

Air Quality Assessment

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**Grey Mare Lane Site 1
Manchester**

On behalf of

Great Places Housing Group



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Executive Summary

Energy Counsel was commissioned to undertake an Air Quality Assessment in support of a residential apartment development on land known as Site 1, on Grey Mare Lane, Manchester.

An Air Quality Assessment was undertaken to:

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

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

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

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

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

A number of mitigation measures were identified in line with the requirements of the Manchester City Council's 'Air Quality and Planning Technical Guidance' in order to reduce vehicle exhaust emissions associated with the proposals. It is considered these are appropriate for a development of this scale and nature and will further control impacts during the operational phase.

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

1.0 INTRODUCTION

1.1 Instruction

- 1.1.1 Energy Counsel was commissioned to undertake an Air Quality Assessment in support of a residential development on land known as Site 1, off Grey Mare Lane, Manchester.

1.2 Site Location and Context

- 1.2.1 The site is located on land known as Plot A, off Grey Mare Lane, Manchester, at approximate National Grid Reference (NGR): 386945, 398300. The relevant Local Authority (LA) is Manchester City Council (MCC). Reference should be made to Figure 1 for a map of the site and surrounding area.
- 1.2.2 The proposals include the construction of one residential block comprising 82 flats and associated infrastructure. The scheme will include 7No. car parking spaces (one for servicing and the rest for disabled parking and a total of 7No. Electric Vehicle (EV) charging spaces.

1.3 Assessment Scope

- 1.2.3 The proposals have the potential to cause air quality impacts at sensitive locations. As such, an Air Quality Assessment was undertaken to:
- Assess potential impacts associated with fugitive dust emissions during the construction phase of the development;
 - Assess potential impacts associated with road transport emissions during the operational phase of the development;
 - Assess risk of future resident exposure to any existing air quality issues; and,
 - Identify the requirement for relevant mitigation measures.
- 1.2.4 This is detailed in the following report.

2.0 LEGISLATION AND POLICY

2.1 Legislation

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

- Nitrogen dioxide (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.

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

2.1.3 The Air Quality Strategy (AQS) was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published on 28th April 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.

2.1.4 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).

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

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

² Environmental Improvement Plan 2023, DEFRA, 2023.

Table 1 Air Quality Objectives/Interim Target

Pollutant	Air Quality Objective/Interim Target	
	Concentration ($\mu\text{g}/\text{m}^3$)	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

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

2.1.6 Table 2 summarises the advice provided in DEFRA guidance³ on where the AQOs for pollutants considered within this report apply.

Table 2 Examples of Where the Air Quality Objectives Apply

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

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

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

2.2 Local Air Quality Management

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

2.3 Dust

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

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

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

2.4 National Planning Policy

2.4.1 The revised National Planning Policy 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.

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

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

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

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

[...]

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality [...]."

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

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

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

Air Zones is consistent with the local air quality action plan."

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

2.5 National Planning Practice Guidance

2.5.1 The National Planning Practice 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:

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

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

2.6 Local Planning Policy

2.6.1 The Manchester Local Development Framework consists of a series of planning documents. The Core strategy development plan was adopted by MCC on 11th July 2012 and provided policies which guide the determination of planning applications within the city. Recently the Places for Everyone planning policy became part of the statutory development plan for each of the nine PforE authorities on March 21, 2024. Policy JP-S5⁶ covers the clean air requirements.

2.6.2 Review of the document indicated the following policies of relevance to this assessment:

"Policy JP-S5 Clean Air

The Council will seek to improve the air quality within Manchester. Developers will be expected to take measures to minimise and mitigate the local effect of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant.

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

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

⁶ Places for Everyone Local Policy, 2024.

"JP-C1: An Integrated Network
Development Management

All development should have regard to the following specific issues:

"Transforming transport infrastructure and services by securing investment in new and improved transport infrastructure and services that will: promote social inclusion, support economic growth, reduce carbon emissions and protect our environment and air quality";

2.6.3 The Places for Everyone Plan (PfEP)⁶ 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.

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

"Policy JP:S5: Clean Air

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

1. Locating and designing development, and focusing transport investment, so as to reduce reliance on forms of transport that generate air pollution;
2. Determining planning applications having regard to the most recent development and planning control guidance published jointly by the Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK), and the most recent IAQM Guidance on the Assessment of Dust from Demolition and Construction, or relevant successor guidance, including the requirement for developers to submit construction management plans as appropriate;
3. Requiring applications for developments that could have an adverse impact on air quality to submit relevant air pollution data so that adverse impacts on air 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;

⁶ PfEP, GMCA, 2024.

5. Significantly expanding the existing commercial network of electric vehicle charging points, both for public and private use, including as part of new developments;
6. Implementing the Clean Air Plan and associated measures;
7. Facilitating the more sustainable distribution of goods within the urban area, including through accommodating urban consolidation centres and urban distribution centres that use ultra-low-emission vehicles, and local delivery facilities to reduce repeat delivery attempts;
8. Designing streets to avoid trapping air pollution at ground level, including through the appropriate location and scale of buildings and trees;
9. Controlling traffic and parking within and around schools, early years sites and other locations that are particularly sensitive to air quality;
10. Promoting actions that help remove pollutants from the air, such as enhancing the green infrastructure network and using innovative building materials that capture air pollutants; and,
11. Development should be located in areas that maximise the use of sustainable travel modes and be designed to minimise exposure to high levels of air pollution, particularly for vulnerable users."

"Policy JP-P1 Sustainable Places

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

[...]

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

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

- 2.6.5 MCC has also produced the 'Air Quality & Planning Technical Guidance' Document⁷ which provides guidance on assessing the impact of proposed development on air quality.

⁷ Air Quality & Planning Technical Guidance, MCC, 2022.

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

3.0 METHODOLOGY

3.1 Introduction

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

3.2 Construction Phase Assessment

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

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

- Earthworks;
- Construction; and,
- Trackout.

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

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

3.2.4 The assessment steps are detailed below.

Step 1 - Screen the Need for an Assessment

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

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

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

Step 2 - Assess the Risk of Dust Impacts

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

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

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

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

Table 3 Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Earthworks	- Total site area greater than 110,000m² - 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 75,000m³ - 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 18,000m² to 110,000m² - 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 12,000m³ to 75,000m³ - 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 18,000m² - 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 12,000m³ - 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

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

Table 4 Construction Dust - Sensitivities of Human and Ecological Receptors

Receptor Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	• Users expect high levels of amenity • 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
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

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

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

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

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

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

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

		1 - 10	Medium	Low	Low	Low
	Less than 24µg/m³	More than 100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	Greater than 32µg/m³	More than 10	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	28 - 32µg/m³	More than 10	Medium	Low	Low	Low
		1 - 10	Low	Low	Low	Low
	24 - 28µg/m³	More than 10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
	Less than 24µg/m³	More than 10	Low	Low	Low	Low
Low		1 - 10	Low	Low	Low	Low
	-	1 or more	Low	Low	Low	Low

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

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

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

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

3.2.15 Table 8 outlines the risk category from earthworks, construction and trackout activities.

Table 8 Construction Dust - Dust Risk Category from Earthworks, Construction and Trackout Activities

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

Step 3 - Site-specific Mitigation

3.2.16 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.

Step 4 - Determine Significance

3.2.17 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**.

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

3.3 Operational Phase Assessment

3.3.1 The development has the potential to affect air quality as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site, as well as expose future

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

residents to any existing air quality issues. Potential impacts have therefore been defined by predicting pollutant concentrations at sensitive locations using dispersion modelling for the following scenarios:

- 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).

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

Potential Development Impacts

- 3.3.3 Locations sensitive to potential changes in off-site pollutant concentrations were identified within 200m of the highway network in accordance with 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, was utilised to determine worst-case receptor positions in the vicinity of links likely to be affected by changes in traffic flows as a result of the development.
- 3.3.4 The significance of predicted air quality impacts was determined in accordance with the guidance provided within the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'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 9.

Table 9 Significance of Operational Phase 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

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

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

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

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

3.3.5 The matrix shown in Table 9 is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which makes it clearer which cell the impact falls within. It should be noted that changes of 0%, i.e. less than 0.5%, are described as **negligible**.

3.3.6 Following the prediction of impacts at discrete receptor locations, the IAQM 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.

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

3.3.8 The determination of significance relies on professional judgement and reasoning has been provided as far as practicable. The IAQM guidance¹⁵ suggests the provision of details of the assessor's qualifications and experience.

Potential Future Exposure

3.3.9 The proposals have the potential to expose future residents to any existing air quality issues. In order to assess NO₂, PM₁₀ and PM_{2.5} concentrations across the development site, detailed dispersion modelling was undertaken. The results were subsequently compared with the relevant AQOs and Interim Target to determine any potential areas of exceedence and associated constraints to the proposed land use. Reference should be made to Appendix 1 for a full description of the assessment input data.

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

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

4.0 BASELINE

4.1 Introduction

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

4.2 Local Air Quality Management

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

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

4.2.2 The development is partly located within the AQMA. As such, there is the potential for the exposure of future residents to poor air quality and any emissions associated with the proposals to cause air quality effects within this sensitive location. This has therefore been considered within the assessment.

4.2.3 MCC 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

4.3.1 Monitoring of pollutant concentrations is undertaken by MCC throughout their area of jurisdiction. Recent NO₂ concentrations recorded in the vicinity of the development, as provided in GMCA's '2022 Air Quality Annual Status Report (ASR)'¹⁶, are shown in Table 10. Exceedences of the AQO are shown in **bold**.

Table 10 Monitoring Results

Monitoring Site	Monitored NO ₂ Concentration (µg/m ³)			
	2019	2020	2021	2022
MA28NO	36.1	26.4	29.4	29.3
MA95BNO	43.4	31.5	34.1	33.7

4.3.2 As shown in Table 10, annual mean NO₂ concentrations were above the AQO of 40µg/m³ at the MA95BNO monitor in 2019. As this site is situated within an AQMA, elevated levels would be expected. It should be noted that concentrations have decreased to below 40µg/m³ in recent years. Reference should be made to Figure 2 for a map of the survey positions.

4.3.3 Pollutant concentrations during 2020 and 2021 were affected by changes to travel patterns and associated emissions caused by the COVID-19 pandemic. The results should therefore be viewed with caution. However, monitoring data for 2022 is now considered representative of post-pandemic conditions. This is supported by the IAQM¹⁴, who have adopted the following position:

"ambient air quality monitoring data for the year 2022 and beyond is generally considered to represent the current post-pandemic baseline."

4.3.4 MCC do not undertake PM₁₀ or PM_{2.5} monitoring within the vicinity of the site.

4.4 Background Pollutant Concentrations

4.4.1 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located in grid square NGR: 386500, 398500. Data for this location was downloaded from the DEFRA website¹⁵ for the purpose of the assessment and is summarised in Table 11.

