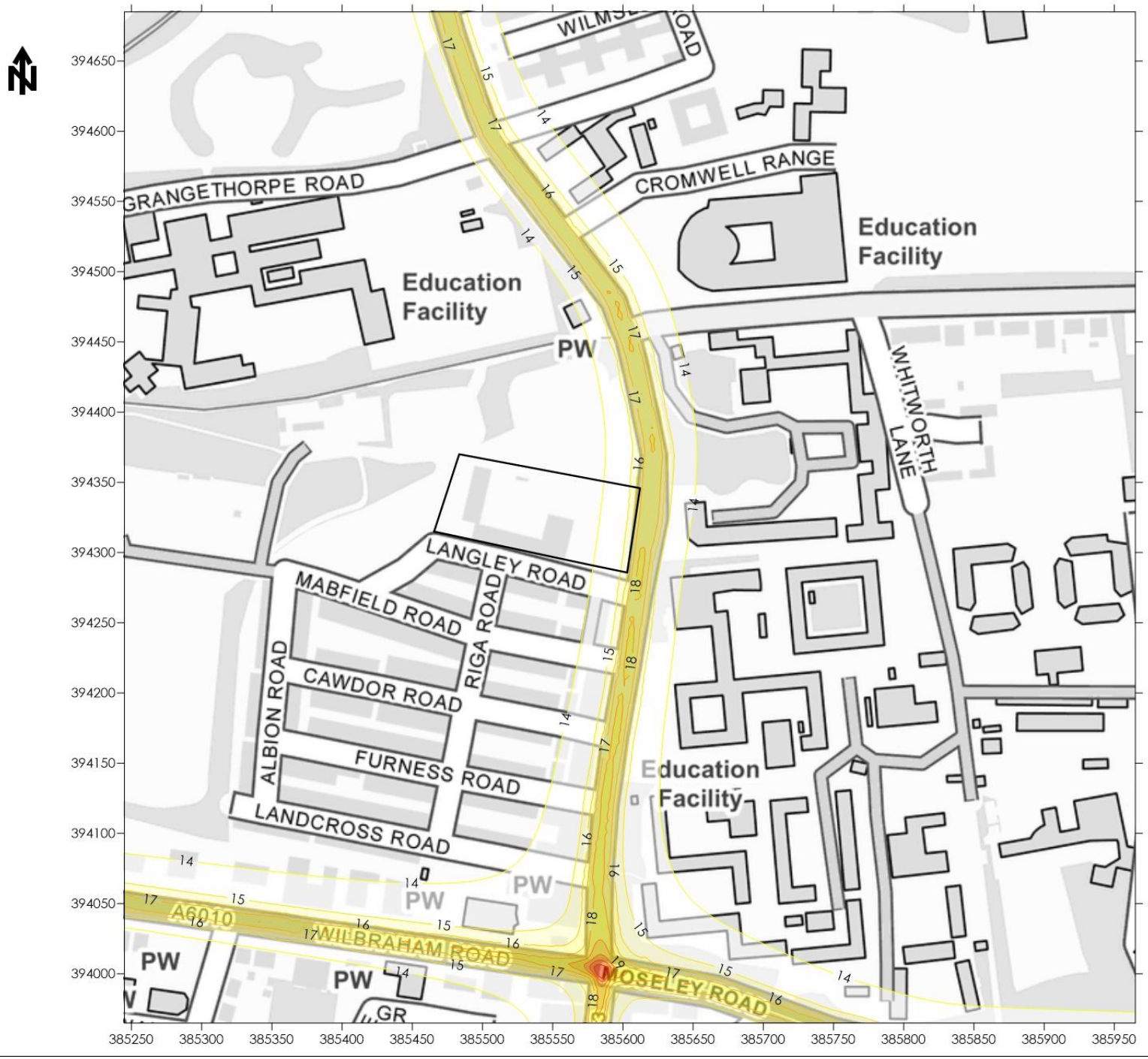
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**Legend**

Site Boundary

Annual Mean $PM_{10}$ Concentration ($\mu g/m^3$)

23
22
21
20
19
18
17
16
15
14

**Title**

Figure 7 - Predicted Annual Mean $PM_{10}$ Concentrations ($\mu g/m^3$) Do-Something

