

Air Quality Assessment

Site: Trubs Farm, Rochdale

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1. INTRODUCTION

1.1. BACKGROUND

E3P was commissioned by M.C.I. Developments Ltd to produce an Air Quality Assessment in support of a proposed residential development on land at Trubs Farm, Rochdale.

The proposals have the potential to cause air quality impacts at sensitive locations as a result of fugitive dust emissions during construction and road vehicle exhaust emissions during operation, as well as expose future residents to any existing air quality issues at the site. As such, an Air Quality Assessment was undertaken to determine baseline conditions, consider suitability for the proposed end-use and assess potential impacts associated with the scheme.

1.2. SITE LOCATION AND CONTEXT

The site is located on land at Trubs Farm, Rochdale, at approximate National Grid Reference (NGR): 388230, 410061. The site lies within Rochdale Borough Council's (RBC's) administrative extents. Reference should be made to Figure 1 for a map of the site and surrounding area.

The proposals comprise construction of 162 residential dwellings alongside associated landscaping and infrastructure.

1.3. ASSESSMENT SCOPE

The proposals have the potential to cause air quality impacts during the construction and operational phases, as well as expose future residents any to any existing air quality issues. An Air Quality Assessment has therefore been undertaken in order to define baseline conditions and assess potential effects as a result of the proposals. This is detailed in the following report.

1.4. LIMITATIONS

The limitations of this report are presented in Appendix II.

1.5. CONFIDENTIALITY

E3P has prepared this report solely for the use of the client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from E3P; a charge may be levied against such approval.



2. LEGISLATION AND POLICY

2.1. LEGISLATION

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

- ✦ Nitrogen dioxide (NO₂);
- ✦ Sulphur dioxide;
- ✦ Lead;
- ✦ Particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀);
- ✦ Particulate matter with an aerodynamic diameter of less than 2.5µm (PM_{2.5});
- ✦ Benzene; and,
- ✦ Carbon monoxide.

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

The Air Quality Strategy (AQS) was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published on 28th April 2023¹. The document contains standards, objectives and measures for improving ambient air quality, including a number of Air Quality Objectives (AQOs). These are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

The Environmental Improvement Plan 2023² was published in January 2023, providing long term and Interim Targets in order to reduce population exposure to PM_{2.5}. The concentration target for 2040 was subsequently adopted in the Environmental Targets (Fine Particulate Matter) (England) Regulations (2023).

Table 2.1 presents the AQOs and Interim Target for pollutants considered within this assessment.

TABLE 2.1 AIR QUALITY OBJECTIVES/INTERIM TARGET

POLLUTANT	AIR QUALITY OBJECTIVE/INTERIM TARGET	
	Concentration (µg/m ³)	Averaging Period
NO ₂	40	Annual mean
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
PM ₁₀	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum
PM _{2.5}	12 ^(a)	Annual mean

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

² Environmental Improvement Plan 2023, DEFRA, 2023.



Note: (a) Interim Target to be achieved by end of January 2028.

Table 2.2 summarises the advice provided in DEFRA guidance³ on where the AQOs for pollutants considered within this report apply.

TABLE 2.2 EXAMPLES OF WHERE THE AIR QUALITY OBJECTIVES APPLY

AVERAGING PERIOD	OBJECTIVE SHOULD APPLY AT	OBJECTIVE SHOULD NOT APPLY AT
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools (including all of playgrounds), hospitals (and their grounds), care homes (and their grounds) etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean	All locations where the annual mean objective would apply, together with hotels	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping street). Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour more. Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

2.2. LOCAL AIR QUALITY MANAGEMENT

Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure, as summarised in Table 2.2, are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA the LA is required to produce an Air Quality Action Plan, the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.3. DUST

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

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



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

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

2.4. NATIONAL PLANNING POLICY

The revised National Planning Policy Framework⁴ (NPPF) was published in December 2023 and sets out the Government's planning policies for England and how these are expected to be applied.

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

"c) an environmental objective - to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

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

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

[...]

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of 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

[...]"

The NPPF specifically recognises air quality as part of delivering sustainable development and states that:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air

⁴ NPPF, Ministry of Housing, Communities and Local Government, 2023.



Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

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

2.5. NATIONAL PLANNING PRACTICE GUIDANCE

The National Planning Practice Guidance⁵ (NPPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 and updated on 1st November 2019 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

- ✿ What air quality considerations does planning need to address?
- ✿ What is the role of plan-making with regard to air quality?
- ✿ Are air quality concerns relevant to neighbourhood planning?
- ✿ What information is available about air quality?
- ✿ When could air quality considerations be relevant to the development management process?
- ✿ What specific issues may need to be considered when assessing air quality impacts?
- ✿ How detailed does an air quality assessment need to be?
- ✿ How can an impact on air quality be mitigated?

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

2.6. LOCAL PLANNING POLICY

The Rochdale Local Plan: Core Strategy 2016-2028⁶ was adopted by RBC on 19th October 2016. Review of the document indicated the following of relevance to this report:

"Policy G9 - Reducing the Impact of Pollution, Contamination and Land Stability

We will reduce all forms of pollution, contamination and land instability in the borough, by:

a. Focusing on measures that reduce air pollution in Air Quality Management Areas, and other areas where pollution levels are unacceptable, particularly around motorways and main roads;

b. Requiring that development does not have impacts that lead to an unacceptable increase in air, water, noise, light or other pollution;

⁵ <https://www.gov.uk/guidance/air-quality-3>.

⁶ Rochdale Local Plan: Core Strategy 2016 - 2028, RBC, 2016.



c. Ensuring sensitive new developments such as housing, schools and hospitals are not adversely affected by existing sources of pollution such as roads and certain types of industry;

d. Requiring a Low Emissions Strategy (LES) where development requires a Transport Assessment, and in other circumstances as appropriate;
[...]

g. Using planning conditions or obligations to control pollution from new development, or the impact of pollution on new development."

"Policy DM1 - General Development Requirements

All development proposals, including changes of use of land and buildings, extensions and alterations, will be expected to demonstrate that they:

[...]

d. Mitigate against any impacts due to noise, air, dust, light and odour pollution, traffic generation or inadequate access, where such mitigation is identified as being necessary;

[...]

f. Do not have an adverse impact on health, through its impact or the effect of existing problems e.g. land contamination, or poor air quality;

[...]"

"DM2 - Delivering planning contributions and infrastructure

[...]

For all types of development, including housing, we will seek contributions for any infrastructure or other measures necessary to mitigate any on site or off-site impacts from the development.

These contributions may cover, dependent on need:

[...]

e. Mitigation or compensation against environmental impacts e.g. noise, air quality (particularly in Air Quality Management Areas);

[...]."

The Places for Everyone Plan⁷ (PfEP) was produced by the nine Greater Manchester Combined Authorities (GMCAs), Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan, and became part of the statutory development plan for each of the councils on 21st March 2024.

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

⁷ PfEP, GMCA, 2024.



"Policy JP:S5: Clean Air

A comprehensive range of measures will be taken to support improvements in air quality, focusing particularly on locations where people live, where children learn and play, where there are impacts on the green infrastructure network and where air quality targets are not being met, including:

- 1. Locating and designing development, and focusing transport investment, so as to reduce reliance on forms of transport that generate air pollution;*
- 2. Determining planning applications having regard to the most recent development and planning control guidance published jointly by the Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK), and the most recent IAQM Guidance on the Assessment of Dust from Demolition and Construction, or relevant successor guidance, including the requirement for developers to submit construction management plans as appropriate;*
- 3. Requiring applications for developments that could have an adverse impact on air quality to submit relevant air pollution data so that adverse impacts on air quality can be fully assessed and development only permitted where they are acceptable and/or suitable mitigation can be provided;*
- 4. Restricting developments that would generate significant point source pollution such as some types of industrial activity and energy generation;*
- 5. Significantly expanding the existing commercial network of electric vehicle charging points, both for public and private use, including as part of new developments;*
- 6. Implementing the Clean Air Plan and associated measures;*
- 7. Facilitating the more sustainable distribution of goods within the urban area, including through accommodating urban consolidation centres and urban distribution centres that use ultra-low-emission vehicles, and local delivery facilities to reduce repeat delivery attempts;*
- 8. Designing streets to avoid trapping air pollution at ground level, including through the appropriate location and scale of buildings and trees;*
- 9. Controlling traffic and parking within and around schools, early years sites and other locations that are particularly sensitive to air quality;*
- 10. Promoting actions that help remove pollutants from the air, such as enhancing the green infrastructure network and using innovative building materials that capture air pollutants; and,*
- 11. Development should be located in areas that maximise the use of sustainable travel modes and be designed to minimise exposure to high levels of air pollution, particularly for vulnerable users."*

"Policy JP-P1 Sustainable Places

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

[...]



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

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

[...]."

The above policies have been taken into consideration throughout the undertaking of the assessment.



3. METHODOLOGY

3.1. INTRODUCTION

The proposed development has the potential to cause air quality impacts during the construction and operational phases, as well as expose future residents to any existing air quality issues at the site. These factors have been assessed in accordance with the following methodology.

3.2. CONSTRUCTION PHASE ASSESSMENT

There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction V2.2'⁸.

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

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

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

- ✳ Annoyance due to dust soiling;
- ✳ Harm to ecological receptors; and,
- ✳ The risk of health effects due to a significant increase in exposure to PM₁₀.

The assessment steps are detailed below.

3.2.1. STEP 1

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

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

⁸ Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.



3.2.2. STEP 2

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

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

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

Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table 3.1.

TABLE 3.1 CONSTRUCTION DUST - MAGNITUDE OF EMISSION

MAGNITUDE	ACTIVITY	CRITERIA
Large	Earthworks	Total site area greater than 110,000m ² Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) More than 10 heavy earth moving vehicles active at any one time Formation of bunds greater than 6m in height
	Construction	Total building volume greater than 75,000m ³ On site concrete batching Sandblasting
	Trackout	More than 50 Heavy Duty Vehicle (HDV) trips per day Potentially dusty surface material (e.g. high clay content) Unpaved road length greater than 100m
Medium	Earthworks	Total site area 18,000m ² to 110,000m ² Moderately dusty soil type (e.g. silt) 5 to 10 heavy earth moving vehicles active at any one time Formation of bunds 3m to 6m in height
	Construction	Total building volume 12,000m ³ to 75,000m ³ Potentially dusty construction material (e.g. concrete) On site concrete batching
	Trackout	20 to 50 HDV trips per day Moderately dusty surface material (e.g. high clay content) Unpaved road length 50m to 100m
Small	Earthworks	Total site area less than 18,000m ² Soil type with large grain size (e.g. sand) Less than 5 heavy earth moving vehicles active at any one time Formation of bunds less than 3m in height
	Construction	Total building volume less than 12,000m ³ Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	Less than 20 HDV trips per day Surface material with low potential for dust release Unpaved road length less than 50m



Step 2B defines the sensitivity of the area around the development to potential dust impacts. The sensitivities of specific receptors are shown in Table 3.2.

TABLE 3.2 CONSTRUCTION DUST - SENSITIVITIES OF PEOPLE AND ECOLOGICAL RECEPTORS

RECEPTOR SENSITIVITY	EXAMPLES	
	HUMAN RECEPTORS	ECOLOGICAL RECEPTORS
High	Users expect high levels of amenity High aesthetic or value property People expected to be present continuously for extended periods of time Locations where members of the public are exposed over a time period relevant to the AQO for PM₁₀. e.g. residential properties, hospitals, schools and residential care homes	Internationally or nationally designated site e.g. Special Area of Conservation (SAC)
Medium	Users would expect to enjoy a reasonable level of amenity Aesthetics or value of their property could be diminished by soiling People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work	Nationally designated site e.g. Sites of Special Scientific Interest
Low	Enjoyment of amenity would not reasonably be expected Property would not be expected to be diminished in appearance Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, farmland, short term car parks and roads	Locally designated site e.g. Local Nature Reserve

The criteria for determining the sensitivity of the area to dust soiling effects on people and property is summarised in Table 3.3.

TABLE 3.3 CONSTRUCTION DUST - SENSITIVITY OF THE AREA TO DUST SOILING EFFECTS ON PEOPLE OR PROPERTY

RECEPTOR SENSITIVITY	NUMBER OF RECEPTORS	DISTANCE FROM THE SOURCE (m)			
		Less than 20	Less than 50	Less than 100	Less than 250
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

Table 3.4 outlines the criteria for determining the sensitivity of the area to human health impacts.



