

RENAKER BUILD LIMITED**CROWN STREET PHASE 2, MANCHESTER – FULL DISCHARGE OF CONDITION 97 ATTACHED TO PLANNING PERMISSION 126668/FO/2020 (AS AMENDED)**

Following the submission of the planning application (ref: 126668/FO/2020) to Manchester City Council (MCC), planning permission for the Phase C development was granted subject to following Reserved Matters planning condition in relation to Air Quality. Condition 97 requests the following:

Prior to first occupation of Phase C, an Air Quality Impact Assessment (AQIA) shall be submitted to and approved in writing by the Local Planning Authority. The AQIA shall include full details of all mitigation measures required for the development. Any agreed mitigation measures shall be implemented in full before first occupation of the development and shall remain in situ whilst the development is in operation.

As noted within the ES Chapter air quality is predicted to improve in the future. However, in order to provide a robust assessment, 2018 emission factors were utilised within the dispersion model for future year scenarios. As such the use of 2024 traffic data and 2018 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 and are likely to be overestimating emissions for the 2024 opening year scenario.

Further modelling detailed within Air Quality Addendum (AQ73415r3) was undertaken to determine the anticipated pollutant concentrations across the Proposed Development site utilising 2024 traffic data and 2024 emissions factors to provide a reasonable and more realistic assessment.

Additionally, associated impacts from the Proposed Development were also based on worst case sensitivity analysis in the form of robust emission factor assumptions. The use of 2024 operational traffic data, together with 2018 emission factors does not consider future improvements (due to the current shift towards a greater production and uptake low emission vehicles) and significantly overestimate actual pollutant concentrations at nearby sensitive receptors within the modelling domain.

Furthermore, no additional parking is to be provided as part of the reserved matters proposals for Phase C, the education facility. Electric vehicle charging and cycle provisions are to be provided as part of the wider detailed application for Crown Street Phase 2 and it is considered that these measures are sufficient in securing a further reduction in the associated road vehicle exhaust emissions.

As such, the information submitted within the 2020 ES chapter (ref: 126668/FO/2020) and within Air Quality Technical Note (AQ73415r3) is considered to be sufficient to discharge Condition 97, without any further assessment and Air Quality should not be viewed as a constraint to planning approval.

Rachael Harrison
Air Quality Consultant

6 Air Quality

A6 ES Addendum Alterations

The following change has been made to this chapter to take into account the detailed reserved matters proposals for Phase C of Crown Street Phase 2 which received outline consent as part of the hybrid planning permission:

- Updates to reflect the publishing of the revised NPPF (July 2021).

An EIA Technical Note is included at Appendix 6.3 (ES Volume 2) has been prepared by Ensafé (formerly REC Ltd) to consider the environmental impacts arising from the detailed reserved matters proposals for Phase C (education facility). The EIA Technical Note confirms that the conclusions of the previous assessment (below) remain valid.

Introduction

- 6.1 This Chapter of the ES, prepared by Resource and Environmental Consultants (REC) Limited (Ltd), assesses the likely significant effects of the Proposed Development with respect to Air Quality. This Chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding areas; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.
- 6.2 The chapter has been prepared with due regard to the requirements of Manchester City Council (MCC) Environmental Health Department. Reference should be made to Appendix 6.1 (AQ107792 Air Quality) for the details of the proposed methodology consultation, and the utilised assessment inputs including ADMS-Roads parameters, utilised traffic data and model verification process. Reference should be made to Appendix 6.2 which provides the relevant assessment figures.
- 6.3 Due to the scale of the Proposed Development, there is the potential for impacts to arise at nearby sensitive receptors during the construction and operational phases. These may include fugitive dust emissions generated by construction processes, as well as additional road vehicle exhaust emissions generated during operation.
- 6.4 Additionally, the Site is located within the Greater Manchester Air Quality Management Area (AQMA), designated due to elevated Nitrogen Dioxide (NO₂) concentrations, and situated adjacent to the A57 ring road and Deansgate Interchange, a considerable source of road vehicle exhaust emissions. As such, the Proposed Development may introduce future sensitive receptors (residents) to an area experiencing elevated pollutant levels.
- 6.5 An Air Quality ES Chapter is therefore required in order to define baseline conditions, assess Site suitability for the proposed end-use and consider effects as a result of the development in accordance with the requirements of the National Planning Policy Framework (NPPF).
- 6.6 The Air Quality Chapter was directed by Josh Davies, Senior Air Quality Consultant at REC and member of the Institute of Air Quality Management (IAQM) and Institute of Environmental Science (IES). He has over 5 years' experience in the air quality sector. His role includes the production and project management of Air Quality Assessments in support of planning applications for a wide range of UK and international clients and sectors. He also has detailed knowledge of the LAQM process and annual reporting to DEFRA, Environmental Impact Assessment (EIA), co-ordination of multi-disciplinary environmental assessment work in support of planning applications and dispersion modelling studies.

Legislative and Policy Context

European Legislation

- 6.7 European Union (EU) air quality legislation is provided within Directive 2008/50/EC, which came into force on 11th June 2008. This Directive consolidated previous legislation which was designed to deal with specific pollutants in a consistent manner and provided new air quality objectives for particulate matter with an aerodynamic diameter of less than 2.5µm (PM_{2.5}). The relevant consolidated Directives include:
- Directive 99/30/EC - the First Air Quality "Daughter" Directive - sets ambient Air Quality Limit Values (AQLVs) for nitrogen dioxide (NO₂), oxides of nitrogen (NO_x), sulphur dioxide, lead and particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀);

National Planning Policy

- 6.8 The National Planning Policy Framework (NPPF)² - was published on 24th July 2018, updated on 19th February 2019 and a revised version was subsequently published in July 2021, and sets out the Government's core policies and principles with respect to land use planning, including air quality. The implications of the NPPF have been considered throughout this assessment where relevant.
- 6.9 The National Planning Practice Guidance (NPPG)³ - launched by the Department for Communities and Local Government on 1st November 2019 to support the NPPF. The NPPG will be reviewed and the relevant guidance considered as necessary throughout the undertaking of the air quality assessment.

UK Legislation

- 6.10 The Air Quality Standards (Amendment) Regulations (2016) - these Regulations amend the Air Quality Standards Regulations 2010 and transpose the EU Directive 2008/50/EC into UK law. Air Quality Limit Values (AQLVs) were published in these regulations for 7 pollutants, as well as Target Values for an additional 6 pollutants.
- 6.11 Air Quality Strategy ((AQS) 2007) - Sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK. It also sets standards and objectives for ten main air pollutants to protect health, vegetation and ecosystems
- 6.12 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 2007⁴. 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 exceedances over a specified timescale. These are generally in line with the AQLVs, although the requirements for compliance vary slightly.

UK Guidance

- 6.13 The Chapter was undertaken in accordance with a number of guidance documents as detailed below:

² National Planning Policy Framework, Department for Communities and Local Government, 2018.

³ <https://www.gov.uk/government/collections/planning-practice-guidance>

⁴ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2007

- Department for Environment Food and Rural Affairs (DEFRA) (2016): Local Air Quality Management Technical Guidance TG(16)⁵;
- IAQM (2014): Guidance on the Assessment of Dust from Demolition and Construction⁶; and
- IAQM & Environmental Protection UK (EPUK) (2017): Land-use Planning & Development Control: Planning for Air Quality⁷.

6.14 Table 6.1 presents the AQOs for pollutants to be considered within this Chapter.

Table 6.1 – Air Quality Objectives

Pollutant	Air Quality Objective	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period
NO₂	40	Annual mean
	200	1-hour mean; not to be exceeded more than 18 times a year
PM₁₀	40	Annual mean
PM_{2.5}	25	Annual Mean

6.15 Table 6.2 summarises the advice provided in DEFRA guidance LAQM (TG16)⁴ on where the AQOs for pollutants considered within this report apply.

⁵ Local Air Quality Management Technical Guidance 2016 LAQM (TG16), DEFRA, 2016.

⁶ Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management, 2016

⁷ Land-Use Planning and Development Control: Planning for Air Quality, Environmental Protection UK and Institute of Air Quality Management, 2017.

Table 6.2 Examples of where the Air Quality Objectives Apply

Averaging Period	Objectives Should Apply At	Objectives 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
1-hour mean	All locations where the annual mean and 24-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

Local Air Quality Management

- 6.16 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 administration under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves considering present and likely future air quality against the AQOs. If it is predicted that levels at sensitive locations where members of the public are regularly present for the relevant averaging period are likely to be exceeded, the LA is required to declare an 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.

Dust

- 6.17 The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations (2018) are those 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."

- 6.18 Enforcement of the Act, in regard to nuisance, is currently under the administration 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). Enforcement can insist that there be no dust beyond the boundary of the works. 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 practice measures.

Local Planning Policy

- 6.19 The Manchester Local Development Framework (LDF) Core Strategy was formally adopted in 2012 and provides a framework for development within the city. The LDF comprises a number of documents which set out Manchester City Council's (MCC's) spatial policy framework for delivering a number of policies contained within the Core Strategy which have been saved in accordance with the Planning and Compulsory Purchase Act (2004) and therefore provide the basis for the determination of planning applications prior to the finalisation of the local development framework.
- 6.20 A review of the Core Strategy indicated the following policy in relation to air quality that relevant to this assessment:

Policy EN16 - Air Quality

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

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

Policy DM1 – 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.

- 6.21 Reference has been made to these policies during the preparation of this Air Quality Assessment by assessing pollutant concentrations across the Site and determining potential air quality impacts as a result of the Proposed Development.

Greater Manchester Air Quality Action Plan

- 6.22 The Greater Manchester Air Quality Action Plan (AQAP) has involved a review of the strategies, policies and plans which tackle or are in some way related to air quality, to develop a clear, robust and meaningful set of actions which will deliver real changes in terms of air quality, whilst supporting the sustainable economic growth of the region.
- 6.23 The primary objectives of the AQAP are to improve air quality across Greater Manchester and to embed low-emission behaviours into the culture of our organisations and lifestyles by 2025, whilst supporting the UK Government in meeting all EU thresholds for key air pollutants. The Plan identifies 'Key Priority Areas' which are generally locations near to major roads and heavily trafficked areas in Manchester city centre, and other major urban centres across the other nine districts.

