

CHAIN ROAD, MANCHESTER

Proposed Residential Development

Air Quality Assessment

Prepared for: Great Places Housing Group

SLR Ref: 410.12096.00001
Version No: v1.0
September 2021



BASIS OF REPORT

This document has been prepared by SLR Consulting Limited with reasonable skill, care and diligence, and taking account of the manpower, timescales and resources devoted to it by agreement with Great Places Housing Group (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

SLR shall not be liable for the use of or reliance on any information, advice, recommendations and opinions in this document for any purpose by any person other than the Client. Reliance may be granted to a third party only in the event that SLR and the third party have executed a reliance agreement or collateral warranty.

Information reported herein may be based on the interpretation of public domain data collected by SLR, and/or information supplied by the Client and/or its other advisors and associates. These data have been accepted in good faith as being accurate and valid.

The copyright and intellectual property in all drawings, reports, specifications, bills of quantities, calculations and other information set out in this report remain vested in SLR unless the terms of appointment state otherwise.

This document may contain information of a specialised and/or highly technical nature and the Client is advised to seek clarification on any elements which may be unclear to it.

Information, advice, recommendations and opinions in this document should only be relied upon in the context of the whole document and any documents referenced explicitly herein and should then only be used within the context of the appointment.

CONTENTS

1.0 INTRODUCTION.....	1
1.1 Scope of Assessment.....	1
2.0 RELEVANT AIR QUALITY LEGISLATION AND GUIDANCE	2
2.1 Legislative Context.....	2
2.2 Local Air Quality Management.....	3
2.3 Clean Air Strategy.....	4
2.4 General Nuisance Legislation	4
2.5 Planning Policy	4
2.6 Assessment Guidance	6
3.0 ASSESSMENT METHODOLOGY	7
3.1 Construction Phase	7
3.2 Operational Phase Road Traffic Emission Screening	8
3.3 Site Suitability Assessment.....	8
3.4 Sensitive Receptors.....	10
4.0 BASELINE ENVIRONMENT	14
4.1 Baseline Air Quality	14
5.0 CONSTRUCTION PHASE.....	18
5.1 Construction Dust Assessment	18
6.0 ASSESSMENT OF EFFECTS AND SIGNIFICANCE: SITE SUITABILITY ASSESSMENT	22
6.1 Modelling Outputs	22
6.2 Site Suitability Assessment.....	22
7.0 OPERATIONAL PHASE SCREENING ASSESSMENT	26
7.1 Trip Generation.....	26
7.2 Screening Assessment – Consideration of Potential Impacts.....	26
8.0 MITIGATION MEASURES	27
8.1 Construction Phase	27
8.2 Operational Phase Road Traffic Emissions	29
9.0 CONCLUSIONS.....	30
9.1 Construction Phase	30

9.2 Operational Phase.....	30
APPENDIX A – ADVANCED MODEL INPUT AND VERIFICATION.....	31
Advanced Model Input Summary	31
Traffic Data	31
Model Verification	32
APPENDIX B – SENSITIVITY ASSESSMENT: RESULTS.....	35

DOCUMENT REFERENCES

TABLES

Table 2-1 Relevant Ambient AQALs.....	3
Table 2-2 Human Health Relevant Exposure.....	3
Table 3-1 Human Receptor Locations Considered	11
Table 4-1 Automatic Monitor: 2018-2020 Annual Mean NO ₂ Results	14
Table 4-2 Automatic Monitor: 2018-2020 Number of NO ₂ Hourly Mean Exceedences	15
Table 4-3 Automatic Monitor: 2018-2020 Annual Mean PM ₁₀ Results.....	15
Table 4-4 Automatic Monitor: 2018-2020 Number of PM ₁₀ Daily Mean Exceedences	15
Table 4-5 Automatic Monitor: 2018-2020 Annual Mean PM _{2.5} Results.....	15
Table 4-6 LAQM Diffusion Tube Monitoring Sites: Details.....	15
Table 4-7 LAQM Diffusion Tube Monitoring Sites: Results	16
Table 4-8 Defra Background Pollutant Concentrations.....	17
Table 5-1 Potential Dust Emission Magnitude	19
Table 5-2 Sensitivity of the Area	19
Table 5-3 Risk of Dust Impacts	20
Table 6-1 Modelled NO ₂ Concentration	22
Table 6-2 Modelled PM ₁₀ Concentration.....	23
Table 6-3 Modelled PM _{2.5} Concentration	24
Table 7-1 Trip Generation and Distribution	26
Table 8-1 Construction Dust Mitigation Measures	27
Table A-1 Advanced Modelling Inputs	31
Table A-2 Traffic Data Used Within the Assessment.....	32
Table A-3 Traffic Data Used Within the 2019 Verification	33
Table A-4 Verification Data 2019, Final Comparison.....	33
Table B-1 2019 Modelled Annual Mean NO ₂ Concentrations: Assessment Sensitivity	35

Table B-2 2019 Modelled Annual Mean PM ₁₀ Concentrations: Assessment Sensitivity.....	36
--	----

Table B-3 2019 Modelled Annual Mean PM _{2.5} Concentrations: Assessment Sensitivity	36
--	----

FIGURES

Figure 3-1 Wind Rose for Manchester Airport Meteorological Station (2019).....	9
--	---

Figure 3-2 Modelled Road Links, Receptors and Monitoring Locations.....	13
---	----

Figure 5-1 Construction Dust Assessment Buffers	21
---	----

1.0 INTRODUCTION

SLR Consulting Ltd (SLR) has been commissioned by Great Places Housing Group to undertake an air quality assessment in support of a planning application for a proposed residential development comprising up to 32 residential dwellings (the 'Proposed Development') on land off Chain Road, Manchester, M9 6QX (the 'Site').

The Proposed Development is located at the approximate centroid National Grid Reference (NGR): x385990, y404150 and is bounded by:

- Chain Road to the north and north-east, beyond which are existing residential dwellings. The M60 is located approximately 530m north-east of the Site.
- Existing residential dwellings to the east, beyond which is the A664 Rochdale Road;
- Victoria Avenue to the south, beyond which are residential dwellings and the E-ACT Blackley Academy; and
- Existing residential dwellings immediately to the west, beyond which is Blackley Recreational Ground.

1.1 Scope of Assessment

The scope of the assessment was as follows and has been agreed with MCC¹:

- Baseline Evaluation – Assessment of existing air quality in the local area;
- Construction Phase Assessment – Identification and assessment of potential air quality effects associated with the construction phase of the Proposed Development;
- Operational Phase Assessment – Identification of air quality effects and design constraints associated with the operational phase of the Proposed Development, including a Site Suitability Assessment; and
- Mitigation Measures – as required and inclusive of an emissions mitigation assessment.

¹ Email communication between SLR Consulting and Rebecca Twigg, Environmental protection at MCC on 26th August 2021.

2.0 RELEVANT AIR QUALITY LEGISLATION AND GUIDANCE

2.1 Legislative Context

2.1.1 Air Quality Standards

The Air Quality Standards Regulations 2010² (AQSR) transpose both the EU Ambient Air Quality Directive (2008/50/EC)³, and the Fourth Daughter Directive (2004/107/EC)⁴ within UK legislation, in order to align and bring together in one statutory instrument the Government's obligations. The AQSR includes Limit Values, Target Values, Objectives, Critical Levels and Exposure Reduction Targets for the protection of human health and the environment. Limit values are legally binding and are considered to apply everywhere with the exception of the carriageway and central reservation of roads and any location where the public do not have access (e.g. industrial sites). Compliance is regulated at a national level (based upon a series of zones/agglomerations).

The UK nationally has failed to meet the Limit Values, as outlined in the Ambient Air Quality Directive (2008/50/EC), for nitrogen dioxide (NO₂) by the 2010 target date. As a result, the Government has had to submit time extension applications for compliance with the EU Limit Values, which has since passed and its continued failure to achieve these limits is currently giving rise to infringement procedures being implemented. In July 2017, the Government published its plan for tackling roadside NO₂ concentrations⁵, to achieve compliance with EU Limit Values. This sets out Government policies for bringing NO₂ concentrations within statutory limits in the shortest time period possible.

In the interim period the UK has formally left the EU, however despite this, EU rules and regulations referred above have subsequently been written into UK law and are still relevant – although there is uncertainty as to who will enforce these requirements domestically.

2.1.2 Greater Manchester Combined Authority Air Quality Direction 2019

In response to this Government-led plan, the Greater Manchester Combined Authority (GMCA), which includes Manchester City Council (MCC), was identified by the Pollution Climate Mapping (PCM) national model to have persistent (post-2021) long term exceedences of the annual mean NO₂ EU Limit Value, at roadside locations. As such, the GMCA was issued with Air Quality Direction by the Secretary of State under the Environment Act (1995)⁶, to develop a Local NO₂ Plan to identify and implement measures that could bring forward compliance with EU Limit Values within the shortest possible time, and by 2024 at the latest.

In response, BCC submitted a 'local plan for NO₂ compliance' means a detailed scheme of charging measures (Class C CAZ) to achieve the legal limit value for NO₂ in the shortest possible time and by 2024 at the latest. The GMCA CAZ is set to launch on 30th May 2022.

2.1.3 Air Quality Strategy

Irrespective of the above, the UK Government and the devolved administrations are required under the Environment Act 1995 to produce a national air quality strategy to improve air quality. The latest Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland was published in 2007⁷. The AQS provides the over-arching strategic framework for air quality management in the UK and contains non-statutory national air quality standards and objectives established by the UK Government and Devolved Administrations for the protection of public health and the environment, taking into account epidemiological evidence and international

² The Air Quality Standards Regulations (England) 2010, Statutory Instrument No 1001, The Stationary Office Limited.

³ Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe.

⁴ Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004.