TABLE 3.4 CONSTRUCTION DUST - SENSITIVITY OF THE AREA TO HUMAN HEALTH IMPACTS

RECEPTOR SENSITIVITY	ANNUAL MEAN BACKGROUND PM ₁₀ CONCENTRATION	NUMBER OF RECEPTORS	DISTANCE FROM THE SOURCE (m)			
			Less than 20	Less than 50	Less than 100	Less than 250
High	Greater than 32 ug/m ³	More than 100	High	High	High	Medium
		10 - 100	High	High	Medium	Low
		1 - 10	High	Medium	Low	Low
	28 - 32ug/m ³	More than 100	High	High	Medium	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low
	24 - 28ug/m ³	More than 100	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	Less than 24ug/m ³	More than 100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	Greater than 32ug/m ³	More than 10	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	28 - 32ug/m ³	More than 10	Medium	Low	Low	Low
		1 - 10	Low	Low	Low	Low
	24 - 28 ug/m ³	More than 10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
	Less than 24 ug/m ³	More than 10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Low	-	1 or More	Low	Low	Low	Low

Table 3.5 outlines the criteria for determining the sensitivity of the area to ecological impacts.

TABLE 3.5 CONSTRUCTION DUST - SENSITIVITY OF THE AREA TO ECOLOGICAL IMPACTS

RECEPTOR SENSITIVITY	DISTANCE FROM THE SOURCE (m)	
	Less than 20	Less than 50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

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

Table 3.6 outlines the risk category from earthworks, construction and trackout activities.

TABLE 3.6 CONSTRUCTION DUST - DUST RISK CATEGORY FROM EARTHWORKS, CONSTRUCTION AND TRACKOUT ACTIVITIES

RECEPTOR SENSITIVITY	DUST EMISSION MAGNITUDE		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible



3.2.3. STEP 3

Step 3 requires the identification of site specific mitigation measures within the IAQM guidance⁹ to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with **negligible** risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

3.2.4. STEP 4

Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. For almost all construction activity, the aim should be to control effects through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be **not significant**.

3.3. OPERATIONAL PHASE ASSESSMENT

3.3.1. ROAD VEHICLE EXHAUST EMISSIONS

The development has the potential to affect existing air quality as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site during the operational phase. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations.

The assessment considered the following scenarios:

- 🏠 2022 - Verification;
- 🏠 Opening year Do-Minimum (DM) (predicted traffic flows in 2026 should the proposals not proceed); and,
- 🏠 Opening year Do-Something (DS) (predicted traffic flows in 2026 should the proposals be completed).

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

Locations sensitive to potential changes in pollutant concentrations were identified within 200m of the highway network in accordance with the guidance provided within the Design Manual for Roads and Bridges (DMRB)¹⁰ on the likely limits of pollutant dispersion from road sources. The criteria provided within DEFRA guidance¹¹ on where the AQOs apply, as summarised in Table 2.2, was utilised to determine appropriate receptor positions.

⁹ Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

¹⁰ LA 105: Air Quality, Highways England, 2019.

¹¹ Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.



The significance of predicted air quality impacts was determined in accordance with the guidance provided within the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'¹². Using this methodology impacts were defined based on the interaction between the predicted pollutant concentration from the DS scenario and the magnitude of change between the DM and DS scenarios, as outlined in Table 3.7.

TABLE 3.7 SIGNIFICANCE OF ROAD VEHICLE EXHAUST EMISSION IMPACTS

CONCENTRATION AT RECEPTOR IN ASSESSMENT YEAR	PREDICTED CONCENTRATION CHANGE AS PROPORTION OF AQO/INTERIM TARGET (%)			
	1	2 - 5	6 - 10	>10
75% or less of AQO/Interim Target	Negligible	Negligible	Slight	Moderate
76 - 94% of AQO/Interim Target	Negligible	Slight	Moderate	Moderate
95 - 102% of AQO/Interim Target	Slight	Moderate	Moderate	Substantial
103 - 109% of AQO/Interim Target	Moderate	Moderate	Substantial	Substantial
110% or more of AQO/Interim Target	Moderate	Substantial	Substantial	Substantial

The matrix shown in Table 3.7 is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which makes it clearer which cell the impact falls within. It should be noted that changes of 0%, i.e. less than 0.5%, are described as **negligible**.

Following the prediction of impacts at discrete receptor locations, the IAQM document¹³ provides guidance on determining the overall air quality impact significance of the operation of a development. The following factors are identified for consideration by the assessor:

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

The IAQM guidance states that an assessment must reach a conclusion on the likely significance of the predicted impact. It should be noted that this is a binary judgement of either it is **significant** or it is **not significant**. The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

3.3.2. POTENTIAL FUTURE EXPOSURE

The proposals have the potential to expose future residents to elevated pollution levels. In order to assess NO₂, PM₁₀ and PM_{2.5} concentrations across the development site, detailed dispersion modelling was undertaken. Reference should be made to Appendix 1 for a full description of the assessment input data.

The dispersion modelling results were compared against the relevant AQOs and Interim Target in order to determine the potential for exposure of future residents to elevated pollutant concentrations and identify any requirement for mitigation.

¹² Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

¹³ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.



4. BASELINE

4.1. INTRODUCTION

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

4.2. LOCAL AIR QUALITY MANAGEMENT

As required by the Environment Act (1995), as amended by the Environment Act (2021), RBC has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean concentrations of NO₂ are above the AQO within the borough. As such, a number of roads within Rochdale have been included within the Greater Manchester Combined Authority (GMCA) AQMA. This is described as follows:

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

The development is partly located within the AQMA. As such, there is the potential for vehicles travelling to and from the site to increase pollution levels in this sensitive area, as well as the exposure of future residents to elevated pollution levels. This has been considered throughout the assessment.

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

4.3. AIR QUALITY MONITORING

Monitoring of pollutant concentrations is undertaken by RBC throughout their area of jurisdiction. Recent NO₂ results recorded in the vicinity of the development are shown in Table 4.1. Exceedences of the AQO are shown in **bold**.

TABLE 4.1 MONITORING RESULTS - NO₂

MONITORING SITE	MONITORED NO ₂ CONCENTRATION (ug/m ³)			
	2019	2020	2021	2022
RDL001	-(a)	-(a)	28.5	27
RO2ANO	32.7	21.7	-(b)	-(b)
RO3ANO	22.1	16.0	16.4	17.0
RO7ANO	32.1	25.2	27.7	26.4
RO8ANO	44.7	33.6	36.6	36.3
RO9ANO	39.6	30.3	34.9	36.4
RO24ANO	30.0	24.8	23.1	24.0

Note: (a) Monitor commissioned in 2021.
(b) Monitor de-commissioned in 2021.

As shown Table 4.1, annual mean NO₂ concentrations were above the AQO of 40ug/m³ at the RO8ANO monitoring site in 2019. As this position is located adjacent to a roadside within an AQMA, elevated pollution levels would be expected. Annual mean NO₂ concentrations were below the AQO at all remaining monitors in recent years. Reference should be made to Figure 2 for a map of the survey sites.

Recent annual mean PM₁₀ concentrations recorded in the vicinity of the development are shown in Table 4.2.



TABLE 4.2 MONITORING RESULTS - PM₁₀

MONITORING SITE	MONITORED ANNUAL MEAN PM ₁₀ CONCENTRATION (ug/m ³)			
	2019	2020	2021	2022
RDL001	-(a)	-(a)	15.5	18

Note: (a) Monitor commissioned in 2021.

As shown in Table 4.2, annual mean PM₁₀ concentrations were below the AQO of 40µg/m³ at the RDL001 monitor in recent years.

Recent annual mean PM_{2.5} concentrations recorded in the vicinity of the development are shown in Table 4.3.

TABLE 4.3 MONITORING RESULTS - PM_{2.5}

MONITORING SITE	MONITORED ANNUAL MEAN PM _{2.5} CONCENTRATION (ug/m ³)			
	2019	2020	2021	2022
RDL001	-	-	9.2	10

As shown in Table 4.3, annual mean PM_{2.5} concentrations were below the Interim Target of 12µg/m³ at the RDL001 monitor in recent years.

Pollutant concentrations during 2020 and 2021 were affected by changes in travel patterns and associated emissions caused by COVID-19 pandemic. The results should therefore be viewed with caution.

4.4. BACKGROUND POLLUTANT CONCENTRATIONS

Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located in grid square NGR: 388500, 410500. Data for this location was downloaded from the DEFRA website¹⁴ for the purpose of the assessment and is summarised in Table 4.4.

TABLE 4.4 BACKGROUND POLLUTANT CONCENTRATIONS

POLLUTANT	PREDICTED BACKGROUND POLLUTANT CONCENTRATION (µg/m ³)		
	2022	2024	2026
NO₂	15.20	14.06	13.13
PM₁₀	11.85	11.65	11.54
PM_{2.5}	8.04	7.88	7.80

As shown in Table 4.4, predicted background NO₂, PM₁₀ and PM_{2.5} concentrations are below the relevant AQOs and Interim Target at the development site.

4.5. SENSITIVE RECEPTORS

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

¹⁴ <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>.



4.5.1. CONSTRUCTION PHASE SENSITIVE RECEPTORS

Receptors sensitive to potential dust impacts during earthworks and construction were identified from a desk-top study of the area up to 250m from the development boundary. These are summarised in Table 4.5.

TABLE 4.5 EARTHWORKS AND CONSTRUCTION DUST SENSITIVE RECEPTORS

DISTANCE FROM SITE BOUNDARY (m)	APPROXIMATE NUMBER OF HUMAN RECEPTORS	APPROXIMATE NUMBER OF ECOLOGICAL RECEPTORS
Up to 20	1 - 10	1
Up to 50	10 - 100	1
Up to 100	More than 100	-
Up to 250	More than 100	-

Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 250m of the site access. These are summarised in Table 4.6.

TABLE 4.6 TRACKOUT DUST SENSITIVE RECEPTORS

DISTANCE FROM SITE ACCESS ROUTE (m)	APPROXIMATE NUMBER OF HUMAN RECEPTORS	APPROXIMATE NUMBER OF ECOLOGICAL RECEPTORS
Up to 20	More than 100	1
Up to 50	More than 100	1

The ecological receptor identified in Table 4.5 and Table 4.6 is the Rochdale Canal SAC. This is situated adjacent to the site boundary.

A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in Table 4.7.

TABLE 4.7 ADDITIONAL AREA SENSITIVITY FACTORS TO POTENTIAL DUST IMPACTS

GUIDANCE	COMMENT
Whether there is any history of dust generating activities in the area	A number of developments have recently been constructed in the vicinity of the site. It is therefore possible that there has been a history of dust generation in the area
The likelihood of concurrent dust generating activity on nearby sites	A review of the planning portal indicated a number of proposals have been granted consent in the vicinity of the site. These may cause concurrent dust emissions should the construction phases overlap with those of the proposals
Pre-existing screening between the source and the receptors	There is no pre-existing screening between emission sources and nearby receptors
Conclusions drawn from analysing local meteorological data which accurately represent the area, and if relevant the season which works will take place	As shown in Figure 3, the predominant wind bearing is from the south-west. As such, receptors to the north-east of the site are most likely to be affected by dust releases
Conclusions drawn from local topography	There are no significant topographical constraints to dust dispersion



Duration of the potential impact, as a receptor may become more sensitive over time	Currently it is unclear as to the duration of the construction phase. However, it is likely that it will extend over one year. The sensitivity of nearby receptors is unlikely to change during this time
Any known specific receptor sensitivities which go beyond the classifications given in the document	No specific receptor sensitivities identified during the baseline assessment

Based on the criteria shown in Table 3.2, the sensitivity of the receiving environment to potential dust impacts was determined as **high**. This was because the identified receptors included residential properties.

The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria shown in Section 3.2, is shown in Table 4.8.

TABLE 4.8 SENSITIVITY OF THE SURROUNDING AREA TO POTENTIAL DUST IMPACTS

POTENTIAL IMPACT	SENSITIVITY OF THE SURROUNDING AREA		
	EARTHWORKS	CONSTRUCTION	TRACKOUT
Dust Soiling	Medium	Medium	High
Human Health	Low	Low	Medium
Ecological	High	High	High

4.5.2. OPERATIONAL PHASE ROAD VEHICLE EXHAUST EMISSION SENSITIVE RECEPTORS

Receptors sensitive to potential operational phase road vehicle exhaust emissions impacts were identified from a desk-top study and are summarised in Table 4.9. Receptor heights were selected based on the location of residential units to allow for less sensitive land uses, such as retail, at ground level.