Table 11 Background Pollutant Concentration Predictions

Pollutant	Predicted Background Pollutant Concentration (µg/m ³)		
	2022	2024	2026
NO ₂	17.43	16.37	15.53
PM ₁₀	12.00	11.78	11.67
PM _{2.5}	7.86	7.70	7.61

4.4.2 As shown in Table 11, predicted background concentrations are below the relevant AQOs and Interim Target at the development site.

¹⁴ Use of 2020 and 2021 Monitoring Datasets - IAQM Position Statement V1.1, IAQM, 2023.

¹⁶ 2022 Air Quality ASR, GMCA, 2023.

¹⁵ <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>.

4.5 Sensitive Receptors

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

Construction Phase Sensitive Receptors

4.5.2 Receptors sensitive to potential dust impacts during 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 12.

Table 12 Earthworks and Construction Dust Sensitive Receptors

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

4.5.3 Receptors sensitive to potential dust impacts from trackout were identified from a desktop study of the area up to 50m from the road network within 250m of the site access. These are summarised in Table 13.

Table 13 Trackout Dust Sensitive Receptors

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

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

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

Operational Phase Sensitive Receptors

4.5.6 Locations sensitive to potential operational phase road vehicle exhaust emission impacts, including positions within the GMCA AQMA, were identified from a desk-top study. These are summarised in Table 14.

Table 14 Operational Phase Road Vehicle Exhaust Emission Sensitive Receptor Locations

Receptor		NGR (m)	
		X	Y
R1	Residential - Claybrook Walk	387161.2	398255.5
R2	Residential - Grey Mare Lane	386995.9	398275.1
R3	Residential - Jenkyn Walk	386916.9	398305.6
R4	Residential - Ashton New Road	386782.8	398341.4
R5	Residential - Purslow Close	386181.8	398438.1
R6	St Brigid's Primary School	387105.8	397973.3
R7	Residential - Outrington Drive	387245.8	397695.8
R8	Residential - Ashton New Road	387617.0	398502.1
R9	Residential - Gibbon Street	387019.2	398759.5

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

5.0 CONSTRUCTION PHASE ASSESSMENT

5.1 Introduction

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

5.2 Step 1 - Screen the Need for an Assessment

5.2.1 The undertaking of activities such as excavation, groundworks, cutting, construction and storage of materials has the potential to result in fugitive dust emissions throughout the

construction phase. Vehicle movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul roads and highway surfaces.

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

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

5.3 Step 2a - Define the Potential Dust Emission Magnitude

Earthworks

5.3.1 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. The area of the proposed development site is less than 18,000m². In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from earthworks is therefore **small**.

Construction

5.3.2 Due to the size of the development, the total building volume is estimated to be between 12,000m³ and 75,000m³. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from construction is therefore **medium**.

Trackout

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

5.4 Step 2b - Define the Sensitivity of the Area

Dust Soiling

5.4.1 Table 12 shows that there are more than 100 **high** sensitivity receptors within 50m of the site boundary. The sensitivity of the area with respect to dust soiling from earthworks and construction, as defined using the criteria summarised in Table 5, is therefore considered to be **high**.

5.4.2 Table 13 shows that there are more than 100 **high** sensitivity receptors within 20m of the road network within 250m of the site access. The sensitivity of the area with respect to dust

soiling from trackout, as defined using the criteria summarised in Table 5, is therefore considered **high**.

Human Health

5.4.3 Table 11 shows the annual mean PM₁₀ background concentration at the site is 11.78µg/m³. As shown in Table 6, where the background annual mean PM₁₀ concentration is below 24µg/m³ and there are more than 100 **high** sensitivity receptors within 50m of the site boundary, the sensitivity of the area with respect to human health from earthworks and construction is considered to be **low**.

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

5.5 Step 2c - Define the Risk of Dust Impacts

5.5.1 The derived dust emission magnitude for each activity was combined with the sensitivity of the area to determine the risk of unmitigated impacts in line with the methodology set out in Table 8. A summary of the risk from each dust generating activity is provided in Table 15.

Table 15 Summary of Potential Unmitigated Dust Risks

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

5.5.2 As indicated in Table 15, the potential risk of dust soiling is **medium** from construction and **low** from earthworks and trackout. The potential risk of human health impacts is **low** from construction and trackout and **negligible** from earthworks.

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

5.6 Step 3 - Site-specific Mitigation

5.6.1 The IAQM guidance¹⁶ 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 16. 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.

¹⁶ Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

Table 16 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, which may include measures to control other emissions, approved by the LA
Site management	- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken - Make the complaints log available to the LA upon request - Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book
Monitoring	- Carry out regular site inspections, record inspection results, and make an inspection log available to the LA upon request - Increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions
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 - Fully enclose site or specific operations where there is a high potential for dust production and they are active for an extensive period - Avoid site runoff of water or mud - Keep site fencing, barriers and scaffolding clean using wet methods - Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used - Cover, seed or fence stockpiles to prevent wind whipping
Operating vehicle/machinery and sustainable travel	- Ensure all vehicles switch off engines when stationary - no idling vehicles - Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable - Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials

Issue	Control Measure
Operations	- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques - 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 - Minimise drop heights and use fine water sprays wherever appropriate - Ensure equipment is available to clean any dry spillages, and clean up spillages as soon as reasonably practicable using wet cleaning methods
Waste management	Avoid bonfires or burning of waste materials
Construction	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out
Trackout	- Use water-assisted dust sweeper on the access and local roads, to remove, as necessary, any material tracked out of the site - Avoid dry sweeping of large areas - Implement a wheel washing system, if required

5.7 Step 4 - Determine Significance

5.7.1 Assuming the relevant mitigation measures outlined in Table 16 are implemented, the residual impacts from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance¹⁷.

6.0 OPERATIONAL PHASE ASSESSMENT

6.1 Introduction

6.1.1 The development has the potential to increase concentrations of NO₂, PM₁₀ and PM_{2.5} as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site during the operational phase. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site, as well as consider potential exposure of future residents to AQO and Interim Target exceedences.

6.1.2 The assessment considered the following scenarios:

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

¹⁷ Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

- 2026 - DS.

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

6.1.4 For the purpose of the assessment traffic data for 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, emissions factors and background concentrations 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 pollution concentrations.

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

6.2 Potential Development Impacts

Predicted Concentrations

6.2.1 Annual mean NO₂ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 17.

Table 17 Predicted Annual Mean NO₂ Concentrations

Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		DM	DS	Change
R1	Residential - Claybrook Walk	33.65	33.90	0.25
R2	Residential - Grey Mare Lane	22.85	23.12	0.27
R3	Residential - Jenkyn Walk	21.62	21.70	0.08
R4	Residential - Ashton New Road	24.54	24.66	0.12

R5	Residential - Purslow Close	22.61	22.69	0.08
R6	St Brigid's Primary School	21.31	21.43	0.12
R7	Residential - Outrington Drive	31.15	31.34	0.19

R8	Residential - Ashton New Road	24.40	24.52	0.12
R9	Residential - Gibbon Street	27.68	27.83	0.15

6.2.2 As indicated in Table 17, predicted annual mean NO₂ concentrations were below the relevant AQO at all sensitive receptors in both scenarios.

6.2.3 Reference should be made to Figures 4 and 5 for graphical representations of annual mean NO₂ concentrations across the assessment area for the DM and DS scenarios, respectively.

6.2.4 Annual mean PM₁₀ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 18.

Table 18 Predicted Annual Mean PM₁₀ Concentrations

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R1	Residential - Claybrook Walk	15.99	16.05	0.07
R2	Residential - Grey Mare Lane	13.28	13.35	0.07
R3	Residential - Jenkyn Walk	13.03	13.05	0.02
R4	Residential - Ashton New Road	13.88	13.91	0.03
R5	Residential - Purslow Close	13.35	13.37	0.02
R6	St Brigid's Primary School	12.94	12.97	0.03
R7	Residential - Outrington Drive	15.41	15.46	0.05
R8	Residential - Ashton New Road	13.55	13.58	0.03
R9	Residential - Gibbon Street	14.39	14.43	0.04

6.2.5 As indicated in Table 18, predicted annual mean PM₁₀ concentrations were below the relevant AQO at all sensitive receptors in both scenarios.

6.2.6 Reference should be made to Figures 6 and 7 for graphical representations of annual mean PM₁₀ concentrations across the assessment area for the DM and DS scenarios, respectively.

6.2.7 Annual mean PM_{2.5} concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 19.

Table 19 Predicted Annual Mean PM_{2.5} Concentrations

Receptor		Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		
		DM	DS	Change
R1	Residential - Claybrook Walk	10.21	10.25	0.04
R2	Residential - Grey Mare Lane	8.75	8.79	0.04
R3	Residential - Jenkyn Walk	8.62	8.63	0.01
R4	Residential - Ashton New Road	9.07	9.09	0.02
R5	Residential - Purslow Close	8.79	8.80	0.01
R6	St Brigid's Primary School	8.57	8.59	0.02
R7	Residential - Outrington Drive	9.90	9.93	0.03
R8	Residential - Ashton New Road	8.90	8.92	0.01
R9	Residential - Gibbon Street	9.36	9.38	0.02

6.2.8 As indicated in Table 19, predicted annual mean PM_{2.5} concentrations were below the Interim Target at all sensitive receptors in both scenarios.

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

Predicted Impacts

6.2.10 Predicted impacts on annual mean NO₂ concentrations at the sensitive receptor locations are summarised in Table 20.

Table 20 Predicted Impacts - NO₂

Receptor		Predicted Annual Mean NO ₂ Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - Claybrook Walk	76 - 94% of AQO	1	Negligible
R2	Residential - Grey Mare Lane	Below 75% of AQO	1	Negligible
R3	Residential - Jenkyn Walk	Below 75% of AQO	0	Negligible
R4	Residential - Ashton New Road	Below 75% of AQO	0	Negligible
R5	Residential - Purslow Close	Below 75% of AQO	0	Negligible
R6	St Brigid's Primary School	Below 75% of AQO	0	Negligible
R7	Residential - Outrington Drive	76 - 94% of AQO	0	Negligible
R8	Residential - Ashton New Road	Below 75% of AQO	0	Negligible
R9	Residential - Gibbon Street	Below 75% of AQO	0	Negligible

6.2.11 As indicated in Table 20, impacts on annual mean NO₂ concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

6.2.12 Predicted impacts on annual mean PM₁₀ concentrations at the sensitive receptor locations are summarised in Table 21.