⁵ Defra, DfT (2017), UK plan for tackling roadside nitrogen dioxide concentrations.

⁶ Environment Act 1995 (Greater Manchester) Air Quality Direction 2019.

⁷ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Defra. July 2007.

regulations, as well as economic efficiency, practicability and technical feasibility. There is no legal requirement to meet these objectives except where they mirror an equivalent legally binding Limit Value as prescribed within EU legislation, however compliance is regulated at a local level by local planning authorities.

The AQS objectives apply at locations outside buildings or other natural or man-made structures above or below ground, where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period – herein referred to as relevant exposure. Table 2-2 provides an indication of those locations.

The ambient air quality standards of relevance to human receptors in this assessment (collectively termed Air Quality Assessment Levels (AQALs) throughout this report) are provided in Table 2-1.

Table 2-1
Relevant Ambient AQALs

Pollutant	Standard ($\mu\text{g}/\text{m}^3$)	Measured As	Equivalent percentile
NO ₂	40	Annual Mean	-
	200	1-hour Mean	99.79 th percentile of 1-hour means (equivalent to 18 1-hour exceedences)
Particulate matter with an aerodynamic diameter of less than 10 μm (PM ₁₀)	40	Annual Mean	-
	50	24-hour mean	90.41 th percentile of 24-hour means (equivalent to 35 24-hour exceedences)
Particulate matter with an aerodynamic diameter of less than 2.5 μm (PM _{2.5})	25	Annual Mean	-

Table 2-2
Human Health Relevant Exposure

AQAL Averaging Period	Relevant Locations	AQALs should apply at	AQALs should not apply at
Annual Mean	Where individuals are exposed for a cumulative period of 6-months in a year	Building facades of residential properties, schools, hospitals etc.	Facades of offices Hotels Gardens of residences Kerbside sites
24-hour mean	Where individuals may be exposed for eight hours or more in a day	As above together with hotels and gardens of residential properties	Kerbside sites where public exposure is expected to be short term
1-hour mean	Where individuals might reasonably be expected to spend one hour or longer	As above together with kerbside sites of regular access, car parks, bus stations etc.	Kerbside sites where public would not be expected to have regular access

2.2 Local Air Quality Management

As reinforced within the AQS, Part IV of the Environment Act 1995 induces a statutory duty for local authorities to undergo a process of Local Air Quality Management (LAQM). This requires local authorities to Review and Assess air quality within their boundaries to determine the likeliness of compliance, regularly and systematically.

Where any of the prescribed AQS objectives are not likely to be achieved, the authority must designate an Air Quality Management Area (AQMA). For each AQMA, the local authority is required to prepare an Air Quality Action Plan (AQAP), which details measures the authority intends to introduce to deliver improvements in local air quality in pursuit of the objective. AQMAs can give rise to potential constraints to development, or at least a higher degree of scrutiny to air quality assessment work. Local authorities therefore have formal powers to control air quality through a combination of LAQM and through application of wider planning policies.

After a high number of declarations across the UK, it has become standard practice for planning authorities to require an air quality assessment to be carried out for a proposed development.

2.3 Clean Air Strategy

The Clean Air Strategy (CAS)⁸, published in 2019, sets out the Government's proposals aimed at delivering cleaner air in England, and also indicates how devolved administrations intend to make emissions reductions. It sets out the comprehensive action that is required from across all parts of government and society to deliver clean air.

2.4 General Nuisance Legislation

Part III of the Environmental Protection Act (EPA) 1990 (as amended) contains the main legislation on Statutory Nuisance and allows local authorities and individuals to take action to prevent a statutory nuisance. Section 79 of the EPA defines, amongst other things, smoke, fumes, dust and smells emitted from industrial, trade or business premises so as to be prejudicial to health or a nuisance, as a potential Statutory Nuisance.

Fractions of dust greater than 10µm (i.e. greater than PM₁₀) in diameter typically relate to nuisance effects as opposed to potential health effects and therefore are not covered within the UK AQS. In legislation there are currently no numerical limits in terms of what level of dust deposition constitutes a nuisance.

2.5 Planning Policy

2.5.1 National Policy

The 2021 update to the National Planning Policy Framework (NPPF) describes the policy context in relation to pollutants including air pollutants:

"Para 174: 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 [...] air [...] pollution [...]. Development should, wherever possible, help to improve local environmental conditions such as air [...] quality [...]"

"Para 185: Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development."

Specifically, within the context of development control:

"Para 186: 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

⁸ The Clean Air Strategy, Defra. January 2019.

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.”

The NPPF is accompanied by web based supporting Planning Practice Guidance (PPG) which includes guiding principles on how planning can take account of the impacts of new development on air quality. In regard to air quality, the PPG states:

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

“Whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate air quality impact in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation (including that applicable to wildlife).”

The PPG sets out the information that may be required within the context of a supporting air quality assessment, stating that *“assessments should be proportional to the nature and scale of development proposed and the level of concern about air quality [...] Mitigation options where necessary, will depend on the proposed development and should be proportionate to the likely impact”*.

The policies within the NPPF and accompanying PPG in relation to air pollution are considered within this assessment.

2.5.2 Local Policy

The Manchester Local Development Framework, including the Core Strategy Development Plan Document was adopted by MCC on 11th July 2012. The following policies relate to air quality:

“Policy EN 16 Air Quality

The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester’s principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant.

When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas.”

“Policy CC 5 Transport

The Transport Strategy for Manchester City Centre will be delivered to ensure that transport is managed in a way which supports the projected growth of the City Centre.

Developers should work with public transport providers to ensure that all users are able to access development by sustainable means, especially taking account of times when developments are likely to be busiest.

Proposals will be supported that improve pedestrian safety, improve air quality and increase the scope for accessible public realm improvements, for example improvements to:

- *remove buses and private cars from St Peter's Square*
- *create a new pedestrian priority zone initially the area bounded by Deansgate, Peter Street / Oxford Street, Portland Street, Piccadilly North, Manchester Arndale, Corporation Street and Exchange Square*
- *close Victoria Street in the Medieval Quarter to traffic and create a new public realm around the Cathedral and Chethams.*

The Council will seek to ensure that development includes adequate parking provision for cars and bicycles."

The above policies have been addressed within this assessment.

2.6 Assessment Guidance

The air quality assessment has been carried out in accordance with the following principles contained within the guidance documents below.

2.6.1 Local Air Quality Management Technical Guidance

The Department for Environment, Food and Rural Affairs (Defra) Local Air Quality Management Technical Guidance (LAQM.TG(16))⁹ was published for use by local authorities in their LAQM Review and Assessment work. The document provides key guidance in aspects of air quality assessment, including screening, model verification, use of monitoring data, and use of background data that are applicable to all air quality assessments.

2.6.2 Environmental Protection UK and Institute of Air Quality Management Guidance

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have together published guidance¹⁰ to help ensure that air quality is appropriately accounted for in the development control process. The guidance clarifies when an air quality assessment should be undertaken, as well as the likely proportional scope, with reference to indicative screening criteria, and provides a significance criterion for use to evaluate and describe potential developmental impacts and effects.

2.6.3 Design Manual for Roads and Bridges

The Design Manual for Roads and Bridges (DMRB) LA 105¹¹ states receptors, including ecological designations, within 200m of an 'affected road' source, require assessment of potential impacts.

2.6.4 Construction and Demolition Dust Guidance

Guidance on the assessment of dust from demolition and construction has been published by the IAQM¹². The guidance provides a series of matrices to determine the risk magnitude of potential dust sources associated with construction activities to identify appropriate mitigation measures that are defined within further IAQM guidance.

⁹ Local Air Quality Management Technical Guidance 16, Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland, April 2021.

¹⁰ EPUK and IAQM, Land-Use Planning and Development Control: Planning for Air Quality', v1.2 2017.

¹¹ DMRB, LA 105-Air Quality, Highways England, 2019.

¹² Institute of Air Quality Management (IAQM), Guidance on the assessment dust from demolition and construction (2016).

3.0 ASSESSMENT METHODOLOGY

3.1 Construction Phase

The assessment has been undertaken in accordance with IAQM guidance. The assessment of risk is determined by considering the risk of dust effects arising from four activities in the absence of mitigation:

- demolition;
- earthworks;
- construction; and
- track-out.

The assessment methodology considers three separate dust impacts with account being taken of the sensitivity of the area that may experience these effects:

- annoyance due to dust soiling;
- the risk of health effects due to an increase in exposure to PM₁₀; and
- harm to ecological receptors.

The first stage of the assessment involves a screening to determine if there are sensitive receptors within threshold distances of the site activities associated with the construction phase of the scheme. A detailed assessment is required where a:

- human receptor is located within 350m of the Site, and/or within 50m of routes used by construction vehicles, up to 500m from the site entrance(s); and/or
- ecological receptor is located within 50m of the Site, and/or within 50m of routes used by construction vehicles, up to 500m from the site entrance(s).

The dust emission class (or magnitude) for each activity is determined on the basis of the guidance, indicative thresholds and professional judgement. The risk of dust effects arising is based upon the relationship between the dust emission magnitude and the sensitivity of the area. The risk of impact is then used to determine the appropriate mitigation requirements, whereby through effective application, residual effects are considered to be 'not significant'.

3.1.1 Construction Phase Plant Emissions Assessment

To facilitate construction, Non-Road Mobile Machinery (NRMM) may be used. NRMM refers to mobile machines, transportable industrial equipment or vehicles which are fitted with an internal combustion engine and not intended for transporting goods or passengers on roads.

Pollutants emitted by NRMM that may have the most significant potential effects on local air quality are particulate matter (PM₁₀ and PM_{2.5}), and oxides of nitrogen (NO_x) / NO₂. NRMM emissions associated with construction programmes can adversely affect local air quality.