- 6.24 The AQAP comprises a single document including actions that will be ratified by Transport for Greater Manchester (TfGM) and district authorities to tackle air quality in Key Priority Areas, whilst supporting the sustainable economic growth of the region. This plan will allow councils to carry out their statutory duties under Part IV of the Environment Act 1995, as its implementation will help mandatory EU limit values to be met. Consideration to the action plan has been made throughout the preparation assessment.
- 6.25 Reference has been made to this policy during the undertaking of this Air Quality Assessment by assessing pollutant concentrations across the development Site.

Assessment Methodology and Significance Criteria

- 6.26 The Proposed Development has the potential to cause air quality impacts during the construction and operational phases in addition to exposing future Site users to elevated pollution levels. The chapter assess the impacts of Proposed Development of the detailed submission of Zone 2. In summary, the proposals include the following elements for which full planning permission is sought:
- Erection of two 51-storey residential buildings (Buildings C4 and C5) each incorporating a podium accommodating residential amenity facilities and ground floor commercial units
 - Each building has separate private car and cycle parking within a three-storey basement.
 - A three-storey basement public car park with access on to Silvercroft Street.
 - A new public park
 - Landscaping and public realm works; and
 - A highways and servicing route.
- 6.27 In addition, the proposals also include the following elements for which outline planning permission (with all matters reserved) is sought:
- A single-form entry primary school (Building C3)
- 6.28 There are two methods of assessing potential impacts associated with the Proposed Development, these include:
- Construction Phase Assessment; and
 - Operational Phase Assessment.

Assessment Methodology

Construction Methodology

- 6.29 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'⁸.
- 6.30 Activities on the proposed construction Site have been divided into three types to reflect their different potential impacts. These are:
- Earthworks
 - Construction
 - Trackout

⁸ Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management, 2014.

6.31 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 PM_{10}

Step 1

6.32 Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the Site boundary or 50m from the construction vehicle route up to 500m from the Site entrance, then the assessment should proceed to Step 2. Additionally, should ecological receptors be identified within 50m of the boundary Site or 50m from the construction vehicle route up to 500m from the Site entrance, then the assessment should also proceed to Step 2.

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

Step 2

6.34 Step 2 assesses the risk of potential dust impacts. A Site is allocated to 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).

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

6.36 Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table 6.3

Table 6.3 Construction Dust – Magnitude of Emissions

Magnitude	Activity	Criteria
Major	<i>Earthworks</i>	• Total Site area greater than 10,000m² • 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 8m in height • More than 100,000 tonnes of material moved
	<i>Construction</i>	• Total building volume greater than 100,000m³ • On Site concrete batching • Sandblasting
	<i>Trackout</i>	• 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
Moderate	<i>Earthworks</i>	• Total Site area 2,500m² to 10,000m² • Moderately dusty soil type (e.g. silt) • 5 to 10 heavy earth moving vehicles active at any one time • Formation of bunds 4m to 8m in height • Total material moved 20,000 tonnes to 100,000 tonnes

Magnitude	Activity	Criteria
Minor	<i>Construction</i>	- Total building volume 25,000m³ to 100,000m³ - Potentially dusty construction material (e.g. concrete) - On Site concrete batching
	<i>Trackout</i>	10 to 50 HDV trips per day - Moderately dusty surface material (e.g. high clay content) - Unpaved road length 50m to 100m
	<i>Earthworks</i>	- Total Site area less than 2,500m² - 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 4m in height - Total material moved less than 20,000 tonnes - Earthworks during wetter months
	<i>Construction</i>	- Total building volume less than 25,000m³ - Construction material with low potential for dust release (e.g. metal cladding or timber)
	<i>Trackout</i>	- Less than 10 HDV trips per day - Surface material with low potential for dust release - Unpaved road length less than 50m

6.37 Step 2B defines the sensitivity of the area around the development Site for construction, earthworks and trackout. The factors influencing the sensitivity of the area are shown in Table 6.4.

Table 6.4 Examples of Factors Defining Sensitivity of the Area

Sensitivity	Receptor	
	Human	Ecological
High	- Users expect of 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
Moderate	- 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, playing	Locally designated Site e.g. Local Nature Reserve

Sensitivity	Receptor	Ecological
	Human	
	fields, farmland, footpaths, short term car park and roads	

6.38 The guidance also provides the following factors to consider when determining the sensitivity of an area to potential dust impacts during the construction phase:

- Any history of dust generating activities in the area;
- The likelihood of concurrent dust generating activity on nearby sites;
- Any pre-existing screening between the source and the receptors;
- Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which works will take place;
- Any conclusions drawn from local topography;
- Duration of the potential impact, as a receptor may become more sensitive over time; and
- Any known specific receptor sensitivities which go beyond the classifications given in the document.

6.39 These factors were considered in the undertaking of this assessment.

6.40 The sensitivity of the area to dust soiling effects on people and property is shown in [Table 6.5](#).

Table 6.5 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 350
High	<i>More than 100</i>	Major	Major	Moderate	Minor
	<i>10 - 100</i>	Major	Moderate	Minor	Minor
	<i>1 - 10</i>	Moderate	Minor	Minor	Minor
Moderate	<i>More than 1</i>	Moderate	Minor	Minor	Minor
Low	<i>More than 1</i>	Minor	Minor	Minor	Minor

6.41 [Table 6.6](#) outlines the sensitivity of the area to human health impacts.

Table 6.6 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
High	<i>Greater than 32µg/m³</i>	More than 100	Major	Major	Major	Moderate	Minor
		10 - 100	Major	Major	Moderate	Minor	Minor
		1 - 10	Major	Moderate	Low	Minor	Minor

	28 - 32 $\mu\text{g}/\text{m}^3$	More than 100	Major	Major	Moderate	Minor	Minor
		10 - 100	Major	Moderate	Minor	Minor	Minor
		1 - 10	Major	Moderate	Minor	Minor	Minor
	24 - 28 $\mu\text{g}/\text{m}^3$	More than 100	Major	Moderate	Minor	Minor	Minor
		10 - 100	Major	Moderate	Minor	Minor	Minor
		1 - 10	Moderate	Minor	Minor	Minor	Minor
	Less than 24 $\mu\text{g}/\text{m}^3$	More than 100	Moderate	Minor	Minor	Minor	Minor
		10 - 100	Minor	Minor	Minor	Minor	Minor
		1 - 10	Minor	Minor	Minor	Minor	Minor
Moderate	Greater than 32 $\mu\text{g}/\text{m}^3$	More than 10	Major	Moderate	Minor	Minor	Minor
		1 - 10	Moderate	Minor	Minor	Minor	Minor
	28 - 32 $\mu\text{g}/\text{m}^3$	More than 10	Moderate	Minor	Minor	Minor	Minor
		1 - 10	Minor	Minor	Minor	Minor	Minor
	24 - 28 $\mu\text{g}/\text{m}^3$	More than 10	Minor	Minor	Minor	Minor	Minor
		1 - 10	Minor	Minor	Minor	Minor	Minor
	Less than 24 $\mu\text{g}/\text{m}^3$	More than 10	Minor	Minor	Minor	Minor	Minor
		1 - 10	Minor	Minor	Minor	Minor	Minor
	-	More than 1	Minor	Minor	Minor	Minor	Minor

6.42 [Table 6.7](#) outlines the sensitivity of the area to ecological impacts.

Table 6.7 Sensitivity of the Area to Human Health Impacts

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

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

6.44 [Table 6.8](#) outlines the risk category from earthworks and construction activities.

Table 6.8 Dust Risk Category from Earthworks and Construction Activities

Sensitivity of Area	Dust Emission Magnitude		
	Major	Moderate	Minor
High	Major	Moderate	Minor
Moderate	Major	Moderate	Minor
Low	Minor	Minor	Negligible

6.45 [Table 6.9](#) outlines the risk category from trackout activities.

Table 6.9 Dust Risk Category from Trackout Activities

Sensitivity of Area	Dust Emission Magnitude		
	Major	Moderate	Minor
High	Major	Moderate	Minor
Moderate	Moderate	Minor	Negligible
Low	Minor	Minor	Negligible

Step 3

- 6.46 Step 3 requires the identification of Site specific mitigation measures within the IAQM guidance⁶ 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

- 6.47 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'. This has been described as negligible within this report to provide continuity between assessment terminologies.
- 6.48 The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

Operational Phase Assessment Methodology

- 6.49 Without appropriate mitigation, the operational phase of the Proposed Development is likely to introduce new residents to poor air quality, as predicted from the review of baseline Air Quality conditions. Additionally, traffic generated by the proposals may cause increases in pollutant concentrations as a result of additional road vehicle exhaust emissions. Potential air quality effects across the Proposed Development and at sensitive receptors within close proximity to the Site will therefore be assessed on a quantitative basis. This will be undertaken by calculating NO₂, PM₁₀ and PM_{2.5} levels across the Proposed Development and at sensitive locations with and without the development using the ADMS-Roads dispersion modelling software. It should be noted that the ADMS modelling software is widely accepted within the UK by the Local Authorities, the Environment Agency and DEFRA.
- 6.50 The assessment of operational phase impacts will therefore consider the following development scenarios
- Scenario A: 2018 Baseline year, for verification purposes against latest 2018 MCC and SCC ratified Air Quality Monitoring data;
 - Scenario E: Anticipated Do something 2025 Opening Year baseline plus, predicted traffic flows associated with C3, C4, C5, basement car park (entirety), highways, public realm; inclusive of all committed developments listed in Appendix 2.2 (should the proposal be completed).
- 6.51 Please note the future year scenario will be considered in conjunction with the anticipated 2025 baseline opening year conditions (should the proposal not be completed).
- 6.52 With regards to associated Air Quality impacts, a worst-case operational scenario has been undertaken through the assessment of Scenarios E, which assess the combined impact of all developable aspects as well as specific committed developments listed in Appendix 2.2. The

choice of Scenario E, not only ensures that all development phases are considered in conjunction with baseline committed development traffic flows, but moreover provides a worst-case assessment of development related road vehicle exhaust emissions and takes account of anticipated future traffic generation in the vicinity of the Site.

