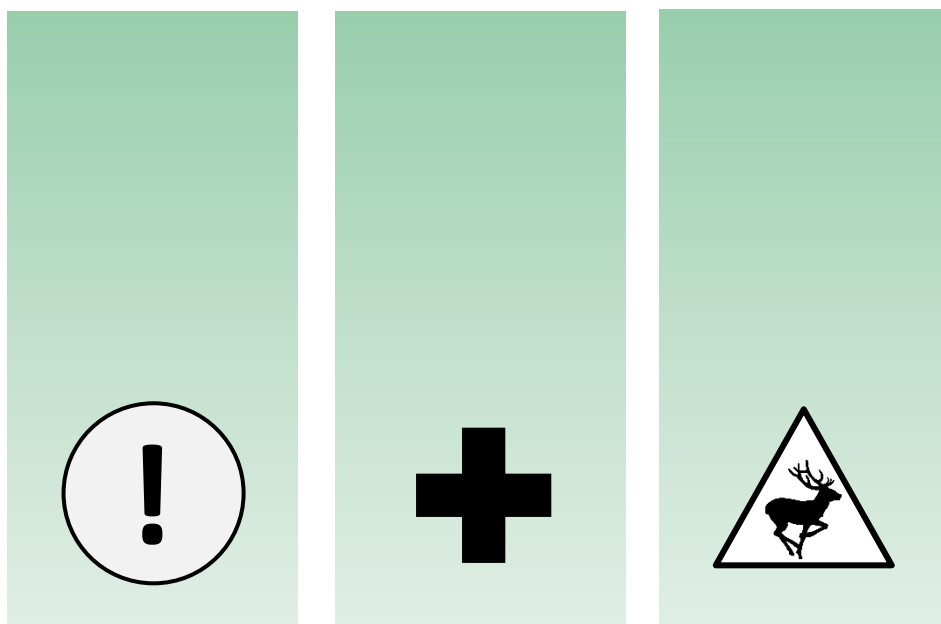


AIR QUALITY ASSESSMENT FORMER MONDI/HOLCOMBE MILL, BRIDGE STREET, RAMSBOTTOM

ENSAFE REFERENCE: AQ108648R1

REPORT PREPARED FOR: ECCLESTON HOMES LIMITED



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EXECUTIVE SUMMARY

Ensafe Consultants (formerly Resource and Environmental Consultants Limited) was commissioned by Eccleston Homes Limited to undertake an Air Quality Assessment in support of a proposed mixed-use development at the Former Mondi/Holcombe Mill, Bridge Street, Ramsbottom, Bury.

The proposals comprise the development of the site to provide circa 72 residential units and associated infrastructure on land allocated for development.

The proposed development is located in close proximity to an area identified by the Greater Manchester Combined Authority as experiencing elevated pollution levels. Subsequently, there is potential for the development to introduce future site users to poor air quality as well as to cause impacts upon existing pollution levels at nearby sensitive receptors, during the construction and operational phases. An Air Quality Assessment is therefore required to quantify pollution levels across the site, consider its suitability for the proposed end-use and assess potential impacts as a result of the development.

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

Dispersion modelling was undertaken to quantify annual mean pollutant concentrations across the application site, and to predict air quality impacts as a result of road vehicle exhaust emissions associated with traffic generated by the Proposed Development. Results were subsequently verified using the latest monitoring data from Bury Metropolitan Borough Council.

The dispersion modelling results concluded that impacts on pollutant levels as a result of operational phase emissions are predicted to be not significant at all sensitive locations in the vicinity of the site.

Additionally, the assessment indicates that relevant pollutant levels across the site were below the air quality objectives and, as such, the location is considered suitable for the proposed end-uses without the inclusion of protective mitigation methods although some best practice measures have been suggested. The use of robust assumptions, where necessary, was considered to provide sufficient results confidence for an assessment of this nature.

Based on the assessment results, air quality is not considered a constraint to planning consent for the Proposed Development.

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1. INTRODUCTION

1.1 Background

Ensafe Consultants (Ensafe) Limited (Ltd) was commissioned by Eccleston Homes Limited to undertake an Air Quality Assessment in support of a residential development at the Former Mondy/Holcombe Mill, Bury, herein after referred to as the 'Proposed Development'.

1.2 Site Location and Context

The Proposed Developments application site is located on land adjacent to Bridge Street, Bury, at approximate National Grid Reference (NGR): 379380, 416750. Reference should be made to Figure 1 within Appendix I for a location plan.

The proposal comprises the development of the site to provide circa 72 units which includes the conversion of existing structures and associated infrastructure.

The proposed development is in close proximity to the Greater Manchester Combined Authority (GMCA) Air Quality Management Area (AQMA), which has been declared for exceedances of the annual mean Air Quality Objective (AQO) for nitrogen dioxide (NO₂). Subsequently, there is potential for the development to introduce future site users to poor air quality, as well as to cause impacts upon existing pollution levels at nearby sensitive receptors within the AQMA, during the construction and operational phases.

An Air Quality Assessment is therefore required to quantify pollution levels across the site, consider its suitability for the proposed end-use and assess potential impacts as a result of the development in accordance with the requirements of the National Planning Policy Framework (NPPF). This is detailed in the following report.

1.3 Limitations

This report has been produced in accordance with Ensafe's standard terms of engagement. Ensafe has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Ensafe; a charge may be levied against such approval.

2. LEGISLATION AND POLICY

2.1 European Legislation

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 directive relevant to the preparation of the assessment is:

- ▶ Directive 99/30/EC - the First Air Quality "Daughter" Directive - sets ambient Air Quality Limit Values (AQLVs) for NO₂, oxides of nitrogen (NO_x), sulphur dioxide, lead and particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀);

2.2 UK Legislation

The Air Quality Standards (Amendment) Regulations (2016) came into force on 31st December 2016. These Regulations amend the Air Quality Standards Regulations 2010 and transpose the EU Directive 2008/50/EC into UK law. AQLVs were published in these regulations for 7 pollutants, as well as Target Values for an additional 6 pollutants.

Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007¹. The AQS sets out 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.

Table 1 presents the AQOs for pollutants considered within this assessment.

Table 1 Air Quality Objectives

Pollutant	Air Quality Objective	
	Concentration (µg/m ³)	Averaging Period
NO ₂	40	Annual mean
	200	1-hour mean; not to be exceeded more than 18 times a year
PM ₁₀	40	Annual mean
	50	24-hour mean; not to be exceeded more than 35 times a year
PM _{2.5}	25	Annual Mean

Table 2 summarises the advice provided in DEFRA guidance LAQM (TG16)² on where the AQOs for pollutants considered within this report apply.

¹ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.

² Local Air Quality Management Technical Guidance 2016 LAQM (TG16), DEFRA, 2016.

Table 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

2.3 Local Air Quality Management

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.

2.4 Dust

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."

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.

2.5 National Planning Policy

2.5.1 National Planning Policy Framework

The National Planning Policy Framework³ (NPPF) was published on 24th July 2018 (updated on 19th February 2019) and sets out the Government's core policies and principles with respect to land use planning, including air quality. The document includes the following considerations which are relevant to this assessment:

"The planning system should contribute to and enhance the natural and local environment by:

[...]

Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability

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

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

2.5.2 National Planning Practice Guidance

The National Planning Practice Guidance⁴ (NPPG) web-based resource was launched by the Department for Communities and Local Government to support the NPPF and make it more accessible. The air quality chapters were produced on 6th March 2014 (updated on November 1st 2019) and the relevant sections are highlighted below:

Paragraph 001 states that: "Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with EU Limit Values" and "It is important that the potential impact of new development on air quality is taken into account, where the

³ National Planning Policy Framework, Department for Communities and Local Government, 2018.

⁴ <http://planningguidance.planningportal.gov.uk/>.

national assessment indicates that relevant limits have been exceeded or are near the limit". The role of Local Authorities under LAQM are stated and that Air Quality Action Plans should "identify measures that will be introduced in pursuit of the objectives"

Paragraph 005 states that *"Whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate air quality impact in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation"*

Paragraph 007 states that *"Assessments should be proportional to the nature and scale of development proposed and the level of concern about air quality". In terms of mitigation, it states that "Mitigation options where necessary will be location specific, will depend on the proposed development and should be proportionate to the likely impact".*

Paragraph 009 shows a flow chart highlighting how the assessment of air quality impacts should fit into the development management process. It makes it clear that air quality impact risks, AQLVs and AQOs should be considered in the decision-making process.

The NPPG has been reviewed and the relevant guidance considered throughout this assessment.

2.6 Local Planning Policy

The Bury Metropolitan Borough Council (BMBC) is currently in the process of being renewed and will form a key part of Council's overall development plan for the next 20 years.

A review of the Local Plan Policy Directions indicated the following policy in relation to air quality.

"Policy Direction OP4: Air Quality and Pollution Control

It is proposed that the Local Plan should include a policy that seeks to prevent both new and existing development from contributing to, or being adversely affected by, unacceptable levels of pollution either individually or cumulatively with other existing or proposed developments.

It is considered that the policy should also set out the issues that the Council will have regard to when considering the potential impact of development on pollution and what should be required from applicants, including mitigation measures, in the event that a proposal is considered to have the potential to give rise to any impacts on air quality or other forms of pollution."

"Policy Direction OP8: Amenity

It is proposed that the Local Plan should include a policy that seeks to ensure that all new development does not have an adverse impact on the amenity of new and existing residents in the surrounding area."

This policy have been taken into account during the undertaking of this Air Quality Assessment by assessing the potential impacts of road vehicle exhaust emissions on existing sensitive receptors in the vicinity of the proposed development site.

2.7 Greater Manchester Air Quality Action Plan

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.

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.

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.

Reference has been made to this policy during the undertaking of this Air Quality Assessment by assessing pollutant concentrations across the development site.

3. METHODOLOGY

This section details the methodology used to assess exposure of future site occupants to pollution levels, as well as criteria utilised to assess the significance of potential impacts during both the construction and operational phases.

3.1 Construction Phase Assessment

There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction'⁵.

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

- ▶ Demolition
- ▶ Earthworks;
- ▶ Construction; and
- ▶ Trackout.

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

- ▶ Annoyance due to dust soiling;
- ▶ Harm to ecological receptors; and
- ▶ The risk of health effects due to a significant increase in exposure to PM₁₀ and PM_{2.5}.

The assessment steps are detailed below.

3.1.1 Step 1

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.

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

3.1.2 Step 2

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

⁵ Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management, 2016.

- ▶ The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (Step 2B).

The two factors are combined in Step 2C to determine the risk of dust impacts without the application of best practice mitigation measures.

3.1.3 Step 3

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

3.1.4 Step 4

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

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. The IAQM⁵ guidance suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix III.

3.2 Operational Phase Assessment

The proposed development is located within close proximity to the local highway network and to an AQMA. As such, the proposals have the potential to introduce new receptors into an area of existing poor air quality, as well as to cause impacts upon existing pollution levels at nearby sensitive receptors within the AQMA. Detailed dispersion modelling was therefore undertaken to quantify NO₂, PM₁₀ and PM_{2.5} concentrations across the site and determine suitability for the proposed use. The following scenarios were utilised during the assessment

- ▶ 2018 as baseline year for verification against latest ratified data; and;
- ▶ Opening year do-minimum (DM) (predicted traffic flows in 2023 should the proposals not proceed); and
- ▶ Opening year do-something (DS) (predicted traffic flows in 2023 should the proposals be completed, with the addition of traffic generated by the Proposed Development).

The DM (i.e. without development) scenario is representative of anticipated traffic data for 2023. The DS (i.e. with development) scenario is representative of anticipated traffic data for 2023 with the addition of predicted variations in traffic flow patterns as a result of the proposals.

It should be noted that air quality is predicted to improve in the future. However, in order to provide a robust assessment, emission factors for 2018 were utilised within the dispersion model. The use of 2023 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.

