

Air Quality Assessment
Stockport Road, Manchester

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Executive Summary

Redmore Environmental Ltd was commissioned by One Manchester Property Limited to undertake an Air Quality Assessment in order to address a planning condition in relation to a residential development at 1198 Stockport Road, Manchester.

Planning consent for the proposals was granted by Manchester City Council on 8th September 2021, subject to a number of conditions. These included a requirement for details of air quality mitigation measures included as part of the development to be submitted to and approved prior to commencement of the scheme. An Air Quality Assessment was therefore undertaken in order to determine baseline conditions at the development and identify the relevant mitigation measures.

Dispersion modelling was undertaken in order to predict pollutant concentrations across the proposed development site as a result of emissions from the local highway network. Outputs were then verified using local monitoring data. The results were subsequently used to determine the requirement for mitigation, such as mechanical ventilation.

The dispersion modelling assessment indicated that predicted pollutant levels were below the relevant criteria at the building façade. As such, there is no requirement for mitigation to protect future users to elevated pollution concentrations.

Additional control measures included as part of the proposals to minimise potential air quality impacts at nearby sensitive locations were also identified. These were considered appropriate for a scheme of this scale and nature, in accordance with the relevant guidance.

Based on the assessment results, it is considered that the condition has been addressed and it is recommended that it be discharged.

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1.0 INTRODUCTION

1.1 Background

- 1.1.1 Redmore Environmental Ltd was commissioned by One Manchester Property Limited to undertake an Air Quality Assessment in order to address a planning condition in relation to a residential development at 1198 Stockport Road, Manchester.
- 1.1.2 The planning condition requires details of air quality mitigation measures included as part of the development to be submitted to and approved by Manchester City Council (MCC) prior to commencement of the scheme. An Air Quality Assessment was therefore undertaken in order to determine baseline conditions at the development and identify the relevant mitigation measures.

1.2 Site Location and Context

- 1.2.1 The site is located at 1198 Stockport Road, Manchester, at approximate National Grid Reference (NGR): 387810, 393278. Reference should be made to Figure 1 for a map of the site and surrounding area.
- 1.2.2 The proposals comprise redevelopment of the existing property to provide three self-contained apartments.
- 1.2.3 Planning consent for the scheme was granted by MCC on 8th September 2021, subject to a number of conditions. These include the following in relation to air quality:

"7) Prior to commencement of the development mitigation measures to safeguard local air quality shall be submitted to and approved in writing by the City Council as local planning authority. Any agreed mitigation measures shall be implemented as part of the development and shall remain in situ whilst the use or development is in operation.

Reason - To secure a reduction in air pollution from traffic or other sources in order to protect existing and future residents from air pollution, pursuant to policies EN16, SP1 and DM1 of the Manchester Core Strategy."

- 1.2.4 An Air Quality Assessment has therefore been undertaken in order to address the above condition. This is detailed within the following report.

2.0 **LEGISLATION AND POLICY**

2.1 **Legislation**

2.1.1 The Air Quality Standards Regulations (2010) came into force on 11th June 2010 and 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 Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007¹. The AQS sets out Air Quality Objectives (AQOs) that 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 Table 1 presents the AQOs and AQLVs for pollutants considered within this assessment.

¹ The AQS for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.

Table 1 Air Quality Objectives/Limit Values

Pollutant	Air Quality Objective/Limit Value	
	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}	20	Annual mean

2.1.8 Table 2 summarises the advice provided in DEFRA guidance² 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

² Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021

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 Under Section 82 of the Environment Act (1995) (Part IV) 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, 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 **National Planning Policy**

- 2.3.1 The revised National Planning Policy Framework³ (NPPF) was published in July 2021 and sets out the Government's planning policies for England and how these are expected to be applied.
- 2.3.2 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:

³ NPPF, Ministry of Housing, Communities and Local Government, 2021.

"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."

2.3.3 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:

[...]

preventing new and existing development from contributing to, or 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 [...]"

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

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

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

2.4 National Planning Practice Guidance

2.4.1 The National Planning Practice Guidance⁴ (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?

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

2.5 Local Planning Policy

2.5.1 The Manchester Local Development Framework consists of a series of planning documents of which the Core Strategy is central. This was adopted by MCC on 11th July 2012.

2.5.2 A review of the Core Strategy identified the following policies of relevance to this assessment:

"Policy EN 16

Air Quality

⁴ <https://www.gov.uk/guidance/air-quality--3>.

The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local 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."

"Policy DM 1

Development Management

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

[...]

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

- 2.5.3 The implications of the above policies were taken into consideration throughout the undertaking of the assessment.

3.0 BASELINE

3.1 Introduction

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

3.2 Local Air Quality Management

- 3.2.1 As required by the Environment Act (1995), 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 across the city. As such, a number of roads within Manchester have been included within the Greater Manchester Combined Authority AQMA. This is described as follows:

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

- 3.2.2 The development is located within the AQMA. As such, there is the potential for the exposure of future residents to poor air quality and any emissions from the proposals to affect this sensitive area. These factors have been considered throughout the assessment.
- 3.2.3 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.

3.3 Air Quality Monitoring

- 3.3.1 Monitoring of pollutant concentrations is undertaken by MCC throughout their area of jurisdiction. Recent results recorded in the vicinity of the development are shown in Table 3. Exceedences of the AQO are shown in **bold**.