Emissions from construction phase plant, as NRMM have been screened following LAQM.TG(16) guidance.

3.2 Operational Phase Road Traffic Emission Screening

Screening of potential impacts associated with the Proposed Development's operational phase has been undertaken qualitatively, in accordance with the EPUK & IAQM Guidance¹³.

The EPUK & IAQM guidance provides a series of indicative screening criteria (termed 'the indicative criterion for assessment') where if exceeded, should require greater consideration to determine potential impacts on air quality. If the Proposed Development is found not to exceed any of the relevant indicative criteria presented, then a detailed impact assessment is consequently not required. Impacts can therefore be considered as having an 'insignificant' effect in accordance with the EPUK & IAQM guidance.

The indicative screening criteria relevant for this assessment is as follows (specific to a location within an AQMA):

- a change of light duty vehicle (LDV)¹⁴ flows of more than 100 annual average daily traffic (AADT); and
- a change of heavy duty vehicle (HDV)¹⁵ flows of more than 25 AADT.

3.3 Site Suitability Assessment

In order to appropriately assess the suitability of the Site for residential purposes, detailed dispersion modelling has been undertaken using the Cambridge Environmental Research Consultants (CERC) ADMS-Roads v5.0.0.1 dispersion model. This modelling exercise has focussed on concentrations of NO₂, PM₁₀ and PM_{2.5} (the pollutants of principal concern arising from road traffic) for the following scenarios:

- 2019 Verification / Base Case (2019 BC) – Without development base flows for the year (2019); and
- 2024 Do Something (2024 DS) – 'Do Minimum' flows (i.e. without the Proposed Development occurring), plus all trips associated with the Proposed Development flows for the proposed year of opening (2024).

For the above future year scenario (2024), concurrent emission factors and background pollutant concentrations have been used.

Details of model inputs are discussed in turn, below, and in Appendix A.

3.3.1 Traffic Inputs

The ADMS-Roads assessment incorporates numbers of road traffic vehicles, vehicle speeds on the local roads and the composition of the traffic fleet.

Traffic data was provided by Eddisons – the appointed transport consultant. This data has principally informed the spatial extent and inclusion of initial road links within the assessment (as traffic data is a principal input into an ADMS-Roads assessment). The extent of road links for input to the Site Suitability assessment focussed on those road links within 200m of the Proposed Development in line with DMRB Guidance.

Traffic speeds were modelled at the relevant speed limit for each road. However, where appropriate, the speeds have been reduced to simulate queues at junctions, traffic lights and other locations where queues or slower traffic are known to be an issue in accordance with LAQM.TG(16).

The Emissions Factors Toolkit (EFT) version 10.1 developed by Defra¹⁶ has been used to determine vehicle emission factors for input into the ADMS-Roads dispersion model.

¹³ Environmental Protection UK and Institute of Air Quality Management, 'Land-Use Planning and Development Control: Planning for Air Quality', v1.2 2017.

¹⁴ As defined by the design manual for roads and bridges (DMRB), and includes vehicles <3.5tonnes including cars and light duty vehicles.

¹⁵ As defined by the design manual for roads and bridges (DMRB), and includes vehicles ≥3.5tonnes and includes heavy duty vehicles and buses.

¹⁶ Defra, EFT v10.1 (2020). <https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html>, accessed August 2021.

Details of the traffic flows used in this assessment are provided in Table A-2 of Appendix A, whilst the modelled roads in relation to the Site are presented in Figure 3-2.

3.3.2 Meteorological Data

To calculate pollutant concentrations at identified sensitive receptor locations the dispersion model uses hourly sequential meteorological data, including wind direction, wind speed, temperature, cloud cover and stability, which exert significant influence over atmospheric dispersion.

The dispersion modelling has been undertaken using 2019 data from Manchester International Airport meteorological station, located approximately 21km to the south of the Site – the closest representative meteorological station relative to the Site.

LAQM.TG(16) recommends that meteorological data should have a percentage of usable hours greater than 85%. 2019 meteorological data from Manchester Airport meteorological station includes 8,760 lines of usable hourly data for the year, i.e. 100% usable data. This is therefore suitable for the dispersion modelling exercise.

A wind rose is presented in Figure 3-1.

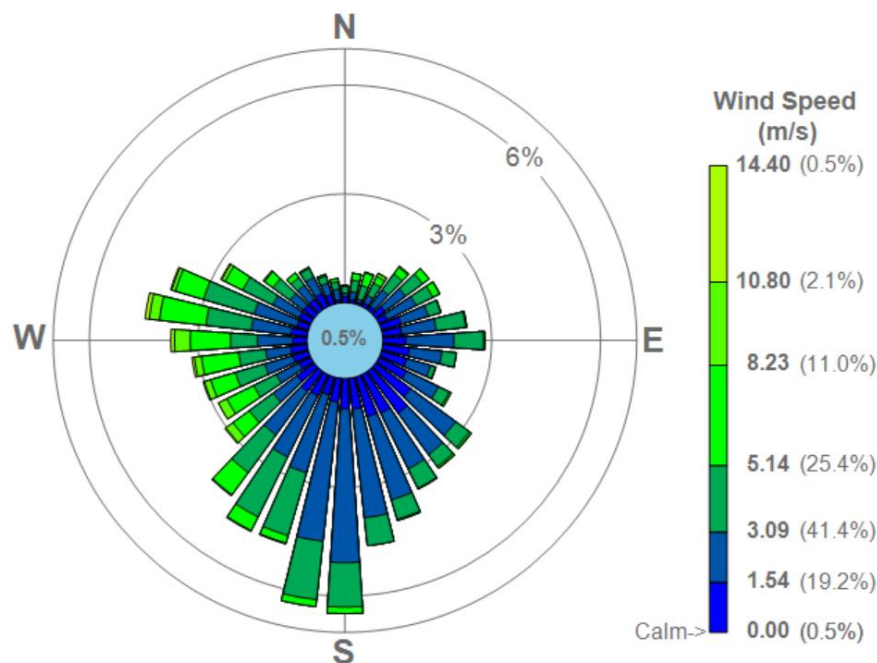


Figure 3-1
Wind Rose for Manchester Airport Meteorological Station (2019)

3.3.3 Background Concentrations

In the absence of locally representative background monitoring sites, annual mean background concentrations used for the purposes of the assessment have been obtained from the Defra supplied background maps (2018 reference year)¹⁷, based on the 1km grid squares which cover the modelled area. Further detail on these datasets can be found in Section 4.1.3.

To avoid double counting of potential source contributions already contained within the ADMS-Roads dispersion model, 'Motorways in' and 'Primary A Road in' was removed from each grid square (where modelled in full), as recommended in the DEFRA Background Maps User Guide¹⁸.

¹⁷ Background mapping data for local authorities – <http://uk-air.defra.gov.uk/data/laqm-background-home>, accessed August 2021.

¹⁸ Defra Background Concentration Maps User Guide. August 2020.

No adjustment for background concentration variability with height has been made.

3.4 Sensitive Receptors

3.4.1 Construction Dust Receptors

The main receptors likely to be affected by the generation of construction dust are those existing receptors within approximately 350m of the Application Site boundary and/or within 50m of the route(s) used by vehicles on the public highway, up to 500m from the site entrance(s), according to the IAQM guidance¹⁹. However, for those receptors sited in a downwind location from the development site boundary, potential dust impacts may be witnessed at a distance of greater than 350m on occasion under worst case conditions.

Reference should be made to Figure 5-1 for an illustration of buffer zones of all sensitive receptors with the potential to be impacted upon by construction phase dust in accordance with the stated IAQM assessment methodology.

3.4.2 Ecological Receptors

A review using the Magic web-based mapping service²⁰ was undertaken to identify any designated sites of ecological or nature conservation importance required for consideration within the assessment, as follows:

- construction phase assessment – any ecological designation within 50m of the Application Site boundary, or 50m of any road projected to witness construction phase road traffic movements, that could potentially be affected by dust from the construction phases of the proposed development; and
- operational phase assessment – any ecological designation, but with particular reference to Ramsar, Special Areas of Conservation (SAC), Special Protection Areas (SPA) or Sites of Special Scientific Interest (SSSI) within 200m of any ‘affected road’ as part of the scheme, that could be affected by any change in vehicle emissions associated with the proposed development.

A search within 50m of the development boundary / any road projected to witness construction phase road traffic movements within 500m of the development boundary identified no ecological receptors which could potentially be affected by construction dust.

A search within 200m of an ‘affected road’ / road predicted to witness additional Proposed Development trips no ecological receptors which could potentially be affected by vehicle emission during the operational phase.

3.4.3 Human Receptors

Human receptors considered in the assessment of road traffic emissions are shown Table 3-1, whilst their locations are illustrated in Figure 3-2. New receptors introduced as a result of the Proposed Development, NR1 – NR18, are selected as the locations of worst-case exposure within the Site relative to the surrounding modelled road network and proposed Site layout.

Receptor locations represent relevant exposure – in accordance with LAQM.TG(16), as presented in Table 2-2. All receptors were considered in relation to exposure at breathing height relative to the adjacent modelled road.

¹⁹ IAQM, Guidance on the assessment dust from demolition and construction v1.1, 2016.

²⁰ Natural England, www.magic.gov.uk, accessed August 2021.