- 6.53 It should be noted that air quality is predicted to improve in the future (due to the current shift towards a greater production and uptake of low emission vehicles, supported by national government targets). However, in order to provide a robust assessment, emission factors for 2018 were utilised within the dispersion model. Subsequently, the use of 2025 operational traffic data, together with 2018 emission factors is considered to provide a worst-case scenario which overestimates potential impacts. Therefore, a sufficient level of confidence can be placed within the predicted emission levels and conclusions regarding impact significance.
- 6.54 NO_x and PM factors emission factors were calculated using the Emission Factor Toolkit (version 9.0.1) produced by DEFRA Reference should be made to Appendix 6.1 for the assessment input data, including ADMS-Roads parameters, utilised traffic data and model verification process.
- 6.55 The Proposed Development includes the provision of basement level car parking which is to be served by ventilation units in order to provide suitable extraction of pollutants. Emissions extracted and released by a number of ventilation units which may have the potential to increase pollutant concentration in the vicinity of the proposed residential locations. The impacts associated with the ventilation systems, are considered further throughout the preparation of this Chapter.

Significance Criteria

- 6.56 Receptors potentially sensitive to changes in NO₂ and PM₁₀ concentrations were identified within 200m of the affected highway network. LAQM (TG16)⁵ provides the following examples of where annual mean AQOs should apply:
- Residential properties;
 - Schools;
 - Hospitals; and,
 - Care homes.
- 6.57 The sensitivity impact significance of each receptor was defined in accordance with the criteria shown in [Table 6.10](#)~~Table 6.10~~. These are based upon the guidance provided within the EPUK and IAQM guidance⁷.

Table 6.10 Operational Traffic Exhaust Emissions – Significance of Impact

Long Term Average Concentration	% Change in Concentration Relative to AQO			
	1	2-5	6-10	>10
75% or less of AQO	Negligible	Negligible	Minor	Moderate
76 - 94% of AQO	Negligible	Minor	Moderate	Moderate
95 - 102% of AQO	Minor	Moderate	Moderate	Major
103 - 109% of AQO	Moderate	Moderate	Major	Major
110% or more of AQO	Moderate	Major	Major	Major

- 6.58 The criteria shown in [Table 6.10](#)~~Table 6.10~~ is EPUK and IAQM guidance⁷ with sensitivity descriptors included to allow comparisons of various air quality impacts. It should be noted that

changes of 0%, i.e. less than 0.5%, will be described as negligible in accordance with the EPUK and IAQM guidance

- 6.59 Following the prediction of impacts at discrete receptor locations utilising the criteria in [Table 6.10](#)~~Table 6.10~~, the EPUK and IAQM⁷ document states that this framework is to be used as a starting point to make a judgement on significance of effect but other influences might need to be accounted for.
- 6.60 Whilst impacts might be determined as 'minor', 'moderate' or 'major' at individual receptors, overall effect might not necessarily be deemed as significant in some circumstances. The following factors may provide some assistance in determining the overall significance of a development:
- Number of properties affected by significant air quality impacts and a judgement on the overall balance;
 - Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective will be relevant;
 - The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors;
 - Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a major increase or decrease; and,
 - Duration of the potential impacts, either temporary or permanent; and
 - The extent to which an objective is exceeded e.g. an annual mean NO₂ concentration of 41µg/m³ should attract less significance than an annual mean of 51µg/m³.
- 6.61 These factors were considered and an overall significance determined for the impact of operational phase road traffic emissions. It should be noted that the determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

Limitations and Assumptions

Operational Phase

- 6.62 For the operational phase assessment, it should be noted that there is current uncertainty over NO₂ concentrations within the UK not reducing as previously expected due to the shifts towards a greater production and uptake of electric and hybrid vehicles. In order to provide a robust assessment, emission factors for 2018 were utilised within the dispersion model for the prediction of pollution levels for all scenarios. As such, the use of 2025 traffic data, together with 2018 emission factors is considered to provide a worst-case scenario and therefore a sufficient level of confidence can be placed within the predicted emission levels.
- 6.63 Similarly, it has been assumed that background concentrations will not improve in line with current predictions and therefore 2018 background concentrations have been utilised for the assessment of the opening year of the 2025 Proposed Development. This further provides a robust assessment and is likely to overestimate actual pollutant concentrations during the operation of the Proposed Development.
- 6.64 Although the full scheme is projected to open during 2028 it is not a simple task to accurately extrapolate 2025 traffic data to 2028. From an Air Quality perspective, the Proposed Development traffic forms the main body assessment and crucially this will remain unchanged with the utilised base year.
- 6.65 Regarding committed developments it was not possible for the Transport Consultant to provide individual scheme flows given the nature of the agreed TfGM SATURN model. It has been confirmed by Vectos that the dataset fully accounts for planned growth in line with all committed developments listed in Appendix 2.2 and is considered to be a robust base upon to assess Proposed Development trips. For this reason, it was not possible to provide individual analysis of

Scenarios B, C or D. It should again be noted that Scenario E, assesses the combined impact of all developable aspects as well as specific committed developments listed in Appendix 2.2. The choice of Scenario E, not only ensures that all development phases are considered in conjunction with baseline committed development traffic flows, but moreover provides a worst-case assessment of development related road vehicle exhaust emissions and takes account of anticipated future traffic generation in the vicinity of the Site.

- 6.66 It is therefore considered that the assessment is considered robust and provides an appropriate analysis of associated impacts.

Baseline Conditions

- 6.67 Existing air quality conditions in the vicinity of the Proposed Development were identified in order to provide a baseline for assessment. These are detailed in the following sections.

Local Air Quality Management

- 6.68 As required by the Environment Act (1995), MCC has undertaken Review and Assessment of air quality within their area of administration. This process concluded that annual mean concentrations of NO₂ are above the relevant AQO within the city. As such, one AQMA has been declared, which is described as:

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

- 6.69 The Site is located within the Greater Manchester Combined Authority (GMCA) AQMA, as such, there is the potential for the Proposed Development to introduce future Site users to elevated pollutant concentrations as well as cause adverse impacts to air quality within the designated AQMA. Potential impacts at sensitive receptor locations within the AQMA have therefore been considered further within this report.
- 6.70 MCC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs and as such no further AQMAs have designated.

Air Quality Management

- 6.71 Monitoring of pollutant concentrations is undertaken by MCC using continuous and periodic methods throughout their area of administration. A review of MCC's most recent Air Quality data available⁹ indicated that there are currently three automatic analysers operated by MCC. The closest automatic monitoring station is the Manchester Oxford Road (Urban traffic analyser), located approximately 1km east of The Site at the NGR: 384233, 397287. The monitoring location is classified as a Kerbside site and as such has not been considered further in the context of the assessment or within the verification process. This is in accordance with LAQM (TG16)⁵ which suggests that the inclusion of Kerbside sites within the verification procedure may lead to an over-adjustment of modelling at roadside sites. This may then lead to inaccuracies during the modelling of potential exposure across the Proposed Development and potential impacts at nearby sensitive receptor locations.
- 6.72 MCC also utilises passive diffusion tubes to monitor NO₂ concentrations throughout their area of administration. A review of MCC's most recent Air Quality data available indicated that there is currently one diffusion tube located in the vicinity of the Proposed Development which is suitable for use within the verification procedure. Recent monitoring results are summarised in [Table 6.11](#). Exceedances of the relevant AQO are shown in **bold**.

⁹ <https://cleanairm.com/air-quality-data/diffusion-tubes>

Table 6.11 MCC Diffusion Tube Monitoring Results

ID	Site Name	Site Type	NGR		Distance to Site (m)	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)		
			X	Y		2016	2017	2018
29A	Oxford Street	Urban Traffic	384117	397505	1,010	66.2	58.4	58.8
77	Hewitt Street	Urban Centre	383602	397488	520	44.2	39.2	41.0
82	Oxford Road	Urban Traffic	384233	397287	1,100	61.6	56.6	52.8

- 6.73 The neighbouring Salford City Council (SCC) also undertake Air Quality monitoring within the vicinity of the Site. A review of the latest data⁹ indicated two representative diffusion tube monitoring locations. Recent results from these locations are shown in [Table 6.12](#)~~Table 6.12~~. Exceedances of the relevant AQO are highlighted in **bold**.

Table 6.12 SCC Diffusion Tube Monitoring Results

ID	Site Name	Site Type	NGR		Distance to Site (m)	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)		
			X	Y		2016	2017	2018
SA59	West Crown Avenue	Urban Traffic	381822	397895	1,470	-	36.66	33.33
SA60	Regent Road	Urban Traffic	382445	397724	840	-	40.70	40.20

- 6.74 As shown in [Table 6.11](#)~~Table 6.11~~ and [Table 6.12](#)~~Table 6.12~~ there were exceedances of the annual mean AQO for NO₂ at all but one monitoring location in recent years. Exceedances are likely due to their kerbside and roadside locations within AQMAs.
- 6.75 A review of 2018 monitoring results detailed in [Table 6.11](#)~~Table 6.11~~ and [Table 6.12](#)~~Table 6.12~~ provide an indication that pollutant concentrations adjacent to the Site may exceed the annual mean AQO for NO₂.
- 6.76 Similar to the Oxford Road analyser, both Oxford Street (29A) and Oxford Road (82) are of kerbside classification and will only be considered further in context of the baseline assessment. Monitoring of particulate matter with an aerodynamic diameter of less than 10 μm (PM10) and 2.5 μm (PM2.5) is not currently undertaken by MCC in the vicinity of the Site.
- 6.77 Reference should be made to Figure 6.1 for geographical representation of diffusion tube monitoring locations.