**Project**

Air Quality Assessment
Wilmslow Road, Fallowfield

**Project Reference**

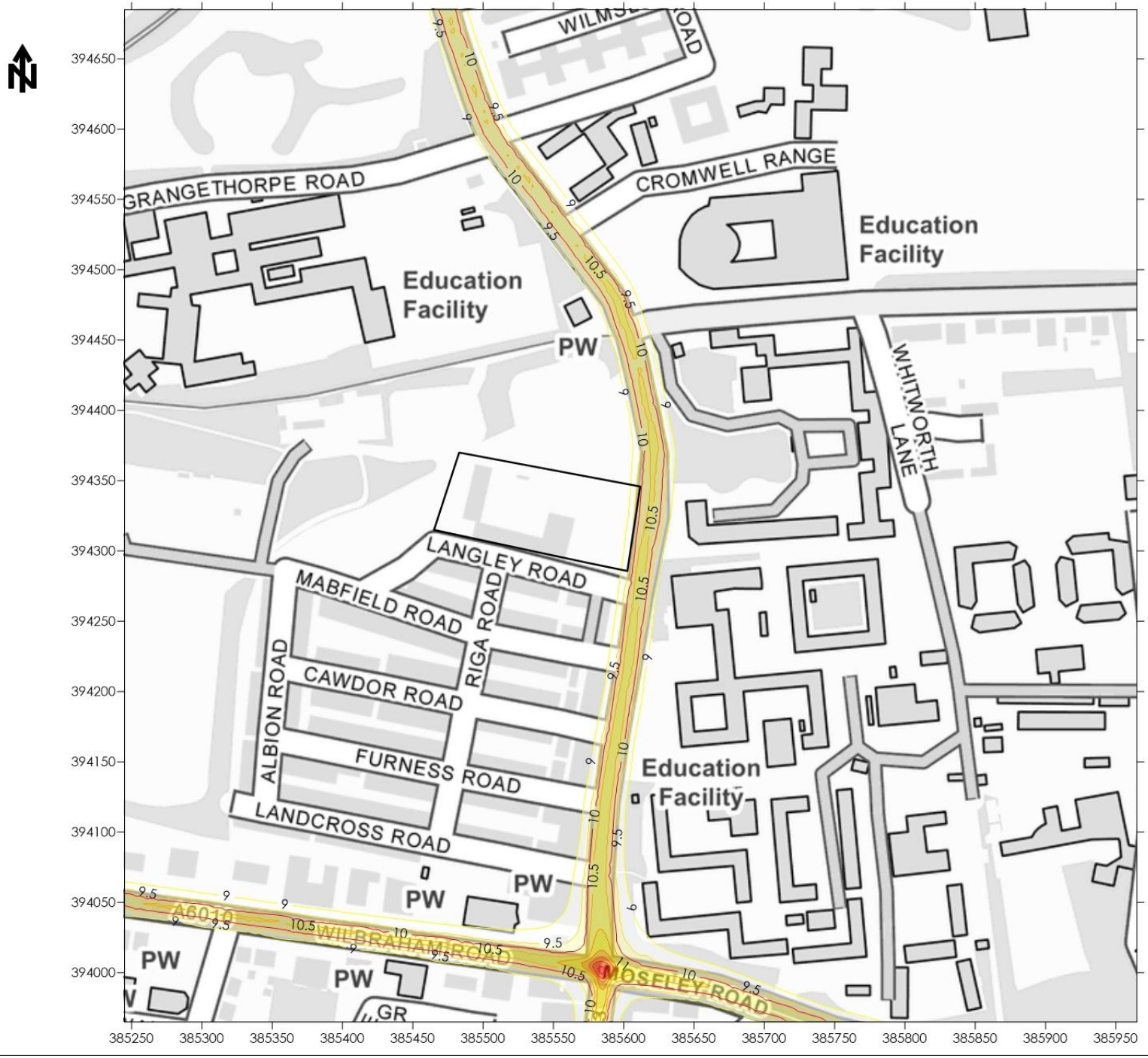
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Site Boundary

Annual Mean $PM_{2.5}$ Concentration ($\mu g/m^3$)

13
12.5
12
11.5
11
10.5
10
9.5
9

**Title**
Figure 8 - Predicted Annual Mean $PM_{2.5}$ Concentrations ($\mu g/m^3$) Do-Minimum

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**Legend**

Site Boundary

13
12.5
12
11.5
11
10.5
10
9.5
9

Annual Mean $PM_{2.5}$ Concentration ($\mu g/m^3$)

**Title**

Figure 9 - Predicted Annual Mean $PM_{2.5}$ Concentrations ($\mu g/m^3$) Do-Something