Table 3-1
Human Receptor Locations Considered

Receptor	Location	NGR (m)		Height (m)
		X	Y	
New Receptors				
NR1	House 1 (3bed/4 person)	385960	404136	1.5
NR2	House 2 (3bed/4 person)	385965	404135	1.5
NR3	House 3 (3bed/4 person)	385970	404133	1.5
NR4	House 4 (3bed/4 person)	385976	404132	1.5
NR5	Apartment Block 1 (2bed/3 person) (ground)	385985	404130	1.5
NR6	Apartment Block 2 (2bed/3 person) (ground)	385995	404128	1.5
NR7	Apartment Block 3 (1bed/2 person) (ground)	386009	404124	1.5
NR8	Apartment Block 4 (1bed/2 person) (ground)	385984	404137	1.5
NR9	Apartment Block 5 (2bed/3 person) (ground)	386010	404144	1.5
NR10	Apartment Block 6 (2bed/3 person) (ground)	386004	404152	1.5
NR11	House 5 (3bed/4 person)	385990	404169	1.5
NR12	House 6 (3bed/4 person)	385983	404178	1.5
NR13	House 7 (3bed/4 person)	385975	404180	1.5
NR14	House 8 (3bed/4 person)	385971	404185	1.5
NR15	House 9 (4bed/6 person)	385966	404191	1.5
NR16	House 10 (4bed/6 person)	385962	404196	1.5
NR17	House 11 (3bed/4 person)	385958	404209	1.5
NR18	House 12 (3bed/4 person)	385953	404215	1.5

3.4.4 Model Outputs

The background pollutant values discussed in Section 4.1.3 have been used in conjunction with the concentrations predicted by the ADMS-Roads model to calculate predicted total annual mean concentrations of NO₂, PM₁₀ and PM_{2.5} for each respective scenario.

For the prediction of annual mean NO₂ concentrations at receptor locations, the road NO_x contributions (adjusted as per Appendix A) have been converted to total NO₂ following the methodology in LAQM.TG(16) using the latest version of Defra's NO_x to NO₂ conversion tool (v8.1)²¹. The modelled NO₂ road contribution was then added to the appropriate NO₂ background concentration value to obtain an overall total annual mean NO₂ concentration.

For the prediction of short-term NO₂ impacts, LAQM.TG(16) advises that it is valid to assume that exceedences of the 1-hour mean AQAL for NO₂ are unlikely to occur where the annual mean NO₂ concentration is <60µg/m³. This approach has thus been adopted for the purposes of this assessment, at relevant receptor locations.

For the prediction of short-term PM₁₀, LAQM.TG(16) provides an empirical relationship between the annual mean and the number of exceedences of the 24-hour mean AQAL for PM₁₀ that can be calculated as follows:

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

²¹ Defra NO_x to NO₂ Calculator v8.1 (2020), available at <https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc>.

This relationship has thus been adopted to determine whether exceedences of the short-term PM₁₀ AQAL are likely in this assessment.

Verification of the ADMS-Roads assessment has been undertaken, as per Appendix A. All results presented in the assessment are those calculated following the process of model verification, using an adjustment factor of 4.353 for NO₂, PM₁₀ and PM_{2.5}.

3.4.5 Assessing Significance

The EPUK & IAQM guidance requires a judgment on the significance of the 'effect', this is based upon consideration, as necessary, of the following factors:

- the existing and future air quality in the absence of the development;
- the extent of current and future population exposure to the impacts;
- the worst-case assumptions adopted when undertaking the prediction of impacts; and
- the extent to which the Proposed Development has adopted best practice to eliminate and minimise emissions.

To determine the significance of predicted air quality impacts based upon a site-suitability assessment, the EPUK & IAQM guidance states:

"Where the air quality is such that an air quality objective at the building façade is not met, the effect on residents or occupants will be judged as significant, unless provision is made to reduce their exposure by some means."

3.4.6 Uncertainty

Dispersion modelling is inherently uncertain and is principally reliant on the accuracy and representativity of its inputs. In acknowledgement of this, the ADMS-Roads dispersion model has been verified with the latest publicly available local monitoring data, as collected by MCC.

In addition, there is a widely acknowledged disparity between emission factors and ambient monitoring data²². To help minimise any associated uncertainty when forming conclusions from the results, this assessment has utilised the latest EFT version 10.1 utilising COPERT 5.3 emission factors, and associated tools/datasets published by Defra.

Further to this, to help ameliorate any local uncertainties with regard to representativity of future national projections (as embedded within the EFT v10.1 and Defra supplied background concentration estimates), the assessment has included a sensitivity scenario to minimise uncertainty of modelled predictions i.e. no future projection of emission factors/background concentrations has been adopted:

- 2019 Do Something (2019 DS) – 2024 DS flows, processed using 2019 emission factors and background concentration estimates.

This represents an overly conservative approach, based on a series of worst-case parameters. Details of the sensitivity assessment are provided in Appendix B.

²² Carslaw, et al. (2011). Trends in NO_x and NO₂ emissions and ambient measurements in the UK.

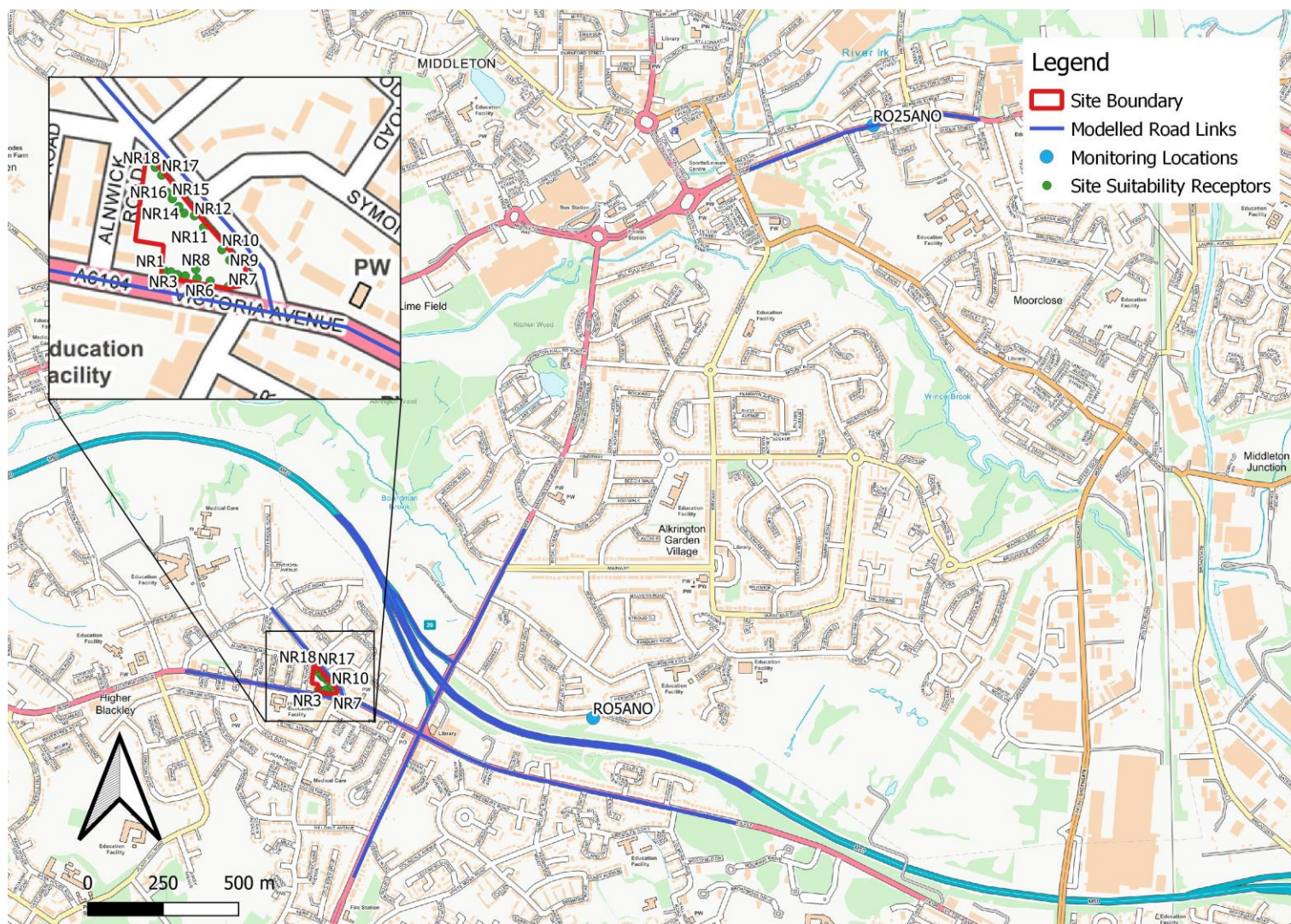


Figure 3-2
Modelled Road Links, Receptors and Monitoring Locations

4.0 BASELINE ENVIRONMENT

4.1 Baseline Air Quality

4.1.1 LAQM Review and Assessment

As required under Section 82 of the Environment Act (1995) (Part IV), MCC has conducted an on-going exercise to review and assess air quality within their administrative area.

This process has indicated that annual mean NO₂ concentrations are above, and likely to remain above the relevant AQO at locations of relevant public exposure within MCC's administrative area. MCC is part of the Greater GMCA and one AQMA has been declared within the Greater Manchester area. The Greater Manchester AQMA is defined as the 'An area covering the 10 districts of Greater Manchester, including arterial routes, district centres and airport'. Furthermore, the GMCA has also declared a Cat. C CAZ (see Section 2.1.2 for further information), the boundary of which follows the administrative boundary of Greater Manchester. Therefore, the Site is situated within the CAZ.

The Site located 200m south / west of the AQMA. As such, there is the potential for future Site users to be subject to elevated pollution concentrations. As such, the impact of the AQMA on the Site has been assessed within this Air Quality Assessment.

All other Air Quality Strategy pollutants were below the relevant AQOs at locations of relevant public exposure, and as such no further AQMAs have been declared within the Council's administrative area.