Receptors potentially sensitive to changes in NO₂, PM₁₀ and PM_{2.5} concentrations were identified

within 200m of the affected highway network in accordance with the guidance provided within the IAQM guidance⁶ on the likely limits of pollutant dispersion from road sources. LAQM (TG16)² provides the following examples of where annual mean AQOs should apply:

- ▶ Residential properties;
- ▶ Schools;
- ▶ Hospitals; and
- ▶ Care homes.

The sensitivity impact significance of each receptor was defined in accordance with the criteria shown in Table 3. These are based upon the guidance provided within the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance 'Land-Use Planning and Development Control: Planning for Air Quality'⁶.

Table 3 Operational Traffic Exhaust Emissions – Assessment of Impacts

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

The criteria shown in Table 3 is adapted from the EPUK and IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality'⁶ 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.

Following the prediction of impacts at discrete receptor locations utilising the criteria in Table 3 the EPUK and IAQM⁵ 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. Whilst impacts might be determined as 'slight', 'moderate' or 'substantial' 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;

⁶ Land-Use Planning and Development Control: Planning for Air Quality, Environmental Protection UK and Institute of Air Quality Management, 2017.

- ▶ Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease; 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.

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.

4. BASELINE

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

4.1 Local Air Quality Management

As required by the Environment Act (1995), GMCA, of which BMBC is a part of have undertaken Review and Assessment of air quality within their area of administration. This process has indicated that concentrations of NO₂ are above the AQO within the area. As such, one AQMA has been declared which is described as:

"Greater Manchester AQMA - An area covering the 10 districts of Greater Manchester, including arterial routes, district centres and airport."

The development is located approximately 300m east of the nearest area of the Greater Manchester AQMA. As such, there is the potential for the development to introduce future site users to elevated pollutant concentrations as well as cause potential impacts to air quality within this area. This has been considered within this report.

GMCA has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs and as such no further AQMA's have designated.

4.2 Air Quality Monitoring

Monitoring of pollutant concentrations is undertaken by BMBC using continuous and periodic methods throughout their area of administration. A review of their most recent Air Quality Annual Status Report⁷ indicated that there is no automatic analysers located in the assessment extents.

BMBC also utilise passive air quality monitoring techniques to monitor NO₂ concentrations within their area of administration. A review of the most recent monitoring data available⁷ indicated that there is one diffusion tube located in the vicinity of the proposed development. Recent results are shown in Table 4.

Table 4 Diffusion Tube Monitoring Results

Site ID		Type	NGR (m)		Annual Mean NO ₂ Concentration (µg/m ³)		
			X	Y	2016	2017	2018
BU2	Ramsbottom Lane	Urban Background	379115	417186	37.3	32.4	35.7

Table 4 demonstrates that the annual mean AQO for NO₂ was not exceeded at this tube location in recent years. Reference should be made to Figure 2 for a graphical representation of the referenced monitoring location.

⁷ 2018 Air Quality Annual Status Report (ASR), GMCA, June 2019

4.3 Background Pollutant Concentrations

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.

Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located across grid square NGR: 379500, 416500.

Data for these locations were downloaded from the DEFRA website⁸ for the purpose of this assessment and average was taken for the verification year (2018) and development opening year (2023). The concentrations are summarised in Table 5.

Table 5 Predicted Background Pollutant Concentrations

Pollutant	Predicted Background Concentrations ($\mu\text{g}/\text{m}^3$)	
	2018	2023
NO _x	20.78	16.48
NO ₂	14.85	12.06
PM ₁₀	10.55	10.07
PM _{2.5}	7.13	6.73

As shown in Table 5 background pollutant concentrations at the application site are not predicted to exceed the relevant AQOs. The DEFRA background concentrations are deemed appropriate to represent pollutant concentrations (not included local emission sources) across the application site and have been used for the DM and DS scenarios. Specific background pollutant concentrations used to represent conditions at monitoring and receptor location are detailed further in Appendix II.

4.4 Sensitive Receptors

A sensitive receptor is defined as any location where AQOs may apply (See Table 2) as well as being susceptible to changes in local pollutant concentrations. Receptors have been defined for both construction and operational scenarios.

4.4.1 Construction Phase Sensitive Receptors

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 this assessment.

⁸ <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>.

Human receptors are considered sensitive to potential dust impacts during demolition, earthworks and construction and have been identified from a desk-top study of the area up to 350m from the development boundary. These are summarised in Table 6.

Table 6 Demolition, Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors
Less than 20	1 - 10
20 - 50	1 - 10
50 - 100	10 - 100
100 - 350	More than 100

Reference should be made to Figure 3 within Appendix I for a graphical representation of earthworks and construction dust buffer zones.

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 7. 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. However, it was assumed that construction traffic would exit the application site east and west of Bridge Street.

Table 7 Trackout Dust Sensitive Receptors

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

Reference should be made to Figure 4 within Appendix I for a graphical representation of trackout dust buffer zones. A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in Table 8.

Table 8 Additional Area Sensitivity Factors

Guidance	Comment
Whether there is any history of dust generating activities in the area	The site is predominantly located within a residential area. As such, historical dust generation may have occurred as a result of windblown emissions from road vehicle emissions, regeneration and farming processes.
The likelihood of concurrent dust generating activity on nearby sites.	A review of the BMBC Planning Portal indicated that there are no large scale active planning applications within 500m of the site.
Pre-existing screening between the source and the receptors	There is hedgerow vegetation present along the east boundary of the site. If retained, this could provide natural protective screening to receptors in these directions.
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 development, as shown in Figure 5 within Appendix I. As such, properties to the north of the site would be most affected by dust emissions.
Conclusions drawn from local topography	The topography within the immediate vicinity of the Proposed Development 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 duration of the construction phase is three years, with a predicted opening year of 2023.
Any known specific receptor sensitivities which go beyond the classifications given in the document.	No specific receptor sensitivities identified during the baseline

4.4.2 Operational Phase Sensitive Receptors

Specified receptors for operational impacts are selected as areas representative of indicative worst case locations in respect to changes in traffic emissions.

A desk-top study was undertaken in order to identify any sensitive receptor locations in the vicinity of the site that require specific consideration during the assessment. These were modelled at a height of 1.5m in order to represent ground floor level and are summarised in Table 9.

Table 9 Existing Sensitive Human Receptors

Receptor		Height (m)	NGR (m)	
			X	Y
R1	5 Peel Brow	1.5	379435.2	416851.4
R2	31 Peel Brow	1.5	379560.0	416841.8
R3	11 Bury New Road	1.5	379580.5	416777.9

Receptor		Height (m)	NGR (m)	
			X	Y
R4	46 Bury New Road	1.5	379677.9	416600.6
R5	80 Peel Brow	1.5	379693.1	416802.2
R6	2 Cheshire Court	1.5	379979.4	416851.0
R7	99 Bury New Road	1.5	380030.4	416540.8
R8	22 Bridge Street	4.5	379224.2	416870.4
R9	60 Bolton Street	1.5	379016.6	416802.6
R10	75 Bolton Street	1.5	379035.8	416691.0
R11	30 Whalley Road (A56)	2.0	380031.4	416961.2
R12	55 Whalley Road (A56)	1.5	379988.6	417048.8
R13	40 Manchester Road (A56)	1.5	380027.6	416702.6
R14	119 Manchester Road (A56)	1.5	380079.6	416414.3
R15	80 Bridge Street	4.5	379080.4	416940.8
R16	59 Bridge Street	4.5	379063.5	416963.7

The sensitive receptors identified in Table 9 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 within Appendix I for a graphical representation of operational phase emission sensitive human receptor locations.

5. ASSESSMENT

There is the potential for air quality impacts as a result of the construction and operation of the Proposed Development in addition to the exposure of future site users to elevated pollution levels. These are assessed in the following Sections.

5.1 Construction Phase Assessment

5.1.1 Step 1 - Screening

The undertaking of 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.

The desk-study detailed in Section 3.1 identified a number of highly sensitive receptors within 350m of the site boundary, and within 50m of the anticipated trackout routes. As such, a detailed assessment of potential dust impacts was required, and summarised in the below sections.

Reference should be made to Appendix III for details of the relevant IAQM⁵ construction phase assessment criteria, which were utilised in conjunction with site specific information.

5.1.1 Step 2A – Magnitude

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 Appendix III, with the outcome of Step 2A is summarised below in Table 10.

Demolition

The proposed development will include the demolition of an existing building. The volume of the building to be demolished is likely to be less than 1,000m³. With this considered the magnitude of potential dust emissions related to demolition activities is **small**.

Earthworks

The application site is estimated to cover an approximate area of 34,300m². Based on this information the magnitude of potential dust emissions related to earthwork activities is therefore considered **large**.

Construction

The proposals comprise the construction of circa 72 units. Given the scale of the development, the total building volume is likely to be between 50,000 – 100,000m³. The magnitude of potential dust emissions related to construction activities is therefore considered **medium**.

Trackout

Information on the number of HDV trips to be generated during the construction phase of the development was not available at the time of assessment. Similarly, the surface material and unpaved road length was not known at this stage of the project. 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 **large**.

Table 10 Dust Emission Magnitude

Magnitude of Activities			
Demolition	Earthworks	Construction	Trackout
Small	Large	Medium	Large

5.1.2 Step 2B – Sensitivity

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

As shown in Table 6 and Table 7, the desk top study indicated are **1 – 10** human receptors within 20 – 50m of the application site boundary, and **more than 100** within 20m of the anticipated trackout routes. Based on the assessment criteria detailed in Appendix III, the sensitivity of the receiving environment to potential dust soiling impacts was considered to be **medium** for construction, earthworks and trackout activities.

Human Health

The annual mean concentration of PM₁₀ is 10.55µg/m³ as detailed in Table 5, combined with the receptor counts above the area is considered to be of **low** sensitivity for earthworks and construction activities and **medium** for trackout activities.

Table 11 Sensitivity of the Surrounding Area

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

5.1.3 Step 2C – Risk

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.

It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location. Risk was predicted based on a worst-case scenario of works being undertaken at the site boundary closest to each sensitive area. Therefore, actual risk is likely to be lower than that predicted during the majority of the construction phase. A summary of the risk from each dust generating activity is provided in Table 12.

Table 12 Summary of Potential Unmitigated Dust Risks

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

5.1.3 Step 3 – Mitigation

The IAQM guidance⁵ 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 13. The mitigation measures outlined in Table 13 can be reviewed prior to the commencement of construction works incorporated into the existing strategies as applicable.

Table 13 Fugitive Dust Mitigation Measures

Issue	Control Measure
Communications	• Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. • Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. • 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 Local Authority.
Site Management	• Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. • Make the complaints log available to the local authority when asked. • Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book. • Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised.
Monitoring	• Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. • Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked. • Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Issue	Control Measure
Preparing and Maintaining the Site	• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible • Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. • Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive time period. • Avoid site runoff of water or mud. • Keep site fencing, barriers and scaffolding clean using wet methods. • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. • Cover, seed or fence stockpiles to prevent wind whipping.
Operating Vehicle/ Machinery and Sustainable Travel	• Ensure all vehicles switch off engines when stationary - no idling vehicles. • Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. • Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas. • Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. • Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. • Use enclosed chutes and conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste Management	• Avoid bonfires and burning of waste materials
Demolition	• Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust). • Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. • Avoid explosive blasting, using appropriate manual or mechanical alternatives. • Bag and remove any biological debris or damp down such material before demolition

Issue	Control Measure
Earthworks and Construction	• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. • Only remove the cover in small areas during work and not all at once. • Avoid scabbling (roughening of concrete surfaces) if possible. • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out. • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. • For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout	• Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. • Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. • Record all inspections of haul routes and any subsequent action in a site log book. • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). • 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 10 m from receptors where possible.

5.1.4 Step 4 – Residual Impacts

Assuming the relevant mitigation measures outlined in Table 13 are implemented, the residual effect from all dust generating activities is predicted to be **negligible**, in accordance with the IAQM guidance⁵.

