



Yeargate Limited

LAND NORTH OF BIRCH BUSINESS PARK

Environmental Statement Volume I Chapter 8 - Air
Quality

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8 AIR QUALITY

ABBREVIATIONS

AQMA	Air Quality Management Area
APIS	Air Pollution Information System
AQO	Air Quality Objective
ASR	Annual Status Report
AURN	Automatic Urban and Rural Network
CAP	Clean Air Plan
CEMP	Construction Environmental Management Plan
DEFRA	Department for Education, Food and Rural Affairs
DfT	Department for Transport
DM	Do Minimum
DMP	Dust Management Plan
DS	Do Something
EV	Electric Vehicle
GMCA	Greater Manchester Combined Authority
HRA	Habitats Regulations Assessment
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxides
PfE	Places for Everyone
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
RMBC	Rochdale Metropolitan Borough Council
SAC	Special Area of Conservation

GLOSSARY

Air Quality Limit Value	Legally binding parameters defined in European Union air quality legislation that must not be exceeded. Limit values are set for individual pollutants and are a combination of a concentration value, an averaging time over which it is measured, the number of exceedences allowed per year, and a date by which it must be achieved
Air Quality Management Area	An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives.
Air Quality Objective	The name given to the maximum ambient pollutant concentration that is not to be exceeded either without exception or within a permitted number of exceedences over a specified timescale for a pollutant outlined in the national Air Quality Strategy.
Air Quality Strategy	A national government document which contains standards, objectives and measures for improving ambient air quality.
Annual Average Daily Traffic	The number of traffic movements on a given road in a 24-hour period as an average across one year.
Background Concentration	The pollutant concentration assumed to represent baseline concentrations in the atmosphere across the modelled area.
Heavy Duty Vehicle	Vehicles with a gross weight of greater than 3.5 tonnes.
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10µm
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm

8.1 INTRODUCTION

- 8.1.1. This chapter reports the outcome of the assessment of likely significant effects arising from the Proposed Development upon air quality. It has been produced by Redmore Environmental Ltd.
- 8.1.2. The assessment of air quality effects has established that additional mitigation measures are not required. However, a Construction Environmental Management Plan (CEMP) will be produced to control potential air quality effects during the construction phase.
- 8.1.3. The following residual effects have been identified:
- There is likely to be a direct, temporary, short-term **adverse** residual effect at local human receptors as a result of fugitive dust and particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀) emissions during the construction phase (**not significant**);
 - There is likely to be a direct, temporary, short-term **negligible** residual effect at local human receptors as a result of road vehicle exhaust emissions during the construction phase (**not significant**);
 - There is likely to be a direct, permanent, long-term **negligible** residual effect at local human receptors as a result of road vehicle exhaust emissions during the operational phase (**not significant**); and,

- There is likely to be a **negligible** residual effect at local ecological receptors as a result of road vehicle exhaust emissions during the operational phase (**not significant**).

8.1.4. No monitoring requirements have been identified during the undertaking of the assessment

8.1.5. No environmental enhancement opportunities have been identified.

8.1.6. The remainder of this chapter describes the assessment methodology and the baseline conditions relevant to the assessment, which have been used to reach these conclusions, as well as a summary of the likely significant effects leading to the additional mitigation measures required to avoid, prevent, reduce or, if possible, offset any likely significant adverse effects, and the likely residual effects and any required monitoring after these measures have been employed. Opportunities for environmental enhancement, where such opportunities exist, are also discussed.

8.1.7. This chapter (and its associated figures and appendices) is intended to be read as part of the wider ES, with particular reference to **Chapter 6 - Highways, Traffic and Transport** and the following appendices:

- Appendix 8.1 – Air Quality – Assessment Input Data; and,
- Appendix 8.2 – Air Quality – Supporting Information.

8.2 CONSULTATION, SCOPE, METHODOLOGY AND SIGNIFICANCE CRITERIA

CONSULTATION UNDERTAKEN TO DATE

8.2.1. No consultation specific to the Air Quality Environmental Impact Assessment has been undertaken. The assessment has been undertaken with reference to relevant legislation, policy, published guidance and available baseline information.

SCOPE OF THE ASSESSMENT

8.2.2. This section provides the scope of the assessment and outlines the evidence base for scoping out elements following further iterative assessment.

ELEMENTS SCOPED OUT OF THE ASSESSMENT

8.2.3. No specific air quality elements were scoped out of the assessment.

ELEMENTS SCOPED INTO THE ASSESSMENT

Construction Phase

8.2.4. The following elements are considered to have the potential to give rise to likely significant effects during construction of the Proposed Development and have therefore been considered within this assessment:

- Fugitive dust and increases in PM₁₀ concentrations generated by earthworks, construction and trackout activities; and,
- Vehicle exhaust emissions associated with vehicles travelling to and from the Site.

Operation Phase

8.2.5. The following element is considered to have the potential to give rise to likely significant effects during operation of the Proposed Development and has therefore been considered within this assessment:

- Vehicle exhaust emissions associated with vehicles travelling to and from the Site.

EXTENT OF THE STUDY AREA

- 8.2.6. The study area for the assessment of fugitive dust and PM₁₀ emissions during the construction phase of the Proposed Development has been defined using the Institute of Air Quality Management (IAQM) guidance (**Ref. 8.1**). The assessment considered sensitive receptors within 250m from the Site for earthworks and construction activities, and within 50m of the Site access route up to 250m from the Site entrance for trackout.
- 8.2.7. The study area for the assessment of road vehicle exhaust emissions during the construction and operational phases was within 200m of roads with associated sensitive receptor locations where there was a predicted change in traffic flow as a result of the Proposed Development. The IAQM guidance (**Ref. 8.2**) was utilised to identify road links where the change in traffic flow had the potential to result in significant effects. The relevant roads considered as part of the assessment are shown in **Figure 8. 1**.

METHOD OF BASELINE DATA COLLATION

DESK STUDY

- 8.2.8. The scope of the assessment has been determined through completion of the following tasks:
- A review of predicted background concentrations within the vicinity of the Proposed Development produced by the Department for Education, Food and Rural Affairs (DEFRA);
 - A desk study of satellite imagery to confirm the location of existing sensitive receptors that may be sensitive to changes in air quality as a result of the Proposed Development;
 - A review of the Greater Manchester Combined Authority (GMCA) 2024 Air Quality Annual Status Report (ASR) (**Ref. 8.3**) to determine monitoring data within the vicinity of the Proposed Development and Air Quality Management Areas (AQMAs); and,
 - A review of baseline and future opening year (without and with the Proposed Development) traffic data, as provided by the Project Transport Consultants.

SURVEYS

- 8.2.9. For the purpose of this assessment, no site visits or surveys were required as sufficient information was available from the previously identified sources to describe the baseline environment.

ASSESSMENT METHODOLOGY

- 8.2.10. The Proposed Development has the potential to cause air quality effects during the construction and operational phases. These were assessed in accordance with the following methodology.

Construction Phase

Fugitive Dust and PM₁₀ Emissions

- 8.2.11. 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 IAQM document 'Guidance on the Assessment of Dust from Demolition and Construction V2.2' (**Ref. 8.1**).
- 8.2.12. Activities to be undertaken as part of the Proposed Development have been divided into three types of reflect their different potential impacts. These are:
- Earthworks;

- Construction; and,
- Trackout.

8.2.13. 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.

8.2.14. The first stage screens the requirement for a more detailed assessment. Should human receptors be identified within 250m from the Site boundary or 50m from the construction vehicle route up to 250m from the Site entrance, then the assessment proceeds to the next step. Additionally, should ecological receptors be identified within 50m of the Site or the construction vehicle route up to 250m from the Site entrance, then the assessment also proceeds to the next stage.

8.2.15. The second stage of the assessment screens the risk of potential dust impacts. The risk category was defined based on two factors:

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

8.2.16. The two factors are combined in order to determine the impact risk without mitigation applied.

8.2.17. The influencing factors that define the sensitivity of specific receptors are shown in **Table 8-1**.

Table 8-1 – Construction Dust – Sensitivities of People and Ecological Receptors

Receptor Sensitivity	Example	
	Human Receptors	Ecological Receptors
High	Users expect high levels of amenity High aesthetic or value property People expected to be present continuously for extended periods of time Locations where members of the public are exposed over a time period relevant to the Air Quality Objective (AQO) for PM₁₀ e.g. residential properties, hospitals, schools and residential care homes	Internationally or nationally designated site e.g. Special Area of Conservation
Medium	Users would expect to enjoy a reasonable level of amenity Aesthetics or value of their property could be diminished by soiling People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work	Nationally designated site e.g. Sites of Special Scientific Interest

Low	Enjoyment of amenity would not reasonably be expected Property would not be expected to be diminished in appearance Transient exposure, where people would only be expected to be present for limited periods e.g. public footpaths, playing fields, shopping streets, farmland, short term car parks and roads	Locally designated site e.g. Local Nature Reserve
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8.2.18. The criteria for determining the sensitivity of the area to dust soiling effects on people and property is summarised in **Table 8-2**.

Table 8-2 – Construction Dust – Sensitivity of the Area to Dust Soiling Effects on People and Property

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

8.2.19. **Table 8-3** below outlines the criteria for determining the sensitivity of the area to human health impacts.

Table 8-3 – Construction Dust – Sensitivity of the Area to Human Health Impacts

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

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

8.2.20. **Table 8-4** outlines the criteria for determining the sensitivity of the area to ecological impacts.

Table 8-4 – Construction Dust – Sensitivity of the Area to Ecological Impacts

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

8.2.21. The scale and nature of the construction works determined the magnitude of dust impacts arising from each activity. The relevant criteria are summarised in **Table 8-5**.

Table 8-5 – Construction Dust – Magnitude of Emission

Magnitude	Activity	Criteria
Large	Earthworks	Total site area more than 110,000m ² Potentially dusty soil type (e.g. clay) More than 10 heavy earth moving vehicles active at any one time Formation of bunds greater than 6m in height
	Construction	Total building volume more than 75,000m ³ On site concrete batching, sand blasting
	Trackout	More than 50 Heavy Duty Vehicles (HDV) movements per day Potentially dusty surface material (e.g. high clay content) Unpaved road length more than 100m

Medium	Earthworks	Total site area between 18,000m ² and 110,000m ² Moderately dusty soil type (e.g. silt) Between 5 and 10 heavy earth moving vehicles active at any one time Formation of bunds between 3m and 6m in height
	Construction	Total building volume between 12,000m ³ and 75,000m ³ Potentially dusty construction material (e.g. concrete)
	Trackout	Between 20 and 50 HDV movements per day Moderately dusty surface material (e.g. high clay content) Unpaved road length between 50m and 100m
Low	Earthworks	Total site area less than 18,000m ² Soil type with large grain size (e.g. sand) Less than 5 heavy earth moving vehicles active at any one time Formation of bunds less than 3m in height
	Construction	Total building volume less than 12,000m ³ Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	Less than 20 HDV movements per day Surface material with low potential for dust release Unpaved road length less than 50m

- 8.2.22. The dust emission magnitude and the sensitivity of the area were combined to determine the significance of the unmitigated effects.
- 8.2.23. **Table 8-6** combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts.

Table 8-6 – Construction Dust – Dust Risk Category from Earthworks, Construction and Trackout

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

- 8.2.24. It should be noted that predicted effects from construction phase fugitive emissions are considered to be adverse but temporary in nature.
- 8.2.25. Based on the dust risk category, Site-specific mitigation measures were identified from the IAQM guidance (**Ref. 8.1**) in order to reduce potential dust effects. The residual effect was subsequently defined based on the methodology outlined below.

Road Vehicle Exhaust Emissions

- 8.2.26. The Proposed Development has the potential to affect air quality as a result of road traffic exhaust emissions associated with vehicles travelling to and from the Site during the construction phase. Specific data to define vehicle trip generation and distribution was unavailable to inform the assessment. However, it is anticipated that any change in traffic flow is likely to be lower than during the operational phase. As such, potential effects have been assessed using the findings of the operational phase assessment, as a worst case. This is likely to overestimate potential effects during the construction stage.

Operational Phase

Road Vehicle Exhaust Emissions

Human Receptors

- 8.2.27. The Proposed Development has the potential to impact on existing air quality as a result of road traffic exhaust emissions associated with vehicles travelling to and from the Site during the operational phase.
- 8.2.28. It should be noted that a bus gate is currently proposed on Whittle Lane as part of the wider Northern Gateway development (reference: 25/00418/OUT), which has the potential to affect the distribution of trips on the local network from the Proposed Development. The application has not been approved and therefore does not constitute a committed scheme. However, to provide a robust assessment of potential effects as a result of the Proposed Development, consideration has been given to the potential future bus gate as an alternative future year scenario.
- 8.2.29. Potential effects were defined by predicting pollutant levels at sensitive human receptor locations using dispersion modelling for the following scenarios:
- 2024 - Model Verification (comparison of predicted and measured pollutant concentrations allowing a verification factor to be made to adjust results accordingly);
 - Core Do-Minimum (DM) (predicted flows in 2027 opening year should the Proposed Development not proceed);
 - Core Do-Something (DS) (predicted flows in 2027 opening year should the Proposed Development be completed);
 - Bus gate scenario DM (predicted flows in 2032 should the Proposed Development not proceed, with the potential future implementation of a bus gate on Whittle Lane); and,
 - Bus gate scenario DS (predicted flows in 2032 should the Proposed Development be completed, with the potential future implementation of a bus gate on Whittle Lane).
- 8.2.30. The DM scenarios (i.e. without the Proposed Development) included baseline traffic data, inclusive of anticipated growth and committed developments. The DS scenarios (i.e. with the Proposed Development) included baseline traffic data, inclusive of anticipated growth and committed developments, in addition to predicted vehicle trips associated with the Proposed Development.
- 8.2.31. Reference should be made to **Appendix 1.1** for a description of the dispersion modelling inputs.
- 8.2.32. The sensitivity of receptor and magnitude of impact was combined to determine the effect significance. This is explained in the Significance Criteria Section.