Table 3 Monitoring Results

Monitoring Site		Monitored NO ₂ Concentration (µg/m ³)		
		2018	2019	2020
MA75NO	Stockport Road	47.6	47.0	33.7
MA80NO	Alma Road	32.2	33.2	22.5
MA81NO	Peaceville Road	21.8	23.1	16.6

- 3.3.1 As shown in Table 3, annual mean NO₂ concentrations were above the AQO at the Stockport Road monitor during 2018 and 2019. As this position is situated at a roadside location within an AQMA, elevated levels would be expected. Pollutant concentrations were below 40µg/m³ at all remaining positions in recent years. Reference should be made to Figure 2 for a map of the survey positions.
- 3.3.2 Pollutant concentrations during 2020 are lower than 2019 due to reduction in traffic and associated emissions caused by the COVID-19 pandemic. The results should therefore be viewed with caution.
- 3.3.3 MCC do not undertake monitoring of PM₁₀ or PM_{2.5} within the vicinity of the development.

3.4 Background Pollutant Concentrations

- 3.4.1 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: 38700, 393500. Data for this location was downloaded from the DEFRA website⁵ for the purpose of the assessment and is summarised in Table 4.

Table 4 Background Pollutant Concentration Predictions

Pollutant	Predicted Background Pollutant Concentration (µg/m ³)		
	2019	2022	2023
NO ₂	19.57	17.50	17.01

⁵ <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>.

Pollutant	Predicted Background Pollutant Concentration ($\mu\text{g}/\text{m}^3$)		
	2019	2022	2023
PM ₁₀	12.86	12.36	12.25
PM _{2.5}	8.86	8.53	8.45

3.4.2 As shown in Table 4, predicted background NO₂, PM₁₀ and PM_{2.5} concentrations are below the relevant AQOs and AQLV at the development site.

4.0 METHODOLOGY

4.1 Introduction

- 4.1.1 The proposed development has the potential to expose future residents to poor air quality. In order to assess pollutant concentrations across the site, detailed dispersion modelling was undertaken in accordance with the following methodology.

4.2 Dispersion Model

- 4.2.1 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.
- 4.2.2 Modelling was undertaken for 2019 to allow verification against recent monitoring results and 2023 to represent the development opening year.
- 4.2.3 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.
- 4.2.4 The relevant inputs are detailed in the following Sections.

4.3 Assessment Area

- 4.3.1 Ambient concentrations were predicted over the area NGR: 387750, 393230 to 387870, 393350. One Cartesian grid was used within the model to produce data suitable for contour plotting using the Surfer software package.
- 4.3.2 It should be noted that although the grid only covered the proposed site, road links were extended in order to ensure the impact of all relevant vehicle emissions in the vicinity of the development were considered.
- 4.3.3 Reference should be made to Figure 3 for a graphical representation of the assessment grid extents.

4.4 Traffic Flow Data

- 4.4.1 Baseline traffic data for use in the assessment, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition as Heavy Duty Vehicle (HDV) proportion, was obtained from the Department for Transport (DfT)⁶. 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 2020. It should be noted that the DfT web tool is referenced in DEFRA guidance⁷ 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.
- 4.4.2 The baseline traffic data was converted to the site opening year utilising a factor obtained from TEMPro (Version 7.2). This software package has been developed by the DfT to calculate future traffic growth throughout the UK.
- 4.4.3 Road widths and vehicle speeds were estimated from aerial photography and UK highway design standards. A summary of the traffic data used in the assessment is provided in Table 5.

⁶ <https://roadtraffic.dft.gov.uk/>.

⁷ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

Table 5 Traffic Data

Link		24-hour AADT Flow		HDV Prop. of Fleet (%)	Road Width (m)	Mean Vehicle Speed (km/h)
		2019	2023			
L1	A6 North of Approach to Matthews Lane Junction	22,764	24,280	3.51	13.0	20
L2	A6 Approach to Matthews Lane Junction from North, Slow Phase (SP)	22,764	24,280	3.51	13.0	20
L3	A6 between Park Grove and Yew tree Avenue	22,764	24,280	3.51	7.5	20
L4	A6 between Yew Tree Avenue and Approach to Albert Road Junction	22,764	24,280	3.51	11.0	35
L5	A6 Approach to Albert Road Junction from North, SP	22,764	24,280	3.51	12.8	20
L6	A6 Approach to Albert Road Junction from South, SP	22,764	24,280	3.51	13.4	20
L7	A6 between Approach to Albert Road Junction and Approach to Elbow Street Junction	22,764	24,280	3.51	9.2	40
L8	A6 Approach to Elbow Street Junction from North, SP	22,764	24,280	3.51	11.1	20
L9	A6 Approach to Elbow Street Junction from South, SP	22,764	24,280	3.51	10.3	20
L10	A6 South of Elbow Street Junction	22,764	24,280	3.51	7.2	40
L11	Broom Lane	11,634	12,408	2.65	6.8	40
L12	Broom Lane Approach to A6, SP	11,634	12,408	2.65	9.5	20
L13	A6 Junction to Broom Lane, SP	22,764	24,280	3.51	10.8	20
L14	A6, south of Cringle Road	22,764	24,280	3.51	11.0	35
L15	A6, Approach to Llyod Street Junction, SP	22,764	24,280	3.51	10.8	20
L16	Wellington Road North	22,764	24,280	3.51	7.9	40

4.4.4 Reference should be made to Figure 3 for a graphical representation of the road link locations.

4.5 Emission Factors

- 4.5.1 Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 11.0). This has been produced by DEFRA and incorporates COPERT 5.3 vehicle emission factors and fleet information.