Table 21 Predicted Impacts - PM₁₀

Receptor		Predicted Annual Mean PM ₁₀ Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - Claybrook Walk	Below 75% of AQO	0	Negligible
R2	Residential - Grey Mare Lane	Below 75% of AQO	0	Negligible
R3	Residential - Jenkyn Walk	Below 75% of AQO	0	Negligible
R4	Residential - Ashton New Road	Below 75% of AQO	0	Negligible
R5	Residential - Purslow Close	Below 75% of AQO	0	Negligible
R6	St Brigid's Primary School	Below 75% of AQO	0	Negligible
R7	Residential - Outrington Drive	Below 75% of AQO	0	Negligible
R8	Residential - Ashton New Road	Below 75% of AQO	0	Negligible
R9	Residential - Gibbon Street	Below 75% of AQO	0	Negligible

6.2.13 As indicated in Table 21, impacts on annual mean PM₁₀ concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

6.2.14 Predicted impacts on annual mean PM_{2.5} concentrations at the sensitive receptor locations are summarised in Table 22.

Table 22 Predicted Impacts - PM_{2.5}

Receptor		Predicted Annual Mean PM _{2.5} Concentration	Predicted Conc. Change as Proportion of Interim Target (%)	Impact Significance
R1	Residential - Claybrook Walk	76 - 94% of Interim Target	0	Negligible
R2	Residential - Grey Mare Lane	Below 75% of Interim Target	0	Negligible
R3	Residential - Jenkyn Walk	Below 75% of Interim Target	0	Negligible
R4	Residential - Ashton New Road	76 - 94% of Interim Target	0	Negligible
R5	Residential - Purslow Close	Below 75% of Interim Target	0	Negligible
R6	St Brigid's Primary School	Below 75% of Interim Target	0	Negligible
R7	Residential - Outrington Drive	76 - 94% of Interim Target	0	Negligible
R8	Residential - Ashton New Road	Below 75% of Interim Target	0	Negligible
R9	Residential - Gibbon Street	76 - 94% of Interim Target	0	Negligible

6.2.15 As indicated in Table 22, impacts on annual mean PM_{2.5} concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

6.3 Potential Future Exposure

6.3.1 The proposed development has the potential to cause the exposure of future residents to elevated pollution levels. Dispersion modelling was therefore undertaken with the inputs described in Appendix 1 to quantify air quality conditions at the site. Reference should be made to Figures 5, 7 and 9 for graphical representations of annual mean NO₂, PM₁₀ and PM_{2.5} concentrations.

6.3.2 As shown in Figure 5, annual mean NO₂ concentrations were predicted to be below the AQO of 40µg/m³ across the site. The maximum level at the boundary was 30.39µg/m³.

6.3.3 As shown in Figure 7, annual mean PM₁₀ concentrations were predicted to be below the AQO of 40µg/m³ across the site. The maximum level at the boundary was 15.46µg/m³.

6.3.4 As shown in Figure 9, annual mean PM_{2.5} concentrations were predicted to be below the Interim Target of 12µg/m³ across the site. The maximum level at the boundary was 9.92µg/m³.

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

6.4 Overall Impact Significance

6.4.1 The overall significance of operational phase road traffic emission impacts was determined as **negligible**. This was based on the overall predicted impacts at discrete receptor locations and the considerations outlined previously. Further justification is provided in Table 23.

Table 23 Overall Impact Significance of Road Vehicle Exhaust Emission Impacts

Guidance	Comment
The existing and future air quality in the absence of the development	Predicted annual mean NO₂, PM₁₀ and PM_{2.5} concentrations were below the relevant AQOs and Interim Target at all locations in the DM scenario It is considered unlikely that future air quality conditions will change significantly in the absence of the development given the relatively established nature of the area
The extent of current and future population exposure to the impacts	The development is not predicted to affect the population exposed to exceedences of the AQOs or Interim Target
The influence and validity of any assumptions adopted when undertaking the prediction of impacts	It was assumed that vehicle exhaust emission rates and background concentrations will not reduce in future years. This provides worst-case results when compared with 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

6.4.2 The IAQM guidance¹⁸ states that only if the impact is greater than **slight**, the effect is considered **significant**. As impacts were predicted to be **negligible**, overall effects are considered **not significant**, in accordance with the stated methodology.

¹⁸ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

7.0 MITIGATION

7.1.1 A number of mitigation measures have been included within the development to encourage the use of sustainable transport modes, manage vehicle flow and reduce pollution around the site. These are in accordance with MCC's 'Air Quality and Planning Technical Guidance'¹⁹, which is based upon the Good Practice Design Principles outlined in the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'²⁰. Table ²¹ describes the good practice principles along with how each has been addressed with regards to the proposals.

Table 24 Good Practice Design Principles for Operational Phase Air Quality Impacts

Phase	Principle	Action
Design Phase	New developments should not contravene the Council's AQAP ²⁴ , or render any of the measures unworkable	It is confirmed that the proposals will not contravene MCC's AQAP, or render any of the measures unworkable
	Wherever possible, new developments should not create a new "street canyon", or a building configuration that inhibits effective pollution dispersion	The development will not create a new street canyon or a building configuration that inhibits effective dispersion
	Delivering sustainable development should be the key theme of any application	The proposals have been designed to encourage sustainable behaviours, such as active and public transport due to its proximity to public transport and amenities
Operational Phase	The provision of at least 1 EV "rapid charge" point per 10 residential dwellings and/or 1,000m ² of commercial floor space. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made	The proposals include 7No. EV charging points. Example EVCP shown below. DATA SHEET QUANTUM Intelligent EV charging pedestal The QUANTUM EV charging pedestal is a sophisticated and robust EV charging point, providing a combination of durability and impeccable design for all locations. This charger's integrated LED amenity lighting also provides greater visibility of the charging bays and surrounding areas. This future-proof OCPP compliant pedestal can offer a simple plug & charge or pay-to-charge solution via the EV driver's smartphone and/or RFID card/keys through any chosen OCPP back-office management system. Feature-rich, this EV charger supports dynamic load balancing and is equipped with PME fault detection, so there is no requirement for an earth rod, reducing installation costs. Available in 7day, 2day or 4day versions, providing up to 220kW superfast charging. 

¹⁹ Air Quality & Planning Technical Guidance, MCC, 2022.

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

²¹ Greater Manchester AQAP 2016-2021, GMCA, 2016.

Phase	Principle	Action
	Where development generates significant additional traffic, provision of a detailed Travel Plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety	A Travel Plan can be secured via condition, if required by MCC
	All gas-fired boilers to meet a minimum standard of <40mgNO_x/kWh. All gas-fired CHP plant to meet a minimum emissions standard of: • Spark ignition engine: 250mgNO_x/Nm³; • Compression ignition engine: 400mgNO_x/Nm³; • Gas turbine: 50mgNO_x/Nm³. A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of: • Solid biomass boiler: 275mgNO_x/Nm³ and 25mgPM/Nm³	There are no boilers included on the development. An 'all electric' scheme using heat pumps is proposed.