Ecological Receptors

- 8.2.33. The Proposed Development has the potential to impact on existing air quality at ecological receptors as a result of road traffic exhaust emissions associated with vehicles travelling to and from the Site during the operational phase. These were assessed in accordance with 'Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations', which describes how competent authorities and others will assess plans and projects likely to generate road traffic emissions and subsequently affect international ecological designations. This provides a staged assessment methodology to provide consideration of potential air quality impacts from a development both alone and cumulatively with other developments.
- 8.2.34. The approach is summarised as follows. Please note that this has been adapted to align with the requirements under the EIA Regulations:
- Stage 1a - Undertake a baseline study to determine the location of any ecological designations within 200m of a road link subject to changes in traffic flows as a result of the Proposed Development alone. If there are any features within the relevant distance that are considered sensitive to changes in air quality then the assessment should proceed to Stage 1b;
 - Stage 1b - Determine the predicted change in Annual Average Daily Traffic (AADT) flow on road links situated within the relevant distance of sensitive ecological receptors as a result of the Proposed Development alone. If the AADT flow change is above 1,000 then there is a risk of a significant effect on air quality and further assessment is required. If the change in AADT is below 1,000 then the assessment should proceed to Stage 2; and,
 - Stage 2 - If the change in AADT is below 1,000 then there is a risk of an appreciable effect on air quality but it is unlikely to be significant for the Proposed Development alone. As such, screening for cumulative effects should be undertaken. This requires the predicted change in AADT flow on road links within the vicinity of the sensitive ecological receptors as a result of the Proposed Development and any other relevant committed development. If this is below 1,000 then it can be concluded that air quality impacts are not significant. If the threshold is exceeded the further assessment is required.
- 8.2.35. Should the change in vehicle movements exceed the screening criteria outlined above, a Stage 2: Appropriate Assessment is required in accordance with the Habitats Regulations Assessments: Protecting a European Site. This should consider in greater details whether the air quality impact would contribute to a likely significant effect at the relevant ecological designation.
- 8.2.36. Dispersion modelling was undertaken by Ricardo Energy & Environment as part of the Air Quality Habitats and Regulations Assessment (**Ref. 8.4**) conducted to support the Habitats and Regulations Assessment (HRA for the Places for Everyone (PfE) Plan. This quantified changes in pollutant concentrations at relevant ecological designations as a result of road vehicle exhaust emissions associated with traffic generated by sites allocated within the PfE Plan. This includes the Proposed Development. The Natural England (**Ref. 8.5**) and IAQM guidance (**Ref. 8.6**) documents state that for individual planning applications, where European designations are a consideration, it is acceptable to adopt the assessment, reasoning, and conclusions of the Local Plan HRA that considers said application. As such, the conclusions of the PfE Plan HRA were considered when determining the potential for air quality impacts on the relevant sensitive ecological receptors as a result of the Proposed Development.

SIGNIFICANCE CRITERIA

- 8.2.37. The significance level attributed to each effect has been assessed based on the sensitivity/value of the affected receptor(s) and the magnitude of change arising from the Proposed Development, as well as a number of other factors that are outlined in more detail in **Chapter 5: Approach to EIA**. In general, the sensitivity of the affected receptor is assessed on a scale of high, medium, low and negligible, and the magnitude of change is assessed on a scale of large, medium, small, negligible and no change, as set out in **Chapter 5: Approach to EIA**. It should be noted that these descriptors and classifications have been amended as required to align with the requirements of relevant IAQM guidance.

Operational Phase

Road Vehicle Exhaust Emissions

- 8.2.38. Receptors sensitive to potential changes in off-site pollutant concentrations were identified within 200m of the highway network in accordance with the guidance provided by National Highways (**Ref. 8.7**) on the likely limits of pollutant dispersion from road sources. The criteria provided within DEFRA guidance (**Ref 1.8**) on where the AQOs apply was utilised to determine worst-case receptor positions in the vicinity of links likely to be affected by changes in traffic flows as a result of the Proposed Development.
- 8.2.39. The magnitude of predicted air quality impacts was calculated based on the predicted concentration change between the DM and DS scenarios as a proportion of the AQO or Concentration Target. This is outlined in **Table 8-7**.

Table 8-7 – Road Vehicle Exhaust Emissions – Receptor Sensitivity

Receptor Sensitivity	Pollutant Concentration at Receptor in Assessment Year
Very High	110% or more of AQO/Concentration Target
High	103 - 109% of AQO/Concentration Target
Medium	95 - 102% of AQO/Concentration Target
Low	76 - 94% of AQO/Concentration Target
Very Low	75% or less of AQO/Concentration Target

- 8.2.40. The magnitude of predicted air quality impacts was calculated based on the predicted concentration change between the DM and DS scenarios as a proportion of the AQO or Concentration Target. This is outlined in **Table 8-8**.

Table 8-8 – Road Vehicle Exhaust Emissions – Magnitude of Impact

Predicted Concentration Change as a Proportion of AQO and Concentration Target (%)	Magnitude of Impact
0	Negligible
1	Small
2 – 5	Medium
6 – 10	Large

More than 10	Very Large
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- 8.2.41. It should be noted that the categories shown in **Table 8-8** are intended to be used by rounding the change in percentage pollutant concentration to whole numbers.

EFFECT SIGNIFICANCE

Construction Phase

Fugitive Dust and PM₁₀

- 8.2.42. Site-specific mitigation measures were identified from the IAQM guidance (**Ref. 8.1**) to reduce potential dust impacts based upon the predicted impact risk. The IAQM guidance indicates industry standard procedures are usually effective in minimising dust emissions during construction, hence the residual effect will normally be **negligible**. This is regarded as **not significant** with respect to the Town and Country Planning (Environmental Impact Assessment) Regulations (UK Government, 2017) (**Ref. 8.9**).

Road Vehicle Exhaust Emissions

- 8.2.43. The assessment of effects associated with construction phase road vehicle exhaust emissions was based on the operational phase results, as outlined below.

Operational Phase

Road Vehicle Exhaust Emissions – Human Receptors

- 8.2.44. The significance of operational phase road vehicle exhaust emissions effects was determined through the interaction between the magnitude of impact and sensitivity of the receptor, as outlined in **Table 8-9**.

Table 8-9 – Road Vehicle Exhaust Emissions – Effect Significance

Magnitude	Sensitivity				
	Very High	High	Medium	Low	Very Low
Very Large	Major	Major	Major	Moderate	Moderate
Large	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Small	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

- 8.2.45. The following terms have been used to define the significance of the effects identified and apply to both beneficial and adverse effects:

- **Major effect:** where the Proposed Development could be expected to have a substantial improvement or deterioration on receptors;
- **Moderate effect:** where the Proposed Development could be expected to have a noticeable improvement or deterioration on receptors;
- **Minor effect:** where the Proposed Development could be expected to result in a perceptible improvement or deterioration on receptors; and,
- **Negligible:** where no discernible improvement or deterioration is expected as a result of the Proposed Development on receptors, including instances where no change is confirmed.

- 8.2.46. As set out in **Chapter 5: Approach to EIA**, effects that are classified as **moderate or above** are considered to be **significant**. Effects classified as below **moderate** are considered to be **not significant**.

Road Vehicle Exhaust Emissions - Ecological Receptors

- 8.2.47. The significance of predicted air quality impacts was determined in accordance with the guidance provided within IAQM 'A guide to the assessment of air quality impacts on designated nature conservation sites' (**Ref. 8.6**) and Natural England 'Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations' guidance (**Ref. 8.5**).

8.3 LEGISLATIVE FRAMEWORK, POLICY AND GUIDANCE

LEGISLATIVE FRAMEWORK

- 8.3.1. The applicable legislative framework is summarised as follows, refer to full details in **Appendix 8.2**.
- Air Quality Standards Regulations (Amendments) 2016 (**Ref. 8.10**);
 - Air Quality Strategy 2023 (**Ref. 8.11**);
 - The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 (**Ref. 8.12**);
 - The Environment Act 1995 (**Ref. 8.13**);
 - Environmental Improvement Plan 2025 (**Ref. 8.14**);
 - Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (**Ref. 8.15**); and,
 - The Environment Protection Act 1990 (**Ref. 8.16**).

POLICY

- 8.3.2. The applicable policy framework is summarised as follows:
- National Planning Policy Framework (NPPF) 2024, Chapter 15 (**Ref. 8.17**);
 - Clean Air Strategy 2019 (**Ref. 8.18**);
 - Places for Everyone Plan 2024, Policy JP:S5 and Policy JP-P1 (**Ref. 8.19**); and,
 - Rochdale Local Plan 2016, Core Strategy 2016 – 2028, Policy G9, Policy DM1, Policy DM2 and Policy C6 (**Ref. 8.20**).
- 8.3.3. In addition, this chapter has been prepared in accordance with the Government's National Planning Practice Guidance (**Ref. 8.21**).

GUIDANCE

- 8.3.4. The following guidance documents have been used during the preparation of this chapter:
- DEFRA The Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2011 (**Ref. 8.22**);
 - DEFRA Local Air Quality Management Technical Guidance TG22 (**Ref. 8.8**);
 - IAQM Land-use Planning & Development Control: Planning for Air Quality 2017 (**Ref. 8.2**);
 - Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations 2018 (**Ref. 8.5**);
 - IAQM Guidance on the Assessment of Dust from Demolition and Construction (2024) (**Ref. 8.1**);
 - Greater Manchester Clean Air Plan (CAP) 2022 (**Ref. 8.23**);
 - IAQM A guide to the assessment of air quality impacts on designated nature conservation sites (**Ref. 8.6**); and,

- LA105: National Highways 2024 (**Ref. 8.7**).

8.4 BASELINE CONDITIONS

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

LOCAL AIR QUALITY MANAGEMENT

- 8.4.2. A review of the latest Local Air Quality Management (LAQM) review and assessment report published by RMBC (**Ref. 8.3**) confirmed that there are a number of roads within Rochdale that have been included within the GMCA AQMA due to exceedences of the annual mean AQO for NO₂.
- 8.4.3. The Proposed Development is located approximately 650m to the north of the Rochdale AQMA and 1.3km north-east of the Bury AQMA. As such, there is the potential for vehicles travelling to and from the Site to increase pollution levels in these sensitive areas. This has been considered throughout the assessment. Reference should be made to **Appendix 8.2** for further information.

LOCAL AIR QUALITY MONITORING

- 8.4.4. RMBC and BC have undertaken monitoring of NO₂ concentrations throughout their areas of jurisdiction. Data has also been collected by the GMCA to inform the CAP.
- 8.4.5. Recent annual mean NO₂ concentrations recorded within the vicinity of the Proposed Development were above the AQO of 40µg/m³ at the following positions in recent years:
- BU15NO - Bury New Road/Bury Old Road;
 - CAP_BURY_004 - A56 (Bury New Road);
 - CAP_BURY_006 - A576 (Middleton Road);
 - CAP_BURY_011 - A58 (Bury New Road);
 - CAP_BURY_027- A57;
 - CAP_BURY_028 - Rochdale Road
 - CAP_BURY_029 - Walsh Lane; and,
 - CAP_BURY_033 - A58.
- 8.4.6. The above monitors are positioned adjacent to roads within an AQMA. Elevated pollutant concentrations would therefore be expected. Pollution levels have since fallen below the AQO during 2024. Annual mean NO₂ concentrations were below the AQO at all remaining survey positions during recent years.
- 8.4.7. Recent annual mean PM₁₀ concentrations recorded within the vicinity of the Proposed Development were below the AQO of 40µg/m³.
- 8.4.8. Reference should be made to **Appendix 8.2** for the monitoring results and Error! Reference source not found. for a map of the survey positions.
- 8.4.9. Monitoring of PM_{2.5} concentrations is not undertaken within the vicinity of the Site.

BACKGROUND POLLUTANT CONCENTRATIONS

- 8.4.10. Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist local authorities in their Review and Assessment of air

quality. The Proposed Development Site is located within grid square National Grid Reference (NGR): 384500, 408500. Predicted background concentrations for this location were below the relevant AQOs and Concentration Target.

- 8.4.11. Reference should be made to **Appendix 8.2** for the background concentrations.

FUTURE BASELINE

- 8.4.12. It is currently predicted that air quality will improve in future years. The DEFRA 'Air Pollution in the UK 2024 (**Ref. 8.24**) report published in September 2025 indicates that ambient concentrations of NO₂, as measured by the Automatic Urban and Rural Network (AURN), have demonstrated a downward trend since the AURNs inception in 1992. In addition, in January 2019 the UK Government launched the Clean Air Strategy which included a commitment to end the sale of new diesel and petrol cars and vans by the end of 2030. This will continue to aid the reduction of road vehicle exhaust emissions from combustion engines, including nitrogen oxides (NO_x) and PM₁₀.
- 8.4.13. In order to provide a future baseline for assessment of potential operational stage air quality impacts, future year emission factors were considered within the assessment.