TABLE 4.9 ROAD VEHICLE EXHAUST EMISSION SENSITIVE RECEPTOR LOCATIONS

RECEPTOR		NGR (m)		Height (m)
		X	Y	
R1	Residential - Heywood Road	388256.0	410593.4	1.5
R2	Residential - Partington Street	387911.7	410664.0	1.5
R3	Residential - Durban Street	388119.3	410736.7	3.5
R4	Residential - A664 Manchester Road	388363.1	410442.4	3.5
R5	Residential - A664 Manchester Road	388388.1	410339.2	1.5
R6	Residential - A664 Manchester Road	388461.9	410086.6	1.5
R7	Residential - Trows Lane	388496.8	409943.9	1.5
R8	Residential - Albion Street	388422.7	410483.6	1.5
R9	Residential - A664 Queensway	388855.7	411066.9	1.5
R10	Residential - A664 Queensway	389013.2	411194.4	1.5
R11	Residential - Queens Drive	389170.8	411256.7	1.5
R12	Residential - Dunlop Avenue	389297.2	411414.9	1.5
R13	Residential - Dunlop Avenue	389226.7	411451.6	1.5
R14	Residential - A58	388469.9	411819.5	1.5
R15	Residential - A58	388396.3	411761.3	1.5
R16	Residential - A58 Bolton Road	388347.7	411756.5	1.5
R17	Residential - A58 Bolton Road	387970.9	411784.9	1.5
R18	Residential - A58 Bolton Road	387502.9	411755.3	1.5



R19	Residential - A664 Manchester Road	388385.4	411701.3	1.5
R20	Residential - A664 Manchester Road	388076.0	411305.1	1.5
R21	Residential - A664 Manchester Road	388053.9	411154.2	1.5
R22	Residential - A664 Manchester Road	388092.6	410873.5	1.5
R23	Residential - A664 Manchester Road	388515.0	409858.6	1.5
R24	Residential - Royal Barn Road	388609.1	411533.2	1.5
R25	Residential - Rufford Avenue	388694.1	411888.3	1.5

Reference should be made to Figure 4 for a map of the road vehicle exhaust emission sensitive receptor locations.

4.5.3. RAIL EMISSIONS

The development site is located adjacent to the Northern Caldervale railway line. Diesel locomotives are a source of atmospheric emissions and research has shown that NO₂ and SO₂ concentrations can be elevated alongside rail lines with a large number of movements. DEFRA has therefore issued guidance on the assessment of potential impacts for use in the LAQM process.

The DEFRA guidance¹⁵ indicates there is risk of exposure to exceedences of the 15-minute mean AQO for SO₂ should a stationary locomotive be situated within 15m of a sensitive land use on more than three occasions per day. Review of the area indicated that no trains are scheduled to be stationary for a period of 15-minutes or more within 15m of the site boundary. As such, exceedences of the relevant AQO for SO₂ due to rail emissions is not anticipated at the development location.

DEFRA guidance¹⁶ indicates there is risk of exposure to exceedences of the annual mean AQO for NO₂ should a sensitive land use be situated within 30m of a railway line identified as having a heavy flow of diesel locomotives and the annual mean background NO₂ concentration is above 25µg/m³. Review of Table 7.2 in the LAQM guidance¹⁷ indicates the Northern Caldervale Line has not been identified as a track experiencing a high number of diesel train movements. Additionally, the predicted annual mean background NO₂ concentration at the site is 14.06µg/m³. As such, exceedences of the relevant AQO for NO₂ due to rail emissions are not anticipated at the development location.

Based on the above factors, air quality conditions at the proposed site are not predicted to be significantly affected by rail emissions.

¹⁵ Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

¹⁶ Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

¹⁷ Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.



5. ASSESSMENT

5.1. INTRODUCTION

The proposed development has the potential to cause air quality impacts during the construction and operational phases, as well as the exposure of future residents to any existing air quality issues. These factors are assessed in the following Sections.

5.2. CONSTRUCTION PHASE ASSESSMENT

5.2.1. STEP 1

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

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

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

5.2.2. STEP 2

EARTHWORKS

Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. The site area is between 18,000m² and 110,000m². In accordance with the criteria outlined in Table 3.1, the magnitude of potential dust emissions from earthworks is therefore **medium**.

Table 4.8 indicates the sensitivity of the area to dust soiling effects on people and property is **medium**. In accordance with the criteria outlined in Table 3.6, the development is considered to be a **medium** risk site for dust soiling as a result of earthworks.

Table 4.8 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 3.6, the development is considered to be a **low** risk site for human health impacts as a result of earthworks.

Table 4.8 indicates the sensitivity of the area to ecological impacts is **high**. In accordance with the criteria outlined in Table 3.6, the development is considered to be a **medium** risk site for ecological impacts as a result of earthworks.

CONSTRUCTION

The total building volume to be constructed is estimated to be greater than 75,000m³. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from construction is therefore **large**.



Table 4.8 indicates the sensitivity of the area to dust soiling effects on people and property is **medium**. In accordance with the criteria outlined in Table 3.6, the development is considered to be a **medium** risk site for dust soiling as a result of construction.

Table 4.8 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 3.6, the development is considered to be a **low** risk site for human health impacts as a result of construction.

Table 4.8 indicates the sensitivity of the area to ecological impacts is **high**. In accordance with the criteria outlined in Table 3.6, the development is considered to be a **high** risk site for ecological impacts as a result of construction.

TRACKOUT

Based on the site area, it is anticipated that the unpaved road length may be greater than 100m during certain stages of construction. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from trackout is therefore **large**.

Table 4.8 indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in Table 3.6, the development is considered to be a **high** risk site for dust soiling as a result of trackout.

Table 4.8 indicates the sensitivity of the area to human health impacts is **medium**. In accordance with the criteria outlined in Table 3.6, the development is considered to be a **medium** risk site for human health impacts as a result of trackout.

Table 4.8 indicates the sensitivity of the area to ecological impacts is **high**. In accordance with the criteria outlined in Table 3.6, the development is considered to be a **high** risk site for ecological impacts as a result of trackout.

SUMMARY OF THE RISK OF DUST EFFECTS

A summary of the risk from each dust generating activity is provided in Table 5.1.

TABLE 5.1 SUMMARY OF UNMITIGATED DUST RISKS DURING CONSTRUCTION

POTENTIAL IMPACT	UNMITIGATED DUST RISK		
	EARTHWORKS	CONSTRUCTION	TRACKOUT
Dust Soiling	Medium	Medium	High
Human Health	Low	Low	Medium
Ecological	Medium	High	High

As indicated in Table 5.1, the potential risk of dust soiling is **high** from trackout and **medium** from earthworks and construction. The potential risk of human health impacts is **medium** from trackout and **low** from earthworks and construction. The potential risk of ecological impacts is **high** from construction and trackout and **medium** from earthworks.

It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location. Risk was predicted based on a worst-case scenario of works being undertaken at the site boundary closest to each sensitive area. Therefore, actual risk is likely to be lower than that predicted during the majority of the construction phase.



5.2.3. STEP 3

The IAQM guidance¹⁸ provides potential mitigation measures to reduce impacts as a result of fugitive dust emissions during the construction phase. These have been adapted for the development site as summarised in Table 5.2. These may be reviewed prior to the commencement of construction works and incorporated into a Construction Environmental Management Plan or similar if required by the LA.

TABLE 5.2 FUGITIVE DUST EMISSION MITIGATION MEASURES

ISSUE	CONTROL MEASURE
Communications	- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary - Display the head or regional office contact information - Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the LA
Site Management	- Record all dust 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 LA upon request - 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 - Hold regular liaison meetings with other high risk construction sites within 250m of the site boundary
Monitoring	- Undertake daily on-site and off-site inspection, where receptors are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked - Carry out regular site inspections, record inspection results, and make an inspection log available to the LA on request - Increase the frequency of site inspections when activities with a high potential to produce dust emissions are being carried out and during prolonged dry or windy conditions
Site Preparation	- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible - Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site - Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period - Avoid site runoff of water or mud - Keep site fencing, barriers and scaffolding clean using wet methods - Remove materials that have the potential to produce dust from site as soon as possible unless being re-used on site - Cover, seed or fence stockpiles to prevent wind whipping
Operating vehicle/machinery and sustainable travel	- Ensure all vehicles switch off engines when stationary - Avoid the use of diesel or petrol powered generators by using mains electricity as a power source as far as practicable - Implement a Construction Logistics Plan to manage the sustainable delivery of goods
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques

¹⁸ Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.



	Ensure an adequate water supply on the site for effective dust suppression, using non-potable water where possible and appropriate Use enclosed chutes and conveyors and covered skips where possible Minimise drop heights and use fine water sprays wherever appropriate Ensure equipment is readily available on site to clean any dry spillages
Waste management	Avoid bonfires or burning of waste materials
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable Use Hessian, mulches or 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
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 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 on access and local roads, if required Avoid dry sweeping of large areas Ensure vehicles entering and leaving site are covered to prevent escape of materials Implement a wheel washing system, if required Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits Access gates to be located at least 10m from receptors where possible

5.2.4. STEP 4

Assuming the relevant mitigation measures outlined in Table 5.2 are implemented, the residual impact from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance¹⁹.

5.3. OPERATIONAL PHASE ASSESSMENT

Vehicle movements associated with the operation of the proposal will generate exhaust emissions on the local and regional road networks. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site.

The assessment considered the following scenarios:

-  2022 - Verification;
-  2026 - DM; and,
-  2026 - DS.

¹⁹ Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.



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

For the purpose of the assessment traffic data for 2026 was utilised as the development opening year. Air quality is predicted to improve in the future. However, in order to provide a robust assessment, emission factors for 2022 were utilised within the dispersion model. The use of 2026 traffic data and 2022 emission factors is considered to provide a worst-case scenario and therefore a sufficient level of confidence can be placed within the predicted concentrations.

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

5.3.1. PREDICTED CONCENTRATIONS

Annual mean NO₂ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 5.3. Exceedences of the AQO are shown in **bold**.

TABLE 5.3 PREDICTED ANNUAL MEAN NO₂ CONCENTRATIONS

RECEPTOR		PREDICTED ANNUAL MEAN NO ₂ CONCENTRATION (µg/m ³)		
		DM	DS	CHANGE
R1	Residential - Heywood Road	23.22	23.26	0.04
R2	Residential - Partington Street	19.81	19.96	0.15
R3	Residential - Durban Street	21.89	21.92	0.03
R4	Residential - A664 Manchester Road	24.88	24.96	0.08
R5	Residential - A664 Manchester Road	26.06	26.18	0.12
R6	Residential - A664 Manchester Road	32.22	32.39	0.17
R7	Residential - Trows Lane	41.99	42.09	0.10
R8	Residential - Albion Street	23.59	23.66	0.07
R9	Residential - A664 Queensway	22.44	22.51	0.07
R10	Residential - A664 Queensway	26.09	26.20	0.11
R11	Residential - Queens Drive	21.64	21.68	0.04
R12	Residential - Dunlop Avenue	26.33	26.66	0.33
R13	Residential - Dunlop Avenue	26.39	26.52	0.13
R14	Residential - A58	25.86	25.88	0.02
R15	Residential - A58	29.61	29.64	0.03
R16	Residential - A58 Bolton Road	27.89	27.93	0.04
R17	Residential - A58 Bolton Road	26.60	26.63	0.03
R18	Residential - A58 Bolton Road	21.10	21.11	0.01
R19	Residential - A664 Manchester Road	26.53	26.58	0.05
R20	Residential - A664 Manchester Road	22.36	22.40	0.04
R21	Residential - A664 Manchester Road	24.58	24.63	0.05
R22	Residential - A664 Manchester Road	25.42	25.48	0.06
R23	Residential - A664 Manchester Road	37.67	37.77	0.10
R24	Residential - Royal Barn Road	20.13	20.14	0.01
R25	Residential - Rufford Avenue	24.98	24.99	0.01

As indicated in Table 5.3, predicted annual mean NO₂ concentrations were below the AQO at 24 sensitive receptors and above at one location in both scenarios. It should be noted that there were no new exceedences of the AQO in the DS scenario when compared with the DM.



Annual mean PM₁₀ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 5.4.

TABLE 5.4 PREDICTED ANNUAL MEAN PM₁₀ CONCENTRATIONS

RECEPTOR		PREDICTED ANNUAL MEAN PM ₁₀ CONCENTRATION (µg/m ³)		
		DM	DS	CHANGE
R1	Residential - Heywood Road	16.94	16.95	0.01
R2	Residential - Partington Street	15.98	16.02	0.04
R3	Residential - Durban Street	16.58	16.59	0.01
R4	Residential - A664 Manchester Road	17.30	17.32	0.02
R5	Residential - A664 Manchester Road	17.68	17.71	0.03
R6	Residential - A664 Manchester Road	19.25	19.31	0.05
R7	Residential - Trows Lane	20.99	21.03	0.03
R8	Residential - Albion Street	16.94	16.96	0.02
R9	Residential - A664 Queensway	16.77	16.79	0.02
R10	Residential - A664 Queensway	17.80	17.83	0.03
R11	Residential - Queens Drive	16.52	16.53	0.01
R12	Residential - Dunlop Avenue	17.82	17.92	0.10
R13	Residential - Dunlop Avenue	17.78	17.82	0.04
R14	Residential - A58	17.78	17.79	0.01
R15	Residential - A58	18.67	18.68	0.01
R16	Residential - A58 Bolton Road	18.25	18.26	0.01
R17	Residential - A58 Bolton Road	18.02	18.03	0.01
R18	Residential - A58 Bolton Road	16.42	16.42	0.00
R19	Residential - A664 Manchester Road	17.90	17.91	0.02
R20	Residential - A664 Manchester Road	16.77	16.78	0.01
R21	Residential - A664 Manchester Road	17.41	17.43	0.02
R22	Residential - A664 Manchester Road	17.61	17.63	0.02
R23	Residential - A664 Manchester Road	20.10	20.14	0.03
R24	Residential - Royal Barn Road	16.11	16.12	0.00
R25	Residential - Rufford Avenue	17.44	17.45	0.00

As indicated in Table 5.4, predicted annual mean PM₁₀ concentrations were below the relevant AQO at all sensitive receptors in both scenarios.