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

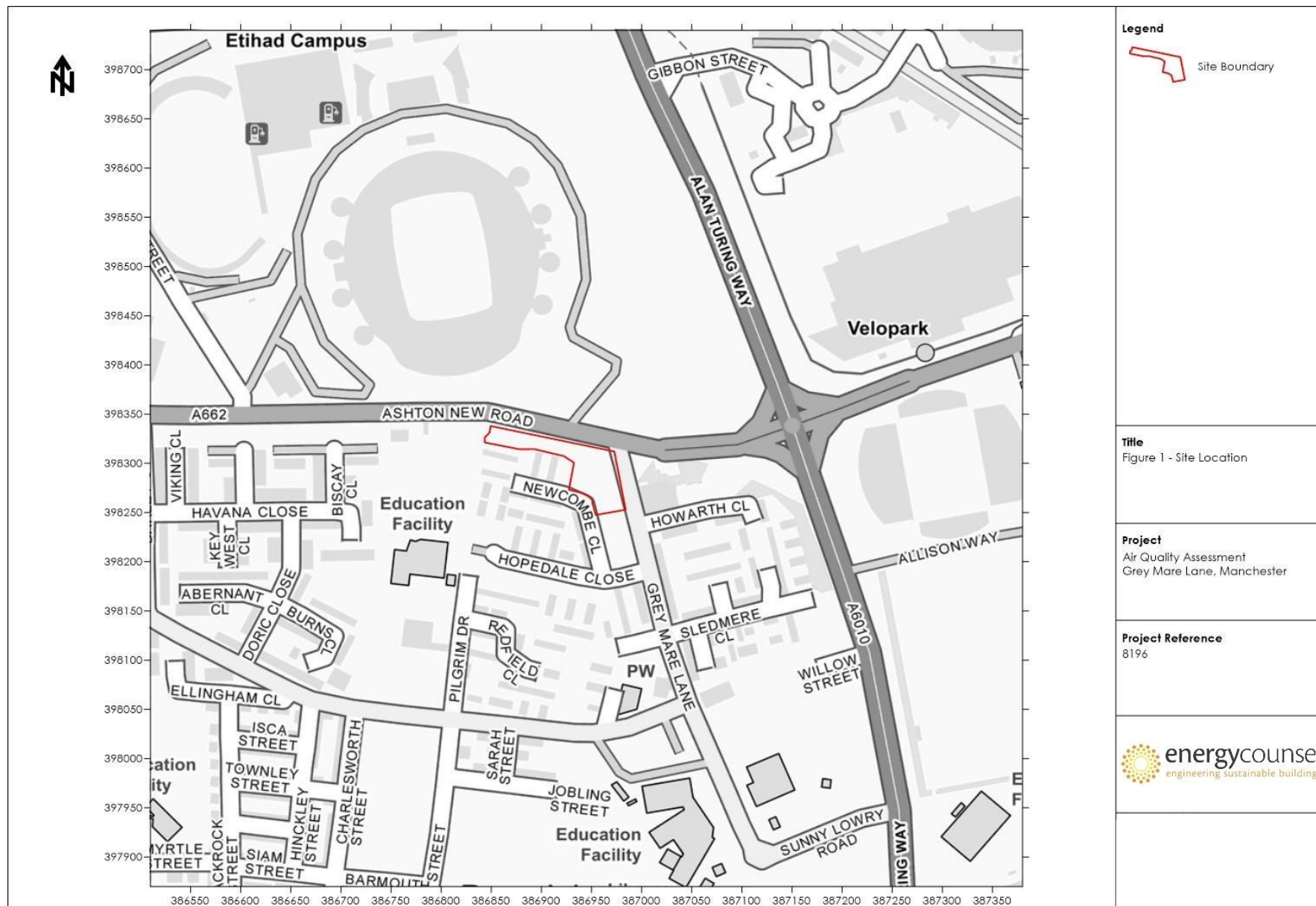
8.0 CONCLUSION

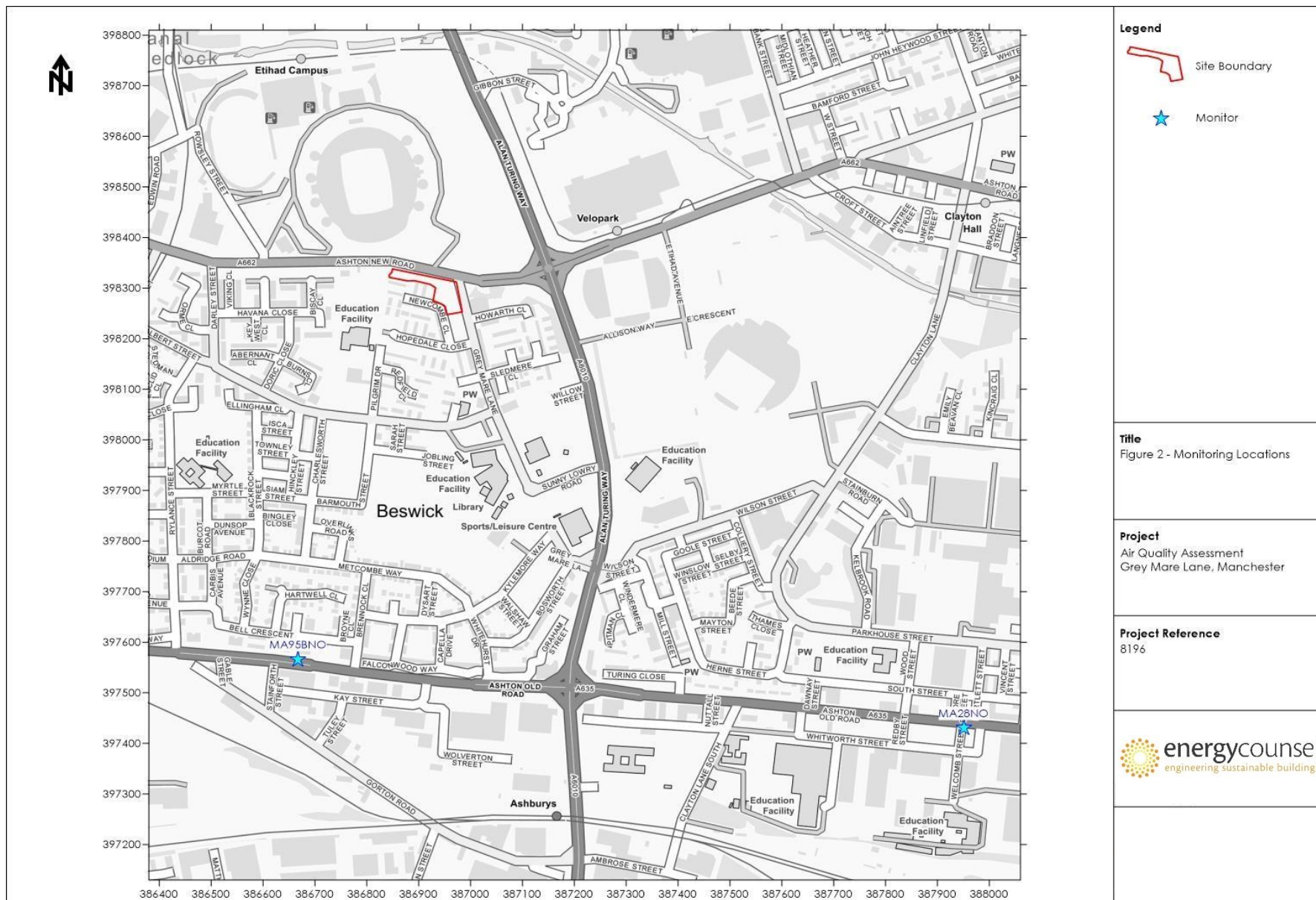
- 8.1.1 Energy Counsel was commissioned to undertake an Air Quality Assessment in support of a residential development at land known as Site 1, off Grey Mare Lane, Manchester.
- 8.1.2 The proposals have the potential to cause air quality impacts at sensitive locations during the construction and operational phases, as well as expose future residents to any existing air quality issues at the site. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions, consider location suitability for the proposed end-use and assess potential effects as a result of the scheme.
- 8.1.3 During the construction phase of the development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Site-specific dust control measures were subsequently determined based on the identified risk ratings. Subject to implementation, potential air quality impacts from dust generated by earthworks, construction and trackout activities are predicted to be **not significant**.
- 8.1.4 The development has the potential to impact on existing air quality in the vicinity of the site and expose future residents to elevated pollution levels during operation. Dispersion modelling was therefore undertaken in order to predict pollutant concentrations at sensitive locations as a result of emissions from the highway network both with and without the development in place. Results were subsequently verified using local monitoring data.
- 8.1.5 Review of the dispersion modelling results indicated that impacts on annual mean NO₂, PM₁₀ and PM_{2.5} concentrations as a result of traffic generated by the development were predicted to be **negligible** at all receptor locations.
- 8.1.6 The results of the dispersion modelling assessment also indicated that predicted annual mean NO₂, PM₁₀ and PM_{2.5} concentrations were below the relevant AQOs and Interim Target across the development. The site is therefore considered suitable for the proposed use from an air quality perspective.
- 8.1.7 Following consideration of the relevant issues, residual impacts as a result of the operation of the development were considered to be **not significant**, in accordance with the IAQM guidance.
- 8.1.8 A number of mitigation measures were identified in line with the requirements of the MCC 'Air Quality and Planning Technical Guidance' in order to reduce vehicle exhaust emissions associated with the proposals. It is considered these are appropriate for a development of this scale and nature and will further control impacts during the operational phase.

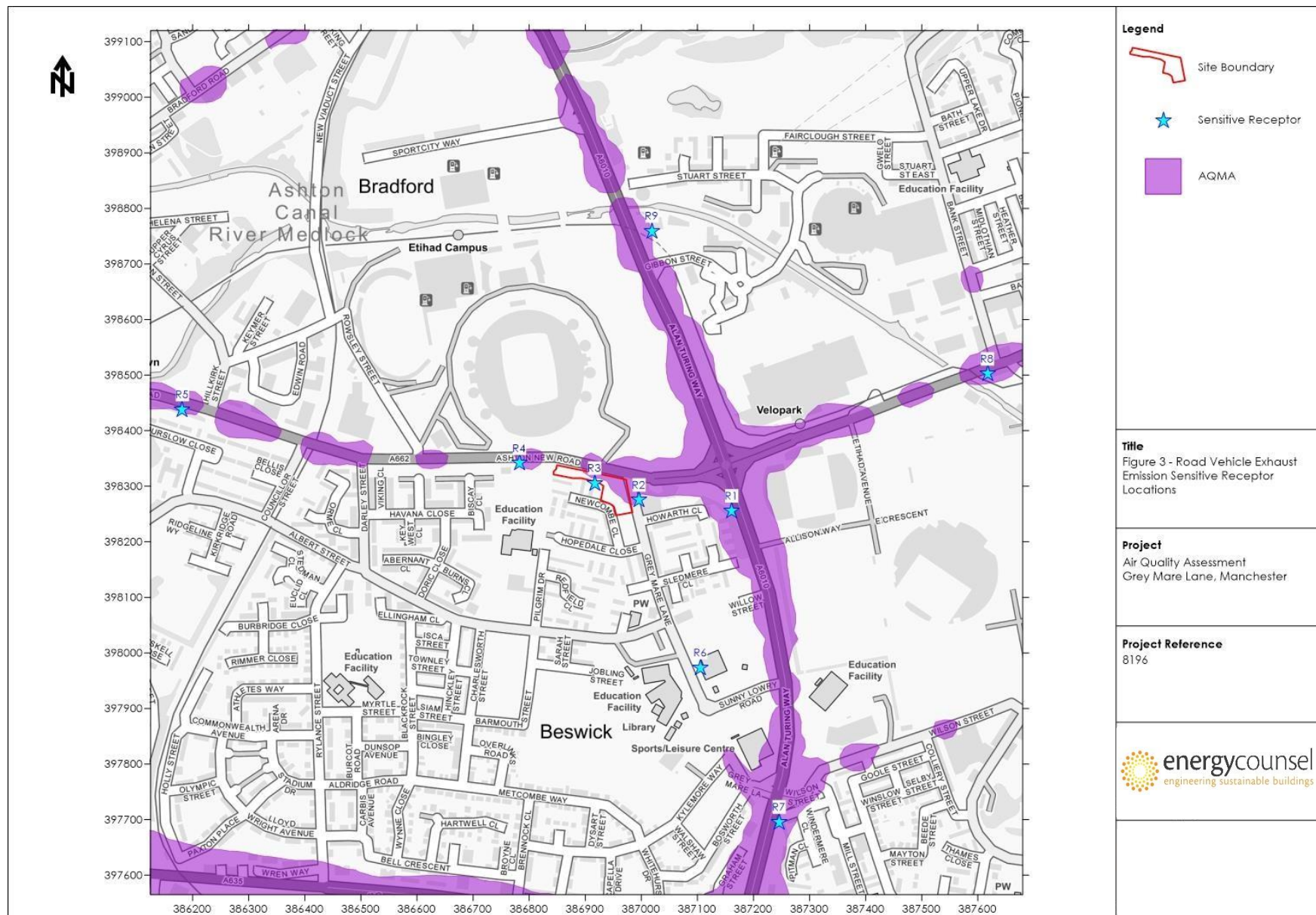
- 8.1.9 Based on the assessment results, air quality factors are **not considered a constraint to the development. Future residents are not predicted to be exposed to pollution concentrations above the AQOs, so no mitigation measures are required.**