8.5 SENSITIVE RECEPTORS

- 8.5.1. A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a development. The following sensitive receptors have been assessed during the construction and operational phase.

CONSTRUCTION PHASE

- 8.5.2. Receptors sensitive to potential dust impacts during earthworks and construction were identified from a desk-top study of the area up to 250m from the Site boundary. These are summarised in **Table 8-11**.

Table 8-1 – Construction Dust Sensitive Receptors – Earthworks and Construction

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

- 8.5.3. Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 250m of the Site access. These are summarised in **Table 8-11**.

Table 8-11 – Construction Dust Sensitive Receptors – Trackout

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

- 8.5.4. Dust sensitive receptors within 250m of the Site include places of work and residential dwellings. These are considered to be of medium and high sensitivity, respectively. It should be noted that there are no high sensitivity receptors within 100m of the Site boundary and there are only 1 to 10 high sensitivity receptors within 20m of the road network within 250m of the Site access.
- 8.5.5. There are no ecological receptors within 50m of the Site boundary or the access route within 250m of the site entrance. As such, impacts on ecological receptors as a result of fugitive dust emissions during construction have not been considered further.
- 8.5.6. The sensitivity of the receiving environment to dust soiling and human health impacts has been derived from **Table 8-2**, **Table 8-3** and **Table 8-6**, respectively. These are shown in **Table 8-12**.

Table 8-12 – Construction Dust – Sensitivity of the Surrounding Area to Specific Dust Impacts

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

OPERATIONAL PHASE

Human Receptors

- 8.5.7. Locations sensitive to potential operational phase road vehicle exhaust emission impacts were identified from a desk-top study and are summarised in **Table 8-13**. It should be noted that these include locations within the Rochdale and Bury AQMAs. Receptor heights were selected based on the location of residential units to allow for less sensitive land uses, such as retail, at ground level.

Table 8-14 – Operational Phase – Vehicle Exhaust Emissions Sensitive Receptors

Receptor		NGR (m)		Height (m)
		X	Y	
R1	Residential - Warwick Avenue	381794.7	405324.3	1.5
R2	Residential - Hollins Brow	381015.6	408068.6	1.5
R3	Residential - Pilsworth Road	381367.2	408643.0	1.5
R4	Jackson Fold Barn	382520.7	409230.2	1.5
R5	Residential - Waterfold Lane	382208.4	410273.9	1.5
R6	Residential - Rochdale Road	381979.1	410561.4	1.5
R7	Residential - Rochdale Road	381619.4	410704.5	1.5
R8	Hazel Wood High School	382013.9	410807.7	1.5
R9	Residential - Alder Avenue	382151.8	411041.7	1.5
R10	Residential - Ferngrove	382047.6	411681.5	1.5
R11	Residential - Bury New Road	382400.7	410514.1	1.5
R12	Residential - Heap Brow	382728.9	410425.9	1.5
R13	Residential - Moss Hall Road	382942.4	410074.5	1.5

R14	Residential - Moss Hall Road	382908.1	410264.2	1.5
R15	Residential - Bury New Road	384469.3	410760.2	1.5
R16	Residential - Bury New Road	383581.1	410737.0	1.5
R17	Residential - Bridge Street	384972.4	410773.1	1.5
R18	Woodland Community Primary School	384841.6	410412.8	1.5
R19	Residential - Pilsworth Road	384857.1	410137.1	1.5
R20	Coal Pits Farm	383643.9	408867.7	1.5
R21	Siddal Moor Farm	385265.3	409036.8	1.5
R22	Residential - Manchester Road	385781.1	409046.8	1.5
R23	Residential - Manchester Road	385672.5	408763.4	1.5
R24	Residential - Manchester Road	385428.2	408345.0	1.5
R25	Siddal Farm	385769.3	408383.1	1.5
R26	Residential - Coronation Avenue	386096.6	409549.3	1.5
R27	Residential - Coronation Avenue	386280.4	409457.4	1.5
R28	Residential - Manchester Road	386243.2	409862.1	1.5
R29	Highfield Manor Care Home	386178.5	409987.3	1.5
R30	Residential - Church Street	385827.9	410696.5	1.5
R31	Residential - Rochdale Road	386073.7	410731.9	1.5
R32	Residential - Rochdale Road	386582.0	410978.3	1.5
R33	Residential - Market Place	385541.2	410783.0	3.5
R34	Residential - Market Street	385326.6	410812.9	3.5
R35	Residential - Coronation Avenue	386369.8	409203.9	1.5
R36	Residential - Coronation Avenue	386390.2	408996.1	1.5
R37	Residential - Earl Street	388305.5	409756.4	1.5
R38	Residential - Langley Lane	385153.3	407742.5	1.5
R39	Residential - Heywood Old Road	385131.9	407621.3	1.5
R40	Residential - Whittle Lane	384460.5	407794.7	1.5
R41	Whittle Fold Smallholding	384109.4	407437.9	1.5
R42	Egypt Farm	383279.0	406379.7	1.5
R43	Lower Droughts Farm	383392.2	406316.3	1.5
R44	Cowgate Farm	382612.7	406157.5	1.5
R45	Droughts Lane	382956.5	405924.5	1.5
R46	Residential - Heywood Road	382924.7	405694.9	1.5
R47	Heywood Farm	383398.8	405533.9	1.5
R48	Residential - Baguley Crescent	384377.7	404927.5	1.5
R49	Residential - Old Hall Lane	384177.0	404887.7	1.5
R50	Residential - Old Hall Lane	384218.8	404744.3	1.5

R51	Residential - Middleton Road	384534.3	405060.8	1.5
R52	Residential - Manchester Old Road	385215.9	405256.7	1.5
R53	Residential - Heywood Old Road	384442.0	406041.0	1.5
R54	Residential - Hills Lane	382538.5	406788.3	1.5
R55	Unsworth Academy	382166.9	407182.3	1.5
R56	Residential - Plantation Grove	382105.3	407926.8	1.5

8.5.8. All key sensitive receptor locations in relation to air quality are shown on **Figure 8-3**.

Ecological Receptors

- 8.5.9. One ecological receptor sensitive to potential operational phase road vehicle exhaust emission impacts was identified from a desk-top study. This is the Rochdale Canal Special Area of Conservation (SAC) which is located within 10m of a road link subject to changes in traffic flow as a result of the Proposed Development.
- 8.5.10. Reference should be made to Error! Reference source not found. for the receptor location.

8.6 ASSESSMENT OF POTENTIAL EFFECTS, MITIGATION AND RESIDUAL EFFECTS

CONSTRUCTION PHASE - FUGITIVE DUST AND PM₁₀ EMISSIONS

Assessment of Potential Effects

- 8.6.1. Activities such as excavation, ground works, cutting, construction, concrete batching and storage of materials have the potential to result in fugitive dust emissions throughout the construction phase. Vehicle movements both on-Site and on the local road network also have the potential to result in the re-suspension of dust from haul roads and highway surfaces.
- 8.6.2. The potential for effects at sensitive locations depends significantly on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.
- 8.6.3. The desk-top study undertaken to inform the baseline identified a number of sensitive receptors within 250m of the Site boundary. As such, a detailed assessment of potential dust effects has been undertaken.

Earthworks

- 8.6.4. Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as Site levelling and landscaping. The area of the Site is between 18,000m² and 110,000m². In accordance with the criteria outlined in **Table**, the magnitude of potential dust emissions from earthworks is therefore **medium**.
- 8.6.5. As indicated in **Table**, the sensitivity of the study area to dust soiling effects on people and property is **medium**. In accordance with the criteria outlined in Error! Reference source not found., the Proposed Development is considered to be a **medium** risk site for dust soiling as a result of earthworks.

- 8.6.6. As indicated in **Table** , the sensitivity of the study area to human health impacts **low**. In accordance with the criteria outlined in Error! Reference source not found., the Proposed Development is considered to be a **low** risk site for human health receptors as a result of earthworks.

Construction

- 8.6.7. Due to the size of the Proposed Development, the total building volume is likely to be greater than 75,000m³. In accordance with the criteria outlined in **Table** , the magnitude of potential dust emissions from construction is therefore **large**.
- 8.6.8. As indicated in **Table** , the sensitivity of the study area to dust soiling effects on people and property is **medium**. In accordance with the criteria outlined in Error! Reference source not found., the Proposed Development is considered to be a **medium** risk site for dust soiling as a result of construction activities.
- 8.6.9. As indicated in **Table** , the sensitivity of the study area to human health impacts **low**. In accordance with the criteria outlined in Error! Reference source not found. the Proposed Development is considered to be a **low** risk site for human health receptors as a result of construction activities.

Trackout

- 8.6.10. Based on the site area, it is anticipated that the unpaved road length may be greater than 100m during certain stages of construction. In accordance with the criteria outlined in **Table** the magnitude of potential dust emissions from trackout is therefore **large**.
- 8.6.11. As indicated in **Table** , the sensitivity of the study area to dust soiling effects on people and property is **medium**. In accordance with the criteria outlined in Error! Reference source not found., the Proposed Development is considered to be a **medium** risk site for dust soiling as a result of trackout activities.
- 8.6.12. As indicated in **Table** the sensitivity of the study area to human health impacts **low**. In accordance with the criteria outlined in Error! Reference source not found., the Proposed Development is considered to be a **low** risk site for human health receptors as a result of trackout activities.

Mitigation

- 8.6.13. Due to the size and nature of the Proposed Development, a CEMP will be produced to control potential air quality effects during the construction phase. This will include the measures outlined in **Table 8-2** to mitigate fugitive dust emissions during construction. These are based on the advice provided within the IAQM guidance and are therefore considered suitable for the Site.

Table 8-2 – Fugitive Construction Dust Emission Mitigation Measures

Issue	Control Measure
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on Site Display the name and contact details of person(s) accountable for air quality and dust issues on the Site boundary Display the head or regional office contact information Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by RMBC
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 RMBC when requested 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
Monitoring	Carry out regular site inspections, record inspection results, and make an inspection log available to the local authority upon request Increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions
Site preparation	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible Erect solid screens or barriers around dusty activities or the site Fully enclose site or specific operations where there is a high potential for dust production and they are active for an extensive period Avoid site runoff of water or mud Keep site fencing, barriers and scaffolding clean using wet methods Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used Cover, seed or fence stockpiles to prevent wind whipping
Operating vehicle/machinery and sustainable travel	Ensure all vehicles switch off engines when stationary - no idling vehicles Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques Ensure an adequate water supply on the site for effective dust suppression, using non-potable water where possible and appropriate Use enclosed chutes and conveyors and covered skips Minimise drop heights and use fine water sprays wherever appropriate Ensure equipment is available to clean any dry spillages, and clean up spillages as soon as reasonably practicable using wet cleaning methods
Waste management	Avoid bonfires or burning of waste materials
Construction	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out
Trackout	Use water-assisted dust sweeper on access and local roads, if required Avoid dry sweeping of large areas Ensure vehicles entering and leaving site are covered to prevent escape of materials 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 Implement a wheel washing system, if required Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exist, wherever size and layout permits Access gates to be located at least 10m from receptors where possible

Residual Effects

- 8.6.14. Assuming the relevant mitigation measures outlined in **Table 8-2** are implemented, the residual effects from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance (**Ref.1.1**)

Summary

- 8.6.1. A summary of the potential air quality impacts as a result of fugitive dust and PM₁₀ emissions during the construction phase are summarised in **Table 8-**.

Table 8-15 – Assessment of Potential Effects, Additional Mitigation, Residual Effects and Monitoring During the Construction Phase – Fugitive Dust and PM₁₀

Sensitive receptor	Local sensitive receptors
Potential effects	During the construction phase there is the potential for air quality impacts on local residents as a result of fugitive dust and increases in PM ₁₀ emissions from the Proposed Development. The sensitivity of local receptors is medium, and the potential risk of dust soiling and human health impacts is medium and low, respectively. Therefore, there is predicted to be a direct, temporary short-term unmitigated impact on local sensitive receptors.
Additional mitigation	Due to the size and nature of the Proposed Development, a CEMP will be produced to control potential air quality effects during the construction phase. This will include the measures outlined in Table 8-2 to mitigate fugitive dust emissions during construction. These are based on the advice provided within the IAQM guidance (Ref. 8.1) and are therefore considered suitable for the Site
Residual effects and monitoring	Assuming the relevant mitigation measures outlined in Table 8-2 are implemented, the residual impacts from all dust generating activities is predicted to be not significant , in accordance with the IAQM guidance (Ref. 8.1) and there is no requirement for monitoring

CONSTRUCTION PHASE – ROAD VEHICLE EXHAUST EMISSIONS

Assessment of Potential Effects

- 8.6.2. At the time of reporting the number of vehicle trips likely to be generated by the Proposed Development during the construction phase was unknown. However, it is likely that it will be lower than the operational phase due to the scale and nature of the Proposed Development. As such, the results of the operational phase assessment, as outlined below, have been used to represent impacts during construction as a worst-case.
- 8.6.3. As outlined in the section below, effects on annual mean NO₂, PM₁₀ and PM_{2.5} concentrations at sensitive locations were predicted to be **negligible (not significant)** as a result of road vehicle exhaust emissions during the operational phase.