**Project**

Air Quality Assessment
Wilmslow Road, Fallowfield

**Project Reference**

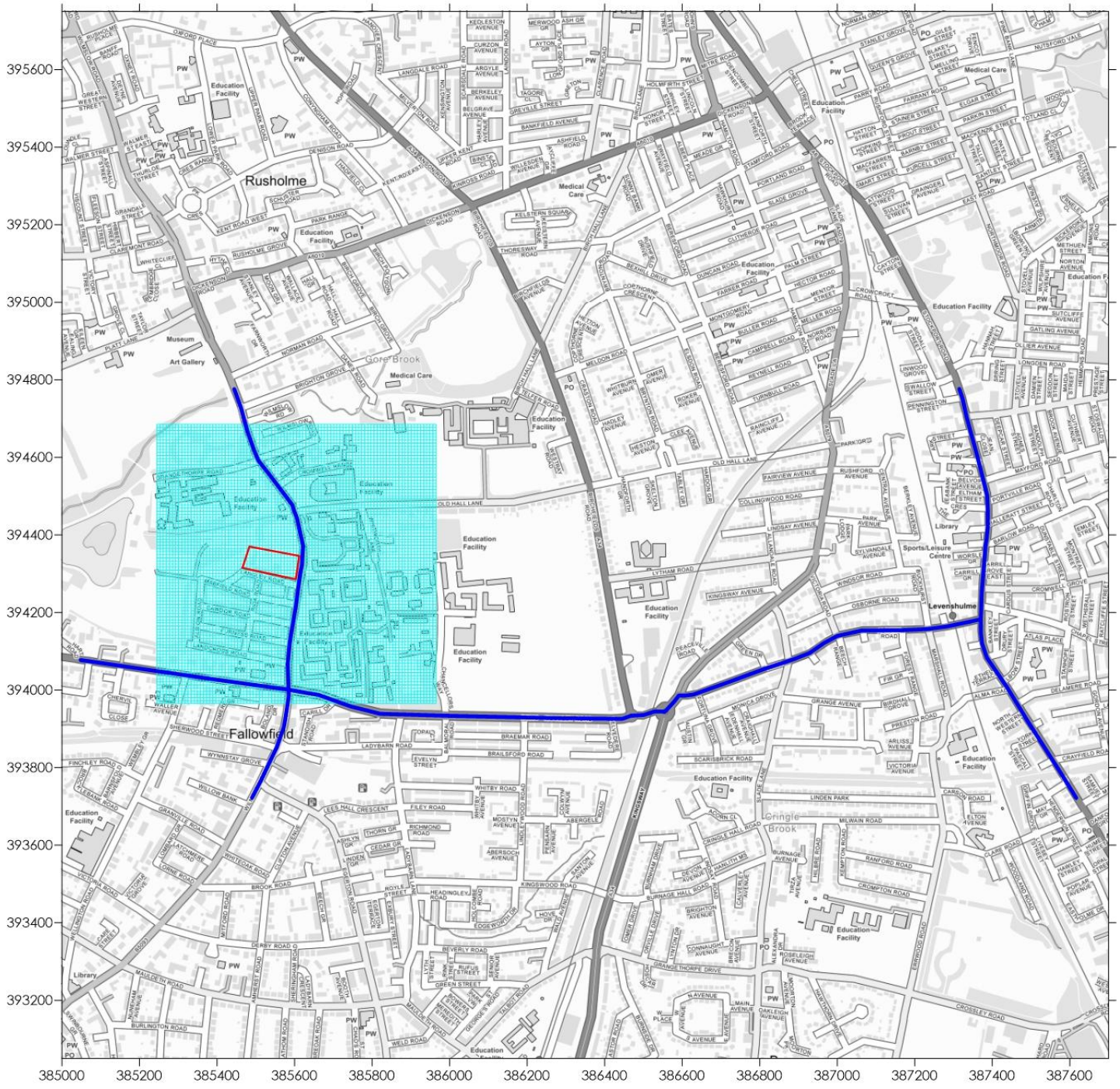
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**Legend**

Site Boundary

Road Link

Output Grid

**Title**
Figure 10 - ADMS-Roads Inputs

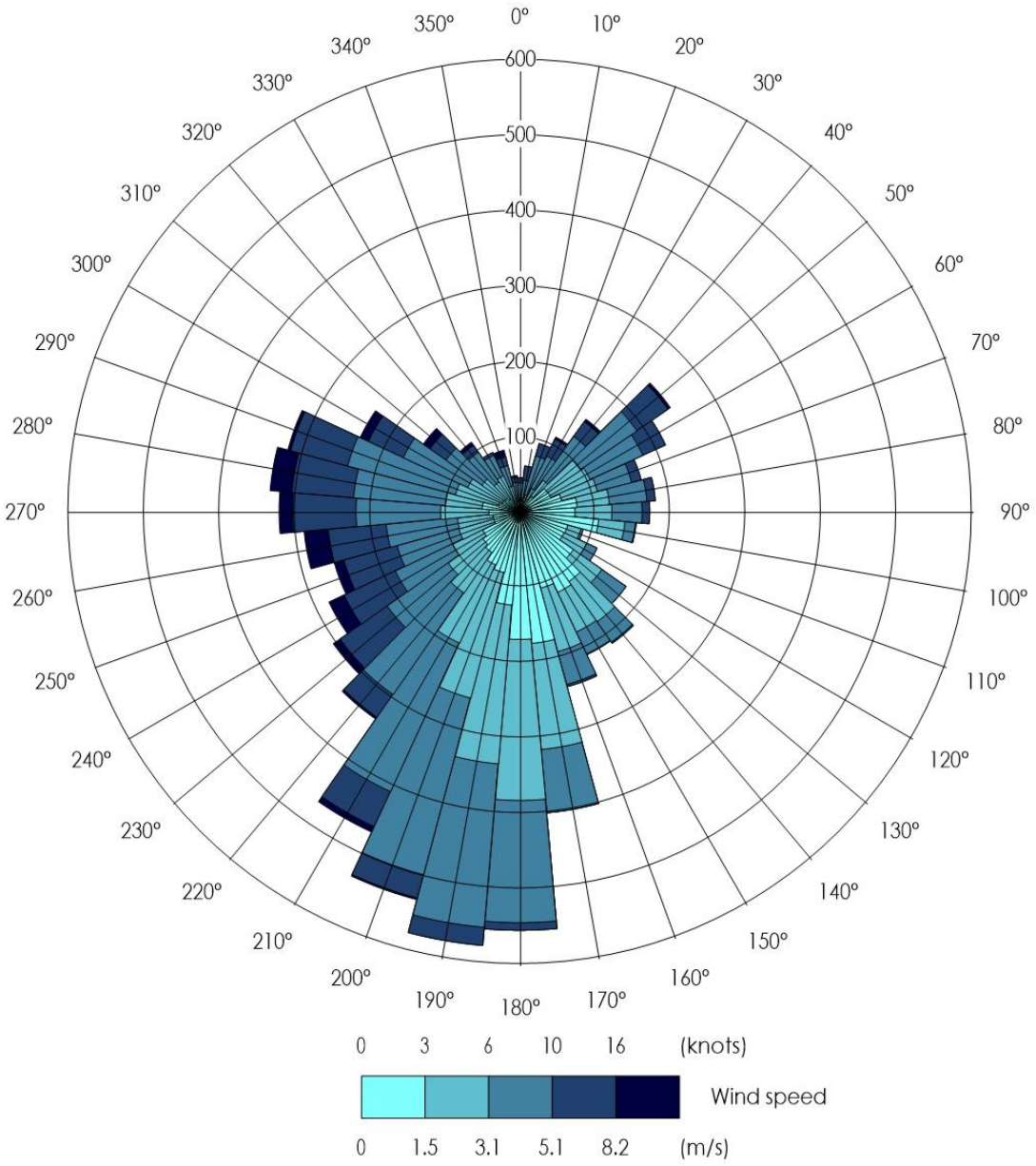
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**Title**
Figure 11 - Wind Rose of 2024 Manchester Airport Meteorological Data

