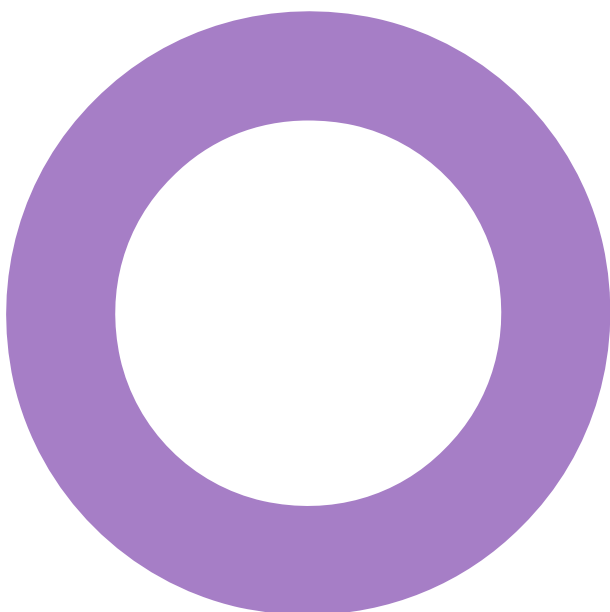


**Mobility Hub.
Manchester.**
**Manchester Life Strategic
Development Company
Limited.**

AIR QUALITY

AIR QUALITY ASSESSMENT – FINAL ISSUE

REVISION 04 – 27 MAY 2021



Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
00	28/04/2021	First Draft – For Client Comment	BP	AD	KW
01	30/04/2021	Second Draft	BP	AD	KW
02	10/05/2021	First Issue – Updated with Client Comments	BP/AD	KW	KW
03	11/05/2021	Second Issue – Updated with Client Comments	BP	KW	KW
04	27/05/2021	Final issue	AD	KW	KW

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Project number: 10/12895

Document reference: 20210527_Air Quality Report-Mobility Hub Manchester-Rev04.docx

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Executive Summary.

Hoare Lea have been commissioned by Manchester Life Strategic Development Company Limited (the Applicant) to undertake an air quality assessment to support the planning application of the proposed Ancoats Mobility Hub at land off Poland Street, Ancoats, Manchester (the 'Application Site').

The proposals comprise of the development of land bound by Poland Street to deliver a Mobility Hub of up to eight storeys including 150 cycle parking spaces, 408 car parking spaces, ground floor retail and a delivery hub. As the proposals include commercial uses, the 1-hour mean air quality objective (AQO) for nitrogen dioxide (NO₂) applies. Mobility Hubs are referenced within the City Centre Transport Strategy as enablers of more sustainable neighbourhood mobility and parking choices. The Ancoats Mobility Hub is the first Mobility Hub proposed within Manchester and Greater Manchester and is specifically highlighted within the CCTS as an opportunity to meet parking requirements for the residential and commercial developments within Ancoats whilst supporting a modal shift away from petrol / diesel car ownership.

The baseline assessment shows the Application Site is approximately 40 m south of the Greater Manchester Combined Authority (GMCA) Air Quality Management Area (AQMA) declared for exceedances of the annual mean NO₂ AQO. Annual mean NO₂ concentrations have been in exceedance of the annual mean NO₂ AQO at the nearest monitoring locations to the Application Site, approximately 580m south along the A665 Great Ancoats Street. However, Defra predicted background concentrations at the Application Site are below the relevant AQO in the earliest anticipated opening year of the Proposed Development.

The impacts of construction work on dust soiling and ambient fine particulate matter concentrations have been assessed. This assessment has identified that there is a medium risk of dust soiling impacts and a medium risk of increases in particulate matter concentrations for activities during the construction phase. The risk of dust causing a loss of local amenity and increased exposure to fine particulate matter concentrations has been used to identify appropriate mitigation measures. Provided these mitigation measures are implemented through good practice, the residual impacts are considered to be not significant.

The potential impacts as a result of the additional vehicle trips associated with the Proposed Development on existing receptors has been assessed using detailed dispersion modelling. The results of the detailed dispersion modelling show the impact at existing receptors range from 'moderate adverse' to 'negligible' in accordance with the EPUK and IAQM planning guidance.

Moderate adverse impacts are predicted in a worst-case vehicle routing scenario only. When using a more realistic trip distribution, the impacts range from 'slight adverse' to 'negligible adverse'. Based on this, mitigation measures are not required to offset the adverse impacts from the operational phase of the Proposed Development in relation to annual mean NO₂ concentrations.

Mitigation measures that will be incorporated into the scheme include Electric Vehicle (EV) active charging provision for 25% of spaces with passive EV charging infrastructure installed for all remaining spaces, allowing the scheme to meet the demand of uptake of EVs in the future with the potential for 100% where demand requires. Network capacity has been secured for 100% EV charging in the future. In addition, 30 car parking spaces will be allocated to the car club and ride share.

As detailed within the Environment Standards and Energy Statement prepared by Burohappold, the energy strategy for the Proposed Development is for an all-electric approach incorporating electric panel heaters for space heating and electric immersion heaters for domestic hot water with no combustion systems and as such zero on-site emissions. Consequently, there will be no impact to local air quality, a detailed assessment of the proposed energy systems has been screened out and no mitigation is required.

The site suitability assessment indicates no likely exceedances of the 1-hour mean AQO for NO₂, at the Application Site. As such, the Application Site is considered suitable for the Proposed Development without the inclusion of mitigation measures.

Provided appropriate mitigation measures are implemented, it is considered that air quality should not be viewed as a constraint to planning and the Proposed Development conforms to the principles of the National Planning Policy Framework and the MCC Local Plan.

1. Introduction.

Hoare Lea have been commissioned by Manchester Life Strategic Development Company Limited to undertake an Air Quality Assessment to support the planning application for the proposed Ancoats Mobility Hub at land bound by Poland Street, Ancoats, Manchester (hereafter referred to as the 'Application Site').

1.1 Proposed Development.

The Proposed Development will comprise of the development of the existing Application Site to deliver a Mobility Hub of up to eight-storeys including 150 cycle parking spaces, 408 car parking spaces, ground floor retail and a delivery hub. The Application Site is currently occupied by low-rise multi-tenanted Poland Street Industrial Estate units and hard standing areas. Access to the Application Site is currently via Poland Street. Proposed Development Plans are provided in Appendix 1.

The Mobility Hub will provide parking for other nearby future development within the Ancoats area as part of the Poland Street Neighbourhood Development Framework (NDF) Zone, which is part of Ancoats. Timescales for completion of these developments vary over the next decade. As such, the usage of the Mobility Hub is expected to evolve over time, initially providing parking for commuters and visitors. Over time, as the Poland Street NDF Zone developments are completed increasing the residential parking provision within the Mobility Hub the usage is expected to change away from commuters in responses to increased residential parking provision.

The Mobility Hub will provide active EV charging on Day 1 for 25% of the parking spaces. Network capacity has been secured and passive EV charging infrastructure will be available to 100% of the spaces which will be upgraded to increase active charging spaces as demand increases over time, allowing for all spaces to become an EV charging space.

The Proposed Developments overall aim is to reduce the number of vehicles throughout the Poland Street NDF Zone and wider Ancoats area as opposed to individual plots having separate on-site parking provision. The Mobility Hub is located towards the edge of Ancoats which is expected to reduce vehicles routing through the area, enabling the creation of improved public realm. Additionally, the Delivery Hub will prevent parcel deliveries being distributed in an uncoordinated manner throughout the Poland Street NDF Zone and will provide a single destination for deliveries. The provision of the Mobility Hub will aim to provide a betterment in terms of traffic in the Poland Street NDF Zone which has the potential to lead to improvements in local air quality.

As the Proposed Development is mainly for a car park, there will be limited heating demand. It is anticipated that the heating for the ground floor commercial units will be provided by an 'all-electric' approach. Should catering facilities be added at a later date, these units will be provided with electric cooking appliances. There will be no on-site combustion plant and therefore zero combustion emissions. Consequently, there will be no impact to local air quality from the energy plant and an assessment has been screened out.

1.2 Application Site Description and Location.

The Application Site is located within Manchester City Councils (MCC) administrative area at approximate National Grid Reference (NGR) X 385170, Y 398879.

The Application Site is bound by Poland Street to the west, Ancoats Green to the east, Crown Industrial Estate to the north and City Court Trading Estate to the south. Modern industrial units lie to the north and west of the Application Site with the residential neighbourhood of Miles Platting further to the east. Figure 1 shows the location of the Application Site within the wider context of Ancoats.

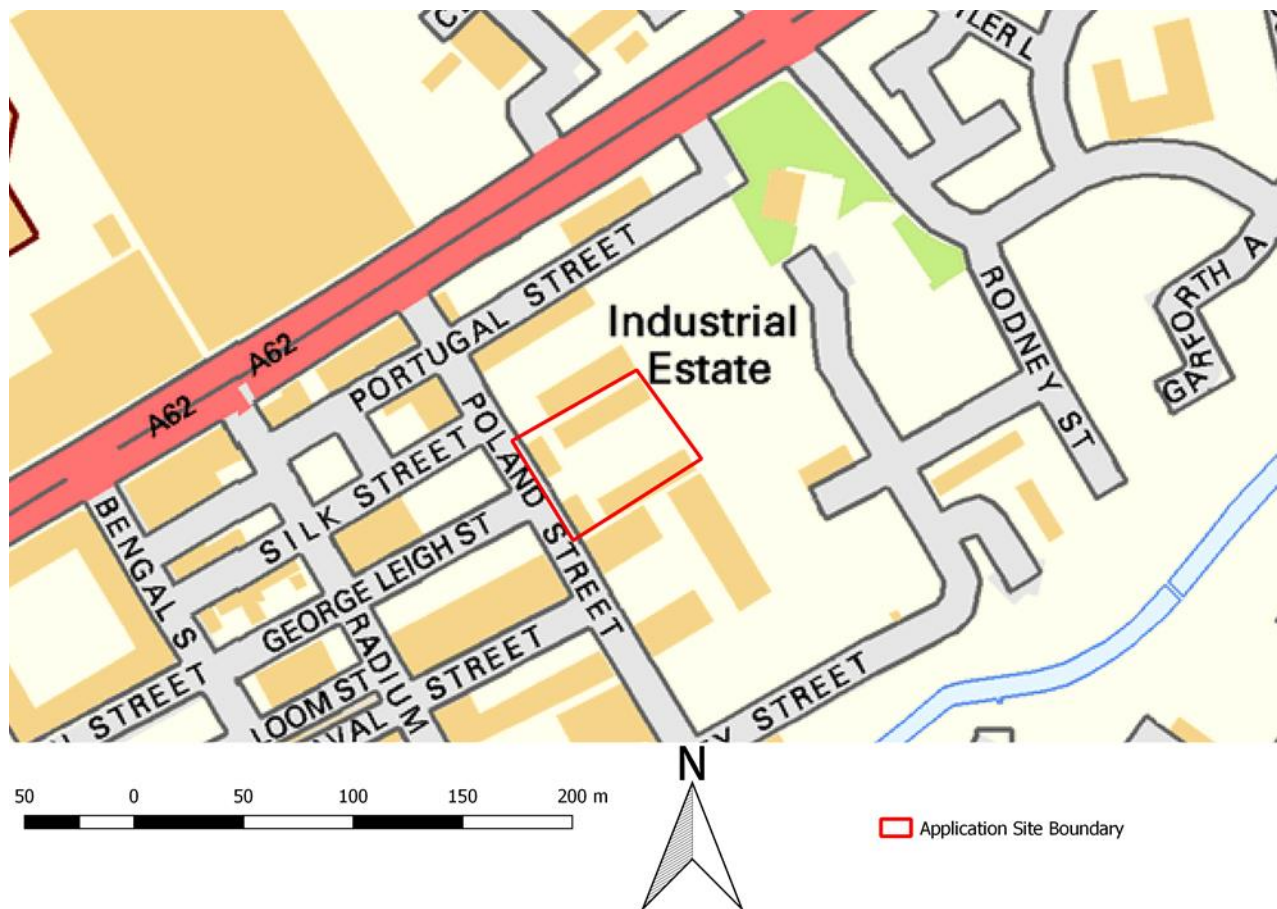


Figure 1 Location of the Application Site. Contains OS Data Crown Copyright and Database Rights 2021.

1.3 Scope of Assessment.

An email detailing the proposed methodology for the Air Quality Assessment (AQA) was provided to MCC on the 9th April 2021.

A summary of the scope of the assessment includes:

- Determination of baseline scenario, using MCC monitoring data;
- Assessment of potential air quality impacts during the construction phase;
- An assessment of the suitability of the Application Site for the proposed use
- Assessment of potential air quality impacts during the operational phase; and
- Identification of required mitigation measures.

A response was received on the 16th April 2021 from the Environmental Protection Section at MCC advising the scope of assessment had been passed onto Air Quality Lead at MCC. Following this a response was received from MCC agreeing with the scope of assessment as well as providing some further considerations which are summarised as follows:

- Consideration of other committed development in the area, especially in relation to the construction phase
- Consideration of the nearest residential receptors at 6 Poland Street and those using Ancoats Green
- Consideration of PM10 and PM2.5 within the assessment
- Consideration of the emissions from LGVs using the Delivery Hub in addition to vehicles using the car park.

The above points have been considered and included as part of the scope of assessment. A copy of the correspondence with MCC has been included in Appendix 2.

Hoare Lea provided a response to MCC on the 4th May 2021 on the above points. A response from the Environmental Protection Section at MCC was received on the 10th May 2021 agreeing with the responses provided. A copy of the full correspondence with MCC has been included in Appendix 2.

2. Legislation, Policy and Guidance Documents.

2.1 Air Quality Strategy and Local Air Quality Management.

The Environment Act 1995 (Part IV)¹ requires the Secretary of State to publish an air quality strategy and local authorities to review and assess the quality of air within their boundaries. The latter has become known as Local Air Quality Management (LAQM).

The Air Quality Strategy² provides the policy framework for local air quality management and assessment in the UK. It sets out air quality standards and objectives for key air pollutants. These standards and objectives are designed to protect human health and the environment. The Strategy also sets out how the different sectors of industry, transport and local government, can contribute to achieving these AQOs.

Local authorities are required to identify whether the objectives have been, or will be, achieved at relevant locations. If the objectives are not achieved, the authority must declare an Air Quality Management Area (AQMA) and should prepare an Air Quality Action Plan (AQAP) within 12 months. The action plan must identify appropriate measures and policies that can be introduced to help achieve the objective(s).

The AQOs set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality (England) Regulations 2000³, and the Air Quality (England) (Amendment) Regulations 2002⁴.

The objectives for nitrogen dioxide (NO₂) and fine particulate matter (PM₁₀ and PM_{2.5}) are given in Table 1. The target dates for meeting the NO₂ and PM₁₀ objectives were 2005 and 2004, respectively. It should be noted that local authorities in England have a flexible role in working towards reducing emissions and concentrations of PM_{2.5}.

Table 1: Air Quality Objectives for NO₂, PM₁₀ and PM_{2.5}

Pollutant	Time Period	Objective
Nitrogen Dioxide (NO ₂)	1-hour Mean	200 µg/m ³ Not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m ³
Fine Particulate Matter (PM ₁₀) [†]	24-hour Mean	50 µg/m ³ Not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m ³
Fine Particulate Matter (PM _{2.5}) [†]	Annual Mean	25 µg/m ³
Notes: [†] Measured gravimetrically.		

The objectives apply at locations where members of the public are likely to be regularly present and exposed over the averaging period of the objective. Examples of where the annual mean objectives should apply are provided in LAQM.TG(16)¹⁶ and include building facades of residential properties, schools, hospitals. The annual mean objectives are not relevant for the building facades of offices or other places of work where members of the public do not have regular access, nor kerbsides nor gardens.

The 24-hour objective for PM₁₀ is considered to apply at the same locations as the annual mean objective, as well as in gardens of residential properties and at hotels.

The 1-hour objective for NO₂ also applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations, pavements of busy shopping streets, carparks and bus stations which are not fully enclosed. The 1-hour objective does not apply at kerbside sites where the public do not have regular access.

2.2 EU Limit Values.

The European Union has also set limit values for NO₂, PM₁₀ and PM_{2.5}; these are legally binding and have been implemented into English legislation by The Air Quality Standards Regulations 2010⁵ and The Air Quality Standards (Amendment) Regulations 2016⁶.

The limit values for NO₂, PM₁₀ and PM_{2.5} are the same as the English objectives (given in Table 1), but applied from 2010 for NO₂, 2005 for PM₁₀ and 2015 for PM_{2.5}. The limit values apply at all locations (apart from where the public does not have access, where health and safety at work provisions apply and on the road carriageway).

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

2.4 UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations.

The UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations⁷ was published in 2017. This sets out roles and responsibilities and measures for bringing NO₂ levels within the mandatory limit values in the shortest possible time. Under the UK Plan, local authorities with roadside concentrations of NO₂ forecast by the Defra as exceeding legal limits are identified; MCC has been identified as one of these local authorities.

2.5 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 to help meet EU limit values for the five most damaging air pollutants: NO_x (including NO₂), PM_{2.5}, NH₃, sulphur dioxide (SO₂), non-methane volatile organic compounds (NMVHC).

The immediate challenge is to reduce NO_x emissions due to non-compliance with the limit value for annual mean NO₂ (as given in Table 1). Targets for action include road traffic to reduce ambient NO₂ concentrations, and domestic coal and wood burning to improve ambient PM_{2.5} concentrations.

2.6 Planning Policy.

2.6.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) 2019⁹ sets out planning policy for England. It includes advice on when air quality should be a material consideration in development control decisions. Relevant sections are set out below:

Paragraph 54: "Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition."

Paragraph 102: "...c) opportunities to promote walking, cycling and public transport use are identified and pursued; d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account - including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains... "

Paragraph 103: "Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions and improve air quality and public health."

Paragraph 170: “Planning policies and decisions should contribute to and enhance the natural and local environment by: preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality.”

Paragraph 180: “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.”

Paragraph 181: “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.”

Paragraph 183: “The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.”

The NPPF is supported by Planning Practice Guidance (PPG)¹⁰.

The 2018 PPG states that:

Paragraph 001 (Reference ID: 32-001-20191101): “Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance relevant Limit Values. It is important that the potential impact of new development on air quality is taken into account in planning where the national assessment indicates that relevant limits have been exceeded or are near the limit or where the need for emissions reductions has been identified.”

Paragraph 002 (Reference ID: 32-002-20191101): Plans may need to consider ways in which the development could be made appropriate in locations where air quality is or is likely to be a concern, and not give rise to unacceptable risks from pollution. This could, for example entail identifying measures for offsetting the impact on air quality arising from new development including supporting measures in an air quality action plan or low emissions strategy where applicable”.

Paragraph 005 (Reference ID: 32-005-20191101): “Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and / or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity.

The PPG also sets out the information that may be required in an air quality assessment, stating that:

Paragraph 007 (Reference ID: 32-007-20191101): “Assessments need to be proportional to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific. The scope and content of supporting information is best discussed and agreed between the local planning authority and applicant before it is commissioned”.

It also provides guidance on options for mitigating air quality impacts, and makes clear that:

Paragraph 008 (Reference ID: 32-008-20191101): “Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact.”

2.7 Local Policy.

2.7.1 Manchester City Council Core Strategy Development Plan

The Manchester Core Strategy Development Plan, adopted in July 2012 and covering the years 2012-2027, states in Policy EN16 that:

“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 developments the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas”

Other policies which relate to air quality include:

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. [...] Proposals will be supported that improve pedestrian safety, improve air quality and increase the scope of accessible public realm improvements.”*

Policy EN 7 Energy Infrastructure Opportunities – *There will be a general presumption in favour of low and zero carbon decentralised energy schemes, subject to the following considerations:*

- *The cumulative impact of energy schemes will be taken into account when considering applications, to include modelled impacts on air quality and landscape character, with reference to Policy EN16 Air Quality.*

2.8 Local Air Quality Management in Manchester.

An AQMA was declared in Greater Manchester in 2016 for exceedances of the annual mean NO₂ AQO. The AQMA covers the 10 districts of Greater Manchester, including arterial routes, district centres, and the airport. Consequently, an Air Quality Action Plan was published in 2016 to set out actions and measures to bring about an improvement in air quality, to benefit the health of the population¹¹. The proposed actions cover three main themes:

- Reduce Traffic - for instance by encouraging modal shift from private vehicle use to public transport, cycling and walking.
- Increasing Efficiency - of traffic movement by reducing congestion and stop-start travel to achieve a smoother emission profile and overall lower emissions, which may be particularly significant at peak hours.
- Improve Fleet - by incentivising the replacement of older, more polluting vehicles with newer, smaller, cleaner, lower-emissions vehicles.

Alongside the Air Quality Action Plan, the Greater Manchester Low Emission Strategy¹² presents a long-term approach to carbon emissions and air quality in the period up to 2040. The key aims of the strategy are to:

- Support the UK Government in meeting all EU thresholds for key pollutants at the earliest date;
- Contribute to reducing Greater Manchester’s carbon footprint, in line with the Greater Manchester Climate Change Strategy; and
- Reduce air pollution as a contributor to ill-health in Greater Manchester.

An outline business case for a Clean Air Zone (CAZ) covering Greater Manchester was also submitted to government in March 2019¹³. The CAZ would be introduced in two phases from 2021 and 2023, targeting the

most polluting commercial vehicles including older Heavy Duty Vehicles (HDVs), buses, coaches, taxis and private hire vehicles from 2021, and older polluting Light Duty Vehicles (LDVs) from 2023.