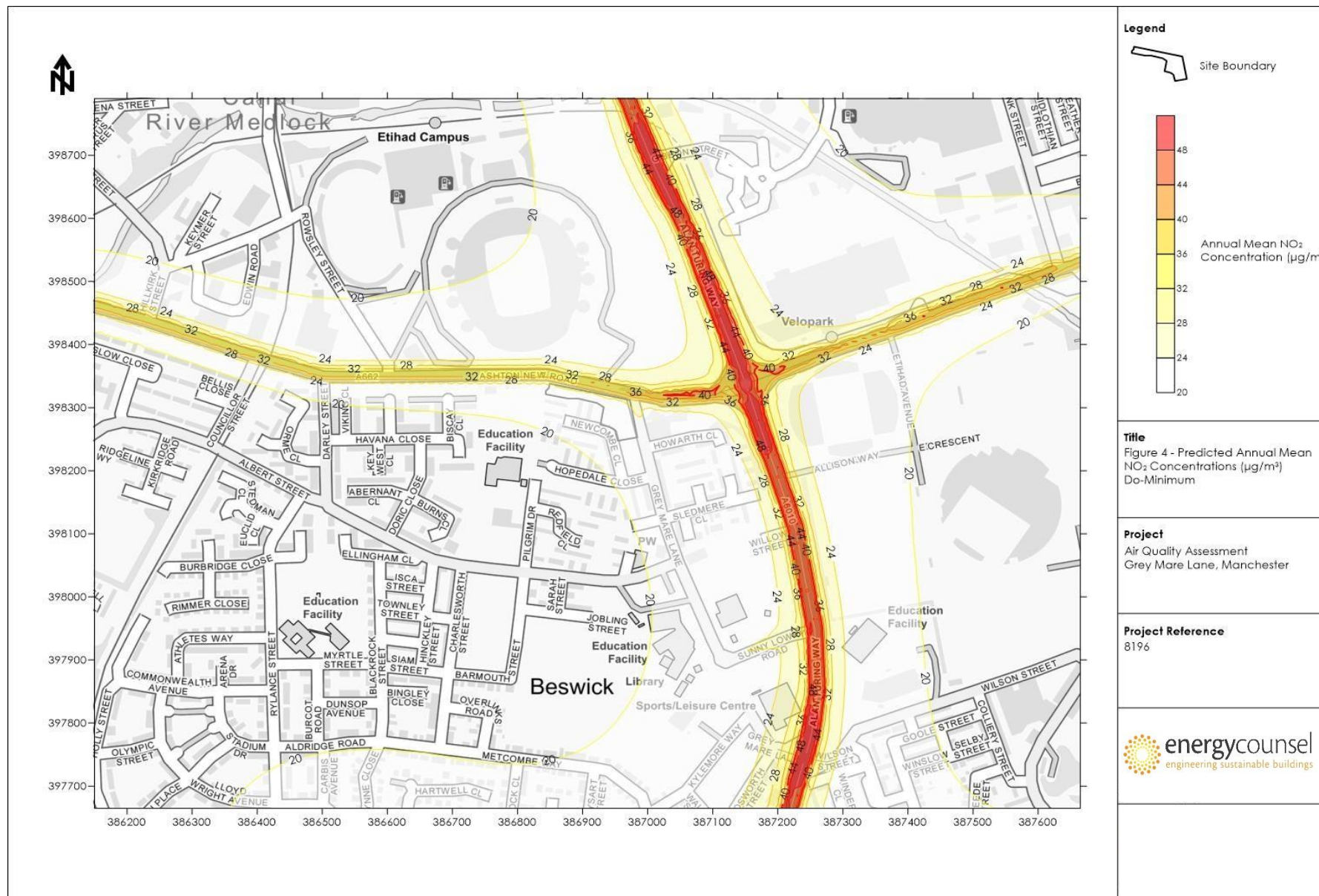
9.0 ABBREVIATIONS

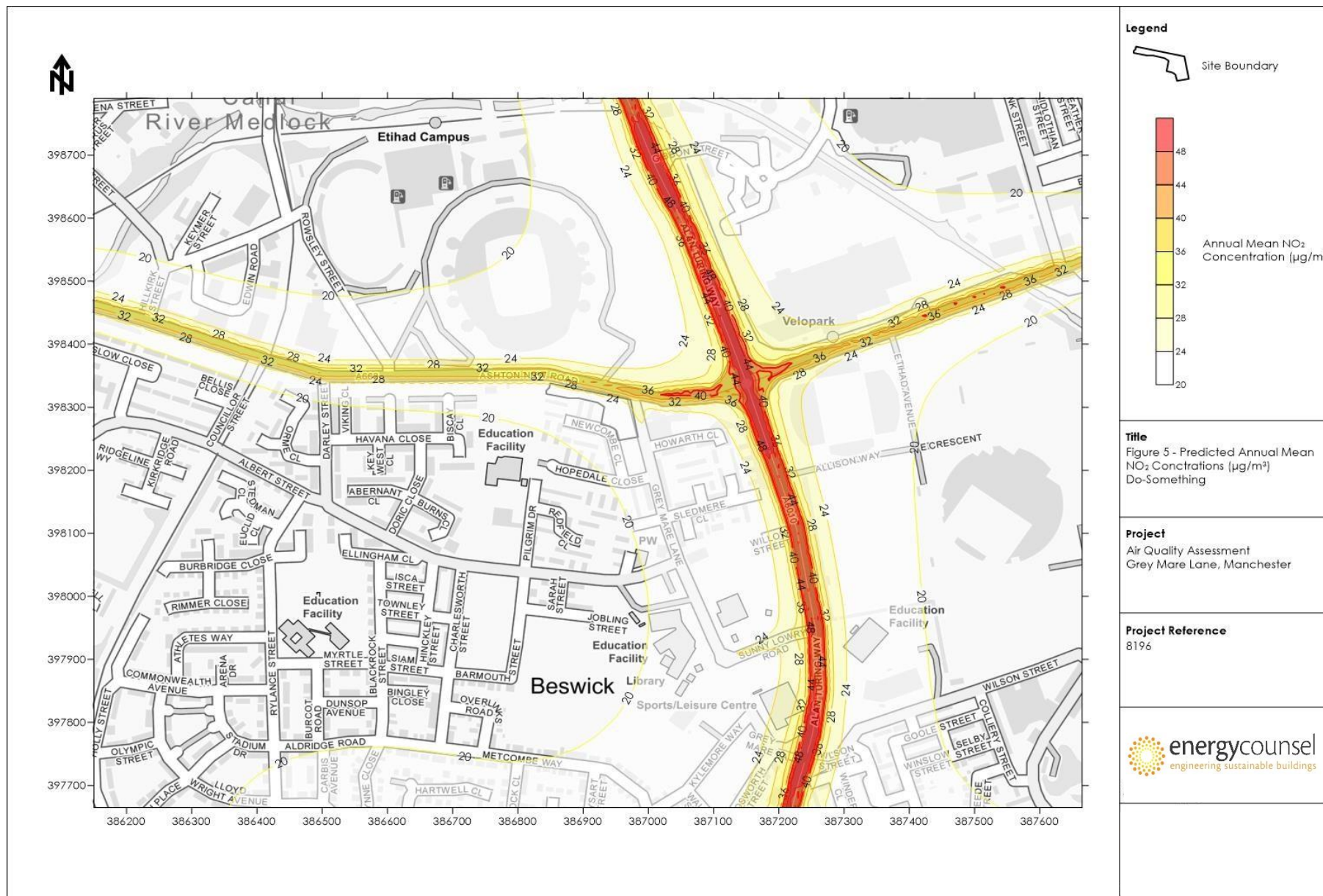
AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
ASR	Annual Status Report
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DM	Do-Minimum
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
DPD	Development Plan Document
DS	Do-Something
EFT	Emissions Factor Toolkit
GMCA	Greater Manchester Combined Authority
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
MCC	Manchester City Council
NB	Northbound
NGR	National Grid Reference
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
PfEP	Places for Everyone Plan
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10µm
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm
SB	Southbound
SP	Slow Phase
Z ₀	Roughness length