4.1.2 Review of Air Quality Monitoring

Automatic Air Quality Monitoring

The UK Automatic Urban and Rural Network (AURN) is a countrywide network of air quality monitoring stations operated on behalf of the DEFRA, used primarily in support of the UK's national compliance reporting against EU directives. Monitoring data for AURN sites is publicly available via the UK Air Information Resource (AIR) website²³. The closest automatic monitor to the Site is the Manchester Piccadilly AURN (NGR: x384311, y398337) classified as an 'urban background' site located approximately 6km south-east of the Site.

Details and relevant 2018 - 2020 concentrations monitored / statistics at the automatic monitoring locations of relevance to the Site are presented in Table 4-1 to Table 4-5.

The GMCA also operates a series of automatic monitors as part of their LAQM obligations. Manchester Oxford Road is classified as a 'kerbside' automatic monitor and is located 6.8km south of the Site. Due to the distance between the Site and the automatic monitor, it is not considered likely that concentrations would be comparable.

Table 4-1
Automatic Monitor: 2018-2020 Annual Mean NO₂ Results

Site ID	2019 Data Capture %	Annual Mean NO ₂ Concentration (µg/m ³)		
		2018	2019	2020
Manchester Piccadilly	98.8	34.6	36.3	27.1

²³ DEFRA, UK Air Information Resource (UK-AIR) website, <http://uk-air.defra.gov.uk/>, accessed August 2021.

Table 4-2
Automatic Monitor: 2018-2020 Number of NO₂ Hourly Mean Exceedences

Site ID	2019 Data Capture %	Hourly NO ₂ Means in Excess of 200µg/m ³		
		2018	2019	2020
Manchester Piccadilly	98.8	0	0	0

Table 4-3
Automatic Monitor: 2018-2020 Annual Mean PM₁₀ Results

Site ID	2019 Data Capture %	Annual Mean PM ₁₀ Concentration (µg/m ³)		
		2018	2019	2020
Manchester Piccadilly	6.45	/	14.4	14.5

Table 4-4
Automatic Monitor: 2018-2020 Number of PM₁₀ Daily Mean Exceedences

Site ID	2019 Data Capture %	Daily PM ₁₀ Means in Excess of 50µg/m ³		
		2018	2019	2020
Manchester Piccadilly	6.45	/	0	1

Table 4-5
Automatic Monitor: 2018-2020 Annual Mean PM_{2.5} Results

Site ID	2019 Data Capture %	Annual Mean PM _{2.5} Concentration (µg/m ³)		
		2018	2019	2020
Manchester Piccadilly	92.1	10.9	11.5	8.24

For the period assessed (2018-2020), all pollutant concentrations monitored were below the relevant annual mean and short term (1-hour and 24-hour) AQALs.

Passive Diffusion Tube Monitoring

Passive NO₂ diffusion tube monitoring is currently undertaken by GMCA across Manchester, at numerous locations – in fulfilment of their statutory LAQM obligations. Typically, diffusion tubes are deployed in areas which are deemed to require further assessment of NO₂ concentrations.

The details and results of the monitoring locations of relevance to the Site are presented in Table 4-6 and Table 4-7 respectively, whilst their locations are illustrated in Figure 3-2. All monitoring data presented has been ratified by GMCA. It should be note that MA98BNO only began monitoring in 2019.

Table 4-6
LAQM Diffusion Tube Monitoring Sites: Details

Site ID	Site Type	NGR (m)		Height (m)	Within AQMA	Distance to Site (km)
		X	Y			
RO5ANO	Roadside ^(A)	386870	404044	2	Yes	0.8

Site ID	Site Type	NGR (m)		Height (m)	Within AQMA	Distance to Site (km)
		X	Y			
RO25ANO	Roadside ^(A)	387798	406006	3	No	2.5

Notes:

(A) defined by LAQM.TG(16) as a site sampling typically within one to five metres of the kerb of a busy road.

Table 4-7
LAQM Diffusion Tube Monitoring Sites: Results

Site ID	2019 Data Capture %	Annual Mean NO ₂ Concentration (µg/m ³)				
		2016	2017	2018	2019	2020
RO5ANO	100	24.7	25.9	31.5	24.5	16.5
RO25ANO	91.7				34.7	25.9

As shown in Table 4-7, both monitoring locations have historically recorded annual mean NO₂ concentrations below the AQAL (40µg/m³) across the period assessed.

Defra has published guidance²⁴ to assist Local Authorities in respect of LAQM reporting and the interpretation of 2020 monitoring data. This guidance considers the effect of the ongoing COVID-19 pandemic and implications on reductions to traffic flows and the associated reduction in monitored air pollutant concentrations in terms of compliance with the AQALs. Whilst Defra recommends presenting 2020 monitoring data, the guidance states:

“We advise against considering the revocation of an AQMA based solely upon compliance being achieved in 2020, as this year may not be representative of long-term trends in pollutant concentrations and we must be confident that air quality objectives will continue to be met in future years. Where 2020 is one of many (i.e. at least three) consecutive years of compliance, this may still be considered for revocation where the supporting evidence is considered suitably robust.”

The empirical relationship given in LAQM.TG(16) states that exceedences of the 1-hour mean NO₂ AQAL is only unlikely to occur where annual mean concentrations are <60µg/m³. This indicates that exceedences of the 1-hour mean NO₂ AQAL are unlikely to have occurred at these sites between 2016 and 2020.

4.1.3 Defra Mapped Background Concentrations

Defra maintains a nationwide model of existing and future background air quality concentrations at a 1km grid square resolution which is routinely used to support LAQM requirements and air quality assessments. The data sets include semi-empirical annual average concentration estimates for NO_x, NO₂, PM₁₀ and PM_{2.5} using a base year of 2018 (the year in which comparisons between modelled and monitoring are made)²⁵.

Annual mean background concentrations of NO_x, NO₂, PM₁₀ and PM_{2.5} have been obtained from the Defra published background maps (2018 base year), based on the 1km grid squares which cover the modelled area. The Defra mapped background concentrations for the baseline year of 2019 and expected development opening year (2024) are presented in Table 4-8.

All of the mapped background concentrations presented are well below the respective annual mean AQALs.

²⁴ COVID-19 Supplementary Guidance, Local Air Quality Management Reporting in 2021. April 2021, version 1.0. DEFRA.

²⁵ Background mapping data for local authorities – <http://uk-air.defra.gov.uk/data/laqm-background-home>, accessed August 2021.

Table 4-8
Defra Background Pollutant Concentrations

Grid Square (X, Y)	Year	Annual Mean Background Concentration ($\mu\text{g}/\text{m}^3$)			
		NO _x	NO ₂	PM ₁₀	PM _{2.5}
385500, 404500	2019	22.2	16.0	13.2	8.7
	2024	17.7	13.1	12.5	8.2
386500, 404500	2019	23.0	16.6	13.5	8.9
	2024	18.4	13.6	12.8	8.4
AQAL		-	40	40	25

5.0 CONSTRUCTION PHASE

This section presents the potential air quality impacts and effects associated with the construction of the Proposed Development.

5.1 Construction Dust Assessment

Where figures relating to area of the site, volume of the site, approximate number of construction vehicles or distances to receptors are given, these relate to thresholds as defined in the IAQM guidance to guide the assessor to define the dust emissions magnitude and sensitivity of the area.

5.1.1 Assessment Screening

As shown in Figure 5-1, there are 'human receptors' within 350m of the Site but no designated habitat sites within 50m of the Site boundary or up to 200m of the Site entrance(s) / 50m of the roads anticipated to witness construction traffic movements. Therefore, an assessment of construction dust on human receptors only is required.

5.1.2 Potential Dust Emissions Magnitude

Demolition

The Site is currently brownfield land and does not contain any buildings or structures. As such, no further consideration of demolition impacts is required.

Earthworks

Site earthworks are required over an area between 2,500m² and 10,000m². However, due to the typical phased nature of the construction of residential schemes, the total Site area at any given time is not expected to be greater than 2,500m². In addition, it is believed that 5 – 10 heavy earth moving vehicles are considered to be required on Site at once. The dust emission magnitude for earthworks is therefore initially considered to be 'medium'.

Construction

Construction works are required for a building volume between 25,000m³ and 100,000m³. However, due to the typical phased nature of the construction of residential schemes, construction activities at the Site will total a building volume expected to be no greater than 50,000m³ at any given time. As such, the dust emission magnitude for construction is therefore initially considered to be 'medium'.

Trackout

Construction vehicles are expected to access the Site via the existing entrance, off the Chain Road to the north of the Site. No details are available at the time of assessment on the number of additional HDV movements associated with construction works in each phase, however, given the scale and nature of works required, it is considered unlikely that >50 HDV outward movements will occur in any worst-case day. In addition, due to the proposed construction of internal Site roads and the phased approach to construction, the unpaved road length is likely to be between 50m - 100m at any one time. The dust emission magnitude for trackout is therefore initially considered to be 'medium'.

Summary

A summary of the dust emission magnitude for the assessed activities is detailed in Table 5-1.

Table 5-1
Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Earthworks	Medium
Construction	Medium
Trackout	Medium

5.1.3 Sensitivity of the Area

Dust Soiling Impacts

There are considered to be between 10 – 100 residential units (high sensitivity) within 20m of the Site boundary. Furthermore, there are approximately 10 – 100 residential properties (high sensitivity) located less than 20m from sections of access roads (Chain Road) that are within 200m from the Site entrance - commensurate of a medium site²⁶.

The sensitivity of the area with respect to dust soiling effects on people and property in relation to earthworks, construction and trackout is therefore considered to be 'high'.

Human Health Impacts

The maximum 2019 mapped background PM₁₀ concentration (2018 base year) for the 1km² grid squares centred on the Proposed Development is estimated to be 13.5µg/m³ (i.e. falls into the <24µg/m³ class).