4.6 Meteorological Data

- 4.6.1 Meteorological data used in the assessment was taken from Manchester Airport meteorological station over the period 1st January 2019 to 31st December 2019 (inclusive). Manchester Airport is located at NGR: 381792, 384116, which is approximately 10.9km south-west of the development site. 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.
- 4.6.2 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 4 for a wind rose of utilised meteorological data.

4.7 Roughness Length

- 4.7.1 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 is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'parkland, open suburbia'.
- 4.7.2 A z_0 of 0.2m was used to describe the meteorological site. This is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'agricultural areas (min)'.

4.8 Monin-Obukhov Length

- 4.8.1 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'.

4.9 Background Concentrations

- 4.9.1 A review of DEFRA data and local monitoring records was undertaken in order to identify an appropriate background value for use in the assessment. This indicated the annual mean NO₂ concentration recorded at the MA81NO - Peaceville Road monitor during 2019 was 23.1 µg/m³, higher than the DEFRA background for the grid square containing the site, as shown in Table 4. The survey result was therefore used throughout the assessment as a worst-case.
- 4.9.2 Monitoring of annual mean PM₁₀ and PM_{2.5} concentrations is not within the vicinity of the site. As such, background values for these species were obtained from the DEFRA mapping study for the grid square containing the proposed development, as shown in Table 4.
- 4.9.3 Background concentrations from 2019 were utilised in preference to the opening year. This provided a robust assessment and is likely to overestimate pollutant concentrations during the operation of the proposal.

4.10 NO_x to NO₂ Conversion

- 4.10.1 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 guidance⁸.

4.11 Verification

- 4.11.1 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.

⁸ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

4.11.2 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.

4.11.3 For the purpose of the assessment model verification was undertaken for 2019 using traffic data, meteorological data and monitoring results from this year. The choice of 2019 as the verification year aligns with the IAQM position statement 'Use of 2020 and 2021 Monitoring Datasets'⁹, which states:

"If you are carrying out an air quality study that includes validation against monitoring data, use 2019 monitoring data as the last typical year."

4.11.4 Monitoring of NO₂ concentrations was undertaken at one location within the vicinity of roads included in the model during 2019. The result was obtained and the road contribution to total NO_x concentration calculated following the methodology contained within DEFRA guidance¹⁰. The monitored annual mean NO₂ concentration and calculated road NO_x concentration is summarised in Table 6.

Table 6 Verification - Monitoring Result

Monitoring Location		Monitored NO ₂ Concentration (µg/m ³)	Calculated Road NO _x Concentration (µg/m ³)
MA75NO	Stockport Road	47.0	50.79

4.11.5 The annual mean road NO_x concentration predicted from the dispersion model and the calculated 2019 road NO_x monitoring result is summarised in Table 7.

Table 7 Verification - Modelling Result

Monitoring Location		Calculated Road NO _x Concentration (µg/m ³)	Modelled Road NO _x Concentration (µg/m ³)
MA75NO	Stockport Road	50.79	20.19

⁹ Use of 2020 and 2021 Monitoring Datasets, IAQM, 2021.

¹⁰ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

4.11.6 The monitored and modelled road NO_x concentrations were compared to calculate the associated ratio. This indicated that a verification factor of 2.5157 was required to be applied to all NO_x modelling results.

4.11.7 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 guidance¹¹.

¹¹ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

5.0 ASSESSMENT

- 5.1.1 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 Section 4.0 to quantify air quality conditions at the site. Reference should be made to Figures 5, 6 and 7 for graphical representations of the results.
- 5.1.2 As shown in Figure 5, annual mean NO₂ concentrations were predicted to be below the AQO of 40µg/m³ at the building façade. The maximum level was 37.03µg/m³.
- 5.1.3 As shown in Figure 6, annual mean PM₁₀ concentrations were predicted to be below the AQO of 40µg/m³ at the building façade. The maximum level was 14.68µg/m³.
- 5.1.4 As shown in Figure 7, annual mean PM_{2.5} concentrations were predicted to be below the AQO of 20µg/m³ at the building façade. The maximum level was 12.03µg/m³.
- 5.1.5 Based on the assessment results, future residents are not predicted to be exposed to pollutant concentrations above the relevant AQOs and AQLV. As such, mitigation to protect future residents from elevated pollution concentrations is not considered necessary.

6.0 **MITIGATION STRATEGY**

6.1 **Introduction**

6.1.1 The planning condition indicates a requirement for details of any air quality mitigation measures included as part of the development to be submitted to and approved by MCC prior to commencement of the scheme. The following Section outlines the proposed measures to be implemented as part of the proposals.

6.2 **Control Measures**

6.2.1 In order to protect local air quality, the following mitigation measures have been included as part of the proposals:

- No provision of car parking in order to encourage sustainable methods of transport;
- Provision of secure cycle storage to encourage the use of sustainable transport methods; and,
- Provision of one gas-combi boiler per apartment that meets the emission standard of <40mgNO_x/kWh.

6.2.2 Consideration of the mitigation requirements outlined in the Institute of Air Quality Management (IAQM) document 'Land-Use Planning & Development Control: Planning for Air Quality' was also provided during the scheme design. Table 8 describes the good practice principles detailed in the guidance¹², along with how each has been addressed with regards to the proposals.