Annual mean PM_{2.5} concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 5.5.



TABLE 5.5 PREDICTED ANNUAL MEAN PM_{2.5} CONCENTRATIONS

RECEPTOR		PREDICTED ANNUAL MEAN PM _{2.5} CONCENTRATION (µg/m ³)		
		DM	DS	CHANGE
R1	Residential - Heywood Road	9.51	9.52	0.01
R2	Residential - Partington Street	9.05	9.07	0.02
R3	Residential - Durban Street	9.34	9.34	0.00
R4	Residential - A664 Manchester Road	9.69	9.70	0.01
R5	Residential - A664 Manchester Road	9.87	9.89	0.02
R6	Residential - A664 Manchester Road	10.65	10.68	0.03
R7	Residential - Trows Lane	11.67	11.69	0.02
R8	Residential - Albion Street	9.51	9.52	0.01
R9	Residential - A664 Queensway	9.42	9.43	0.01
R10	Residential - A664 Queensway	9.92	9.93	0.02
R11	Residential - Queens Drive	9.31	9.31	0.01
R12	Residential - Dunlop Avenue	9.92	9.96	0.05
R13	Residential - Dunlop Avenue	9.90	9.92	0.02
R14	Residential - A58	9.90	9.90	0.00
R15	Residential - A58	10.31	10.32	0.00
R16	Residential - A58 Bolton Road	10.12	10.12	0.00
R17	Residential - A58 Bolton Road	10.01	10.01	0.00
R18	Residential - A58 Bolton Road	9.25	9.25	0.00
R19	Residential - A664 Manchester Road	9.95	9.96	0.01
R20	Residential - A664 Manchester Road	9.42	9.42	0.00
R21	Residential - A664 Manchester Road	9.72	9.73	0.01
R22	Residential - A664 Manchester Road	9.82	9.83	0.01
R23	Residential - A664 Manchester Road	11.18	11.19	0.02
R24	Residential - Royal Barn Road	9.11	9.11	0.00
R25	Residential - Rufford Avenue	9.74	9.74	0.00

As indicated in Table 5.5, predicted annual mean PM_{2.5} concentrations were below the Interim Target at all sensitive receptors in both scenarios.

5.3.2. PREDICTED IMPACTS

Predicted impacts on annual mean NO₂ concentrations at the sensitive receptor locations are summarised in Table 5.6.

TABLE 5.6 PREDICTED IMPACTS - NO₂

RECEPTOR		PREDICTED CONCENTRATION	PREDICTED CONCENTRATION CHANGE AS PROPORTION OF AQO (%)	IMPACT SIGNIFICANCE
R1	Residential - Heywood Road	Below 75% of AQO	0	Negligible
R2	Residential - Partington Street	Below 75% of AQO	0	Negligible
R3	Residential - Durban Street	Below 75% of AQO	0	Negligible
R4	Residential - A664 Manchester Road	Below 75% of AQO	0	Negligible
R5	Residential - A664 Manchester Road	Below 75% of AQO	0	Negligible



R6	Residential - A664 Manchester Road	76 - 94% of AQO	0	Negligible
R7	Residential - Trows Lane	103 - 109% of AQO	0	Negligible
R8	Residential - Albion Street	Below 75% of AQO	0	Negligible
R9	Residential - A664 Queensway	Below 75% of AQO	0	Negligible
R10	Residential - A664 Queensway	Below 75% of AQO	0	Negligible
R11	Residential - Queens Drive	Below 75% of AQO	0	Negligible
R12	Residential - Dunlop Avenue	Below 75% of AQO	1	Negligible
R13	Residential - Dunlop Avenue	Below 75% of AQO	0	Negligible
R14	Residential - A58	Below 75% of AQO	0	Negligible
R15	Residential - A58	Below 75% of AQO	0	Negligible
R16	Residential - A58 Bolton Road	Below 75% of AQO	0	Negligible
R17	Residential - A58 Bolton Road	Below 75% of AQO	0	Negligible
R18	Residential - A58 Bolton Road	Below 75% of AQO	0	Negligible
R19	Residential - A664 Manchester Road	Below 75% of AQO	0	Negligible
R20	Residential - A664 Manchester Road	Below 75% of AQO	0	Negligible
R21	Residential - A664 Manchester Road	Below 75% of AQO	0	Negligible
R22	Residential - A664 Manchester Road	Below 75% of AQO	0	Negligible
R23	Residential - A664 Manchester Road	95 - 102% of AQO	0	Negligible
R24	Residential - Royal Barn Road	Below 75% of AQO	0	Negligible
R25	Residential - Rufford Avenue	Below 75% of AQO	0	Negligible

As indicated in Table 5.6, impacts on annual mean NO₂ concentrations as a result of the proposed development were predicted to be **negligible** at all locations.

Predicted impacts on annual mean PM₁₀ concentrations at the sensitive receptor locations are summarised in Table 5.7.

TABLE 5.7 PREDICTED IMPACTS - PM₁₀

	RECEPTOR	PREDICTED CONCENTRATION	PREDICTED CONCENTRATION CHANGE AS PROPORTION OF AQO (%)	IMPACT SIGNIFICANCE
R1	Residential - Heywood Road	Below 75% of AQO	0	Negligible
R2	Residential - Partington Street	Below 75% of AQO	0	Negligible
R3	Residential - Durban Street	Below 75% of AQO	0	Negligible
R4	Residential - A664 Manchester Road	Below 75% of AQO	0	Negligible
R5	Residential - A664 Manchester Road	Below 75% of AQO	0	Negligible



R6	Residential - A664 Manchester Road	Below 75% of AQO	0	Negligible
R7	Residential - Trows Lane	Below 75% of AQO	0	Negligible
R8	Residential - Albion Street	Below 75% of AQO	0	Negligible
R9	Residential - A664 Queensway	Below 75% of AQO	0	Negligible
R10	Residential - A664 Queensway	Below 75% of AQO	0	Negligible
R11	Residential - Queens Drive	Below 75% of AQO	0	Negligible
R12	Residential - Dunlop Avenue	Below 75% of AQO	0	Negligible
R13	Residential - Dunlop Avenue	Below 75% of AQO	0	Negligible
R14	Residential - A58	Below 75% of AQO	0	Negligible
R15	Residential - A58	Below 75% of AQO	0	Negligible
R16	Residential - A58 Bolton Road	Below 75% of AQO	0	Negligible
R17	Residential - A58 Bolton Road	Below 75% of AQO	0	Negligible
R18	Residential - A58 Bolton Road	Below 75% of AQO	0	Negligible
R19	Residential - A664 Manchester Road	Below 75% of AQO	0	Negligible
R20	Residential - A664 Manchester Road	Below 75% of AQO	0	Negligible
R21	Residential - A664 Manchester Road	Below 75% of AQO	0	Negligible
R22	Residential - A664 Manchester Road	Below 75% of AQO	0	Negligible
R23	Residential - A664 Manchester Road	Below 75% of AQO	0	Negligible
R24	Residential - Royal Barn Road	Below 75% of AQO	0	Negligible
R25	Residential - Rufford Avenue	Below 75% of AQO	0	Negligible

As indicated in Table 5.7, impacts on annual mean PM₁₀ concentrations as a result of the proposed development were predicted to be **negligible** at all locations.

Predicted impacts on annual mean PM_{2.5} concentrations at the sensitive receptor locations are summarised in Table 5.8.

TABLE 5.8 PREDICTED IMPACTS - PM_{2.5}

	RECEPTOR	PREDICTED CONCENTRATION	PREDICTED CONCENTRATION CHANGE AS PROPORTION OF INTERIM TARGET (%)	IMPACT SIGNIFICANCE
R1	Residential - Heywood Road	76 - 94% of Interim Target	0	Negligible
R2	Residential - Partington Street	76 - 94% of Interim Target	0	Negligible
R3	Residential - Durban Street	76 - 94% of Interim Target	0	Negligible
R4	Residential - A664 Manchester Road	76 - 94% of Interim Target	0	Negligible



R5	Residential - A664 Manchester Road	76 - 94% of Interim Target	0	Negligible
R6	Residential - A664 Manchester Road	76 - 94% of Interim Target	0	Negligible
R7	Residential - Trows Lane	95 - 102% of Interim Target	0	Negligible
R8	Residential - Albion Street	76 - 94% of Interim Target	0	Negligible
R9	Residential - A664 Queensway	76 - 94% of Interim Target	0	Negligible
R10	Residential - A664 Queensway	76 - 94% of Interim Target	0	Negligible
R11	Residential - Queens Drive	76 - 94% of Interim Target	0	Negligible
R12	Residential - Dunlop Avenue	76 - 94% of Interim Target	0	Negligible
R13	Residential - Dunlop Avenue	76 - 94% of Interim Target	0	Negligible
R14	Residential - A58	76 - 94% of Interim Target	0	Negligible
R15	Residential - A58	76 - 94% of Interim Target	0	Negligible
R16	Residential - A58 Bolton Road	76 - 94% of Interim Target	0	Negligible
R17	Residential - A58 Bolton Road	76 - 94% of Interim Target	0	Negligible
R18	Residential - A58 Bolton Road	76 - 94% of Interim Target	0	Negligible
R19	Residential - A664 Manchester Road	76 - 94% of Interim Target	0	Negligible
R20	Residential - A664 Manchester Road	76 - 94% of Interim Target	0	Negligible
R21	Residential - A664 Manchester Road	76 - 94% of Interim Target	0	Negligible
R22	Residential - A664 Manchester Road	76 - 94% of Interim Target	0	Negligible
R23	Residential - A664 Manchester Road	76 - 94% of Interim Target	0	Negligible
R24	Residential - Royal Barn Road	76 - 94% of Interim Target	0	Negligible
R25	Residential - Rufford Avenue	76 - 94% of Interim Target	0	Negligible

As indicated in Table 5.8, impacts on annual mean PM_{2.5} concentrations as a result of the proposed development were predicted to be **negligible** at all locations.

5.3.3. POTENTIAL FUTURE EXPOSURE

The proposed development has the potential to expose future residents to elevated pollution levels. Dispersion modelling was therefore undertaken with the inputs described in Appendix 1 to quantify air quality conditions at the site. Reference should be made to Figures 5, 6 and 7 for graphical representations of predicted annual mean NO₂, PM₁₀ and PM_{2.5} concentrations.



As shown in Figure 5, annual mean NO₂ concentrations were predicted to be below the AQO of 40µg/m³ at all proposed dwellings. The maximum level at any building façade was 28.62µg/m³.

As shown in Figure 6, annual mean PM₁₀ concentrations were predicted to be below the AQO of 40µg/m³ at all proposed dwellings. The maximum level at any building façade was 17.50µg/m³.

As shown in Figure 7, annual mean PM_{2.5} concentrations were predicted to be below the Interim Target of 12µg/m³ at all proposed dwellings. The maximum level at any building façade was 9.92µg/m³.

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

5.3.4. OVERALL SIGNIFICANCE

The overall significance of road vehicle exhaust emission impacts was determined as **negligible**. This was based on the predicted impacts at discrete receptor locations and the considerations outlined in the road vehicle exhaust emission methodology. Further justification is provided in Table 5.9.

TABLE 5.9 OVERALL SIGNIFICANCE OF OPERATIONAL PHASE ROAD VEHICLE EXHAUST EMISSIONS IMPACTS

GUIDANCE	COMMENT
The existing and future air quality in the absence of the development	Predicted NO₂ concentrations were below the AQO at 24 receptors and above at one location in the DM and DS scenario. There were no new exceedences of the AQO in the DS when compared with the DM scenario PM₁₀ and PM_{2.5} concentrations were below the relevant AQOs and Interim Target at all receptor positions in the DM scenario This is unlikely to change in the absence of the proposals given the relatively established nature of the area
The extent of current and future population exposure to the impacts	The development is not predicted to affect the population exposed to exceedences of the AQOs and Interim Target
The influence and validity of any assumptions adopted when undertaking the prediction of impacts	The assessment assumed that vehicle exhaust emission rates and background pollution levels will not reduce in future years. This provides worst-case results when compared with the DEFRA and National Highways methodologies. Due to the adopted assumptions, it is considered the presented results are sufficiently robust for an assessment of this nature

The IAQM guidance²⁰ states that only if the impact is greater than **slight**, the effect is considered **significant**. Given that the overall impact of operational phase road traffic emissions was concluded to be **negligible**, the effect of the proposals is considered to be **not significant**.