Given the above information regarding the number of residential receptors within 20m of the Site boundary and within 20m of Site access roads, the sensitivity of the area with respect to human health impacts in relation to earthworks, construction and trackout is therefore considered to be 'low'.

Summary

A summary of the sensitivity of the surrounding area is detailed in Table 5-2 whilst the spatial density of nearby receptors is provided in Figure 5-1.

Table 5-2
Sensitivity of the Area

Potential Impact	Sensitivity of Surrounding Area		
	Earthworks	Construction	Trackout
Dust Soiling Impacts	High	High	High
Human Health Impacts	Low	Low	Low

5.1.4 Risk of Impacts

The outcome of the assessment of the potential 'magnitude of dust emissions', and the 'sensitivity of the area' are combined in Table 5-3 below to determine the risk of impact which is used to inform the selection of appropriate mitigation.

²⁶ As per the IAQM's 'Guidance on the Assessment of Dust from Demolition and Construction', without site-specific mitigation, trackout may occur along the public highway up to 500m from large sites, 200m from medium sites and 50m from small sites (determined by the calculated trackout dust emission magnitude), as measured from the site exit.

Table 5-3
Risk of Dust Impacts

Potential Impact	Earthworks	Construction	Trackout
Dust Soiling Impacts	Medium Risk	Medium Risk	Low Risk
Human Health Impacts	Low Risk	Low Risk	Low Risk

Following the construction dust assessment, the Site is found to be at worse 'Medium Risk' in relation to dust soiling effects on people and property and 'Low Risk' in relation to human health impacts (Table 5-3). However, potential dust effects during the construction phase are considered to be temporary in nature and may only arise at particular times (i.e. certain activities and/or meteorological conditions).

Nonetheless, commensurate with the above designation of dust risk, mitigation measures, as identified by IAQM guidance are required to ensure that any potential impacts arising from the construction phase of the Proposed Development are reduced and, where possible, completely removed. In accordance with IAQM guidance, providing effective mitigation measures are implemented, such as those outlined in Section 8.1, construction dust effects are considered to be 'not significant'.



Figure 5-1
Construction Dust Assessment Buffers

6.0 ASSESSMENT OF EFFECTS AND SIGNIFICANCE: SITE SUITABILITY ASSESSMENT

This section presents the potential air quality impacts associated with traffic associated with the operational phase of the Proposed Development.

6.1 Modelling Outputs

Paragraph 7.519 of LAQM.TG(16) states that: 'The model used should have some form of published validation assessment available and/or should be recognised as being fit for purpose by the regulatory authorities'. An adjustment factor has been calculated for the assessment scenarios in line with this guidance. Reference should be made to Appendix A for the details of the verification process.

6.2 Site Suitability Assessment

6.2.1 Nitrogen Dioxide Annual Mean Modelling Results

Predicted annual mean NO₂ concentrations were assessed against the AQO of 40µg/m³, based upon the proposed site suitability receptor locations detailed in Table 3-1.

Results of the dispersion modelling illustrates that there are no predicted exceedences of the annual mean NO₂ AQAL at any locations across the Proposed Development in the 2024 opening year. The predicted annual mean NO₂ concentrations are presented in Table 6-1.

It is noted that all considered receptors and presented concentrations are situated at ground floor. The Proposed Development contains some apartment blocks, up to 3-storeys in height. However, it is considered that ground floor concentrations are worst-case in respect of their position relative to the surrounding road network, and pollutant concentrations predicted at 1st floor and upwards would likely be lower than those presented.

Table 6-1
Modelled NO₂ Concentration

ID	2024 DS NO ₂ Annual Mean Concentration (µg/m ³)	Percentage of Annual Mean AQAL (%)
NR1	31.5	78.8
NR2	31.5	78.8
NR3	32.2	80.5
NR4	32.2	80.5
NR5	32.3	80.8
NR6	32.2	80.5
NR7	33.3	83.3
NR8	29.0	72.5
NR9	27.4	68.5
NR10	26.4	66.0
NR11	24.5	61.3
NR12	24.0	60.0
NR13	23.6	59.0
NR14	23.4	58.5

ID	2024 DS NO ₂ Annual Mean Concentration (µg/m ³)	Percentage of Annual Mean AQAL (%)
NR15	23.1	57.8
NR16	22.9	57.3
NR17	22.9	57.3
NR18	22.7	56.8

6.2.2 Nitrogen Dioxide 1-hour Mean Modelling Results

The maximum annual mean NO₂ 'do-something' concentration is 33.3µg/m³ (predicted at NR7). Therefore, predicted concentrations are well below the 60µg/m³ indicative criteria and, in accordance with DEFRA guidance, exceedences of the 1-hour mean NO₂ AQAL are considered unlikely across the Site.

6.2.3 Particulate Matter (PM₁₀) Annual Mean Modelling Results

Results of the dispersion modelling illustrates that there are no predicted exceedences of the annual mean PM₁₀ AQAL at any of the receptors across the Proposed Development.

A summary of the predicted annual mean PM₁₀ concentrations at receptor locations across the Proposed Development is presented in Table 6-2.

Table 6-2
Modelled PM₁₀ Concentration

ID	2024 DS PM ₁₀ Annual Mean Concentration (µg/m ³)	Percentage of Annual Mean PM ₁₀ AQO (%)
NR1	17.4	43.5
NR2	17.5	43.8
NR3	17.7	44.3
NR4	17.7	44.3
NR5	17.8	44.5
NR6	17.9	44.8
NR7	18.6	46.5
NR8	16.7	41.8
NR9	16.3	40.8
NR10	16.0	40.0
NR11	15.2	38.0
NR12	15.1	37.8
NR13	15.0	37.5
NR14	14.9	37.3
NR15	14.8	37.0

ID	2024 DS PM ₁₀ Annual Mean Concentration (µg/m ³)	Percentage of Annual Mean PM ₁₀ AQO (%)
NR16	14.7	36.8
NR17	14.7	36.8
NR18	14.7	36.8

6.2.4 Particulate Matter 24-hour Mean Modelling Results

Based upon the maximum predicted annual mean PM₁₀ concentration of 18.6µg/m³ (predicted at NR7), this equates to 2 days where 24-hour mean PM₁₀ concentrations are greater than 50µg/m³. Therefore, the number of maximum exceedences is in compliance with the 24-hour mean AQAL.

6.2.5 Particulate Matter (PM_{2.5}) Annual Mean Modelling Results

Results of the dispersion modelling illustrates that there are no predicted exceedences of the annual mean PM_{2.5} AQAL at any of the receptors across the Proposed Development.

A summary of the predicted annual mean PM_{2.5} concentrations at receptor locations across the Proposed Development is presented in Table 6-3.

Table 6-3
Modelled PM_{2.5} Concentration

ID	2024 DS PM _{2.5} Annual Mean Concentration (µg/m ³)	Percentage of Annual Mean PM _{2.5} AQO (%)
NR1	11.0	44.0
NR2	11.0	44.0
NR3	11.2	44.8
NR4	11.2	44.8
NR5	11.2	44.8
NR6	11.2	44.8
NR7	11.7	46.8
NR8	10.6	42.4
NR9	10.4	41.6
NR10	10.2	40.8
NR11	9.77	39.2
NR12	9.69	38.8
NR13	9.62	38.4
NR14	9.58	38.4
NR15	9.54	38.0

ID	2024 DS PM _{2.5} Annual Mean Concentration (µg/m ³)	Percentage of Annual Mean PM _{2.5} AQO (%)
NR16	9.51	38.0
NR17	9.50	38.0
NR18	9.48	38.0

6.2.6 Significance of Air Quality Impacts

Consistent with EPUK & IAQM guidance, given that the maximum predicted concentrations at all receptors are below the relevant AQALs, effect can be considered 'not significant'.

7.0 OPERATIONAL PHASE SCREENING ASSESSMENT

This section presents the potential air quality effects associated with the operational phase of the Proposed Development.

7.1 Trip Generation

Traffic data used for the purposes of the screening assessment was provided by Eddisons - the appointed transport consultant.

Based upon the proposed 32 dwellings, this indicated a total 24-hour AADT trip generation of 120 AADT (rounded). This value represents the maximum developmental generated AADT flows, which will disperse onto the surrounding highway network.

The distribution of these trips on the local road network is detailed in Table 7-1. All trips are predicted to be LDVs.

Table 7-1
Trip Generation and Distribution

Link Name	Distributed Trips (AADT)	% of Total Trips
Chain Road	120	100
Victoria Avenue (Eastbound)	49	38
Victoria Avenue (Westbound)	74	62

7.2 Screening Assessment – Consideration of Potential Impacts

The Proposed Development is located 200m south of the GMCA AQMA. Chain Road itself is not located within the extent of the declared AQMA. In accordance with the EPUK & IAQM Guidance, developments not located within or adjacent to an AQMA require consideration of potential air quality impacts where additional development trips are in excess of 500 AADT as LDV trips or 100 AADT as HDV trips.

Based upon the trip details and distribution outlined above, the maximum number of predicted development trips (as 24-hour AADT) are below the relevant criterion. Therefore, in accordance with the EPUK & IAQM Guidance, the *'impacts [on air quality from operational phase trips] can be considered as having an insignificant effect'*.

It is also noted that once trips have been distributed onto the local road network, they are below the EPUK & IAQM criteria for developments located within an AQMA (where development trips are in excess of 100 AADT as LDV trips or 25 AADT at HDV trips) and therefore impacts within the GMCA AQMA are also considered to have an 'insignificant effect'.

8.0 MITIGATION MEASURES

This section presents any mitigation measures required during the construction and operational phases of the development in order to reduce the potential impact of the predicted effect.

8.1 Construction Phase

As discussed in Section 5.1, construction impacts associated to the Proposed Development would result in the generation of dust and PM₁₀.