Table 8 Good Practice Design Principles for Operational Phase Air Quality Impacts

Phase	Principle	Action
Design Phase	New developments should not contravene the Council's AQAP ¹³ , 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

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

¹³ Greater Manchester AQAP 2016-2021, GMCA, 2016

Phase	Principle	Action
	Wherever possible, new developments should not create a new "street canyon", or a building configuration that inhibits effective pollution dispersion	The proposals will not lead to the generation of a street canyon
	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 bus services and amenities, as well as provision of secure cycle storage and no car parking
Operational Phase	The provision of at least 1 Electric Vehicle (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	No car parking is provided as part of the scheme. As such, there is no requirement for EV charging points
	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	No vehicle movements are predicted to be generated from the development. As such, there is no requirement for a Travel Plan
	All gas-fired boilers to meet a minimum standard of <40mgNO_x/kWh. All gas-fired 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	Boilers included in the development have been provisioned in accordance with the relevant requirements

6.2.3 It is considered the above methods will minimise potential air quality impacts associated with the scheme and are sufficient for a development of this scale and nature.

7.0 CONCLUSION

7.1.1 Redmore Environmental Ltd was commissioned by One Manchester Property Limited to undertake an Air Quality Assessment in order to address a planning condition in relation to a residential development at 1198 Stockport Road, Manchester.

1.1.3 The planning condition requires details of air quality mitigation measures included as part of the development to be submitted to and approved by MCC prior to commencement of the scheme. An Air Quality Assessment was therefore undertaken in order to determine baseline conditions at the development and identify the relevant mitigation measures.

7.1.2 Dispersion modelling was undertaken in order to predict pollutant concentrations across the proposed development site as a result of emissions from the local highway network. Outputs were subsequently verified using local monitoring data obtained from MCC. The results were then used to determine the requirement for mitigation to protect future residents from poor air quality, such as mechanical ventilation.

7.1.3 The results of the dispersion modelling assessment indicated that predicted NO₂, PM₁₀ and PM_{2.5} concentrations were below the relevant AQOs and AQLV at the building façade. As such, mitigation to protect future users from elevated pollution concentrations is not considered necessary.

7.1.4 Mitigation included as part of the proposals in order to minimise potential air quality impacts at nearby sensitive locations was also identified. This was considered suitable for a scheme of this scale and nature, in accordance with the IAQM guidance.

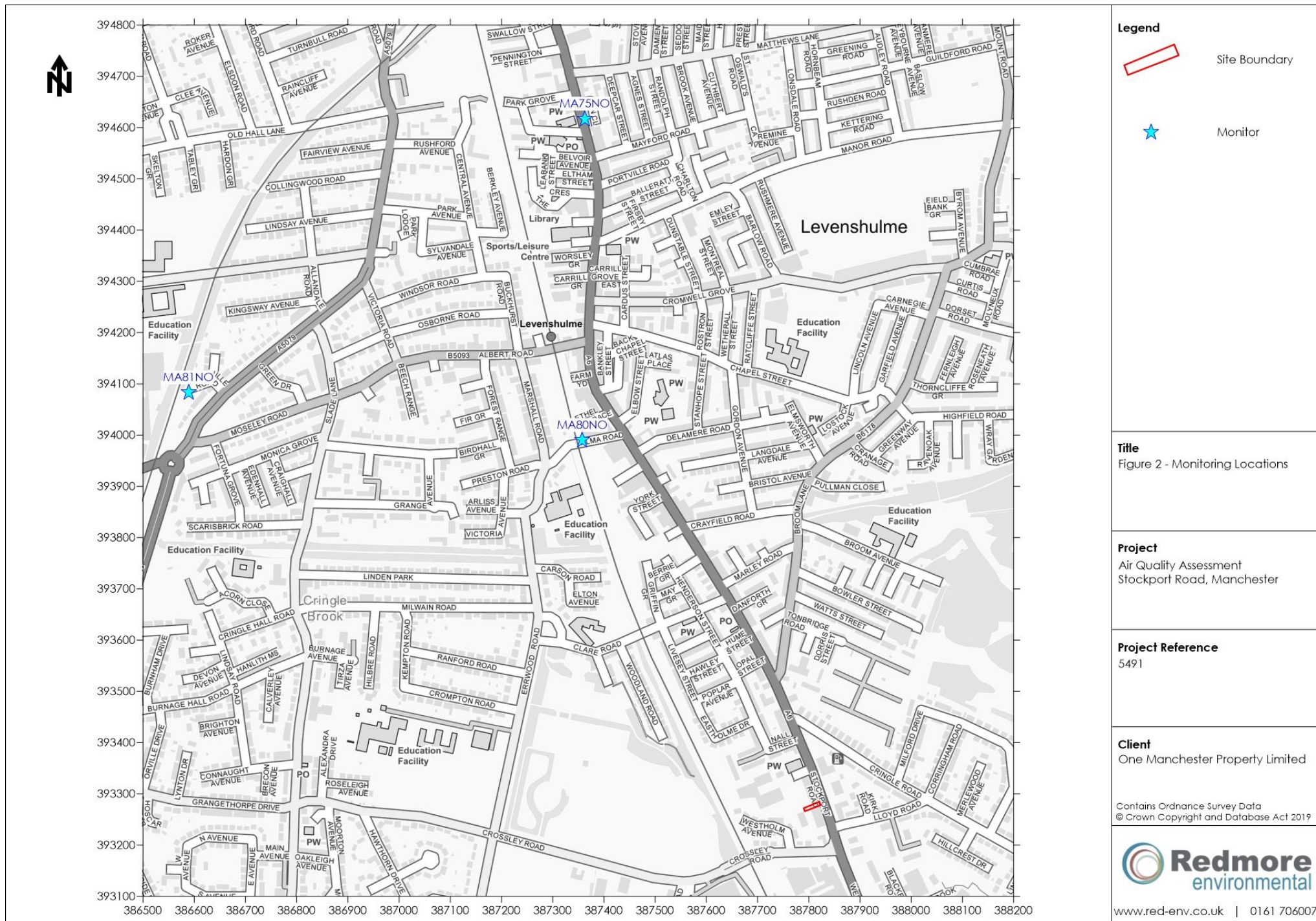
7.1.5 Based on the assessment results, it is considered that the condition has been addressed and it is recommended that it be discharged.