²⁰ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.



6. CONCLUSION

E3P was commissioned by M.C.I. Developments Ltd to produce an Air Quality Assessment in support of a proposed residential development on land at Trubs Farm, Rochdale.

The proposals have the potential to cause air quality impacts at sensitive locations as a result of fugitive dust emissions during construction and road vehicle exhaust emissions during operation, as well as the exposure of future residents to any existing air quality issues. As such, an Air Quality Assessment was undertaken to determine baseline conditions, consider site suitability for the proposed end-use and assess potential impacts associated with the scheme.

During the construction phase of the development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated by earthworks, construction and trackout activities was predicted to be **not significant**.

Potential impacts during the operational phase of the proposed development may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the site. An assessment was therefore undertaken using detailed dispersion modelling to quantify NO₂, PM₁₀ and PM_{2.5} concentrations both with and without the proposals.

Review of the dispersion modelling results indicated that impacts on NO₂, PM₁₀ and PM_{2.5} concentrations as a result of traffic generated by the development were predicted to be **negligible** at all sensitive receptor locations.

The results of the dispersion modelling assessment also indicated that predicted annual mean NO₂, PM₁₀ and PM_{2.5} concentrations were below the relevant AQOs and Interim Target at all sensitive locations across the development. The site is therefore considered suitable for the proposed use from an air quality perspective.

Following consideration of the relevant factors, air quality impacts as a result of the operation of the development were predicted to be **not significant**, in accordance with the IAQM guidance.

Based on the assessment results, air quality issues are not considered a constraint to planning consent for the development.

END OF REPORT

APPENDIX I

ASSESSMENT INPUT

DATA



INTRODUCTION

The proposed development has the potential to cause air quality impacts as a result of exhaust emissions associated with vehicles travelling to and from the site, as well as expose future residents to any existing air quality issues. In order to assess changes in NO₂, PM₁₀ and PM_{2.5} concentrations at sensitive locations, detailed dispersion modelling was undertaken in accordance with the following methodology.

DISPERSION MODEL

Dispersion modelling was undertaken using the ADMS-Roads dispersion model (version 5.0.1.3). ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

The model requires input data that details the following parameters:

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

The relevant inputs are detailed in the following Sections.

ASSESSMENT AREA

Ambient concentrations were predicted over the area NGR: 387670, 409510 to 388760, 410600. One Cartesian grid was used within the model to produce data suitable for contour plotting using the Surfer software package.

Reference should be made to Figure 8 for a graphical representation of the assessment extents.



TRAFFIC FLOW DATA

Baseline traffic data for use in the assessment, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition as HDV proportion, was obtained from the Department for Transport (DfT)²¹. The DfT web tool enables the user to view and download traffic flows on every link of the 'A' road and motorway network, as well as selected minor roads, in Great Britain for the years 1999 to 2022. It should be noted that the DfT web tool is referenced in DEFRA guidance²² as being a suitable source of data for air quality assessments and it is therefore considered to provide a reasonable estimate of traffic flows in the vicinity of the site.

Baseline traffic data was not available for a number of roads included within the modelling extents. Flows for these links were therefore obtained from the previous Air Quality Assessment²³ undertaken by Redmore Environmental Ltd in support of planning application 23/00431/HYBR. This was considered to provide a reasonable estimate of traffic flows on these roads in lieu of other data.

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

In order to take account of cumulative air quality impacts at sensitive receptors, vehicle flows from the following developments were added to the relevant links for both the DM and DS scenarios:

-  Planning application - 23/00431/HYBR: Hybrid planning application for the East Lancashire Railway extension and development of 191 residential dwellings; and,
-  Planning application - 23/00650/HYBR: Hybrid planning application for the erection of 233 residential dwellings up to 1380 residential dwellings.

Development trip generation was provided by Eddisons, the Transport Consultants for the scheme. These were added to the relevant links to provide an estimation of traffic flows with the development in place.

A summary of the traffic flow data is provided in Table A1.1.

TABLE A1.1 TRAFFIC DATA

LINK		24-HOUR AADT FLOW			HDV Prop. Of Fleet (%)		
		VERIF.	2026 DM	2026 DS	VERIF.	2026 DM	2026 DS
L1	A664, Manchester Road, North of Partington Street	11,625	14,756	14,893	2.43	2.00	1.98
L2	A664, Manchester Road, Northbound (NB), South of A58, Slow Phase (SP)	3,875	4,781	4,816	2.43	2.21	2.20
L3	A664, Manchester Road, NB, Intersection with A58, SP	3,875	4,781	4,816	2.43	2.21	2.20
L4	A664, Manchester Road, NB, North of A58, SP	14,507	15,859	15,893	2.92	2.83	2.83

²¹ <https://roadtraffic.dft.gov.uk/#6/55.254/-11.107/basemap-regions-countpoints>.

²² Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

²³ Air Quality Assessment - Castle Sidings, Rochdale, Redmore Environmental Ltd, 2023.



L5	A58, Manchester Road, Eastbound (EB), Intersection with A664/B6452, SP	14,507	15,487	15,521	2.92	2.92	2.92
L6	A58, Manchester Road, EB, East of A664 Edinburgh Way, SP	18,624	19,777	19,811	2.92	2.92	2.91
L7	A58, Manchester Road, EB, West of Kemp Avenue	18,624	19,777	19,811	2.92	2.92	2.91
L8	A58, Manchester Road, EB, East of Kemp Avenue	18,624	19,777	19,811	2.92	2.92	2.91
L9	A58, Manchester Road, Westbound (WB), East of Kemp Avenue	17,715	18,830	18,864	3.02	3.02	3.01
L10	A58, Manchester Road, WB, West of Kemp Avenue	17,715	18,830	18,864	3.02	3.02	3.01
L11	A58, Manchester Road, WB, East of A664 Edinburgh Way, SP	17,715	18,830	18,864	3.02	3.02	3.01
L12	A58, Manchester Road, WB, Intersection with A664/B6452, SP	13,650	14,966	15,000	3.31	3.20	3.19
L13	A58, Manchester Road, WB, West of A664 Edinburgh Way, SP	13,650	14,966	15,000	3.31	3.20	3.19
L14	A58, Manchester Road, WB, North of A58, Bolton Road	13,650	14,966	15,000	3.31	3.20	3.19
L15	A664, Manchester Road, Southbound (SB), South of A58, SP	3,875	5,201	5,269	2.43	2.14	2.11
L16	A664, Manchester Road, NB Slip onto A58, Bolton Road, SP	3,875	4,744	4,778	2.43	2.19	2.17
L17	A58, Bolton Road, West of A664/A58, Manchester Road	16,477	18,294	18,362	3.92	3.74	3.72
L18	A58, Bolton Road, EB, West of A664, SP	5,492	6,286	6,320	3.92	3.66	3.64
L19	A58, Bolton Road, EB, East of A664, SP	5,492	5,866	5,866	3.92	3.82	3.82
L20	A58, Bolton Road, WB, East of A664, SP	5,492	5,722	5,722	3.92	3.92	3.92
L21	A58, Bolton Road, WB, West of A664, SP	5,492	6,286	6,320	3.92	3.66	3.64
L22	A58, Bolton Road, EB Slip onto A58, Manchester Road, SP	5,492	5,722	5,722	3.92	3.94	3.94
L23	A58, Manchester Road, EB, North of A58, Bolton Road	14,507	15,859	15,893	2.92	2.83	2.83
L24	B6452, Roch Valley Way, North of Roch Mills Crescent	9,997	10,860	10,860	2.34	2.25	2.25
L25	B6452, Roch Valley Way, South of Roch Mills Crescent	9,997	10,860	10,860	2.34	2.25	2.25
L26	B6452, Roch Valley Way, SB Slip onto A58, Manchester Road, SP	3,329	3,468	3,468	2.34	2.37	2.37
L27	B6452, Roch Valley Way, SB, North of A58, Manchester Road, SP	3,329	3,841	3,841	2.34	2.13	2.13
L28	B6452, Roch Valley Way, NB, North of A58, Manchester Road, SP	3,329	3,841	3,841	2.34	2.13	2.13



L29	A664, Manchester Road, EB, Slip from A58, Manchester Road, SP	8,969	9,345	9,345	3.31	3.31	3.31
L30	A664, Manchester Road, EB, South of A58, Manchester Road	8,969	9,345	9,345	3.31	3.31	3.31
L31	A664, Manchester Road, WB, South of A58, Manchester Road	9,099	9,480	9,480	3.73	3.73	3.73
L32	A664, Manchester Road, WB, Slip to A58, Manchester Road, SP	9,099	9,480	9,480	3.73	3.73	3.73
L33	A664, Manchester Road, WB, Intersection with A58, SP	9,099	9,480	9,480	3.73	3.73	3.73
L34	A664, Manchester Road, EB, Intersection with A58, SP	17,938	18,690	18,690	3.31	3.31	3.31
L35	A664, Manchester Road, EB, West of A627(M)	17,938	18,690	18,690	3.31	3.31	3.31
L36	A664, Manchester Road, EB, West of A627(M)	18,197	18,959	18,959	3.73	3.73	3.73
L37	Royle Barn Road SP	4,036	4,270	4,270	0.00	0.00	0.00
L38	A664, Manchester Road between Royle Barn Road and Durban Street	11,625	14,830	14,967	2.43	1.99	1.97
L39	A664, Manchester Road between Durban Street and Heywood Road	11,625	14,399	14,535	2.43	2.05	2.03
L40	A664, Manchester Road north of A664 Queensway	11,625	14,848	14,985	2.43	1.99	1.97
L41	A664, Manchester Road at A664 Queensway junction SP	15,099	19,833	20,264	3.51	2.80	2.74
L42	A664, Manchester Road south of A664 Queensway	15,099	19,833	20,264	3.51	2.80	2.74
L43	A664, Manchester Road, south of the M62	15,099	19,833	20,146	3.51	2.80	2.75
L44	A664, Manchester Road Queensway, SP	11,031	13,523	13,818	2.67	2.18	2.13
L45	A664, Manchester Road Queensway	11,031	13,523	13,818	2.67	2.18	2.13
L46	A664, Manchester Road Queensway west of roundabout	11,031	13,523	13,818	2.67	2.18	2.13
L47	A664, Edinburgh Way north of roundabout EB	10,517	10,958	11,124	4.15	4.08	4.08
L48	A664, Edinburgh Way north of roundabout EB south of A627(M)	7,888	8,218	8,218	4.15	4.15	4.15
L49	A664, Edinburgh Way north of roundabout EB north of A627(M)	7,888	8,218	8,218	4.15	4.15	4.15
L50	A664, Edinburgh Way south of A627(M) SP	10,460	10,898	11,065	3.53	3.47	3.47
L51	A664, Queensway	21,704	22,613	24,772	3.36	3.05	3.02
L52	A627(M)	36,941	38,489	38,655	6.88	6.85	6.85
L53	A627(M) between slip roads and A664 Edinburgh Way	27,706	28,867	28,950	6.88	6.86	6.86



L54	A627(M) north slip road approach to A664, Edinburgh Way EB	9,235	9,622	9,622	6.88	6.88	6.88
L55	A627(M) north south road exit from A664, Edinburgh Way EB	2,629	2,739	2,823	16.58	16.09	16.09
L56	Partington Street	1,241	1,293	1,717	0.00	0.00	0.00
L57	M62 WB west of Junction 20	72,425	75,460	75,501	16.63	16.62	16.62
L58	M62 WB east of Junction 20	54,319	56,595	56,595	16.63	16.63	16.63
L59	M62 WB slip road at Junction 20	18,106	18,865	18,907	16.63	16.59	16.59
L60	M62 EB east of Junction 20	48,933	50,983	50,983	16.19	16.19	16.19
L61	M62 EB slip road at Junction 20	16,311	16,994	17,036	16.19	16.15	16.15
L62	M62 EB west of Junction 20	65,244	67,978	68,019	16.19	16.18	16.18
R1	A664 Roundabout	17,904	18,654	18,821	3.41	3.38	3.38

Road widths and vehicle speeds were estimated from aerial photography and UK highway design standards. These are summarised in Table A1.2.