Furthermore, Transport for Greater Manchester established the Greater Manchester Electric Vehicle (GMEV) Network in 2013. The network offers free electric vehicle charging for a nominal annual fee to help the mass adoption of electric vehicles across the region, playing a central role in improving air quality.¹⁴

2.9 Transport Strategy for Manchester City Centre 2040

The Transport Strategy for Manchester City Centre¹⁵ adopted in March 2021 sets out the strategy for Manchester to create a well-connected, zero-carbon centre offering residents, workers and visitors a place to live. As part of the Transport Strategy, there is a focus on Mobility Hubs as enablers of more sustainable mobility and neighbourhood parking choices. The Ancoats Mobility Hub is the first Mobility Hub proposed within Manchester and Greater Manchester and is specifically highlighted within the CCTS as an opportunity to meet parking requirements for the residential and commercial developments within Ancoats whilst supporting a modal shift away from petrol / diesel car ownership. The aims of the Ancoats Mobility Hub are listed as follows in the CCTS:

- Proposed to meet the parking requirements of residential and commercial development in the next phase of redevelopment in Ancoats, removing parking from individual schemes and promoting a modal shift by providing infrastructure that offers sustainable alternatives.
- Designed to provide access to sustainable modes including cycling and walking, public transport and car clubs;
- Planned to be integrated with enhanced cycling and walking routes, including the canal towpaths and the route towards New Islington Metrolink stop;
- Planned to include secure cycle storage and cycle hub facilities to encourage cycling as a primary mode of transport;
- Supporting the promotion of EVs where private car use is required, with EV charging infrastructure provided;
- Utilising the latest digital technology to help customers plan how they use transport through interactive systems to book car clubs, EV charging and cycle facilities;
- A hub for a local car club which encourages flexible car sharing/rental over car ownership, offering a range of vehicles to suit as many users as possible. Visible to users via digital means such as an app; and
- A hub for parcel deliveries including smart parcel lockers, with last mile deliveries to be arranged via electric vehicles or cargo cycles.

2.10 Assessment Guidance.

The primary guidance documents consulted in undertaking this assessment are detailed below.

2.10.1 Defra Local Air Quality Management Technical Guidance

Defra Local Air Quality Management Technical Guidance (LAQM.TG(16))¹⁶ 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, use of monitoring data, and use of background data that are applicable to all air quality assessments.

2.10.2 EPUK-IAQM 'Air Quality Guidance for Planning'

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have published guidance¹⁷ to help ensure that air quality is properly accounted for in the development control process. It clarifies

when an air quality assessment should be undertaken, what it should contain, and how impacts should be described and assessed including guidelines for assessing the significance of impacts.

2.10.3 IAQM ‘Construction and Demolition Dust Guidance’

Guidance on the assessment of dust from demolition and construction has been published by the IAQM¹⁸. The guidance provides a methodology to determine the dust emission magnitude and provides a series of matrices to determine the risk magnitude of potential dust sources associated with construction activities. This allows for the identification of appropriate mitigation measures that are defined within further IAQM guidance.

3. Assessment Methodology.

3.1 Consultation.

The approach to the assessment, as described in section 1.3, was provided to MCC for review. A response was received on the 22nd April 2021. Following this, Hoare Lea provided comments to the response on the 4th May 2021 agreement from MCC was received on the 10th of May 2021.. Full details of the correspondence with MCC has been included in Appendix 2.

3.2 Existing Air Quality in the Study Area.

A baseline air quality review was undertaken to determine the existing air quality in the vicinity of the Application Site. This desk-top study was undertaken using the following sources:

- Air quality data for MCC, including a review of the MCC air quality reports¹⁹ and local monitoring data;
- The UK Pollutant Release and Transfer Register²⁰;
- Background pollution maps taken from Defra's Local Air Quality Management (LAQM) website²¹;
- Pollution Inventory from the Environment Agency²²
- Ordnance Survey data and aerial photography from Google Maps.

3.3 Construction Phase Impacts.

3.3.1 Construction Dust Assessment

The assessment of construction dust impacts has been undertaken in line with the IAQM methodology. The Application Site is currently occupied by low-rise multi-tenanted Poland Street Industrial Estate units which are to be demolished. The Application Site is mostly and a hard-standing surface. 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

The risk of dust emissions was assessed for each activity with respect to:

- Potential loss of amenity due to dust soiling; and
- The risk of health effects due to a significant increase in exposure to PM₁₀.

The first stage of the assessment involves screening to determine whether there are any sensitive receptors within the threshold distances defined by the IAQM guidance. A detailed assessment of the impact of dust from construction sites will be required where:

- A 'human receptor' is located within 350 m of the boundary of the Site or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the Site entrance;
- An 'ecological receptor' is located within 50 m of the boundary of the Site or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the Site entrance.

The magnitude of dust emission for each activity is determined on the basis of the guidance, indicative thresholds, information available relating to the project and expert 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 mitigation requirements.

Descriptors for magnitude of impact and impact significance used in this assessment of construction phase dust are given in the guidance¹⁸ available online.

3.3.2 Construction Traffic

3.3.2.1 Construction Traffic Emissions Screening

A screening assessment has been undertaken with reference to the following EPUK and IAQM guidance indicative criteria:

- a change of Light Duty Vehicle (LDV) flows of more than 500 Annual Average Daily Traffic (AADT) (outside an AQMA);
- a change of Heavy Duty Vehicle (HDV) flows of more than 100 AADT (outside an AQMA);
- a change of LDV flows of more than 100 AADT (within an AQMA); and/or
- a change of HDV flows of more than 25 AADT (within an AQMA).

3.3.2.2 NRMM Emissions Screening

Non-Road Mobile Machinery (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. NRMM emissions have been screened following the guidance in Defra's LAQM.TG(16).

3.4 Operational Phase Impacts.

3.4.1 Operational Phase – Road Traffic Impacts

The purpose of the Proposed Development is to provide parking provision for associated residential developments within the area which form the Poland Street NDF Zone. Information on the traffic associated with the Proposed Development has been provided by Hydrock, the projects transport consultant. Timescales for completion of these developments varies and therefore the Proposed Development will initially provide parking for a combination of the following three user categories:

- Residents within the surrounding Ancoats and New Islington area
- Working Commuters
- Visitors to the area

It should be noted that all three of these categories could be considered 'existing' vehicle trips, with all of the above currently taking place just spread across the Ancoats and New Islington area. However, there will be an element of 'new' vehicle trips associated with the Proposed Development due to the new end destination of the trips on Poland street appose to a more dispersed end destination across the wider Poland Street NDF Zone. . All commuter and residential trips have been included as new trips which represents a worst-case scenario. Existing visitors to the area have not been included in the Traffic data provide by Hydrock as they are considered to be contained with the baseflows provided. This reduces the chance of double counting any possible impacts and is considered robust when the worst case nature of the residential and working commuters is considered. As the Poland Street NDF Zone evolves and residential development in the area is completed, the usage of the Mobility Hub is expected to change. As such, the proportion of the above users will transition from predominantly existing residential. commuter and visitor usage to predominantly new residential usage.

The above user categories have different associated trip generations and therefore the trip generation associated with the evolution of the Mobility Hub is expected to change in the future. The below scenarios have been assessed to reflect the change in users as follows:

- Scenario 1A – Representative of a scenario where the Proposed Development trips are routed using a worst-case distribution. Where there is uncertainty in the distribution 100% of vehicle trips have been routed down Livesey Street as a worst-case. The majority of trips associated with this scenario are for commuters and visitors. The minority of trips are associated with residents of the nearby residential developments.
- Scenario 1B – As per 1A but representative of a more 'realistic' distribution of the maximum trip generation in line with 2011 Journey to Work census data and Hydrock's local knowledge of the surrounding road network for the residential zone in which the Application Site lies.
- Scenario 2A – Representative of a future year where the Poland Street NDF Zone developments are operational and using the Mobility Hub for parking provision. The majority of trips associated with this

scenario are for residents of the nearby Poland Street NDF Zone developments. The minority of trips associated with this scenario are for commuters and visitors. Routing of vehicle trips have been distributed as per the worst-case assumptions for Scenario 1A.

- Scenario 2B - Representative of a future year where the Poland Street NDF Zone developments are operational and using the Mobility Hub for parking provision. The majority of trips associated with this scenario are for residents of the nearby Poland Street NDF Zone developments. The minority of trips associated with this scenario are for commuters and visitors. Routing of vehicle trips have been distributed as per the more 'realistic' routing in line with 1B.

All of the above scenarios have been provided by Hydrock, the appointed transport consultant for the project. Hydrock have used TRICS to generate future year traffic data based on the number of proposed future dwellings in 2023, 2026 and 2029 for the Poland Street NDF Zone. The Proposed Development is expected to open in 2023, however, baseline flows including committed developments were only available for 2026 from TfGM as provide by Hydrock. . As such, 2026 has been used as the future base year (do minimum) for this assessment to allow for the interaction of this Proposed Development with committed developments in the local. Therefore 2026 is the first year of traffic data to be assessed but this is worst case proxy for the opening year of the Proposed Development. Hydrock have provided a robust assessment of the total trip generation where the trip rate for residential users is greater than for commuters and visitors. For all Scenarios a trip rate of 8.4 trips per space has been applied in AADT for every single day of the year.

This presents a worst-case trip generation and in reality, is not likely to be realistic. In reality, lower car trips are likely to be made by residents due to the location of Ancoats, the connection to public transport and the short distance to Manchester City Centre. Therefore, this provides an overly conservative and robust assessment in order to understand the worst-case impacts of the Proposed Development as it evolves over time. It is important to understand that this data has limitations and can lead to overestimations of the impacts of the scheme on local air quality. Additionally, the Mobility Hub will provide a centralised location for deliveries to be received for the Poland Street NDF Zone. Hydrock have calculated the deliveries trips within Ancoats based on survey data during the COVID-19 pandemic and thus they are considered robust at 2099 AADT. This has been held constant in all scenarios. Again, it should be noted that these deliveries could be considered 'existing' vehicle trips, with all of the above currently taking place just spread across the Ancoats and New Islington area.

The increase in emissions from vehicle trips may have an impact on the air quality in the surrounding area and this has been assessed by predicting pollutant concentrations at locations of relevant exposure using ADMS Roads (v5.0.0.1) dispersion model software.

The dispersion model has been verified using 2019 MCC monitoring data as the most recent year with complete datasets. Traffic flows have been provided by Hydrock, the appointed transport consultants for 2019 (verification year), Opening year 2026 (provided by Hydrock to provide a robust assessment) and 2029 (all Poland Street NDF Zone schemes fully operational) for scenarios both with and without the Proposed Development in place.

The following modelling parameters have been assessed and summarised as follows:

- Baseline – 2019 verification year, diffusion tube monitoring and meteorological data with which to carry out model verification, in accordance with LAQM.TG(16). 2019 emission factors and 2019 traffic flows have been used.
- Do Minimum (DM) – baseline (2019) emission factors future year traffic flows (including Committed Developments) without the additional Proposed Development vehicle trips.
- Do Something (DS) –baseline (2019) emission factors with the future year traffic (Scenario 1A, 1B and 2A and 2B), including Proposed Development trips and nearby Committed Development.

The Committed Development included within the traffic data have been provided by Hydrock and agreed with TfGM and MCC as follows:

- Ref: 125927/FO/2020 - Proposed 22 Residential Dwellings;
- Ref: 126467/FO/2020 - Proposed 22 Residential Dwellings;
- Ref: 123887/FO/2019 - Proposed 37 Residential Dwellings; and
- Ref: 123453/JO/2019 - 3 Commercial units.

Details of the dispersion model set-up and traffic data are provided in Appendix 4.

3.4.2 Traffic Emission Factors and Sensitivity Assessment

Defra provides an Emission Factor Toolkit (EFT) in order to calculate emissions from a given length of road based on the traffic composition (number of vehicles of each type) and speed data.

Traffic data has been provided by Hydrock for 2026 and 2029, however, to provide a precautionary assessment, emission factors determined for each scenario using the latest EFT (v10.1) have been held in the baseline year 2019.

Predicted trip generation with traffic composition (Light Duty Vehicle (LDV <3.5t) and Heavy-Duty Vehicle (HDV >3.5t)) were provided by Hydrock (the appointed Transport Consultants). Speeds used in the model were based on posted limits and adjusted for junctions following guidance in LAQM.TG(16)²³.

The Proposed Development is to provide parking provision for nearby residential development within Ancoats. Timescales for completion of these nearby developments varies and will not all be operational at the time of the opening of the Proposed Development. Traffic flows have been provided by Hydrock for different future years. Three scenarios have been assessed and are detailed in Section 3.4.1.

Modelled traffic exhaust concentrations of oxides of nitrogen (NO_x) have been subject to verification in accordance with LAQM.TG(16) (see Appendix 4) and annual mean NO₂ concentrations have been calculated using the latest DEFRA 'NO_x-NO₂ Calculator' (v8.1) for 2019.

There remains some uncertainty regarding future NO_x emissions from diesel vehicles. To address this, the future scenarios have been assessed in which it has been assumed there is no improvement in vehicle emissions from the verified 2019 baseline year or an improvement in background concentrations, which therefore represents a precautionary assessment. These modelling assumptions and sensitivity on the dispersion modelling inputs are in accordance with principles of the IAQM's Position Statement on Dealing with Uncertainty in Vehicle NO_x Emissions within Air Quality Assessments²⁴.

3.4.3 Meteorological Data

To calculate pollutant concentrations at identified receptor locations the model uses sequential hourly 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 data from Manchester Airport for the year 2019. This station records all of the parameters necessary for dispersion modelling.

The meteorological dataset used in this assessment has been provided by APS Ltd.

3.4.4 Defra Background Concentrations

Background NO₂, PM₁₀ and PM_{2.5} concentrations for the individual receptors as predicted by Defra have been used to estimate future concentrations. For all pollutants, in the 2019 Baseline scenario and the DM and DS scenarios, 2019 background concentrations were used to ensure a robust assessment in which background concentrations do not decrease in the future.

For model verification, Defra background NO₂ concentrations for 2019 were used as no representative MCC urban background monitoring sites were suitable.

3.4.5 Existing Receptors

LAQM.TG(16) provides guidance on assessing air quality against the regulations, stating that the AQOs should be assessed at locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the standard.

A desktop review of existing receptors identified receptor locations sensitive to the annual mean AQO, adjacent to roads that are likely to experience an increase in traffic flows as a result of the Proposed Development.

On this basis, concentrations have been determined at a number of existing receptors considered to represent potential worst-case exposure locations. A total of 26 existing receptors were modelled close to the affected road network at locations of relevant exposure to the NO₂, PM₁₀ and PM_{2.5} AQOs. The location of the existing receptors are shown in Figure 2 and detail provided in Table 2.

Annual mean concentrations for NO₂, PM₁₀ and PM_{2.5} were calculated at existing receptors. The risk of exceeding the 1-hour mean AQO was assessed according to the guidance in LAQM.TG(16). This guidance states that:

'authorities may assume that exceedances of the 1-hour mean objective for NO₂ are only likely to occur where annual mean concentrations are 60µg/m³ or above'.

The nearest existing receptors along Poland Street at ground floor have been assessed against the short-term AQO. This is because there are currently proposals to convert the ground floor of 6 Poland Street to *'form a new headquarters for the business having been previously located in AWOL Studio at Hope Mill for a number of years'* as part of the planning application 129986/FO/2021. This approach has been provided to MCC as part of the consultation process and has been included within Appendix 2.

Table 2 Existing Receptors

Receptor ID	Approximate Receptor Address	Lad Use Type	Relevant AQO	Coordinates		
				X	Y	Z
ER1	6 Poland Street	Commercial +Resi	ST + LT	385105	398915	1.5, 4.5
ER2	64 Jersey Street	Office	ST	385193	398745	1.5
ER3*	162 Oldham Road	Office + Resi	ST + LT	385088	398963	1.5, 4.5
ER4	148 Oldham Road	Commercial	ST	385055	398943	1.5
ER5*	92 Oldham Road	Commercial + Resi	ST + LT	384932	398869	1.5
ER6*	49 Oldham Road	Commercial +Resi	ST + LT	384803	398833	1.5, 4.5
ER7*	60A Oldham Road	Commercial + Resi	ST + LT	384849	398824	1.5, 4.5
ER8*	109 Roper Court, George Leigh Street	Commercial + Resi	ST + LT	384984	398787	1.5, 4.5
ER9*	Unit 5 Bengal Street	Commercial + Resi	ST + LT	385072	398687	1.5, 4.5
ER10*	40 Jersey Street	Commercial + Resil	ST + LT	385003	398631	1.5, 4.5
ER11*	87 Great Ancoats Street	Commercial + Resi	ST + LT	384862	398528	1.5, 4.5
ER12*	78 Great Ancoats Street	Commercial + Resi	ST + LT	384844	398501	1.5, 4.5
ER13*	Eliza Yard, Poland Street	Commercial + Resi	ST + LT	385189	398798	1.5, 4.5
ER14	Abbott Community Primary School	School	LT	385041	399338	1.5
ER15	Abbott Community Primary School	School	LT	385013	399371	1.5
ER16	Brian Hughes Close Playground	Playground	ST	385321	399163	1.5
ER17	7 Adstock Walk	Residential	LT	385331	399177	1.5
ER18	38 Eastburn Avenue	Residential	LT	385447	399336	1.5
ER19	59 Farnborough Road	Residential	LT	385587	399484	1.5
ER20	325 Oldham Road	Residential	LT	385733	399710	1.5
ER21	180 Rochdale Road	Residential	LT	385291	399855	1.5
ER22*	6 Poland Street	Commercial +Resi	ST + LT	385101	398921	1.5 + 4.5
ER23	St Gorges Community Centre	Community Centre	ST	385241	399110	1.5
ER24	10 Livesey Street	Residential	LT	385217	399140	1.5
ER25	St Patrick's Primary School	School	LT	385140	399215	1.5
ER26	Ancoats Green	Park	ST	385158	398979	1.5
<u>Notes</u> *-Residential use at first floor 4.5 m height Resi LT = Long term AQAL of 40 µg/m³ for NO₂ and PM₁₀ and 25 µg/m³ for PM_{2.5} assessed against the annual mean AQOs ST = Short term AQAL assessed against the indicative annual mean concentration of 60 µg/m³ to inform the 1-hour mean NO₂ AQO.						

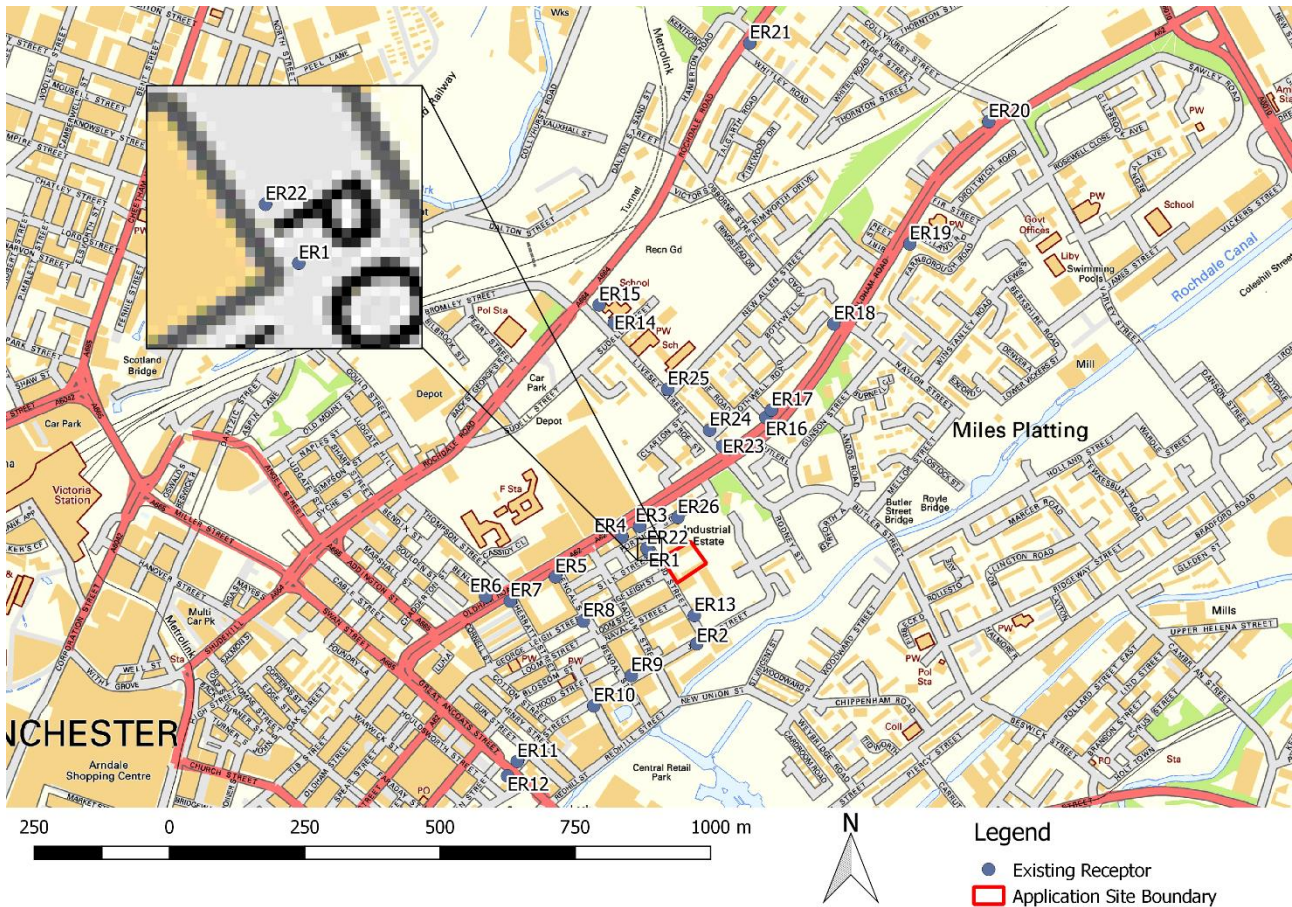


Figure 2 Location of Existing Receptors. Contains OS Data © Crown Copyright and Database rights 2021

3.4.6 Site Suitability Assessment

As part of the detailed dispersion modelling, Proposed Receptors have been assessed against the NO₂ AQO as part of the 'site suitability' assessment. The site suitability assessment has been undertaken to consider the exposure of future users, introduced by the Proposed Development, to existing air quality. As the Proposed Development will include commercial use, the short term NO₂ AQO applies. Detail of the Proposed Receptors is provided in Table 3.

Table 3 Proposed Receptors

Receptor ID	Approximate Receptor Address	Land Use Type	Relevant Objective	Coordinates		
				X	Y	Z
PR_1	Mobility Hub	Commercial	ST	385172	398884	1.5
PR_2	Mobility Hub	Commercial	ST	385149	398884	1.5
PR_3	Mobility Hub	Commercial	ST	385159	398897	1.5

Notes
ST = Short term AQAL assessed against the indicative annual mean concentration of 60 µg/m³ to inform the 1-hour mean NO₂ AQO.