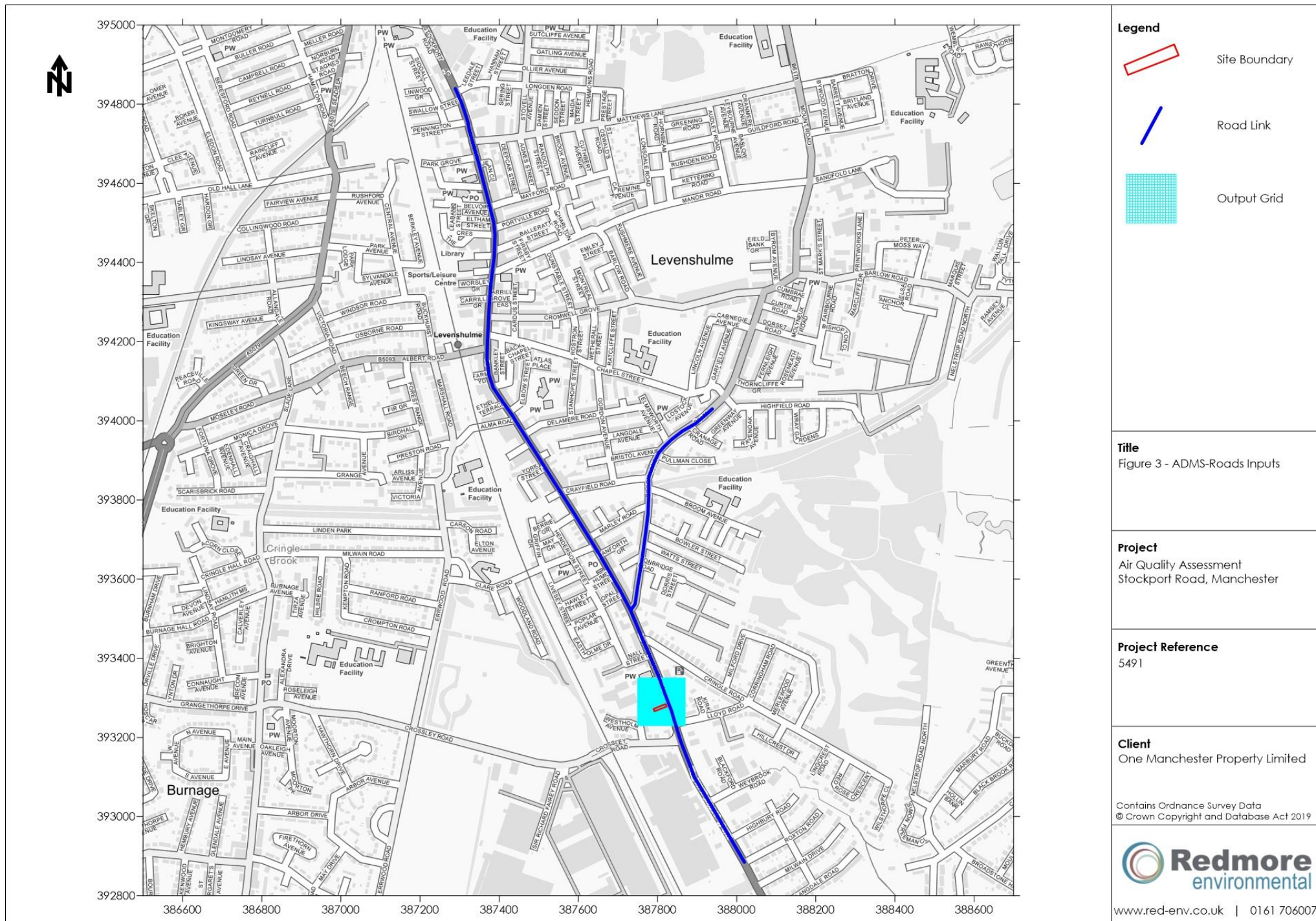
8.0 **ABBREVIATIONS**

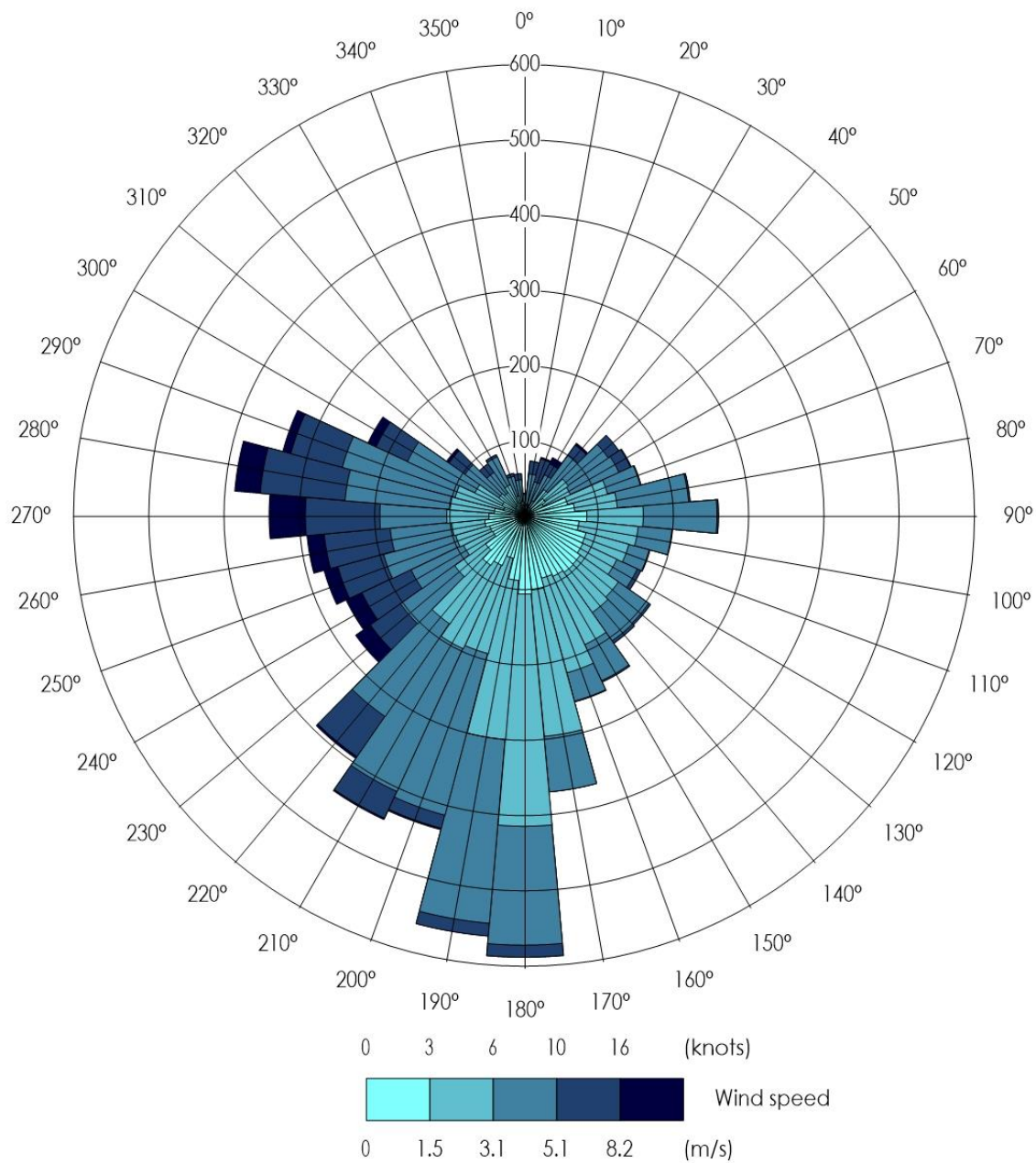
AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQAP	Air Quality Action Plan
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EV	Electric Vehicle
GMCA	Greater Manchester Combined Authority
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
MCC	Manchester City Council
NGR	National Grid Reference
