

Air Quality Assessment
Soothill Lane, Batley

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Prepared by	Pearl Poulton	Pearl Poulton	Pearl Hutchinson	
Position	Air Quality Consultant	Air Quality Consultant	Senior Air Quality Consultant	
Reviewed by	Emily Pears-Ryding	Emily Pears-Ryding	Jethro Redmore	
Position	Senior Air Quality Consultant	Senior Air Quality Consultant	Director	
Authorised by	Jethro Redmore	Jethro Redmore	Jethro Redmore	
Position	Director	Director	Director	
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Heliport Business Park, Liverpool Road, Manchester, M30 7RU

info@red-env.co.uk | 0161 706 0075 | www.red-env.co.uk

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Executive Summary

Redmore Environmental Ltd was commissioned by Kirklees Council to undertake an Air Quality Assessment in support of a planning application for a residential development on land off Soothill Lane, Batley.

The proposals have the potential to cause air quality impacts as a result of fugitive dust emissions during construction and road traffic exhaust emissions associated with vehicles travelling to and from the site during operation. As such, an Air Quality Assessment was required in order to determine baseline conditions and assess potential effects as a result of the scheme.

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

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

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

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

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1.0 INTRODUCTION

1.1 Background

1.1.1 Redmore Environmental Ltd was commissioned by Kirklees Council to undertake an Air Quality Assessment in support of a planning application for a residential development on land off Soothill Lane, Batley.

1.1.2 The proposed development has the potential to cause air quality impacts at sensitive locations during the construction and operational phases. As such, an Air Quality Assessment was required in order to determine baseline conditions and assess potential effects associated with the scheme.

1.2 Site Location and Context

1.2.1 The site is located on land off Soothill Lane, Batley, at approximate National Grid Reference (NGR): 425885, 423972. Reference should be made to Figure 1 for a map of the site and surrounding area.

1.2.2 The proposals comprise a residential development and associated infrastructure.

1.2.3 The development has the potential to cause air quality impacts at sensitive locations. These may include fugitive dust emissions associated with construction works and road traffic exhaust emissions from vehicles travelling to and from the site during the operational phase. An Air Quality Assessment was therefore undertaken in order to determine baseline conditions and consider potential effects as a result of the proposals. This is detailed in the following report.

2.0 LEGISLATION AND POLICY

2.1 European Directives

2.1.1 European Union (EU) air quality legislation is provided within Directive 2008/50/EC, which came into force on 11th June 2008. This Directive consolidated previous legislation which was designed to deal with specific pollutants in a consistent manner and provided new Air Quality Limit Values (AQLVs) for particulate matter with an aerodynamic diameter of less than 2.5µm. The consolidated Directives include:

- Directive 1999/30/EC - the First Air Quality "Daughter" Directive - sets ambient AQLVs for nitrogen dioxide (NO₂), oxides of nitrogen (NO_x), sulphur dioxide, lead and particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀);
- Directive 2000/69/EC - the Second Air Quality "Daughter" Directive - sets ambient AQLVs for benzene and carbon monoxide; and,
- Directive 2002/3/EC - the Third Air Quality "Daughter" Directive - seeks to establish long-term objectives, target values, an alert threshold and an information threshold for concentrations of ozone in ambient air.

2.1.2 The fourth daughter Directive was not included within the consolidation and is described as:

- Directive 2004/107/EC - sets health-based limits on polycyclic aromatic hydrocarbons, cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable.

2.2 UK Legislation

2.2.1 The Air Quality Standards Regulations (2010) came into force on 11th June 2010 and transpose EU Directive 2008/50/EC into UK law. AQLVs were published in these regulations for 7 pollutants, as well as Air Quality Target Values for an additional 5 pollutants.

2.2.2 Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for

Environment, Food and Rural Affairs (DEFRA) and published in July 2007¹. The AQS sets out Air Quality Objectives (AQOs) that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

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

Table 1 Air Quality Objectives

Pollutant	Air Quality Objective	
	Concentration (µg/m ³)	Averaging Period
NO ₂	40	Annual mean
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
PM ₁₀	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum

2.2.4 Table 2 summarises the advice provided in DEFRA guidance² on where the AQOs for pollutants considered within this report apply.