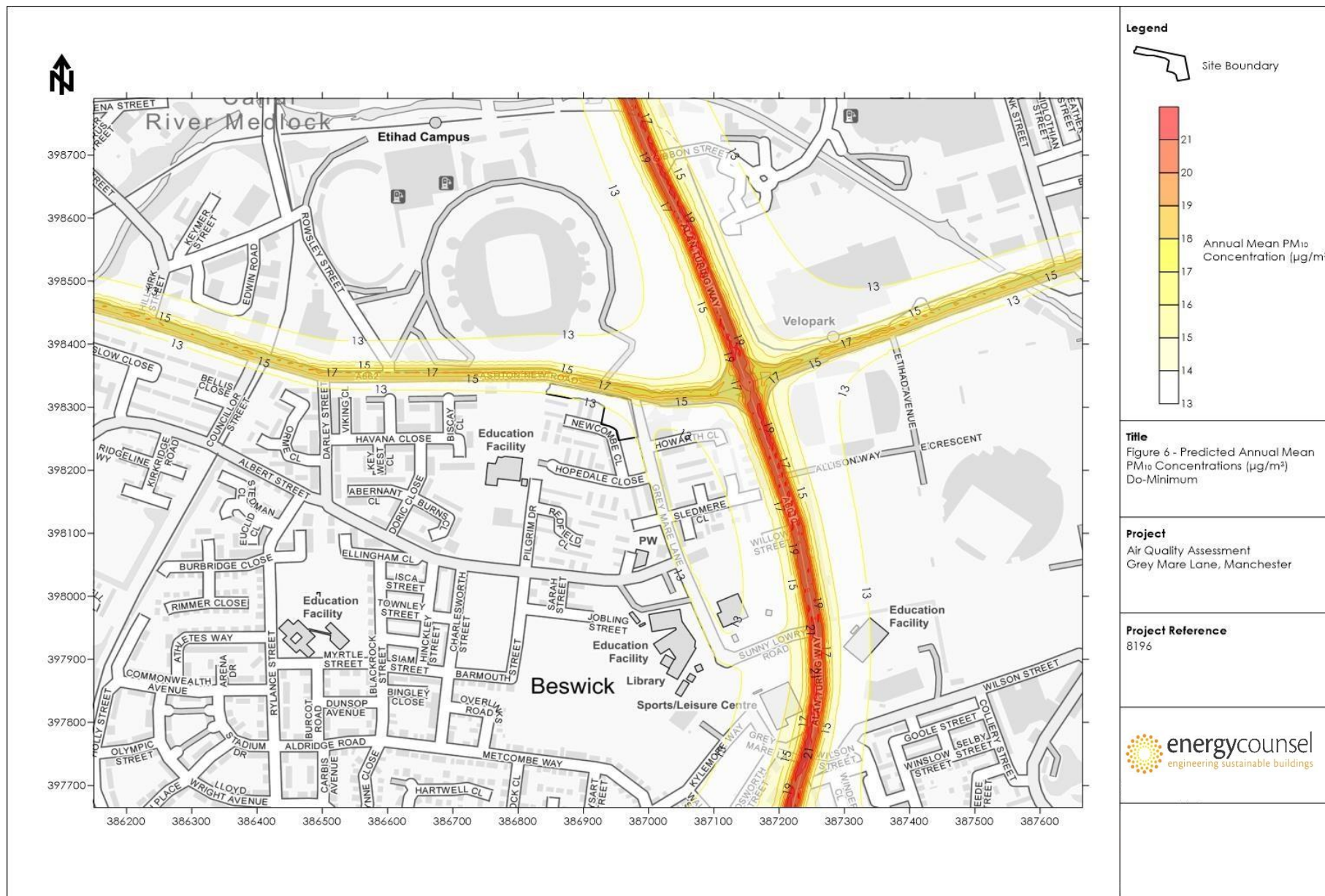


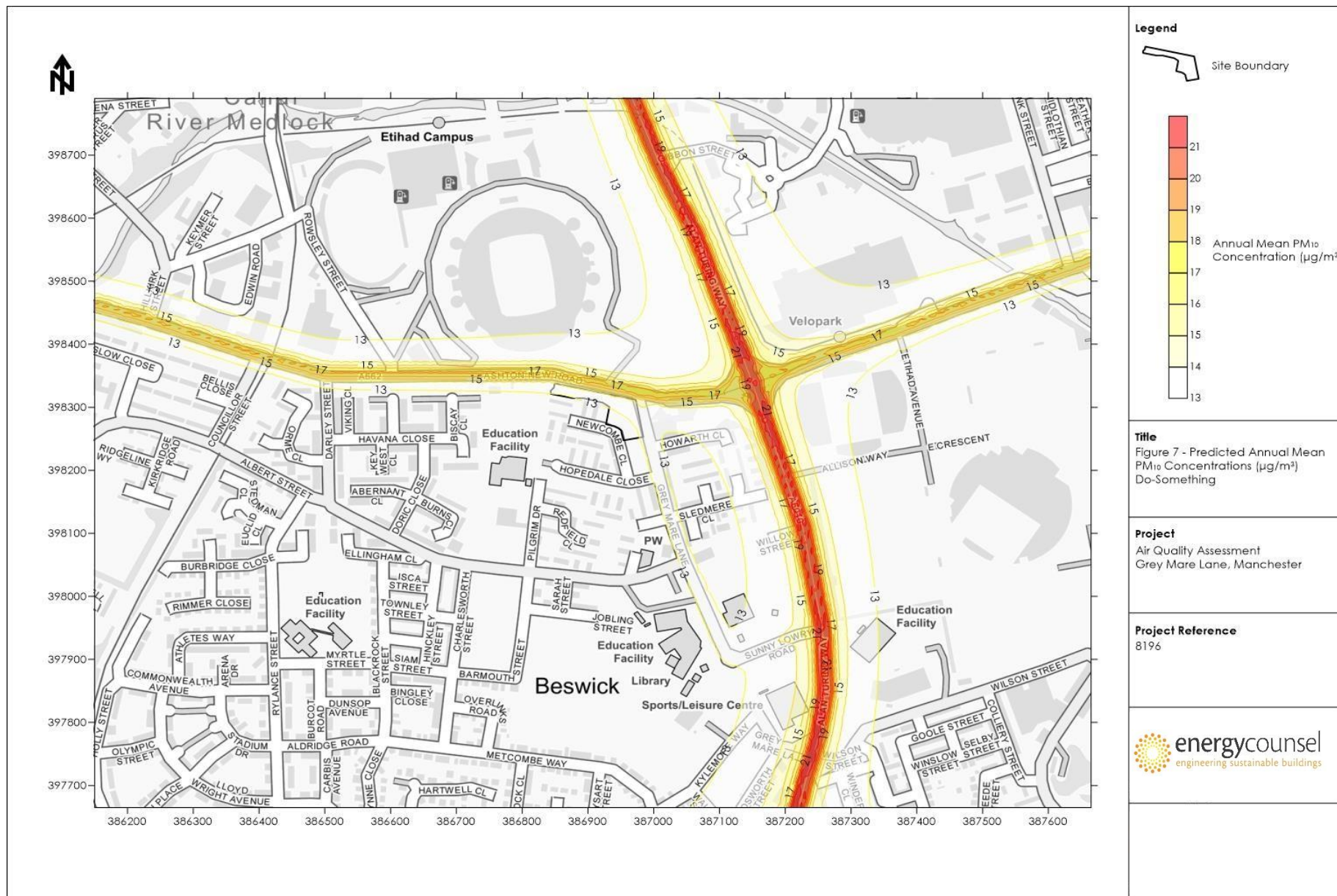


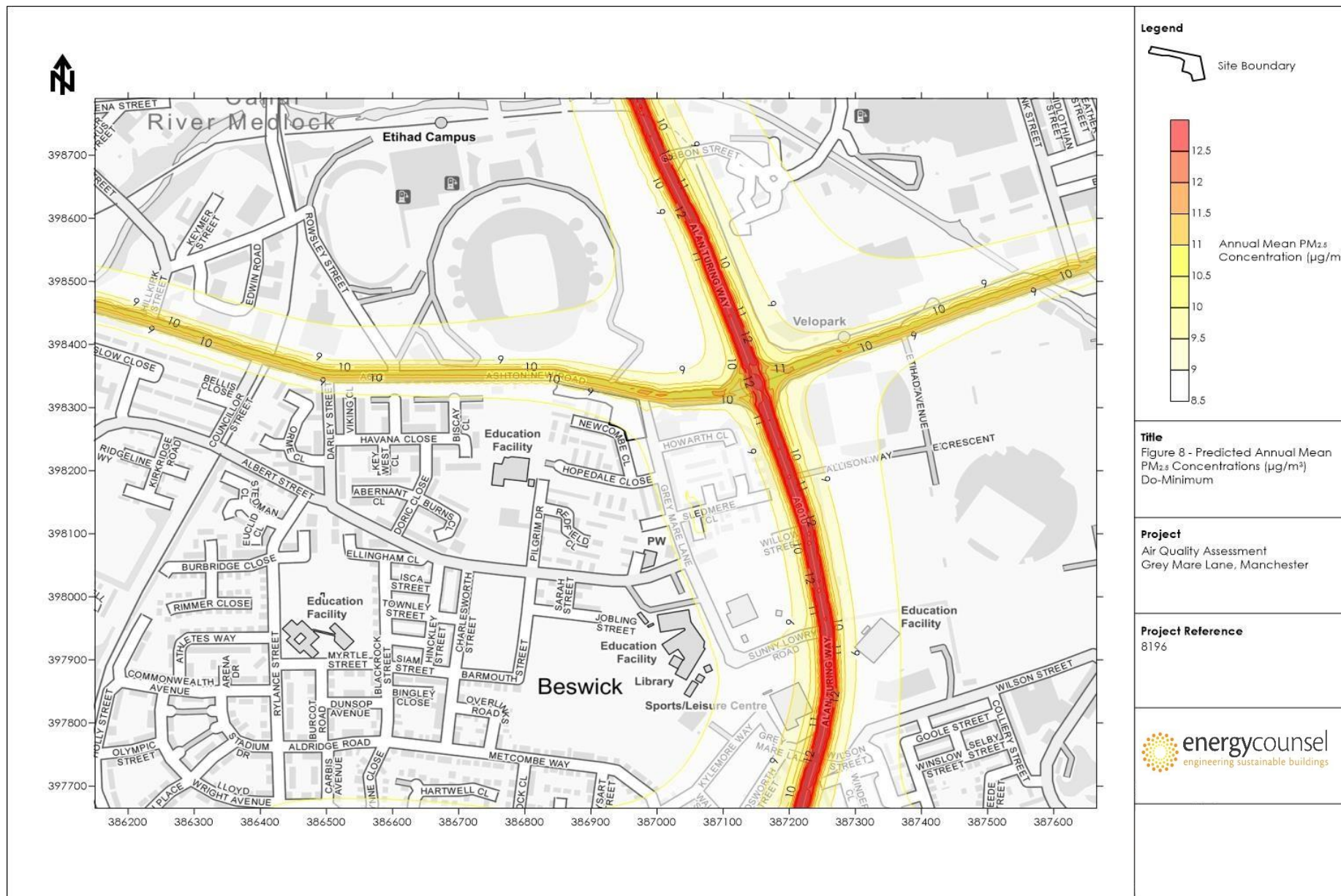


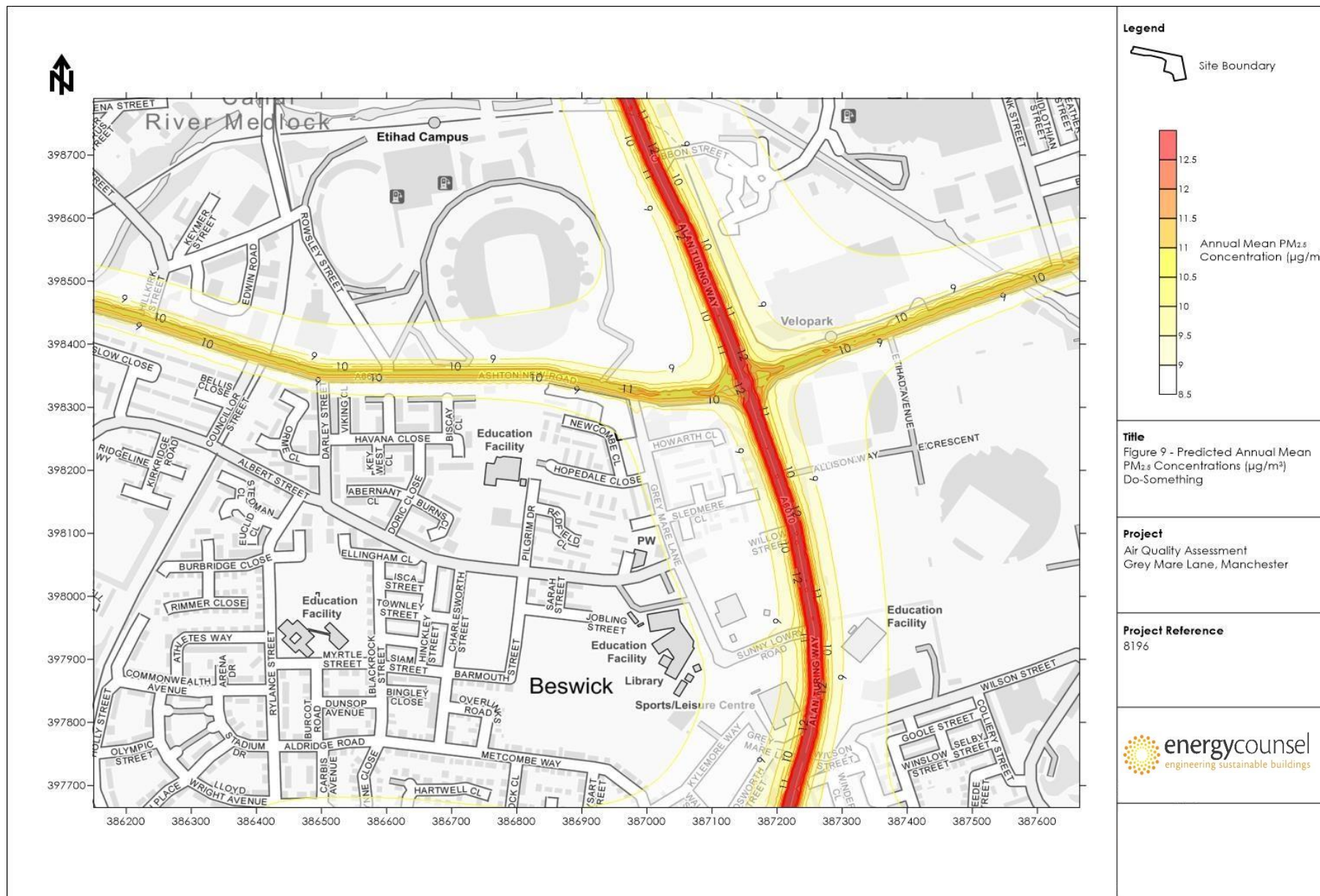


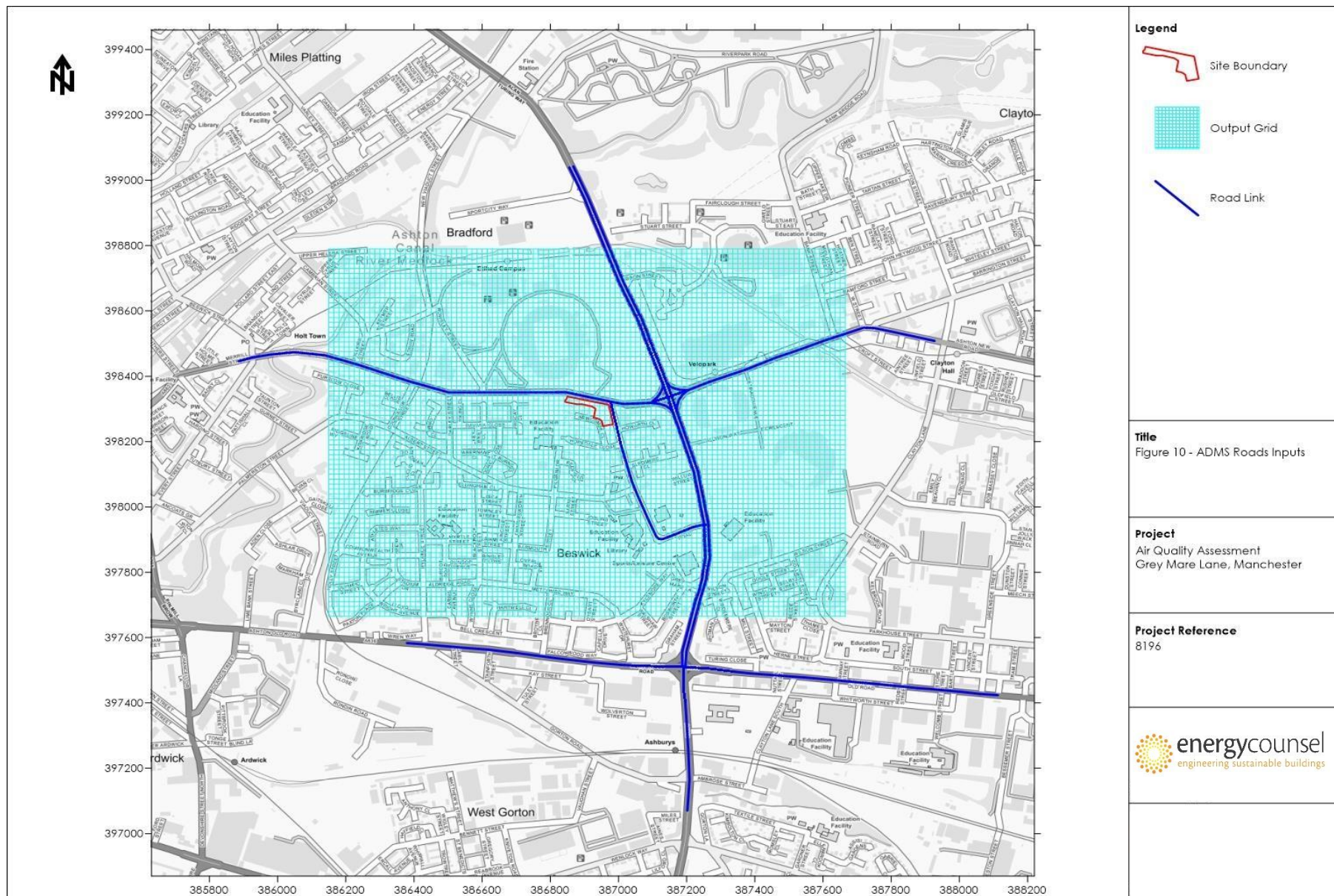


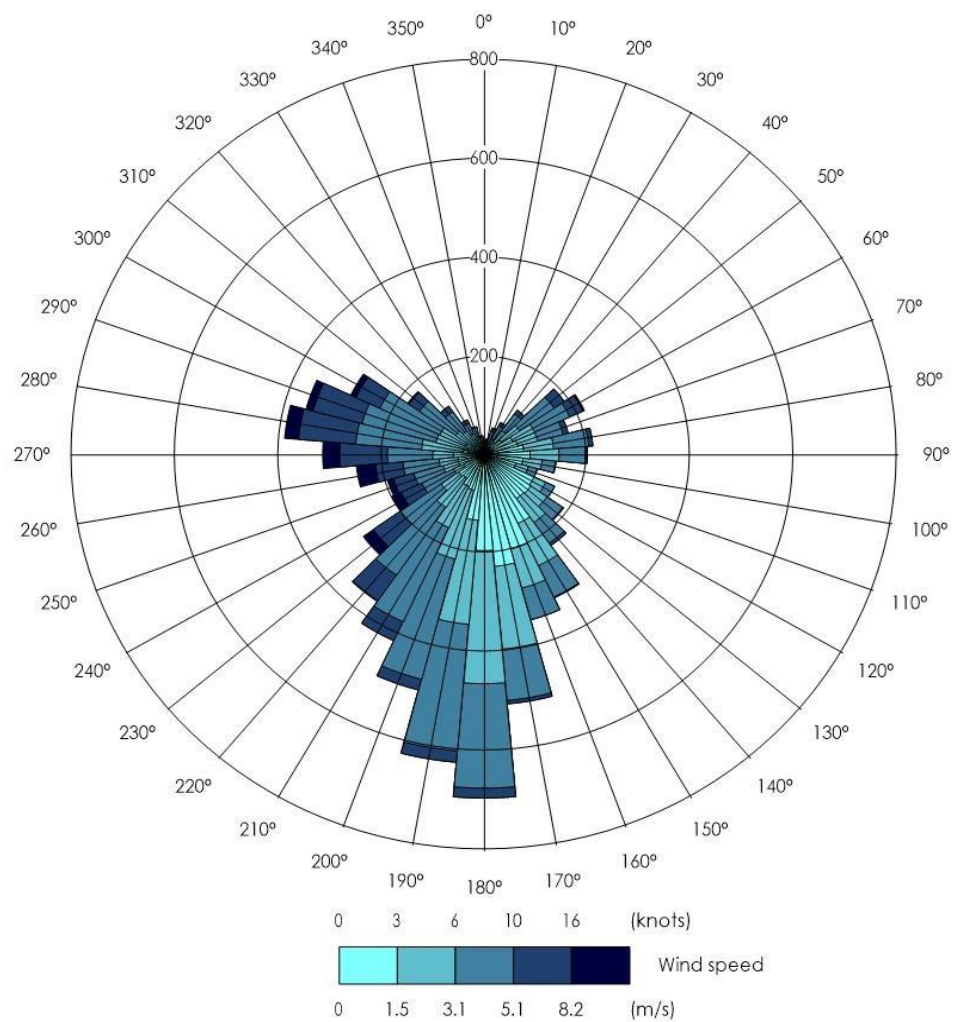












Legend

Title

Figure T1 - Wind Rose of 2022
Manchester Airport Meteorological
Data

Project

Air Quality Assessment
Grey Mare Lane, Manchester

Project Reference

8196

Appendix 1 - Assessment Input Data

Introduction

The proposals have the potential to cause air quality impacts as a result of exhaust emissions associated with vehicles travelling to and from the development, as well as expose future residents to any existing air quality issues at the site. In order to assess 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 in order to predict NO₂, PM₁₀ and PM_{2.5} concentrations across the site 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: 386150, 397665 to 387665, 398790. One Cartesian grid was included within the model to produce data suitable for contour plotting using the Surfer software package.

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

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

Traffic Flow Data

Baseline traffic data for use in the assessment, including 24-hour AADT (Annual Average Daily Traffic) flows and fleet composition as HDV proportion, was obtained from the Department for Transport (DfT)²². 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 guidance²³ as being a suitable source of data for air quality assessments and it is therefore considered to provide a reasonable estimate of traffic flows in the vicinity of the site.