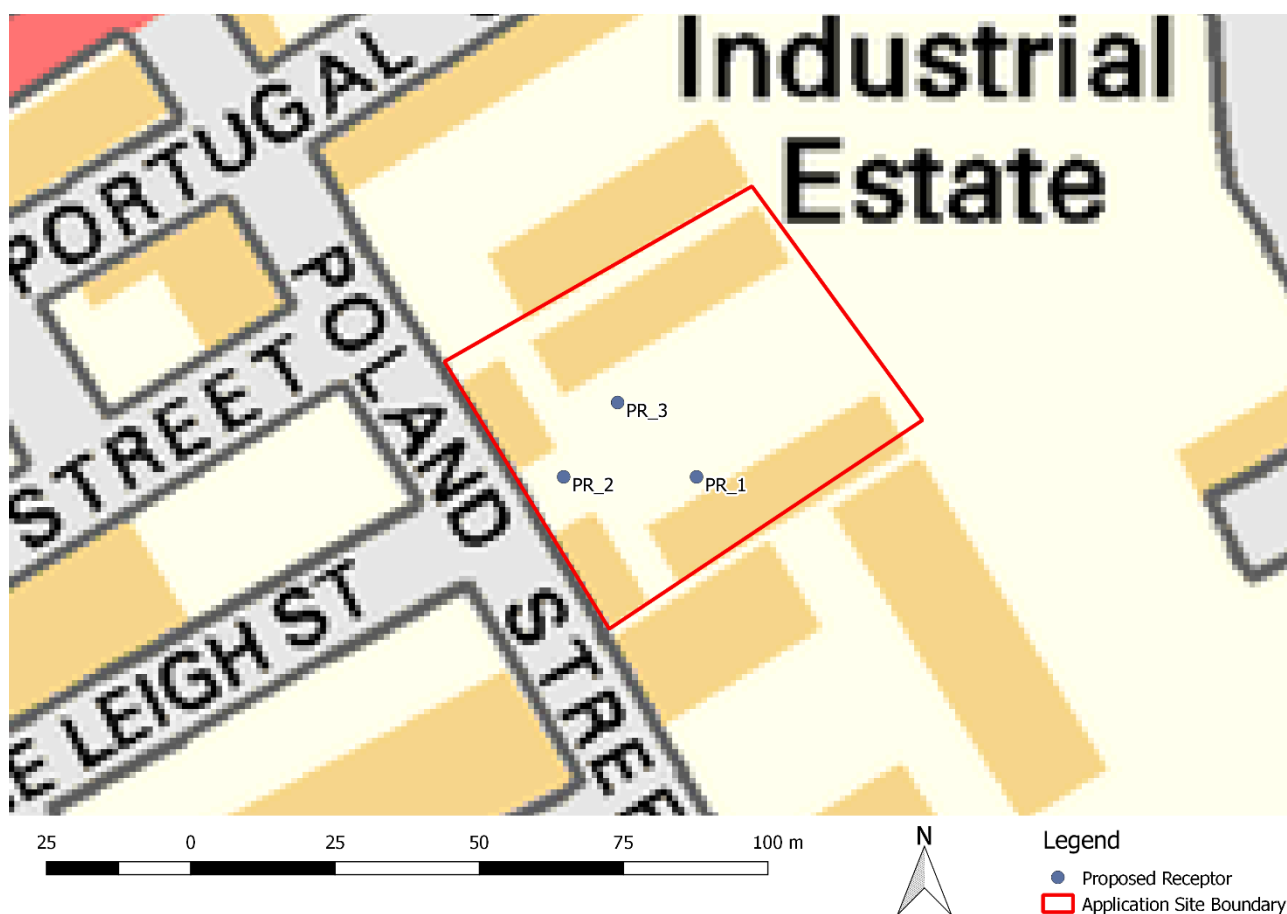


Figure 3 Location of Proposed Receptors. Contains OS Data © Crown Copyright and Database rights 2021

3.5 Assessment of Significance.

3.5.1 Construction Phase Impacts

The IAQM guidance¹⁸ on the assessment of dust from demolition and construction states that the primary aim of the risk assessment is to identify site specific mitigation that, once implemented, should ensure that there will be no significant effect. Therefore, the assessment has been used to determine an appropriate level of mitigation for the construction phase.

The determination of which mitigation measures are recommended include elements of professional judgement and the professional experience of the consultants preparing this report is set out in Appendix 3.

3.5.2 Operational Phase Impacts

The approach suggested by EPUK and the IAQM in guidance on Land-Use Planning & Development Control: Planning for Air Quality²⁵ has been used to determine the significance of impacts from traffic associated with the Proposed Development on existing receptors.

The sensitivity impact significance of each receptor was defined in accordance with the criteria shown in Table 4.

Table 4: EPUK and IAQM impact descriptors for individual receptors

Long term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQO)			
	1	2-5	6-10	>10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76-94% of AQO	Negligible	Slight	Moderate	Moderate
95-102% of AQO	Slight	Moderate	Moderate	Substantial
103-109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

For the existing receptors, the air quality impacts at each location have been described by determining the percentage change in concentrations relative to the AQO and comparing this with the total long-term average concentration (background + road traffic).

The table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impacts fall within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0% i.e. less than 0.5% will be described as Negligible.

The determination of the significance of the effects includes elements of professional judgement and the professional experience of the consultant preparing the report is set out in Appendix 6.

The overall significance of the air quality effects are judged as either significant or not significant taking account of:

- The existing and future air quality in the absence of the development;
- The extent of current and future population exposure to the impacts; and
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

The EPUK and IAQM guidance¹⁷ has been used to assess the potential for significant impacts as a result of vehicle emissions from traffic associated with the Proposed Development. The focus of the guidance is to assess traffic emission impacts and advises on how to describe the air quality impacts and their significance.

3.5.3 Site Suitability

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

“Where the air quality is such that an AQO 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.”

4. Baseline Environment.

This section sets out the available information on air quality in the vicinity of the Application Site.

4.1 Application Site Setting.

The Application Site is located within Manchester City Council's (MCC) administrative area at approximate National Grid Reference (NGR) X 385230, Y 398799.

The Application Site is currently occupied by low-rise multi-tenanted Poland Street Industrial Estate units mostly and hard standing. The Application Site is bound by Poland Street to the west, Ancoats Green to the east, Crown Industrial Estate to the north and City Court Trading Estate to the south. Modern industrial units lie to the north and west of the Application Site with the residential neighbourhood of Miles Platting further past to the east.

4.2 Local Air Quality Management Review and Assessment.

Greater Manchester Combined Authority (GMCA) have declared an AQMA for exceedances of the annual mean NO₂ AQO which covers Manchester City Centre, the area around Manchester Airport and the main arterial traffic routes into the city. The Application Site is not within this designated AQMA and is approximately 40 m from the AQMA covering Oldham Road to the north. Figure 4 shows the location of the Application Site in relation to the nearby GMCA AQMA.

According to the MCC Annual Status Report (ASR)¹⁹, long term trends have shown that there has been improvement in air quality in Manchester, but areas still remain above the annual mean NO₂ AQO.

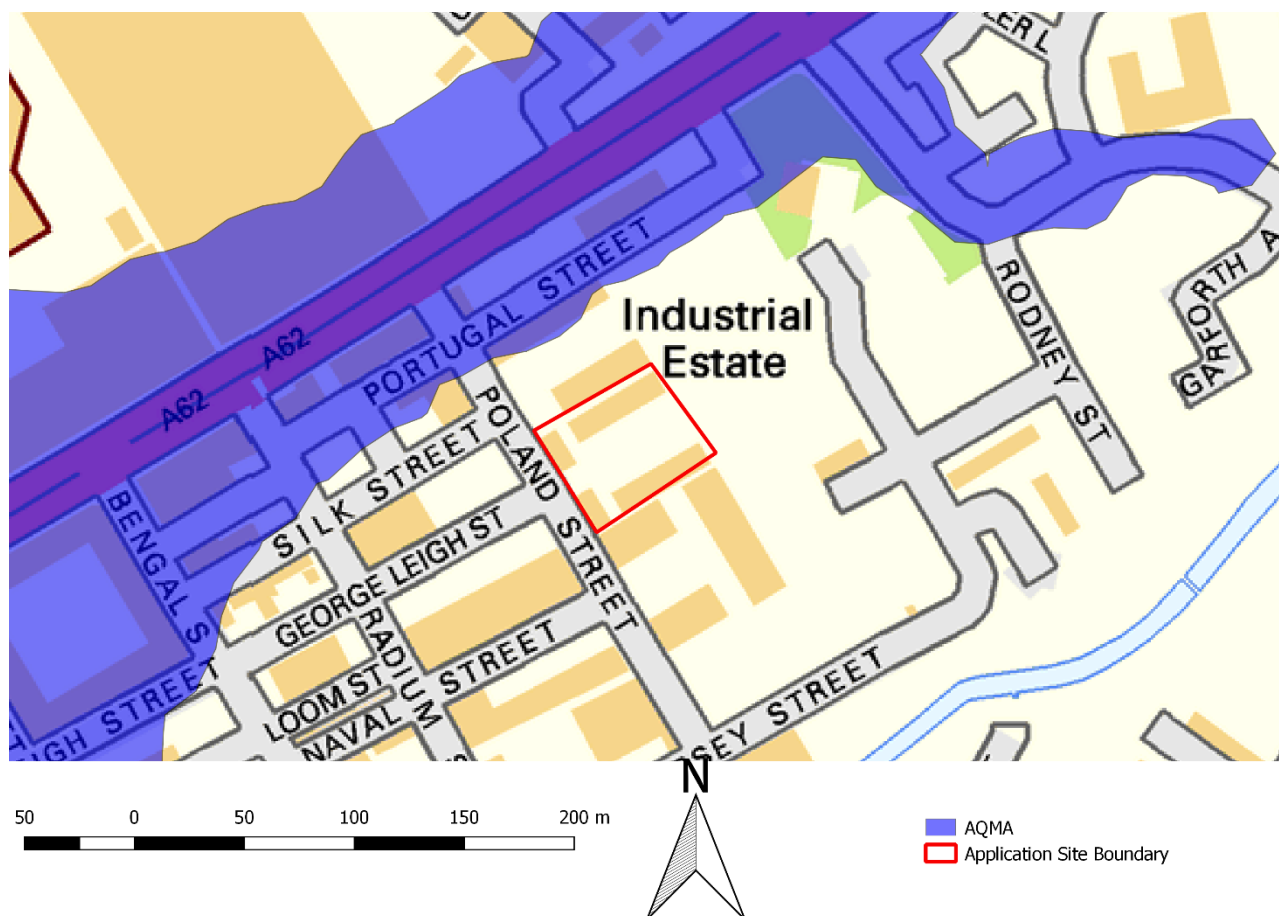


Figure 4 Location of the GMCA AQMA. Contains OS Data Crown Copyright and Database Rights 2021.

4.3 Local Air Quality Monitoring.

The UK Automatic Urban and Rural Network (AURN) is a countrywide network of air quality monitoring stations operated on behalf of Defra. Monitoring data for AURN sites is available from the UK Air Information Resource website (UK-AIR). There are three AURN sites in operation across Greater Manchester with the nearest located approximately 990 m west in Manchester city centre (MAN3 Piccadilly Gardens) in an urban centre location. The other AURN sites are located 7.7 and 13 km from the Application Site. Additionally, MCC operate one other automatic monitor, located 1.8 km south on Oxford Road, a busy bus route into the city centre. Due to distance and differences in site characteristics, these monitoring sites have not been considered further.

Recent monitoring data for the last five years for MAN3 automatic monitoring site is presented in Table 5 and a visual representation of the location in Figure 4.

Table 5: MCC Automatic Monitoring Results

Monitoring site and distance (m) from site boundary (approx.)	Objective	2015	2016	2017	2018	2019
NO₂						
MAN3 Manchester Piccadilly, 990 m	Annual mean (µg/m ³)	39	40	36	35	36
	Number of hours with concentrations >200 µg/m ³	1	0	1	0	0
PM₁₀						
MAN3 Manchester Piccadilly, 990 m	Annual mean (µg/m ³)	20	20	20	21	20
	Number of days with concentrations > 50 µg/m ³	3	3	3	2	7
PM_{2.5}						
MAN3 Manchester Piccadilly, 990 m	Annual mean (µg/m ³)	10	10	8	11	12

The automatic monitoring results presented in Table 5 show compliance with the annual mean NO₂, PM₁₀ and PM_{2.5} objectives in the five-year monitoring period between 2015 and 2019. Concentrations of NO₂ remained constant with a reduction from 2015-2018. Annual mean PM₁₀ and PM_{2.5} concentrations also remained constant during this period. The short-term AQOs for NO₂ and PM₁₀ have not been exceeded in the five-year monitoring period at MAN3.

MCC also utilises passive diffusion tubes to monitor annual mean NO₂ concentrations. A review of the most recent monitoring data available indicated that there are three passive diffusion tube monitoring locations within approximately 1km of the Application Site. Recent monitoring results are shown in Table 6 and a visual representation of the locations in Figure 5.

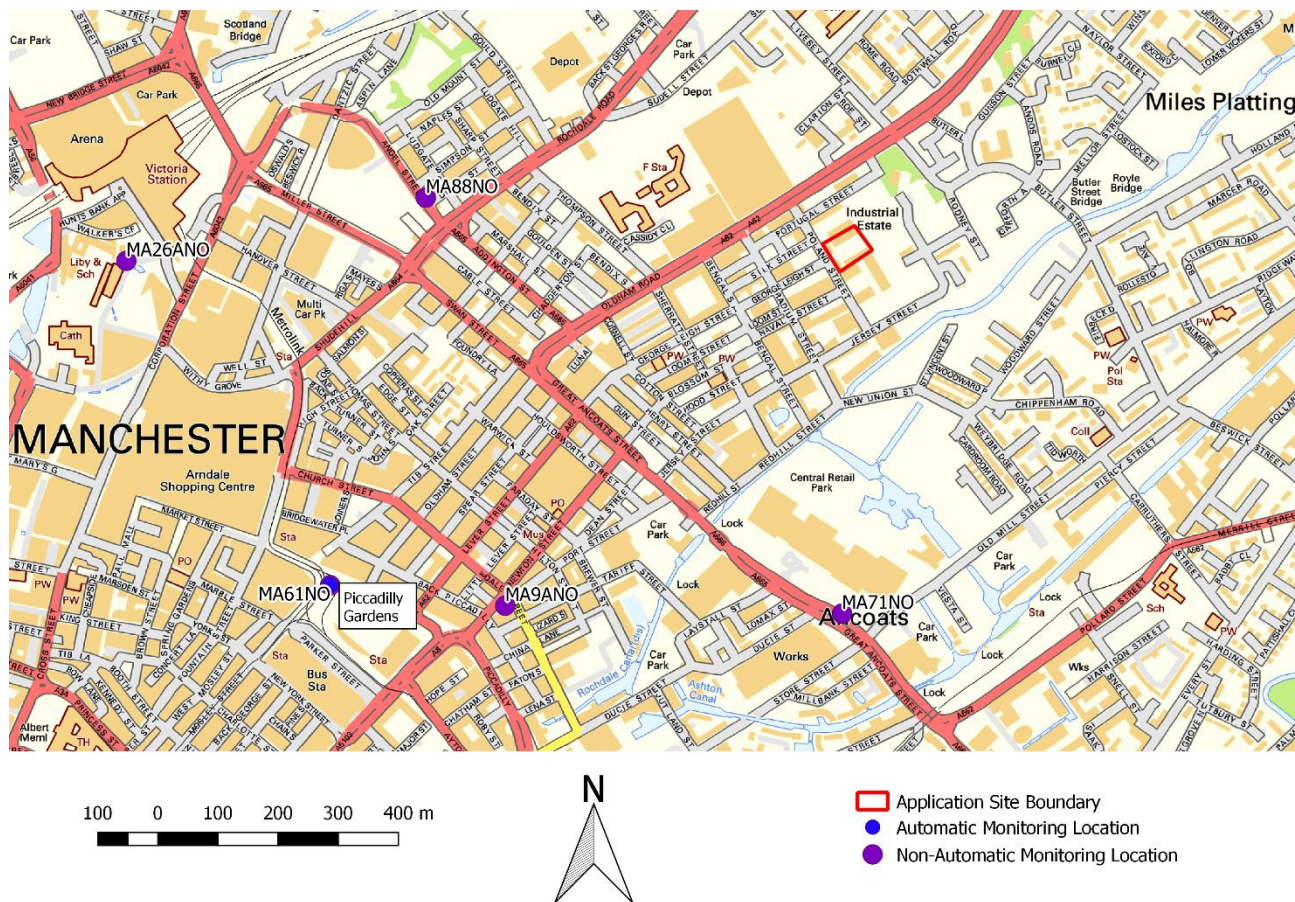


Figure 5 MCC Monitoring Locations. Contains OS Data © Crown Copyright and Database rights 2021.

Table 6 Passive Diffusion Tube Monitoring Results

Site ID	Site Type	Distance (m) from site (approx.)	Annual Mean NO ₂ Concentration (µg/m ³)				
			2015	2016	2017	2018	2019
MA71NO	Roadside	480	46	51	50	46	45
MA88NO	Kerbside	745	41	53	48	44	43
MA9ANO	Kerbside	760	60	52	51	46	45
MA61NO	Urban Background	990	36	41	36	32	33

Notes:
Data presented in **bold** represents exceedances of the annual mean NO₂ AQO.

As shown in Table 6 above, the annual mean NO₂ AQO has been exceeded in all years of available monitoring data at all three roadside and kerbside passive diffusion tube locations. All three of these passive diffusion tube locations are along busy main roads where higher NO₂ concentrations are common. All three of the passive diffusion tube locations are within the GMCA AQMA declared for exceedances of the annual mean NO₂ AQO. Concentrations have shown a gradual reduction over the period between 2015-2019. Concentrations at the nearest urban background passive diffusion tube location have been in compliance in all but one year of the five-year monitoring period.

An annual mean concentration of 60 µg/m³ is often used to indicate a possible exceedance of the hourly mean NO₂ AQO. Concentrations at all nearby passive diffusion tubes presented in Table 6 have not exceeded 60 µg/m³ in the five-year monitoring period.

4.4 Industrial Pollution.

There are industrial and commercial units within the immediate vicinity of the Application Site. A desk-based review of potential industrial sources using the UK Pollutant Release and Transfer Register and the Environment Agency's Pollution Inventory did not identify any significant industrial or waste management sources of air pollution that are likely to affect the Application Site with regard to air quality. Further to this, a review has been completed of publicly available sources such as Google Earth and Street View. No obvious signs of heavy industry such as flues and chimneys have been identified. As such, it is considered unlikely that the local air quality at the Application Site will be impacted by surrounding industrial and commercial units.

4.5 Defra Predicted Concentrations.

Background concentrations have been obtained from the national maps published by Defra²¹. These estimated concentrations are produced on a 1 km by 1 km grid basis for the whole of the UK. The Application Site falls into grid square X 387500 Y 398500 and the predicted concentrations for this grid square for NO_x, NO₂, PM₁₀ and PM_{2.5} are provided in Table 7 for 2019, the most recent year with available monitoring data and for 2026, the earliest anticipated opening year for the Proposed Development.

Table 7: Defra Predicted Background Concentrations

Year	Predicted Background Concentration (µg/m ³)		
	NO ₂	PM ₁₀	PM _{2.5}
2019	23.4	12.6	8.3
2026	18.7	11.7	7.7

As shown in Table 7, background concentrations are below the relevant AQOs for all pollutants in 2026, the earliest anticipated opening year of the Proposed Development.

4.6 Summary of Baseline Data.

The baseline assessment has shown that the Application Site is not within the GMCA AQMA, which is located approximately 40 m north of the Application Site.

Annual mean NO₂ concentrations recorded at the nearest roadside and kerbside passive diffusion tube locations have been in exceedance of annual mean AQO at all sites in the last five years. Concentrations recorded at the nearest urban centre automatic monitoring site and urban background passive diffusion tube site have not exceeded the annual mean NO₂ AQO for the last three years.

The 1-hour NO₂ objective has not been exceeded at the nearest automatic monitoring site in the five-year monitoring period. Concentrations at nearby passive diffusion tubes have not exceeded the annual mean concentration of 60 µg/m³ used to inform compliance with the 1-hour mean AQO in all years of the five-year monitoring period.

The annual mean PM₁₀ and PM_{2.5} and the 24-hour mean PM₁₀ objectives have not been exceeded at the nearest automatic monitoring site in the five-year monitoring period.

Defra predicted background concentrations are expected to be below the annual mean objectives for all considered pollutants at the Application Site in 2022, the earliest anticipated opening year

5. Construction Phase Assessment.

The potential for air quality impacts during the construction of the Proposed Development are assessed in this section. As part of the proposals, the Application Site is to be redeveloped to deliver an eight-storey car park, ground floor commercial floorspace (approximately 220 m²) and ancillary amenity space within a building up to 8 storeys.

5.1 Construction Phase Dust Assessment.

The risk of dust impacts is based on the potential dust emissions magnitude and the sensitivity of the area. These two factors are then combined to determine the risk of dust impacts with no mitigation applied. In the absence of any site-specific information, a higher risk category has been applied to represent a worst-case scenario.

5.1.1 Assessment Screening

There are 'human receptors' within 350 m of the Application Site but no designated habitat sites within 50 m of the Application Site boundary or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the Site entrance. The nearest ecological site to the Application Site is the Clayton Vale Local Nature Reserve, approximately 2.6 km to the east.

Therefore, an assessment of construction dust on ecological receptors can be screened out from this assessment but an assessment of construction dust at human receptors is required.

5.1.2 Potential Dust Emission Magnitude

The potential magnitude of dust emissions from demolition, earthworks, construction and trackout have been assessed, as identified in Table 8.

Table 8: Predicted Magnitude of Dust Emissions

Activity	Magnitude	Justification
Demolition	Small	The Application Site is currently occupied by low-rise, multi-tenanted units which form part of the Poland Street Industrial Estate which are to be demolished. The existing buildings are constructed of metal cladding with a low potential for dust release as well as brick and concrete with a Total building volume to be demolished is approximately 5,200 m ³ of potentially dusty construction material.
Earthworks	Medium	The Application Site is currently a hard-standing area with low-rise industrial units; however, the new buildings and structures require new foundations to be excavated. Total Application Site areas is approximately 3,200 m ³ that could be subject to earthworks with potentially dusty soil type (e.g. loamy and clayey soils).
Construction	Medium	The proposals are for an 8-storey building. Construction materials are expected to be a mixture of a steel frame, concrete, brickwork and metal cladding. Total building volume is likely to be between 25,000 – 100,000m ³ of potentially dusty construction material (e.g. concrete).
Trackout	Small	The proposals are likely to result in <10 outward HDV movements in any one day which will be transporting potentially dusty material away from the Application Site. Due to the size and nature of the Application Site, there are unlikely to be unpaved roads greater than 50m in length.