Table 2 Examples of Where the Air Quality Objectives Apply

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

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

² Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
24-hour mean	All locations where the annual mean objective would apply, together with hotels Gardens of residential properties	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

2.3 **Local Air Quality Management**

- 2.3.1 Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure, as summarised in Table 2, are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.4 **Dust**

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

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

2.4.2 Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (1990). Enforcement can insist that there be no dust beyond the boundary of the works. The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practicable means.

2.5 National Planning Policy

2.5.1 The revised National Planning Policy Framework³ (NPPF) was published in July 2018 and sets out the Government's planning policies for England and how these are expected to be applied.

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

"c) An environmental objective - to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adaption to climate change, including moving to a low carbon economy."

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

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

[...]

³ NPPF, Ministry of House, Communities and Local Government, 2018.

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

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

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

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

2.6 National Planning Practice Guidance

2.6.1 The National Planning Practice Guidance⁴ (NPPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

1. Why should planning be concerned about air quality?
2. What is the role of Local Plans with regard to air quality?
3. Are air quality concerns relevant to neighbourhood planning?
4. What information is available about air quality?

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

5. When could air quality be relevant to a planning decision?
6. Where to start if bringing forward a proposal where air quality could be a concern?
7. How detailed does an air quality assessment need to be?
8. How can an impact on air quality be mitigated?
9. How do considerations about air quality fit into the development management process?

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

2.7 Local Planning Policy

2.7.1 The Kirklees Local Plan (KLP) was adopted by KC on 27th February 2019. The KLP sets out the spatial vision and strategy for the development of Kirklees for the period up to 2031 and is used to guide decisions on planning, development and regeneration.

2.7.2 A review of the KLP indicated the following policies in relation to air quality that are relevant to this assessment:

"Policy PLP 47 - Healthy, active and safe lifestyles

The council will, with its partners, create an environment which supports healthy, active and safe communities and reduces inequality.

Healthy, active and safe lifestyles will be enabled by:

[...]

g. ensuring that the current air quality in the district is monitored and maintained and, where required, appropriate mitigation measures included as part of new development proposals; [...]"

"Policy PLP 51 - Protection and improvement of local air quality

1. Development will be expected to demonstrate that it is not likely to result, directly or indirectly, in an increase in air pollution which would unacceptably affect or cause a nuisance to the national or build environment or to people.

2. Proposals that have the potential to increase local air pollution either individually or cumulatively must be accompanied by evidence to show that the impact of the development has been assessed in accordance with the relevant guidance. Development which has the potential to cause levels of local air pollution to increase to unsafe levels must incorporate sustainable mitigation measures that reduce this impact to a safe level. If sustainable measures cannot be introduced the development will not be permitted.

3. Where the development introduces new receptors into Air Quality Management Areas or Areas of Concern or near other areas of relatively poor air quality, for example near roads or junctions, the development must incorporate sustainable mitigation measures that protect the new receptors from unacceptable levels of air pollution. Where sustainable mitigation measures cannot be introduced which prevent receptors from being exposed to unsafe levels of air pollution, development will not be permitted."

2.7.3 The above policies were taken into consideration throughout the undertaking of the assessment.

3.0 METHODOLOGY

3.1 Introduction

3.1.1 The proposed development has the potential to cause air quality impacts during the construction and operational phases. These have been assessed in accordance with the following methodology.

3.2 Construction Phase Assessment

3.2.1 There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction V1.1'⁵.

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

- Earthworks;
- Construction; and,
- Trackout.

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

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

3.2.4 The assessment steps are detailed below.

⁵ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

Step 1

- 3.2.5 Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the boundary or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment proceeds to Step 2. Additionally, should ecological receptors be identified within 50m of the site or the construction vehicle route up to 500m from the site entrance, then the assessment also proceeds to Step 2.
- 3.2.6 Should sensitive receptors not be present within the relevant distances then **negligible** impacts would be expected and further assessment is not necessary.

Step 2

- 3.2.7 Step 2 assesses the risk of potential dust impacts. A site is allocated a risk category based on two factors:
- The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large (Step 2A); and,
 - The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (Step 2B).
- 3.2.8 The two factors are combined in Step 2C to determine the risk of dust impacts without mitigation applied.
- 3.2.9 Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table 3.