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# Appendix 1 - Assessment Input Data

## Introduction

The proposals have the potential to cause air quality impacts as a result of exhaust emissions associated with vehicles travelling to and from the development, as well as expose future residents to any existing air quality issues at the site. In order to assess $NO_2$, $PM_{10}$ and $PM_{2.5}$ concentrations at sensitive locations, detailed dispersion modelling was undertaken in accordance with the following methodology.

## Dispersion Model

Dispersion modelling was undertaken in order to predict $NO_2$, $PM_{10}$ and $PM_{2.5}$ concentrations across the site using the ADMS-Roads dispersion model (version 5.1.0.2). ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

The model requires input data that details the following parameters:

- Assessment area;
- Traffic flow data;
- Vehicle emission factors;
- Spatial co-ordinates of emissions;
- Street width;
- Meteorological data;
- Roughness length ($z_0$); and,
- Monin-Obukhov length.

Additional options can also be selected within the ADMS-Roads user interface in order to take account of site specific characteristics that may affect model outputs, such as canyons.

The relevant inputs are detailed in the following Sections.

## Assessment Area

Ambient concentrations were predicted over the area NGR: 385245, 393965 to 385965, 394685. One Cartesian grid was included within the model to produce data suitable for contour plotting using the Surfer software package. The default intelligent grid spacing option was selected within ADMS-Roads in order to improve contour resolution within the vicinity of sources.

Receptors potentially sensitive to changes in pollutant concentrations were included in the assessment as outlined in the main report text.

Reference should be made to Figure 10 for a graphical representation of the assessment grid extents.

## Traffic Flow Data

Traffic data for use in the assessment, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition as HDV proportion, was provided by Focus Transport Planning, the Transport Consultants for the project.

Baseline traffic data for a number of roads within the model extents were not available from the Transport Consultant. As such, data was supplemented with information from the Department for Transport (DfT)[28]. The DfT web tool enables the user to view and download traffic flows on every link of the 'A' road and motorway network, as well as selected minor roads, in Great Britain for the years 1999 to 2024. It should be noted that the DfT web tool is referenced in DEFRA guidance[29] as being a suitable source of data for air quality assessments and it is therefore considered to provide a reasonable estimate of traffic flows in the vicinity of the site.

Baseline traffic data was converted to the opening year of the development utilising a factor obtained from TEMPro (version 8.0). This software package has been developed by the DfT to calculate future traffic growth throughout the UK.

Road parameters for input into the model were based on the following:

[28] https://roadtraffic.dft.gov.uk/#6/55.254/-6.053/basemap-regions-countpoints.

[29] Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

- Road widths were estimated from aerial photography and UK highway design standards;
- Vehicle speeds were estimated as an average for the relevant road link over the course of a 24-hour period;
- Vehicle speeds were determined following review of speed limits within the study extents, as well as congestion data available from GoogleMaps;
- Vehicle speeds specific to slow phases were determined using the methodology outlined in the DEFRA guidance[30];
- Necessary adjustments to slow phase vehicle speeds were based upon congestion data available from GoogleMaps; and,
- The distance length for slow phases was derived using the approaching of 25m outlined in the DEFRA guidance[31], and adjusted accordingly based on aerial photography and congestion data available from GoogleMaps.