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

The predicted number of daily traffic movements generated by the development was provided by the Transport Consultants for the project. These were added to each link to determine the DS scenario. The transport Consultant has disaggregated the total vehicle trip rate such that that we can isolate resident car trips from other vehicle trips generated by the development – delivery/servicing modes (LGV and OGV) and taxis. We have then derived a resident car trip rate per parking spaces based on the TRICS resident car trips and TRICS average parking rate. This has been applied to the 6 resident disabled parking spaces to derive the discounted resident car trip numbers. They have then recombined with delivery and taxi trip numbers to provide the total AADT. (The delivery/servicing smaller vehicles included in the flows are what will use the servicing space within the site.)
AADT: total 60 of which 2 are OGV/HDV.

A summary of the traffic data used in the assessment is provided in Table A1.1. Road widths and vehicle speeds were estimated from aerial photography and UK highway design standards.

Table A1.1 Traffic Data

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Avg. Vehicle Speed (km/h)
		2022	2026 DM	2026 DS			
L1	Ashton Old Road East of Greenside Street	19,903	20,914	21,153	3.95	12.8	45
L2	Ashton Old Road West of Greenside Street Slow Phase (SP)	19,903	20,914	21,153	3.95	11.4	20
L3	Ashton Old Road	19,903	20,914	21,153	3.95	11.6	45
L4	Ashton Old Road to Junction East SP	19,903	20,914	21,153	3.95	23.6	20

²² <https://roadtraffic.dft.gov.uk/#6/55.254/-6.053/basemap-regions-countpoints>.