The IAQM guidance outlines a number of site-specific mitigation measures based on the assessed site risk. The measures are grouped into those which are highly recommended and those which are desirable. With the effective application of the dust mitigation measures, as detailed in Table 8-1, residual effects are considered to be 'not significant'.

Table 8-1
Construction Dust Mitigation Measures

Site Application	Construction Dust Mitigation Measures
Highly Recommended	
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
	Display the head or regional office contact information.
	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site.
Construction	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Monitoring	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
	Agree dust deposition, dust flux, or real-time PM ₁₀ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
	Ensure all vehicles switch off engines when stationary - no idling vehicles.
	Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.

Site Application	Construction Dust Mitigation Measures
Operating Vehicle/Machinery and Sustainable Travel	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
	Use enclosed chutes and conveyors and covered skips.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
	Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Preparing and Maintaining the Site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
	Avoid site runoff of water or mud.
	Keep site fencing, barriers and scaffolding clean using wet methods.
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
	Cover, seed or fence stockpiles to prevent wind whipping.
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.
	Make the complaints log available to the local authority when asked.
	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 logbook.
	Hold regular liaison meetings with other high-risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport deliveries which might be using the same strategic road network routes.
Waste Management	Avoid bonfires and burning of waste materials.
Desirable	
Construction	Avoid scabbling (roughening of concrete surfaces) if possible.
	Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.

Site Application	Construction Dust Mitigation Measures
	For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
	Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable
	Only remove the cover in small areas during work and not all at once.
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of site boundary, with cleaning to be provided if necessary.
	With respect to operating vehicle/machinery and sustainable travel:
	Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
	Record all inspections of haul routes and any subsequent action in a site logbook.
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

8.2 Operational Phase Road Traffic Emissions

An assessment of vehicle emissions associated with the operation of the scheme predicted no exceedences of the annual mean NO₂, PM₁₀ or PM_{2.5} AQALs at any site suitability receptor location. Therefore, no air quality input to a ventilation strategy is required, and site-suitability effects predicted to be 'not significant'.

Additionally, trips generated by the proposals have been screened utilising the relevant EPUK & IAQM guidance. Therefore, an overall 'insignificant' effect on air quality is predicted.

Notwithstanding, it is noted that the Greater Manchester Low-Emissions Strategy and AQAP does recommend Electric Vehicle (EV) charging points as best practice for all new developments, with a charging point recommend for each dwelling.

9.0 CONCLUSIONS

SLR Consulting Ltd has been commissioned by Great Places Housing Company, to undertake an air quality assessment to support the planning application for a proposed residential development comprising up to 32 dwellings, on land off Chain Road, Manchester.

9.1 Construction Phase

A qualitative assessment of the potential dust impacts during the construction of the Proposed Development has been undertaken following IAQM guidance.

Following the construction dust assessment, the Site is found to have at worst 'Medium Risk' in relation to dust soiling effects on people and property, and at worst 'Low Risk' in relation to human health impacts. Providing effective mitigation measures are implemented, such as those outlined in Section 7.1 of this report, residual impacts from dust emissions during the construction phase are deemed to be 'not significant'.

9.2 Operational Phase

A site suitability assessment has been undertaken to assess the suitability of the site for the proposed end use (i.e. residential dwellings). Annual mean NO₂, PM₁₀ and PM_{2.5} concentrations resulting from road-traffic emissions were quantified at locations of proposed relevant exposure using the ADMS Road v5.0.0.1 dispersion model. Site-suitability modelling indicates no exceedences of the NO₂, PM₁₀ and PM_{2.5} annual mean AQALs at locations of appropriate exposure corresponding to proposed residential dwellings. As such, baseline NO₂, PM₁₀ and PM_{2.5} concentrations resulting from road-traffic emissions are not considered to represent a development constraint, and no embedded mitigation (i.e. air quality input to a ventilation strategy) is required into the scheme design. Site-suitability effects predicted to be 'not significant'.

The results of the operational phase screening assessment indicate that additional vehicle movements associated with the Proposed Development are not in excess of the EPUK & IAQM criterion for further assessment. Therefore, the potential air quality impact of additional vehicle movements can be considered to result in an 'insignificant' effect.

As such, it is not considered that air quality represents a material constraint to the development proposals, which conform to the principles of national and local policies

APPENDIX A – Advanced Model Input and Verification

Advanced Model Input Summary

Advanced modelling input parameters used (not previously disclosed) are summarised in Table A-1.

Table A-1
Advanced Modelling Inputs

Parameter	Description	Input Variable
Surface Roughness	Surface roughness of the modelling domain as a function of land use	A roughness length z_0 of 0.5m was used to represent the surface roughness of the principal study area. This value relates to 'parkland, open suburbia' and is reflective of the principal study area. In addition, a roughness length z_0 of 0.02m was used to represent the surface roughness of the meteorological site. This value relates to 'open grassland', reflective of the open green space setting of the Manchester Airport meteorological station.
Road Type	Road type within the EFT emission database	England (urban) England (motorway)

Traffic Data

Table A-2 details the traffic data used within the assessment.

No traffic counts were undertaken by Eddisons, the transport consultants for the applicant, as part of the planning application for the Chain Road scheme. Therefore, the 2019 traffic flow data was sourced from Department for Transport (DfT)²⁷. Traffic data was obtained from the DfT for the following count points based upon 2019 traffic surveys:

- M60 east of Junction 20 – count point ID: 74590;
- M60 west of Junction 20 – count point 99615;
- A664 Manchester New Road – count point 99616;
- A6104 Victoria Avenue – count point 37859;
- A6104 Victoria Avenue East – count point 17717; and
- A664 Rochdale Road – count point 47456;

No traffic data was available for Chain Road. Therefore, the transport consultants recommended that the DfT count point located at White Moss Road (count point – 808548) was utilised in lieu of any other traffic data. This count point is considered to be worst-case due to the fact that it is a bus route, which is not the case along Chain Road.

A TEMPRO factor of 1.1032, was provided by the transport consultants to growth the 2019 base traffic data to the proposed 2024 opening year.

Development trips were split east and west of Chain Road, in line with the trip distribution information provided by Eddisons. This is with the exception of Chain Road and the M60, where all 120 AADT trips were included as a worst-case.

²⁷ <http://www.dft.gov.uk/matrix/>, accessed August 2021.

Table A-2
Traffic Data Used Within the Assessment

ID	Link	2024 DS		Speed (kph) ^(A)	
		AADT	% HDV	HDV	LDV
L1 / L14	M60 east of Junction 20 (eastbound)	51,499	6.14	80	112
L2 / L15	M60 east of Junction 20 (westbound)	54,819	5.96	80	112
L3	M60 west of Junction 20 (eastbound)	56,717	6.30	80	112
L4	M60 west of Junction 20 (westbound)	57,982	6.07	80	112
L5	A664 Manchester New Road	31,137	3.93	48	48
L6	A664 Rochdale Road	20,080	4.95	48	48
L7 / L12	A6104 Victoria Avenue East	14,688	3.36	48	48
L8	A6104 Victoria Avenue	13,077	3.13	48/32	48/32
L9	Chain Road	2,242	2.94	48	48

Notes:

(A) Where required, junctions have been modelled following LAQM.TG(16) guidance.

Model Verification

The ADMS-Roads dispersion model has been widely validated for this type of assessment and is specifically listed in the DEFRA's LAQM.TG(16) guidance as an accepted dispersion model.

Model validation undertaken by the software developer (CERC) will not have included validation in the vicinity of the Site. It is therefore necessary to perform a comparison of modelled results with local monitoring data at relevant locations. This process of verification attempts to minimise modelling uncertainty and systematic error by correcting modelled results by an adjustment factor to gain greater confidence in the final results.

Prior to undertaking model verification, model setup parameters and input data were reviewed to maximise the performance of the dispersion model in relation to the real-world conditions.

Baseline air quality monitoring data presented in Section 4.1, and specifically Table 4-6 and Table 4-7, indicates there are two NO₂ diffusion tube monitoring locations in proximity to the Site. However, monitoring location 'RO5ANO' is positioned adjacent to the M60 carriageway and positioned such to monitor concentrations at relevant exposure adjacent to the M60. The Site is located >200m from the M60 carriageway and, therefore, the road traffic emission profile and dispersion characteristics at the Site will differ greatly from the M60 and those concentrations monitored at the RO5ANO. Therefore, the RO5ANO diffusion tube has been discounted from the verification study.

Following the recommendations of the IAQM Position Statement 'Use of 2020 and 2021 Monitoring Datasets' (August 2021, version 1.0) model verification has been completed based upon on 2019 monitoring data as the 'last typical year'. This aligns with the recommendation made within Defra guidance²⁴, which states:

"An option would be to exclude the use of 2020 as a verification year, certainly until such time as it becomes clearer what the longer-term impacts of COVID-19 are / have been. The use of 2019 as a verification year would be recommended under such a direction, as the most recent year available without the effects of the pandemic."

Traffic Data

Table A-3 details the traffic data used within the model verification.

The 2019 verification traffic flow data was also sourced from DfT²⁸ for the following count points based upon 2019 traffic surveys:

- Oldham Road – count point ID: 73888.

Table A-3
Traffic Data Used Within the 2019 Verification

ID	Link	2019		Speed (kph) ^(A)
		AADT	% HDV	
V1	Oldham Road	9,872	3.19	48 / 32
Notes: (A) Where required, junctions have been modelled at a 20kmph speed.				

NO_x / NO₂ Verification

The model output of road-NO_x (i.e. the component of total NO_x coming from road traffic exhaust emissions) has been compared with the 'measured' road-NO_x.