5.1.3 Sensitivity of the Study Area

The sensitivity of the area takes into account the following factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of PM₁₀, the local background concentration; and
- Site-specific factors, such as whether there are natural shelters, such as trees or other vegetation, to reduce the risk of wind-blown dust.

The sensitivity of the area and the factors considered are detailed in Table 9. Figure 6 shows the location of the Application Site within the wider context of Manchester and a series of distance bands used to inform the assessment as outlined in the EPUK and IAQM guidance¹⁸.

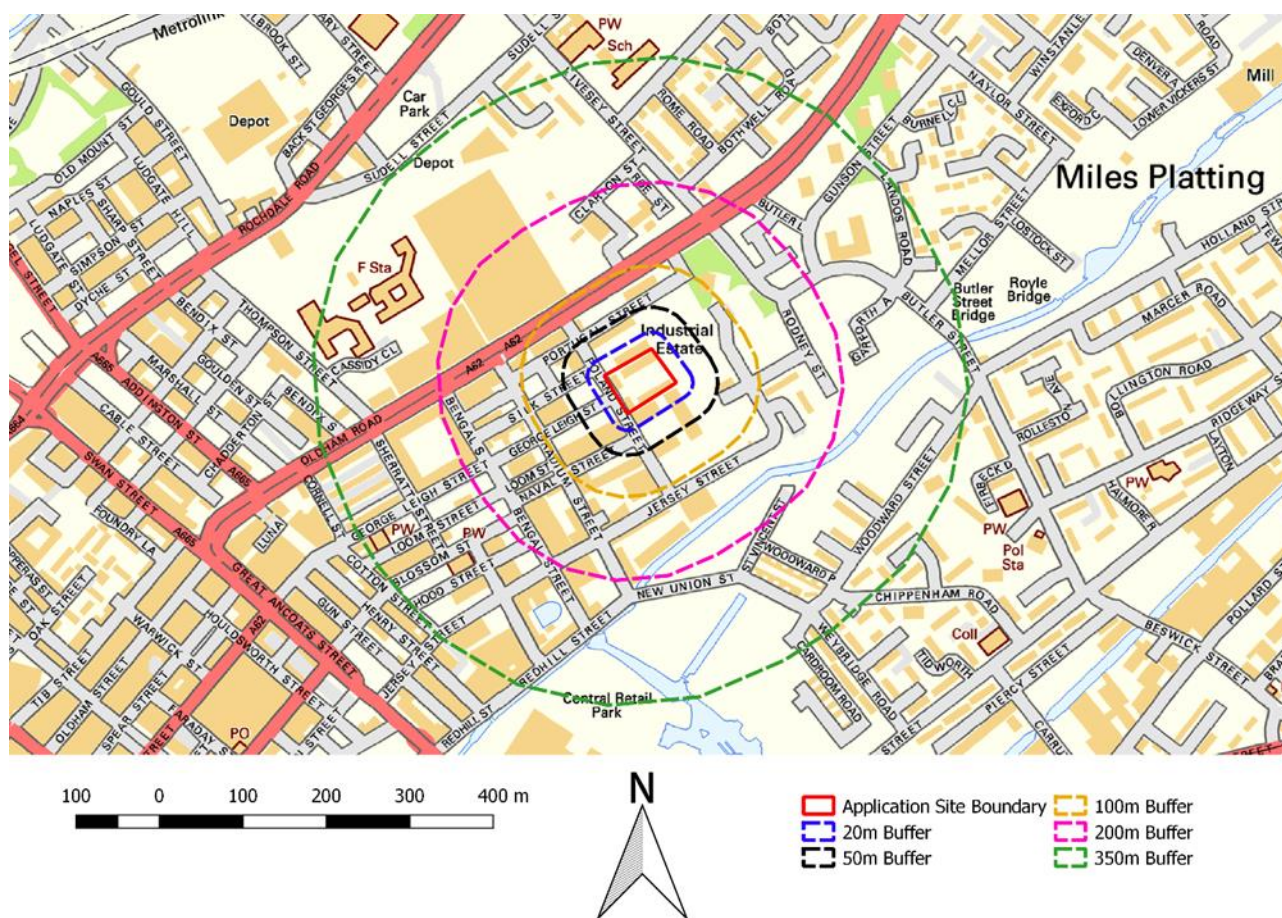


Figure 6 IAQM Demolition and Construction Distance Band Criteria from the Application Site Boundary. Contains OS Data © Crown Copyright and Database rights 2021.

The sensitivity of the area and the factors considered are detailed in Table 9.

Table 9: Sensitivity of the Area

Sensitivity Type	Factors	Sensitivity of Area	
		On – Site Activity	Trackout
Dust Soiling	There are between 10-100 high sensitivity receptors within 50 m of the Application Site such as residential dwellings along Poland Street and George Leigh Street and a medium-term car park directly to the west of the Application Site within 20m. There are between 10-100 high sensitivity receptors, such as residential apartments and medium-term car parks directly to the south of the Application Site and along Jersey Street and Poland Street within 50m of the routes likely to be used by construction traffic.	Medium	Medium
Human Health	The background PM ₁₀ concentration for the location of the Application Site in 2021 is 11.5 µg/m ³ , based upon Defra 2018-based background estimates. There are between 1-10 medium sensitivity receptors within 100m of the Application Site. There are between 10-100 medium sensitivity receptors such as places of work along Jersey Street and Poland Street within 100m of routes likely to be used by construction traffic where people could be exposed to PM ₁₀ for eight hours or more in one day.	Low	Low

5.1.4 Risk of Dust Impacts

The outcomes of the assessments of potential magnitude of dust emissions and the sensitivity of the area are combined to determine the risk of impact. This risk is then used to inform the selection of appropriate mitigation. Table 10 details the risk of dust impacts for demolition, earthworks, construction and trackout activities.

Table 10: Summary of Potential Unmitigated Dust Risks

Potential Impact	Sensitivity	Demolition	Earthworks	Construction	Trackout
		Magnitude			
		Small	Medium	Medium	Small
Dust Soiling Impacts	Medium	Low Risk	Medium Risk	Medium Risk	Negligible Risk
Human Health Impacts	Low	Negligible Risk	Low Risk	Low Risk	Negligible Risk

5.2 Construction Phase – Vehicular Pollutants.

Information on traffic movements anticipated during construction works was unavailable for the completion of the Air Quality Assessment. However, the development quantum is not anticipated to result in a significant increase in movements above the EPUK and IAQM criterion. The duration of movements will be short-term in nature and are not considered further within the context of this assessment. Therefore, in accordance with the criterion presented within EPUK and IAQM guidance, additional road vehicle trips during the construction phase of the Proposed Development “can be considered to have insignificant effects” on air quality.

5.3 Construction Phase – Non-Road Mobile Machinery.

Exhaust emissions of NO_x and fine particulate matter (PM₁₀ and PM_{2.5}) from Non-Road Mobile Machinery (NRMM), associated with construction sites, may have a significant effect on local air quality. Typically, NRMM is and, therefore there is a potential for NRMM emissions to adversely affect local air quality as a result of the Proposed Development.

LAQM.TG(16) guidance states that, with the application of suitable control measures and site management, exhaust emissions from on-site NRMM are “unlikely to make a significant impact on local air quality. In the vast majority of cases they will not need to be quantitatively assessed”.

6. Operational Phase Assessment.

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

6.1 Operational Phase Road Traffic – Scenario Summary

Road traffic data has been provided by Hydrock, the appointed transport consultant for the Proposed Development. The Proposed Development will include up to 408 car parking spaces., but 410 spaces have been modelled by Hydrock to provide a robust assessment. The Proposed Development will provide parking provision for nearby residential developments within Poland Street NDF Zone. Timescales for completion of these developments varies and therefore the Proposed Development will initially provide parking for commuters, visitors and existing residential development within Ancoats.

Trip generations associated with the different users will vary. As such, traffic data has been provided for two different scenarios which represent the evolution of the Proposed Development as the nearby Poland Street NDF Zone developments are completed and the Mobility Hub transitions to provide parking provision for these residential developments.

The total trip generation for the Proposed Development for Scenario 1A and 1B (see Section 3.4.1 for scenario details) has been estimated as 3,925 AADT for 2026 which includes trips associated with 100 spaces for new residents with the remaining spaces will be used by commuters, existing residential and visitors.

The total trip generation for the Proposed Development for Scenario 2A and 2B (see Section 3.4.1 for full scenario details) has been estimated as 5,210 AADT for 2029 which includes trips associated with 330 spaces for residents of the future Poland Street NDF Zone. Remaining spaces will be used by commuters, existing residential and visitors.. Based on the above, a detailed assessment of the likely air quality impacts is required

6.2 Road Traffic Impacts - Scenario 1A

The results of the detailed dispersion modelling for Scenario 1A are presented in the following sections. The operational phase vehicle emissions associated with this Scenario have been used to predict concentrations at locations of relevant exposure to the NO₂, PM₁₀ and PM_{2.5} AQOs for existing receptors.

The majority of trips associated with this scenario are for commuters and deliveries . The minority of trips are associated with new residents of the Poland Street NDF Zone. This scenario has been included to present a worst-case impact for 2026 on existing receptors along Livesey Street. Based on information provided by Hydrock, this routing is unrealistic but has been presented to provide a robust assessment of the impacts along Livesey Street.

6.2.1 Road Traffic Impacts – NO₂ Annual Mean Results

Predicted annual mean NO₂ concentrations were assessed against the AQO of 40 µg/m³ at locations of relevant exposure to the annual mean AQO e.g. residential properties and first floor locations at a height of 4.5m. In addition, locations of relevant exposure to the short term AQO have also been included and assessed against the AQAL of 60 µg/m³ which is the indicative criteria set out in the EPUK/IAQM guidance at which point an exceedance of the 1-hour mean AQO may be exceeded. Table 11 shows the predicted impact of the Proposed Development traffic on NO₂ concentrations. Full details of the existing receptors are provided in Table 3 and shown in Figure 2. Additional NO₂ results are provided in Appendix 5.

Table 11 Predicted Annual Mean NO₂ Concentrations in 2026 Scenario 1A.

Receptor	Relevant AQO	DM Concentration (µg/m ³)	DS Concentration (µg/m ³)	Change (µg/m ³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER1	LT	26.2	27.4	1.1	68%	2.8%	Negligible
ER2	ST	25.7	26.3	0.6	44%	1.0%	Negligible

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER3	LT	29.2	30.6	1.4	77%	3.6%	Slight
ER4	LT	28.9	29.5	0.6	74%	1.5%	Negligible
ER5	LT	35.7	36.1	0.4	90%	0.9%	Negligible
ER6	LT	39.1	39.6	0.5	99%	1.2%	Slight
ER7	LT	35.7	36.1	0.3	90%	0.8%	Negligible
ER8	LT	32.26	32.5	0.2	81%	0.6%	Negligible
ER9	LT	25.98	26.4	0.4	66%	1.1%	Negligible
ER10	LT	25.23	25.5	0.3	64%	0.6%	Negligible
ER11	LT	35.92	36.3	0.4	91%	0.9%	Negligible
ER12	LT	33.21	33.4	0.2	83%	0.5%	Negligible
ER13	LT	25.2	25.7	0.5	64%	1.3%	Negligible
ER14	LT	29.0	30.7	1.7	77%	4.3%	Slight
ER15	LT	30.3	31.8	1.5	79%	3.6%	Slight
ER16	ST	31.1	31.3	0.2	16%	0.4%	Negligible
ER17	LT	29.4	29.6	0.2	74%	0.5%	Negligible
ER18	LT	28.1	28.2	0.1	14%	0.2%	Negligible
ER19	LT	25.1	25.1	0.0	63%	0.1%	Negligible
ER20	LT	32.4	32.4	0.0	81%	0.1%	Negligible
ER21	LT	27.7	28.5	0.8	14%	1.9%	Negligible
ER22	LT	26.5	27.6	1.1	69%	2.73%	Negligible
ER23	ST	39.5	42.5	3.0	71%	5.0%	Negligible
ER24	LT	32.5	35.0	2.5	87%	6.2%	Moderate
ER25	LT	33.9	37.3	3.4	93%	8.4%	Moderate
ER26	ST	27.2	27.9	0.7	46%	1.1%	Negligible
<u>Notes</u> LT = Long term AQAL of 40 µg/m³ for NO₂ and PM₁₀ and 25 µg/m³ for PM_{2.5} assessed against the annual mean AQOs ST = Short term AQAL assessed against the indicative annual mean concentration of 60 µg/m³ to inform the 1-hour mean NO₂ AQO.							

As shown in Table 11 there are no new exceedances of the annual mean NO₂ AQO at locations of relevant exposure.

The maximum predicted change in annual mean NO₂ concentrations associated with the DS scenario at existing receptors is 3.4 µg/m³, which represents 8.4% of the annual mean AQO at ER25 a ground floor receptor along St Patrick Primary School. The DS annual mean concentration at this receptor is 37.3 µg/m³. In accordance with the EPUK and IAQM guidance, the impact at these receptors is considered to be 'moderate adverse'. This receptor represents a worst-case impact from the road traffic associated with the operation of the Proposed Development.

There is also a ‘moderate adverse’ impact predicted at ER24 which is a ground floor residential receptor on Livesey Street.

There are four ‘slight adverse’ impacts predicted at, ER3, ER6, ER14 and ER15. The impact at all other existing receptors is predicted to be ‘negligible’ in accordance with the EPUK and IAQM guidance.

The impacts on existing receptors range from ‘negligible’ to ‘moderate adverse’ in the vicinity of the Proposed Development prior to the implementation of mitigation measures. As such, the overall significance of the operational phase of road traffic emission impacts on annual mean NO₂ concentrations has been determined to be significant without any mitigation in line with the EPUK and IAQM guidance.

The routing for Scenario 1A assumes 100% of the vehicle trips travelling north toward Rochdale Road route down Livesey Street and therefore presents a worst-case assessment. In reality, based on information provided by Hydrock, this would not be the case, based on 2011 Journey to Work Census data and Hydrock’s local knowledge of the road network. As such, additional scenarios have been assessed and the results are presented in subsequent sections.

6.2.2 Road Traffic Impacts - NO₂ 1-Hour Mean Results

A methodology is presented within LAQM.TG(16) to determine compliance with the 1-hour mean NO₂ AQO. This Guidance states that:

‘[...] exceedances of the NO₂ 1-hour mean are unlikely to occur where the annual mean is below 60 µg/m³’.

Based on the results of the dispersion modelling presented in Table 11, there are no existing receptor locations where the predicted annual mean concentration exceeds the annual mean NO₂ indicative concentration of 60 µg/m³ used to inform compliance with the short term AQO.

6.2.3 Road Traffic Impacts – PM₁₀ Annual Mean Results

Predicted annual mean PM₁₀ concentrations were assessed against the PM₁₀ AQO of 40 µg/m³ at locations of relevant exposure. Table 12 shows the predicted impact of the Proposed Development traffic on PM₁₀ concentrations. Full details of existing receptors are provided in Table 2 and shown in Figure 2.

Table 12 Predicted Annual Mean PM₁₀ Concentrations in 2026 Scenario 1A.

Receptor	Relevant AQO	DM Concentration (µg/m ³)	DS Concentration (µg/m ³)	Change (µg/m ³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER1	LT	13.1	13.3	0.2	33%	0.5%	Negligible
ER2	ST	13.0	13.1	0.1	33%	0.3%	Negligible
ER3	LT	13.7	14.0	0.3	35%	0.7%	Negligible
ER4	LT	13.7	13.8	0.1	34%	0.3%	Negligible
ER5	LT	14.8	14.9	0.1	37%	0.2%	Negligible
ER6	LT	15.5	15.6	0.1	39%	0.2%	Negligible
ER7	LT	14.7	14.8	0.1	37%	0.2%	Negligible
ER8	LT	14.2	14.2	<0.1	36%	0.1%	Negligible
ER9	LT	13.0	13.1	0.1	33%	0.2%	Negligible
ER10	LT	12.9	13.0	<0.1	32%	0.1%	Negligible
ER11	LT	15.0	15.1	0.1	38%	0.2%	Negligible
ER12	LT	14.4	14.5	<0.1	36%	0.1%	Negligible
ER13	LT	12.9	13.0	0.1	32%	0.2%	Negligible

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER14	LT	13.84	14.2	0.3	35%	0.8%	Negligible
ER15	LT	14.10	14.4	0.3	36%	0.7%	Negligible
ER16	ST	14.5	14.5	<0.1	36%	0.1%	Negligible
ER17	LT	14.1	14.2	<0.1	35%	0.1%	Negligible
ER18	LT	13.8	13.9	<0.1	35%	<0.1%	Negligible
ER19	LT	13.2	13.2	<0.1	33%	<0.1%	Negligible
ER20	LT	14.5	14.5	<0.1	36%	<0.1%	Negligible
ER21	LT	13.8	13.9	0.2	35%	0.4%	Negligible
ER22	LT	13.1	13.4	0.2	33%	0.5%	Negligible
ER23	ST	15.8	16.4	0.6	41%	1.4%	Negligible
ER24	LT	14.5	15.0	0.5	37%	1.2%	Negligible
ER25	LT	14.8	15.4	0.7	39%	1.7%	Negligible
ER26	ST	13.3	13.4	0.1	34%	0.3%	Negligible
Notes LT = Long term AQAL of 40 µg/m³ for NO₂ and PM₁₀ and 25 µg/m³ for PM_{2.5} assessed against the annual mean AQOs ST = Short term AQAL assessed against the indicative annual mean concentration of 60 µg/m³ to inform the 1-hour mean NO₂ AQO.							

As shown in Table 12 a maximum total DS scenario PM₁₀ concentration of 16.4 µg/m³ has been predicted ER23. A maximum predicted change in annual mean PM₁₀ concentrations associated with the additional development trips is 0.7 µg/m³ predicted at ER25, representing 1.7% of the annual mean AQO. Considering the maximum total DS scenario annual mean concentration of 15.4 µg/m³, representing 41% of the AQO, the impact following the EPUK and IAQM guidance can be considered 'negligible'.

At all existing receptors considered, the magnitude of impact is considered to be 'negligible'. As such, the overall significance of the operational phase of road traffic emission impacts on annual mean PM₁₀ concentrations has been determined to be not significant in line with the EPUK and IAQM guidance.

A methodology is presented within LAQM.TG(16) to determine compliance with the 24-hour mean PM₁₀ objective, using the following relationship:

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

Based upon the maximum predicted PM₁₀ concentration of 16.4 µg/m³, this equates to 1 day when the 24-hour mean PM₁₀ concentrations are greater than 50 µg/m³ therefore the number of exceedances are within the 35-day compliance limit for the 24-hour mean PM₁₀ AQO and as such, there are no exceedances of the 24-hour mean PM₁₀ AQO.

Additional PM₁₀ results can be found in Appendix 5.

6.2.4 PM_{2.5} Annual Mean Modelling Results

Predicted annual mean PM_{2.5} concentrations were assessed against the PM_{2.5} AQO of 25 µg/m³ at locations of relevant exposure. Full results of the predicted PM_{2.5} concentrations can be found in Appendix 5.

A maximum PM_{2.5} concentration of 10.6 µg/m³ has been predicted at ER23. A maximum predicted change in annual mean PM_{2.5} concentrations associated with additional development trips is 0.4 µg/m³, representing 1.6 % of the AQO, as predicted at ER25. Considering a total 'DS' annual mean concentration of 10.6 µg/m³ representing 42 % of the AQO, the impact following the EPUK and IAQM guidance can be considered as 'negligible'.

At all existing receptors considered, the magnitude of impact is predicted to be negligible. As such, the overall significance of operational phase road traffic emission impacts on annual mean PM_{2.5} was determined to be not significant in line with EPUK and IAQM guidance¹⁷.

6.3 Road Traffic Impacts - Scenario 1B

The results of Scenario 1B are presented in the following sections. The operational phase vehicle emissions associated with this Scenario have been used to predict concentrations at locations of relevant exposure to the NO₂, AQOs for existing receptors. PM₁₀ and PM_{2.5} results have not been presented in the following sections as no exceedances nor impacts have been predicted for Scenario 1A. Scenario 1B represents a more 'realistic' distribution where the trip generation for the Proposed Development is routed using a more 'realistic' distribution based on the Journey to Work census data and Hydrock's local knowledge of the surrounding road network. The majority of trips associated with this scenario are for commuters and deliveries. The minority of trips are associated with new residents of the Poland Street NDF Zone.

6.3.1 Road Traffic Impacts – NO₂ Results

Predicted annual mean NO₂ concentrations were assessed against the AQO of 40 µg/m³ at locations of relevant exposure to the annual mean AQO e.g. residential properties and first floor locations at a height of 4.5m. In addition, locations of relevant exposure to the short term AQO have also been included and assessed against the AQAL of 60 µg/m³ which is the indicative criteria set out in the EPUK/IAQM guidance at which point an exceedance of the 1-hour mean AQO may be exceeded. Table 13 shows the predicted impact of the Proposed Development traffic on NO₂ concentrations. Full details of the existing receptors are provided in Table 3 and shown in Figure 2. Additional NO₂ results can be found in Appendix 5.