A summary of the traffic data and link parameters used in the assessment is provided in Table A1.1.

**Table A1.1 Traffic Data**

| Link | | 24-hour AADT Flow | | | HDV Prop. of Fleet (%) | Avg. Vehicle Speed (km/h) | Road Width (m) |
|---|---|---|---|---|---|---|---|
| | | 2024 | 2028 DM | 2028 DS | | | |
| L1 | Wilmslow Road Slow Phase (SP), North of Site | 12,028 | 12,501 | 12,640 | 5.84 | 15 | 15.3 |
| L2 | Wilmslow Road, North of Site | 12,028 | 12,501 | 12,640 | 5.84 | 45 | 11.5 |
| L3 | Wilmslow Road, South of Site | 12,028 | 12,501 | 12,640 | 5.84 | 45 | 10.6 |
| L4 | Wilmslow Road SP, South of Site | 12,028 | 12,501 | 12,640 | 5.84 | 15 | 15.8 |
| L5 | Wilbraham Road | 12,982 | 13,492 | 13,542 | 1.28 | 45 | 8.8 |
| L6 | Wilmslow Road, South of Wilbraham Road | 12,028 | 12,501 | 12,548 | 5.84 | 45 | 7.1 |
| L7 | Moseley Road | 12,982 | 13,492 | 13,533 | 1.28 | 45 | 11.2 |
| L8 | Albert Road | 12,194 | 12,673 | 12,714 | 2.79 | 45 | 6.5 |
| L9 | Albert Road SP | 12,194 | 12,673 | 12,714 | 2.79 | 15 | 5.5 |

30 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

31 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

| Link | | 24-hour AADT Flow | | | HDV Prop. of Fleet (%) | Avg. Vehicle Speed (km/h) | Road Width (m) |
|---|---|---|---|---|---|---|---|
| | | 2024 | 2028 DM | 2028 DS | | | |
| L10 | Stockport Road SP, South of Albert Road | 23,336 | 24,253 | 24,294 | 3.87 | 15 | 13.2 |
| L11 | Stockport Road, South of Albert Road | 23,336 | 24,253 | 24,294 | 3.87 | 45 | 6.9 |
| L12 | Stockport Road SP, North of Albert Road | 23,336 | 24253 | 24,294 | 3.87 | 15 | 12.2 |
| L12a | Stockport Road SP, North of Chapel Street | 23,336 | 24,253 | 24,294 | 3.87 | 15 | 12.2 |
| L13 | Stockport Road, North of Albert Road | 23,336 | 24,253 | 24,294 | 3.87 | 45 | 12.0 |

Reference should be made to Figure 10 for a graphical representation of the road link locations.

**Canyons**

Where buildings or walls surround roads, pollutant dispersion patterns are altered which can lead to high pollutant concentrations. These street canyons can significantly influence air quality along a road and therefore it is important to take consideration of their effects when undertaking dispersion modelling.

The release of ADMS-Roads version 4.0.1.0 in December 2015 incorporated a number of new features including an advanced street canyon module, which have been retained in version 5.1.0.2. Advanced street canyon modelling allows a number of parameters to be included in the dispersion model in order to predict pollutant dispersion patterns which better reflect air flow within complex urban geometries.

Canyons have five principle effects on dispersion which can influence pollutant concentrations. These are:

- Pollutants are channelled along street canyons;
- Pollutants are dispersed across street canyons by circulating flow at road height;
- Pollutants are trapped in recirculation regions;
- Pollutants leave the canyon through gaps between buildings - as if there was no canyon; and,

- Pollutants leave the canyon from the canyon top.

The combined modelling of these effects will result in concentration patterns unique to each canyon. The parameters used in the assessment are outlined in Table A1.2.

**Table A1.2 Canyon Parameters**

| Link | Parameter (m) | | | | | |
|---|---|---|---|---|---|---|
| | Canyon Width to Left | Average Height of Buildings to Left | Building Length Left | Canyon Width Right | Average Height of Buildings to Right | Building Length Right |
| L12 | 11.0 | 6.5 | 40.7 | 7.6 | 7.0 | 23. |
| L12a | 11.2 | 7.0 | 21.5 | 9.7 | 9.0 | 16.8 |

A choice of two modes is provided for use in the advanced canyon module. Standard mode assumes that each road is part of a continuous network of roads with similar properties. Network mode analyses the road network to determine transport of pollutants between adjoining street canyons, allows for varying concentrations along the canyon and accounts for transport of pollutants out of the end of a canyon. Network mode is considered most accurate for detailed local analysis and as such was selected for use in the model.

**Emission Factors**

The emission factors were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 13.1). This has been produced by DEFRA and incorporates COPERT 5.8 vehicle emission factors.

There is current uncertainty over $NO_2$ concentrations within the UK, with the implementation of new vehicle emission standards not resulting in the previously expected reduction in roadside levels. Therefore, 2024 emission factors were utilised in preference to the scheme opening year in order to provide robust model outputs. As predictions for 2024 were verified, it is considered the results are a robust indication of concentrations for the future year.