²³ Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

L5	Ashton Old Road to Junction West SP	21,573	22,669	22,908	4.80	19.6	20
L6	Ashton Old Road West of Whitehurst Road	21,573	22,669	22,908	4.80	12.3	45
L7	Ashton Old Road West of Brennock Close SP	21,573	22,669	22,908	4.80	16.2	20
L8	Pottery Lane South	27,380	28,771	29,010	3.49	18.9	45
L9	Pottery Lane SP	27,380	28,771	29,010	3.49	22.4	20
L10	Alan Turing Way Northbound (NB)	14,896	15,653	15,892	3.07	7.5	45
L11	Alan Turing Way Southbound (SB) SP	13,985	14,695	14,934	3.25	14.1	20
L12	Alan Turing Way South of Wilson Street NB	14,896	15,653	15,892	3.07	6.0	45
L13	Alan Turing Way South of Wilson Street SB	13,985	14,695	14,934	3.25	6.0	45
L14	Alan Turing Way Crossroads SP NB	14,896	15,653	15,892	3.07	9.3	20
L15	Alan Turing Way Crossroads SP SB	13,985	14,695	14,934	3.25	9.3	20
L16	Alan Turing Way North of Wilson Street NB	14,896	15,653	15,892	3.07	6.8	45
L17	Alan Turing Way North of Wilson Street SB	13,985	14,695	14,934	3.25	6.8	45
L18	Alan Turing Way North of Allison Way NB SP	14,896	15,653	15,892	3.07	9.6	20
L19	Alan Turing Way North of Allison Way SB	13,985	14,695	14,934	3.25	6.5	45
L20	Alan Turing Way NB Left Turn SP	3,724	3,913	4,152	3.07	4.1	20
L21	Alan Turing Way Junction NB SP	11,172	11,740	11,979	3.07	13.2	20
L22	Alan Turing Way Junction SB	10,489	11,022	11,261	3.25	8.6	45
L23	A6010 North Junction NB	10,532	11,067	11,306	4.31	8.6	45
L24	A6010 North Junction SB SP	10,145	10,660	10,899	4.10	13.2	20

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Avg. Vehicle Speed (km/h)
		2022	2026 DM	2026 DS			
L25	A6010 North SB Left Turn SP	3,382	3,553	3,792	4.10	4.5	20
L26	A6010 North NB	14,042	14,755	14,994	4.31	6.8	45
L27	A6010 North SB SP	13,526	14,213	14,452	4.10	10.5	20
L28	A6010 North NB	14,042	14,755	14,994	4.31	6.0	45
L29	A6010 North SB	13,526	14,213	14,452	4.10	6.4	45
L30	A6010 Gibbon Street Junction NB SP	14,042	14,755	14,994	4.31	9.0	20
L31	A6010 Gibbon Street Junction SB SP	13,526	14,213	14,452	4.10	7.3	20
L32	A6010 North of Gibbon Street NB	14,042	14,755	14,994	4.31	6.7	45
L33	A6010 North of Gibbon Street SB	13,526	14,213	14,452	4.10	6.4	45
L34	A6010 Sportcity Way Junction NB SP	14,042	14,755	14,994	4.31	9.5	20
L35	A6010 Sportcity Way Junction SB SP	13,526	14,213	14,452	4.10	10.3	20
L36	Merrill Street SP	12,833	13,485	13,724	4.16	6.9	20
L37	Ashton New Road West of Grey Mare Lane	12,833	13,485	13,724	4.16	11.0	45
L38	Ashton New Road West SP	12,833	13,485	13,724	4.16	14.0	20
L39	Ashton New Road West Left Turn SP	3,511	3,689	3,929	4.31	4.4	20
L40	Ashton New Road West Junction SP	4,278	4,495	4,734	4.16	21.3	20
L41	Ashton New Road East Junction SP	4,023	4,227	4,466	3.60	20.5	20
L42	Ashton New Road East Left Turn SP	3,496	3,674	3,913	3.25	4.6	20

L43	Ashton New Road East SP	12,069	12,682	12,921	3.60	16.6	20
L44	Ashton New Road West of Etihad Avenue	12,069	12,682	12,921	3.60	8.9	45
L45	Ashton New Road East of Etihad Avenue SP	12,069	12,682	12,921	3.60	11.2	20
L46	Ashton New Road East of Bank Street	12,069	12,682	12,921	3.60	12.5	45
L47	Grey Mare Lane Approach to Ashton New Road SP	1,636	1,719	1,958	0.32	12.6	20
L48	Grey Mare Lane North of Hopedale Close	1,636	1,719	1,958	0.32	8.8	30
L49	Grey Mare Lane South of Hopedale Close	1,636	1,719	1,958	0.32	9.0	30
L50	Sunny Lowry Road SP	1,636	1,719	1,958	0.32	10.0	20

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

Emission Factors

The emission factors were calculated using the relevant traffic flows and the EFT (version 12.0.1). This has been produced by DEFRA and incorporates COPERT 5.6 vehicle emission factors.

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 scheme 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 site over the period 1st January 2022 to 31st December 2022 (inclusive). Manchester Airport is located at NGR: 381792, 384116, which is approximately 15.1km south-west of the scheme. It is anticipated that conditions would be reasonably similar over a distance of this magnitude. The data was therefore considered suitable for an assessment of this nature.

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

Roughness Length

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

A z_0 of 0.2m was used to describe the meteorological site. This value is considered appropriate for the morphology of the area 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 both the modelling extents and the meteorological site. This is considered appropriate for the nature of both areas and is suggested within ADMS-Roads as being suitable for 'cities and large towns'.

Background Concentrations

Background annual mean NO_2 , PM_{10} and $\text{PM}_{2.5}$ concentrations for use in the assessment were obtained from the DEFRA mapping study for the grid square containing the MA28NO monitor, NGR: 387500, 397500. These are shown Table A1.2.

Table A1.2 Background Pollutant Concentrations - Modelling Extents

Pollutant	Predicted 2022 Background Pollutant Concentration ($\mu\text{g}/\text{m}^3$)
NO_2	18.09
PM_{10}	12.13
$\text{PM}_{2.5}$	8.14

The annual mean NO_2 , PM_{10} and $\text{PM}_{2.5}$ concentrations were chosen to represent concentrations throughout the dispersion modelling extents without the contribution from road vehicles as they were higher than the DEFRA backgrounds for the grid square containing the site, as shown in Table 11.

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

NO_x to NO₂ Conversion

Predicted annual mean NO_x concentrations were converted to NO₂ 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;
- 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.

MCC undertook monitoring of NO₂ concentrations at two locations within the vicinity of roads included in the model 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 A1.3.

Table A1.3 NO_x Verification - Monitoring Results

Monitoring Location	Monitored NO ₂ Concentration (µg/m ³)	Calculated Road NO _x Concentration (µg/m ³)
MA28NO	29.3	21.96
MA95BNO	33.7	31.21

The annual mean road NO_x concentrations predicted from the dispersion model and the road NO_x concentrations calculated from the monitoring results are summarised in Table A1.4.

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

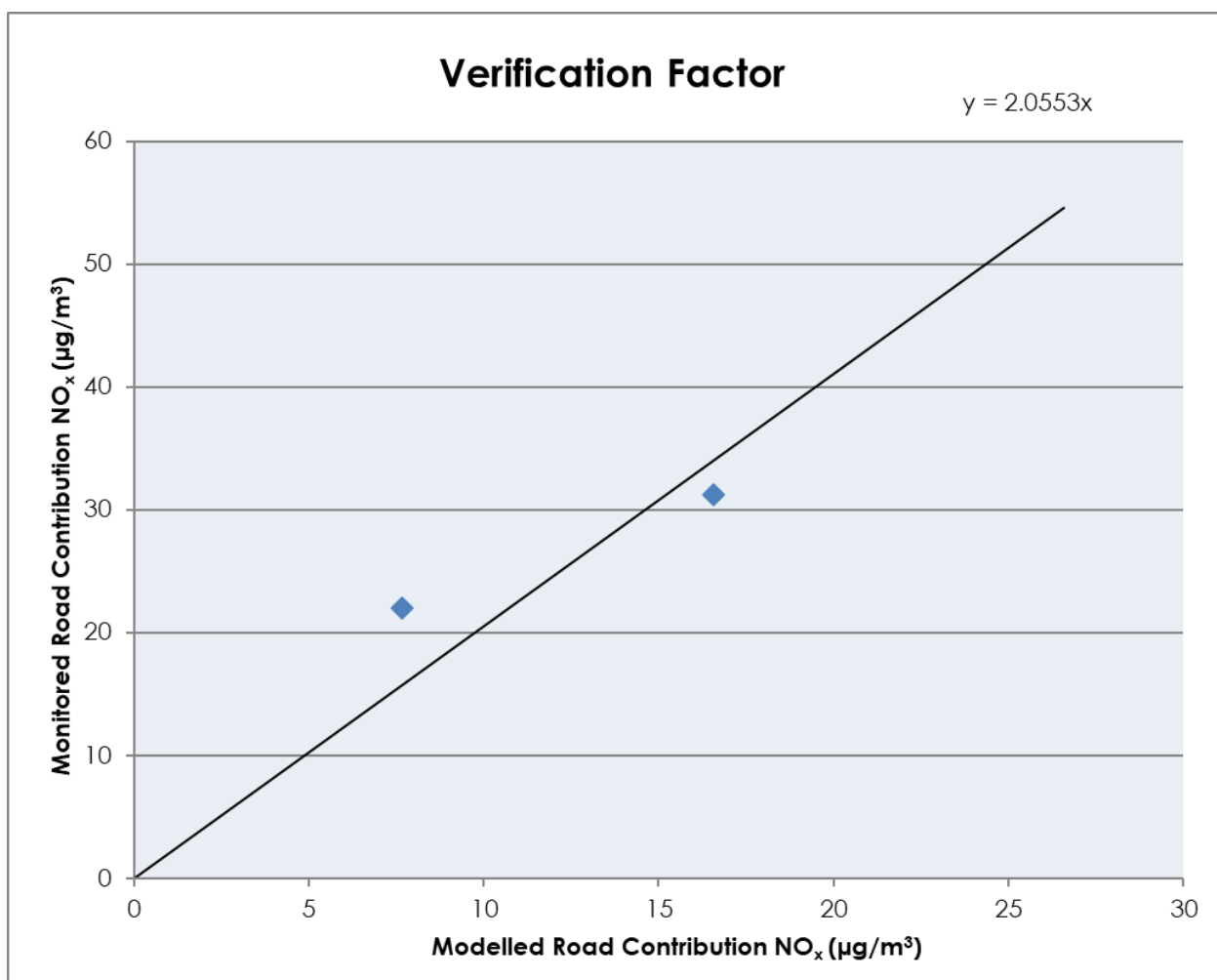
²⁵ Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

Table A1.4 NO_x Verification - Modelling Results

Monitoring Location	Calculated Road NO _x Concentration (µg/m ³)	Modelled Road NO _x Concentration (µg/m ³)
MA28NO	21.96	7.68
MA95BNO	31.21	16.58

The monitored and modelled road NO_x concentrations were graphed and the equation of the trendline based on linear progression through zero calculated. This indicated that a verification factor 2.0553 was required to be applied to all road NO_x modelling results, as shown in Graph 1.

Graph 1 NO_x Verification Factor



Monitoring of PM₁₀ and PM_{2.5} concentrations is not undertaken within the assessment extents. The NO_x verification factor was therefore used to adjust model predictions of these species in lieu of more accurate data in accordance with DEFRA guidance²⁶.

²⁶ Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.