Mitigation

- 8.6.4. Air quality effects as a result of construction phase road vehicle exhaust emissions were predicted to be **not significant**. As such, additional mitigation measures were not considered necessary.

Residual Effects

- 8.6.5. Residual air quality effects as a result of construction phase road vehicle exhaust emissions were predicted to be **not significant**.

Summary

- 8.6.6. A summary of the potential air quality impacts as a result of road vehicle exhaust emissions during the construction phase are summarised in **Table 8-3**.

Table 8-3 – Assessment of Potential Effects, Additional Mitigation, Residual Effects and Monitoring During the Construction Phase – Road Vehicle Exhaust Emissions

Sensitive receptor	Local residents
Potential effects	During the construction phase there is the potential for air quality impacts at sensitive receptors as a result of road vehicle exhaust emissions from the Proposed Development The sensitivity of receptors is very low to low and the magnitude of change is negligible to small. Therefore, there is predicted to be a direct, temporary, short-term negligible effect (not significant)
Additional mitigation	Air quality effects as a result of construction phase road vehicle exhaust emissions were predicted to be not significant . As such, additional mitigation measures were not considered necessary
Residual effects and monitoring	Residual air quality effects as a result of construction phase road vehicle exhaust emissions were predicted to be not significant . As such, there is no requirement for monitoring

OPERATIONAL PHASE - ROAD VEHICLE EXHAUST EMISSIONS – HUMAN RECEPTORS

Assessment of Potential Effects

- 8.6.7. Vehicle movements associated with the operation of the Proposed Development will generate exhaust emissions on the local and regional road networks. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the Site.
- 8.6.8. Reference should be made to **Appendix 1.1** for assessment inputs.

2027 Core Scenario

Predicted Concentrations

- 8.6.9. Annual mean NO₂ concentrations were predicted at the sensitive receptor locations for the 2027 core DM and DS scenarios. The results are summarised in **Table 8-**.

Table 8-7 – Operational Phase Road Vehicle Exhaust Emissions – Predicted Annual Mean NO₂ Concentrations - 2027 Core Scenario

Receptor		Annual Mean NO₂ Concentration (µg/m³)		
		DM	DS	Change
R1	Residential - Warwick Avenue	27.09	27.10	0.01
R2	Residential - Hollins Brow	20.50	20.53	0.03
R3	Residential - Pilsworth Road	20.17	20.19	0.02
R4	Jackson Fold Barn	19.82	19.89	0.07
R5	Residential - Waterfold Lane	20.46	20.47	0.01
R6	Residential - Rochdale Road	24.52	24.54	0.02
R7	Residential - Rochdale Road	24.14	24.18	0.04

R8	Hazel Wood High School	21.65	21.67	0.02
R9	Residential - Alder Avenue	30.64	30.68	0.04
R10	Residential - Ferngrove	32.45	32.50	0.05
R11	Residential - Bury New Road	21.13	21.16	0.03
R12	Residential - Heap Brow	20.14	20.19	0.05
R13	Residential - Moss Hall Road	20.14	20.20	0.06
R14	Residential - Moss Hall Road	18.81	18.85	0.04
R15	Residential - Bury New Road	26.27	26.28	0.01
R16	Residential - Bury New Road	20.37	20.38	0.01
R17	Residential - Bridge Street	26.52	26.67	0.15
R18	Woodland Community Primary School	17.51	17.54	0.03
R19	Residential - Pilsworth Road	22.05	22.23	0.18
R20	Coal Pits Farm	20.44	20.93	0.49
R21	Siddal Moor Farm	18.51	18.53	0.02
R22	Residential - Manchester Road	23.13	23.24	0.11
R23	Residential - Manchester Road	24.01	24.22	0.21
R24	Residential - Manchester Road	38.69	38.83	0.14
R25	Siddal Farm	23.76	23.77	0.01
R26	Residential - Coronation Avenue	23.69	23.75	0.06
R27	Residential - Coronation Avenue	22.10	22.12	0.02
R28	Residential - Manchester Road	20.85	20.93	0.08
R29	Highfield Manor Care Home	18.91	18.95	0.04
R30	Residential - Church Street	23.09	23.14	0.05
R31	Residential - Rochdale Road	21.28	21.39	0.11
R32	Residential - Rochdale Road	20.38	20.48	0.10
R33	Residential - Market Place	20.91	20.95	0.04
R34	Residential - Market Street	20.36	20.40	0.04
R35	Residential - Coronation Avenue	25.88	25.90	0.02
R36	Residential - Coronation Avenue	34.28	34.32	0.04
R37	Residential - Earl Street	24.98	25.03	0.05
R38	Residential - Langley Lane	22.70	22.97	0.27
R39	Residential - Heywood Old Road	20.03	20.15	0.12

R40	Residential - Whittle Lane	29.62	29.70	0.08
R41	Whittle Fold Smallholding	31.69	31.70	0.01
R42	Egypt Farm	32.51	32.51	0.00
R43	Lower Droughts Farm	25.48	25.49	0.01
R44	Cowgate Farm	26.35	26.36	0.01
R45	Droughts Lane	32.10	32.11	0.01
R46	Residential - Heywood Road	24.62	24.63	0.01
R47	Heywood Farm	26.05	26.06	0.01
R48	Residential - Baguley Crescent	31.60	31.61	0.01
R49	Residential - Old Hall Lane	24.41	24.42	0.01
R50	Residential - Old Hall Lane	23.06	23.07	0.01
R51	Residential - Middleton Road	24.96	24.97	0.01
R52	Residential - Manchester Old Road	19.89	19.89	0.00
R53	Residential - Heywood Old Road	20.20	20.22	0.02
R54	Residential - Hills Lane	23.34	23.35	0.01
R55	Unsworth Academy	20.85	20.86	0.01
R56	Residential - Plantation Grove	25.12	25.13	0.01

- 8.6.10. As shown in **Table 8-**, predicted annual mean NO₂ concentrations were below the relevant AQO at all sensitive receptors in both the DM and DS scenarios.
- 8.6.11. Annual mean PM₁₀ concentrations were predicted at the sensitive receptor locations for the 2027 core DM and DS scenarios. The results are summarised in **Table 8-4**.

Table 8-4 – Operational Phase Road Vehicle Exhaust Emissions – Predicted Annual Mean PM₁₀ Concentrations - 2027 Core Scenario

Receptor		Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R1	Residential - Warwick Avenue	13.03	13.03	0.00
R2	Residential - Hollins Brow	12.90	12.90	0.00
R3	Residential - Pilsworth Road	12.86	12.86	0.00
R4	Jackson Fold Barn	12.79	12.80	0.01
R5	Residential - Waterfold Lane	12.76	12.76	0.00
R6	Residential - Rochdale Road	13.00	13.00	0.00
R7	Residential - Rochdale Road	13.15	13.15	0.00
R8	Hazel Wood High School	12.83	12.83	0.00

R9	Residential - Alder Avenue	13.20	13.20	0.00
R10	Residential - Ferngrove	13.28	13.28	0.00
R11	Residential - Bury New Road	12.89	12.89	0.00
R12	Residential - Heap Brow	12.85	12.85	0.00
R13	Residential - Moss Hall Road	12.86	12.86	0.00
R14	Residential - Moss Hall Road	12.76	12.76	0.00
R15	Residential - Bury New Road	13.35	13.35	0.00
R16	Residential - Bury New Road	12.89	12.89	0.00
R17	Residential - Bridge Street	13.26	13.27	0.01
R18	Woodland Community Primary School	12.68	12.69	0.00
R19	Residential - Pilsworth Road	13.01	13.03	0.01
R20	Coal Pits Farm	12.88	12.91	0.04
R21	Siddal Moor Farm	12.72	12.72	0.00
R22	Residential - Manchester Road	13.04	13.05	0.01
R23	Residential - Manchester Road	13.06	13.08	0.02
R24	Residential - Manchester Road	13.74	13.76	0.01
R25	Siddal Farm	12.91	12.91	0.00
R26	Residential - Coronation Avenue	13.08	13.09	0.01
R27	Residential - Coronation Avenue	12.98	12.98	0.00
R28	Residential - Manchester Road	12.91	12.91	0.01
R29	Highfield Manor Care Home	12.77	12.78	0.00
R30	Residential - Church Street	13.08	13.08	0.00
R31	Residential - Rochdale Road	12.96	12.97	0.01
R32	Residential - Rochdale Road	12.90	12.90	0.01
R33	Residential - Market Place	12.89	12.89	0.00
R34	Residential - Market Street	12.85	12.85	0.00
R35	Residential - Coronation Avenue	13.21	13.21	0.00
R36	Residential - Coronation Avenue	13.69	13.69	0.00
R37	Residential - Earl Street	12.97	12.97	0.00
R38	Residential - Langley Lane	13.04	13.06	0.02
R39	Residential - Heywood Old Road	12.85	12.85	0.01
R40	Residential - Whittle Lane	13.17	13.17	0.01

R41	Whittle Fold Smallholding	13.25	13.25	0.00
R42	Egypt Farm	13.29	13.29	0.00
R43	Lower Droughts Farm	12.97	12.97	0.00
R44	Cowgate Farm	13.00	13.00	0.00
R45	Droughts Lane	13.32	13.32	0.00
R46	Residential - Heywood Road	12.92	12.92	0.00
R47	Heywood Farm	12.95	12.95	0.00
R48	Residential - Baguley Crescent	13.37	13.38	0.00
R49	Residential - Old Hall Lane	12.95	12.95	0.00
R50	Residential - Old Hall Lane	13.00	13.00	0.00
R51	Residential - Middleton Road	13.10	13.10	0.00
R52	Residential - Manchester Old Road	12.87	12.87	0.00
R53	Residential - Heywood Old Road	12.86	12.87	0.00
R54	Residential - Hills Lane	12.85	12.85	0.00
R55	Unsworth Academy	12.76	12.76	0.00
R56	Residential - Plantation Grove	12.91	12.91	0.00

- 8.6.12. As shown in **Table 8-4**, predicted annual mean PM₁₀ concentrations were below the relevant AQO at all sensitive receptors in both the DM and DS scenarios.
- 8.6.13. Annual mean PM_{2.5} concentrations were predicted at the sensitive receptor locations for the 2027 core DM and DS scenarios. The results are summarised in **Table 8-**.

Table 8-19 – Operational Phase Road Vehicle Exhaust Emissions – Predicted Annual Mean PM_{2.5} Concentrations - 2027 Core Scenario

Receptor		Annual Mean PM _{2.5} Concentration (µg/m ³)		
		DM	DS	Change
R1	Residential - Warwick Avenue	7.60	7.60	0.00
R2	Residential - Hollins Brow	7.51	7.52	0.00
R3	Residential - Pilsworth Road	7.49	7.49	0.00
R4	Jackson Fold Barn	7.44	7.45	0.00
R5	Residential - Waterfold Lane	7.42	7.42	0.00
R6	Residential - Rochdale Road	7.58	7.58	0.00
R7	Residential - Rochdale Road	7.67	7.68	0.00
R8	Hazel Wood High School	7.47	7.47	0.00
R9	Residential - Alder Avenue	7.71	7.71	0.00

R10	Residential - Ferngrove	7.76	7.76	0.00
R11	Residential - Bury New Road	7.51	7.51	0.00
R12	Residential - Heap Brow	7.48	7.48	0.00
R13	Residential - Moss Hall Road	7.48	7.49	0.00
R14	Residential - Moss Hall Road	7.42	7.42	0.00
R15	Residential - Bury New Road	7.81	7.81	0.00
R16	Residential - Bury New Road	7.51	7.51	0.00
R17	Residential - Bridge Street	7.75	7.76	0.01
R18	Woodland Community Primary School	7.37	7.37	0.00
R19	Residential - Pilsworth Road	7.59	7.60	0.01
R20	Coal Pits Farm	7.50	7.52	0.02
R21	Siddal Moor Farm	7.39	7.40	0.00
R22	Residential - Manchester Road	7.60	7.61	0.01
R23	Residential - Manchester Road	7.62	7.63	0.01
R24	Residential - Manchester Road	8.06	8.07	0.01
R25	Siddal Farm	7.52	7.52	0.00
R26	Residential - Coronation Avenue	7.63	7.64	0.00
R27	Residential - Coronation Avenue	7.56	7.56	0.00
R28	Residential - Manchester Road	7.52	7.52	0.00
R29	Highfield Manor Care Home	7.43	7.43	0.00
R30	Residential - Church Street	7.63	7.63	0.00
R31	Residential - Rochdale Road	7.55	7.56	0.01
R32	Residential - Rochdale Road	7.51	7.52	0.00
R33	Residential - Market Place	7.51	7.51	0.00
R34	Residential - Market Street	7.48	7.48	0.00
R35	Residential - Coronation Avenue	7.71	7.71	0.00
R36	Residential - Coronation Avenue	8.02	8.03	0.00
R37	Residential - Earl Street	7.56	7.56	0.00
R38	Residential - Langley Lane	7.60	7.61	0.01
R39	Residential - Heywood Old Road	7.48	7.48	0.01
R40	Residential - Whittle Lane	7.68	7.69	0.00
R41	Whittle Fold Smallholding	7.74	7.74	0.00

R42	Egypt Farm	7.76	7.76	0.00
R43	Lower Droughts Farm	7.56	7.56	0.00
R44	Cowgate Farm	7.58	7.58	0.00
R45	Droughts Lane	7.78	7.78	0.00
R46	Residential - Heywood Road	7.52	7.52	0.00
R47	Heywood Farm	7.54	7.54	0.00
R48	Residential - Baguley Crescent	7.82	7.82	0.00
R49	Residential - Old Hall Lane	7.54	7.54	0.00
R50	Residential - Old Hall Lane	7.58	7.58	0.00
R51	Residential - Middleton Road	7.64	7.64	0.00
R52	Residential - Manchester Old Road	7.49	7.49	0.00
R53	Residential - Heywood Old Road	7.49	7.49	0.00
R54	Residential - Hills Lane	7.48	7.48	0.00
R55	Unsworth Academy	7.42	7.42	0.00
R56	Residential - Plantation Grove	7.52	7.52	0.00

- 8.6.14. As shown in **Table 8-**, predicted annual mean PM_{2.5} concentrations were below the Concentration Target at all sensitive receptors in both the DM and DS scenarios.