For this calculation, the following assessment inputs were used, which are considered to be representative of the development locale:

- DEFRA's NO_x to NO₂ calculator version 8.1;
- 'Rochdale' was selected as the 'Local Authority';
- 2019 NO₂ monitoring location RO25ANO from the GMCA monitoring network; and
- 2019 DEFRA mapped background concentrations (2018 base year) for the grid square containing the above diffusion tube.

Prior to undertaking model verification, model setup parameters and input data were reviewed to maximise the performance of the dispersion model in relation to the real-world conditions.

Calculated (monitored) NO_x data versus modelled NO_x data is shown in Table A-4 below with the derived adjustment factor based on a linear regression forced through zero.

Table A-4
Verification Data 2019, Final Comparison

Monitoring Location	Modelled NO _x Road Contribution (µg/m ³)	Calculated NO _x Road Contribution (µg/m ³)	Adjusted Modelled NO _x Road Contribution (µg/m ³)	Monitored NO ₂ Concentration (µg/m ³)
RO25ANO	8.0	35.0	59.0	34.7
		<i>m</i> -regression factor	4.353	

Refinements have been made to the model performance without "*providing unreasonable data inputs in order to reduce model adjustment factors is not an acceptable approach*" – as stated within LAQM.TG(09), which despite its status (i.e. superseded) the above extract is still considered to be relevant.

²⁸ <http://www.dft.gov.uk/matrix/>, accessed August 2021.

In accordance with LAQM.TG(16), the ratio of 'Calculated (Monitored) Road NO_x Contribution' to 'Modelled NO_x Road Contribution' has been calculated and reviewed. The calculated ratio is a 1:4.353.

PM₁₀ / PM_{2.5} Verification

Given the absence of PM₁₀ and PM_{2.5} monitoring in the development locale, modelled PM₁₀ and PM_{2.5} concentrations have been verified in accordance with the above methodology i.e. as consistent with NO_x, using a factor of 4.353 following the recommendations within LAQM.TG(16).

APPENDIX B – Sensitivity Assessment: Results

In consideration of the potential uncertainty in predictions of future year pollutants, as well as the current national and local sensitivities seen in response to elevated roadside NO₂ concentrations, an additional scenario has been assessed which considers:

- 2019 NO_x / NO₂, background concentrations (2018 reference year); and
- 2019 NO_x emission factors obtained from EFT v10.1.

Use of these variables therefore assumes that there is no improvement in either emission factors and / or background concentrations within Manchester for future years, relative to 2019. These modelled scenarios are likely to represent an overly conservative approach as, despite uncertainty in quantification, it is generally accepted that variables such as background concentrations and/or vehicle emission factors will improve to some degree in future years, with local monitoring trends somewhat supporting this.

The results of this sensitivity assessment with respect to annual mean NO₂ concentrations are presented in Table B-1, Table B-2 and Table B-3 below. Any exceedences are displayed in bold text.

Table B-1
2019 Modelled Annual Mean NO₂ Concentrations: Assessment Sensitivity

ID	2019 DS NO ₂ Annual Mean Concentration (µg/m ³)	Percentage of Annual Mean AQAL (%)
NR1	45.6	114.0
NR2	45.7	114.3
NR3	46.8	117.0
NR4	46.7	116.8
NR5	46.9	117.3
NR6	46.6	116.5
NR7	48.2	120.5
NR8	41.8	104.5
NR9	39.1	97.8
NR10	37.6	94.0
NR11	34.8	87.0
NR12	34.0	85.0
NR13	33.4	83.5
NR14	33.0	82.5
NR15	32.6	81.5
NR16	32.3	80.8
NR17	32.2	80.5
NR18	32.0	80.0

Table B-2
2019 Modelled Annual Mean PM₁₀ Concentrations: Assessment Sensitivity

ID	2019 PM ₁₀ Annual Mean Concentration (µg/m ³)	Percentage of Annual Mean AQAL (%)
NR1	18.4	46.0
NR2	18.4	46.0
NR3	18.7	46.8
NR4	18.7	46.8
NR5	18.8	47.0
NR6	18.8	47.0
NR7	19.6	49.0
NR8	17.6	44.0
NR9	17.2	43.0
NR10	16.9	42.3
NR11	16.1	40.3
NR12	15.9	39.8
NR13	15.8	39.5
NR14	15.7	39.3
NR15	15.6	39.0
NR16	15.6	39.0
NR17	15.6	39.0
NR18	15.5	38.8

Table B-3
2019 Modelled Annual Mean PM_{2.5} Concentrations: Assessment Sensitivity

ID	2019 PM _{2.5} Annual Mean Concentration (µg/m ³)	Percentage of Annual Mean AQAL (%)
NR1	11.8	47.2
NR2	11.8	47.2
NR3	12.0	48.0
NR4	12.0	48.0
NR5	12.0	48.0
NR6	12.1	48.4
NR7	12.5	50.0
NR8	11.3	45.2
NR9	11.1	44.4
NR10	10.9	43.6
NR11	10.4	41.6
NR12	10.4	41.6

ID	2019 PM _{2.5} Annual Mean Concentration (µg/m ³)	Percentage of Annual Mean AQAL (%)
NR13	10.3	41.2
NR14	10.2	40.8
NR15	10.2	40.8
NR16	10.1	40.4
NR17	10.1	40.4
NR18	10.1	40.4

Analysis of Assessment Sensitivities

Sensitivity modelling has been undertaken which utilises 2019 emission factors (EFT v10.1) and 2019 mapped background concentrations the DEFRA mapping study. This scenario predicts a number of exceedences of the annual mean NO₂ AQAL.

It is noted that this precautionary assessment assumes that road traffic emission factors and background concentrations in the 2024 development opening year will remain at the 2019 base year level. Furthermore, the precautionary assessment assumes that road traffic flows predicted in the 2024 development opening year will occur in 2019.

DEFRA projections and the basis for future year road traffic emission factor reductions embedded within the EFT v10.1 are based upon a number of assumptions, including the following:

- Updated basic fleet assumptions for 2017-2030 in line with DfT, NAEI and TfL projections; and
- Updated Euro class compositions for 2017-2030 in line with DfT, NAEI, and TfL data (inclusive of Euro 6 subcategories).

These assumptions and forecasts are in accordance with the release of new car sales data, which represents a stronger empirical dataset than previous forecasts.

It is considered that the 2019 modelling predictions presented within this sensitivity assessment are worst-case reflections to provide confidence in the modelling predictions, and do not reflect likely impacts from additional development trips in the development opening year. Actual impacts in the development opening year are likely to be lower than those predicted given the projected road traffic exhaust emission factor improvements, as indicated by the impact assessment scenario and modelled concentrations in the main body of the reporting text.

DEFRA mapped background concentrations (2018-base) and their future year projections are based on a number of assumptions which include the following:

- all assumptions underlying the latest (2018) NO_x emission projections for road transport, as detailed above;
- updated road transport forecasts for Great Britain from the DfT;
- updated assumptions on diesel car penetration rates provided by the DfT; and
- updated vehicle sales projections for cars and Light Goods Vehicles (LGV) based on information provided by the DfT.

In relation to trends in air pollutant concentrations within MCC's area, including those of NO₂, a review of the GMCA 2020 Air Quality Annual Status Report (the most recent Air Quality Annual Status Report made available by MCC) highlights a general decline in annual mean concentrations at the majority of the considered locations between 2015 – 2019. The GMCA 2020 ASR states:

“Long term trends show that there has been an improvement in air quality, but areas still remain above the annual mean air quality objective for Nitrogen Dioxide (NO₂).”

On this basis, the precautionary approach of using 2019 mapped background concentrations and verifying the assessment based upon 2019 monitoring data (with all future year scenarios built around this data) to reflect the 2024 development opening year is considered likely to overestimate background concentrations in 2024.

Furthermore, as discussed in Section 2.1.2, MCC and the GMCA are legally required to achieve NO₂ concentration reduction and compliance with the EU limit value within the shortest possible time, and by 2024 at the latest. This 2024 year aligns with the opening year for the Proposed Development. Whilst the Proposed Development does generate a small number of operational phase trips, the impact of these trips has been screened out from further assessment (in reference to the EPUK & IAQM 'indicative criterion for assessment') and concluded to result in an 'insignificant' effect on air quality. On this basis, it is considered that existing baseline air quality / road traffic emissions represents the overriding cause of predicted exceedences in the 2024 assessment sensitivity scenario presented within Appendix B. Therefore, as MCC and the GMCA are legally required to achieve compliance with the annual mean NO₂ EU limit value by the time the Proposed Development opens, these exceedences would not occur as they would contravene the legal mandate from the Secretary of State.

EUROPEAN OFFICES

United Kingdom

AYLESBURY

T: +44 (0)1844 337380

BELFAST

belfast@slrconsulting.com

BRADFORD-ON-AVON

T: +44 (0)1225 309400

BRISTOL

T: +44 (0)117 906 4280

CARDIFF

T: +44 (0)29 2049 1010

CHELMSFORD

T: +44 (0)1245 392170

EDINBURGH

T: +44 (0)131 335 6830

EXETER

T: + 44 (0)1392 490152

GLASGOW

T: +44 (0)141 353 5037

GUILDFORD

T: +44 (0)1483 889800

LONDON

T: +44 (0)203 805 6418

MAIDSTONE

T: +44 (0)1622 609242

MANCHESTER (Denton)

MANCHESTER (Media City)

T: +44 (0)161 872 7564

NEWCASTLE UPON TYNE

T: +44 (0)191 261 1966

NOTTINGHAM

T: +44 (0)115 964 7280

SHEFFIELD

T: +44 (0)114 2455153

SHREWSBURY

T: +44 (0)1743 23 9250

STIRLING

T: +44 (0)1786 239900

WORCESTER

T: +44 (0)1905 751310

Ireland

DUBLIN

T: + 353 (0)1 296 4667

France

GRENOBLE

T: +33 (0)6 23 37 14 14