Table 3 Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Earthworks	• Total site area greater than 10,000m² • Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) • More than 10 heavy earth moving vehicles active at any one time • Formation of bunds greater than 8m in height • More than 100,000 tonnes of material moved

Magnitude	Activity	Criteria
	Construction	- Total building volume greater than 100,000m³ - On site concrete batching - Sandblasting
	Trackout	- More than 50 Heavy Duty Vehicle (HDV) trips per day - Potentially dusty surface material (e.g. high clay content) - Unpaved road length greater than 100m
Medium	Earthworks	- Total site area 2,500m² to 10,000m² - Moderately dusty soil type (e.g. silt) 5 to 10 heavy earth moving vehicles active at any one time - Formation of bunds 4m to 8m in height - Total material moved 20,000 tonnes to 100,000 tonnes
	Construction	- Total building volume 25,000m³ to 100,000m³ - Potentially dusty construction material (e.g. concrete) - On site concrete batching
	Trackout	10 to 50 HDV trips per day - Moderately dusty surface material (e.g. high clay content) - Unpaved road length 50m to 100m
Small	Earthworks	- Total site area less than 2,500m² - Soil type with large grain size (e.g. sand) - Less than 5 heavy earth moving vehicles active at any one time - Formation of bunds less than 4m in height - Total material moved less than 20,000 tonnes - Earthworks during wetter months
	Construction	- Total building volume less than 25,000m³ - Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	- Less than 10 HDV trips per day - Surface material with low potential for dust release - Unpaved road length less than 50m

3.2.13 Step 2B defines the sensitivity of the area around the development to potential dust impacts. The influencing factors are shown in Table 4.

Table 4 Construction Dust - Examples of Factors Defining Sensitivity of an Area

Receptor Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	• Users expect high levels of amenity • High aesthetic or value property • People expected to be present continuously for extended periods of time • Locations where members of the public are exposed over a time period relevant to the AQO for PM₁₀. e.g. residential properties, hospitals, schools and residential care homes	• Internationally or nationally designated site e.g. Special Area of Conservation
Medium	• Users would expect to enjoy a reasonable level of amenity • Aesthetics or value of their property could be diminished by soiling • People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work	• Nationally designated site e.g. Sites of Special Scientific Interest
Low	• Enjoyment of amenity would not reasonably be expected • Property would not be expected to be diminished in appearance • Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, farmland, short term car parks and roads	• Locally designated site e.g. Local Nature Reserve

3.2.14 The guidance also provides the following factors to consider when determining the sensitivity of an area to potential dust impacts:

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

- Any known specific receptor sensitivities which go beyond the classifications given in the document.

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

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

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

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

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

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

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
High	Greater than 32µg/m ³	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m ³	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
	24 - 28µg/m ³	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	Less than 24µg/m ³	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	Medium	Greater than 32µg/m ³	More than 10	High	Medium	Low	Low
			1 - 10	Medium	Low	Low	Low
	28 - 32µg/m ³	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24 - 28µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	Less than 24µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	Low	-	1 or more	Low	Low	Low	Low

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

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

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

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

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

3.2.20 Table 8 outlines the risk category from earthworks and construction activities.

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

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

3.2.21 Table 9 outlines the risk category from trackout activities.

Table 9 Construction Dust - Dust Risk Category from Trackout Activities

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

Step 3

3.2.22 Step 3 requires the identification of site specific mitigation measures within the IAQM guidance⁶ to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with **negligible** risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

Step 4

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

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

3.3 Operational Phase Assessment

3.3.1 The development has the potential to affect existing air quality as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site. Potential impacts have therefore been defined by predicting pollutant concentrations at sensitive locations using dispersion modelling for the following scenarios:

- 2017 - Verification;
- Opening year Do-Minimum (DM) (predicted traffic flows in 2023 should the proposals not proceed); and,
- Opening year Do-Something (DS) (predicted traffic flows in 2023 should the proposals be completed).