5.2 Operational Phase Assessment

The Proposed Development has the potential to expose future occupants to elevated pollution levels. Additionally, vehicle movements associated with the operation of the Proposed Development will generate exhaust emissions, such as NO₂, PM₁₀ and PM_{2.5}, on the local and regional road networks. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity and across the application site.

The assessment considered the following scenarios:

- ▶ 2018 Verification;

- ▶ 2023 DM Opening year; and
- ▶ 2023 DS Opening year.

The DM (i.e. without development) scenarios are representative of anticipated traffic data for 2023. The DS (i.e. with development) scenarios are representative of anticipated traffic data for 2023, with the addition of predicted variations in traffic flow patterns as a result of the proposals.

For the purpose of this assessment traffic data was supplied for 2023, the Proposed Development opening year. Air quality is predicted to improve in the future. However, in order to provide a robust assessment, emission factors for 2018 were utilised within the dispersion model. The use of 2023 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.

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

Annual mean NO₂ and PM₁₀ concentrations were predicted across the application site during the 2023 DS scenario at a height of 1.5m to represent exposure across the proposed ground floor residential unit. Reference should be made to Figures 7 and 8 within Appendix I for a graphical representation of pollutant concentrations.

5.2.1 Nitrogen Dioxide

Predicted Concentrations at the Development Site

Predicted annual mean NO₂ concentrations across the development site during the DS scenario are summarised in Table 14.

Table 14 Modelling Results - Annual Mean NO₂

Floor Level	Predicted 2023 Annual Mean NO ₂ Concentration Range (µg/m ³)
Ground (1.5m)	17.45 – 37.33

As indicated in Table 14 there were no predicted exceedances of the annual mean AQO across the application site.

Background NO₂ concentrations are likely to be lower at elevated heights due to increased distance from emission sources, such as roads. Therefore, predicted concentrations at heights above ground floor level across the Proposed Development are considered acceptable in regards to future exposure and have not been assessed further.

Furthermore, Predictions of 1-hour NO₂ concentrations were not produced as part of the dispersion modelling assessment. However, as stated in LAQM (TG16)² 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 14, it is not predicted that concentrations will exceed the 1-hour mean AQO for NO₂ across the development site in the opening year scenario.

Based on the results of the dispersion modelling assessment, the application site is considered to be suitable for proposed end use without the implementation of mitigation techniques to protect future site users from elevated NO₂ concentrations.

Predicted Concentrations at Sensitive Receptors

Annual mean NO₂ concentrations were predicted for 2023 DM and DS scenarios and are summarised in Table 15.

Table 15 Predicted Annual Mean NO₂ Concentrations

Sensitive Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		DM	DS	Change
R1	5 Peel Brow	32.83	33.17	0.34
R2	31 Peel Brow	25.79	26.07	0.28
R3	11 Bury New Road	29.48	29.83	0.35
R4	46 Bury New Road	23.97	24.19	0.22
R5	80 Peel Brow	20.74	20.88	0.14
R6	2 Cheshire Court	23.73	23.88	0.15
R7	99 Bury New Road	34.67	35.00	0.33
R8	22 Bridge Street	23.37	23.44	0.07
R9	60 Bolton Street	50.74	50.74	0.00
R10	75 Bolton Street	29.12	29.12	0.00
R11	30 Whalley Road (A56)	24.02	24.14	0.12
R12	55 Whalley Road (A56)	25.10	25.20	0.10
R13	40 Manchester Road (A56)	25.88	25.88	0.00
R14	119 Manchester Road (A56)	32.20	32.43	0.23
R15	80 Bridge Street	52.91	53.09	0.18
R16	59 Bridge Street	56.49	56.67	0.18

As detailed in Table 15, annual mean NO₂ concentrations exceeded the AQO at 3 sensitive receptor locations in both the DM and DS scenarios. No new exceedances of the annual mean AQO for NO₂ are predicted to occur as a result of the proposed development.

The use of 2023 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.

Predicted impacts on annual mean NO₂ concentrations at the sensitive receptor locations are summarised in Table 16.

Table 16 Predicted NO₂ Impacts

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	5 Peel Brow	0.85	76-94% of the AQO	Negligible
R2	31 Peel Brow	0.70	75% or Less of the AQO	Negligible
R3	11 Bury New Road	0.87	75% or Less of the AQO	Negligible
R4	46 Bury New Road	0.55	75% or Less of the AQO	Negligible
R5	80 Peel Brow	0.35	75% or Less of the AQO	Negligible
R6	2 Cheshire Court	0.37	75% or Less of the AQO	Negligible
R7	99 Bury New Road	0.82	76-94% of the AQO	Negligible
R8	22 Bridge Street	0.18	75% or Less of the AQO	Negligible
R9	60 Bolton Street	0.00	110+% of the AQO	Negligible
R10	75 Bolton Street	0.00	75% or Less of the AQO	Negligible
R11	30 Whalley Road (A56)	0.30	75% or Less of the AQO	Negligible
R12	55 Whalley Road (A56)	0.25	75% or Less of the AQO	Negligible
R13	40 Manchester Road (A56)	0.00	75% or Less of the AQO	Negligible
R14	119 Manchester Road (A56)	0.57	76-94% of the AQO	Negligible
R15	80 Bridge Street	0.45	110+% of the AQO	Negligible
R16	59 Bridge Street	0.45	110+% of the AQO	Negligible

Table 16 demonstrates that impacts on annual mean NO₂ concentrations as a result of road vehicle exhaust emissions associated with the development are predicted to be **negligible** at all 16 receptor locations sensitive receptors considered. It is therefore considered that the overall impacts as a result of the Proposed Development are **not significant**. Further justifications are discussed in Section 5.2.4.

5.2.2 Particulate Matter (PM₁₀)

Predicted Concentrations at the Development Site

Predicted annual mean PM₁₀ concentrations across the development site during the DS scenario are summarised in Table 17.

Table 17 Modelling Results - Annual Mean PM₁₀

Floor Level	Predicted 2023 Annual Mean PM ₁₀ Concentration Range (µg/m ³)
Ground (1.5m)	10.95 – 14.23

The predicted concentrations shown in Table 17 indicate that there were no exceedances of the AQO across the application site.

Similar to NO₂ concentrations, background PM₁₀ concentrations are likely to be lower at elevated heights due to increased distance from emission sources, such as roads. Therefore, predicted concentrations at heights above ground floor level across the residential aspects of the developments are considered acceptable in regards to future exposure and have not been assessed further.

Based on the results of the dispersion modelling assessment, the site is considered to be suitable for proposed end use without the implementation of mitigation techniques to protect future site users from elevated PM₁₀ concentrations.

Predicted Concentrations at Sensitive Receptors

Annual mean PM₁₀ concentrations were predicted for 2023 DM and DS scenarios and are summarised in Table 18.

Table 18 Predicted Annual Mean PM₁₀ Concentrations

Sensitive Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R1	5 Peel Brow	13.49	13.59	0.10
R2	31 Peel Brow	12.40	12.45	0.05
R3	11 Bury New Road	13.11	13.18	0.07
R4	46 Bury New Road	12.11	12.15	0.04
R5	80 Peel Brow	11.53	11.56	0.03
R6	2 Cheshire Court	11.98	12.01	0.03
R7	99 Bury New Road	14.04	14.12	0.08
R8	22 Bridge Street	11.90	11.91	0.01
R9	60 Bolton Street	17.12	17.12	0.00
R10	75 Bolton Street	12.89	12.90	0.01
R11	30 Whalley Road (A56)	12.67	12.69	0.02
R12	55 Whalley Road (A56)	12.13	12.15	0.02
R13	40 Manchester Road (A56)	12.95	12.96	0.01
R14	119 Manchester Road (A56)	14.55	14.60	0.05
R15	80 Bridge Street	17.37	17.42	0.05
R16	59 Bridge Street	18.45	18.50	0.05

As detailed in Table 18, predicted annual mean PM₁₀ concentrations were below the relevant AQO at all sensitive receptor locations. Predicted impacts on annual mean PM₁₀ concentrations are summarised in Table 19.

Table 19 Predicted PM₁₀ Impacts

Sensitive Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	5 Peel Brow	0.25	75% or Less of the AQO	Negligible
R2	31 Peel Brow	0.12	75% or Less of the AQO	Negligible
R3	11 Bury New Road	0.18	75% or Less of the AQO	Negligible
R4	46 Bury New Road	0.10	75% or Less of the AQO	Negligible
R5	80 Peel Brow	0.08	75% or Less of the AQO	Negligible
R6	2 Cheshire Court	0.07	75% or Less of the AQO	Negligible
R7	99 Bury New Road	0.20	75% or Less of the AQO	Negligible
R8	22 Bridge Street	0.02	75% or Less of the AQO	Negligible
R9	60 Bolton Street	0.00	75% or Less of the AQO	Negligible
R10	75 Bolton Street	0.02	75% or Less of the AQO	Negligible
R11	30 Whalley Road (A56)	0.05	75% or Less of the AQO	Negligible
R12	55 Whalley Road (A56)	0.05	75% or Less of the AQO	Negligible
R13	40 Manchester Road (A56)	0.03	75% or Less of the AQO	Negligible
R14	119 Manchester Road (A56)	0.12	75% or Less of the AQO	Negligible
R15	80 Bridge Street	0.13	75% or Less of the AQO	Negligible
R16	59 Bridge Street	0.13	75% or Less of the AQO	Negligible

Table 19 demonstrates that impacts on annual mean PM₁₀ concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be **negligible** at all receptor locations. It is therefore considered that the overall impacts as a result of the Proposed Development are **not significant**. Further justifications are discussed in Section 5.2.4.

5.2.3 Particulate Matter (PM_{2.5})

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.

5.2.4 Impact Significance

The overall significance of operational phase road traffic emission impacts for 2025 was determined as **not significant**. This was based on the predicted impacts at discrete receptor locations and the considerations outlined in Section 5.2. Further justifications are provided in Table 20.

Table 20 Overall Road Emissions Impact Significance

Guidance	Comment
Number of properties affected by slight, moderate or substantial air quality impacts and a judgement on the overall balance	Impacts on annual mean NO₂ and PM₁₀, concentrations were predicted to be negligible at all 16 of the sensitive receptors which is considered not significant The sensitive locations represent worst-case locations and therefore it is unlikely that any other receptors would be significantly affected by the proposed development It should be noted that associated impacts were based upon a robust approach which may lead to overestimations, and as such the overall balance can be judged as 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	The proposed development will not result in any new exposure to pollutant concentrations above the AQOs at sensitive locations across the application site
The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors	The change in concentration relative to the AQO was predicted to range from: ▶ 0.00% to 0.87% for NO₂; ▶ 0.00% to 0.25% for PM₁₀ Resultant impacts were subsequently predicted to be not significant at all receptor locations considered
Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease	There were no exceedances of the annual mean for NO ₂ , or PM ₁₀ at any location within the assessment extents
The extent to which an objective is exceeded e.g. an annual mean NO ₂ concentration of 41µg/m ³ should attract less significance than an annual mean of 51µg/m ³	There were predicted exceedances of the annual mean AQO for NO₂ above 41µg/m³ in both the DM and DS scenarios at 3 sensitive receptor, while remaining 13 receptors are predicted to experience NO₂ concentrations below 40µg/m³. Furthermore, the magnitude of change at receptor locations was again considered not significant

Critically, the use of 2023 traffic data and 2018 emission factors is considered to provide a worst-case scenario given the lack of anticipated emission reduction in future years. This approach will lead to overestimations of actual pollutant concentrations during the operation of the proposals.

As such, the overall significance of operational phase road traffic emission impacts on annual mean NO₂ concentration was determined **not significant**.