Table 13 Predicted Annual Mean NO₂ Concentrations in 2026 Scenario 1B

Receptor	Relevant AQO	DM Concentration (µg/m ³)	DS Concentration (µg/m ³)	Change (µg/m ³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER1	LT	26.2	27.3	1.1	68.4%	2.8%	Negligible
ER2	ST	25.7	26.3	0.6	43.8%	1.0%	Negligible
ER3	LT	29.2	30.6	1.4	76.6%	3.6%	Slight
ER4	LT	28.9	29.5	0.6	73.8%	1.5%	Negligible
ER5	LT	35.7	36.1	0.4	90.1%	0.9%	Negligible
ER6	LT	39.1	39.6	0.5	98.9%	1.2%	Slight
ER7	LT	35.7	36.1	0.3	90.2%	0.8%	Negligible
ER8	LT	32.3	32.5	0.2	81.3%	0.6%	Negligible
ER9	LT	26.0	26.4	0.4	66.0%	1.1%	Negligible
ER10	LT	25.2	25.5	0.3	63.7%	0.6%	Negligible
ER11	LT	35.9	36.3	0.4	90.8%	0.9%	Negligible
ER12	LT	33.2	33.4	0.2	83.5%	0.4%	Negligible
ER13	LT	25.2	25.7	0.5	64.2%	1.3%	Negligible

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER14	LT	29.0	29.1	0.1	72.7%	0.2%	Negligible
ER15	LT	30.3	30.5	0.1	76.1%	0.3%	Negligible
ER16	ST	31.1	32.2	1.2	53.7%	2.0%	Negligible
ER17	LT	29.4	30.4	1.0	76.1%	2.5%	Slight
ER18	LT	28.1	29.0	0.9	72.4%	2.2%	Negligible
ER19	LT	25.1	25.6	0.5	64.0%	1.3%	Negligible
ER20	LT	32.4	33.8	1.4	84.5%	3.5%	Slight
ER21	LT	27.7	28.5	0.8	71.2%	1.9%	Negligible
ER22	LT	26.5	27.5	1.1	68.8%	2.7%	Negligible
ER23	ST	39.5	40.9	1.4	68.1%	0.7%	Negligible
ER24	LT	32.5	33.2	0.7	82.9%	1.6%	Slight
ER25	LT	33.9	34.3	0.4	85.8%	1.0%	Negligible
ER26	ST	27.2	27.8	0.6	46.40%	1.07%	Negligible
Notes LT = Long term AQAL of 40 µg/m³ for NO₂ and PM₁₀ and 25 µg/m³ for PM_{2.5} assessed against the annual mean AQOs ST = Short term AQAL assessed against the indicative annual mean concentration of 60 µg/m³ to inform the 1-hour mean NO₂ AQO.							

As presented in Table 13 there are no exceedances of the annual mean NO₂ AQO at the existing receptors.

The maximum predicted change in annual mean NO₂ concentrations associated with the DS scenario at existing receptors is 1.4 µg/m³, which represents 3.5% of the annual mean AQO at ER20. The DS annual mean concentration at this receptor is 33.8 µg/m³. In accordance with the EPUK and IAQM guidance, the impact at these receptors is considered to be 'slight adverse'. This receptor represents a worst-case impact from the road traffic associated with the operation of the Proposed Development.

There are five 'slight adverse' impacts predicted at, ER3, ER6, ER17, ER20 and ER24. The impact at all other existing receptors is predicted to be 'negligible' in accordance with the EPUK and IAQM guidance.

The impacts on existing receptors range from 'negligible' to 'slight adverse' in the vicinity of the Proposed Development prior to the implementation of mitigation measures. As such, the overall significance of the operational phase of road traffic emission impacts on annual mean NO₂ concentrations has been determined to be not significant without any mitigation in line with the EPUK and IAQM guidance.

6.4 Road Traffic Impacts - Scenario 2A

The results of the detailed dispersion modelling for Scenario 2A are presented in the following sections. The operational phase vehicle emissions associated with this Scenario have been used to predict concentrations at locations of relevant exposure to the NO₂, PM₁₀ and PM_{2.5} AQOs for existing receptors. The majority of trips are associated new residents of the Poland Street NDF Zone. The minority of trips are associated with commuters and Deliveries. The vehicle trips for this Scenario have been routed using a worst-case distribution of 100% using Livesey Street as detailed in Section 3.4.1. Full details of the existing receptors are provided in Table 3 and shown in Figure 2.

6.4.1 Road Traffic Impacts – NO₂ Results

Predicted annual mean NO₂ concentrations were assessed against the AQO of 40 µg/m³ at locations of relevant exposure to the annual mean AQO e.g. residential properties and first floor locations at a height of 4.5m. In addition, locations of relevant exposure to the short term AQO have also been included and assessed against the AQAL of 60 µg/m³ which is the indicative criteria set out in the EPUK/IAQM guidance at which point an exceedance of the 1-hour mean AQO may be exceeded. Table 13 shows the predicted impact of the Proposed Development traffic on NO₂ concentrations. Full details of the existing receptors are provided in Table 3 and shown in Figure 2. Additional NO₂ results can be found in Appendix 5.

Table 14 Predicted Annual Mean NO₂ Concentrations in 2029 Scenario 2A

Receptor	Relevant AQO	DM Concentration (µg/m ³)	DS Concentration (µg/m ³)	Change (µg/m ³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER1	LT	26.2	27.6	1.4	69%	3%	Negligible
ER2	ST	25.7	26.3	0.6	44%	1%	Negligible
ER3	LT	29.2	30.9	1.7	77%	4%	Slight
ER4	LT	32.1	33.0	0.9	83%	2%	Slight
ER5	LT	35.7	36.1	0.4	90%	1%	Negligible
ER6	LT	39.1	39.6	0.5	99%	1%	Slight
ER7	LT	35.7	36.1	0.4	90%	1%	Negligible
ER8	LT	32.3	32.5	0.3	81%	1%	Negligible
ER9	LT	26.0	26.4	0.4	66%	1%	Negligible
ER10	LT	25.2	25.5	0.3	64%	1%	Negligible
ER11	LT	35.9	36.3	0.4	91%	1%	Negligible
ER12	LT	33.2	33.4	0.2	83%	0%	Negligible
ER13	LT	25.2	25.9	0.7	65%	2%	Negligible
ER14	LT	29.0	31.0	2.0	77%	5%	Slight
ER15	LT	30.3	32.0	1.7	80%	4%	Slight
ER16	ST	31.1	31.3	0.3	52%	0%	Negligible
ER17	LT	29.4	29.6	0.2	74%	1%	Negligible
ER18	LT	28.1	28.2	0.1	70%	0%	Negligible
ER19	LT	25.1	25.1	0.0	63%	0%	Negligible
ER20	LT	32.4	32.4	0.0	81%	0%	Negligible
ER21	LT	27.7	28.5	0.8	71%	2%	Negligible
ER22	LT	26.4	27.8	1.4	70%	3%	Negligible
ER23	ST	39.5	43.0	3.5	72%	6%	Slight
ER24	LT	32.5	35.4	2.9	88%	7%	Moderate
ER25	LT	33.9	37.8	3.9	95%	10%	Moderate
ER26	ST	27.2	28.0	0.8	14%	0%	Negligible

Receptor	Relevant AQO	DM Concentration ($\mu\text{g}/\text{m}^3$)	DS Concentration ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
<u>Notes</u> LT = Long term AQAL of 40 $\mu\text{g}/\text{m}^3$ for NO₂ and PM₁₀ and 25 $\mu\text{g}/\text{m}^3$ for PM_{2.5} assessed against the annual mean AQOs ST = Short term AQAL assessed against the indicative annual mean concentration of 60 $\mu\text{g}/\text{m}^3$ to inform the 1-hour mean NO₂ AQO.							

As presented in Table 14 there are no exceedances of the annual mean NO₂ AQO at the worst-case existing receptors.

The maximum predicted change in annual mean NO₂ concentrations associated with the DS scenario at existing receptors is 3.9 $\mu\text{g}/\text{m}^3$, which represents 10% of the annual mean AQO at ER2. The DS annual mean concentration at this receptor is 37.8 $\mu\text{g}/\text{m}^3$ and 95% of the annual mean AQO. In accordance with the EPUK and IAQM guidance, the impact at these receptors is considered to be 'moderate adverse'. This receptor represents a worst-case impact from the road traffic associated with the operation of the Proposed Development. There is also a 'moderate adverse' impact predicted at ER24.

There are six 'slight adverse' impacts predicted at, ER3, ER4, ER6, ER14, ER15 and ER23. The impact at all other existing receptors is predicted to be 'negligible' in accordance with the EPUK and IAQM guidance.

The impacts on existing receptors range from 'negligible' to 'moderate adverse' in the vicinity of the Proposed Development prior to the implementation of mitigation measures. As such, the overall significance of the operational phase of road traffic emission impacts on annual mean NO₂ concentrations has been determined to be significant without any mitigation in line with the EPUK and IAQM guidance.

The routing for Scenario 2A assumes 100% of the vehicle trips travelling north toward Rochdale Road route down Livesey Street and therefore presents a worst-case assessment. In reality, based on information provided by Hydrock, this would not be the case, based on 2011 Journey to Work Census data and Hydrock's local knowledge of the road network. As such, additional scenarios have been assessed and the results are presented in subsequent sections.

6.4.2 Road Traffic Impacts – PM₁₀ Annual Mean Results

At all existing receptors in Scenario 2A the magnitude of impact of PM₁₀ concentrations can be considered 'Negligible'. As such, the overall significance of the operational phase of road traffic emission impacts on annual mean PM₁₀ concentrations has been determined to be not significant in line with the EPUK and IAQM guidance. Full modelling results for Scenario 2A are presented in Appendix 5.

6.4.3 Road Traffic Impacts – PM_{2.5} Annual Mean Results

At all existing receptors in Scenario 2A the magnitude of impact of PM_{2.5} concentrations can be considered 'Negligible'. As such, the overall significance of the operational phase of road traffic emission impacts on annual mean PM_{2.5} concentrations has been determined to be not significant in line with the EPUK and IAQM guidance. Full modelling results for Scenario 2A are presented in Appendix 5.

6.5 Road Traffic Impacts - Scenario 2B

The results of the detailed dispersion modelling for Scenario 2B are presented in the following sections. The operational phase vehicle emissions associated with this Scenario have been used to predict concentrations at locations of relevant exposure to the NO₂, AQOs for existing receptors. PM₁₀ and PM_{2.5} results have not been presented in the following sections as no exceedances nor impacts have been predicted for Scenario 2A. The majority of trips associated with this scenario are associated with new residents of the Poland Street NDF Zone. The minority of trips are associated with commuters and deliveries.. The vehicle trips for this Scenario have been routed using a more 'realistic' distribution based on the Journey to Work census data and Hydrock's

local knowledge of the surrounding road network. Full details of the modelling scenarios have been provided in Section 3.4.1.

6.5.1 Road Traffic Impacts – NO₂ Annual Mean Results

Predicted annual mean NO₂ concentrations were assessed against the AQO of 40 µg/m³ at locations of relevant exposure to the annual mean AQO e.g. residential properties and first floor locations at a height of 4.5m. In addition, locations of relevant exposure to the short term AQO have also been included and assessed against the AQAL of 60 µg/m³ which is the indicative criteria set out in the EPUK/IAQM guidance at which point an exceedance of the 1-hour mean AQO may be exceeded. Table 15 shows the predicted impact of the Proposed Development traffic on NO₂ concentrations. Full details of the existing receptors are provided in Table 3 and shown in Figure 2. Additional NO₂ results can be found in Appendix 5.

Table 15 Predicted Annual Mean NO₂ Concentrations in 2029 Scenario 2B

Receptor	Relevant AQO	DM Concentration (µg/m ³)	DS Concentration (µg/m ³)	Change (µg/m ³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER1	LT	26.2	27.6	1.4	69%	3%	Negligible
ER2	ST	25.7	26.3	0.6	44%	1%	Negligible
ER3	LT	29.2	30.9	1.7	77%	4%	Slight
ER4	LT	32.1	33.0	0.9	83%	2%	Slight
ER5	LT	35.7	36.1	0.4	90%	1%	Negligible
ER6	LT	39.1	39.6	0.5	99%	1%	Slight
ER7	LT	35.7	36.1	0.4	90%	1%	Negligible
ER8	LT	32.3	32.5	0.3	81%	1%	Negligible
ER9	LT	26.0	26.4	0.4	66%	1%	Negligible
ER10	LT	25.2	25.5	0.3	64%	1%	Negligible
ER11	LT	35.9	36.3	0.4	91%	1%	Negligible
ER12	LT	33.2	33.4	0.2	83%	0%	Negligible
ER13	LT	25.2	25.9	0.7	65%	2%	Negligible
ER14	LT	29.0	29.1	0.1	73%	0%	Negligible
ER15	LT	30.3	30.5	0.1	76%	0%	Negligible
ER16	ST	31.1	32.5	1.4	54%	2%	Negligible
ER17	LT	29.4	30.6	1.2	77%	3%	Slight
ER18	LT	28.1	29.1	1.0	73%	3%	Negligible
ER19	LT	25.1	25.7	0.6	64%	2%	Negligible
ER20	LT	32.4	34.1	1.7	85%	4%	Slight
ER21	LT	27.7	28.5	0.8	71%	2%	Negligible
ER22	LT	26.4	27.8	1.4	70%	3%	Negligible
ER23	ST	39.5	41.0	1.6	68%	3%	Negligible
ER24	LT	32.5	33.3	0.8	83%	2%	Slight

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER25	LT	33.9	34.4	0.5	57%	1%	Negligible
ER26	ST	27.2	28.0	0.8	70%	2%	Negligible
Notes LT = Long term AQAL of 40 µg/m³ for NO ₂ and PM ₁₀ and 25 µg/m³ for PM _{2.5} assessed against the annual mean AQOs ST = Short term AQAL assessed against the indicative annual mean concentration of 60 µg/m³ to inform the 1-hour mean NO ₂ AQO.							

As presented in Table 15 there are no exceedances of the annual mean NO₂ AQO at the worst-case existing receptors.

The maximum predicted change in annual mean NO₂ concentrations associated with the DS scenario at existing receptors is 1.7 µg/m³, which represents 4% of the annual mean AQO at ER20. The DS annual mean concentration at this receptor is 34.1 µg/m³. In accordance with the EPUK and IAQM guidance, the impact at these receptors is considered to be 'slight adverse'. This receptor represents a worst-case impact from the road traffic associated with the operation of the Proposed Development.

There are six 'slight adverse' impacts predicted at, ER3, ER4, ER6, ER17, ER20 and ER24. The impact at all other existing receptors is predicted to be 'negligible' in accordance with the EPUK and IAQM guidance.

The impacts on existing receptors range from 'negligible' to 'slight adverse' in the vicinity of the Proposed Development prior to the implementation of mitigation measures. As such, the overall significance of the operational phase of road traffic emission impacts on annual mean NO₂ concentrations has been determined to be not significant without any mitigation in line with the EPUK and IAQM guidance.

6.5.2 Road Traffic Impacts – PM₁₀ Annual Mean Results

At all existing receptors in Scenario 2B the magnitude of impact of PM₁₀ concentrations can be considered 'Negligible'. As such, the overall significance of the operational phase of road traffic emission impacts on annual mean PM₁₀ concentrations has been determined to be not significant in line with the EPUK and IAQM guidance. Full modelling results for Scenario 2B are presented in Appendix 5.

6.5.3 Road Traffic Impacts – PM_{2.5} Annual Mean Results

At all existing receptors in Scenario 2B the magnitude of impact of PM_{2.5} concentrations can be considered 'Negligible'. As such, the overall significance of the operational phase of road traffic emission impacts on annual mean PM_{2.5} concentrations has been determined to be not significant in line with the EPUK and IAQM guidance. Full modelling results for Scenario 2B are presented in Appendix 5.

6.6 Site Suitability Assessment

6.6.1 1-Hour Mean NO₂ Concentrations

Annual mean NO₂ concentrations have been predicted at Proposed Receptors across the Application Site at worst case locations.

Table 16 Site Suitability Results

Receptor	DS NO ₂ Concentration (µg/m³)				Short term AQO exceeded?
	Scenario 1A	Scenario 1B	Scenario 2A	Scenario 2B	
PR_1	26.0	26.0	26.2	26.2	No
PR_2	31.8	31.8	32.2	32.2	No

Receptor	DS NO ₂ Concentration (µg/m ³)				Short term AQO exceeded?
	Scenario 1A	Scenario 1B	Scenario 2A	Scenario 2B	
PR_3	26.9	26.9	27.1	27.1	No

The maximum predicted DS concentration at Proposed Receptors is 32.2 µg/m³ for Scenario 2A and 2B. A methodology is presented within LAQM.TG(16) to determine compliance with the 1-hour mean NO₂ AQO. This Guidance states that:

'[...] exceedances of the NO₂ 1-hour mean are unlikely to occur where the annual mean is below 60 µg/m³'.

Based on the results of the dispersion modelling, there are no existing receptor locations where the predicted annual mean concentration exceeds the annual mean NO₂ indicative concentration of 60 µg/m³ used to inform compliance with the short term AQO. Full results of the predicted concentrations at Proposed Receptors is presented in Appendix 5.

6.6.2 Significance of Air Quality Impacts

To determine the significance of predicted air quality impacts based upon the detailed dispersion modelling, such as that undertaken as part of this assessment, the EPUK and LAQM guidance states:

“Where the air quality is such that an AQO 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.”

With regards to the Proposed Development, the unmitigated impact significance associated with the Proposed Development has been predicted in accordance with the stated assessment methodology. The following factors have been considered when providing justification:

- The maximum predicted change of annual mean NO₂ concentrations is 10% of the AQO in Scenario 2A. The DS total NO₂ concentration at this receptor is 95% of the AQO. Therefore, an unmitigated ‘moderate adverse’ impact is predicted at ER25 in accordance with the assessment methodology.
- Moderate adverse impacts have been predicted at existing receptors along Livesey Street when using the Scenario 2A worst-case distribution of 100% of the vehicle trips are routed along this road. No Exceedances of the AQO are predicted to be created by the operation of the Proposed Development.
- When a more realistic routing Scenario 2B is used, these moderate impacts are no longer predicted. ‘Slight adverse’ impact have still been predicted at six existing receptors in Scenario 2B with a new slight adverse impact predicted at ER20 along Oldham Road.
- When account of worst-case trip generation, emission factors and background concentrations are allowed for it is considered that the Proposed Development is unlikely to result in Moderate impacts.
- The maximum predicted percentage change of the annual mean PM₁₀ concentrations at existing receptors is ‘1% of the AQO’. An unmitigated ‘negligible’ impact is predicted at all receptor locations in accordance with the assessment methodology.
- The maximum predicted percentage change of the annual mean PM_{2.5} concentrations at existing receptors is ‘1% of the AQO’. An unmitigated ‘negligible’ impact is predicted at all receptor locations in accordance with the assessment methodology.
- The Proposed Development will not introduce any new receptor into an area of exceedance of the 1-hour mean NO₂ AQO based upon the site suitability assessment.

Based on the above assessment results, specifically Scenario 2B, the overall effect is considered to be ‘not significant’. As part of the scheme, mitigation measures are still to be included to further reduce the impact of the Proposed Development on local air quality. Detail of mitigation measures are provided in Section 7.2.

The overall aim of the Mobility Hub and associated delivery hub is to reduce and confine vehicle trips in the Ancoats area as well as providing a coordinated alternative to deliveries to the Poland Street NDF Zone developments. The Mobility Hub is located toward to edge of Ancoats which is expected to reduce vehicles

routing through the area, improving public realm. The provision of the Mobility Hub will aim to provide a betterment in terms of traffic in the Poland Street NDF Zone which has the potential to lead to improvements in local air quality.

7. Mitigation.

7.1 Construction Phase.

To mitigate the potential impacts during the construction phase it is recommended that mitigation measures as detailed in the IAQM guidance are implemented. These mitigation measures have been carefully selected for the Proposed Development and are based upon the dust risk categories outlined in the guidance¹⁸.

It is recommended that MCC approve a Dust Management Plan (DMP) prior to works commencing on site, and that this is implemented using an appropriately worded planning condition. Table 17 below details the measures that should be incorporated in the DMP. For general mitigation measures, which excludes those specifically targeted towards demolition, earthworks, construction and trackout (which are given towards the end of the table), 'medium risk' measures have been applied as these represent the highest risk category determined in Table 10. This approach is consistent with the IAQM guidance.

Table 17: Mitigation Measures

Issue	Mitigation Measure
Communications	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
Dust Management Plan	Develop and implement a DMP, which may include measures to control emissions, approved by the Local Authority. The DMP may include monitoring of dust deposition, dust flux, real-time PM ₁₀ continuous monitoring and/or visual inspections.
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 off- site, and the action taken to resolve the situation in the log book
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 check of surfaces such as street furniture, cars, windowsills within 100 m of the site boundary, with cleaning to be provided if necessary
	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 MCC. Where possible commence baseline monitoring at least three months before work commences on site.
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

Issue	Mitigation Measure
	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 cover as described below
	Cover, seed or fence stockpiles to prevent wind whipping
Operating vehicles/machinery and sustainable travel	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
	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 applicable)
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials
	Implement a Travel Plan that supports and encourages sustainable travel
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
	Minimize 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
Waste management	Avoid bonfires and burning of waste materials
Demolition	Soft strip inside building before demolition
	Ensure effective water suppression is used during demolition activities
	Bag and remove any biological debris before demolition
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable
	Use Hessian, mulches and trackifiers 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

Issue	Mitigation Measure
Construction	Avoid scabbling (roughening of concrete surfaces) if possible
	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
	For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust
	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
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 in continuous 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 log book
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable)

Potential dust effects during the construction phase are considered to be both temporary and short-term in nature. The impacts are determined to be 'temporary' as they will only potentially occur throughout the construction phase and 'short term' because these will only arise at particular times when certain activities and meteorological conditions combine to create the predicted level. Notwithstanding this, with the application of the above dust control and mitigation measures, it is considered that residual effect at all receptors will be 'not significant' in accordance with the IAQM guidance.

7.1.1 Construction Phase Road Traffic Emissions

The need for further assessment of the potential air quality impacts associated with construction phase road traffic emissions, principally HDV movements, have been screened out as they are considered to have an insignificant effect on air quality and mitigation measures are not required.

7.1.2 Construction Phase NRMM Emissions

In accordance with Part 4 of the IAQM Control of Dust and Emissions guidance, all NRMM would need to adhere to the emissions standards for NO₂ and PM₁₀ set out for NRMM. It is therefore considered the likely effects of construction plant on local air quality would be insignificant.

7.2 Operational Phase

7.2.1 Road Traffic Emissions

The detailed dispersion modelling of the impacts of additional road traffic associated with the operational phase of the Proposed Development has predicted no significant impacts at existing receptors in the vicinity of the Application Site where there is relevant exposure. However, a number of mitigation measures are still to be implemented into the scheme has been summarised below:

- Provision of Electric Vehicle (EV) charging points. 25% provision will initially be allocated with passive provision to all remaining spaces to 100% in the future.
- As part of the scheme 30 car parking spaces will be allocated to the car club and ride share.
- Speed mitigation measures in the form of coloured raised table surface within the vicinity of the Application Site access

- Double yellow lines proposed by Hydrock to reduce vehicle conflict

The recommended measures will help to mitigate the impacts associated with the operational phase of the Proposed Development on local air quality.