⁶ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

- 3.3.2 Reference should be made to Appendix 1 for assessment input data and details of the verification process.
- 3.3.3 Locations sensitive to potential changes in off-site pollutant concentrations were identified within 200m of the highway network in accordance with the guidance provided within the Design Manual for Roads and Bridges (DMRB)⁷ on the likely limits of pollutant dispersion from road sources. The criteria provided within DEFRA guidance⁸ on where the AQOs apply, as summarised in Table 2, was utilised to determine worst-case receptor positions in the vicinity of links likely to be affected by changes in traffic flows as a result of the development.
- 3.3.4 The significance of predicted air quality impacts was determined in accordance with the guidance provided within the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'⁹. Using this methodology impacts were defined based on the interaction between the predicted pollutant concentration from the DS scenario and the magnitude of change between the DM and DS scenarios, as outlined in Table 10.

Table 10 Significance of Impact

Concentration at Receptor in Assessment Year	Predicted Concentration Change as Proportion of AQO (%)			
	1	2 - 5	6 - 10	> 10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76 - 94% of AQO	Negligible	Slight	Moderate	Moderate
95 - 102% of AQO	Slight	Moderate	Moderate	Substantial
103 - 109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

- 3.3.5 The matrix shown in Table 10 is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which makes it clearer which cell the impact falls within. It should be noted that changes of 0%, i.e. less than 0.5%, are described as **negligible**.

⁷ DMRB Volume 11, Section 3, Part 1, HA207/07, Highways Agency, 2007.

⁸ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

⁹ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

3.3.6 Following the prediction of impacts at discrete receptor locations, the IAQM document¹⁰ provides guidance on determining the overall air quality impact significance of the operation of a development. The following factors are identified for consideration by the assessor:

- The existing and future air quality in the absence of the development;
- The extent of current and future population exposure to the impacts; and,
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

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

3.3.8 The determination of significance relies on professional judgement and reasoning has been provided as far as practicable. The IAQM guidance¹¹ suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix 2.

¹⁰ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

¹¹ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

4.0 BASELINE

4.1 Introduction

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

4.2 Local Air Quality Management

- 4.2.1 As required by the Environment Act (1995), KC has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean concentrations of NO₂ and 24-hour mean PM₁₀ concentrations are above the AQOs within the borough. As such, nine AQMAs have been declared. The closest to the site is Kirklees AQMA 5, which was declared due to exceedences of the annual mean NO₂ AQO and is described as follows:

"The designated area incorporates Leeds Road (A653), Dewsbury Ring Road (A638), Wakefield Road (A638), Highgate Road, Highgate Terrace, Bank Street and Old Bank Road, which is in close proximity to Dewsbury Town Centre."

- 4.2.2 The development is located approximately 1.9km north-west of the AQMA. As such, there is the potential for vehicles travelling to and from the site to increase pollution levels in this sensitive area. This has been considered throughout the assessment.
- 4.2.3 KC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs. As such, no further AQMAs have been designated.

4.3 Air Quality Monitoring

- 4.3.1 Monitoring of pollutant concentrations is undertaken by KC using continuous and periodic methods throughout their area of jurisdiction. Recent results recorded in the vicinity of the development are shown in Table 11. Exceedences of the relevant AQO are shown in **bold**.

Table 11 Monitoring Results

Monitoring Site		Monitored NO ₂ Concentration (µg/m ³)		
		2015	2016	2017
4	Princess Street, Batley	35.16	32.68	25.20
20	Rockley Street, Dewsbury	40.68	36.20	35.69
39	Bradford Road, Batley	40.40	39.30	36.41
40	Leeds Road, Dewsbury	60.39	54.40	53.44
42	Leeds Road, Dewsbury - 2	42.99	43.60	45.94
43	John Street, Dewsbury	43.97	43.00	38.59
44	Calmswood Road, Eastborough	36.68	32.20	34.44
54	Wakefield Road, Dewsbury	39.60	39.00	35.00

4.3.2 As shown in Table 11, annual mean NO₂ concentrations were above the AQO at several sites between 2015 and 2017. As the monitors are positioned at roadside locations, exceedences would be expected. Reference should be made to Figure 2 for a map of the survey positions.