Effect Significance

- 8.6.15. Predicted effects on annual mean NO₂ concentrations at sensitive receptor locations as a result of operational phase road vehicle exhaust emissions during the 2027 core scenario are summarised in **Table 8-5**.

Table 8-5 – Operational Phase Road Vehicle Exhaust Emissions – Effect Significance NO₂ - 2027 Core Scenario

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R1	Residential - Warwick Avenue	Very Low	Negligible	Negligible
R2	Residential - Hollins Brow	Very Low	Negligible	Negligible
R3	Residential - Pilsworth Road	Very Low	Negligible	Negligible
R4	Jackson Fold Barn	Very Low	Negligible	Negligible
R5	Residential - Waterfold Lane	Very Low	Negligible	Negligible
R6	Residential - Rochdale Road	Very Low	Negligible	Negligible
R7	Residential - Rochdale Road	Very Low	Negligible	Negligible
R8	Hazel Wood High School	Very Low	Negligible	Negligible

R9	Residential - Alder Avenue	Low	Negligible	Negligible
R10	Residential - Ferngrove	Low	Negligible	Negligible
R11	Residential - Bury New Road	Very Low	Negligible	Negligible
R12	Residential - Heap Brow	Very Low	Negligible	Negligible
R13	Residential - Moss Hall Road	Very Low	Negligible	Negligible
R14	Residential - Moss Hall Road	Very Low	Negligible	Negligible
R15	Residential - Bury New Road	Very Low	Negligible	Negligible
R16	Residential - Bury New Road	Very Low	Negligible	Negligible
R17	Residential - Bridge Street	Very Low	Negligible	Negligible
R18	Woodland Community Primary School	Very Low	Negligible	Negligible
R19	Residential - Pilsworth Road	Very Low	Negligible	Negligible
R20	Coal Pits Farm	Very Low	Small	Negligible
R21	Siddal Moor Farm	Very Low	Negligible	Negligible
R22	Residential - Manchester Road	Very Low	Negligible	Negligible
R23	Residential - Manchester Road	Very Low	Small	Negligible
R24	Residential - Manchester Road	Medium	Negligible	Negligible
R25	Siddal Farm	Very Low	Negligible	Negligible
R26	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R27	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R28	Residential - Manchester Road	Very Low	Negligible	Negligible
R29	Highfield Manor Care Home	Very Low	Negligible	Negligible
R30	Residential - Church Street	Very Low	Negligible	Negligible
R31	Residential - Rochdale Road	Very Low	Negligible	Negligible
R32	Residential - Rochdale Road	Very Low	Negligible	Negligible
R33	Residential - Market Place	Very Low	Negligible	Negligible
R34	Residential - Market Street	Very Low	Negligible	Negligible
R35	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R36	Residential - Coronation Avenue	Low	Negligible	Negligible
R37	Residential - Earl Street	Very Low	Negligible	Negligible
R38	Residential - Langley Lane	Very Low	Small	Negligible
R39	Residential - Heywood Old Road	Very Low	Negligible	Negligible
R40	Residential - Whittle Lane	Very Low	Negligible	Negligible

R41	Whittle Fold Smallholding	Low	Negligible	Negligible
R42	Egypt Farm	Low	Negligible	Negligible
R43	Lower Droughts Farm	Very Low	Negligible	Negligible
R44	Cowgate Farm	Very Low	Negligible	Negligible
R45	Droughts Lane	Low	Negligible	Negligible
R46	Residential - Heywood Road	Very Low	Negligible	Negligible
R47	Heywood Farm	Very Low	Negligible	Negligible
R48	Residential - Baguley Crescent	Low	Negligible	Negligible
R49	Residential - Old Hall Lane	Very Low	Negligible	Negligible
R50	Residential - Old Hall Lane	Very Low	Negligible	Negligible
R51	Residential - Middleton Road	Very Low	Negligible	Negligible
R52	Residential - Manchester Old Road	Very Low	Negligible	Negligible
R53	Residential - Heywood Old Road	Very Low	Negligible	Negligible
R54	Residential - Hills Lane	Very Low	Negligible	Negligible
R55	Unsworth Academy	Very Low	Negligible	Negligible
R56	Residential - Plantation Grove	Very Low	Negligible	Negligible

- 8.6.16. As shown in **Table 8-5**, effects on annual mean NO₂ concentrations as a result of operational phase road vehicle exhaust emissions were predicted to be **negligible (not significant)** at all receptors.
- 8.6.17. Predicted effects on annual mean PM₁₀ concentrations at sensitive receptor locations as a result of operational phase road vehicle exhaust emissions during the 2027 core scenario are summarised in **Table 8-**.

Table 8-21 – Operational Phase Road Vehicle Exhaust Emissions – Effect Significance PM₁₀ - 2027 Core Scenario

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R1	Residential - Warwick Avenue	Very Low	Negligible	Negligible
R2	Residential - Hollins Brow	Very Low	Negligible	Negligible
R3	Residential - Pilsworth Road	Very Low	Negligible	Negligible
R4	Jackson Fold Barn	Very Low	Negligible	Negligible
R5	Residential - Waterfold Lane	Very Low	Negligible	Negligible
R6	Residential - Rochdale Road	Very Low	Negligible	Negligible
R7	Residential - Rochdale Road	Very Low	Negligible	Negligible
R8	Hazel Wood High School	Very Low	Negligible	Negligible

R9	Residential - Alder Avenue	Very Low	Negligible	Negligible
R10	Residential - Ferngrove	Very Low	Negligible	Negligible
R11	Residential - Bury New Road	Very Low	Negligible	Negligible
R12	Residential - Heap Brow	Very Low	Negligible	Negligible
R13	Residential - Moss Hall Road	Very Low	Negligible	Negligible
R14	Residential - Moss Hall Road	Very Low	Negligible	Negligible
R15	Residential - Bury New Road	Very Low	Negligible	Negligible
R16	Residential - Bury New Road	Very Low	Negligible	Negligible
R17	Residential - Bridge Street	Very Low	Negligible	Negligible
R18	Woodland Community Primary School	Very Low	Negligible	Negligible
R19	Residential - Pilsworth Road	Very Low	Negligible	Negligible
R20	Coal Pits Farm	Very Low	Negligible	Negligible
R21	Siddal Moor Farm	Very Low	Negligible	Negligible
R22	Residential - Manchester Road	Very Low	Negligible	Negligible
R23	Residential - Manchester Road	Very Low	Negligible	Negligible
R24	Residential - Manchester Road	Very Low	Negligible	Negligible
R25	Siddal Farm	Very Low	Negligible	Negligible
R26	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R27	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R28	Residential - Manchester Road	Very Low	Negligible	Negligible
R29	Highfield Manor Care Home	Very Low	Negligible	Negligible
R30	Residential - Church Street	Very Low	Negligible	Negligible
R31	Residential - Rochdale Road	Very Low	Negligible	Negligible
R32	Residential - Rochdale Road	Very Low	Negligible	Negligible
R33	Residential - Market Place	Very Low	Negligible	Negligible
R34	Residential - Market Street	Very Low	Negligible	Negligible
R35	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R36	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R37	Residential - Earl Street	Very Low	Negligible	Negligible
R38	Residential - Langley Lane	Very Low	Negligible	Negligible
R39	Residential - Heywood Old Road	Very Low	Negligible	Negligible
R40	Residential - Whittle Lane	Very Low	Negligible	Negligible

R41	Whittle Fold Smallholding	Very Low	Negligible	Negligible
R42	Egypt Farm	Very Low	Negligible	Negligible
R43	Lower Droughts Farm	Very Low	Negligible	Negligible
R44	Cowgate Farm	Very Low	Negligible	Negligible
R45	Droughts Lane	Very Low	Negligible	Negligible
R46	Residential - Heywood Road	Very Low	Negligible	Negligible
R47	Heywood Farm	Very Low	Negligible	Negligible
R48	Residential - Baguley Crescent	Very Low	Negligible	Negligible
R49	Residential - Old Hall Lane	Very Low	Negligible	Negligible
R50	Residential - Old Hall Lane	Very Low	Negligible	Negligible
R51	Residential - Middleton Road	Very Low	Negligible	Negligible
R52	Residential - Manchester Old Road	Very Low	Negligible	Negligible
R53	Residential - Heywood Old Road	Very Low	Negligible	Negligible
R54	Residential - Hills Lane	Very Low	Negligible	Negligible
R55	Unsworth Academy	Very Low	Negligible	Negligible
R56	Residential - Plantation Grove	Very Low	Negligible	Negligible

- 8.6.18. As shown in **Table 8-**, effects on annual mean PM₁₀ concentrations as a result of operational phase road vehicle exhaust emissions were predicted to be **negligible (not significant)** at all receptors.
- 8.6.19. Predicted effects on annual mean PM_{2.5} concentrations at sensitive receptor locations as a result of operational phase road vehicle exhaust emissions during the 2027 core scenario are summarised in **Table 8-6**.

Table 8-6 – Operational Phase Road Vehicle Exhaust Emissions – Effect Significance PM_{2.5} - 2027 Core Scenario

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R1	Residential - Warwick Avenue	Low	Negligible	Negligible
R2	Residential - Hollins Brow	Low	Negligible	Negligible
R3	Residential - Pilsworth Road	Very Low	Negligible	Negligible
R4	Jackson Fold Barn	Very Low	Negligible	Negligible
R5	Residential - Waterfold Lane	Very Low	Negligible	Negligible
R6	Residential - Rochdale Road	Low	Negligible	Negligible
R7	Residential - Rochdale Road	Low	Negligible	Negligible
R8	Hazel Wood High School	Very Low	Negligible	Negligible

R9	Residential - Alder Avenue	Low	Negligible	Negligible
R10	Residential - Ferngrove	Low	Negligible	Negligible
R11	Residential - Bury New Road	Low	Negligible	Negligible
R12	Residential - Heap Brow	Very Low	Negligible	Negligible
R13	Residential - Moss Hall Road	Very Low	Negligible	Negligible
R14	Residential - Moss Hall Road	Very Low	Negligible	Negligible
R15	Residential - Bury New Road	Low	Negligible	Negligible
R16	Residential - Bury New Road	Low	Negligible	Negligible
R17	Residential - Bridge Street	Low	Negligible	Negligible
R18	Woodland Community Primary School	Very Low	Negligible	Negligible
R19	Residential - Pilsworth Road	Low	Negligible	Negligible
R20	Coal Pits Farm	Low	Negligible	Negligible
R21	Siddal Moor Farm	Very Low	Negligible	Negligible
R22	Residential - Manchester Road	Low	Negligible	Negligible
R23	Residential - Manchester Road	Low	Negligible	Negligible
R24	Residential - Manchester Road	Low	Negligible	Negligible
R25	Siddal Farm	Low	Negligible	Negligible
R26	Residential - Coronation Avenue	Low	Negligible	Negligible
R27	Residential - Coronation Avenue	Low	Negligible	Negligible
R28	Residential - Manchester Road	Low	Negligible	Negligible
R29	Highfield Manor Care Home	Very Low	Negligible	Negligible
R30	Residential - Church Street	Low	Negligible	Negligible
R31	Residential - Rochdale Road	Low	Negligible	Negligible
R32	Residential - Rochdale Road	Low	Negligible	Negligible
R33	Residential - Market Place	Low	Negligible	Negligible
R34	Residential - Market Street	Very Low	Negligible	Negligible
R35	Residential - Coronation Avenue	Low	Negligible	Negligible
R36	Residential - Coronation Avenue	Low	Negligible	Negligible
R37	Residential - Earl Street	Low	Negligible	Negligible
R38	Residential - Langley Lane	Low	Negligible	Negligible
R39	Residential - Heywood Old Road	Very Low	Negligible	Negligible
R40	Residential - Whittle Lane	Low	Negligible	Negligible

R41	Whittle Fold Smallholding	Low	Negligible	Negligible
R42	Egypt Farm	Low	Negligible	Negligible
R43	Lower Droughts Farm	Low	Negligible	Negligible
R44	Cowgate Farm	Low	Negligible	Negligible
R45	Droughts Lane	Low	Negligible	Negligible
R46	Residential - Heywood Road	Low	Negligible	Negligible
R47	Heywood Farm	Low	Negligible	Negligible
R48	Residential - Baguley Crescent	Low	Negligible	Negligible
R49	Residential - Old Hall Lane	Low	Negligible	Negligible
R50	Residential - Old Hall Lane	Low	Negligible	Negligible
R51	Residential - Middleton Road	Low	Negligible	Negligible
R52	Residential - Manchester Old Road	Very Low	Negligible	Negligible
R53	Residential - Heywood Old Road	Very Low	Negligible	Negligible
R54	Residential - Hills Lane	Very Low	Negligible	Negligible
R55	Unsworth Academy	Very Low	Negligible	Negligible
R56	Residential - Plantation Grove	Low	Negligible	Negligible

- 8.6.20. As shown in **Table 8-6**, effects on annual mean PM_{2.5} concentrations as a result of operational phase road vehicle exhaust emissions were predicted to be **negligible (not significant)** at all receptors.