## Meteorological Data

Meteorological data used in the assessment was taken from Manchester Airport meteorological station over the period 1st January 2024 to 31st December 2024 (inclusive). Manchester Airport is located at NGR: 381792, 384116, which is approximately 10.4km south-west of the scheme. It is anticipated that conditions would be reasonably similar over a distance of this magnitude. The data was therefore considered suitable for an assessment of this nature.

All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 11 for a wind rose of the utilised meteorological data.

## Roughness Length

The $z_0$ is a modelling parameter applied to allow consideration of surface height roughness elements. A $z_0$ of 0.5m was used to describe the modelling extents. This value is considered appropriate for the morphology of the area and is suggested within ADMS- Roads as being suitable for 'parkland, open suburbia'.

A $z_0$ of 0.2m was used to describe the meteorological site. This value is considered appropriate for the morphology of the area due to the large expanse of surrounding flat land use, such as surrounding runways and grassland, and is suggested within ADMS- Roads as being suitable for 'agricultural areas (min)'.

## Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 30m was used to describe the modelling extents and meteorological site. This is considered appropriate for the nature of both areas and is suggested within ADMS-Roads as being suitable for 'cities and large towns'.

## Background Concentrations

Background annual mean $NO_2$, $PM_{10}$ and $PM_{2.5}$ concentrations for use in the assessment were obtained from the DEFRA mapping study for the grid square containing the MA80NO monitor, NGR: 387500, 393500. These are shown in Table A1.3.

**Table A1.3 Background Pollutant Concentrations - Modelling Extents**

| Pollutant | Predicted 2024 Background Pollutant Concentration (µg/m³) |
|---|---|
| $NO_2$ | 16.51 |
| $PM_{10}$ | 13.02 |
| $PM_{2.5}$ | 7.95 |

The annual mean $NO_2$ concentration was chosen to represent concentrations throughout the dispersion modelling extents without the contribution from road vehicles as it was higher than the DEFRA background for the grid square containing the site and the $NO_2$ concentration recorded at the MA81NO urban background monitor, as shown in Table 11 and Table 12. Background $PM_{10}$ and $PM_{2.5}$ values were chosen to provide continuity throughout the assessment.

Similarly to emission factors, background concentrations from 2024 were utilised in preference to the future year. This provided a robust assessment and is likely to overestimate pollutant concentrations during the operation of the proposal.

**$NO_x$ to $NO_2$ Conversion**

Predicted annual mean $NO_x$ concentrations were converted to $NO_2$ concentrations using the spreadsheet (version 9.1) provided by DEFRA, which is the method detailed within DEFRA guidance[32].

**Verification**

The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons, including:

- Estimates of background concentrations;
- Uncertainties in source activity data such as traffic flows and emission factors;
- Variations in meteorological conditions;
- Overall model limitations; and,
- Uncertainties associated with monitoring data, including locations.

32 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

Model verification is the process by which these and other uncertainties are investigated and where possible minimised. In reality, the differences between modelled and monitored results are likely to be a combination of all of these aspects.

For the purpose of the assessment, model verification was undertaken for 2024 using traffic data, meteorological data and monitoring results from this year.

Monitoring of $NO_2$ concentrations was undertaken at four locations within the vicinity of roads included in the model during 2024. However, a number of survey positions were not included within the verification model due to the following reasons:

- MA75NO - Classed as a kerbside position within the GMCA 2024 Air Quality ASR[33]. Therefore, excluded in accordance with the DEFRA guidance[34]; and,
- MA81NO - Classed as an urban background position within the GMCA 2024 Air Quality ASR[35]. Therefore, excluded in accordance with the DEFRA guidance[36].

The results for the remaining monitors were obtained and the road contributions to total $NO_x$ concentrations calculated following the methodology contained within DEFRA guidance[37]. The monitored annual mean $NO_2$ concentrations and calculated road $NO_x$ concentrations are summarised in Table A1.4.

**Table A1.4 $NO_x$ Verification - Monitoring Result**

| Monitoring Location | | Monitored $NO_2$ Concentration (µg/m$^3$) | Calculated Road $NO_x$ Concentration (µg/m$^3$) |
|---|---|---|---|
| CAP_MANC_125 | A6 Stockport Road | 47.5 | 90.32 |
| CAP_MANC_126 | A6 Stockport Road | 40.7 | 65.32 |

The annual mean road $NO_x$ concentrations predicted from the dispersion model and the road $NO_x$ concentrations calculated from the monitoring result are summarised in Table A1.5.