TABLE A1.2 ROAD PARAMETERS

	LINK	ROAD WIDTH (m)	AVERAGE VEHICLE SPEED (km/h)
L1	A664, Manchester Road, North of Partington Street	8.7	45
L2	A664, Manchester Road, Northbound (NB), South of A58, SP	6.9	30
L3	A664, Manchester Road, NB, Intersection with A58, SP	8.5	30
L4	A664, Manchester Road, NB, North of A58, SP	8.8	30
L5	A58, Manchester Road, EB, Intersection with A664/B6452, SP	11.3	30
L6	A58, Manchester Road, EB, East of A664 Edinburgh Way, SP	11.5	30
L7	A58, Manchester Road, EB, West of Kemp Avenue	6.8	40
L8	A58, Manchester Road, EB, East of Kemp Avenue	6.9	55
L9	A58, Manchester Road, Westbound WB, East of Kemp Avenue	6.8	55
L10	A58, Manchester Road, WB, West of Kemp Avenue	7.2	40
L11	A58, Manchester Road, WB, East of A664 Edinburgh Way, SP	10.2	30
L12	A58, Manchester Road, WB, Intersection with A664/B6452, SP	6.4	30
L13	A58, Manchester Road, WB, West of A664 Edinburgh Way, SP	7.5	30
L14	A58, Manchester Road, WB, North of A58, Bolton Road	7.0	45
L15	A664, Manchester Road, SB, South of A58, SP	4.5	30
L16	A664, Manchester Road, NB Slip onto A58, Bolton Road, SP	5.8	30
L17	A58, Bolton Road, West of A664/A58, Manchester Road	11.7	45



L18	A58, Bolton Road, EB, West of A664, SP	3.4	30
L19	A58, Bolton Road, EB, East of A664, SP	5.6	30
L20	A58, Bolton Road, WB, East of A664, SP	10.1	30
L21	A58, Bolton Road, WB, West of A664, SP	6.0	30
L22	A58, Bolton Road, EB Slip onto A58, Manchester Road, SP	6.2	30
L23	A58, Manchester Road, EB, North of A58, Bolton Road	9.9	45
L24	B6452, Roch Valley Way, North of Roch Mills Crescent	7.3	60
L25	B6452, Roch Valley Way, South of Roch Mills Crescent	11.2	40
L26	B6452, Roch Valley Way, SB Slip onto A58, Manchester Road, SP	5.8	30
L27	B6452, Roch Valley Way, SB, North of A58, Manchester Road, SP	12.4	30
L28	B6452, Roch Valley Way, NB, North of A58, Manchester Road, SP	5.1	30
L29	A664, Manchester Road, EB, Slip from A58, Manchester Road, SP	7.6	30
L30	A664, Manchester Road, EB, South of A58, Manchester Road	7.6	30
L31	A664, Manchester Road, WB, South of A58, Manchester Road	12.1	30
L32	A664, Manchester Road, WB, Slip to A58, Manchester Road, SP	7.8	30
L33	A664, Manchester Road, WB, Intersection with A58, SP	9.1	30
L34	A664, Manchester Road, EB, Intersection with A58, SP	8.2	30
L35	A664, Manchester Road, EB, West of A627(M)	7.5	55
L36	A664, Manchester Road, EB, West of A627(M)	7.3	55
L37	Royle Barn Road SP	9.8	30
L38	A664, Manchester Road between Royle Barn Road and Durban Street	9.5	45
L39	A664, Manchester Road between Durban Street and Heywood Road	9.3	45
L40	A664, Manchester Road north of A664 Queensway	10.1	45
L41	A664, Manchester Road at A664 Queensway junction SP	9.3	30
L42	A664, Manchester Road south of A664 Queensway	7.9	45
L43	A664, Manchester Road, south of the M62	7.9	45
L44	A664, Manchester Road Queensway, SP	13.7	30
L45	A664, Manchester Road Queensway	6.9	45
L46	A664, Manchester Road Queensway west of roundabout	16.0	45
L47	A664, Edinburgh Way north of roundabout EB	11.4	55



L48	A664, Edinburgh Way north of roundabout EB south of A627(M)	13.6	55
L49	A664, Edinburgh Way north of roundabout EB north of A627(M)	7.3	55
L50	A664, Edinburgh Way south of A627(M) SP	8.0	30
L51	A664, Queensway	13.7	45
L52	A627(M)	15.6	65
L53	A627(M) between slip roads and A664 Edinburgh Way	21.7	30
L54	A627(M) north slip road approach to A664, Edinburgh Way EB	5.4	30
L55	A627(M) north south road exit from A664, Edinburgh Way EB	7.9	30
L56	Partington Street	5.1	35
L57	M62 WB west of Junction 20	14.3	95
L58	M62 WB east of Junction 20	11.4	95
L59	M62 WB slip road at Junction 20	9.5	45
L60	M62 EB east of Junction 20	11.4	95
L61	M62 EB slip road at Junction 20	7.4	95
L62	M62 EB west of Junction 20	14.3	95
R1	A664 Roundabout	9.9	30

Reference should be made to Figure 8 for a graphical representation of the road link locations.

EMISSION FACTORS

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 12.0.1). This has been produced by DEFRA and incorporates COPERT 5.6 vehicle emission factors and fleet information.

There is current uncertainty over NO₂ concentrations within the UK, with the implementation of new vehicle emission standards not resulting in the previously expected reduction in roadside levels. Therefore, 2022 emission factors were utilised in preference to the development opening year in order to provide robust model outputs. As predictions for 2022 were verified, it is considered the results are a robust indication of worst case concentrations for the future year.

METEOROLOGICAL DATA

Meteorological data used in the assessment was taken from Manchester Airport meteorological station over the period 1st January 2022 to 21st December 2022 (inclusive). Manchester Airport is located at NGR: 381792, 384116, which is approximately 26.7km south-west of the development. It is anticipated that conditions would be reasonably similar over a distance of this magnitude. The data was therefore considered suitable for an assessment of this nature.

All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 3 for a wind rose of the utilised meteorological data.



ROUGHNESS LENGTH

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

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

MONIN-OBUKHOV LENGTH

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

BACKGROUND CONCENTRATIONS

Annual mean NO_2 , PM_{10} and $\text{PM}_{2.5}$ background concentrations for use in the assessment were taken from the DEFRA mapping study for the grid square containing the RO3ANO monitor, as shown in Table A1.3.

TABLE A1.3 BACKGROUND POLLUTANT CONCENTRATIONS - MODELLING EXTENTS

POLLUTANT	PREDICTED BACKGROUND POLLUTANT CONCENTRATION ($\mu\text{g}/\text{m}^3$)
NO_2	17.77
PM_{10}	12.46
$\text{PM}_{2.5}$	8.06

The annual mean background concentrations were chosen to represent concentrations throughout the dispersion modelling extents without the contribution from road vehicles as they were higher than the DEFRA background for the grid square containing the site, as shown in Table 4.2.

Similarly, to emission factors, background concentrations from 2022 were utilised in preference to the development opening year. This provided a robust assessment and is likely to overestimate pollutant concentrations during the operation of the proposal.

NO_x TO NO_2 CONVERSION

Predicted annual mean oxides of nitrogen (NO_x) concentrations were converted to NO_2 concentrations using the spreadsheet (version 8.1) provided by DEFRA, which is the method detailed within DEFRA guidance²⁴.

VERIFICATION

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

-  Estimates of background concentrations;

²⁴ Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.



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

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

For the purpose of the assessment model verification was undertaken for 2022 using traffic data, meteorological data and monitoring results from this year.

NO_x Verification

RBC undertook monitoring of NO₂ concentrations at five locations within the vicinity of roads included in the modelling extents during 2022. The results were obtained and the road contributions to total NO_x concentrations calculated following the methodology contained within DEFRA guidance²⁵. The monitored annual mean NO₂ concentrations and calculated road NO_x concentrations are summarised in Table A1.4.

TABLE A1.4 NO_x VERIFICATION - MONITORING RESULTS

MONITORING LOCATION	MONITORED NO ₂ CONCENTRATION (µg/m ³)	CALCULATED ROAD NO _x CONCENTRATION (µg/m ³)
RDL001	27.0	17.8
RO7ANO	26.4	16.6
RO8ANO	36.3	37.27
RO9ANO	36.4	37.49
RO24ANO	24.0	11.86

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

TABLE A1.5 NO_x VERIFICATION - MODELLING RESULTS

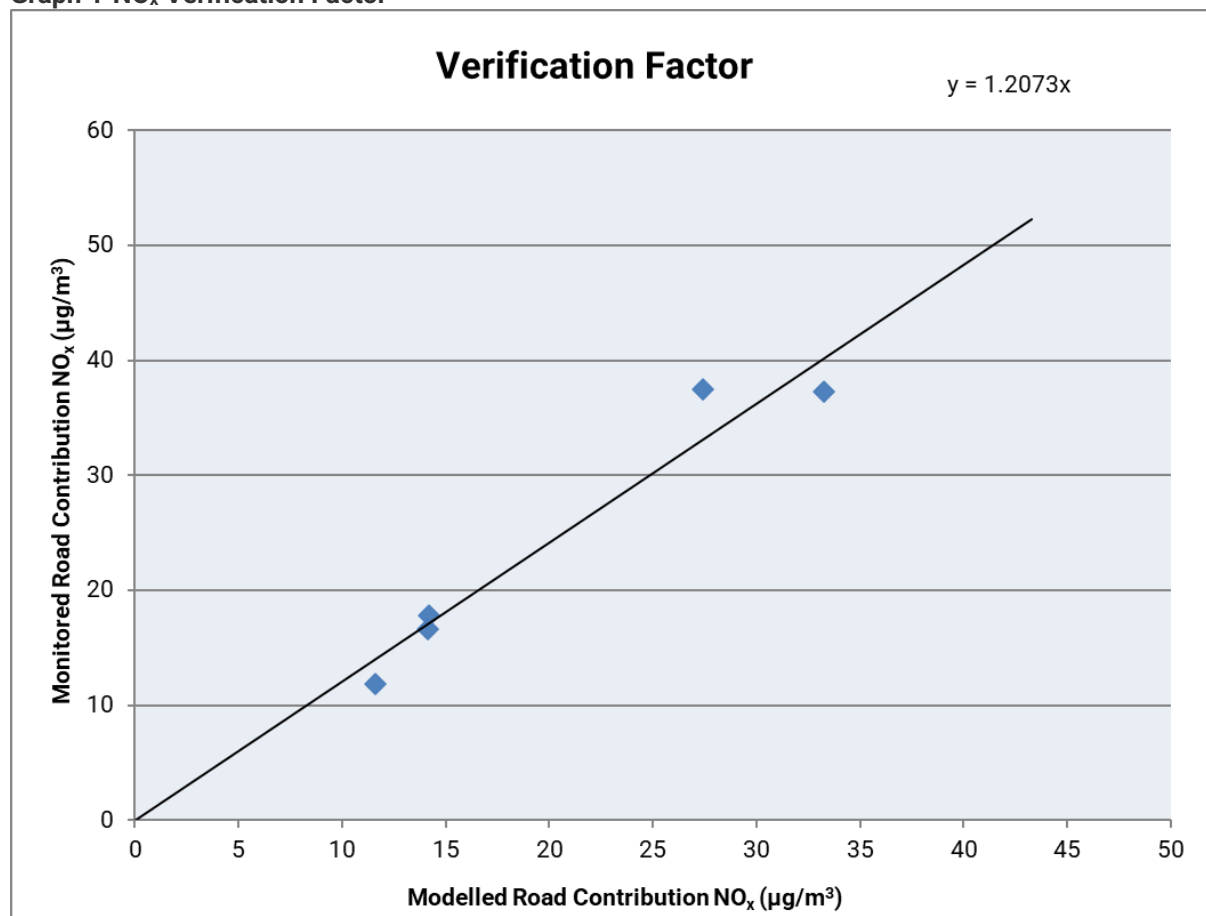
MONITORING LOCATION	CALCULATED ROAD NO _x CONCENTRATION (ug/m ³)	MODELLED ROAD NO _x CONCENTRATION (ug/m ³)
RDL001	17.80	14.21
RO7ANO	16.60	14.15
RO8ANO	37.27	33.28
RO9ANO	37.49	27.43
RO24ANO	11.86	11.63

The monitored and modelled road NO_x concentrations were graphed and the equation of the trendline based on linear progression through zero calculated. This indicated that a verification factor of 1.2073 was required to be applied to be applied to all road NO_x modelling results, as shown in Graph 1.

²⁵ Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.



Graph 1 NO_x Verification Factor



PM₁₀ Verification

RBC undertook monitoring of PM₁₀ concentrations at one location within the modelling extents during 2022. The monitored annual mean PM₁₀ concentration and modelled PM₁₀ concentration is shown in Table A1.6.

TABLE A1.6 PM₁₀ VERIFICATION - MODELLING RESULTS

MONITORING LOCATION	MONITORED PM ₁₀ CONCENTRATION (ug/m³)	MODELLED PM ₁₀ CONCENTRATION (ug/m³)
RDL001	18.0	14.4

The monitored and modelled PM₁₀ concentrations were compared to calculate the associated ratio. This indicated a verification factor of 1.2467 was required to be applied to all modelling results.

PM_{2.5} Verification

RBC undertook monitoring of PM_{2.5} concentrations at one location within the modelling extents during 2022. The monitored annual mean PM_{2.5} concentration and modelled PM_{2.5} concentration is shown in Table A1.7.