4.3.3 KC do not undertake monitoring of PM₁₀ concentrations in the vicinity of the site.

4.4 Background Pollutant Concentrations

4.4.1 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located in grid square NGR: 425500, 423500. Data for this location was downloaded from the DEFRA website¹² for the purpose of the assessment and is summarised in Table 12.

¹² <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2015>.

Table 12 Background Pollutant Concentration Predictions

Pollutant	Predicted Background Pollutant Concentration (µg/m³)		
	2017	2018	2023
NO ₂	18.75	18.11	15.63
PM ₁₀	12.97	12.88	12.68

4.4.2 As shown in Table 12, predicted background NO₂ and PM₁₀ concentrations are below the relevant AQOs at the development site.

4.5 Sensitive Receptors

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

Construction Phase Sensitive Receptors

4.5.2 Receptors sensitive to potential dust impacts during earthworks and construction were identified from a desk-top study of the area up to 350m from the development boundary. These are summarised in Table 13.

Table 13 Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	10 - 100	0
Up to 50	More than 100	0
Up to 100	More than 100	-
Up to 350	More than 100	-

4.5.3 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 500m of the site access. These are summarised in Table 14.

Table 14 Trackout Dust Sensitive Receptors

Distance from Site Access Route (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	10 - 100	0
Up to 50	10 - 100	0

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

4.5.5 A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in Table 15.

Table 15 Additional Area Sensitivity Factors

Guidance	Comment
Whether there is any history of dust generating activities in the area	The desk top study did not indicate any dust generating activities in the local area
The likelihood of concurrent dust generating activity on nearby sites	A review of the planning portal did not indicate any additional development proposals likely to result in concurrent dust generation in the vicinity of the site
Pre-existing screening between the source and the receptors	Trees and shrubs are located sporadically along the site boundary. These may act as a barrier between emission sources and receptors should they be retained during construction
Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place	As shown in Figure 3, the predominant wind bearing at the site is from the east. As such, receptors to the west of the boundary are most likely to be affected by dust releases
Conclusions drawn from local topography	There are no significant topographical constraints to dust dispersion
Duration of the potential impact, as a receptor may become more sensitive over time	Currently it is unclear as to the duration of the construction phase. However, it is possible that it will extend over one year
Any known specific receptor sensitivities which go beyond the classifications given in the document	No specific receptor sensitivities identified during the baseline assessment

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

included residential properties. As such, users would expect to enjoy a reasonable level of amenity, aesthetics or the value of their property could be diminished by soiling and people would be expected to be present for extended periods of time.

- 4.5.7 The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria shown in Section 3.2, is shown in Table 16.

Table 16 Sensitivity of the Surrounding Area

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

Operational Phase Sensitive Receptors

- 4.5.8 Locations sensitive to potential operational phase road vehicle exhaust emission impacts were identified from a desk-top study and are summarised in Table 17. Receptor heights were selected to take account for less sensitive land uses, such as ground floor retail units.

Table 17 Operational Phase Sensitive Receptor Locations

Receptor		Height (m)	NGR (m)	
			X	Y
R1	Residential - Bradford Road	1.5	424548.6	424329.2
R2	Residential - Bradford Road	4.0	424702.3	423945.0
R3	Residential - Bradford Road	1.5	424618.2	423203.6
R4	Residential - Bradford Road	3.5	424450.3	422175.2
R5	Residential - Northgate	3.5	424514.3	421998.9
R6	Residential - Grange Road	1.5	425420.5	423707.8
R7	Residential - Soothill Lane	1.5	424859.6	423945.5
R8	Residential - Soothill Lane	1.5	426235.3	424361.1
R9	Residential - Soothill Lane	1.5	425980.5	424275.9