7.2.2 Site Suitability

The results of the detailed dispersion modelling show no exceedance of the 1-hour mean NO₂ AQO.

As no exceedance of the considered AQO is predicted, this follows the 1st hierarchy principle of the IAQM guidance 'to prevent and avoid exposure'²⁶. Therefore, no embedded mitigation into the Proposed Development design (in the form of filtration on mechanical ventilation, for example) is required.

8. Summary and Conclusions.

This report details the potential air quality impacts associated with the construction and operation of the Ancoats Mobility Hub at land bound by Poland Street, Ancoats, Manchester.

The findings of the assessment are as follows:

- A qualitative assessment of the potential dust impacts during the construction of the Proposed Development has been undertaken. Through good practice and implementation of appropriate mitigation measures, it is expected that the release of dust would be effectively controlled and mitigated, with resulting impacts considered to be 'not significant'. All dust impacts are considered to be temporary and short-term in nature;
- Detailed dispersion modelling has been undertaken to assess the impacts of the additional vehicle trips associated with the operational phase of the Proposed Development. The results of the detailed dispersion modelling show the impacts of the additional development vehicle trips are predicted to range from 'negligible adverse' to 'moderate adverse' for Scenario 2A, which represents a worst case assessment.
- Scenario 2B represents a more realistic scenario. The results of the detailed dispersion modelling show the impacts of the additional development vehicle trips are predicted to range from 'slight adverse' to negligible adverse' in accordance with the EPUK and IAQM guidance and as such the overall effect is considered to be 'not significant'.
- As part of the Proposed Development, a number of mitigation measures are proposed to reduce the impact of the operational phase vehicle trips on local air quality.
- The Site Suitability assessment has been undertaken to assess the suitability of the Application Site for the proposed uses. NO₂ concentrations are not predicted to be in exceedance of the 1-hour mean NO₂ AQO. Therefore, the Application Site is considered suitable for the Proposed Development and mitigation measures are not required.
- Energy provision for the ground floor commercial units will be provided by an all-electric incorporating electric panel heaters for space heating and electric immersion heaters for domestic hot water with no combustion processes. Consequently, there will be no impact on local air quality from the energy plant and no mitigation measures are required.

Based on the assessment results, it is considered that air quality should not be viewed as a constraint to planning and the Proposed Development conforms to the principles of National Planning Policy Framework and the MCC Local Plan.

9. Glossary of Terms.

AADT	Annual Average Daily Traffic
AQA	Air Quality Assessment
AQMA	Air Quality Management Area
AQO	Air Quality Objective
Defra	Department for Environment, Food and Rural Affairs
DMP	Dust Management Plan
EPUK	Environmental Protection UK
HDV	Heavy Duty Vehicles (> 3.5 tonnes gross vehicle weight)
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LDV	Light Duty Vehicles ($\leq$ 3.5 tonnes gross vehicle weight)
$\mu\text{g}/\text{m}^3$	Micrograms per cubic metre
MCC	Manchester City Council
NDF	Neighbourhood Development Framework
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides (taken to be $\text{NO}_2 + \text{NO}$)
NPPF	National Planning Policy Framework
NRMM	Non-Road Mobile Machinery
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PM_{10}	Particulate matter with an aerodynamic diameter less than 10 micrometres
$\text{PM}_{2.5}$	Particulate matter with an aerodynamic diameter less than 2.5 micrometres
PPG	Planning Practice Guidance
SPG	Supplementary Planning Guidance
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
Trackout	The process involving the transport of dust and dirt from the construction / demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction / demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site

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Appendix 1 – Proposed Development Plans.

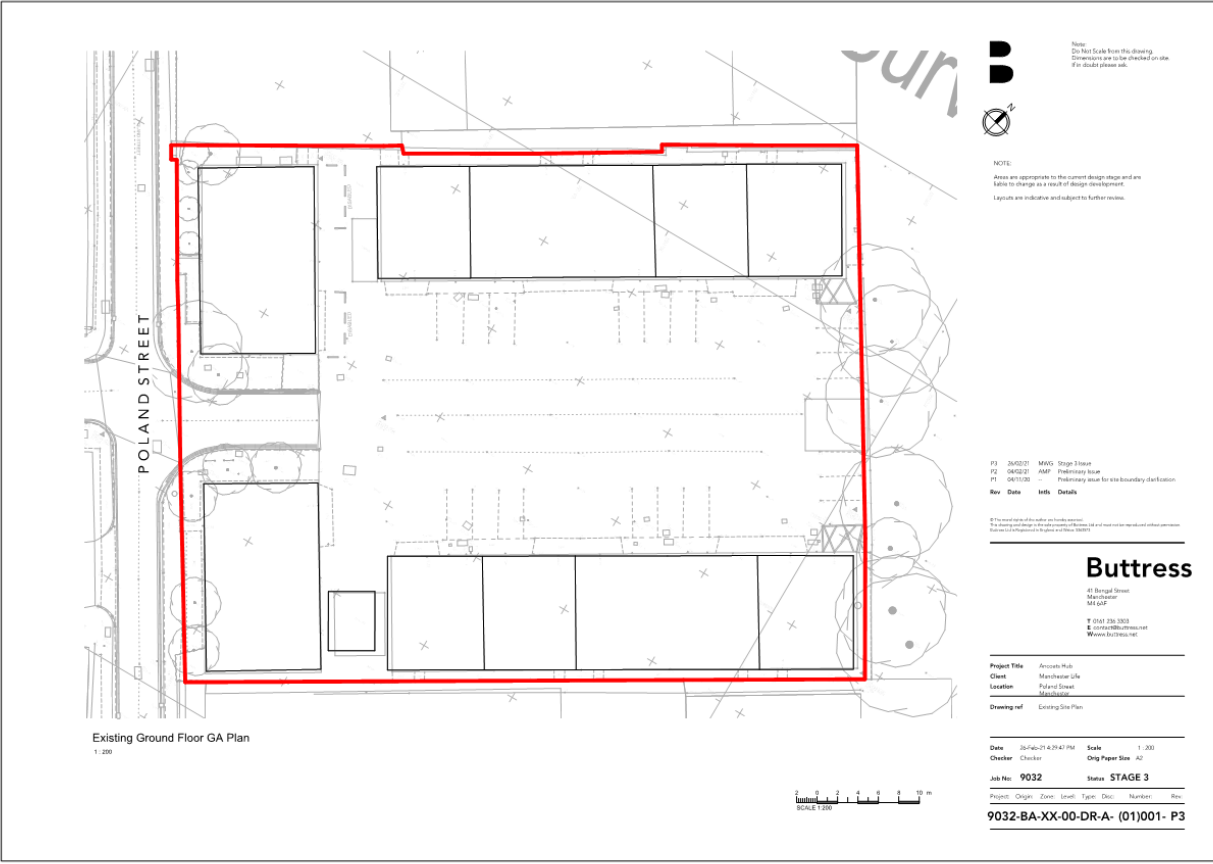


Figure 7 Existing Site Plan. Source Document Buttress 9032-BA-XX-00-DR-A

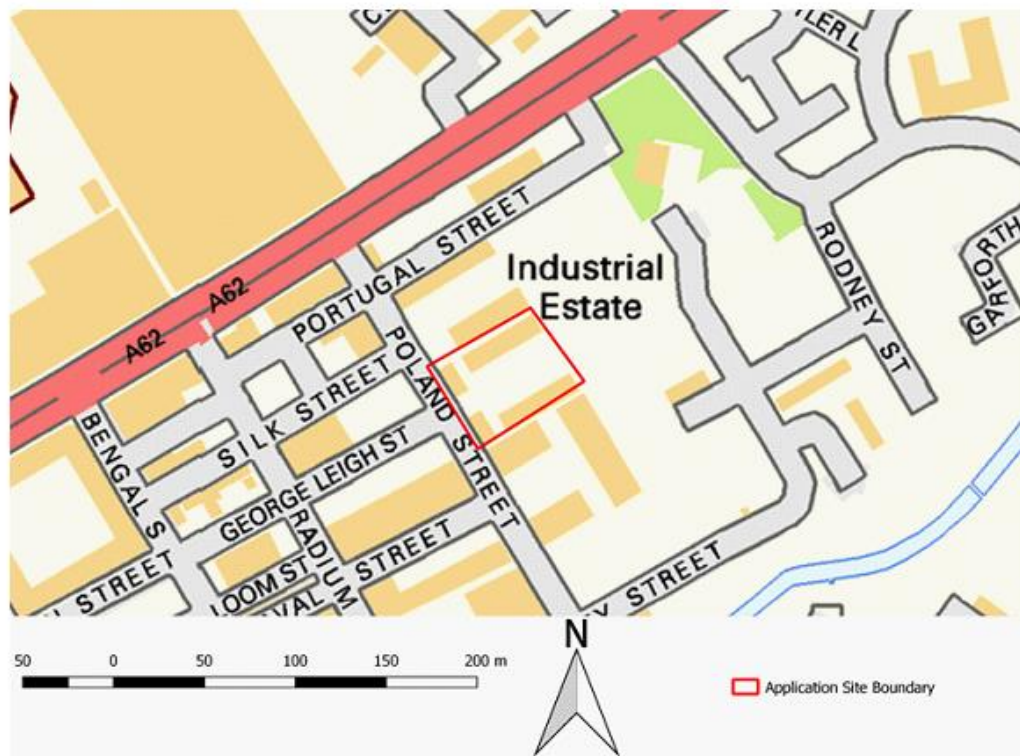
Appendix 2 - EHO Consultation.

Benny Pygott

From: Benny Pygott
Sent: 09 April 2021 16:44
To: karen.williamson@manchester.gov.uk
Cc: Kathryn Woolley
Subject: Ancoats Mobility Hub - Air Quality Scope of Assessment

Good afternoon Karen,

Hoare Lea have been instructed to undertake an air quality assessment for the proposed Ancoats Mobility Hub at land bound by Poland Street. The Proposed Development will consist of up to 408 parking spaces within a building up to 8 storeys. As part of the proposals there will be a ground floor retail unit (Use Class E (b)), delivery hub and cycle hub.



Hoare Lea propose to undertake the assessment using the following methodology:

- A baseline assessment will be undertaken using data from Manchester City Council's most recent Annual Status Report (June 2020).
- Defra's background pollution maps will be used to establish background concentrations in the area.
- As part of the proposals there will be up to 408 car parking spaces. It has been confirmed by the appointed Transport Consultant that the scheme will result in a net increase in vehicle trips that will exceed the indicative criteria within the EPUK & IAQM guidance for roads within an AQMA as it is noted that sections of Oldham Road are within the wider Manchester AQMA. As such, a detailed assessment of the impacts of road traffic will be carried out using ADM S-Roads dispersion model software at nearby sensitive receptor locations.
- The dispersion model will be verified using MCC diffusion tube location on Great Ancoats Street (MA71NO), Rochdale Road (MA36NO), Ashton Old Road (MA95BNO) and A6010 Pottery Lane (MA86ANO) for 2019. We propose to use 2019 Defra background concentrations and Manchester Airport (2019) as the meteorological station. Please could you confirm this approach is acceptable?

- A quantitative site suitability assessment will be undertaken which will consider short term NO₂ concentrations at locations of relevant exposure at the Application Site.
- Due to the proposed car park use, there will be limited energy demand. Space and water heating for the retail units and delivery/cycle hubs will be provided by an all-electric approach with no on-site combustion plant and no therefore no emissions. As such, no further assessment is required.
- The assessment will consider impacts during the construction phase of the development, using the IAQM 'Guidance on the Assessment of Dust from Demolition and Construction' 2014.
- The assessment will be undertaken in line with the EPUK and IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality' January 2017.
- If any impacts are observed, suitable mitigation will be recommended.

I would be grateful if you could please confirm your acceptance of the proposed methodology and provide me with any comments you may have.

Please do not hesitate to contact me if you would like to discuss anything further.

Best wishes,

Benny Pygott
Graduate Air Quality Consultant

DDI +44 161 672 7152
Tel +44 161 834 4754
Email bennypygott@hoareleas.com



From: Laura Miller
Sent: 16 April 2021 08:52
To: 'BennyPygott@hoarelea.com' <BennyPygott@hoarelea.com>
Subject: Ancoats Mobility Hub

Good morning Benny,

I have been passed your email as I am the district officer for the Ancoats ward. Due to the nature of this development I need to discuss the proposals with our AQ lead. She is currently on leave and we have booked some time to look at this on Tuesday afternoon and I will feed back our comments after this meeting.

Kind Regards

Laura

Laura Miller (MRes, MA, BSc(Hons))

Please note that due to working compressed hours Wednesdays are a non-working day for me, I will respond to your email when I return to the office

Environmental Protection Section
Environmental Health
Neighbourhoods Directorate
Manchester City Council

Telephone: 0161 234 5004
email: laura.miller@manchester.gov.uk
website: www.manchester.gov.uk

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Benny Pygott

From: Laura Miller <laura.miller@manchester.gov.uk>
Sent: 22 April 2021 07:39
To: Benny Pygott
Subject: FW: Ancoats Mobility Hub

[External email]

Good morning Benny,

I am sorry for the delay replying to you.

In general your proposals look reasonable but we would like the following to also be included:

1. Consideration of other committed developments in the area (especially during the construction phase) – information can be found via our planning department - <https://pa.manchester.gov.uk/online-applications/> (there have been some issues with the portal lately so please keep trying if it does not work the first time, it has been reported but the root cause has not been found yet)
2. The nearest sensitive receptors are residents at 6 Poland Street and those using Ancoats Green
3. You need to also include PM10 and PM2.5 in the assessment
4. The emissions from LGVs using the parcel hub also need to be included in the assessment as well as cars using the car park.

If you require any further information about this site please contact me.

Kind Regards

Laura

Laura Miller (MRes, MA, BSc(Hons))

Please note that due to working compressed hours Wednesdays are a non-working day for me, I will respond to your email when I return to the office

Environmental Protection Section
Environmental Health
Neighbourhoods Directorate
Manchester City Council

Benny Pygott

From: Benny Pygott
Sent: 04 May 2021 17:31
To: 'Laura Miller'
Cc: Kathryn Woolley
Subject: RE: Ancoats Mobility Hub

Good afternoon Laura,

Thank you very much for your comments on our proposed scope of assessment. I have responded to each of your comments below in blue

1. Consideration of other committed developments in the area (especially during the construction phase) – information can be found via our planning department - <https://pa.manchester.gov.uk/online-applications/> (there have been some issues with the portal lately so please keep trying if it does not work the first time, it has been reported but the route cause has not been found yet).
 - The traffic data provided by the schemes appointed transport consultant has been based on a future year baseline traffic data has been provided for 2026 and sourced from TfGM which includes committed developments. A full list of committed development will be provided within the Air Quality Assessment once confirmed with TfGM and the transport consultant.
 - The Proposed Development quantum is not anticipated to result in a significant increase in vehicle movements during the construction phase (>25AADT HDV). The duration of movements are considered to be short-term in nature. As such, in accordance with the EPUK and IAQM guidance, additional road vehicle trips during the construction phase “can be considered to have insignificant effects” on local air quality. The impact from the construction phase road traffic emissions is expected to be negligible. Adequate mitigation measures will be put in place to prevent impacts occurring and will be included within a CEMP. Consequently, it is unlikely that committed developments will result in any further impact as these controls in the CEMP will be in place.
2. The nearest sensitive receptors are residents at 6 Poland Street and those using Ancoats Green
 - Please see below figure of sensitive receptors that have been considered as part of our assessment. These sensitive receptors have been assessed at ground floor (1.5m) and first floor (4.5) against the long term and short term air quality objectives where relevant for NO₂, PM₁₀ and PM_{2.5}.
 - We have reviewed the information available on the MCC Planning Portal in relation to the sensitive receptors at 6 Poland Street. Since the submission of 119090/FO/2018 for the conversion of the ground floor into residential units, there has been a more recent application submitted on 20th April 2021 (129986/FO/2021) on behalf of J'Adore Models which seeks to 'form a new headquarters for the business having been previously located in AWOL Studio at Hope Mill for a number of years'. As such, we believe there will no residential uses at ground floor level at this location. Receptors at this location will be assessed against the short-term Air Quality Objectives for NO₂ and PM₁₀. Please could you confirm agreement of the above approach?
 - A receptor has been included at a worst case location for Ancoats Green.
3. You need to also include PM10 and PM2.5 in the assessment This has been assessed as part of our detailed dispersion modelling at locations of relevant exposure.
4. The emissions from LGVs using the parcel hub also need to be included in the assessment as well as cars using the car park. The traffic data provided by the schemes appointed transport consultant has been split to provide the breakdown of trips associated with Residents of the nearby development, commuters and parcel delivery. The Air Quality Assessment has considered all trips associated with all users, including vehicle trips associated the delivery hub. For your information, the splits for the Proposed Development when 100 spaces are for residential users is as follows:

Residential	Work Commuter	Parcel Delivery
21.5%	25.0%	53.5%

As further residential developments are completed, the proportion of residential users is expected to increase and the proportion of users associated with work commuters will reduce. Therefore multiple scenarios have been modelled to reflect this change. We are happy to discuss the model scenarios once you have received our report.

If you would like to discuss any of the above points in further detail, please do not hesitate to get in touch.

Best wishes,

Benny Pygott
Graduate Air Quality Consultant

DDI +44 161 672 7152
Tel +44 161 834 4754
Email bennypygott@hoarelealea.com



Benny Pygott

From: Laura Miller <laura.miller@manchester.gov.uk>
Sent: 10 May 2021 08:08
To: Benny Pygott
Subject: RE: Ancoats Mobility Hub

[External email]

Hi Benny,

I have read through your email and agree with your updates to the AQ assessment.

Kind Regards

Laura

Laura Miller (MRes, MA, BSc(Hons))

Please note that due to working compressed hours Wednesdays are a non-working day for me, I will respond to your email when I return to the office

Environmental Protection Section
Environmental Health
Neighbourhoods Directorate
Manchester City Council

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website: www.manchester.gov.uk

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Appendix 3 – IAQM Construction Phase Methodology.

The following tables have been taken from the IAQM guidance document 'Guidance on the Assessment of Dust from Demolition and Construction'¹⁸ and have been utilised to determine the sensitivity of the area and consider the risk of fugitive emissions as a result of construction activities.

A2-1 and A2-2 illustrate how the sensitivity of the area may be determined for dust soiling and human health, respectively. It should be noted that the highest level of sensitivity from each table should be considered, as recommended by the IAQM.

Table A2-1 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10 – 100	High	Medium	Low	Low
	1 – 10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table A2-2 Sensitivity of the Area to Human Health Effects

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32µg/m ³	>100	High	High	High	Medium	Low
		10 – 100	High	High	Medium	Low	Low
		1 – 10	High	Medium	Low	Low	Low
	28 – 32µg/m ³	>100	High	High	Medium	Low	Low
		10 – 100	High	Medium	Low	Low	Low
		1 – 10	High	Medium	Low	Low	Low
	24 – 28µg/m ³	>100	High	Medium	Low	Low	Low
		10 – 100	High	Medium	Low	Low	Low
		1 – 10	Medium	Low	Low	Low	Low
	<24µg/m ³	>100	Medium	Low	Low	Low	Low
		10 – 100	Low	Low	Low	Low	Low

		1 – 10	Low	Low	Low	Low	Low
Medium	>32µg/m ³	>10	High	Medium	Low	Low	Low
		1 – 10	Medium	Low	Low	Low	Low
	28 – 32µg/m ³	>10	Medium	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
	24 – 28µg/m ³	>10	Low	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
	<24µg/m ³	>10	Low	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
Low	-	1	Low	Low	Low	Low	Low

Table A2-3 and Table A2-4 illustrate how the dust emission magnitude should be combined with the sensitivity of the area to determine the risk of impacts with no mitigation measures applied.

Table A2-3 Risk of Dust Impacts – Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table A2-4 Risk of Dust Impacts – Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High	High Risk	Low Risk
Medium	Medium	Low Risk	Negligible
Low	Low	Low Risk	Negligible

Appendix 4 – Road Traffic Model Input Data.

A4.1 Model Input Parameters

Table 18 Model Input Parameters

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 within the assessment area of this dispersion modelling study. This value is for 'parkland, open suburbia' and therefore considered appropriate for the surface roughness of the dispersion modelling assessment area. For the meteorological site, a roughness length z_0 of 0.3m was used due to the more rural location of Manchester Airport
Road Source Emissions	Source of the emission factors used	EFT v.10.1
Emission Year	Modelling year used to factor the traffic emissions	2019 Verification year and future year traffic with 2019 as case sensitivity
NO _x to NO ₂ Conversion	Conversion from NO _x concentrations to NO ₂ concentrations	NO _x to NO ₂ calculator v8.1. General inputs: 2019, Manchester District, All other urban UK traffic
Road Type	Road type within the EFT emission database	England (urban)
Elevation of Road	Height of the road link above ground level	0m no elevation – roads are at ground level
Road Width	Width of the road link	Road width obtained from Google Street View
Road Speed	Road speed in km/h	Variable based on posted limit and adjustment for road geometry in line with LAQM.TG(16)
Time Varied Emissions	Daily, weekly or monthly variations in emissions applied to road sources	None applied.
Meteorology	Representative hourly sequential meteorological data	Manchester Airport 2019
Background	Background pollutant concentration considered during the modelling	Defra background concentrations for verification grid square x 385500, y 399500 and x 386500, y 397500 and x 387500, y 396500
Output	Output as gridded or specified points	At specified points as detailed in Table 2.