Baseline Pollutant Concentrations

- 6.78 The total concentration of a pollutant is comprised of explicit local emission sources (such as roads and industrial sources) and the background component. The background component consists of indeterminate sources which are transported into an area from further away by meteorological conditions. Background pollutant concentrations are therefore the ambient level of pollution that is not affected by local sources of pollution.
- 6.79 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 Local Authorities (LAs) in their Review and

Assessment of air quality. The Proposed EIA Development is located in the background grid square:

- 383500, 397500.

- 6.80 Data for this location was downloaded from the DEFRA website for the purpose of this assessment and is summarised in [Table 6.13](#)~~Table 6.13~~; for the baseline year (2018) and Opening year (2025). In order to avoid 'double-counting' of road vehicle exhaust emissions of NO₂ and NO_x, the proportion of the relevant background concentrations from A-roads was removed in accordance with the methodology outlined in DEFRA guidance LLAQM.TG(16)⁵. The background concentrations before and following the adjustment, utilised the "NO_x Removal Calculator" are presented in [Table 6.13](#)~~Table 6.13~~. Both PM₁₀ and PM_{2.5} background concentrations remain unaffected.

Table 6.13 Predicted Background Pollutant Concentrations

Pollutant	Predicted Background Concentration (µg/m ³)	
	2018	2025
NO_x	36.21	26.21
NO₂	23.37	17.90
PM₁₀	12.71	12.01
PM_{2.5}	8.42	7.82

- 6.81 As shown in [Table 6.13](#)~~Table 6.13~~, background concentrations do not exceed the relevant AQOs. Comparison with the monitoring results provided in Table 6.11 and [Table 6.13](#)~~Table 6.13~~ indicate the influence of road vehicle exhaust emissions have upon roadside pollutant concentrations at roadside locations within an AQMA.

Sensitive receptors

- 6.82 A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a Proposed Development. These have been defined for fugitive dust and road vehicle exhaust emission impacts associated with the construction and operational phases. These are summarised in the following Sections.

Construction Phase Sensitive Receptors

- 6.83 There are no nationally or European designated ecological receptors within 50m of the Site boundary, or within 50m from a route used by construction vehicles on the public highway (up to 500m from the Site entrance). Therefore, the risk of dust effects at a nationally or European designated ecological receptor site from construction impacts is not considered further in the assessment.
- 6.84 Receptors sensitive to potential dust impacts during earthworks and construction were identified from a desk-top study of the area up to 350m from the Site boundary. These are summarised in [Table 6.14](#)~~Table 6.14~~

Table 6.14 Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors	Sensitivity
Less than 20	10 - 100	High
20 - 50	More than 100	
50 - 100	More than 100	
100 - 350	More than 100	

- 6.85 Reference should be made to Figure 6.2 for a graphical representation of earthworks and construction dust buffer zones.
- 6.86 Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 500m of the Site access route. These are summarised in [Table 6.15](#)~~Table 6.15~~. The exact construction vehicle access routes were not available for the purpose of this assessment as they will depend on sourcing of materials. This is likely to be decided by the contractor. It has been confirmed that construction traffic would likely access the Site from a slip road off of the Mancunian Way or from the west of Great Jackson Street. This will ensure that a maximum potential trackout distance is considered.

Table 6.15 Trackout Dust Sensitive Receptors

Distance from Site Access Route (m)	Approximate Number of Human Receptors	Sensitivity
Less than 20	More than 100	High
20 - 50	More than 100	

- 6.87 Reference should be made to Figure 6.3 for a graphical representation of trackout dust buffer zones.
- 6.88 A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in [Table 6.16](#)~~Table 6.16~~.

Table 6.16 Additional Area Sensitivity Factors

Guidance	Comment
Whether there is any history of dust generating activities in the area	The Site is located within a residential area undergoing significant regeneration. As such, historical dust generation may have occurred as a result of windblown emissions from regeneration, specifically as a result of construction phase processes
The likelihood of concurrent dust generating activity on nearby sites	As provided in <i>Appendix 2.2: Committed Developments</i> , a review of the MCC planning portal indicated that there are a series of planning applications are within 500m of the Proposed Development boundary. A full list of committed developments within 500m of the Site are provided in Appendix 2.2. Due to the size and nature of the committed developments, there is a risk of concurrent dust generating activity should the construction phases overlap

Guidance	Comment
Pre-existing screening between the source and the receptors	There is sparse vegetation present along all boundaries of The Site. As such, pre-existing protective screening is limited
Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place	The wind direction is predominantly from the south of the Proposed Development, as shown in Figure 6.4. As such, properties to the north would be most affected by dust emissions
Conclusions drawn from local topography	The topography of the area appears to be predominantly flat. As such, there are no constraints to dust dispersion
Duration of the potential impact, as a receptor may become more sensitive over time	The Crown Street Phase 2 development is anticipated for full completion during 2028, additionally the adjacent Crown Street Phase 1, situated immediately north, is currently under construction. Given the duration and overlapping of nearby construction phases receptor sensitivity could increase over time.
Any known specific receptor sensitivities which go beyond the classifications given in the document.	No specific receptor sensitivities identified during the baseline.

Operational phase Sensitive Receptors

6.89 Receptors sensitive to potential operational phase road vehicle exhaust emission impacts were identified from a desk-top study and are summarised in [Table 6.17](#)~~Table 6.17~~.

Table 6.17 Vehicle Exhaust Emissions Sensitive Receptors

Receptor	NGR (m)		Height (m)
	X	Y	
R1 Residential - Chester Road	382654	397099	1.5
R2 Residential - Chester Road	382887	397207	1.5
R3 Residential - Chester Road	382936	397225	4.5
R4 Residential - Chester Road	382854	397237	1.5
R5 Residential - Chester Road	382912	397297	1.5
R6 Residential - Egerton Street	382973	397347	4.5
R7 Residential - Egerton Street	382912	397396	5.5
R8 Residential - Egerton Street	382786	397441	0.5
R9 Residential - Mancunian Way	383251	397127	1.5
R10 Residential - Chester Road	383216	397424	1.5
R11 Residential - City Road East	383502	397254	5.5
R12 Residential - City Road East	383556	397281	3
R13 Residential - City Road East	383588	397372	1.5
R14 Residential - Albion Street	383610	397476	4.5
R15 Residential - Albion Street	383652	397543	4.5
R16 Residential - Old Deansgate	383357	397450	2.5

Receptor		NGR (m)		Height (m)
		X	Y	
R17	Residential - Bridgewater Viaduct	383306	397447	0.5
R18	Residential - Deansgate Square	383317	397401	1.5
R19	Residential - Deansgate Square	383341	397415	1.5
R20	Residential - Whitworth Street East	383715	397519	4
R21	Commercial - Great Jackson Street	383281	397197	1.5
R22	Commercial - Great Jackson Street	383360	397176	1.5
R23	Commercial - Egerton Street	382865	397438	1.5
R24	Commercial - Gaddum House	383237	397313	1.5
R25	Residential - Crown Street Phase 1	383100	397287	1.7
R26	Residential - Crown Street Phase 1	383145	397307	1.7
R27	Residential - Crown Street Phase 1	383100	397287	5.1
R28	Residential - Crown Street Phase 1	383129	397325	5.1
R29	Residential - Crown Street Phase 1	383161	397307	5.1

- 6.90 The sensitive receptors identified in [Table 6.17](#) represent worst-case locations. However, this is not an exhaustive list and there may be other locations within the vicinity of the Site that may experience air quality impacts as a result of the Proposed Development that have not been individually identified above. Reference should be made to Figure 6.5 for a graphical representation of road vehicle exhaust emission sensitive receptor locations.

Identification and Evaluation of Significant Effects

- 6.91 There is the potential for air quality impacts as a result of the construction and operational phases of the Proposed Development. Additionally, there is the potential for future Site users to be exposed to elevated pollutant concentrations. These are assessed and quantified in the following Sections.

Construction Phase

Step 1 – Screening

- 6.92 The undertaking of on Site activities such as excavation, ground works, cutting, construction, concrete batching 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 road and highway surfaces.
- 6.93 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.
- 6.94 The desk-study undertaken to inform the baseline identified a number of sensitive receptors within 350m of the Site boundary. As such, a detailed assessment of potential dust impacts was required.

Step 2A – Magnitude

- 6.95 The scale and nature of the works was determined to assess the magnitude of dust arising from each construction phase activity. The determination of magnitude was based upon the criteria detailed in Table 6.3, with the outcome of Step 2A summarised below in Table 6.18

Earthworks

- 6.96 As confirmed by WSP, the ground investigation consultant, the on-Site made ground consists of gravelly fine to coarse sand with slightly gravelly sandy clay. Based on this information the soil type was considered to be moderately dusty given the mix of larger grain sands and clay, which will be prone to suspension when dry due to small particle size.
- 6.97 Given the area of the Proposed Development Site (11,000m²) combined with the made ground the magnitude of potential dust emissions related to earthwork activities is therefore considered **major**.

Construction

- 6.98 Given the scale of the Proposed Development, the magnitude of potential dust emissions related to construction activities is considered **major**.

Trackout

- 6.99 Based on the Site area, it is anticipated that the unpaved road length is likely to be greater than 100m. The magnitude of potential dust emissions from trackout is therefore **major**.
- 6.100 A summary of the magnitude of construction phase activities is provide in Table 6.19.

Table 6.18 Dust Emissions Magnitude

Magnitude of Activities		
Earthworks	Construction	Trackout
Major	Major	Major

Step 2B – Sensitivity

- 6.101 The next step (Step 2B) is to determine the sensitivity of the surrounding area, based on general principles such as amenity and aesthetics, as well as human exposure sensitivity.