TABLE A1.7 PM_{2.5} VERIFICATION - MODELLING RESULTS

MONITORING LOCATION	MONITORED PM _{2.5} CONCENTRATION (ug/m³)	MODELLED PM _{2.5} CONCENTRATION (ug/m³)
RDL001	10.0	9.1



The monitored and modelled PM_{2.5} concentrations were compared to calculate the associated ratio. This indicated a verification factor of 1.0952 was required to be applied to all modelling results.

APPENDIX II LIMITATIONS



1. This report and its findings should be considered concerning the terms of reference and objectives agreed upon between E3P and the client, as indicated in Section 1.3.
2. For the work, reliance has been placed on publicly available data from the sources identified. The information is not necessarily exhaustive, and further information relevant to the Site may be available from other sources. When using the information, it has been assumed that it is correct. No attempt has been made to verify the information.
3. This report has been produced following current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and require advice from legal professionals.
4. During the site walkover, a reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the Site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the Site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and does not constitute or replace full and proper surveys.
8. The report's executive summary, conclusions and recommendations sections provide an overview and guidance only. They should not be relied on explicitly without fully considering the report's context.
9. E3P cannot be held responsible for any use of the report or its contents for any purpose other than that it was prepared for. The copyright in this report and other plans and documents designed by E3P is owned by them, and no such plans or documents may be reproduced, published or adapted without written consent. However, complete copies of this may be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied. Still, no professional liability or warranties shall be extended to other parties by E3P in this connection without their explicit written agreement.
10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

APPENDIX III

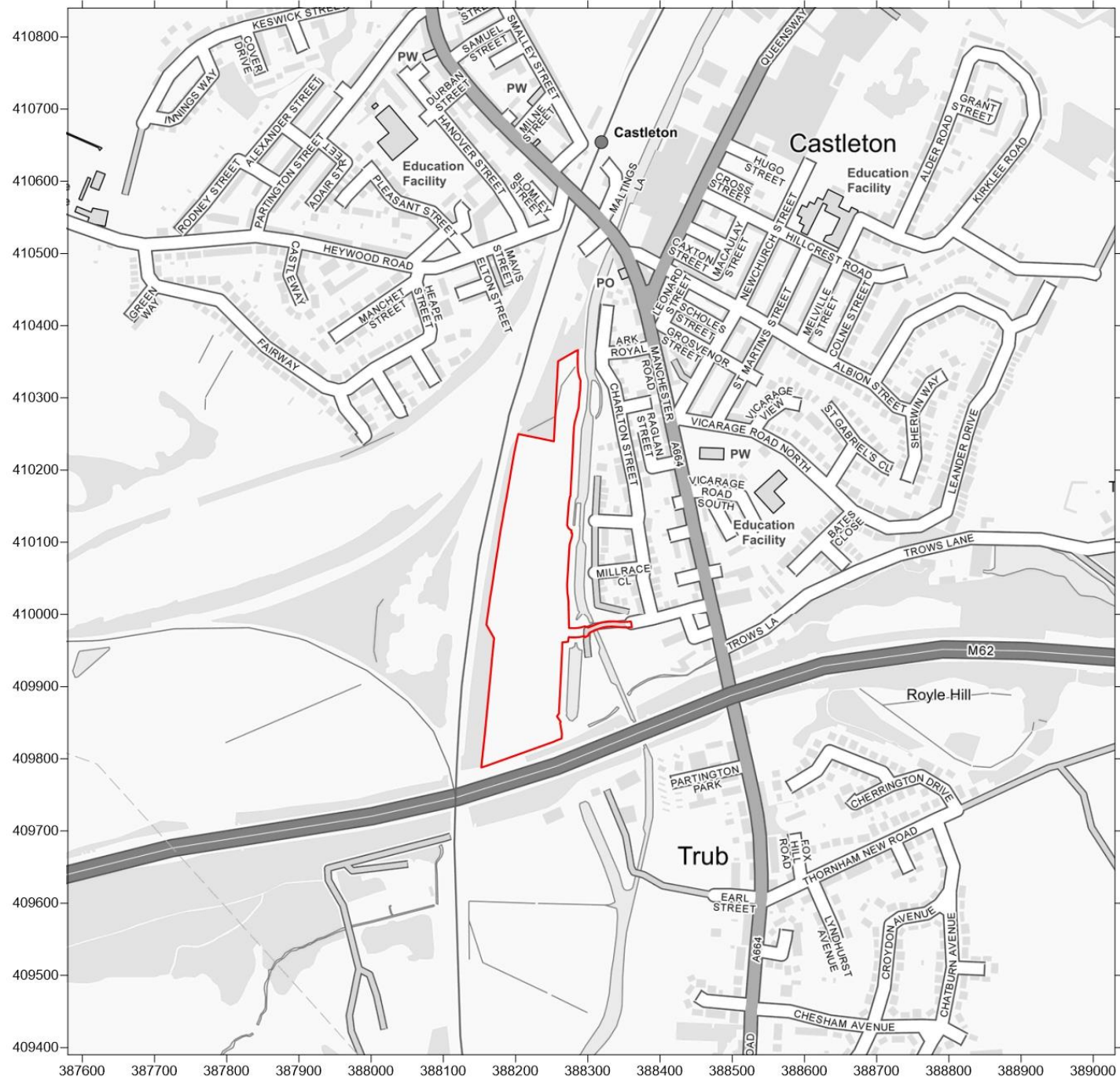
GLOSSARY



TERMS

AADT	Annual Average Daily Traffic
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
DEFRA	Department for Environment, Food and Rural Affairs
DMP	Dust Management Plan
EB	Eastbound
GMCA	Greater Manchester Combined Authority
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
NB	Northbound
NGR	National Grid Reference
NO₂	Nitrogen dioxide
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
PfEP	Places for Everyone Plan
PM₁₀	Particulate matter with an aerodynamic diameter of less than 10µm
PM_{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm
RBC	Rochdale Borough Council
SAC	Special Area of Conservation
SB	Southbound
SO₂	Sulphur dioxide
SP	Slow Phase
WB	Westbound

APPENDIX IV DRAWINGS



Legend



Title

Figure 1 - Site Location Plan

Project

Air Quality Assessment
Trubs Farm, Rochdale

Project Number

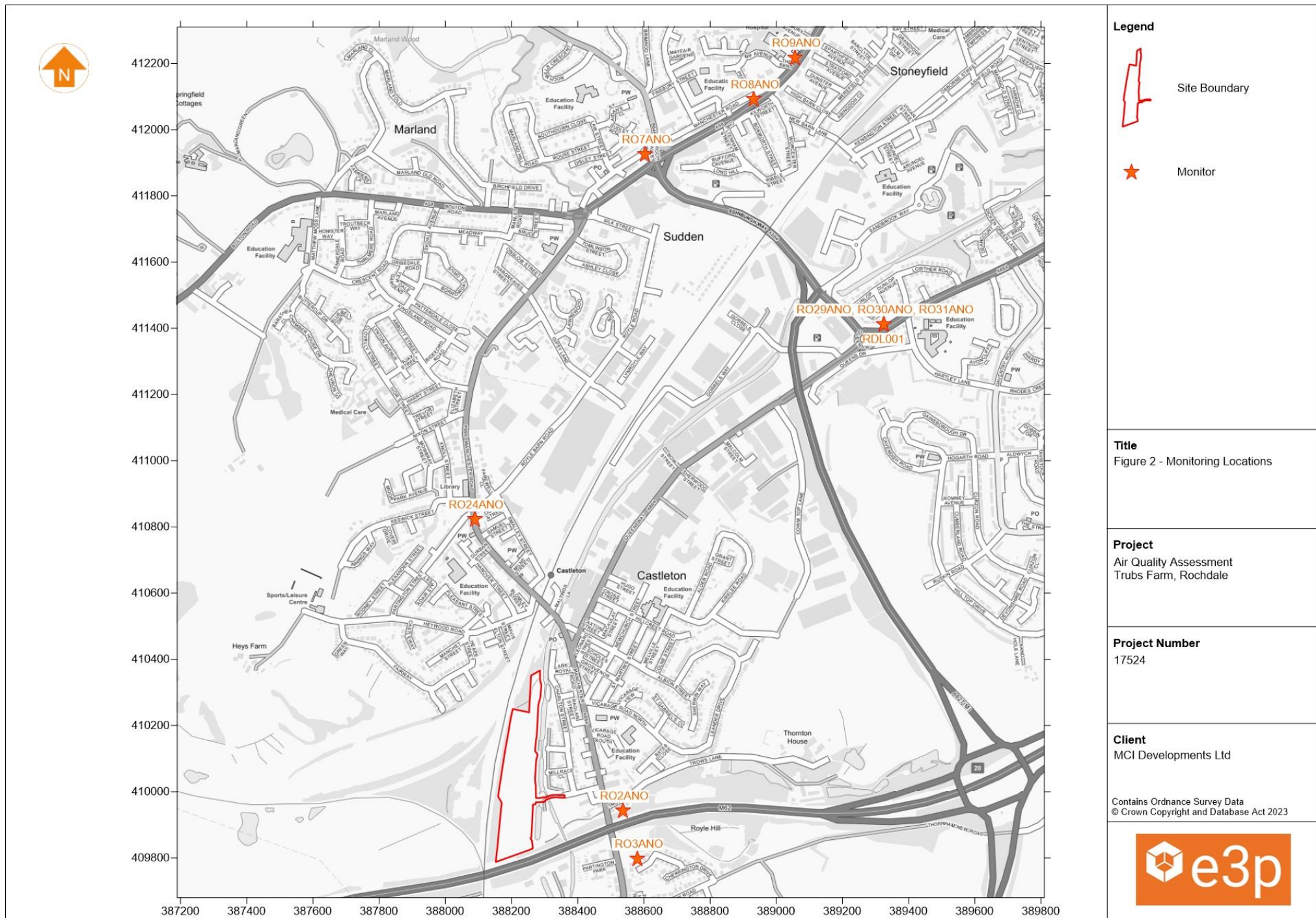
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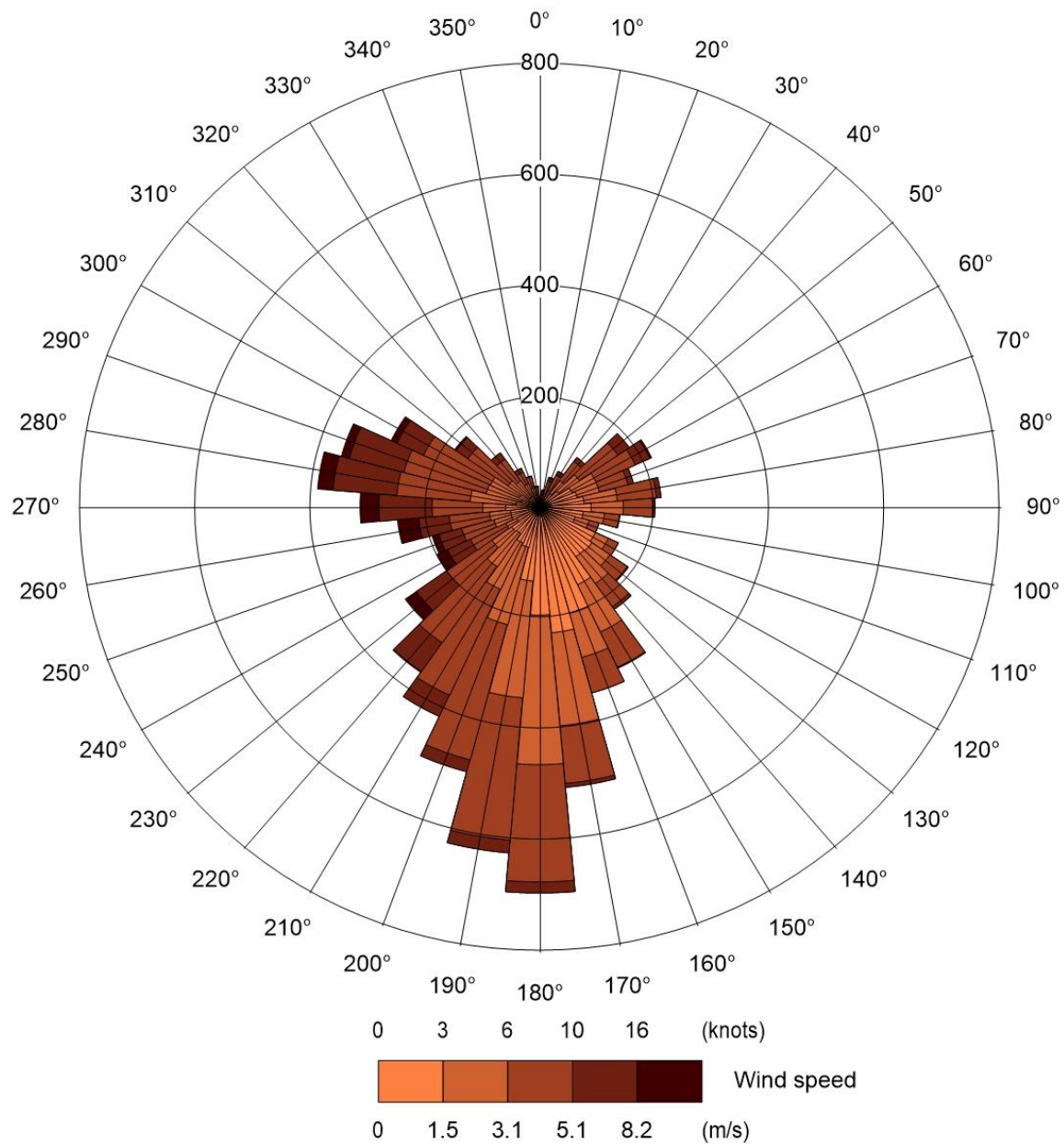
Client