33 GMCA 2024 Air Quality ASR, GMCA, 2024.

34 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

35 GMCA 2024 Air Quality ASR, GMCA, 2024.

36 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

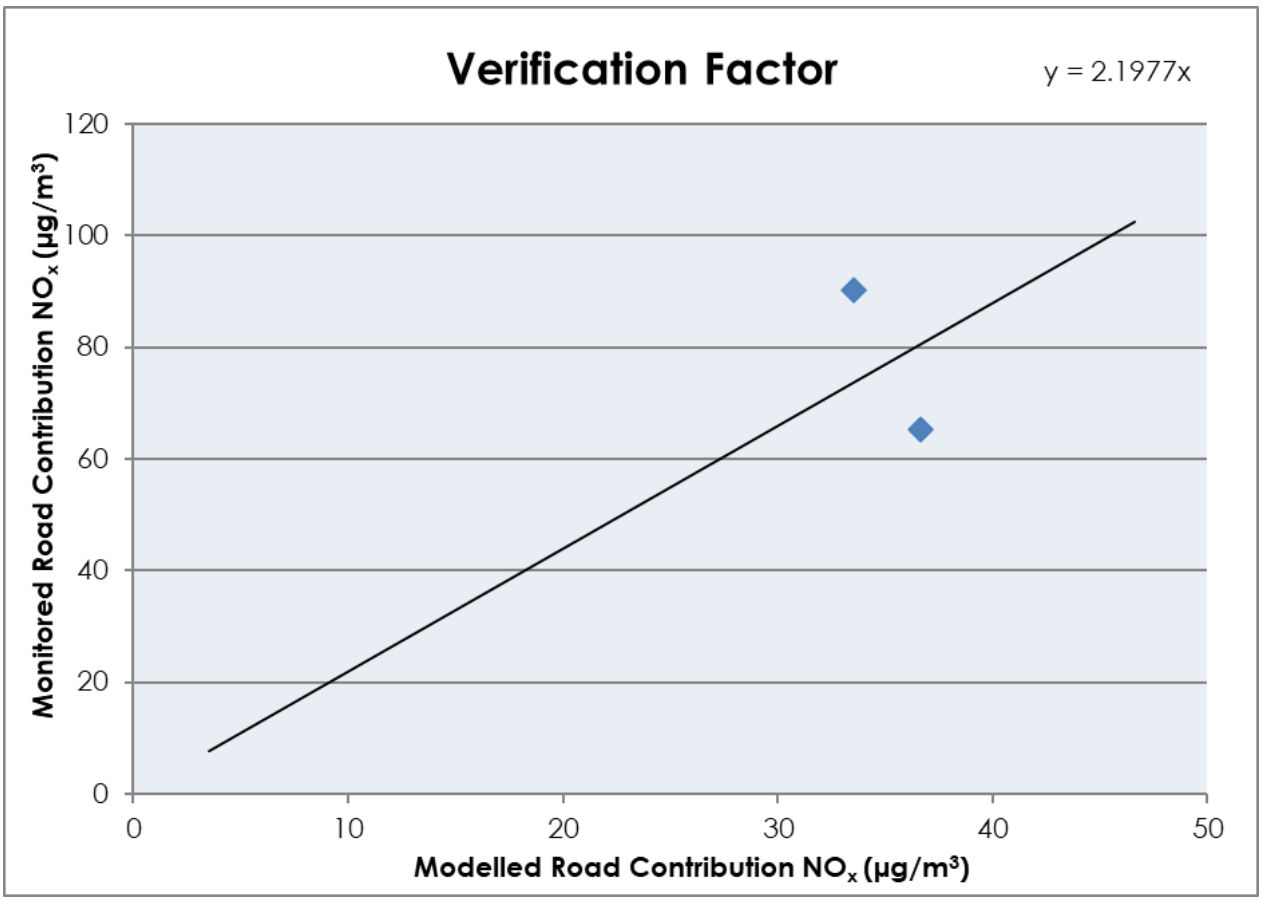
37 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

**Table A1.5 $NO_x$ Verification - Modelling Result**

| Monitoring Location | | Calculated Road $NO_x$ Concentration (µg/m³) | Modelled Road $NO_x$ Concentration (µg/m³) |
|---|---|---|---|
| CAP_MANC_125 | A6 Stockport Road | 90.32 | 33.53 |
| CAP_MANC_126 | A6 Stockport Road | 65.32 | 36.65 |

The monitored and modelled road $NO_x$ concentrations were graphed and the equation of the trendline based on linear progression through zero calculated. This indicated that a verification factor 2.1977 was required to be applied to all modelling results as shown in Graph 1.

**Graph 1 $NO_x$ Verification Factor**



Monitoring of $PM_{10}$ or $PM_{2.5}$ concentrations was not undertaken within the assessment extents. The $NO_x$ verification factor was therefore used to adjust model predictions of these species in lieu of more accurate data in accordance with DEFRA guidance[38].