6. PRINCIPLES OF GOOD PRACTICE MITIGATION

Following comments received from BMBC's Planning Department and to ensure that there are no adverse impacts it is recommended to include the following best practice mitigation measures:

- Dwellings with dedicated spaces: One Electric Vehicle charging point for each residential unit (EV charge points to be chosen from the Electric Vehicle
- Dwellings with unallocated parking: One fast capability EV charging point per 10 parking spaces
- All gas-fired boilers to meet a minimum standard of <40 mgNO_x/kWh.
- A Travel Plan for the development to encourage the use of sustainable transport by the residents.

7. CONCLUSION

Ensafe was commissioned by Eccleston Homes Ltd to undertake an Air Quality Assessment in support of a proposed residential development at the Former Mondi/Holcombe Mill, Bury.

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

Dispersion modelling was undertaken in order to predict air quality impacts as a result of road vehicle exhaust emissions associated with traffic generated by the development and to quantify annual mean NO₂ and PM₁₀ concentrations across the application site. Results were subsequently verified using monitoring results obtained from BMBC.

The dispersion modelling results conclude that annual mean NO₂ and PM₁₀ concentrations across the application site were below the relevant AQOs. The location is therefore considered suitable for the proposed end-uses without the implementation of protective mitigation techniques although best practice measures have been recommended by BMBC.

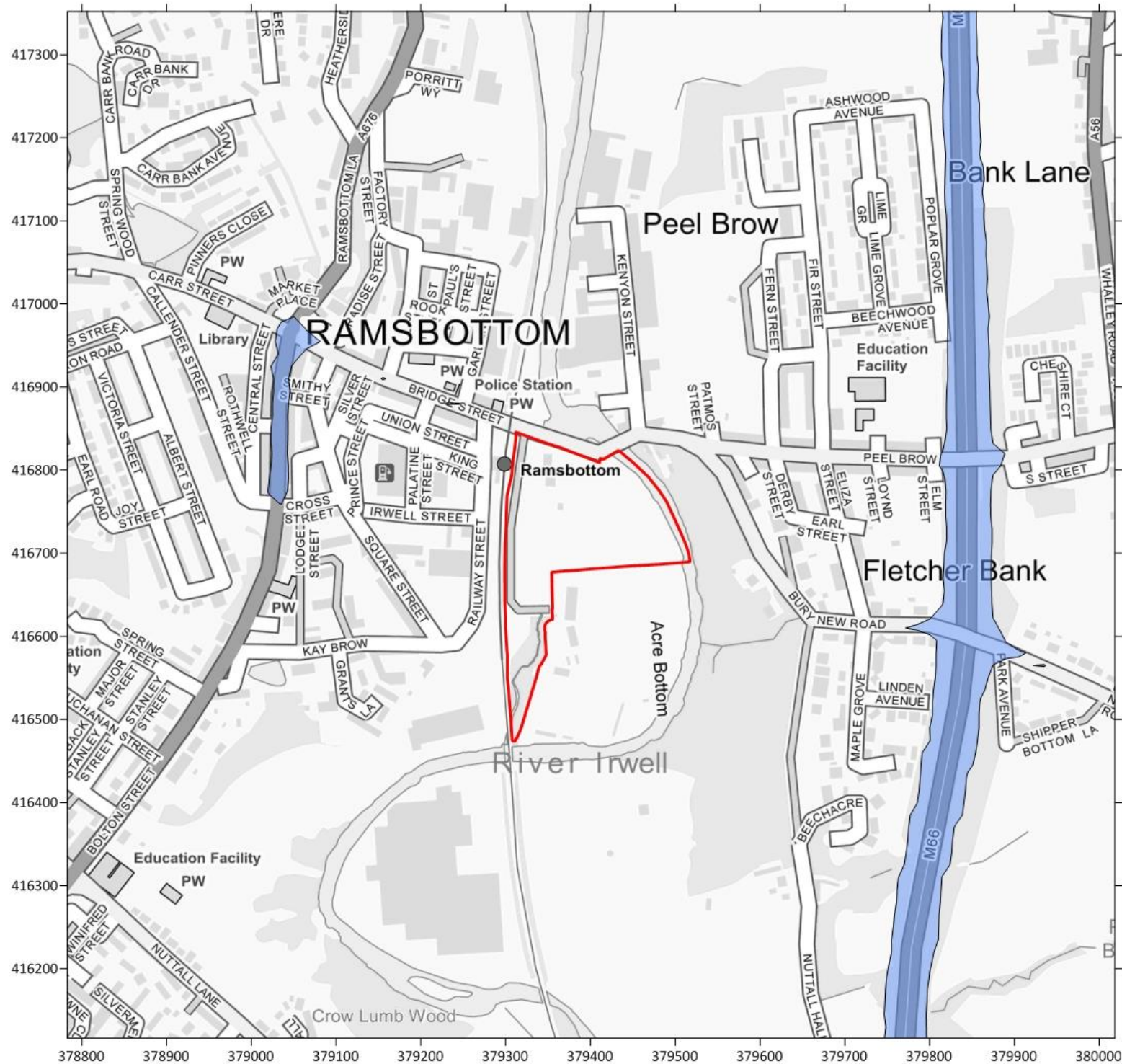
Predicted impacts on annual mean NO₂, PM₁₀ and PM_{2.5} concentrations as a result of operational phase exhaust emissions were predicted to be **negligible** at all 16 sensitive receptor locations within the vicinity of the site. The overall significance of potential impacts was determined to be **not significant**, in accordance with the EPUK and IAQM guidance.

Based on the assessment results, air quality is not considered a constraint to planning consent and is considered suitable for proposed end use.

8. ABBREVIATIONS

AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQAP	Air Quality Action Plan
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Strategy
BMBC	Bury Metropolitan Borough Council
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
Ensafe	Ensafe Consultants
EPUK	Environmental Protection UK
EU	European Union
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
NGR	National Grid Reference
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10µm
TEMPRO	Trip End Model Presentation Program
z ₀	Roughness Length