2032 Bus Gate Scenario

Predicted Concentrations

- 8.6.21. Annual mean NO₂ concentrations were predicted at the sensitive receptor locations for the 2032 bus gate DM and DS scenarios. The results are summarised in **Table 8-**.

Table 8-23 – Operational Phase Road Vehicle Exhaust Emissions – Predicted Annual Mean NO₂ Concentrations - 2032 Bus Gate Scenario

Receptor		Annual Mean NO ₂ Concentration (µg/m ³)		
		DM	DS	Change
R1	Residential - Warwick Avenue	20.37	20.37	0.00
R2	Residential - Hollins Brow	17.51	17.52	0.01
R3	Residential - Pilsworth Road	17.35	17.36	0.01
R4	Jackson Fold Barn	17.46	17.50	0.04
R5	Residential - Waterfold Lane	17.44	17.45	0.01
R6	Residential - Rochdale Road	19.35	19.36	0.01

R7	Residential - Rochdale Road	19.31	19.33	0.02
R8	Hazel Wood High School	17.97	17.98	0.01
R9	Residential - Alder Avenue	22.11	22.13	0.02
R10	Residential - Ferngrove	22.98	23.00	0.02
R11	Residential - Bury New Road	17.82	17.83	0.01
R12	Residential - Heap Brow	17.48	17.51	0.03
R13	Residential - Moss Hall Road	17.52	17.55	0.03
R14	Residential - Moss Hall Road	16.82	16.84	0.02
R15	Residential - Bury New Road	20.43	20.44	0.01
R16	Residential - Bury New Road	17.50	17.50	0.00
R17	Residential - Bridge Street	20.62	20.69	0.07
R18	Woodland Community Primary School	16.18	16.19	0.01
R19	Residential - Pilsworth Road	18.53	18.62	0.09
R20	Coal Pits Farm	17.03	17.46	0.43
R21	Siddal Moor Farm	16.73	16.75	0.02
R22	Residential - Manchester Road	18.97	19.03	0.06
R23	Residential - Manchester Road	19.20	19.22	0.02
R24	Residential - Manchester Road	26.46	26.46	0.00
R25	Siddal Farm	18.85	18.85	0.00
R26	Residential - Coronation Avenue	19.10	19.13	0.03
R27	Residential - Coronation Avenue	18.29	18.30	0.01
R28	Residential - Manchester Road	17.74	17.78	0.04
R29	Highfield Manor Care Home	16.81	16.83	0.02
R30	Residential - Church Street	18.78	18.80	0.02
R31	Residential - Rochdale Road	17.90	17.95	0.05
R32	Residential - Rochdale Road	17.46	17.50	0.04
R33	Residential - Market Place	17.72	17.74	0.02
R34	Residential - Market Street	17.49	17.51	0.02
R35	Residential - Coronation Avenue	20.13	20.14	0.01
R36	Residential - Coronation Avenue	24.57	24.60	0.03
R37	Residential - Earl Street	19.37	19.40	0.03
R38	Residential - Langley Lane	18.55	18.56	0.01

R39	Residential - Heywood Old Road	17.23	17.23	0.00
R40	Residential - Whittle Lane	21.60	21.61	0.01
R41	Whittle Fold Smallholding	22.74	22.74	0.00
R42	Egypt Farm	23.15	23.15	0.00
R43	Lower Droughts Farm	19.63	19.63	0.00
R44	Cowgate Farm	20.11	20.11	0.00
R45	Droughts Lane	22.99	22.99	0.00
R46	Residential - Heywood Road	19.29	19.30	0.01
R47	Heywood Farm	20.06	20.06	0.00
R48	Residential - Baguley Crescent	22.88	22.88	0.00
R49	Residential - Old Hall Lane	19.25	19.25	0.00
R50	Residential - Old Hall Lane	18.73	18.73	0.00
R51	Residential - Middleton Road	19.60	19.60	0.00
R52	Residential - Manchester Old Road	17.23	17.23	0.00
R53	Residential - Heywood Old Road	17.40	17.41	0.01
R54	Residential - Hills Lane	18.76	18.77	0.01
R55	Unsworth Academy	17.59	17.60	0.01
R56	Residential - Plantation Grove	19.57	19.58	0.01

8.6.22. As shown in **Table 8-**, predicted annual mean NO₂ concentrations were below the relevant AQO at all sensitive receptors in both the DM and DS scenarios.

8.6.23. Annual mean PM₁₀ concentrations were predicted at the sensitive receptor locations for the 2032 bus gate DM and DS scenarios. The results are summarised in **Table 8-4**.

Table 8-24 – Operational Phase Road Vehicle Exhaust Emissions – Predicted Annual Mean PM₁₀ Concentrations - 2032 Bus Gate Scenario

Receptor		Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R1	Residential - Warwick Avenue	13.03	13.21	0.00
R2	Residential - Hollins Brow	12.88	13.07	0.00
R3	Residential - Pilsworth Road	12.85	13.04	0.00
R4	Jackson Fold Barn	12.82	13.02	0.01
R5	Residential - Waterfold Lane	12.76	12.95	0.00
R6	Residential - Rochdale Road	12.99	13.18	0.00
R7	Residential - Rochdale Road	13.12	13.31	0.00

R8	Hazel Wood High School	12.83	13.02	0.00
R9	Residential - Alder Avenue	13.19	13.38	0.00
R10	Residential - Ferngrove	13.27	13.46	0.00
R11	Residential - Bury New Road	12.88	13.07	0.00
R12	Residential - Heap Brow	12.86	13.05	0.00
R13	Residential - Moss Hall Road	12.87	13.06	0.00
R14	Residential - Moss Hall Road	12.77	12.96	0.00
R15	Residential - Bury New Road	13.32	13.51	0.00
R16	Residential - Bury New Road	12.88	13.06	0.00
R17	Residential - Bridge Street	13.25	13.44	0.01
R18	Woodland Community Primary School	12.69	12.88	0.00
R19	Residential - Pilsworth Road	13.03	13.23	0.01
R20	Coal Pits Farm	12.79	13.04	0.06
R21	Siddal Moor Farm	12.74	12.93	0.00
R22	Residential - Manchester Road	13.06	13.25	0.01
R23	Residential - Manchester Road	13.06	13.25	0.00
R24	Residential - Manchester Road	13.74	13.93	0.00
R25	Siddal Farm	12.90	13.09	0.00
R26	Residential - Coronation Avenue	13.07	13.26	0.00
R27	Residential - Coronation Avenue	12.96	13.15	0.00
R28	Residential - Manchester Road	12.91	13.10	0.01
R29	Highfield Manor Care Home	12.77	12.96	0.00
R30	Residential - Church Street	13.05	13.24	0.00
R31	Residential - Rochdale Road	12.94	13.14	0.01
R32	Residential - Rochdale Road	12.88	13.07	0.01
R33	Residential - Market Place	12.87	13.06	0.00
R34	Residential - Market Street	12.84	13.03	0.00
R35	Residential - Coronation Avenue	13.20	13.39	0.00
R36	Residential - Coronation Avenue	13.69	13.88	0.00
R37	Residential - Earl Street	12.97	13.16	0.00
R38	Residential - Langley Lane	13.02	13.21	0.00
R39	Residential - Heywood Old Road	12.83	13.02	0.00

R40	Residential - Whittle Lane	13.15	13.34	0.00
R41	Whittle Fold Smallholding	13.26	13.45	0.00
R42	Egypt Farm	13.29	13.48	0.00
R43	Lower Droughts Farm	12.96	13.15	0.00
R44	Cowgate Farm	13.00	13.18	0.00
R45	Droughts Lane	13.31	13.50	0.00
R46	Residential - Heywood Road	12.91	13.10	0.00
R47	Heywood Farm	12.95	13.14	0.00
R48	Residential - Baguley Crescent	13.36	13.54	0.00
R49	Residential - Old Hall Lane	12.94	13.13	0.00
R50	Residential - Old Hall Lane	12.99	13.17	0.00
R51	Residential - Middleton Road	13.08	13.27	0.00
R52	Residential - Manchester Old Road	12.85	13.04	0.00
R53	Residential - Heywood Old Road	12.86	13.05	0.00
R54	Residential - Hills Lane	12.86	13.04	0.00
R55	Unsworth Academy	12.76	12.95	0.00
R56	Residential - Plantation Grove	12.91	13.10	0.00

- 8.6.24. As shown in **Table 8-4**, predicted annual mean PM₁₀ concentrations were below the relevant AQO at all sensitive receptors in both the DM and DS scenarios.
- 8.6.25. Annual mean PM_{2.5} concentrations were predicted at the sensitive receptor locations for the 2032 bus gate DM and DS scenarios. The results are summarised in **Table 8-**.

Table 8-25 – Operational Phase Road Vehicle Exhaust Emissions – Predicted Annual Mean PM_{2.5} Concentrations - 2032 Bus Gate Scenario

Receptor		Annual Mean PM _{2.5} Concentration (µg/m ³)		
		DM	DS	Change
R1	Residential - Warwick Avenue	7.59	7.59	0.00
R2	Residential - Hollins Brow	7.50	7.50	0.00
R3	Residential - Pilsworth Road	7.48	7.48	0.00
R4	Jackson Fold Barn	7.46	7.46	0.00
R5	Residential - Waterfold Lane	7.42	7.42	0.00
R6	Residential - Rochdale Road	7.56	7.57	0.00
R7	Residential - Rochdale Road	7.65	7.65	0.00
R8	Hazel Wood High School	7.46	7.46	0.00

R9	Residential - Alder Avenue	7.69	7.69	0.00
R10	Residential - Ferngrove	7.74	7.74	0.00
R11	Residential - Bury New Road	7.50	7.50	0.00
R12	Residential - Heap Brow	7.48	7.49	0.00
R13	Residential - Moss Hall Road	7.49	7.49	0.00
R14	Residential - Moss Hall Road	7.42	7.43	0.00
R15	Residential - Bury New Road	7.78	7.78	0.00
R16	Residential - Bury New Road	7.50	7.50	0.00
R17	Residential - Bridge Street	7.73	7.74	0.01
R18	Woodland Community Primary School	7.37	7.38	0.00
R19	Residential - Pilsworth Road	7.60	7.60	0.01
R20	Coal Pits Farm	7.44	7.48	0.04
R21	Siddal Moor Farm	7.40	7.41	0.00
R22	Residential - Manchester Road	7.61	7.61	0.01
R23	Residential - Manchester Road	7.61	7.61	0.00
R24	Residential - Manchester Road	8.04	8.04	0.00
R25	Siddal Farm	7.51	7.51	0.00
R26	Residential - Coronation Avenue	7.62	7.62	0.00
R27	Residential - Coronation Avenue	7.55	7.55	0.00
R28	Residential - Manchester Road	7.51	7.52	0.00
R29	Highfield Manor Care Home	7.43	7.43	0.00
R30	Residential - Church Street	7.61	7.61	0.00
R31	Residential - Rochdale Road	7.54	7.54	0.01
R32	Residential - Rochdale Road	7.50	7.50	0.00
R33	Residential - Market Place	7.49	7.50	0.00
R34	Residential - Market Street	7.47	7.47	0.00
R35	Residential - Coronation Avenue	7.70	7.70	0.00
R36	Residential - Coronation Avenue	8.01	8.01	0.00
R37	Residential - Earl Street	7.55	7.55	0.00
R38	Residential - Langley Lane	7.59	7.59	0.00
R39	Residential - Heywood Old Road	7.46	7.47	0.00
R40	Residential - Whittle Lane	7.67	7.67	0.00

R41	Whittle Fold Smallholding	7.73	7.73	0.00
R42	Egypt Farm	7.75	7.75	0.00
R43	Lower Droughts Farm	7.54	7.54	0.00
R44	Cowgate Farm	7.57	7.57	0.00
R45	Droughts Lane	7.77	7.77	0.00
R46	Residential - Heywood Road	7.51	7.52	0.00
R47	Heywood Farm	7.54	7.54	0.00
R48	Residential - Baguley Crescent	7.80	7.80	0.00
R49	Residential - Old Hall Lane	7.53	7.53	0.00
R50	Residential - Old Hall Lane	7.56	7.56	0.00
R51	Residential - Middleton Road	7.62	7.63	0.00
R52	Residential - Manchester Old Road	7.48	7.48	0.00
R53	Residential - Heywood Old Road	7.48	7.48	0.00
R54	Residential - Hills Lane	7.48	7.48	0.00
R55	Unsworth Academy	7.42	7.42	0.00
R56	Residential - Plantation Grove	7.51	7.52	0.00

8.6.26. As shown in **Table 8-**, predicted annual mean PM_{2.5} concentrations were below the Concentration Target at all sensitive receptors in both the DM and DS scenarios.