[38] Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

# Appendix 2 - Curricula Vitae

# JETHRO REDMORE

## Director

BEng (Hons), MSc, MIAQM, MIEnvSc, PISEP, CEnv

**KEY EXPERIENCE:**

Jethro is a Chartered Environmentalist and Director of Redmore Environmental with specialist experience in the air quality and odour sectors. His key capabilities include:

- Production and management of Air Quality, Dust and Odour Assessments for a wide-range of clients from the retail, residential, infrastructure, commercial and industrial sectors.
- Production and co-ordination of Environmental Permit applications for a variety of industrial sectors.
- Detailed dispersion modelling of road vehicle and industrial emissions using ADMS-Roads, ADMS-6, AERMOD-PRIME and BREEZE-ROADS. Studies have included impact assessment of ground level pollutant and odour concentrations and assessment of suitability of development sites for proposed end-use.
- Project management and co-ordination of Environmental Impact Assessments and scoping reports for developments throughout the UK.
- Provision of expert witness services at Planning Inquiries.
- Design and project management of pollutant monitoring campaigns.
- Co-ordination and management of large-scale multi-disciplinary projects and submissions.
- Provision of expert advice to local government and international environmental bodies, as well as involvement in production of industry guidance.

**SELECT PROJECTS SUMMARY:**

**Industrial**

Shanks Waste Management - Odour Assessments of two waste management facilities to support Environmental Permit Applications.

Tatweer Petroleum - dispersion modelling of Bahrain oil field.

Doha South Sewage Treatment Works - AQA for works extension in Qatar.

IRIS Environmental Appraisal Report Reviews, Isle of Man Government - odour assessment reviews.

Lankem, Greater Manchester - Environmental Permit Application for chemical manufacturing plant.

Newport Docks Bulk Drying, Pelleting and CHP Facility - air quality EIA for gas CHP.

Springshades, Leicester - Environmental Permit Variation Application for textile manufacturing plant.

Valspar, Chester - Odour Assessment and production of Odour Management Plan for a paint manufacturing plant in response to neighbour complaints.

Agrivert - dispersion modelling of odour and CHP emissions from numerous AD plants.

James Cropper Paper Mill, Cumbria - air quality EIA, Environmental Permit Variation and Human Health Risk Assessment for new biomass boiler adjacent to SSSI.

Rigg Approach, Leyton - Air Quality Assessment in support of waste transfer site.

Lynchford Lane Waste Transfer Station - biomass facility energy recovery plant.

Barnes Wallis Heat and Power, Cobham - biomass facility adjacent to AQMA.

**Residential**

Wood St Mill, Bury - residential development adjacent to scrap metal yard.

Hyams Lane, Holbrook - Odour Assessment to support residential development adjacent to sewage works.

North Wharf Gardens, London - peer review of EIA undertaken for large residential development.

Loxford Road, Alford - Air Quality EIA for residential development, included consideration of impacts from associated package sewage works

Elephant and Castle Leisure Centre - baseline AQA for redevelopment.

Carr Lodge, Doncaster - EIA for large residential development.

Queensland Road, Highbury - residential scheme including CHP.

Bicester Ecotown - dispersion modelling of energy centre.

Castleford Growth Delivery Plan - baseline air quality constraints assessment for town redevelopment.

York St, Bury - residential development adjacent to AQMA.

Temple Point Leeds - residential development adjacent to M1.

**Commercial and Retail**

Etihad Stadium - Air Quality EIA for the extension to the capacity of the Etihad Stadium, Manchester.

Wakefield College - redevelopment of city centre campus in AQMA.

Manchester Airport Cargo Shed - commercial development.

Manchester Airport Apron Extension - EIA including aircraft emission modelling.

National Youth Theatre, Islington - redevelopment to provide new arts space and accommodation.

# NATASHA JONES

## Air Quality Consultant

BSc (Hons), MSc, AMIEnvSc

Tel: 0161 706 0075 | Email: natasha.jones@red-env.co.uk


**KEY EXPERIENCE:**

Natasha is an Environmental Consultant with specialist experience in the air quality sector. Her key capabilities include:

- Production of Air Quality Assessments in accordance with Department for Environment, Food and Rural Affairs (DEFRA) methodologies for a range of residential, commercial and industrial sectors.
- Detailed dispersion modelling of road vehicle exhaust emissions using ADMS-Roads. Studies have included impact assessments on sensitive receptors and exposure of new residents to poor air quality.
- Dispersion modelling of odour from Wastewater Treatment Works to predict the odour footprint and likely effects on amenity of nearby sensitive receptors
- Odour surveys to assess amenity and suitability of sites for potential future development for residential use.
- Production of Air Quality Neutral Assessments in accordance with The London Plan.
- Advanced canyon modelling to evaluate the impact of altered urban topography on air quality in built up areas.
- Measurement and assessment of workplace air quality. This includes monitoring of different parameters in accordance with the EH40/2005 Workplace Exposure Limits (WELS).
- Assessment of construction dust impacts from a range of development sizes.


Natasha is an Environmental Consultant with specialist experience in the air quality sector. Her key capabilities include:

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- Odour surveys to assess amenity and suitability of sites for potential future development for residential use.
- Production of Air Quality Neutral Assessments in accordance with The London Plan.
- Advanced canyon modelling to evaluate the impact of altered urban topography on air quality in built up areas.
- Measurement and assessment of workplace air quality. This includes monitoring of different parameters in accordance with the EH40/2005 Workplace Exposure Limits (WELS).
- Assessment of construction dust impacts from a range of development sizes.