APPENDIX I - FIGURES



Legend



Site Boundary



Air Quality Management Area

Title

Figure 1
Site Location

Project

Former Mondri/Holcombe Mill,
Bridge Street, Ramsbottom, Bury

Project Number

AQ108648

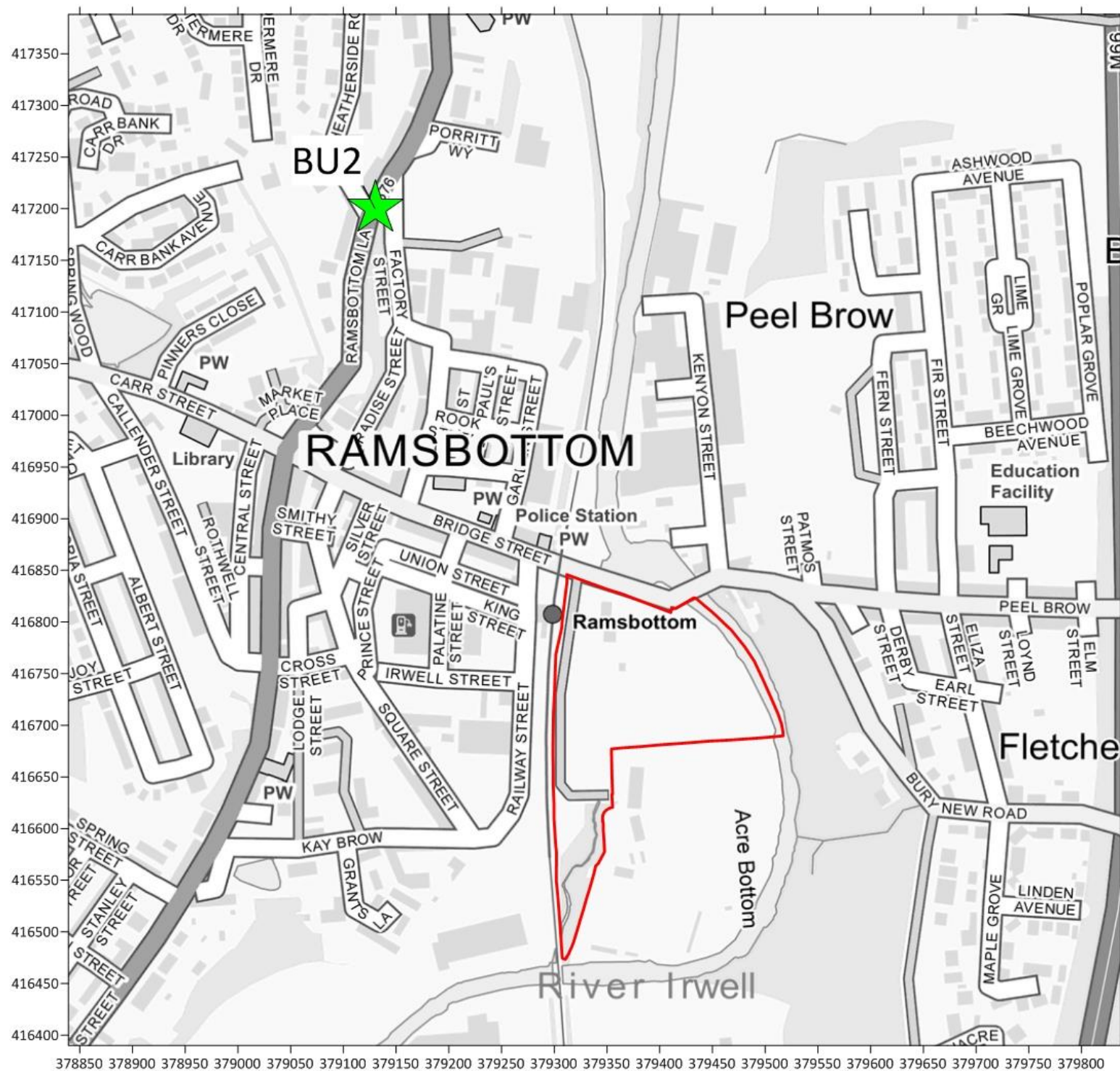
Client

Eccleston Homes Limited

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 Site Boundary

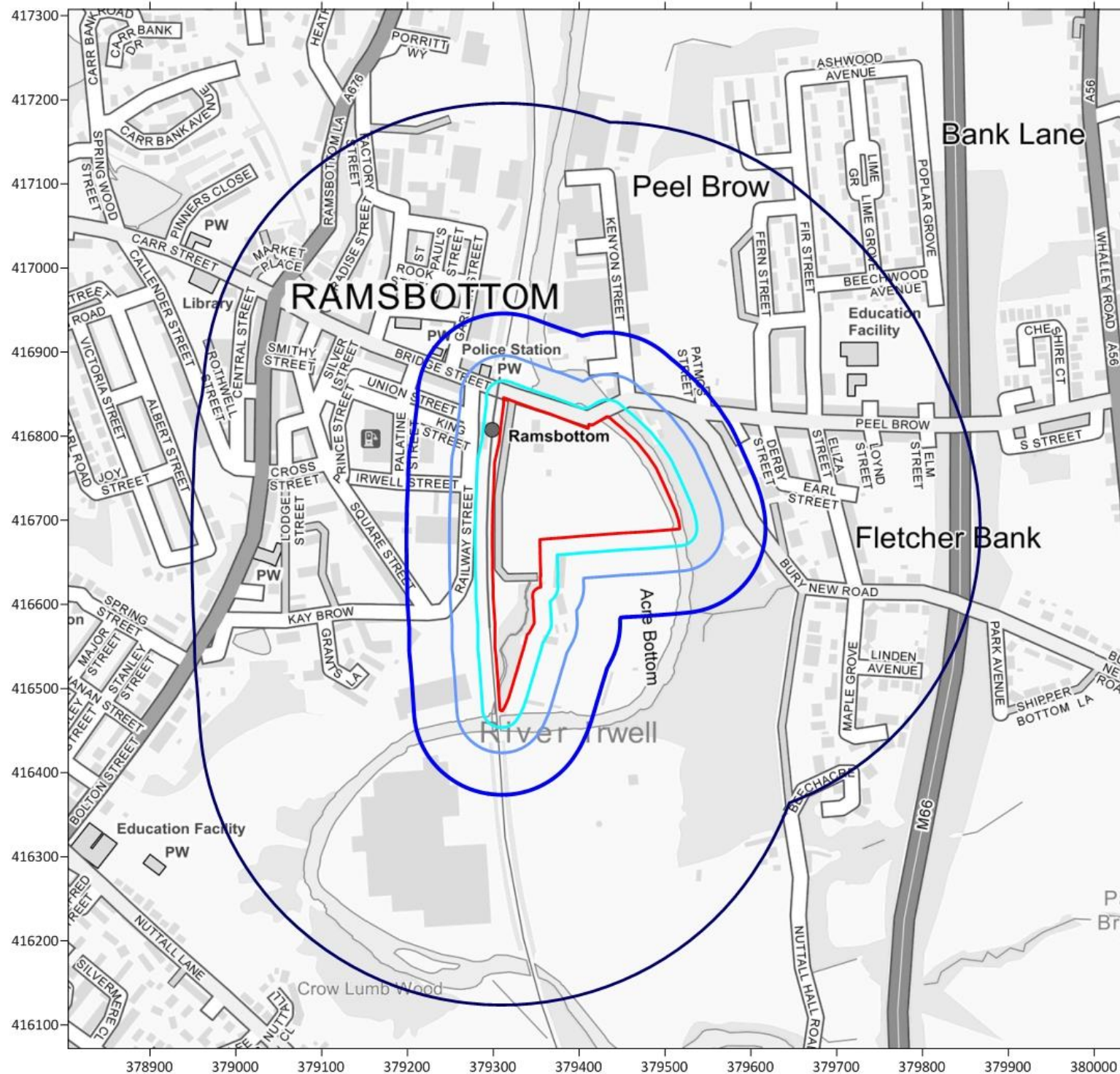
 Diffusion Tube
Monitoring Locations

Project
Former Mondi/Holcombe Mill, Bridge Street, Ramsbottom, Bury

Client	Eccleston Homes Limited
---------------	-------------------------

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Legend

-  Site Boundary
-  20m from Site Boundary
-  50m from Site Boundary
-  100m from Site Boundary
-  350m from Site Boundary