Dust Soiling

- 6.102 As shown in Table 6.14 and Table 6.15 the desk top study indicated are **More than 100** sensitive receptors within 50m of the Proposed Development boundary, and of the anticipated trackout routes. Based on the IAQM assessment criteria the sensitivity of the receiving environment to potential dust soiling impacts was considered to be **high** for earthworks, construction and trackout activities. This is because users would expect to enjoy a reasonable level of amenity and residents would be expected to be present for extended periods of time.

Human Health

- 6.103 The annual mean concentration of PM₁₀ is less than 24 µg/m³ as detailed in Table 6.13
- 6.104 Based on the IAQM assessment criteria and given the presence of **more than 100** sensitive receptors within 50m of the Proposed Development boundary and within 20m of the anticipated

trackout routes, the sensitivity of the area is considered to be **low** for earthworks and construction phase activities and **moderate** trackout.

6.105 The sensitivity of the receiving environment to specific potential dust impacts is summarised in [Table 6.19](#)

Table 6.19 Sensitivity of Surrounding Area

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

Step 2C – Risk

6.106 Both the magnitude and sensitivity factors are combined in Step 2C to determine the risk of dust impacts without the application of best practice mitigation measures.

6.107 It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location, as well as the duration of potential impacts. 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. A summary of the risk from each dust generating activity is provided in Table 6.20.

Table 6.20 Sensitivity of Potential Unmitigated Dust Risk

Potential Impact	Risk		
	Earthworks	Construction	Trackout
Dust Soiling	Moderate Adverse on a temporary basis	Major Adverse on a temporary basis	Major Adverse on a temporary basis
Human Health	Minor Adverse on a temporary basis	Minor Adverse on a temporary basis	Moderate Adverse on a temporary basis

6.108 It is important to note 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.

Step 3 – Mitigation

6.109 The IAQM⁸ guidance provides a number of potential mitigation measures to reduce impacts during the construction phase. These measures have been adapted for the development Site as summarised in Table 6.28. The mitigation measures outlined can be reviewed prior to the commencement of construction works incorporated into the existing strategies as applicable.

Step 4 – Residual Impacts

6.110 Assuming the relevant mitigation measures outlined in Table 6.28 are implemented, the residual effect from all dust generating activities is predicted to be negligible on a temporary basis given the duration of the construction phase. Subsequently, residual impacts are considered **not significant**, in accordance with the IAQM guidance⁸.

Operational Phase

- 6.111 Additional vehicle movements associated with the operation of the Proposed Development will generate exhaust emissions, such as NO₂ and PM₁₀, on the local and regional road networks. Additionally, the Proposed Development has potential to expose future users to elevated concentrations. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity and across the Site. Reference should be made to Figure 6.5 for a graphical representation of road vehicle exhaust emission sensitive receptor locations and ADMS- Roads inputs.
- 6.112 The Assessment considered the following scenarios:
- 2018 Verification;
 - 2025 DM;
 - 2025 DS (Scenario E)
- 6.113 The DM (i.e. without Proposed Development) scenario is representative of anticipated traffic data for 2025 should the Proposed Development not proceed. The DS (i.e. with Proposed Development) scenarios are representative of anticipated traffic data for 2025 should the Proposed Development be completed, with the addition of recent and committed developments, and predicted traffic flows generated by the operation of the Proposed Development.
- 6.114 Reference should be made to Appendix 6.1 for full assessment input details, including ADMS-Roads parameters, utilised traffic data and model verification process.
- 6.115 Annual mean NO₂ and PM₁₀ concentrations were predicted across the application Site during the 2025 DS scenario to represent exposure across the Site. Reference should be made to Figures 6.6 to 6.10 for a graphical representation of annual mean pollutant concentrations.

Nitrogen Dioxide - NO₂

Predicted Annual Mean Concentrations across the Development Site.

- 6.116 Annual mean NO₂ concentrations were predicted across the Site for the DS scenarios at the following building heights to represent exposure in 2025 across the ground to sixth floor levels of the Proposed Development:
- Ground Floor (1.5m)
 - First Floor (6.0m)
 - Second Floor (9.0m)
 - Third Floor (12.35m)
- 6.117 Reference should be made to Figures 6.7 to 6.10 for a graphical representation of contour plots for the predicted annual mean NO₂ concentrations.
- 6.118 Predicted annual mean NO₂ concentrations across The Site during the 2025 DS scenario summarised in Table 6.21. Exceedances of the relevant AQO are highlighted in bold.

Table 6.21 Annual Mean NO₂ Modelling Results

Area	Predicted 2025 Annual Mean NO ₂ Concentration Range (µg/m ³)		
Ground (1.5m)	37.56 – 47.52	37.19 – 46.26	37.61 – 47.46

Area	Predicted 2025 Annual Mean NO ₂ Concentration Range (µg/m ³)		
First Floor (6.0m)	35.85 – 41.09	35.86 – 40.96	36.12 – 40.95
Second Floor (9.0m)	33.71 – 35.70	33.48 – 35.13	33.29 – 34.43
Third Floor (12.3m)	31.86 – 32.43	31.44 – 32.06	31.00 – 31.53

6.119 As indicated in Table 6.22 predicted NO₂ concentrations exceeded the annual mean AQO across ground to first floor levels of Buildings C3, C4 and C5. Based on the results of the dispersion model the implementation of appropriate mitigation measures is required to protect future occupants from elevated pollutant concentrations across affected floor levels.

6.120 Predictions of 1-hour NO₂ concentrations were not produced as part of the dispersion modelling assessment. However, as stated in LAQM (TG16)⁵ if annual mean NO₂ concentrations are below 60µg/m³ then it is unlikely that the 1-hour AQO will be exceeded. As such based on the results in Table 6.21, it is not predicted that concentrations will exceed the 1-hour mean AQO for NO₂ across the development Site in the opening year scenario.

C3 Facades and Internal Areas

6.121 It should be noted that only outline planning permission is sought for the first form entry primary school and exact details on the design and ventilation strategies from an air quality perspective will be submitted within a detailed assessment during the subsequent reserved matter application.

6.122 Given the highly sensitive use of the primary school there is a responsibility to ensure further occupier are not exposed to unacceptable pollutant concentrations. Based on the current understanding of Air Quality conditions across the Site it is recommended to incorporate specialised ventilation systems with NO_x filtration units across the entire school development. Additionally, it is recommended that a sealed façade is to be incorporated into the building design to ensure that the building is supplied with a clean supply of air via the mechanical ventilation systems.

C3 External Areas

6.123 In accordance with LAQM (TG16) the 1-hour mean AQO is applicable to outdoor locations where members of the public might reasonably be expected to spend one hour or longer. In context of the proposed primary school this averaging period relates to proposed play areas in which pupils would be present during recreational times which are not critically expected to last over 1 hour.

6.124 Based on the assessment result it is not anticipated in accordance with LAQM TG(16)⁵ that 1-hour NO₂ concentrations would exceed the relevant AQO of 200 µg/m³ at any location across the primary school. Subsequently, play areas are considered to be suitable for proposed use without the implementation of mitigation measures, assuming that recreational times are reduced to less than 1-hour.

C4 and C5 Towers

6.125 Buildings C4 and C5 comprise of commercial floorspace and residential amenity facilities. Although the annual mean AQO does not apply at commercial or short-term transient land use types, it is necessary to implement non-passive ventilation systems across the amenity areas to limit future pollutant exposure. Further details on the mitigation strategy is provided in Sections 6.146 to 6.159

6.126 Based on the results of the dispersion modelling assessment and worst case assumptions, the Site is considered to be suitable for proposed end use with the implementation of mitigation techniques to protect future Site users from elevated NO₂ concentrations.

Predicted Annual Mean Concentration at the Sensitive Receptors

6.127 Annual mean NO₂ concentrations were predicted for the 2025 DM and DS scenarios and are summarised in [Table 6.22](#)

Table 6.22 Predicted Annual Mean NO₂ Concentrations

Sensitive Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		DM	DS	Change
R1	Chester Road	31.83	31.85	0.02
R2	Chester Road	33.84	33.92	0.08
R3	Chester Road	33.59	33.75	0.16
R4	Chester Road	55.22	55.28	0.06
R5	Chester Road	41.85	42.09	0.24
R6	Egerton Street	52.82	53.35	0.53
R7	Egerton Street	44.80	45.09	0.29
R8	Egerton Street	33.32	33.38	0.06
R9	Mancunian Way	33.54	33.64	0.10
R10	Chester Road	37.07	37.39	0.32
R11	City Road East	32.19	32.39	0.20
R12	City Road East	32.21	32.46	0.25
R13	City Road East	35.84	36.44	0.60
R14	Albion Street	37.58	37.67	0.09
R15	Albion Street	34.58	34.62	0.04
R16	Old Deansgate	30.30	30.38	0.08
R17	Bridgewater Viaduct	33.04	33.14	0.10
R18	Deansgate Square	30.28	30.40	0.12
R19	Deansgate Square	30.14	30.23	0.09
R20	Whitworth Street East	32.71	32.75	0.04
R21	Great Jackson Street	45.19	45.59	0.40
R22	Great Jackson Street	51.11	51.30	0.19
R23	Egerton Street	57.19	57.41	0.22

Sensitive Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		DM	DS	Change
R24	Gaddum House	32.70	33.04	0.34
R25	Crown Street Phase 1	40.62	41.05	0.43
R26	Crown Street Phase 1	35.14	35.43	0.29
R27	Crown Street Phase 1	38.76	39.12	0.36
R28	Crown Street Phase 1	35.47	35.81	0.34
R29	Crown Street Phase 1	33.61	33.85	0.24

6.128 As indicated in Table 6.22, predicted annual mean NO₂ concentrations exceeded the relevant AQO at 8 sensitive receptor locations during both the DM and DS scenarios. This is likely due to their roadside locations within an AQMA, at areas within close proximity to arterial junctions where slow speeds and idling vehicles are often present, particularly during peak hours.