Receptor		Height (m)	NGR (m)	
			X	Y
R10	Lydgate J & I School	1.5	425908.2	424167.8
R11	Residential - Soothill Lane	1.5	425652.9	424244.5
R12	Residential - Leeds Road	1.5	426911.1	424429.4
R13	Residential - Leeds Road	1.5	426933.0	424515.4
R14	Residential - Heybeck Lane	1.5	426958.7	424461.8
R15	Residential - Leeds Road	1.5	426695.0	423769.2
R16	Residential - Leeds Road	1.5	426379.2	423194.0
R17	Residential - Leeds Road	1.5	426264.3	423097.6
R18	Residential - Leeds Road	1.5	426212.5	423094.5
R19	Residential - Leeds Road	1.5	426103.4	423016.3
R20	Residential - Wakefield Road	1.5	427046.7	421950.6
R21	Residential - Wakefield Road	1.5	425577.5	421651.1
R22	Residential - Wakefield Road	1.5	424962.3	421689.6
R23	Residential - Highgate Road	1.5	424895.1	421778.2
R24	Residential - Highgate Road	1.5	424856.2	421830.7
R25	Residential - Leeds Road	1.5	424864.7	421922.8
R26	Residential - Leeds Road	1.5	424921.0	421978.3
R27	Residential - Leeds Road	1.5	424983.9	422015.4
R28	Residential - Leeds Road	1.5	425084.7	422014.8
R29	Residential - Leeds Road	1.5	425457.3	422393.2
R30	Residential - Leeds Road	1.5	425836.5	422793.2
R31	Eastborough Junior Infant and Nursery School	1.5	424834.4	421903.6
R32	Residential - Mill Forest Way	1.5	425708.7	423875.6

4.5.9 Reference should be made to Figure 4 for a graphical representation of road vehicle exhaust emission sensitive receptor locations.

5.0 ASSESSMENT

5.1 Introduction

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

5.2 Construction Phase Assessment

Step 1

- 5.2.1 The undertaking of activities such as excavation, ground works, cutting, construction, concrete batching and storage of materials has the potential to result in fugitive dust emissions throughout the construction phase. Vehicle movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul road and highway surfaces.
- 5.2.2 The potential for impacts at sensitive locations depends significantly on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.
- 5.2.3 The desk-study undertaken to inform the baseline identified a number of sensitive receptors within 350m of the site boundary. As such, a detailed assessment of potential dust impacts was required.

Step 2

Earthworks

- 5.2.4 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. The proposed development site covers an area greater than 10,000m². In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from earthworks is therefore **large**.

5.2.5 Table 16 indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in Table 8, the development is considered to be a **high** risk site for dust soiling as a result of earthworks.

5.2.6 Table 16 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 8 the development is considered to be a **low** risk site for human health impacts as a result of earthworks.

Construction

5.2.7 Due to the size of the development the total building volume is likely to be greater than 100,000m³. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from construction is therefore **large**.

5.2.8 Table 16 indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in Table 8, the development is considered to be a **high** risk site for dust soiling as a result of construction activities.

5.2.9 Table 16 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 8, the development is considered to be a **low** risk site for human health impacts as a result of construction activities.

Trackout

5.2.10 Based on the site area, it is anticipated that the unpaved road length may be greater than 100m. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from trackout is therefore **large**.

5.2.11 Table 16 indicates the sensitivity of the area to dust soiling effects to people and property is **high**. In accordance with the criteria outlined in Table 9, the development is considered to be a **high** risk site for dust soiling as a result of trackout activities.

5.2.12 Table 16 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 9, the development is considered to be a **low** risk site for human health impacts as a result of trackout activities.

Summary of the Risk of Dust Effects

5.2.13 A summary of the risk from each dust generating activity is provided in Table 18.

Table 18 Summary of Potential Unmitigated Dust Risks

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

5.2.14 As indicated in Table 18, the potential risk of dust soiling is **high** from earthworks, construction and trackout. The potential risk of human health impacts is **low** from earthworks, construction and trackout.

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

Step 3

5.2.16 The IAQM guidance¹³ provides potential mitigation measures to reduce impacts as a result of fugitive dust emissions during the construction phase. These have been adapted for the development site as summarised in Table 19. These may be reviewed prior to the commencement of construction works and incorporated into a Construction Environmental Management Plan if required by the LA.