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Legend

Title

Figure 3 - Wind Rose of 2022
Manchester Airport Meteorological
Data

Project

Air Quality Assessment
Trubs Farm, Rochdale

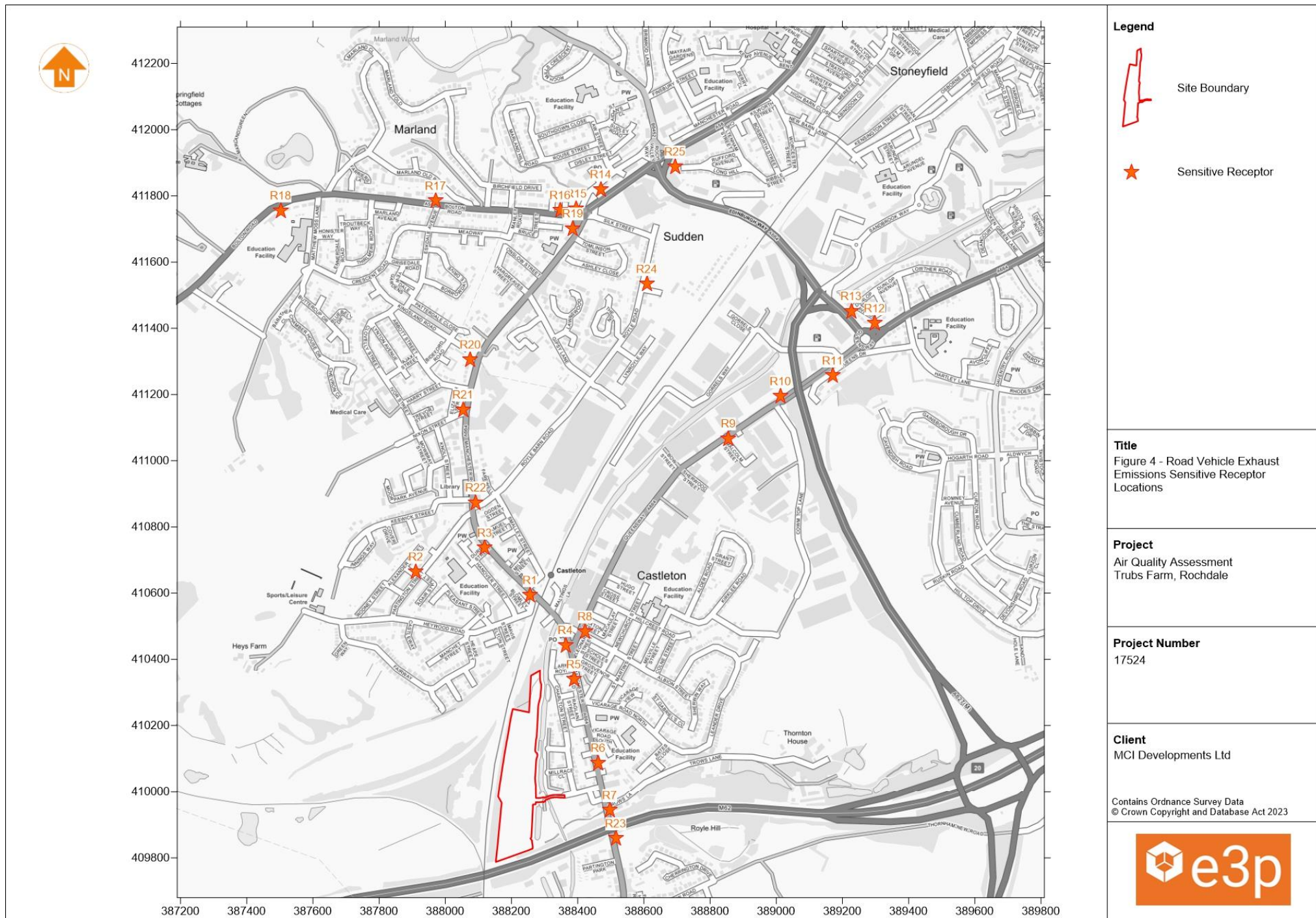
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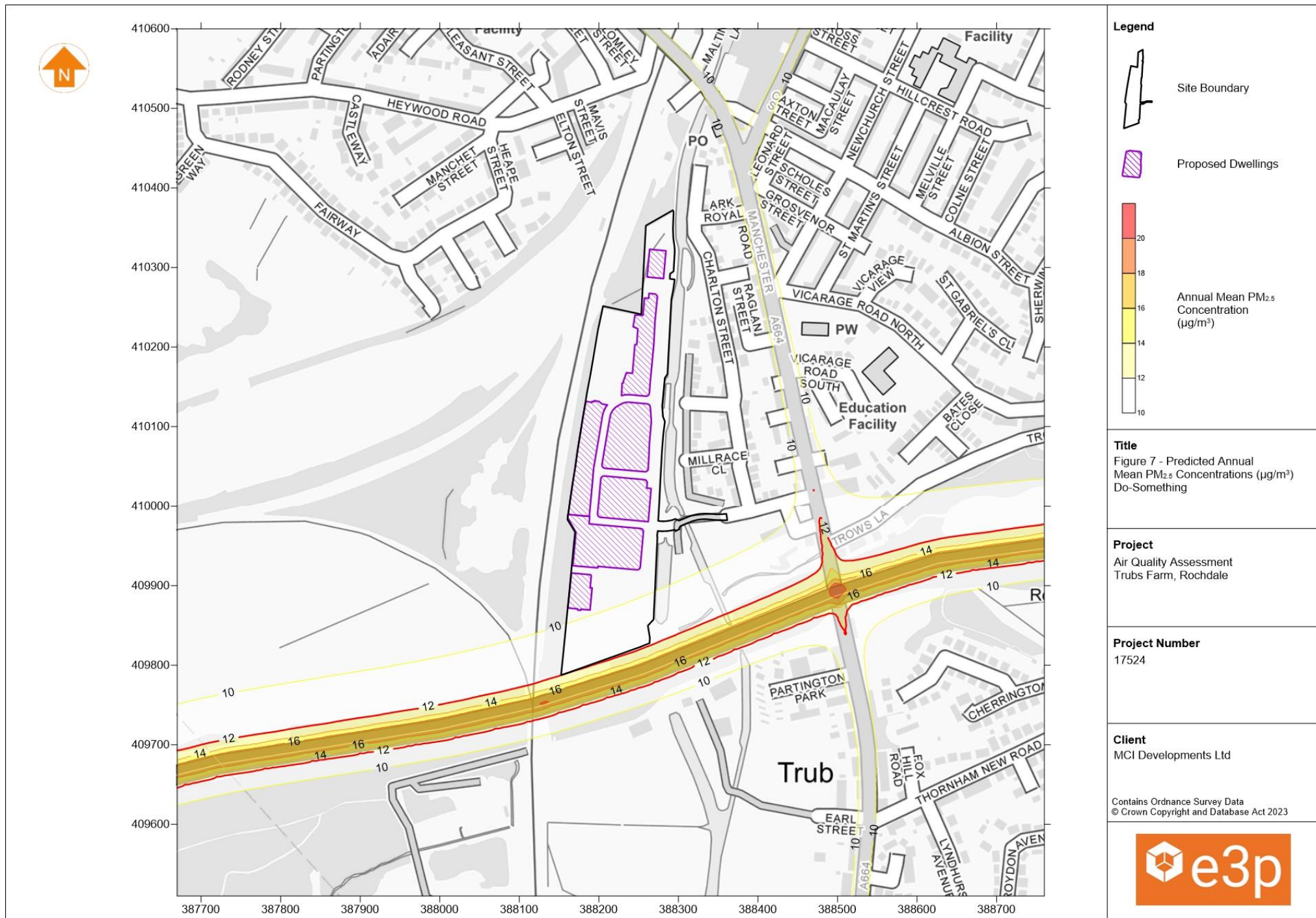
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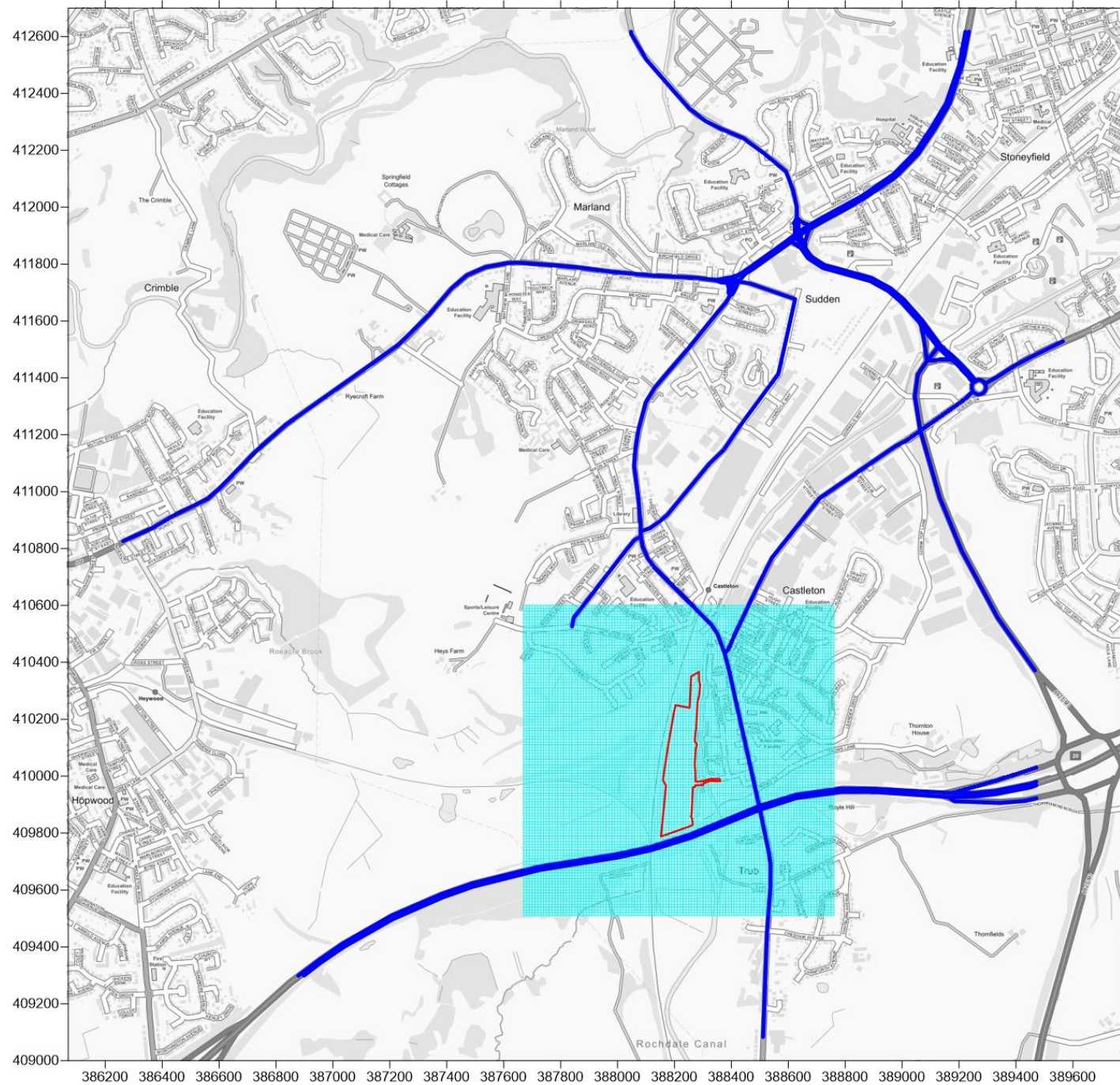












Legend

-  Site Boundary
-  Road Link
-  Output Grid

Title

Figure 8 - ADMS-Roads Inputs

Project

Air Quality Assessment
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