6.129 Critically, no new exceedances of the AQO are anticipated to arise as a result of the Proposed Development. The remaining 21 receptor locations were predicted to experience NO₂ concentrations below the relevant AQO.

6.130 Predicted impacts on annual mean NO₂ concentrations at the sensitive receptor locations are summarised in [Table 6.23](#)~~Table 6.23~~.

Table 6.23 Predicted Annual Mean NO₂ Impacts

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	Chester Road	0.05	76-94% of the AQO	Negligible on a permanent basis
R2	Chester Road	0.20	76-94% of the AQO	Negligible on a permanent basis
R3	Chester Road	0.40	76-94% of the AQO	Negligible on a permanent basis
R4	Chester Road	0.15	110+% of the AQO	Negligible on a permanent basis
R5	Chester Road	0.60	103-109% of the AQO	<i>Moderate Adverse</i> on a permanent basis
R6	Egerton Street	1.33	110+% of the AQO	<i>Moderate Adverse</i> on a permanent basis
R7	Egerton Street	0.73	110+% of the AQO	<i>Moderate Adverse</i> on a permanent basis
R8	Egerton Street	0.15	76-94% of the AQO	Negligible on a permanent basis
R9	Mancunian Way	0.25	76-94% of the AQO	Negligible on a permanent basis
R10	Chester Road	0.80	76-94% of the AQO	Negligible on a permanent basis
R11	City Road East	0.50	76-94% of the AQO	Negligible on a permanent basis

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R12	City Road East	0.63	76-94% of the AQO	Negligible on a permanent basis
R13	City Road East	1.50	76-94% of the AQO	<i>Minor Adverse</i> on a permanent basis
R14	Albion Street	0.23	95-102% of the AQO	Negligible on a permanent basis
R15	Albion Street	0.10	76-94% of the AQO	Negligible on a permanent basis
R16	Old Deansgate	0.20	75% or Less of the AQO	Negligible on a permanent basis
R17	Bridgewater Viaduct	0.25	76-94% of the AQO	Negligible on a permanent basis
R18	Deansgate Square	0.30	76-94% of the AQO	Negligible on a permanent basis
R19	Deansgate Square	0.23	75% or Less of the AQO	Negligible on a permanent basis
R20	Whitworth Street East	0.10	76-94% of the AQO	Negligible on a permanent basis
R21	Great Jackson Street	1.00	110+% of the AQO	<i>Moderate Adverse</i> on a permanent basis
R22	Great Jackson Street	0.47	110+% of the AQO	Negligible on a permanent basis
R23	Egerton Street	0.55	110+% of the AQO	<i>Moderate Adverse</i> on a permanent basis
R24	Gaddum House	0.85	76-94% of the AQO	Negligible on a permanent basis
R25	Crown Street Phase 1	1.08	103-109% of the AQO	<i>Moderate Adverse</i> on a permanent basis
R26	Crown Street Phase 1	0.72	76-94% of the AQO	Negligible on a permanent basis
R27	Crown Street Phase 1	0.90	95-102% of the AQO	<i>Minor Adverse</i> on a permanent basis
R28	Crown Street Phase 1	0.85	76-94% of the AQO	Negligible on a permanent basis
R29	Crown Street Phase 1	0.60	76-94% of the AQO	Negligible on a permanent basis

6.131 As indicated in [Table 6.23](#)~~Table 6-23~~, impacts on annual mean NO₂ concentrations as a result of road vehicle exhaust emissions associated with the Proposed Development are predicted to be **negligible** on a permanent at 21 sensitive receptor locations, **minor adverse** on a permanent at 2 locations and **moderate adverse** on a permanent at 6 sensitive receptor locations.

6.132 With regards to associated Air Quality impacts and those predicted in [Table 6.23](#)~~Table 6-23~~, a worst-case operational scenario has been undertaken, assessing the combined impact of Phase 2 development aspects, including C3, C4, C5, basement car park (entirety), highways and public realm in conjunction with appropriate cumulative traffic flows.

6.133 Further worst case sensitivity analysis has also been provided in the impacts predicted in [Table 6.23](#), in the form of emission factors. The use of 2025 operational traffic data, together with 2018 emission factors is considered to provide a worst-case scenario which overestimates potential impacts and does not consider future improvement due to a shift towards a greater production and uptake low emission and electric vehicles.

Particulate Matter – PM₁₀

Predicted Annual Mean Concentrations across the Development Site

6.134 Annual mean PM₁₀ concentrations were predicted across the Site for the DS scenarios at the following building heights to represent exposure in 2025 across the ground to sixth floor levels of the Proposed Development:

- Ground Floor (1.5m)

6.135 Reference should be made to Figure 6.10 for a graphical representation of contour plots for the predicted annual mean PM₁₀ concentrations.

6.136 Predicted annual mean PM₁₀ concentrations across The Site for the DS scenario are summarised in Table 6.24.

Table 6.24 Annual Mean PM₁₀ Modelling Results

Area	Predicted 2025 Annual Mean PM ₁₀ Concentration Range (µg/m ³)		
Ground (1.5m)	15.42 – 17.62	15.39 – 18.77	15.57 – 18.57

6.137 As indicated in Table 6.24, there are no predicted exceedances of the annual mean PM₁₀ AQO across the entire Proposed Development. Based on the results of the dispersion modelling assessment, the Site is considered to be suitable for residential use without the implementation of mitigation techniques to protect future Site users from elevated PM₁₀ concentrations.

6.138 Predicted annual mean PM₁₀ concentrations are likely to reduce at elevated heights due to increased distance from emission sources, such as roads. This has been directly represented within the NO₂ results and therefore predicted PM₁₀ concentrations at heights above ground floor level have not been included within this report. This is because ground floor concentrations are considered to be acceptable without the inclusion of mitigation measures.

Predicted Annual Mean Concentrations at the Development Site

6.139 Annual mean PM₁₀ concentrations were predicted for each scenario and are summarised in [Table 6.25](#).

Table 6.25 Predicted Annual Mean PM₁₀ Concentrations

Sensitive Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R1	Chester Road	14.54	14.54	0.00
R2	Chester Road	14.46	14.48	0.02
R3	Chester Road	14.50	14.53	0.03

Sensitive Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R4	Chester Road	17.42	17.43	0.01
R5	Chester Road	15.83	15.87	0.04
R6	Egerton Street	17.84	17.94	0.10
R7	Egerton Street	16.64	16.70	0.06
R8	Egerton Street	14.32	14.33	0.01
R9	Mancunian Way	14.71	14.73	0.02
R10	Chester Road	15.09	15.14	0.05
R11	City Road East	14.32	14.35	0.03
R12	City Road East	14.30	14.35	0.05
R13	City Road East	14.83	14.93	0.10
R14	Albion Street	15.05	15.06	0.01
R15	Albion Street	14.60	14.61	0.01
R16	Old Deansgate	13.94	13.95	0.01
R17	Bridgewater Viaduct	14.40	14.42	0.02
R18	Deansgate Square	13.95	13.97	0.02
R19	Deansgate Square	13.92	13.94	0.02
R20	Whitworth Street East	14.17	14.18	0.01
R21	Great Jackson Street	17.33	17.42	0.09
R22	Great Jackson Street	18.98	19.02	0.04
R23	Egerton Street	19.99	20.04	0.05
R24	Gaddum House	14.43	14.49	0.06
R25	Crown Street Phase 1	15.95	16.03	0.08
R26	Crown Street Phase 1	14.86	14.90	0.04
R27	Crown Street Phase 1	15.57	15.64	0.07
R28	Crown Street Phase 1	14.85	14.91	0.06
R29	Crown Street Phase 1	14.58	14.62	0.04

6.140 As indicated in [Table 6.25](#)~~Table-6.25~~, annual mean PM₁₀ concentrations were below the relevant AQO at all sensitive receptor locations for both scenarios considered.

6.141 Predicted impacts on annual mean PM₁₀ concentrations at the sensitive receptor locations are summarised in [Table 6.26](#)~~Table-6.26~~.

Table 6.26 Predicted Annual Mean PM₁₀ Impacts

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	Chester Road	0.00	75% or Less of the AQO	Negligible on a permanent basis

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R2	Chester Road	0.05	75% or Less of the AQO	Negligible on a permanent basis
R3	Chester Road	0.07	75% or Less of the AQO	Negligible on a permanent basis
R4	Chester Road	0.02	75% or Less of the AQO	Negligible on a permanent basis
R5	Chester Road	0.10	75% or Less of the AQO	Negligible on a permanent basis
R6	Egerton Street	0.25	75% or Less of the AQO	Negligible on a permanent basis
R7	Egerton Street	0.15	75% or Less of the AQO	Negligible on a permanent basis
R8	Egerton Street	0.02	75% or Less of the AQO	Negligible on a permanent basis
R9	Mancunian Way	0.05	75% or Less of the AQO	Negligible on a permanent basis
R10	Chester Road	0.13	75% or Less of the AQO	Negligible on a permanent basis
R11	City Road East	0.07	75% or Less of the AQO	Negligible on a permanent basis
R12	City Road East	0.12	75% or Less of the AQO	Negligible on a permanent basis
R13	City Road East	0.25	75% or Less of the AQO	Negligible on a permanent basis
R14	Albion Street	0.02	75% or Less of the AQO	Negligible on a permanent basis
R15	Albion Street	0.02	75% or Less of the AQO	Negligible on a permanent basis
R16	Old Deansgate	0.02	75% or Less of the AQO	Negligible on a permanent basis
R17	Bridgewater Viaduct	0.05	75% or Less of the AQO	Negligible on a permanent basis
R18	Deansgate Square	0.05	75% or Less of the AQO	Negligible on a permanent basis
R19	Deansgate Square	0.05	75% or Less of the AQO	Negligible on a permanent basis
R20	Whitworth Street East	0.02	75% or Less of the AQO	Negligible on a permanent basis
R21	Great Jackson Street	0.23	75% or Less of the AQO	Negligible on a permanent basis
R22	Great Jackson Street	0.10	75% or Less of the AQO	Negligible on a permanent basis
R23	Egerton Street	0.13	75% or Less of the AQO	Negligible on a permanent basis

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R24	Gaddum House	0.15	75% or Less of the AQO	Negligible on a permanent basis
R25	Crown Street Phase 1	0.20	75% or Less of the AQO	Negligible on a permanent basis
R26	Crown Street Phase 1	0.10	75% or Less of the AQO	Negligible on a permanent basis
R27	Crown Street Phase 1	0.18	75% or Less of the AQO	Negligible on a permanent basis
R28	Crown Street Phase 1	0.15	75% or Less of the AQO	Negligible on a permanent basis
R29	Crown Street Phase 1	0.10	75% or Less of the AQO	Negligible on a permanent basis

6.142 As indicated in [Table 6.26](#)~~Table 6.26~~, impacts on annual mean PM₁₀ concentrations as a result of road vehicle exhaust emissions associated with the Proposed Development were predicted to be **negligible** on a permanent basis at all 29 receptor locations considered

6.143 Based on the worst-case impact assessment, the overall significance on annual mean PM₁₀ concentrations was determined to be **not significant**. Further justifications on the significance of potential impacts is provided in Table 6.27.