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10µm
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm
SP	Slow Phase
Z ₀	Roughness length

Figures









Legend

Title

Figure 4 - Wind Rose of 2019
Manchester Airport Meteorological
Data

Project

Air Quality Assessment
Stockport Road, Manchester

Project Reference

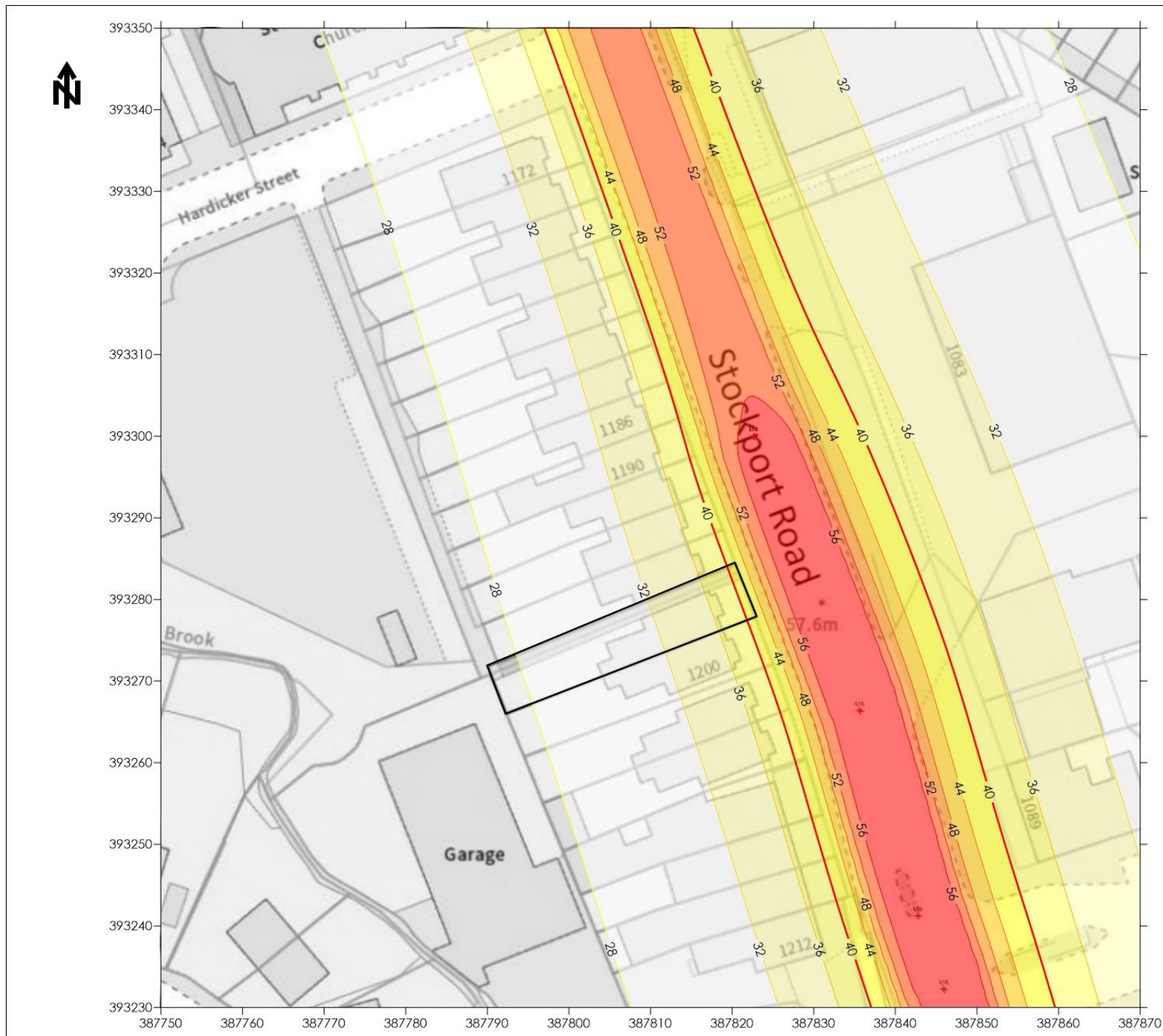
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Client