Pollutant Output	Pollutants modelled and averaging time	NO ₂ and PM ₁₀ annual mean, derived 1-hour mean NO ₂ and 24-hour mean PM ₁₀ .
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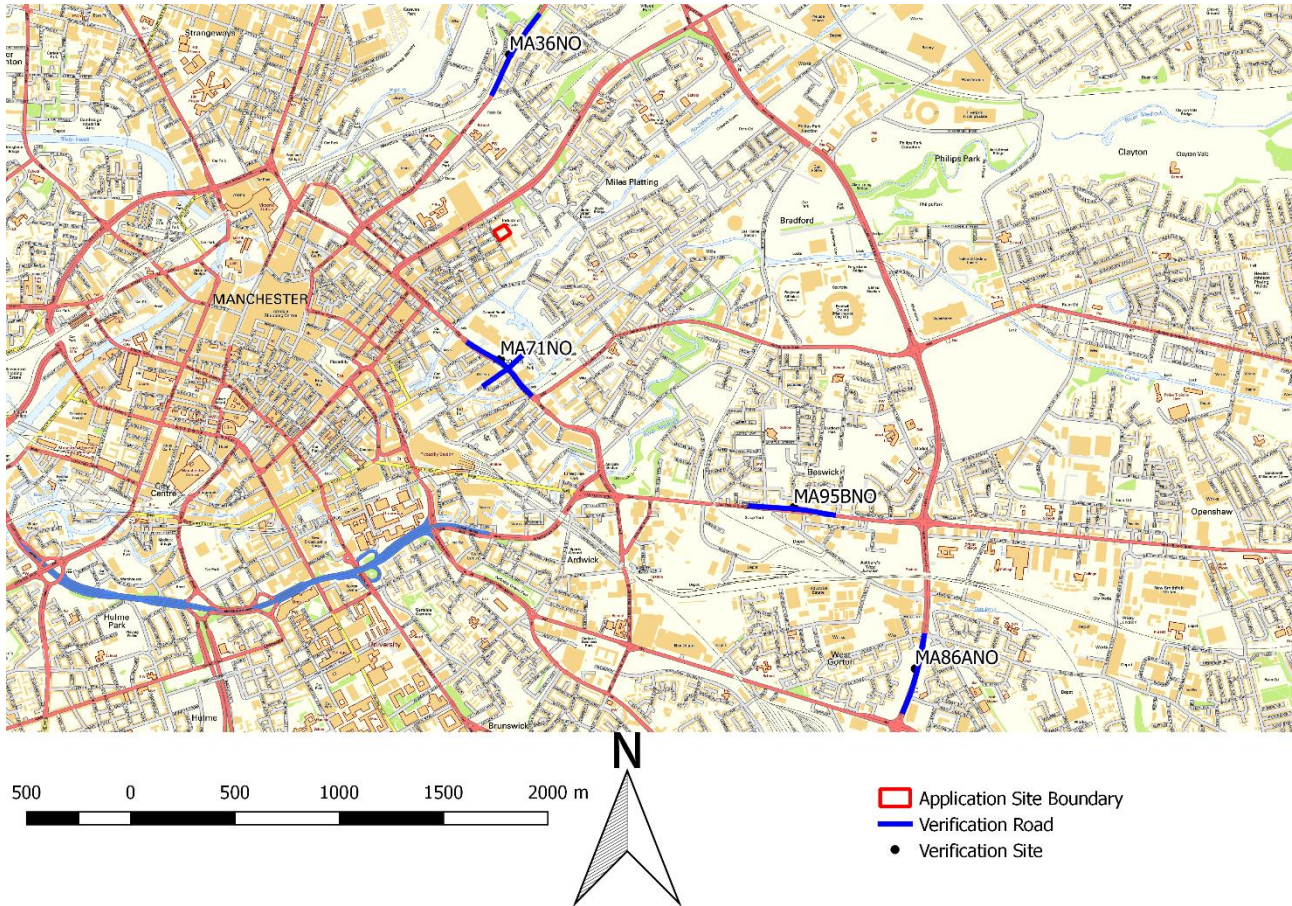


Figure 8 Roads Modelled. Contains Ordnance Survey data © Crown copyright and database right 2021

Table 19 Summary of Traffic Data used in the Verification

Road Name	AADT (2019)	HDV % (2019)	Speed (km/h)
A664 Rochdale Road	14083	1.0%	48
A6010 Pottery Lane	26652	3.0%	48
Ashton Old Road	27155	4.0%	48
A665 Great Ancoats Street (north of Old Mill Street)	42477	2.0%	48
Store Street	6938	1.0%	32
Old Mill Street	13943	1.0%	32
A665 Great Ancoats Street (south of Old Mill Street)	45681	2.0%	48

Table 20 Summary of Traffic Data used in the Assessment

Road Name	AADT					HDV %					Speed (km/h)
	DM	DS 1A	DS 1B	DS 2A	DS 2B	DM	DS 1A	DS 1B	DS 2A	DS 2B	
A664 Rochdale Road	15305	17056	17056	17056	17056	1.0%	1.0%	1.0%	1.0%	1.0%	48
A665 Great Ancoats Street (north of Old Mill Street)	46165	46612	46612	46612	46612	2.0%	2.0%	2.0%	2.0%	2.0%	48
Store Street	7540	7540	7540	7540	7540	1.0%	1.0%	1.0%	1.0%	1.0%	48
Old Mill Street	15153	15153	15153	15153	15153	1.0%	1.0%	1.0%	1.0%	1.0%	48
A665 Great Ancoats Street (south of Old Mill Street)	49646	50093	50093	50093	50093	2.0%	2.0%	2.0%	2.0%	2.0%	48
Ashton Old Road	29512	29641	29641	29641	29641	4.0%	4.0%	4.0%	4.0%	4.0%	48
A6010 Pottery Lane	28965	28965	28965	28965	28965	3.0%	3.0%	3.0%	3.0%	3.0%	48
Site Access off Poland Street	0	3578	3578	3578	3578	1.0%	1.0%	1.0%	1.0%	1.0%	20
Poland Street N of Site Access	1299	4344	4314	5010	5009	1.5%	1.5%	1.5%	1.5%	1.5%	32
Poland Street S of Site Access	1042	1922	1922	2543	2542	0.6%	0.6%	0.6%	0.6%	0.6%	32
Oldham Road E of Poland Street	22442	25075	25075	25451	25451	5.0%	5.0%	5.0%	5.0%	5.0%	48
Oldham Road W of Poland Street	21919	22331	22331	22621	22621	2.7%	2.7%	2.7%	2.7%	2.7%	48
Oldham Road W of Bengal Street	19659	20772	20772	20772	20772	6.0%	6.0%	6.0%	6.0%	6.0%	48
Oldham Road W of Adlington Street	14310	14902	14902	14902	14902	6.0%	6.0%	6.0%	6.0%	6.0%	48

Road Name	AADT					HDV %					Speed (km/h)
	DM	DS 1A	DS 1B	DS 2A	DS 2B	DM	DS 1A	DS 1B	DS 2A	DS 2B	
Swan Street	10397	10913	10913	10913	10913	2.0%	2.0%	2.0%	2.0%	2.0%	32
Oldham Street	2355	2355	2355	2355	2355	18.0%	18.0%	18.0%	18.0%	18.0%	32
Great Ancoats Street N of George Leigh Street	18163	18240	18240	18240	18240	5.0%	5.0%	5.0%	5.0%	5.0%	48
Great Ancoats Street S of George Leigh Street	14725	14803	14803	14803	14803	5.0%	5.0%	5.0%	5.0%	5.0%	48
Great Ancoats Street S of Jersey Street	15582	16355	16355	16355	16355	3.0%	3.0%	3.0%	3.0%	3.0%	48
Jersey Street W of Bengal Street	1839	2534	2534	2534	2534	0.0%	0.0%	0.0%	0.0%	0.0%	32
Jersey Street E of Bengal Street	1969	2655	2655	2655	2655	1.0%	1.0%	1.0%	1.0%	1.0%	32
Jersey Street E of Poland Street	1345	1362	1362	1362	1362	0.0%	0.0%	0.0%	0.0%	0.0%	32
Bengal Street	3866	4164	4164	4164	4164	1.0%	1.0%	1.0%	1.0%	1.0%	48
Livesey Street	7777	10410	7962	10786	8000	3.1%	3.1%	3.1%	3.1%	3.1%	32
A664 Rochdale Road (west of Livesey Street)	20089	20089	20089	20089	20089	1.3%	1.3%	1.3%	1.3%	1.3%	48
A62 Oldham Road (east of Livesey Street)	12731	12731	14398	12732	14737	2.7%	2.7%	2.7%	2.7%	2.7%	48

A4.2 Verification

The verification process seeks to minimise uncertainties associated with the air quality model by comparing the model output with locally measured concentrations. The verification methodology is described in subsequent sections.

A4.3 Background Concentrations

Background concentrations at the monitoring sites in the verification year (2019) have been assumed to be the same as those published by Defra and are shown in Table 21. The nearest MCC urban background monitoring site is an automatic monitor located approximately 1.2 km south west of the Application Site. Concentrations at this location are 5.2 µg/m³ higher than the Defra background concentrations for the grid square containing this monitoring site due to the likely influence of road traffic emissions from nearby roads and Manchester Victoria train station

Table 21 Defra Background Concentrations (µg/m³)

Grid Square	NOx	NO ₂
X 385500, Y 399500	30.3	20.8
X 386500 Y 397500	28.3	19.6
X 387500 Y 396500	26.5	18.6

Grid Square	NO _x	NO ₂
X 385500 Y 398500	35.2	23.4

Background concentrations for existing receptors have assumed to be the same as those published by Defra and are shown in Table 22.

Table 22 Defra Annual Mean Background Concentrations at Existing Receptors (µg/m³)

Grid Square	NO _x	NO ₂	PM ₁₀	PM _{2.5}
X 384500 Y 398500	47.0	29.3	13.6	8.8
X 385500 Y 399500	30.3	20.8	12.3	8.2
X 385500 Y 398500	35.2	23.4	12.6	8.3
X 386500, Y 399500	31.8	21.5	12.6	8.3
X 386500, Y 400500	27.3	19.1	12.4	8.2

A4.4 NO₂

Most NO₂ is produced in the atmosphere by reaction of nitric oxide (NO) with ozone. It is therefore most appropriate to verify the model in terms of primary pollutant emissions of nitrogen oxides (NO_x = NO + NO₂). The model has been run to predict the 2019 annual mean NO_x concentrations at the monitoring sites MA36NO, MA95BNO, MA86ANO and MA71NO.

The model output of road-NO_x has been compared with the 'measured' road-NO_x, calculated from the measured annual mean NO₂ concentrations and the background concentrations using the NO_x from NO₂ calculator v8.1 published by Defra.

The slope of the best-fit line between the 'measured' road-NO_x contribution and the model derived road-NO_x contribution, forced through zero, has been used to determine a primary adjustment factor). This factor has then been applied to the modelled road-NO_x concentration for each receptor to provide adjusted modelled road-NO_x concentrations. The NO_x to NO₂ calculator has then been used to determine total NO₂ concentrations from the adjusted modelled road-NO_x concentrations and the background NO₂ concentrations. A secondary adjustment factor has then been calculated as the slope of the best-fit line between the measured NO₂ concentrations and the primary adjusted total NO₂ concentrations, forced through zero.

The following primary and secondary adjustment factors have been applied to all modelled nitrogen dioxide data:

Primary verification factor: 2.5001

The results imply that the model has both under and over-predicted the road-NO_x contribution. This is a common experience with this and most other models.

Table 23 includes the adjustment undertaken for NO₂ and also compares secondary adjusted total NO₂ at each of the monitoring sites, to measured NO₂, and shows a 1:1 relationship. Table 23 provides the inputs for the comparison of modelled road NO_x and monitored road NO_x, which are used to calculate the primary adjustment factor.

Table 23 Comparison of Modelled and Monitored NO₂ Concentrations.

Monitoring Location	Modelled NO _x Road Contribution (µg/m ³)	Monitored NO _x Road Contribution (µg/m ³)	Adjusted Modelled NO _x Road Contribution (µg/m ³)	Monitored Total NO ₂ Concentration (µg/m ³)	Adjusted Modelled Total NO ₂ Concentration (µg/m ³)	Difference (%)
MA36NO	7.4	21.5	18.4	31.7	30.2	-5
MA95BNO	15.6	49.7	38.9	43.4	38.7	-11
MA86ANO	11.5	29.9	28.7	33.6	33.0	-2
MA71NO	22.1	46.1	55.4	45.3	49.2	9
Adjustment Factor	2.5001					

In accordance with LAQM.TG(16), the ratio of 'Monitored Road Contribution' to 'Modelled Road Contribution NO_x' has been calculated and reviewed.

As stated in LAQM.TG(16), a graph of modelled versus calculated road NO_x contributions has been prepared, including a trend line which presents the following requirements:

"The equation of the trend line should be in the format of

$y = mx$ (intercept at 0)

y is monitored road contribution NO_x and

x is modelled road contribution NO_x

m is the regression correction factor to apply to the modelled road contribution NO_x."

Reference should be made to Figure 9 for the relevant graph and trend line.

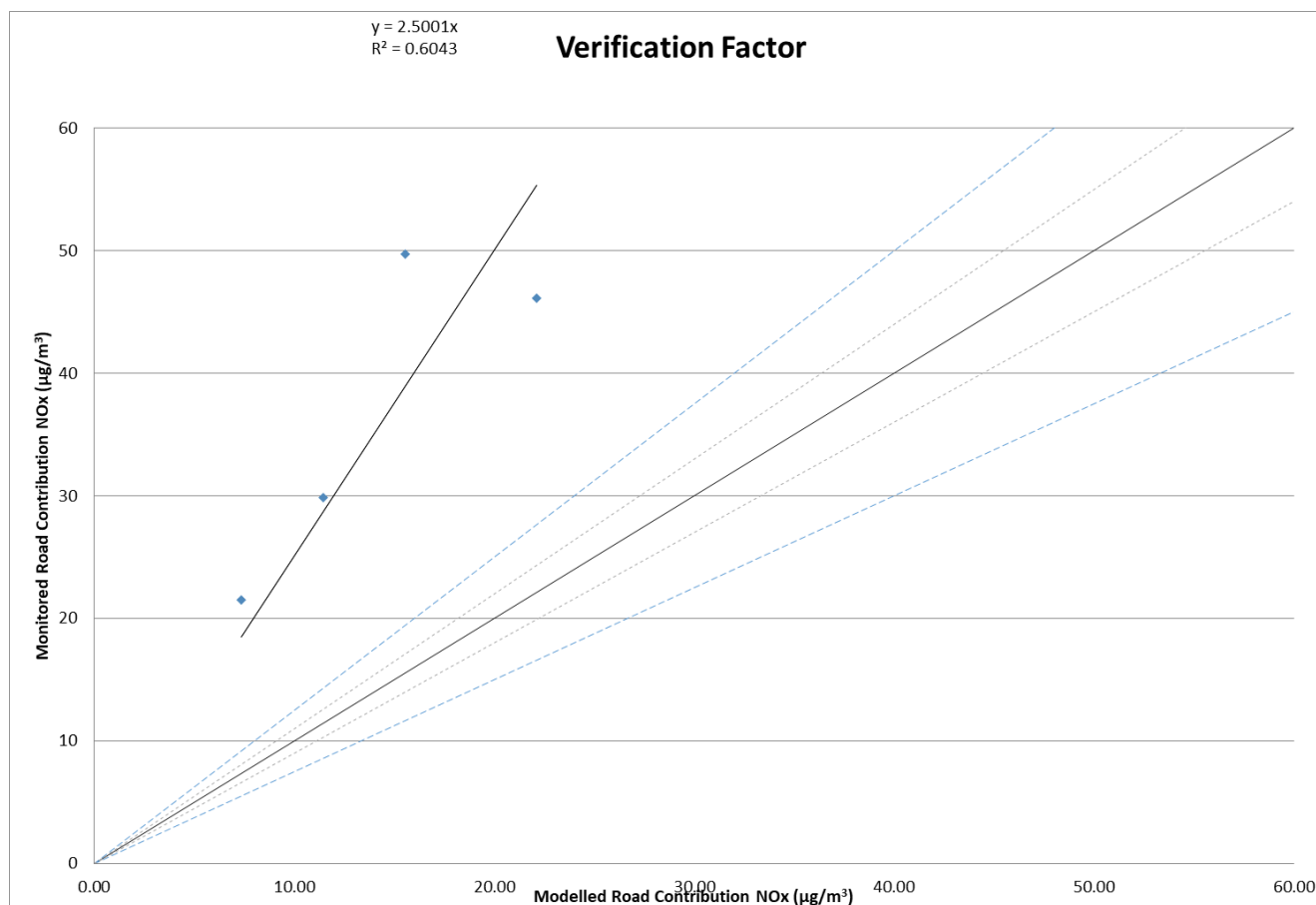


Figure 9 Comparison of Monitored to Modelled Road Contribution NOx

In accordance with LAQM.TG(16), this factor has been applied to predicted PM₁₀ and PM_{2.5} concentrations.

A4.5 Model Performance

An evaluation of model performance has been undertaken to establish confidence levels in model results. LAQM.TG(16) identifies a number of statistical procedures that are appropriate to evaluate model performance and assess uncertainty. The statistical parameters used in this assessment are:

- Root mean square error (RMSE); and
- Fractional bias (FB).

A brief for explanation of each statistic is provided in Table 24 and further details can be found in LAQM.TG(16).

Table 24 Model Performance Parameters

Parameter	Comments	Value
Root Mean Square Error	RMSE is used to define the average error or uncertainty of the model. The units of RMSE are the same as the quantities compared	3.16

	If the RMSE values are higher than $\pm 25\%$ of the objective being assessed, it is recommended that the model inputs and verification should be revisited in order to make improvements. For example, if the model predictions are for the annual mean NO_2 objective of $40\mu\text{g}/\text{m}^3$, if an RMSE of $10\mu\text{g}/\text{m}^3$ or above is determined for a model, the local authority would be advised to revisit the model parameters and model verification. Ideally an RMSE within 10% of the air quality objective would be derived, which equates to $4\mu\text{g}/\text{m}^3$ for the annual average NO_2 AQO.	
Fractional Bias	It is used to identify if the model shows a systematic tendency to over or under predict. FB values vary between +2 and -2 and has an ideal value of zero. Negative values suggest a model over-prediction and positive values suggest a model under-prediction.	0.04

Appendix 5 – ADMS Roads Model Results

Table 25 Scenario 1A PM_{2.5} Results

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER1	LT	8.6	8.8	0.1	35.0%	0.5%	Negligible
ER2	ST	8.6	8.6	0.1	34.5%	0.3%	Negligible
ER3	LT	9.0	9.2	0.2	36.6%	0.7%	Negligible
ER4	LT	9.0	9.0	0.1	36.1%	0.3%	Negligible
ER5	LT	9.5	9.5	0.0	38.2%	0.2%	Negligible
ER6	LT	9.9	10.0	0.1	39.8%	0.2%	Negligible
ER7	LT	9.4	9.5	0.0	37.9%	0.1%	Negligible
ER8	LT	9.1	9.1	0.0	36.5%	0.1%	Negligible
ER9	LT	8.6	8.6	0.0	34.5%	0.2%	Negligible
ER10	LT	8.5	8.5	0.0	34.2%	0.1%	Negligible
ER11	LT	9.6	9.6	0.0	38.6%	0.2%	Negligible
ER12	LT	9.3	9.3	0.0	37.1%	0.1%	Negligible
ER13	LT	8.5	8.6	0.1	34.3%	0.2%	Negligible
ER14	LT	9.07	9.3	0.2	37.0%	0.7%	Negligible
ER15	LT	9.22	9.4	0.2	37.5%	0.6%	Negligible
ER16	ST	9.4	9.5	0.0	37.8%	0.1%	Negligible
ER17	LT	9.2	9.2	0.0	37.0%	0.1%	Negligible
ER18	LT	9.1	9.1	0.0	36.3%	0.0%	Negligible
ER19	LT	8.7	8.7	0.0	34.8%	0.0%	Negligible
ER20	LT	9.5	9.5	0.0	37.9%	0.0%	Negligible
ER21	LT	9.0	9.1	0.1	36.5%	0.4%	Negligible
ER22	LT	8.7	8.8	0.1	35.1%	0.5%	Negligible
ER23	ST	10.2	10.6	0.3	42.3%	1.3%	Negligible
ER24	LT	9.5	9.7	0.3	39.0%	1.1%	Negligible
ER25	LT	9.6	10.0	0.4	40.1%	1.6%	Negligible
ER26	ST	8.8	8.8	0.1	35.3%	0.3%	Negligible
1.g	ST	8.8	9.1	0.3	36.4%	1.4%	Negligible
3.g	ST	9.5	10.0	0.5	40.2%	2.0%	Negligible
5.g	ST	9.5	9.5	0.0	38.2%	0.2%	Negligible
6.g	ST	9.9	10.0	0.1	39.8%	0.2%	Negligible
7.g	ST	9.4	9.5	0.0	37.9%	0.1%	Negligible

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
8.g	ST	9.3	9.4	0.0	37.5%	0.2%	Negligible
9.g	ST	8.6	8.6	0.0	34.5%	0.2%	Negligible
10.g	ST	8.5	8.5	0.0	34.2%	0.1%	Negligible
11.g	ST	9.6	9.6	0.0	38.6%	0.2%	Negligible
12.g	ST	9.0	9.1	0.0	36.2%	0.1%	Negligible
13.g	ST	8.6	8.8	0.1	35.1%	0.6%	Negligible
22.g	ST	8.8	9.1	0.3	36.6%	1.4%	Negligible

Notes

G after the receptor name indicates a ground floor receptor where the 1-hour mean AQO applies

LT = Long term AQAL of 40 µg/m³ for NO₂ and PM₁₀ and 25 µg/m³ for PM_{2.5} assessed against the annual mean AQOs

ST = Short term AQAL assessed against the indicative annual mean concentration of 60 µg/m³ to inform the 1-hour mean NO₂ AQO.