Effect Significance

8.6.27. Predicted effects on annual mean NO₂ concentrations at sensitive receptor locations as a result of operational phase road vehicle exhaust emissions during the 2032 bus gate scenario are summarised in **Table 8-5**.

Table 8-7 – Operational Phase Road Vehicle Exhaust Emissions – Effect Significance NO₂ - 2032 Bus Gate Scenario

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R1	Residential - Warwick Avenue	Very Low	Negligible	Negligible
R2	Residential - Hollins Brow	Very Low	Negligible	Negligible
R3	Residential - Pilsworth Road	Very Low	Negligible	Negligible
R4	Jackson Fold Barn	Very Low	Negligible	Negligible
R5	Residential - Waterfold Lane	Very Low	Negligible	Negligible
R6	Residential - Rochdale Road	Very Low	Negligible	Negligible
R7	Residential - Rochdale Road	Very Low	Negligible	Negligible

R8	Hazel Wood High School	Very Low	Negligible	Negligible
R9	Residential - Alder Avenue	Very Low	Negligible	Negligible
R10	Residential - Ferngrove	Very Low	Negligible	Negligible
R11	Residential - Bury New Road	Very Low	Negligible	Negligible
R12	Residential - Heap Brow	Very Low	Negligible	Negligible
R13	Residential - Moss Hall Road	Very Low	Negligible	Negligible
R14	Residential - Moss Hall Road	Very Low	Negligible	Negligible
R15	Residential - Bury New Road	Very Low	Negligible	Negligible
R16	Residential - Bury New Road	Very Low	Negligible	Negligible
R17	Residential - Bridge Street	Very Low	Negligible	Negligible
R18	Woodland Community Primary School	Very Low	Negligible	Negligible
R19	Residential - Pilsworth Road	Very Low	Negligible	Negligible
R20	Coal Pits Farm	Very Low	Small	Negligible
R21	Siddal Moor Farm	Very Low	Negligible	Negligible
R22	Residential - Manchester Road	Very Low	Negligible	Negligible
R23	Residential - Manchester Road	Very Low	Negligible	Negligible
R24	Residential - Manchester Road	Very Low	Negligible	Negligible
R25	Siddal Farm	Very Low	Negligible	Negligible
R26	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R27	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R28	Residential - Manchester Road	Very Low	Negligible	Negligible
R29	Highfield Manor Care Home	Very Low	Negligible	Negligible
R30	Residential - Church Street	Very Low	Negligible	Negligible
R31	Residential - Rochdale Road	Very Low	Negligible	Negligible
R32	Residential - Rochdale Road	Very Low	Negligible	Negligible
R33	Residential - Market Place	Very Low	Negligible	Negligible
R34	Residential - Market Street	Very Low	Negligible	Negligible
R35	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R36	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R37	Residential - Earl Street	Very Low	Negligible	Negligible
R38	Residential - Langley Lane	Very Low	Negligible	Negligible
R39	Residential - Heywood Old Road	Very Low	Negligible	Negligible

R40	Residential - Whittle Lane	Very Low	Negligible	Negligible
R41	Whittle Fold Smallholding	Very Low	Negligible	Negligible
R42	Egypt Farm	Very Low	Negligible	Negligible
R43	Lower Droughts Farm	Very Low	Negligible	Negligible
R44	Cowgate Farm	Very Low	Negligible	Negligible
R45	Droughts Lane	Very Low	Negligible	Negligible
R46	Residential - Heywood Road	Very Low	Negligible	Negligible
R47	Heywood Farm	Very Low	Negligible	Negligible
R48	Residential - Baguley Crescent	Very Low	Negligible	Negligible
R49	Residential - Old Hall Lane	Very Low	Negligible	Negligible
R50	Residential - Old Hall Lane	Very Low	Negligible	Negligible
R51	Residential - Middleton Road	Very Low	Negligible	Negligible
R52	Residential - Manchester Old Road	Very Low	Negligible	Negligible
R53	Residential - Heywood Old Road	Very Low	Negligible	Negligible
R54	Residential - Hills Lane	Very Low	Negligible	Negligible
R55	Unsworth Academy	Very Low	Negligible	Negligible
R56	Residential - Plantation Grove	Very Low	Negligible	Negligible

- 8.6.28. As shown in **Table 8-5**, effects on annual mean NO₂ concentrations as a result of operational phase road vehicle exhaust emissions were predicted to be **negligible (not significant)** at all receptors.
- 8.6.29. Predicted effects on annual mean PM₁₀ concentrations at sensitive receptor locations as a result of operational phase road vehicle exhaust emissions during the 2032 bus gate scenario are summarised in **Table 8-**.

Table 8-27 – Operational Phase Road Vehicle Exhaust Emissions – Effect Significance PM₁₀ - 2032 Bus Gate Scenario

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R1	Residential - Warwick Avenue	Very Low	Negligible	Negligible
R2	Residential - Hollins Brow	Very Low	Negligible	Negligible
R3	Residential - Pilsworth Road	Very Low	Negligible	Negligible
R4	Jackson Fold Barn	Very Low	Negligible	Negligible
R5	Residential - Waterfold Lane	Very Low	Negligible	Negligible
R6	Residential - Rochdale Road	Very Low	Negligible	Negligible
R7	Residential - Rochdale Road	Very Low	Negligible	Negligible

R8	Hazel Wood High School	Very Low	Negligible	Negligible
R9	Residential - Alder Avenue	Very Low	Negligible	Negligible
R10	Residential - Ferngrove	Very Low	Negligible	Negligible
R11	Residential - Bury New Road	Very Low	Negligible	Negligible
R12	Residential - Heap Brow	Very Low	Negligible	Negligible
R13	Residential - Moss Hall Road	Very Low	Negligible	Negligible
R14	Residential - Moss Hall Road	Very Low	Negligible	Negligible
R15	Residential - Bury New Road	Very Low	Negligible	Negligible
R16	Residential - Bury New Road	Very Low	Negligible	Negligible
R17	Residential - Bridge Street	Very Low	Negligible	Negligible
R18	Woodland Community Primary School	Very Low	Negligible	Negligible
R19	Residential - Pilsworth Road	Very Low	Negligible	Negligible
R20	Coal Pits Farm	Very Low	Negligible	Negligible
R21	Siddal Moor Farm	Very Low	Negligible	Negligible
R22	Residential - Manchester Road	Very Low	Negligible	Negligible
R23	Residential - Manchester Road	Very Low	Negligible	Negligible
R24	Residential - Manchester Road	Very Low	Negligible	Negligible
R25	Siddal Farm	Very Low	Negligible	Negligible
R26	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R27	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R28	Residential - Manchester Road	Very Low	Negligible	Negligible
R29	Highfield Manor Care Home	Very Low	Negligible	Negligible
R30	Residential - Church Street	Very Low	Negligible	Negligible
R31	Residential - Rochdale Road	Very Low	Negligible	Negligible
R32	Residential - Rochdale Road	Very Low	Negligible	Negligible
R33	Residential - Market Place	Very Low	Negligible	Negligible
R34	Residential - Market Street	Very Low	Negligible	Negligible
R35	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R36	Residential - Coronation Avenue	Very Low	Negligible	Negligible
R37	Residential - Earl Street	Very Low	Negligible	Negligible
R38	Residential - Langley Lane	Very Low	Negligible	Negligible
R39	Residential - Heywood Old Road	Very Low	Negligible	Negligible

R40	Residential - Whittle Lane	Very Low	Negligible	Negligible
R41	Whittle Fold Smallholding	Very Low	Negligible	Negligible
R42	Egypt Farm	Very Low	Negligible	Negligible
R43	Lower Droughts Farm	Very Low	Negligible	Negligible
R44	Cowgate Farm	Very Low	Negligible	Negligible
R45	Droughts Lane	Very Low	Negligible	Negligible
R46	Residential - Heywood Road	Very Low	Negligible	Negligible
R47	Heywood Farm	Very Low	Negligible	Negligible
R48	Residential - Baguley Crescent	Very Low	Negligible	Negligible
R49	Residential - Old Hall Lane	Very Low	Negligible	Negligible
R50	Residential - Old Hall Lane	Very Low	Negligible	Negligible
R51	Residential - Middleton Road	Very Low	Negligible	Negligible
R52	Residential - Manchester Old Road	Very Low	Negligible	Negligible
R53	Residential - Heywood Old Road	Very Low	Negligible	Negligible
R54	Residential - Hills Lane	Very Low	Negligible	Negligible
R55	Unsworth Academy	Very Low	Negligible	Negligible
R56	Residential - Plantation Grove	Very Low	Negligible	Negligible

- 8.6.30. As shown in **Table 8-**, effects on annual mean PM₁₀ concentrations as a result of operational phase road vehicle exhaust emissions were predicted to be **negligible (not significant)** at all receptors.
- 8.6.31. Predicted effects on annual mean PM_{2.5} concentrations at sensitive receptor locations as a result of operational phase road vehicle exhaust emissions during the 2032 bus gate scenario are summarised in **Table 8-6**.

Table 8-8 – Operational Phase Road Vehicle Exhaust Emissions – Effect Significance PM_{2.5} - Bus Gate Scenario

Receptor		Sensitivity	Magnitude of Impact	Effect Significance
R1	Residential - Warwick Avenue	Low	Negligible	Negligible
R2	Residential - Hollins Brow	Low	Negligible	Negligible
R3	Residential - Pilsworth Road	Very Low	Negligible	Negligible
R4	Jackson Fold Barn	Very Low	Negligible	Negligible
R5	Residential - Waterfold Lane	Very Low	Negligible	Negligible
R6	Residential - Rochdale Road	Low	Negligible	Negligible
R7	Residential - Rochdale Road	Low	Negligible	Negligible

R8	Hazel Wood High School	Very Low	Negligible	Negligible
R9	Residential - Alder Avenue	Low	Negligible	Negligible
R10	Residential - Ferngrove	Low	Negligible	Negligible
R11	Residential - Bury New Road	Very Low	Negligible	Negligible
R12	Residential - Heap Brow	Very Low	Negligible	Negligible
R13	Residential - Moss Hall Road	Very Low	Negligible	Negligible
R14	Residential - Moss Hall Road	Very Low	Negligible	Negligible
R15	Residential - Bury New Road	Low	Negligible	Negligible
R16	Residential - Bury New Road	Very Low	Negligible	Negligible
R17	Residential - Bridge Street	Low	Negligible	Negligible
R18	Woodland Community Primary School	Very Low	Negligible	Negligible
R19	Residential - Pilsworth Road	Low	Negligible	Negligible
R20	Coal Pits Farm	Very Low	Negligible	Negligible
R21	Siddal Moor Farm	Very Low	Negligible	Negligible
R22	Residential - Manchester Road	Low	Negligible	Negligible
R23	Residential - Manchester Road	Low	Negligible	Negligible
R24	Residential - Manchester Road	Low	Negligible	Negligible
R25	Siddal Farm	Low	Negligible	Negligible
R26	Residential - Coronation Avenue	Low	Negligible	Negligible
R27	Residential - Coronation Avenue	Low	Negligible	Negligible
R28	Residential - Manchester Road	Low	Negligible	Negligible
R29	Highfield Manor Care Home	Very Low	Negligible	Negligible
R30	Residential - Church Street	Low	Negligible	Negligible
R31	Residential - Rochdale Road	Low	Negligible	Negligible
R32	Residential - Rochdale Road	Low	Negligible	Negligible
R33	Residential - Market Place	Very Low	Negligible	Negligible
R34	Residential - Market Street	Very Low	Negligible	Negligible
R35	Residential - Coronation Avenue	Low	Negligible	Negligible
R36	Residential - Coronation Avenue	Low	Negligible	Negligible
R37	Residential - Earl Street	Low	Negligible	Negligible
R38	Residential - Langley Lane	Low	Negligible	Negligible
R39	Residential - Heywood Old Road	Very Low	Negligible	Negligible

R40	Residential - Whittle Lane	Low	Negligible	Negligible
R41	Whittle Fold Smallholding	Low	Negligible	Negligible
R42	Egypt Farm	Low	Negligible	Negligible
R43	Lower Droughts Farm	Low	Negligible	Negligible
R44	Cowgate Farm	Low	Negligible	Negligible
R45	Droughts Lane	Low	Negligible	Negligible
R46	Residential - Heywood Road	Low	Negligible	Negligible
R47	Heywood Farm	Low	Negligible	Negligible
R48	Residential - Baguley Crescent	Low	Negligible	Negligible
R49	Residential - Old Hall Lane	Low	Negligible	Negligible
R50	Residential - Old Hall Lane	Low	Negligible	Negligible
R51	Residential - Middleton Road	Low	Negligible	Negligible
R52	Residential - Manchester Old Road	Very Low	Negligible	Negligible
R53	Residential - Heywood Old Road	Very Low	Negligible	Negligible
R54	Residential - Hills Lane	Very Low	Negligible	Negligible
R55	Unsworth Academy	Very Low	Negligible	Negligible
R56	Residential - Plantation Grove	Low	Negligible	Negligible

8.6.32. As shown in **Table 8-6**, effects on annual mean PM_{2.5} concentrations as a result of operational phase road vehicle exhaust emissions were predicted to be **negligible (not significant)** at all receptors.