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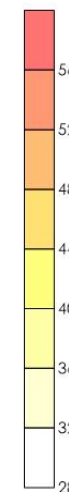
www.red-env.co.uk | 0161 7060075



Legend



Site Boundary



Annual Mean
NO₂
Concentration
(µg/m³)

Title

Figure 5 - Predicted Annual Mean
NO₂ Concentrations (µg/m³)

Project

Air Quality Assessment
Stockport Road, Manchester

Project Reference

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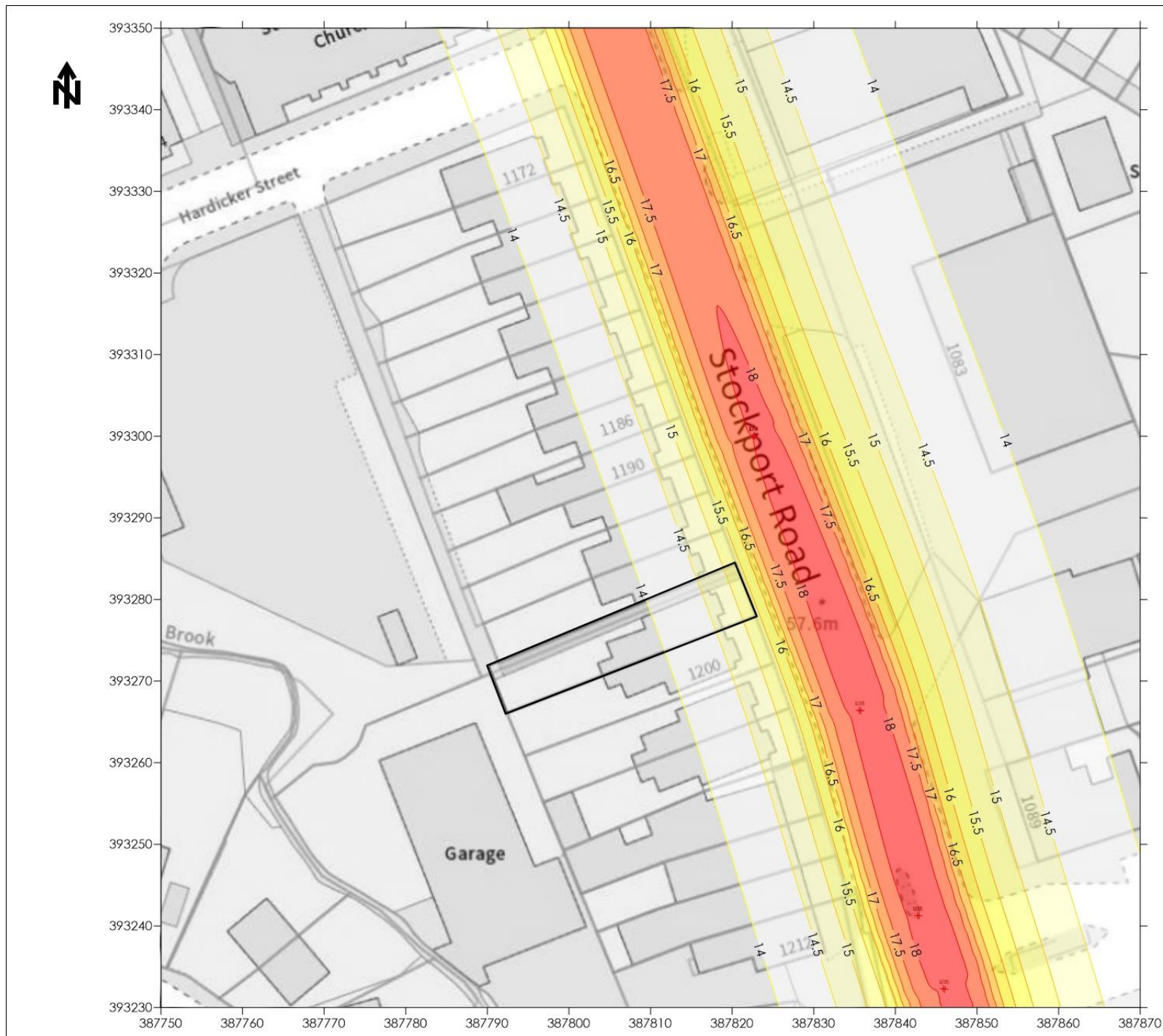
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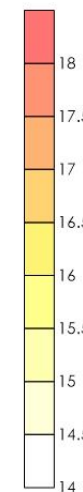
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Legend