Particulate Matter - PM_{2.5}

6.144 PM_{2.5} has not been modelled within the assessment as the predicted concentrations relating to annual mean PM₁₀ remain below the AQO for PM_{2.5} (25 µg/m³). Since PM₁₀ contains all particulate matter with an aerodynamic diameter of less than 10µm, PM_{2.5} is effectively accounted for within these predictions; and at worst could be considered that PM_{2.5} concentrations would be equal to the predicted PM₁₀ concentrations.

Significance Impact

6.145 The overall significance of operational phase road traffic emission impacts was determined as **negligible** on a permanent basis and therefore considered **not significant**. This was based on the predicted impacts at discrete receptor locations and the considerations outlined in the assessment methodology. Further justification is provided in [Table 6.27](#)~~Table 6.27~~.

Table 6.27 – Overall Road Traffic Exhaust Emission Impact Significance

Guidance	Comment
<i>Number of properties affected by minor, moderate or major air quality impacts and a judgement on the overall balance</i>	Impacts on annual mean NO₂ concentrations were predicted to be negligible on a permanent basis at 21 receptor location, minor adverse on a permanent basis at 2 locations, and moderate adverse on a permanent basis at 6 receptor locations. Impacts on PM₁₀ concentrations were predicted to be negligible on a permanent basis at all sensitive receptors. The receptor locations at which moderate adverse impacts were predicted are isolated within two distinct areas. One area adjacent to A57 Egerton Street and Dawson Street contains 4 of the 6 moderately affected receptor locations. The second area, immediately adjacent to the A57(M) includes proposed locations

Guidance	Comment
	across Great Jackson Street Framework, specifically locations within the Crown Street Phase 1 and Plot G developments. Although, these 6 locations represent a number of properties the overall balance of associated impacts is considered not significant. Critically, no new exceedance of the relevant AQOs were predicted as a result of the Proposed EIA Development. Associated impacts were also based on worst case sensitivity analysis in the form of emission factors. The use of 2025 operational traffic data, together with 2018 emission factors does not consider future improvements (due to the current shift towards a greater production and uptake low emission vehicles) and significantly overestimate actual pollutant concentrations within the modelling domain. Therefore, a sufficient level of confidence can be placed within the predicted emission levels and conclusions regarding impact significance. The overall balance on air quality impacts as a result of the Proposed EIA Development is therefore deemed not significant.
Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective or limit value will be relevant	There were predicted exceedances of the annual mean AQO for NO₂ at sensitive locations across the Proposed Development, with exceedances ranging across ground to first-floor levels of Buildings C3, C4 and C5 respectively. As a result, operational phase mitigation is to be implemented to reduce the annual mean NO₂ exposure throughout the Site. Reference should be made to Section 6.146 to 6.155 for further information regarding recommended protective mitigation techniques. Subject to the implementation of the suitable mitigation measures, exposure to elevated NO₂ concentration at sensitive locations across the Site can be considered as negligible on a permanent basis and therefore not-significant
<i>The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors</i>	The change in concentrations relative to the annual mean AQO for NO₂ was predicted to range between 0.05% and 1.5%. Resultant permanent impacts were therefore described as either negligible, minor adverse or moderate adverse on a permanent basis in accordance with the EPUK and IAQM criteria. 21 of the 29 receptor locations were predicted to experience negligible NO₂ impacts on a permanent basis, and therefore the overall balance is considered not significant. The change in concentrations relative to the AQO for PM₁₀ was predicted to range from 0.00% to 0.25%. Resultant impacts were therefore described as negligible impacts on a permanent basis at all sensitive receptors considered
Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a major increase or decrease	There were exceedances of the AQOs for NO₂ at 8 sensitive receptor locations within the modelling extents for the 2025 DM and DS scenarios. The overall magnitude of change was considered to be negligible on a permanent basis and therefore not significant. Conversely, there were no predicted exceedances of both the annual mean AQO for PM₁₀ at any location within the modelling extents
<i>The extent to which an objective is exceeded e.g. an annual mean NO₂ concentration of 41µg/m³ should attract less</i>	As stated above there were exceedances of the annual mean AQO for NO₂ at 8 sensitive locations, of which 4 locations exceeded an annual mean concentration of 51µg/m³, with a maximum of 57.41µg/m³ (R23) Critically, all exceedances were predicted during both the DM and DS and therefore cannot be directly accounted to the operation of

Guidance	Comment
<i>significance than an annual mean of 51µg/m³</i>	the Proposed EIA Development. Furthermore, the magnitude of change relative to pollutant concentrations at the most significantly affected receptor locations was considered negligible on a permanent basis and as such in the overall context of the assessment was considered not-significant It should be noted that the remaining 21 receptor locations are predicted to experience NO₂ concentrations below the annual AQO. Therefore, the overall magnitude of predicted impacts is judged to be negligible on a permanent basis and therefore considered not significant in the context of this assessment

Mitigation Measures

- 6.146 There are a number of air quality mitigation options available to ensure negligible air quality exposure or impacts occur as a consequence of the Proposed Development. Additionally, mitigation measures may be required to protect future Site users from elevated pollutant as a result of fugitive dust emissions and road vehicle exhaust emissions generated by the construction and operational phase of the Proposed Development. Measures relevant to the operational and construction of The Site are outlined in the following Sections.

Operational Phase Assessment

- 6.147 Detailed dispersion modelling undertaken at heights equivalent to the proposed elevations of buildings C3, C4 and C5 indicated that residential (C4 and C5) and educational (C3) units across ground and first floor level may be exposed to elevated annual mean concentrations of NO₂.

C3 Facades and Internal Areas

- 6.148 As indicated in [Table 6.21](#)~~Table 6.21~~, predicted NO₂ concentrations exceed the AQO of 40.0µg/m³ across developable areas of the Site adjacent to arterial road links. Subsequently the inclusion of appropriate mechanical ventilation is recommended to all internal areas ground and first floor levels where proposed educational sensitive use is situated.
- 6.149 The implementation of proven systems would ensure future occupants are not be exposed to unacceptable NO₂ concentrations. Additionally, it is recommended that a sealed façade option is incorporated into the building design to ensure that internal areas are sufficiently ventilated by clean air from the mechanical NO_x filtration systems. As stated previously, only outline planning permission is sought for the first form entry primary school and exact details on the design and ventilation strategies from an air quality perspective will be submitted within a detailed assessment during the subsequent reserved matter application.
- 6.150 The annual mean AQO for PM₁₀ was not exceeded at any location within the modelling domain, as such no further consideration is necessary for exposure to this pollutant.

C4 and C5 Facades and Internal Areas

- 6.151 As indicated in [Table 6.21](#)~~Table 6.21~~, predicted NO₂ concentrations exceed the AQO of 40.0µg/m³ across the ground and first floor levels of the C4 and C5. It is therefore proposed that the inclusion of mechanical ventilation should be implemented to all habitable and amenity areas throughout the ground to first floor levels of Building C4 and C5.
- 6.152 As confirmed by the contractor it is proposed to install dedicated air inlets to each floor level of the Proposed Development. As a result of this design it is not possible to draw clean air from elevated levels to serve the affected lower levels. Subsequently, it will be required to incorporate individual NO_x filtration units to each ventilation system across all ground and first floor levels of

Buildings C4 and C5. The installation of the NO_x filtration units will ensure the supply of clean air within all residential dwellings from the ground to first floor levels across the Proposed Development, the positioning of the filtration unit should be positioned, where feasible, at the highest possible point of each floor level.

6.153 It should be noted that according to the IAQM and EPUK Guidance⁷ highlighted in [Table 6.2](#) the annual mean objective does not apply at the proposed commercial floorspace within the Building C4 or C5. This is due to the intermittent nature of access to this land use, in which users are present for intermittent and irregular periods. However, in the interests of a thorough mitigation strategy it would be recommended to provide mechanical NO_x filtration to all ground and first floor commercial areas.

6.154 A high specification of air tightness on the windows and doors should be incorporated at all habitable and commercial units on the ground to first floors of C4 and C5. This provides freedom of choice over whether natural ventilation is preferable during certain periods. The key to reducing exposure using this method is to ensure occupants are informed over the potential impacts associated with prolonged exposure to elevated pollution levels. As such, it may also be possible to provide residents with a welcome pack containing air quality information which will allow them to follow appropriate advice on protection against high concentrations during certain periods.

6.155 These proposed mitigation options discussed above are considered a suitable solution for a Proposed Development this size and nature.