Mitigation

8.6.33. Air quality effects as a result of operational phase road vehicle exhaust emissions were predicted to be **not significant**. As such, additional mitigation was not considered necessary. However, a number of measures have been proposed in accordance with the requirements of the IAQM guidance (**Ref.1.1**) to encourage the use of sustainable transport modes, manage vehicle flow and reduce pollution around the Site. These include the following:

- Provision of secure cycle parking spaces;
- Provision of EV charging points.

8.6.34. The above methods can be secured through planning condition and would further reduce the overall pollutant burden of the Proposed Development.

Residual Effects

8.6.35. Following the effective implementation of the mitigation measures, the residual effects are predicted to be **not significant** during the operational phase.

Summary

- 8.6.36. A summary of the potential air quality impacts as a result of road vehicle exhaust emissions on human receptors during the construction phase are summarised in **Table 8-9**.

Table 8-9 – Assessment of Potential Effects, Additional Mitigation, Residual Effects and Monitoring During the Operational Phase – Road Vehicle Exhaust Emissions – Human Receptors

Sensitive receptor	Local sensitive receptors
Potential effects	During the operational phase there is the potential for air quality impacts on local residents as a result of road vehicle exhaust emissions from the Proposed Development The sensitivity of receptors is very low to low and the magnitude of change is negligible to small. Therefore, there is predicted to be a direct, long-term negligible effect (not significant)
Additional mitigation	Air quality effects as a result of operational phase road vehicle exhaust emissions were predicted to be not significant . As such, additional mitigation measures were not considered necessary. However, a number of measures have been included within the Proposed Development and can be secured by RMBC through a planning condition, if required
Residual effects and monitoring	Residual air quality effects as a result of operational phase road vehicle exhaust emissions were predicted to be not significant . As such, there is no requirement for monitoring

OPERATIONAL PHASE – ROAD VEHICLE EXHAUST EMISSIONS – ECOLOGICAL RECEPTORS

Assessment of Potential Effects

- 8.6.37. Any vehicle movements associated with the Proposed Development will generate exhaust emissions on the local and regional road networks. Potential impacts on ecological designations are therefore considered in the following Sections.

Step 1a

- 8.6.38. Step 1a required identification of ecological designations for inclusion with the assessment. A desktop study indicated that following site should be considered:

- Rochdale Canal – SAC

- 8.6.39. Information from the Air Pollution Information System (APIS) website indicated that the designation contains features sensitive to atmospheric pollution. As shown in Error! Reference source not found., the designation is located within 200m of the M62, eastbound and westbound, which is affected by traffic generated by the Proposed Development:

- 8.6.40. Based on the above, the assessment proceeded to Step 1b.

Step 1b

- 8.6.41. Predicted vehicle trip generation from the Proposed Development on the listed roads was provided by Axis P.E.G Ltd, the Transport Consultants for the project. This is summarised in **Table** .

Table 8-30 – Operational Phase – Predicted Development Alone Change in AADT Flows

Scenario	Link	Predicted Change in AADT Flow as a Result of the Development Alone
2027 Core	M62 Eastbound	311
	M62 Westbound	307
2032 Bus gate	M62 Eastbound	316
	M62 Westbound	312

- 8.6.42. As shown in **Table** , the Proposed Development is not predicted to increase traffic flows in the vicinity of the Rochdale Canal SAC by more than 1,000. As such, a likely significant effect from the development alone can be ruled out and the assessment proceeded to Step 2.

Step 2

- 8.6.1. Cumulative vehicle trip generation from the Proposed Development and the relevant committed development on the listed roads was provided by Axis P.E.G Ltd, the Transport Consultants for the project. This is summarised in **Table** .

Table 8-31 – Operational Phase – Cumulative Development Change in AADT Flows

Scenario	Link	Predicted Change in AADT Flow as a Result of the Development Alone
2027 Core	M62 Eastbound	576
	M62 Westbound	1,177
2032 Bus gate	M62 Eastbound	582
	M62 Westbound	1,182

- 8.6.2. As shown in **Table 8-31**, the Proposed Development in combination with other committed developments is predicted to increase traffic flows in the vicinity of the Rochdale Canal SAC by more than 1,000. However, as the Proposed Development is located within JPA allocation 1.1 Northern Gateway a significant effect in-combination with other relevant plans was considered within the HRA undertaken by Ricardo Energy & Environment and The Greater Manchester Ecology Team in support of the PfE Plan (**Ref.1.4**). This included an Appropriate Assessment to determine the potential for air quality impacts at the Rochdale Canal SAC as a result of all PfE Plan allocations in-combination with other plans and projects. This indicated that the PfE Plans alone would have no adverse effect on the integrity of any of the Rochdale Canal SAC. As such, a likely significant effect from the Proposed Development in-combination can be ruled out.

Conclusion

- 8.6.3. Based on the above, air quality effects as a result of operational phase road vehicle exhaust emissions at ecological designations are predicted to be **not significant**

Mitigation

- 8.6.4. Air quality effects as a result of operational phase road vehicle exhaust emissions at ecological designations were predicted to be **not significant**. As such, additional mitigation was not considered necessary.

Residual Effects

- 8.6.5. Residual air quality effects at ecological designations as a result of operational phase road vehicle exhaust emissions were predicted to be **not significant**.

Summary

- 8.6.6. A summary of the potential air quality effects as a result of road vehicle exhaust emissions on ecological receptors during the operational phase are summarised in Error! Reference source not found..

Table 8-10 – Assessment of Potential Effects, Additional Mitigation, Residual Effects and Monitoring During the Operational Phase – Road Vehicle Exhaust Emissions – Ecological Receptors

Sensitive receptor	Rochdale Canal SAC
Potential effects	During the operational phase there is the potential for air quality impacts on the Rochdale Canal SAC as a result of road vehicle exhaust emissions from the Proposed Development Review of the HRA conducted to support the HRA PfE Plan indicated that a likely significant effect of operational phase road vehicle exhaust emissions from the Proposed Development in-combination could be ruled out. As such, effects are predicted to be not significant
Additional mitigation	Air quality effects as a result of operational phase road vehicle exhaust emissions were predicted to be not significant . As such, additional mitigation measures were not considered necessary
Residual effects and monitoring	Residual air quality effects as a result of operational phase road vehicle exhaust emissions were predicted to be not significant . As such, there is no requirement for monitoring

INTERIM PLANNING GUIDANCE FOR PM_{2.5}

- 8.6.7. Interim Planning Guidance on the consideration of the PM_{2.5} targets identified in the Environment Act (2021) in planning decisions has been produced by DEFRA. This requires evidence that the key sources of air pollution within a development have been identified and appropriate action to minimise PM_{2.5} and its precursors as far as is reasonably practicable be provided in support of planning applications. To assist the process, two questions and associated considerations are provided. These are summarised in **Table 8-11** below, along with the development response.

Table 8-11 – Interim Planning Guidance for PM_{2.5}

Question	Response
How has exposure to PM_{2.5} been considered when selecting the development site? •Site proximity to people (particularly large populations and/or vulnerable groups, e.g. schools, hospitals, care homes, areas of deprivation) and the impact of the development on these	The Site is located in a predominantly industrial area, with Birch Business Park to the west. There are no schools, hospitals or care homes in the vicinity of the Site. As shown in Section 8.6, potential air quality impacts as a result of road vehicle exhaust emissions were predicted to be not significant

•Site proximity to pollution sources and the impact of these on users of the development •Exposure and emissions during both construction and in-use	The Proposed Development comprises industrial land use, which is not considered sensitive to long-term pollutant exposure As outlined in Table 8-2, a number of mitigation measures will be used throughout the construction phase in order to reduce fugitive dust emissions as far as practicable. This will control potential exposure at off-site locations
What actions and/or mitigations have been considered to reduce PM_{2.5} exposure for development users and nearby receptors (houses, hospitals, schools etc.) and to reduce emissions of PM_{2.5} and its precursors? •Site layout •The development's design •Technology used in the construction or installed for use in the development •Construction and future use of the development	In order to reduce emissions of PM_{2.5} with associated impacts at nearby receptors, the following measures have also been included: • Provision of electric vehicle charging • Secure cycle storage Further to the above, in order to reduce emissions during the construction phase, a number of mitigation measures will be used to minimise dust generation from associated activities

- 8.6.8. Based on the responses provided in **Table 8-11** and the results of the assessment, as outlined previously, it is considered that the proposal has identified key sources of air pollution and taken appropriate action to minimise emissions of PM_{2.5}.

ASSESSMENT AGAINST FUTURE BASELINE

- 8.6.9. Pollutant concentrations will vary in the future when compared to the baseline scenario. This is because of projected improvements in vehicle emissions and variations in traffic distribution across the road network, as well as the implementation of new policies and strategies, potential new road schemes for the area, changing attitudes towards driving, and improvements in fuel and vehicle technology.
- 8.6.10. As part of the operational phase assessment, future air quality was assessed against future year conditions associated with the operational phase of the Proposed Development. As shown in the Assessment Section, annual mean NO₂, PM₁₀ and PM_{2.5} concentrations were predicted to be below the relevant AQOs and Concentration Target at all receptors in all scenarios. As such, future conditions have been appropriately considered throughout the assessment.

CUMULATIVE EFFECTS

Construction Phase

- 8.6.11. Should permission be granted for other committed developments within 500m of the Site, it is possible that cumulative dust effects may occur during construction. However, fugitive dust emissions associated with the Proposed Development will be minimised through the outlined mitigation measures. A similar level of control would also be expected for any other scheme. Therefore, cumulative effects are predicted to be **not significant**.

Operational Phase

- 8.6.12. Cumulative vehicle exhaust emission effects may occur during operation as a result of additional traffic movements associated with committed developments in the vicinity of the Site. However, the

traffic data utilised for the assessment included predicted changes in flows as a result of relevant committed developments. As outlined previously, effects were predicted to be **not significant**. As such, cumulative effects are also predicted to be **not significant**.

8.7 OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT

8.7.1. No opportunities for environmental enhancement were identified during the assessment.

8.8 DIFFICULTIES AND UNCERTAINTIES

8.8.1. A number of assumptions have been made during the undertaking of the assessment. These include the following:

- The meteorological data used for the assessment is representative of the conditions at the site. Records were obtained based on a review of available observation locations to ensure the most representative record station was selected;
- Background pollutant concentrations used for the assessment are representative of baseline and future baseline annual mean pollutant concentrations in the vicinity of the Site. These values were obtained from the DEFRA background mapping study, an industry standard database produced on behalf of the UK Government, to ensure the most accurate representation of background pollutant concentrations;
- Road traffic emissions of NO_x are predicted to decrease in future years with changes to the UK's fleet in line with Government legislation. The relevant predictions from DEFRA were therefore utilised throughout the assessment in accordance with best practice;
- The traffic data obtained for the purpose of the assessment is accurate. These values were provided by Axis P.E.G Ltd, the Transport Consultants for the project. The data is therefore considered suitable for an assessment of this nature;
- Baseline traffic data was not available from Axis P.E.G Ltd for a number of roads within the model extents and was therefore supplemented with data from the Department for Transport (DfT) (**Ref. 8.26**). The DfT web tool is referenced in DEFRA guidance (**Ref. 8.8**) as being a suitable source of data for air quality assessments and it is therefore considered to provide a reasonable estimate of traffic flows in the vicinity of the Site; and,
- The monitoring data used in the assessment is accurate. The results were obtained from GMCA's '2024 Air Quality ASR' which have been ratified by DEFRA and are therefore considered valid.

8.8.2. The above assumptions are similar to those required for any project of this nature and the adoption of worst-case parameters, where necessary, has ensured the assessment results can be considered sufficiently robust.

8.9 SUMMARY

8.9.1. **Table 8-29** provides a summary of the findings of the assessment.

Table 8.29 - Summary of effects

Receptor	Potential Effects	Significance of Effects Prior to Mitigation/Enhancement	Additional Mitigation	Residual Effects	Monitoring
Construction Phase - Fugitive Dust and PM₁₀					
Dust soiling and human health receptors	Dust soiling and increases in PM ₁₀ concentrations a result of fugitive dust emissions	Medium risk of dust soiling for earthworks, construction and trackout Low risk of human health impacts from earthworks, construction and trackout (not significant) T / D / ST	CEMP	Not significant T / D / ST	No requirement
Construction Phase – Road Vehicle Exhaust Emissions					
Local residents	Increases in NO ₂ , PM ₁₀ and PM _{2.5} concentrations associated with vehicle exhaust emissions	Negligible (not significant) T / D / ST	None	Negligible (not significant) T / D / ST	No requirement
Operational Phase – Road Vehicle Exhaust Emissions – Human Receptors					
Local residents	Increases in NO ₂ , PM ₁₀ and PM _{2.5} concentrations associated with vehicle exhaust emissions	Negligible (not significant) P / D / LT	Additional mitigation was not considered necessary. However, a number of measures have been included. These can be secured through a planning condition by RBC	Negligible (not significant) P / D / LT	No requirement
Operational Phase – Road Vehicle Exhaust Emissions – Ecological Receptors					
Rochdale Canal SAC	Changes in pollutant	Not Significant	None	Not Significant	No requirement

Receptor	Potential Effects	Significance of Effects Prior to Mitigation/Enhancement	Additional Mitigation	Residual Effects	Monitoring
	levels as a result of vehicle exhaust emissions				

Key to table:

P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short Term, Medium Term or Long Term, N/A = Not Applicable

8.10 REFERENCES

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