Table 26 Scenario 1B PM₁₀ Results

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER1	LT	13.1	13.3	0.2	33%	0.5%	Negligible
ER2	ST	13.0	13.1	0.1	33%	0.3%	Negligible
ER3	LT	13.7	14.0	0.3	35%	0.7%	Negligible
ER4	LT	13.7	13.8	0.1	34%	0.3%	Negligible
ER5	LT	14.8	14.9	0.1	37%	0.2%	Negligible
ER6	LT	15.5	15.6	0.1	39%	0.2%	Negligible
ER7	LT	14.7	14.8	0.1	37%	0.2%	Negligible
ER8	LT	14.2	14.2	0.0	36%	0.1%	Negligible
ER9	LT	13.0	13.1	0.1	33%	0.2%	Negligible
ER10	LT	12.9	13.0	0.0	32%	0.1%	Negligible
ER11	LT	15.0	15.1	0.1	38%	0.2%	Negligible
ER12	LT	14.4	14.5	0.0	36%	0.1%	Negligible
ER13	LT	12.9	13.0	0.1	32%	0.2%	Negligible
ER14	LT	13.8	13.9	0.0	35%	0.1%	Negligible
ER15	LT	14.1	14.1	0.0	35%	0.1%	Negligible
ER16	ST	14.5	14.7	0.3	37%	0.7%	Negligible
ER17	LT	14.1	14.3	0.2	36%	0.5%	Negligible
ER18	LT	13.8	14.0	0.2	35%	0.5%	Negligible

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER19	LT	13.2	13.3	0.1	33%	0.3%	Negligible
ER20	LT	14.5	14.8	0.3	37%	0.7%	Negligible
ER21	LT	13.8	13.9	0.2	35%	0.4%	Negligible
ER22	LT	13.1	13.3	0.2	33%	0.5%	Negligible
ER23	ST	15.8	16.1	0.3	40%	0.7%	Negligible
ER24	LT	14.5	14.7	0.1	37%	0.3%	Negligible
ER25	LT	14.8	14.9	0.1	37%	0.2%	Negligible
ER26	ST	13.3	13.4	0.1	34%	0.3%	Negligible

Notes

G after the receptor name indicates a ground floor receptor where the 1-hour mean AQO applies

LT = Long term AQAL of 40 µg/m³ for NO₂ and PM₁₀ and 25 µg/m³ for PM_{2.5} assessed against the annual mean AQOs

ST = Short term AQAL assessed against the indicative annual mean concentration of 60 µg/m³ to inform the 1-hour mean NO₂ AQO.

Table 27 Scenario 1B PM_{2.5} Results

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER1	LT	8.6	8.8	0.1	35.0%	0.5%	Negligible
ER2	ST	8.6	8.6	0.1	34.5%	0.3%	Negligible
ER3	LT	9.0	9.2	0.2	36.6%	0.6%	Negligible
ER4	LT	9.0	9.0	0.1	36.1%	0.3%	Negligible
ER5	LT	9.5	9.5	0.0	38.2%	0.2%	Negligible
ER6	LT	9.9	10.0	0.1	39.8%	0.2%	Negligible
ER7	LT	9.4	9.5	0.0	37.9%	0.1%	Negligible
ER8	LT	9.1	9.1	0.0	36.5%	0.1%	Negligible
ER9	LT	8.6	8.6	0.0	34.5%	0.2%	Negligible
ER10	LT	8.5	8.5	0.0	34.2%	0.1%	Negligible
ER11	LT	9.6	9.6	0.0	38.6%	0.2%	Negligible
ER12	LT	9.3	9.3	0.0	37.1%	0.1%	Negligible
ER13	LT	8.5	8.6	0.1	34.3%	0.2%	Negligible
ER14	LT	9.1	9.1	0.0	36.3%	0.0%	Negligible
ER15	LT	9.2	9.1	-0.1	36.3%	-0.6%	Negligible
ER16	ST	9.4	9.6	0.2	38.3%	0.6%	Negligible
ER17	LT	9.2	9.3	0.1	37.4%	0.5%	Negligible

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER18	LT	9.1	9.2	0.1	36.7%	0.4%	Negligible
ER19	LT	8.7	8.8	0.1	35.0%	0.3%	Negligible
ER20	LT	9.5	9.6	0.2	38.5%	0.7%	Negligible
ER21	LT	9.0	9.1	0.1	36.5%	0.4%	Negligible
ER22	LT	8.7	8.8	0.1	35.1%	0.5%	Negligible
ER23	ST	10.2	10.4	0.2	41.6%	0.7%	Negligible
ER24	LT	9.5	9.6	0.1	38.2%	0.3%	Negligible
ER25	LT	9.6	9.7	0.0	38.7%	0.2%	Negligible
ER26	ST	8.8	8.8	0.1	35.3%	0.3%	Negligible
1.g	ST	8.8	9.1	0.3	36.4%	1.4%	Negligible
3.g	ST	9.5	10.0	0.5	40.2%	2.0%	Negligible
5.g	ST	9.5	9.5	0.0	38.2%	0.2%	Negligible
6.g	ST	9.9	10.0	0.1	39.8%	0.2%	Negligible
7.g	ST	9.4	9.5	0.0	37.9%	0.1%	Negligible
8.g	ST	9.3	9.4	0.0	37.5%	0.2%	Negligible
9.g	ST	8.6	8.6	0.0	34.5%	0.2%	Negligible
10.g	ST	8.5	8.5	0.0	34.2%	0.1%	Negligible
11.g	ST	9.6	9.6	0.0	38.6%	0.2%	Negligible
12.g	ST	9.0	9.1	0.0	36.2%	0.1%	Negligible
13.g	ST	8.6	8.8	0.1	35.1%	0.6%	Negligible
22.g	ST	8.8	9.1	0.3	36.5%	1.4%	Negligible

Notes

G after the receptor name indicates a ground floor receptor where the 1-hour mean AQO applies

LT = Long term AQAL of 40 µg/m³ for NO₂ and PM₁₀ and 25 µg/m³ for PM_{2.5} assessed against the annual mean AQOs

ST = Short term AQAL assessed against the indicative annual mean concentration of 60 µg/m³ to inform the 1-hour mean NO₂ AQO.

Table 28 Scenario 2A PM₁₀ Results

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER1	LT	13.1	13.4	0.3	33.4%	0.6%	Negligible
ER2	ST	13.0	13.1	0.1	32.7%	0.3%	Negligible
ER3	LT	13.7	14.1	0.3	35.2%	0.8%	Negligible
ER4	LT	14.4	14.6	0.2	36.4%	0.5%	Negligible

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER5	LT	14.8	14.9	0.1	37.3%	0.2%	Negligible
ER6	LT	15.5	15.6	0.1	39.0%	0.3%	Negligible
ER7	LT	14.7	14.8	0.1	37.0%	0.2%	Negligible
ER8	LT	14.2	14.2	<0.1	35.5%	0.1%	Negligible
ER9	LT	13.0	13.1	0.1	32.8%	0.2%	Negligible
ER10	LT	12.9	13.0	<0.1	32.4%	0.1%	Negligible
ER11	LT	15.0	15.1	0.1	37.7%	0.2%	Negligible
ER12	LT	14.4	14.5	<0.1	36.1%	0.1%	Negligible
ER13	LT	12.9	13.0	0.1	32.5%	0.3%	Negligible
ER14	LT	13.8	14.2	0.4	35.5%	0.9%	Negligible
ER15	LT	14.1	14.4	0.3	36.0%	0.8%	Negligible
ER16	ST	14.5	14.5	0.1	36.3%	0.1%	Negligible
ER17	LT	14.1	14.2	<0.1	35.4%	0.1%	Negligible
ER18	LT	13.8	13.9	<0.1	34.7%	<0.1%	Negligible
ER19	LT	13.2	13.2	<0.1	33.0%	<0.1%	Negligible
ER20	LT	14.5	14.5	<0.1	36.3%	<0.1%	Negligible
ER21	LT	13.8	13.9	0.2	34.9%	0.4%	Negligible
ER22	LT	13.1	13.4	0.3	33.5%	0.6%	Negligible
ER23	ST	15.8	16.5	0.7	41.2%	1.6%	Negligible
ER24	LT	14.5	15.1	0.5	37.7%	1.4%	Negligible
ER25	LT	14.8	15.6	0.8	38.9%	1.9%	Negligible
ER26	ST	13.3	13.5	0.1	33.7%	0.4%	Negligible

Notes

G after the receptor name indicates a ground floor receptor where the 1-hour mean AQO applies

LT = Long term AQAL of 40 µg/m³ for NO₂ and PM₁₀ and 25 µg/m³ for PM_{2.5} assessed against the annual mean AQOs

ST = Short term AQAL assessed against the indicative annual mean concentration of 60 µg/m³ to inform the 1-hour mean NO₂ AQO.

Table 29 Scenario 2A PM_{2.5} Results

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER1	LT	8.6	8.8	0.1	35.1%	0.6%	Negligible
ER2	ST	8.6	8.6	0.1	34.5%	0.3%	Negligible
ER3	LT	9.0	9.2	0.2	36.8%	0.8%	Negligible

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER4	LT	9.4	9.5	0.1	37.9%	0.4%	Negligible
ER5	LT	9.5	9.5	0.0	38.2%	0.2%	Negligible
ER6	LT	9.9	10.0	0.1	39.8%	0.2%	Negligible
ER7	LT	9.4	9.5	0.0	37.9%	0.2%	Negligible
ER8	LT	9.1	9.1	0.0	36.5%	0.1%	Negligible
ER9	LT	8.6	8.6	0.0	34.6%	0.2%	Negligible
ER10	LT	8.5	8.5	0.0	34.2%	0.1%	Negligible
ER11	LT	9.6	9.6	0.0	38.6%	0.2%	Negligible
ER12	LT	9.3	9.3	0.0	37.1%	0.1%	Negligible
ER13	LT	8.5	8.6	0.1	34.3%	0.3%	Negligible
ER14	LT	9.1	9.3	0.2	37.2%	0.9%	Negligible
ER15	LT	9.2	9.4	0.2	37.6%	0.7%	Negligible
ER16	ST	9.4	9.5	0.0	37.8%	0.1%	Negligible
ER17	LT	9.2	9.2	0.0	37.0%	0.1%	Negligible
ER18	LT	9.1	9.1	0.0	36.3%	0.0%	Negligible
ER19	LT	8.7	8.7	0.0	34.8%	0.0%	Negligible
ER20	LT	9.5	9.5	0.0	37.9%	0.0%	Negligible
ER21	LT	9.0	9.1	0.1	36.5%	0.4%	Negligible
ER22	LT	8.7	8.8	0.1	35.2%	0.6%	Negligible
ER23	ST	10.2	10.6	0.4	42.5%	1.6%	Negligible
ER24	LT	9.5	9.8	0.3	39.2%	1.3%	Negligible
ER25	LT	9.6	10.1	0.5	40.3%	1.8%	Negligible
ER26	ST	8.8	8.8	0.1	35.4%	0.3%	Negligible
1.g	ST	8.8	9.2	0.4	36.7%	1.7%	Negligible
3.g	ST	9.5	10.2	0.6	40.6%	2.5%	Negligible
5.g	ST	10.0	10.1	0.1	40.3%	0.3%	Negligible
6.g	ST	10.9	11.0	0.1	44.0%	0.4%	Negligible
7.g	ST	9.8	9.9	0.1	39.6%	0.2%	Negligible
8.g	ST	9.3	9.4	0.0	37.5%	0.2%	Negligible
9.g	ST	8.9	9.0	0.1	36.1%	0.5%	Negligible
10.g	ST	8.6	8.7	0.1	34.6%	0.2%	Negligible
11.g	ST	10.3	10.4	0.1	41.8%	0.5%	Negligible
12.g	ST	9.6	9.6	0.0	38.4%	0.1%	Negligible

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
13.g	ST	8.6	8.9	0.2	35.4%	0.9%	Negligible
22.g	ST	8.8	9.2	0.4	36.9%	1.7%	Negligible

Notes
G after the receptor name indicates a ground floor receptor where the 1-hour mean AQO applies
LT = Long term AQAL of 40 µg/m³ for NO₂ and PM₁₀ and 25 µg/m³ for PM_{2.5} assessed against the annual mean AQOs
ST = Short term AQAL assessed against the indicative annual mean concentration of 60 µg/m³ to inform the 1-hour mean NO₂ AQO.

Table 30 Scenario 2B PM₁₀ Results

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER1	LT	13.1	13.4	0.3	33%	0.63%	Negligible
ER2	ST	13.0	13.1	0.1	33%	0.3%	Negligible
ER3	LT	13.7	14.1	0.3	35%	0.85%	Negligible
ER4	LT	14.4	14.6	0.2	36%	0.47%	Negligible
ER5	LT	14.8	14.9	0.1	37%	0.19%	Negligible
ER6	LT	15.5	15.6	0.1	39%	0.25%	Negligible
ER7	LT	14.7	14.8	0.1	37%	0.16%	Negligible
ER8	LT	14.2	14.2	0.0	36%	0.12%	Negligible
ER9	LT	13.0	13.1	0.1	33%	0.19%	Negligible
ER10	LT	12.9	13.0	0.0	32%	0.12%	Negligible
ER11	LT	15.0	15.1	0.1	38%	0.20%	Negligible
ER12	LT	14.4	14.5	0.0	36%	0.10%	Negligible
ER13	LT	12.9	13.0	0.1	33%	0.34%	Negligible
ER14	LT	13.8	13.9	0.0	35%	0.07%	Negligible
ER15	LT	14.1	14.1	0.0	35%	0.07%	Negligible
ER16	ST	14.5	14.8	0.3	37%	0.78%	Negligible
ER17	LT	14.1	14.4	0.3	36%	0.65%	Negligible
ER18	LT	13.8	14.1	0.2	35%	0.56%	Negligible
ER19	LT	13.2	13.3	0.1	33%	0.33%	Negligible
ER20	LT	14.5	14.8	0.3	37%	0.83%	Negligible
ER21	LT	13.8	14.0	0.2	35%	0.42%	Negligible
ER22	LT	13.1	13.4	0.3	33%	0.64%	Negligible

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER23	ST	15.8	16.2	0.3	40%	0.86%	Negligible
ER24	LT	14.5	14.7	0.2	37%	0.40%	Negligible
ER25	LT	14.8	14.9	0.1	37%	0.24%	Negligible
ER26	ST	13.3	13.5	0.1	34%	0.37%	Negligible

Notes

G after the receptor name indicates a ground floor receptor where the 1-hour mean AQO applies

LT = Long term AQAL of 40 µg/m³ for NO₂ and PM₁₀ and 25 µg/m³ for PM_{2.5} assessed against the annual mean AQOs

ST = Short term AQAL assessed against the indicative annual mean concentration of 60 µg/m³ to inform the 1-hour mean NO₂ AQO.

Table 31 Scenario 2B PM_{2.5} Results

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER1	LT	8.6	8.8	0.1	35%	0.6%	0.1
ER2	ST	8.6	8.6	0.1	35%	0.3%	0.1
ER3	LT	9.0	9.2	0.2	37%	0.8%	0.2
ER4	LT	9.4	9.5	0.1	38%	0.4%	0.1
ER5	LT	9.5	9.5	0.0	38%	0.2%	0.0
ER6	LT	9.9	10.0	0.1	40%	0.2%	0.1
ER7	LT	9.4	9.5	0.0	38%	0.2%	0.0
ER8	LT	9.1	9.1	0.0	37%	0.1%	0.0
ER9	LT	8.6	8.6	0.0	35%	0.2%	0.0
ER10	LT	8.5	8.5	0.0	34%	0.1%	0.0
ER11	LT	9.6	9.6	0.0	39%	0.2%	0.0
ER12	LT	9.3	9.3	0.0	37%	0.1%	0.0
ER13	LT	8.5	8.6	0.1	34%	0.3%	0.1
ER14	LT	9.1	9.1	0.0	36%	0.1%	0.0
ER15	LT	9.2	9.2	0.0	37%	0.1%	0.0
ER16	ST	9.4	9.6	0.2	38%	0.7%	0.2
ER17	LT	9.2	9.4	0.1	37%	0.6%	0.1
ER18	LT	9.1	9.2	0.1	37%	0.5%	0.1
ER19	LT	8.7	8.8	0.1	35%	0.3%	0.1
ER20	LT	9.5	9.7	0.2	39%	0.8%	0.2
ER21	LT	9.0	9.1	0.1	37%	0.4%	0.1

Receptor	Relevant AQO	DM Concentration (µg/m³)	DS Concentration (µg/m³)	Change (µg/m³)	DS Total as a % of AQO	Change Expressed as % AQO	Impact Descriptor
ER22	LT	8.7	8.8	0.1	35%	0.6%	0.1
ER23	ST	10.2	10.4	0.2	42%	0.8%	0.2
ER24	LT	9.5	9.6	0.1	38%	0.4%	0.1
ER25	LT	9.6	9.7	0.1	39%	0.2%	0.1
ER26	ST	8.8	8.8	0.1	35%	0.3%	0.1
1.g	ST	8.8	9.2	0.4	37%	1.7%	0.4
3.g	ST	9.5	10.2	0.6	41%	2.5%	0.6
5.g	ST	10.0	10.1	0.1	40%	0.3%	0.1
6.g	ST	10.9	11.0	0.1	44%	0.4%	0.1
7.g	ST	9.8	9.9	0.1	40%	0.2%	0.1
8.g	ST	9.3	9.4	0.0	37%	0.2%	0.0
9.g	ST	8.9	9.0	0.1	36%	0.5%	0.1
10.g	ST	8.6	8.7	0.1	35%	0.2%	0.1
11.g	ST	10.3	10.4	0.1	42%	0.5%	0.1
12.g	ST	9.6	9.6	0.0	38%	0.2%	0.0
13.g	ST	8.6	8.9	0.2	35%	0.9%	0.2
22.g	ST	8.8	9.2	0.4	37%	1.7%	0.4

Notes

G after the receptor name indicates a ground floor receptor where the 1-hour mean AQO applies

LT = Long term AQAL of 40 µg/m³ for NO₂ and PM₁₀ and 25 µg/m³ for PM_{2.5} assessed against the annual mean AQOs

ST = Short term AQAL assessed against the indicative annual mean concentration of 60 µg/m³ to inform the 1-hour mean NO₂ AQO.

Table 32 Ground Floor Commercial Receptors NO₂ Concentrations

Receptor	Relevant AQO	Scenario 1A	Scenario 1B	Scenario 2A	Scenario 2B
1.g	ST	30.5	30.5	27.4	27.4
3.g	ST	37.9	37.9	33.7	33.7
5.g	ST	36.1	36.1	39.9	39.9
6.g	ST	39.6	39.6	46.8	46.8
7.g	ST	36.1	36.1	39.9	39.9
8.g	ST	34.6	34.6	34.2	34.2
9.g	ST	26.4	26.4	29.0	29.0
10.g	ST	25.5	25.5	26.0	26.0

Receptor	Relevant AQO	Scenario 1A	Scenario 1B	Scenario 2A	Scenario 2B
11.g	ST	36.3	36.3	41.5	41.5
12.g	ST	31.6	31.6	35.7	35.7
13.g	ST	25.7	25.7	26.3	26.3
22.g	ST	30.8	30.8	27.7	27.7

Table 33 Ground Floor Commercial Receptors PM₁₀ Concentrations

Receptor	Relevant AQO	Scenario 1A	Scenario 1B	Scenario 2A	Scenario 2B
1.g	ST	13.3	13.9	13.3	13.3
3.g	ST	14.7	15.5	14.7	14.7
5.g	ST	14.8	14.9	15.7	15.7
6.g	ST	15.5	15.6	17.2	17.2
7.g	ST	14.7	14.8	15.4	15.4
8.g	ST	14.5	14.6	14.5	14.5
9.g	ST	13.0	13.1	13.6	13.6
10.g	ST	12.9	13.0	13.0	13.0
11.g	ST	15.0	15.1	16.2	16.2
12.g	ST	14.1	14.1	15.0	15.0
13.g	ST	13.1	13.3	13.1	13.1
22.g	ST	13.4	14.0	13.4	13.4

Table 34 Ground Floor Commercial Receptors PM₁₀ – Number of Exceedances of 24-hour mean PM₁₀ AQO

Receptor	Relevant AQO	Number of 24-hour Exceedances			
		Scenario 1A	Scenario 1B	Scenario 2A	Scenario 2B
1.g	ST	0	0	0	0
3.g	ST	0	0	0	0
5.g	ST	0	0	0	0
6.g	ST	0	0	1	1
7.g	ST	0	0	0	0
8.g	ST	0	0	0	0
9.g	ST	0	1	0	0
10.g	ST	1	1	1	1

Receptor	Relevant AQO	Number of 24-hour Exceedances			
		Scenario 1A	Scenario 1B	Scenario 2A	Scenario 2B
11.g	ST	0	0	1	1
12.g	ST	0	0	0	0
13.g	ST	0	1	0	0
22.g	ST	0	0	0	0
<u>Notes</u> 24 Hour Mean PM ₁₀ AQO not to be exceeded more than 35 times / year					

Appendix 6 Professional Experience.

Kathryn Woolley (Hoare Lea), BSc (Hons), AMIEnvSc, MIAQM

Kathryn is a Principal Air Quality Consultant with Hoare Lea. She's is an associate Member of the Institution of Environmental Sciences and a Full Member of the Institute of Air Quality Management.

She has a diverse portfolio of experience and has worked on a range of projects from initial site feasibility, through planning and development to construction and operation. Kathryn's expertise covers planning, and air quality, specifically in relation to residential developments, industrial fixed installations such as district heating networks. Kathryn has completed over 30 EIA in the past 6 years throughout the UK and abroad including; St Johns Masterplan in Manchester (residential led), Leicester City Football club training facility north of Leister (sports use), 1-5 Grosvenor Place, Westminster (mixed use residential, retail and hotel site), and Chestnut Avenue in Eastleigh (residential and community use).

Andy Day (Hoare Lea), BSc (Hons), MSc, AMIEnvSc, AMIAQM

Andy is a Senior Air Quality Consultant with Hoare Lea. He is an Associate Member of the Institute of Environmental Sciences and an Associate Member of the Institute of Air Quality Management. He is a chemistry graduate with a Master's specialising in the catalysed removal of harmful volatile organic compounds (VOCs) often generated from the combustion of fuel in car engines.

Andy has worked on a range of projects of varying size across a number of different sectors. His experience focusses on work up to and through planning for air quality assessments and environmental impact assessments. Andy also has experience in detailed dispersion modelling of road traffic and energy combustion plant, emission mitigation statements, damage cost calculations, indoor and outdoor air quality monitoring and assessing the air quality impact at ecologically sensitive sites.

Andy has a particular interest in reducing emissions for the benefit of human health and the environment through the life cycle of a building.

Benny Pygott (Hoare Lea), BSc (Hons), MSc (Hons), AMIEnvSc, AMIAQM

Benny is a Graduate Air Quality Consultant with Hoare Lea. He is a Physical Geography Graduate with an MSc in Pollution and Environmental Control from the University of Manchester. Benny has worked on a range of projects across a number of industries including residential, educational, commercial and industrial developments from initial site suitability, master planning and operational phase impacts of new developments. Benny has experience in atmospheric dispersion modelling including plant emission impacts and road traffic impacts. Benny has also undertaken a number of air quality monitoring surveys.

Benny has also worked as part of an EIA team looking at air quality impacts of HDV movements during the construction phases. His interests lie in pollution mitigation, air pollution control and sustainable travel.



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