Title

Figure 3
Demolition, Earthworks and Construction
Dust Buffer Zones

Project

Former Mondi/Holcombe Mill,
Bridge Street, Ramsbottom, Bury

Project Number

AQ108648

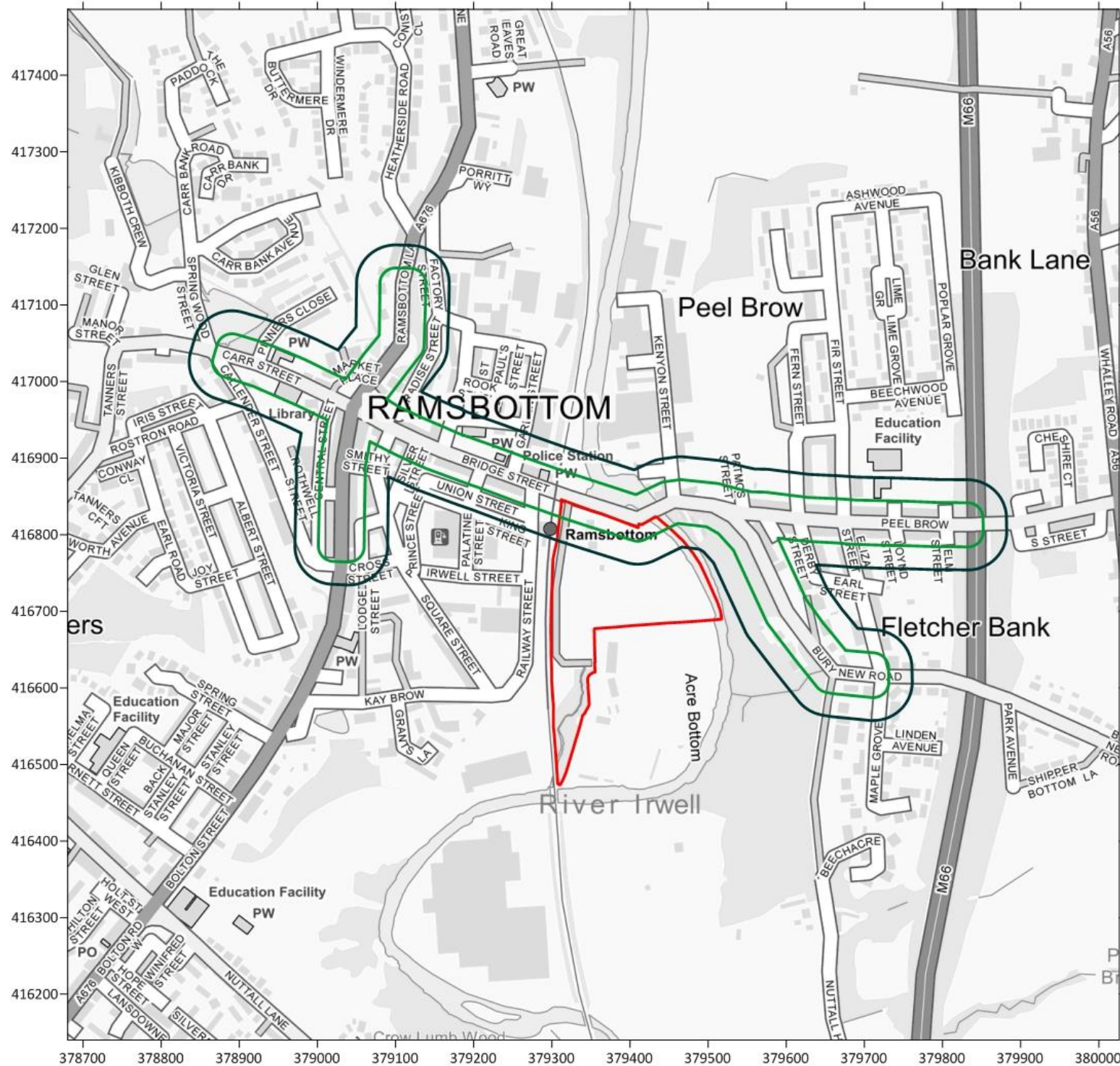
Client

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Legend

-  Site Boundary
-  20m from Site Access Route
-  50m from Site Access Route

Title

Figure 4
Trackout Dust Buffer Zones

Project

Former Mondi/Holcombe Mill,
Bridge Street, Ramsbottom, Bury

Project Number

AQ108648

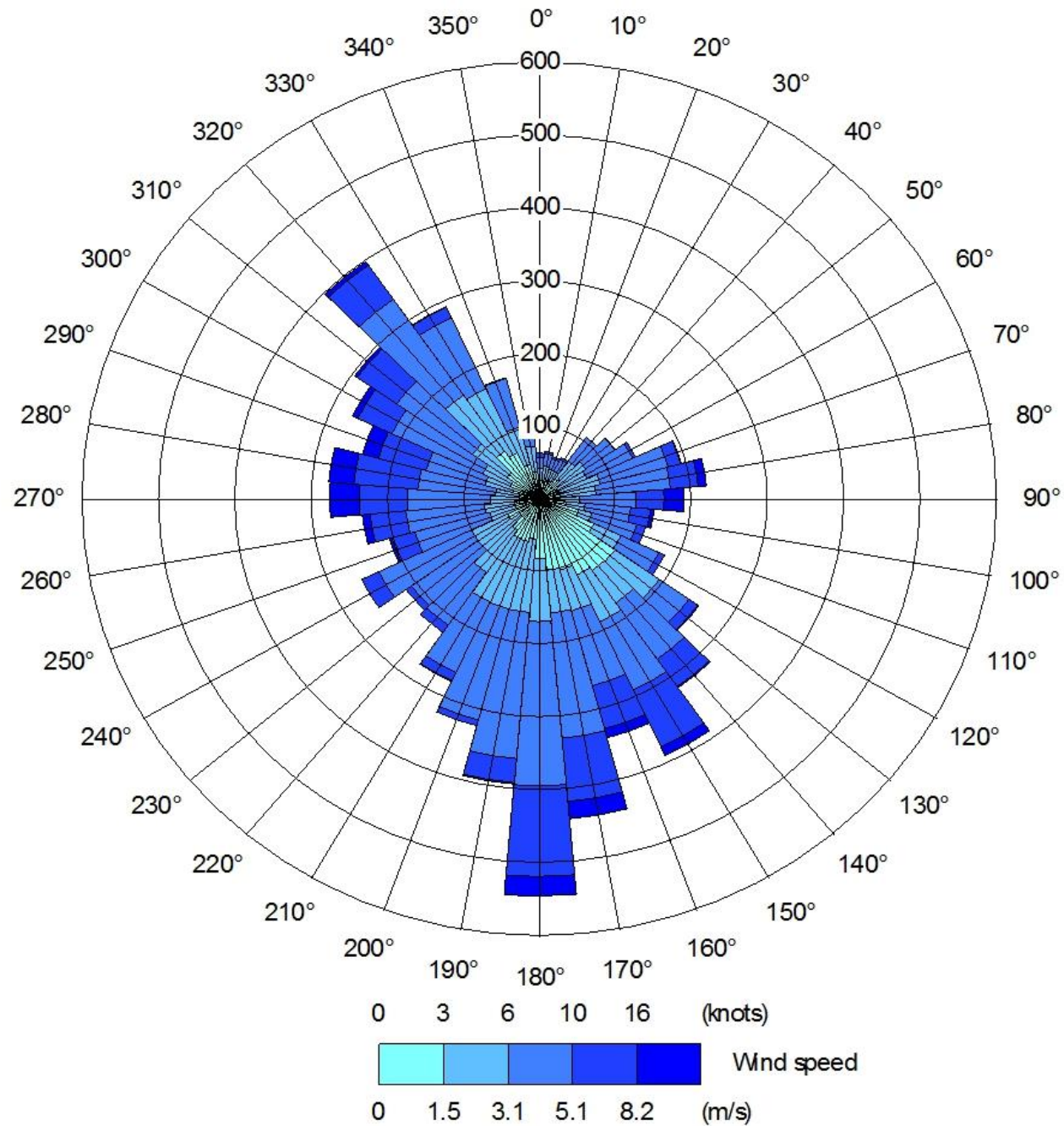
Client

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Legend

Title

Figure 5
Wind Rose
Meteorological Station
Rostherne 2018

Project

Former Mondri/Holcombe Mill,
Bridge Street, Ramsbottom, Bury

Project Number

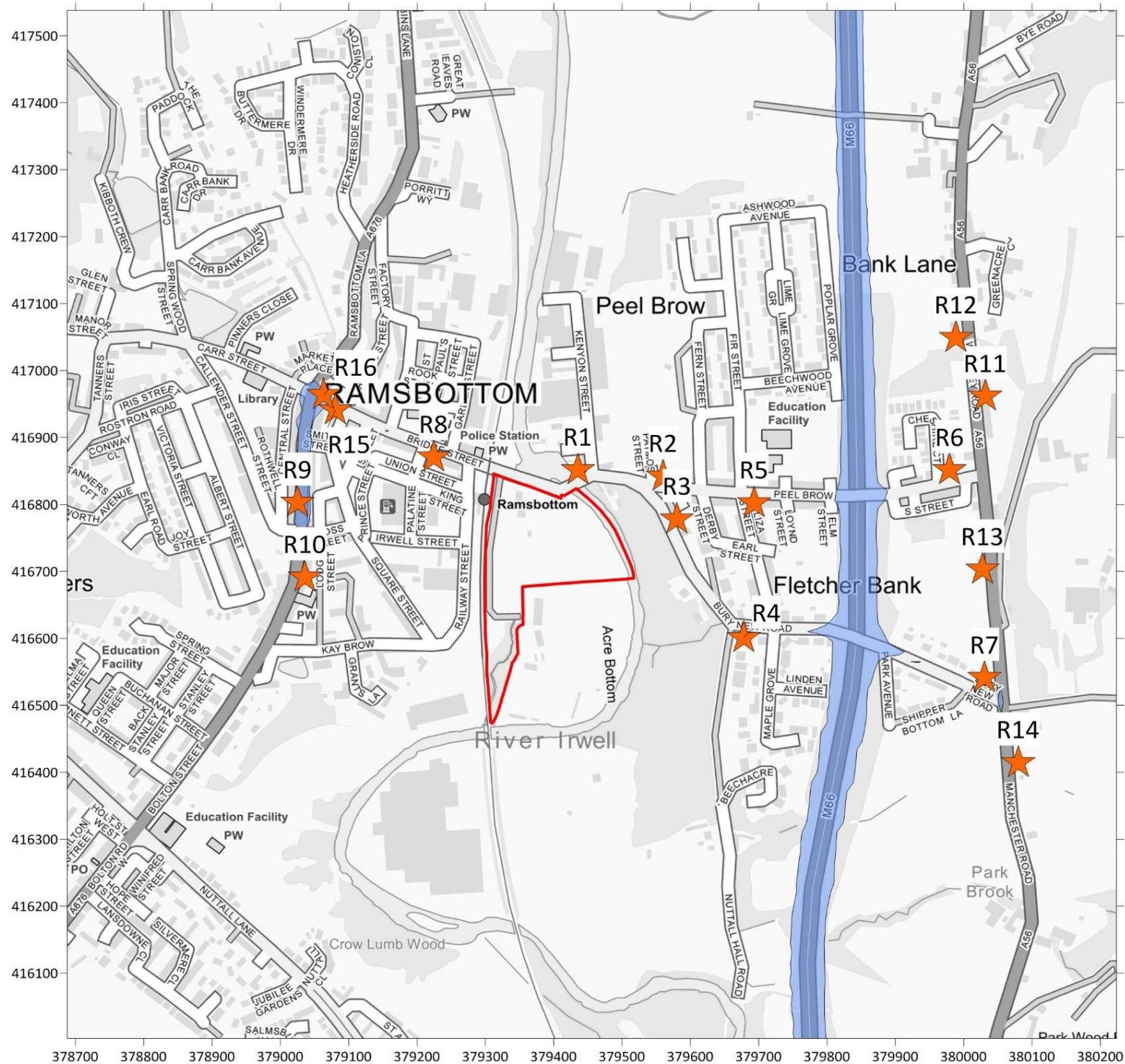
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Legend

-  Site Boundary
-  Air Quality Management Area
-  Sensitive Receptor Locations

Title

Figure 6
Traffic Exhaust Emissions
Sensitive Receptor Locations

Project

Former Mondi/Holcombe Mill,
Bridge Street, Ramsbottom, Bury

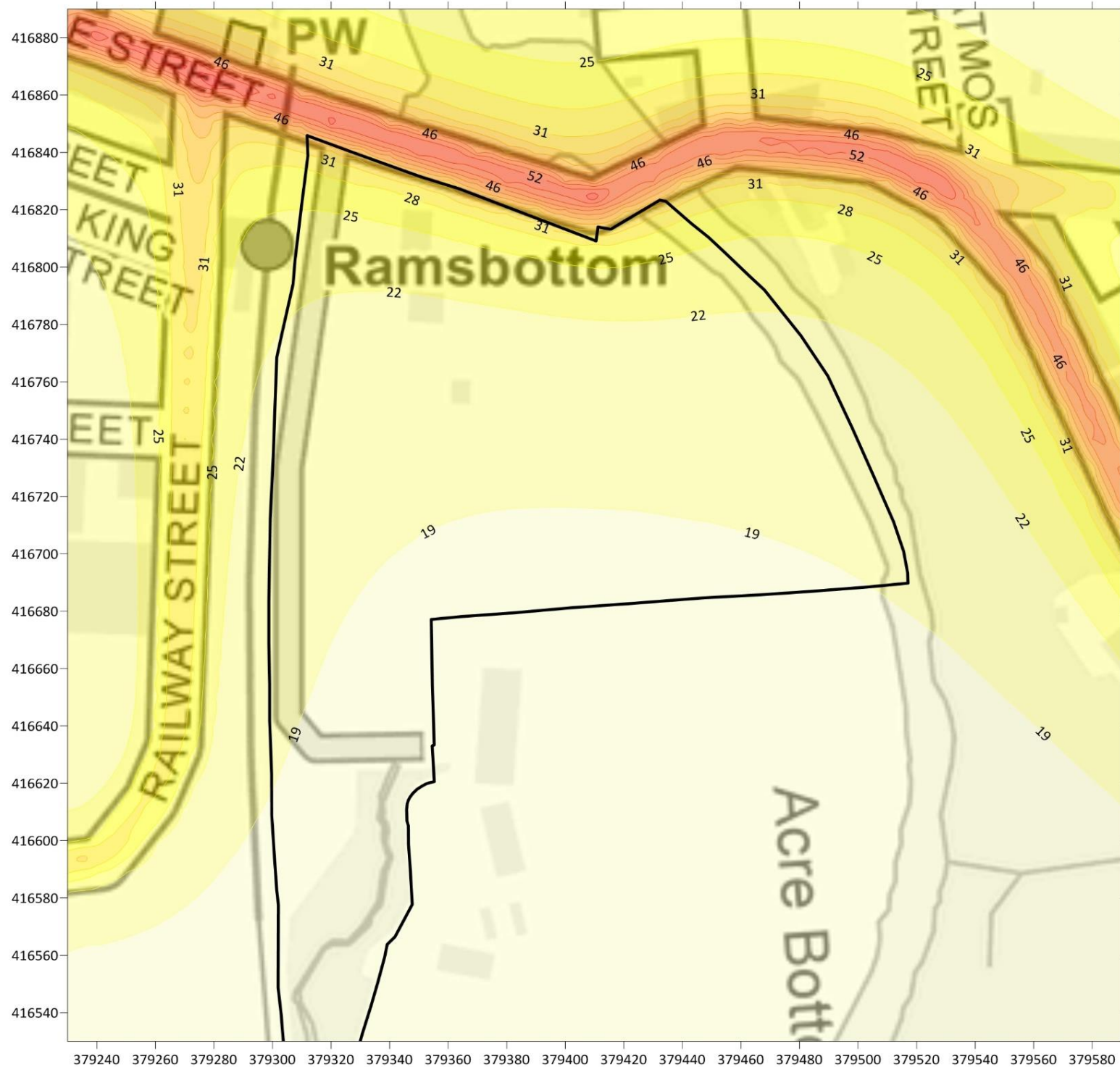
Project Number

AQ108648

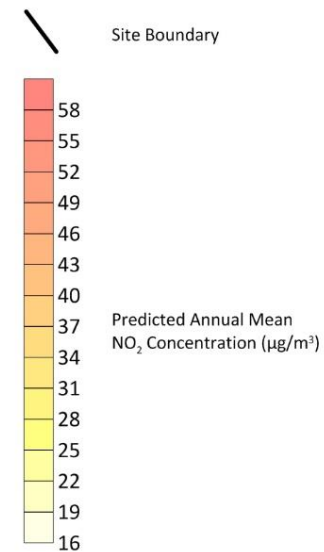
Client

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Legend



Title

Figure 7
Predicted Annual Mean NO₂
Concentrations (µg/m³) 2023 DS

Project

Former Mondi/Holcombe Mill,
Bridge Street, Ramsbottom, Bury

Project Number

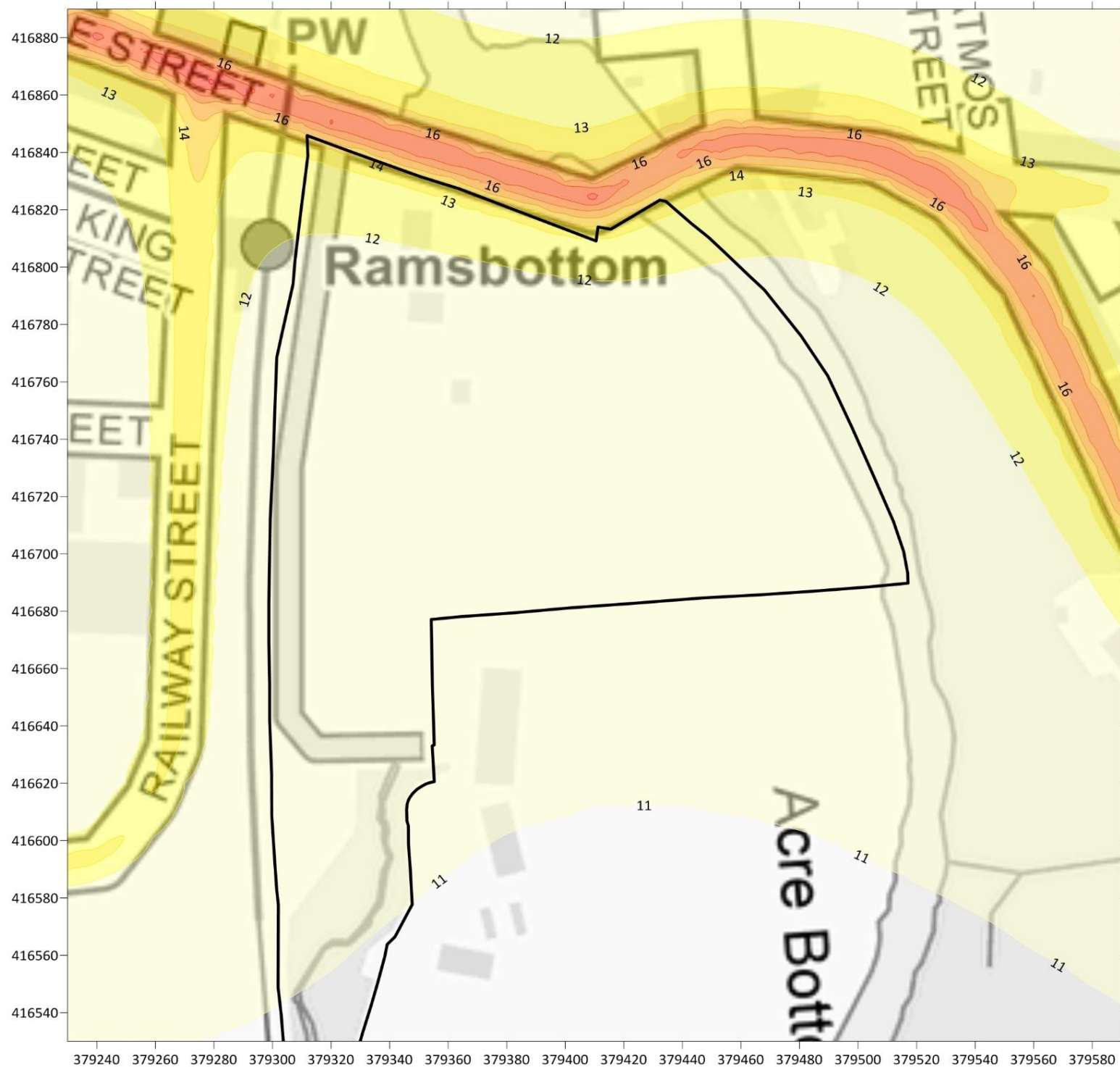
AQ108648

Client

Eccleston Homes Limited

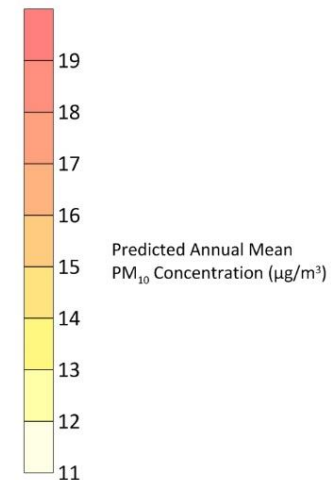
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Legend