Site Boundary



Annual Mean
PM₁₀
Concentration
(µg/m³)

Title

Figure 6 - Predicted Annual Mean
PM₁₀ Concentrations (µg/m³)

Project

Air Quality Assessment
Stockport Road, Manchester

Project Reference

5491

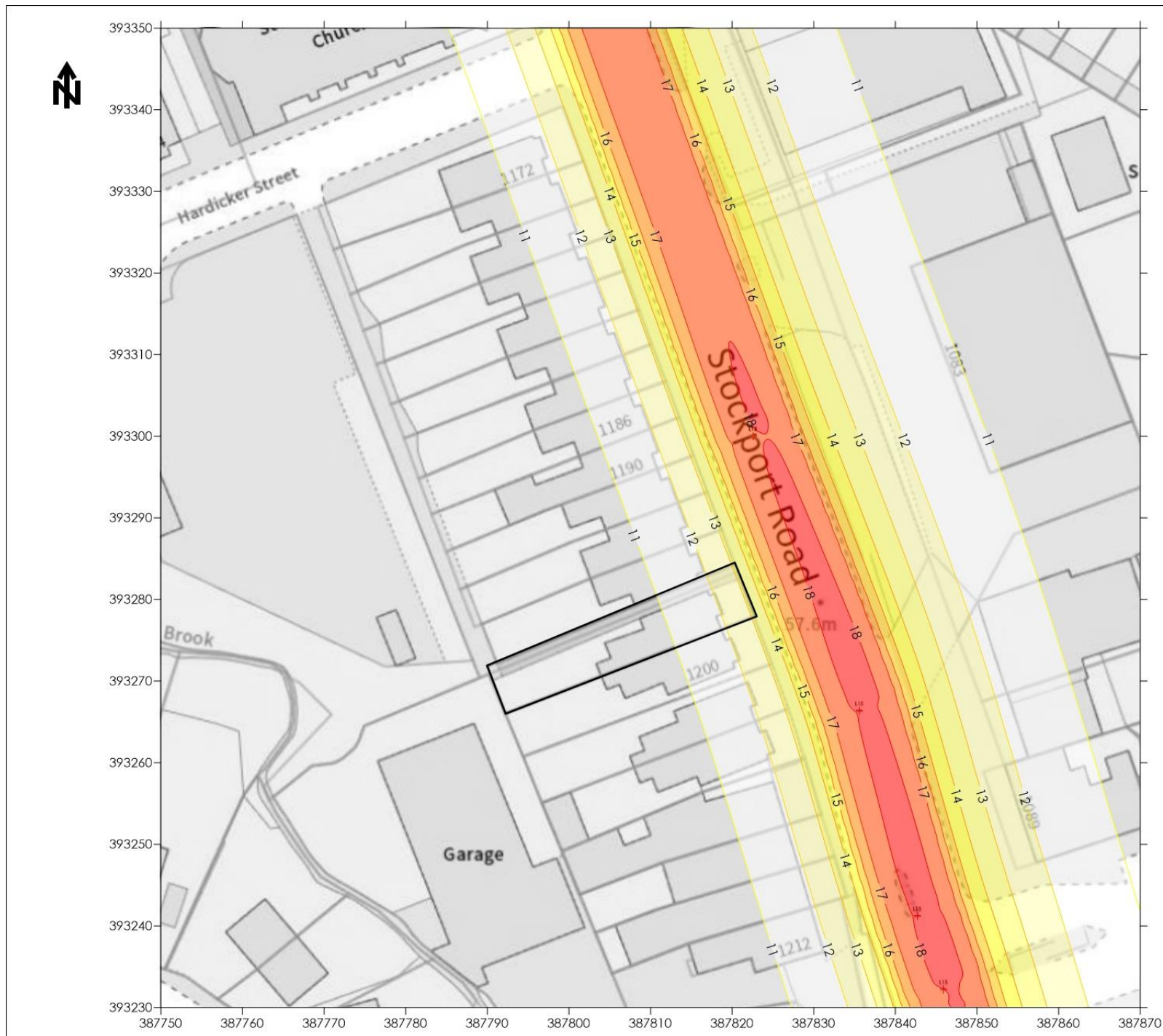
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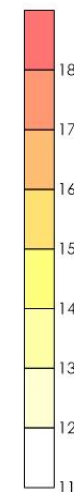
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Legend



Site Boundary



Title

Figure 7 - Predicted Annual Mean PM_{2.5} Concentrations (µg/m³)

Project

Air Quality Assessment
Stockport Road, Manchester

Project Reference

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