Construction Phase Assessment

6.156 The IAQM guidance⁸ provides a number of potential mitigation measures to reduce potential impacts from the construction phase. The Site has been classified as a **major** risk in regards to the potential of unmitigated dust soiling and **moderate adverse** risk in regards to human health resulting from unmitigated construction phase activities. It was identified that mitigation measures are required to reduce the associated risk to an acceptable level. Such mitigation measures have therefore been adapted for the Site, and summarised in [Table 6.28](#). It will be required to review these measures prior to the commencement of construction works and incorporated into existing strategies. It should be noted that some or all of these measures may be used, dependent on the circumstances that arise.

Table 6.28 – Fugitive Dust Mitigation Measures

Guidance	Comment
Communications	- Display the name and contact details of person(s) accountable for air quality and dust issues on the Site boundary - Develop and implement a stakeholder communications plan that includes community engagement - Display the head or regional office contact information - Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the LA
Site Management	- Record all dusty and air quality complaints - Record any exceptional incidents that cause dust/or air emissions, and the action taken to resolve the situation - Hold regular liaison meetings with other high-risk construction Sites that are within 500m of the Site boundary. Ensuring plans are co-ordinated and dust and particulate matter emission are minimised - Make complaints log available to LA when asked
Monitoring	Undertake daily on- Site and off- Site inspection, where receptors are nearby, to monitor dust, record inspection results, and make the log

Guidance	Comment
	available to the LA when asked • Carry out regular Site inspections to monitor compliance with the DMP • Increase frequency of site inspections when activities with a high potential to produce dust are being carried out
Preparing and Maintaining the Site	• Plan Site layout so that machinery and dust causing activities are located away from receptors • Erect solid screens or barriers around dusty activities or the Site boundary that are at least as high as any stockpiles on Site. • Fully enclose Site or specific operations where there is a high potential for dust production and the Site as active for an extensive period • Avoid Site runoff of water or mud • Use water as dust suppressant where applicable • 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 • Cover, seed or fence stockpiles to prevent wind whipping
Operating Vehicle/ Machinery and Sustainable Travel	• All vehicles to switch off engines - no idling vehicles • Avoid the use of diesel or petrol-powered generators where practicable • Impose a signpost a maximum-speed limit of 15mph on surfaced and 10mph on un-surfaced haul roads and work areas • Produce a Construction Logistics Plan to manage sustainable deliveries • Cover, seed or fence stockpiles to prevent wind whipping.
Operations	• Cutting equipment to use water as dust suppressant or suitable local extract ventilation • Ensure adequate water supply on the Site for effective dust/particulate matter suppression/mitigation • Use enclosed chutes and covered skips • Minimise drop heights • Ensure equipment is readily available on Site to clean any spillages
Waste Management	• Avoid bonfires and burning of waste materials
Earthworks and Construction	• Re-vegetate earthworks and exposed areas • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate • Only remove the cover in small areas during work and not all at once • Avoid scabbling • Ensure sand and other aggregates are stored and not able to dry out, unless it is required for a specific process • Ensure bulk cement and other fine powder materials are delivered and stored to prevent escape • For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout	• Use water-assisted dust sweeper on the access and local roads • Avoid dry sweeping of large areas • Ensure vehicles entering and leaving the Site are covered to prevent escape of materials • Inspect on- Site haul routes for integrity, instigate necessary repairs and record in Site log book • Install hard surfaced haul routes which are regularly damped down

Guidance	Comment
	- Implement a wheel washing system at a suitable location near Site exit - Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the Site exit, wherever Site size and layout permits - Access gates to be located at least 10m from receptors, where possible

Best Practice Measures

Construction Phase

6.157 The Proposed Development has access to an off-site concrete batching plant situated immediately adjacent to the Site. Given the proximity to the plant it is assumed that both HGV movements associated with concrete deliveries, and fugitive dust emission generated by trackout activities will be significantly reduced. It has been assumed that the adjacent batching plant will be operated in accordance with industry standards and relevant IAQM dust control measures.

Operational Phase

6.158 Although overall associated operational impacts have been deemed **negligible** on a permanent basis **not-significant** there is still a requirement to secure a reduction in pollution concentrations associated with road vehicle exhaust emissions. The following best practice measures are therefore proposed and will be implemented within the design of the Proposed Development:

- Up to 63 Electric Vehicle Charging Points; and
- 855 Cycle Parking Spaces.

6.159 It is considered that the above measures are proportional to the nature and scale of the Proposed Development, and will secure a reduction in development associated road vehicle exhaust emissions.

Cumulative Effects

6.160 Cumulative effects are defined as those that occur as a result of combined past, current and future activities that may impact collectively over time. Cumulative effects on air quality at the Proposed Development are outlined in the following Sections. These sections consider the effect of the Proposed Development in conjunction with traffic associated with the identified committed developments and the wider Great Jackson Street Framework.

Construction Phase

6.161 As stated previously a review of the MCC Planning Portal indicated that there are several approved large-scale development schemes within 500m of the Site. As such, the likelihood of concurrent dust generating activity is major. It is assumed that the implementation of standard industry best practice measures detailed in [Table 6.28](#), required for the Proposed Development as well as mitigation measures proposed as part of the planning applications for other committed developments will ensure that concurrent Construction Phase impacts are **negligible** on a temporary basis and therefore construction phase impacts are considered **not significant**.

Operational Phase

6.162 The assessment has considered the effect of the Proposed Development in conjunction the identified committed developments with Volume 2. Associated traffic generation from the appropriate and available applications were factored into the modelled traffic data to consider the combined risk of committed developments and the Proposed Development.

Residual Effects

6.163 Residual effects are defined as those that remain following the implementation of mitigation. Residual effects on air quality for the Proposed Development are outlined in the following Sections.

Construction Phase

6.164 Assuming the relevant mitigation measures outline in [Table 6.28](#) ~~Table 6.28~~ are implemented, the residual effect from all dust generation activities is predicted to be **not significant**.

Operational Phase

6.165 Overall impacts on NO₂ and PM₁₀ concentrations as a result of the operational phase were predicted to be **not significant** within the vicinity of The Site. Consequently, the residual effects resulting from road vehicle exhaust emissions associated with traffic generated by the Proposed Development are predicted to be **not significant**.

Table 6.29 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Likely Significant Effect	Receptor(s)	Pre-mitigation Effect	Mitigation Measure	Residual Effect
Construction Phase				
Dust Soiling/Health	Human – Existing	Major adverse on a temporary basis	Table 6.28: The Proposed Development will incorporate the specific construction phase mitigation measures outlined in the IAQM guidance.	Negligible dust impacts to property and people on a temporary basis
Operational Phase				
Existing Road Vehicle Pollutant Concentrations – Health	Human – Future Site Users	Major adverse on a permanent basis	Sections 6.146 to 6.155: Proposed Development will be required to incorporate mechanical ventilation system to each affected floor level that has been predicted to be subjected to exceedances of the AQO for NO ₂ . The ventilation systems will include individual NO _x filtration units which will effectively remove NO _x pollutants, reducing the concentrations to acceptable and safe levels.	Negligible exposure to elevated pollutant concentrations on a permanent basis

Likely Significant Effect	Receptor(s)	Pre-mitigation Effect	Mitigation Measure	Residual Effect
Additional Road Vehicle Pollutant Concentrations – Health	Human – Existing Sensitive Locations	Negligible impacts upon existing sensitive uses on a permanent basis	The Proposed Development will consider best practice measures in the form of sustainable transport principles. The provision of high-level cycle parking facilities as well as availability of Electric Vehicle Charging Points will secure a reduction in development related road vehicle exhaust emissions.	Negligible impacts upon existing sensitive uses on a permanent basis

6.166 As mentioned previously in Section 6.55 the Proposed Development includes the provision of basement level car parking. The extraction units associated with this aspect of the Site has potential to impact upon existing air quality as a result of additional exhaust emissions.

6.167 The EPUK and IAQM guidance⁷ provides screening criteria in regards to basement extraction systems and whether to proceed with a full assessment. The guidance states a detailed assessment may be required if:

"The ventilation extract for the car park will be within 20m of a relevant receptor"

6.168 Although the ventilation extracts associated with the C4, C5 and Public Car Parks are located within 20m of relevant receptors the implementation of NO_x filtration systems to all habitable areas from ground to first floor level, will suitably protect future Site users from elevated pollutant concentrations generated by the car park extraction.

6.169 Following the implementation of operational phase mitigation measures, in the form of NO_x filtration units, the residual impact of car parking emissions associated with the basement ventilation system will be deemed **negligible** on a permanent basis and therefore considered **not significant**.

6.170 As such this aspect of the Proposed Development has not been assessed further in the preparation of this Chapter.

Summary

6.171 The Proposed Development has the potential to cause air quality impacts during both the construction and operational phases.

6.172 During the construction phase of the Proposed Development there is potential for air quality impacts at human receptors as a result of fugitive dust emissions from The Site. These were assessed in accordance with the IAQM methodology. Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated by earthworks, construction and trackout activities was predicted to be **negligible** on a temporary basis and therefore **not significant**.

6.173 Dispersion modelling was undertaken in order to quantify pollutant concentrations at The Site and assess potential exposure of future users. Concentrations of NO₂ and PM₁₀ were predicted across the ground to third floor level of buildings C3, C4 and C5, and were subsequently verified using local monitoring results. Exceedances of annual mean NO₂ concentrations were predicted at proposed sensitive uses on the ground to first floor levels of the Proposed Development. In order

to protect residents from poor air quality, appropriate protective mitigation measures have been recommended.

- 6.174 In addition, dispersion modelling was undertaken in order to predict air quality impacts at sensitive receptor locations within the vicinity of the Site as a result of the additional road vehicle exhaust emission generated by the operation of the Proposed Development.
- 6.175 This indicated that the impacts at sensitive receptor locations ranged from negligible, minor adverse and moderate adverse on a permanent basis. However, whilst considering the overall significance in conjunction with worst case assessment assumptions and best practice offsetting measures residual impacts were determined to be **negligible** on a permanent basis and therefore **not significant**, in accordance with the relevant guidance.