 Site Boundary



Title

Figure 8

Predicted Annual Mean PM₁₀
Concentrations (µg/m³) 2023 DS

Project

Former Mondri/Holcombe Mill,
Bridge Street, Ramsbottom, Bury

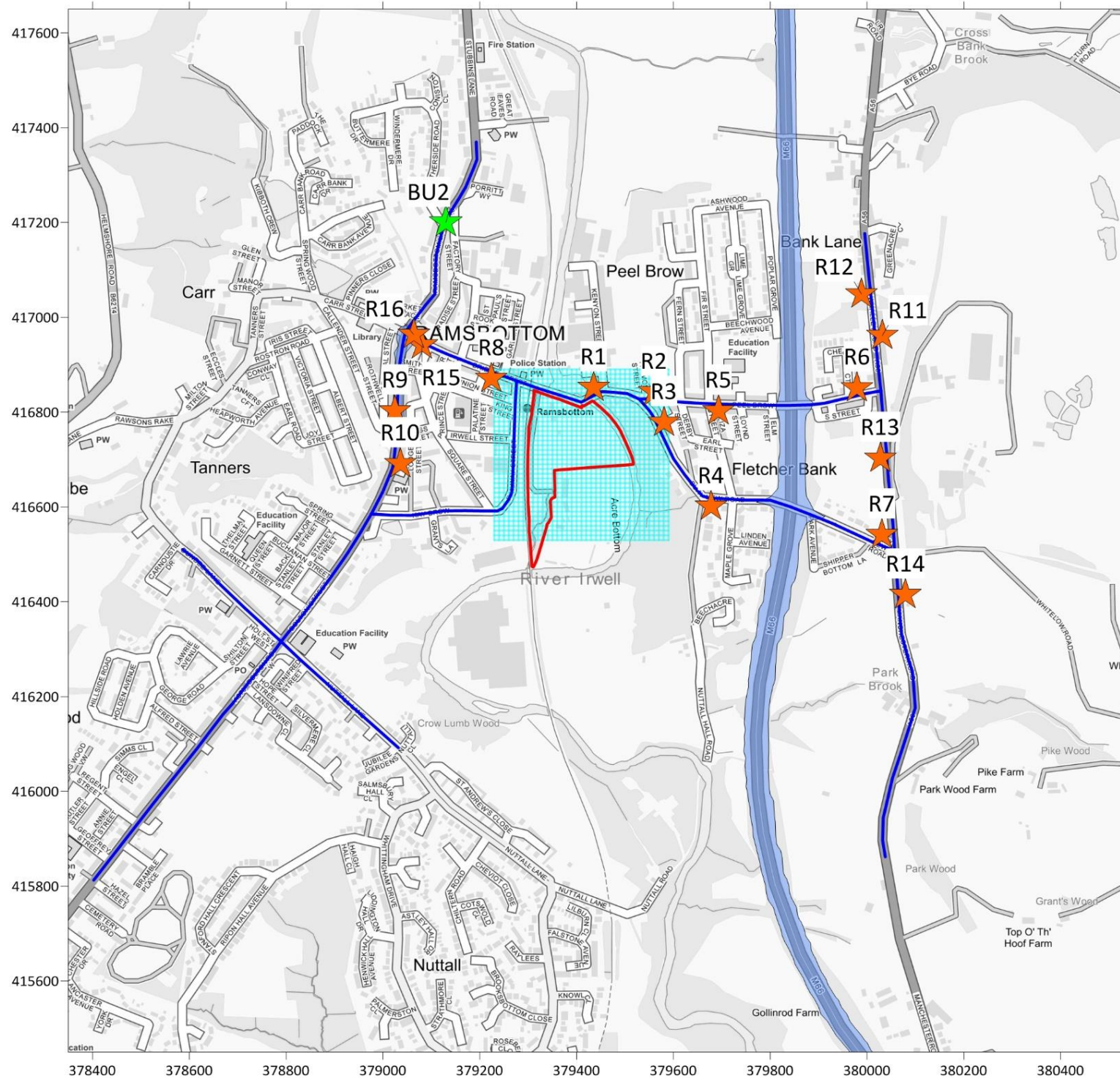
Project Number

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Legend

- Site Boundary
- Modelled Road Link
- Cartesian Grid
- Diffusion Tube Monitoring Location
- Sensitive Receptor Locations
- Greater Manchester AQMA

Title

Figure 9
ADMS-Roads Input

Project

Former Mondri/Holcombe Mill,
Bridge Street, Ramsbottom, Bury

Project Number

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APPENDIX II - ASSESSMENT INPUTS

Assessment Inputs

The Proposed Development has the potential to cause impacts during the construction and operational phases as well as to introduce future site users to poor air quality. In order to assess pollutant concentrations across the site and at specific nearby sensitive locations pollutant concentrations were quantified using detailed dispersion modelling.

The assessment was undertaken in accordance with the technical guidance contained within the DEFRA document LAQM (16)² and the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) 'Land-Use Planning & Development Control: Planning for Air Quality (2018)⁶.

Dispersion Model

Dispersion modelling was undertaken using the ADMS-Roads dispersion model (version 4.0.1.0). ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

The model requires input data that details the following parameters:

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

Assessment Area

Ambient concentrations were predicted over the Proposed Development site and surrounding highway network. One Cartesian grid was included in the model over the area NGR: 379230, 379590 to 416530, 416890 at height of 1.5m to represent the ground floor level.

Results were subsequently used to produce contour plots within the Surfer software package. It should be noted that although the grid only covered the proposed site, road links were extended in order to ensure the impact of all relevant vehicle emissions in the vicinity of the development were considered.

Reference should be made to Figure 9 within Appendix I for a graphical representation of the assessment grid extents.

Traffic Flow Data

For this assignment traffic data along all modelled road links were provided by SCP, the appointed Transport Consultants. Baseline data was also obtained from the Department for Transport (DfT) for roads that the consultants did not include in their assessment. The DfT Matrix web tool enables the user to view and download traffic flows on every link of the A-road and motorway network in Great Britain for the years 1999 to 2018. It should be noted that the DfT matrix is referenced in DEFRA guidance LAQM (TG16)² as being a suitable source of data for air quality assessments and is therefore considered to provide a reasonable representation of traffic flows in the vicinity of the site.

Growth factors provided by the Trip End Model Presentation Program (TEMPO) software package were utilised to allow for conversion from the obtained 2018 traffic flow to 2023 which was used to represent the opening year scenario. Vehicle speeds were estimated based on the free flow potential of each link and local speed limits. Road widths were estimated from aerial photography and UK highway design standards. Reference should be made to Figure 9 for a geographical representation of the road link locations.

A summary of the traffic data used in the verification scenario is provided in Table All 1.

Table All.1 2018 Traffic Data

Road Link		Road Width (m)	24-hour AADT Flow	HDV Prop. (%)	Canyon Height (m)	Mean Vehicle Speed (km/h)
L1A	Bridge Street East of Site	6.6	10,648	5.71	0.0	32
L1B	Bridge Street East of Railway Street	6.6	10,648	5.71	0.0	32
L1C	Bridge Street Canyon	10.7	10,648	5.71	6.4	32
L2	Bridge Street Slowdown at A676	10.2	10,648	5.71	0.0	24
L3	Peel Brow West of Site	7.8	10,648	5.71	0.0	32
L4	Peel Brow	6.8	2,310	5.64	0.0	40
L5	Peel Brow Slowdown at Whalley Road (A56)	9.9	2,310	5.64	0.0	24
L6	Bury New Road	7.8	8,338	5.73	0.0	40
L7	Bury New Road Slowdown at Manchester Road (A56)	12.5	8,338	5.73	0.0	16
L8	Ramsbottom Lane Slowdown at Bridge Street Junction	8.5	10,041	4.13	0.0	16
L9	Ramsbottom Lane	8.9	10,041	4.13	0.0	32
L10	Bolton Street Slowdown at Bridge Street Junction	9.0	10,041	4.13	7.0	24
L11A	Bolton Street Canyon	7.7	10,041	4.13	7.0	32
L11B	Bolton Street	7.7	10,041	4.13	0.0	32
L11C	Bolton Street South of Kaybrow	7.7	13,942	3.46	0.0	32
L12	Bolton Street Slowdown at Dundee Lane/Nuttall Lane	10.0	13,942	3.46	0.0	16

Road Link		Road Width (m)	24-hour AADT Flow	HDV Prop. (%)	Canyon Height (m)	Mean Vehicle Speed (km/h)
L13	Bolton Street Slowdown South of Dundee Lane/Nuttall Lane	10.2	13,499	3.57	0.0	16
L14	Bolton Street South of Dundee Lane/Nuttall Lane	8.4	13,499	3.57	0.0	32
L15	Dundee Lane	5.4	1,370	2.46	0.0	24
L16	Nuttall Lane	8.0	5,551	2.09	0.0	32
L17A	Whalley Road (A56)	9.8	9,091	4.77	0.0	40
L17B	Whalley Road (A56) South of Peel Brow	9.8	8,401	6.49	0.0	40
L18	Manchester Road Slow down at Bury New Road	8.7	16,518	6.07	0.0	32

The road width, height and mean vehicle speed shown in Table AII.1 remained the same for the 2023 scenarios. A summary of the 2023 traffic data is shown in Table AII.2.

Table AII.2 2023 Traffic Data

Road Link		DM		DS	
		24-hour AADT Flow	HDV Prop. (%)	24-hour AADT Flow	HDV Prop. (%)
L1A	Bridge Street East of Site	11,338	5.70	11,435	5.65
L1B	Bridge Street East of Railway Street	11,338	5.70	11,435	5.65
L1C	Bridge Street Canyon	11,338	5.70	11,435	5.65
L2	Bridge Street Slowdown at A676	11,338	5.70	11,435	5.65
L3	Peel Brow West of Site	11,338	5.70	11,783	5.48
L4	Peel Brow	2,471	5.60	2,576	5.37
L5	Peel Brow Slowdown at Whalley Road (A56)	2,471	5.60	2,576	5.37
L6	Bury New Road	8,996	5.64	9,335	5.44
L7	Bury New Road Slowdown at Manchester Road (A56)	8,996	5.64	9,335	5.44
L8	Ramsbottom Lane Slowdown at Bridge Street Junction	10,670	4.13	10,670	4.13
L9	Ramsbottom Lane	10,670	4.13	10,670	4.13
L10	Bolton Street Slowdown at Bridge Street Junction	10,670	4.13	10,670	4.13
L11A	Bolton Street Canyon	10,670	4.13	10,670	4.13
L11B	Bolton Street	10,670	4.13	10,670	4.13

Road Link		DM		DS	
		24-hour AADT Flow	HDV Prop. (%)	24-hour AADT Flow	HDV Prop. (%)
L11C	Bolton Street South of Kaybrow	14,839	3.45	14,935	3.43
L12	Bolton Street Slowdown at Dundee Lane/Nuttall Lane	14,839	3.45	14,935	3.43
L13	Bolton Street Slowdown South of Dundee Lane/Nuttall Lane	14,367	3.57	14,459	3.54
L14	Bolton Street South of Dundee Lane/Nuttall Lane	14,367	3.57	14,459	3.54
L15	Dundee Lane	1,456	2.46	1,456	2.46
L16	Nuttall Lane	5,899	2.09	5,903	2.08
L17A	Whalley Road (A56)	9,694	4.76	9,800	4.71
L17B	Whalley Road (A56) South of Peel Brow	8,946	6.47	8,946	6.47
L18	Manchester Road Slow down at Bury New Road	17,670	6.03	18,009	5.92
L1A	Bridge Street East of Site	16,518	6.03	18,009	5.92
L1B	Bridge Street East of Railway Street	4,037	1.66	4,408	1.63
L1C	Bridge Street Canyon	4,037	1.66	4,408	1.63

Street Canyons

Sections of the local highway network including sections of Bridge Street are flanked by tall buildings on both sides of the highway and therefore potential street canyon effects were considered for the purpose of the dispersion modelling assessment. This allows the additional turbulent flow patterns occurring within a street with high structures on either side to be considered within the predicted concentrations. The average building height on each road were included in the model to provide robust assessment results.

Emission Factors

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 9.0.1) released in 2018, which incorporates updated COPERT 5 vehicle emissions factors for NO_x and vehicle fleet information.

There is current uncertainty over NO₂ concentrations within the UK, with roadside levels not reducing as previously expected due to the implementation of new vehicle emission standards. Therefore, 2018 emission factors have been utilised for the prediction of pollution levels for all scenarios in preference to the development opening year in order to provide a robust assessment

Meteorological Data

Meteorological data used in this assessment was taken from Manchester Ringway Meteorological station over the period 1st January 2018 to 31st December 2018 (inclusive). Rostherne Meteorological station is located at approximate NGR: 381745, 383960, which is approximately 27km South West of

the Proposed Development.

All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 5 within Appendix I for a wind rose of utilised meteorological data.

Roughness Length

A roughness length (z_0) of 0.5m was used in this dispersion modelling study. This value of z_0 is considered appropriate for the morphology of the assessment area and is suggested within ADMS-Roads as being suitable for 'parkland, open suburbia'.

A roughness length (z_0) of 0.2m was used in this dispersion modelling study. This value of z_0 is considered appropriate for the morphology of the meteorological station and is suggested within ADMS-Roads as being suitable for 'agricultural (min)'.

Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 30m was used in this dispersion modelling study. This value is considered appropriate for the nature of the assessment area and is suggested within ADMS-Roads as being suitable for 'mixed urban/industrial, cities and large towns'.

A minimum Monin-Obukhov length of 10m was used in this dispersion modelling study. This value is considered appropriate for the nature of the meteorological station and is suggested within ADMS-Roads as being suitable for 'small towns <50,000'.

Background Concentrations

Background Concentrations as predicted by DEFRA, as detailed in Table 5, have been used in the dispersion modelling assessment to represent annual mean background concentrations in the vicinity of the site.

Table AII.3 displays the specific background concentrations as predicted by DEFRA, utilised to represent the condition at the monitoring locations used within the verification process.

Table AII.3 Predicted Background Pollutant Concentrations for Diffusion Tubes

Monitoring Location	DEFRA Grid Square	Pollutant	2018 Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
BU2	379130,417200	NO _x	21.54
		NO ₂	15.30

Table AII.4 displays the predicted background concentrations by DEFRA used in the operational phase assessment for the sensitive receptor locations.

Table AII.4 Predicted Background Pollutant Concentrations for Receptors

Receptor Grid Square	Receptors	Pollutant	2018 Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
393500, 409500	R1 to R6, R8 to R10, R5, R16	NO ₂	20.78
		NO _x	14.85
		PM ₁₀	10.55
393500, 408500	R7, R11, R13, R14	NO ₂	16.33
		NO _x	11.96
		PM ₁₀	10.59
392500, 408500	R12	NO ₂	21.54
		NO _x	15.30
		PM ₁₀	10.42

Similar to emission factors, background concentrations for 2018 were utilised in preference to predicted background concentrations for the development opening year. This provided a robust assessment and is likely to overestimate actual pollutant concentrations during the operation of the proposals.

NO_x to NO₂ Conversion

Predicted annual mean NO_x concentrations from the dispersion model were converted to NO₂ concentrations using the spreadsheet provided by DEFRA, which is the method detailed within LAQM (TG16)².

Verification

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

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

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

For the purpose of this assessment model verification was undertaken for 2018, using traffic data, meteorological data and monitoring results from this year.

The dispersion model was run with the traffic input data previously detailed for 2018 to predict the NO_x concentration at the monitoring locations. The results are shown in Table AII.5.

Table AII.5 NO_x Verification Results

ID	Modelled Road NO _x Concentration (µg/m ³)	Monitored Road NO _x Concentration (µg/m ³)	Difference (%)
BU2	16.70	42.38	153.77

The monitored and modelled NO_x road contribution concentrations were compared indicating that a verification factor of **2.5377** was required to be applied to all NO_x modelling results.

Table AII.6 presents the monitored annual mean NO_x concentrations and the adjusted modelled total NO₂ concentration based on the above verification factor. Exceedances of the relevant AQO are highlighted in **bold**.

Table AII.6 2018 NO₂ Monitoring Results

ID	Monitored NO ₂ Concentration (µg/m ³)	Adjusted Modelled Total NO ₂ Concentration (µg/m ³)	Difference (%)
BU2	35.70	35.70	0.01

The percentage difference between modelled and monitored concentrations is deemed acceptable and within the 25% accuracy threshold suggested in LAQM (TG16)² and most locations are within the preferable 10% threshold.

As PM₁₀ and PM_{2.5} monitoring is not undertaken within the assessment extents, the NO₂ adjustment factor of **2.5377** was utilised to adjust model predictions of particulate matter in accordance with the guidance provided within LAQM (TG16)².

APPENDIX III CONSTRUCTION PHASE ASSESSMENT CRITERIA

CONSTRUCTION PHASE METHODOLOGY

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'⁹.

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

- ▶ Earthworks;
- ▶ Construction; and
- ▶ Trackout.

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

- ▶ Annoyance due to dust soiling;
- ▶ Harm to ecological receptors; and
- ▶ The risk of health effects due to a significant increase in exposure to PM₁₀ and PM_{2.5}.

The assessment steps are detailed below.

Step 1

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.

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

Step 2

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).

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

Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table AIII.1.

⁹ Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management, 2016.

Table AIII.1 Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Earthworks	- 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
	Construction	- Total building volume greater than 100,000m³ - On site concrete batching - Sandblasting
	Trackout	- More than 50 Heavy Duty Vehicle (HDV) trips per day - Potentially dusty surface material (e.g. high clay content) - Unpaved road length greater than 100m
Medium	Earthworks	- Total site area 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
	Construction	- Total building volume 25,000m³ to 100,000m³ - Potentially dusty construction material (e.g. concrete) - On site concrete batching
	Trackout	10 to 50 HDV trips per day - Moderately dusty surface material (e.g. high clay content) - Unpaved road length 50m to 100m
Small	Earthworks	- Total site area less than 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
	Construction	- Total building volume less than 25,000m³ - Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	- Less than 10 HDV trips per day - Surface material with low potential for dust release - Unpaved road length less than 50m

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

Table AIII.2 Examples of Factors Defining Sensitivity of an Area

Sensitivity	Examples	
	Human Receptors	Ecological Receptors
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
Medium	• Users would expect to enjoy a reasonable level of amenity • Aesthetics or value of their property could be diminished by soiling • People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work	• Nationally designated site e.g. Sites of Special Scientific Interest
Low	• Enjoyment of amenity would not reasonably be expected • Property would not be expected to be diminished in appearance • Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, playing fields, farmland, footpaths, short term car park and roads	• Locally designated site e.g. Local Nature Reserve

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.

These factors were considered in the undertaking of this assessment.

The sensitivity of the area to dust soiling effects on people and property is shown in Table AIII.3.

Table AIII.3 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	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

Table AIII.4 outlines the sensitivity of the area to human health impacts.

Table AIII.4 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	Greater than 32µg/m ³	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m ³	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m ³	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	Less than 24µg/m ³	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	Greater than 32µg/m ³	More than 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	28 - 32µg/m ³	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24 - 28µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low

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
	Less than 24µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Low	-	More than 1	Low	Low	Low	Low	Low

Table AIII.5 outlines the sensitivity of the area to ecological impacts.

Table AIII.5 Sensitivity of the Area to Ecological Impacts

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

Step 2C combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts. Table AIII.6 outlines the risk category from demolition activities

Table AIII.6 Dust Risk Category from Demolition

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

Table AIII.7 outlines the risk category from earthworks and construction activities.

Table AIII.7 Dust Risk Category from Earthworks and Construction

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

Table AIII.8 outlines the risk category from trackout.

Table AIII.8 Dust Risk Category from Trackout

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

Step 3

Step 3 requires the identification of site-specific mitigation measures within the IAQM guidance 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

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'.

CONAL KEARNEY

Head of Noise and Air

BEng(Hons), MSc, MIAQM, MEnvSc

KEY EXPERIENCE:

Conal is Head of Noise and Air with specialist experience in the air quality and odour sector. His key capabilities include:

- ▶ Advanced atmospheric air dispersion modelling of road vehicle and industrial emissions using ADMS-ROADS and AIRVIRO.
- ▶ Preparation of factual and interpretative Air Quality Assessment reports and Air Quality Environmental Statement chapters in the vicinity of proposed schemes and developments in accordance with DEFRA, Environment Agency and Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) methodologies.
- ▶ Management and delivery of project work on key, land development and urban regeneration projects.
- ▶ Assessment of road vehicle exhaust emissions using the Design Manual for Roads and Bridges (DMRB) calculation spreadsheet.
- ▶ Assessment of dust impacts from construction sites to the Institute of Air Quality Management (IAQM) methodology.
- ▶ Dust and Odour impact assessments from minerals and waste sites
- ▶ Representing clients at public enquiries and planning hearings.

QUALIFICATIONS:

- ▶ Bachelor of Engineering
- ▶ Master of Science
- ▶ Member of Institute of Air Quality Management
- ▶ Member of the Institute of Environmental Science (IES)

SELECT PROJECTS SUMMARY:

Industrial Developments

Buck Park, Denholme - AQA and dust assessment for proposed mineral extraction and site restoration project.

Messingham Quarry, North Lincolnshire - AQA and dust impacts for proposed new sand extraction site.

Arden Quarry, Derbyshire - AQA for proposed mineral extraction and site restoration

Calder Brick Works, Yorkshire - AQA for proposed site restoration plan

Coopers Moss, St Helens AQA and dust assessment for materials import and site restoration.

Clayton Hall Landfill, Chorley - AQA and odour assessment for proposed landfill extension and mineral extraction.

Highways Developments

Alderley Edge Bypass, Cheshire - AQA for major new road scheme.

South Heywood – EIA for new link road and mixed use joint development

Residential Developments

Beck's Mill, Silsden – AQA and emissions calculation for proposed residential development

Bredbury Curve, Stockport - AQA assessment for proposed residential development in AQMA.

Hollin Lane, Middlewich – AQA for large scale residential development.

Friars School, Southwark, London. School development for mixed use education and residential building in AQMA.

Abbotsford House, Bearsden, Scotland – AQA and dust assessment for residential development

Kelvedon Street, Newport, South Wale – AQA for new housing development

Westcraig, Edinburgh - EIA for residential development

Public Sector

Technical advisor on Manchester Airport Consultative Committee - advise members on environmental technical matters in relation to the airport's operations.

Cheshire County Council - compile AQ chapters for Local Transport Plan

Cheshire East Council - specialist AQ advice on highways, minerals and waste projects

Local Air Quality Management

Broughton Gyratory, Chester - dispersion model for City Centre detailed assessment report

Congleton town centre - dispersion modelling assessment for detailed and further assessment reports.

Disley - dispersion modelling assessment for detailed and further assessments

Holmes Chapel - dispersion modelling assessment for detailed and further assessment reports for road and rail sources.

Crewe - town centre dispersion modelling for detailed and further assessment reports.

Commercial Developments

Granta Park Daycare Centre, Oxfordshire. AQA for new build daycare centre adjacent to major road.

Curzon Cinema, Colchester. Air quality assessment for town centre new build cinema.

Newfoundland Circus, Bristol - AQA for hotel development in city centre

Salesians School, Chertsey - AQA for school extension near M25