¹³ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

Table 19 Fugitive Dust Emission Mitigation Measures

Issue	Control Measure
Communications	• Develop and implement a stakeholder communications plan that includes community engagement before work commences on site • Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager • Display the head or regional office contact information • Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the LA
Site management	• Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken • Make the complaints log available to the LA upon request • Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book • Hold regular liaison meetings with any other high risk construction sites within 500m of the boundary, to ensure plans are co-ordinated and dust and emissions are minimised
Monitoring	• Undertake daily on-site and off-site inspection to monitor dust, record inspection results, and make the log available to the LA upon request • Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the LA upon request • Increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions
Site preparation	• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible • 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 • Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas • Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials

Issue	Control Measure
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques • Ensure an adequate water supply on the site for effective dust suppression, using non-potable water where possible and appropriate • Use enclosed chutes and conveyors and covered skips • Minimise drop heights and use fine water sprays wherever appropriate • Ensure equipment is available to clean any dry spillages, and clean up spillages as soon as reasonably practicable using wet cleaning methods
Waste management	• Avoid bonfires or burning of waste materials
Earthworks	• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil as soon as practicable
Construction	• Avoid scabbling (roughening of concrete surfaces) if possible • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out • Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos
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 • Implement a wheel washing system, if required

Step 4

5.2.17 Assuming the relevant mitigation measures outlined in Table 19 are implemented, the residual impacts from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance¹⁴.

5.3 Operational Phase Assessment

5.3.1 Vehicle movements associated with the operation of the proposal will generate exhaust emissions on the local and regional road networks. An assessment was therefore

¹⁴ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site.

5.3.2 The assessment considered the following scenarios:

- 2017 - Verification;
- 2023 - DM; and,
- 2023 - DS.

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

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

Predicted Concentrations

5.3.5 Annual mean NO₂ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 20.

Table 20 Predicted Annual Mean NO₂ Concentrations

Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		DM	DS	Change
R1	Residential - Bradford Road	31.33	31.46	0.13
R2	Residential - Bradford Road	27.70	27.76	0.06
R3	Residential - Bradford Road	27.14	27.18	0.04
R4	Residential - Bradford Road	27.82	27.87	0.05
R5	Residential - Northgate	30.66	30.72	0.06
R6	Residential - Grange Road	27.65	27.72	0.07
R7	Residential - Soothill Lane	30.21	30.36	0.15

Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		DM	DS	Change
R8	Residential - Soothill Lane	26.02	26.18	0.16
R9	Residential - Soothill Lane	25.67	25.73	0.06
R10	Lydgate J & I School	24.22	24.24	0.02
R11	Residential - Soothill Lane	28.22	28.34	0.12
R12	Residential - Leeds Road	30.87	31.06	0.19
R13	Residential - Leeds Road	28.30	28.39	0.09
R14	Residential - Heybeck Lane	34.45	34.63	0.18
R15	Residential - Leeds Road	30.33	30.44	0.11
R16	Residential - Leeds Road	31.17	31.29	0.12
R17	Residential - Leeds Road	34.88	35.03	0.15
R18	Residential - Leeds Road	32.46	32.62	0.16
R19	Residential - Leeds Road	32.05	32.21	0.16
R20	Residential - Wakefield Road	33.53	33.60	0.07
R21	Residential - Wakefield Road	32.10	32.16	0.06
R22	Residential - Wakefield Road	30.07	30.12	0.05
R23	Residential - Highgate Road	31.07	31.14	0.07
R24	Residential - Highgate Road	31.34	31.44	0.10
R25	Residential - Leeds Road	32.93	33.09	0.16
R26	Residential - Leeds Road	33.22	33.40	0.18
R27	Residential - Leeds Road	31.81	31.96	0.15
R28	Residential - Leeds Road	28.92	29.03	0.11
R29	Residential - Leeds Road	30.27	30.42	0.15
R30	Residential - Leeds Road	30.22	30.36	0.14
R31	Eastborough Junior Infant and Nursery School	31.30	31.43	0.13
R32	Residential - Mill Forest Way	24.34	24.35	0.01

5.3.6 As indicated in Table 20, predicted annual mean NO₂ concentrations were below the relevant AQO at all receptor locations in both scenarios.

5.3.7 Reference should be made to Figures 5 and 6 for graphical representations of annual mean NO₂ concentrations across the assessment area for the DM and DS scenarios, respectively.

5.3.8 Annual mean PM₁₀ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 21.

Table 21 Predicted Annual Mean PM₁₀ Concentrations

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R1	Residential - Bradford Road	15.73	15.76	0.03
R2	Residential - Bradford Road	14.78	14.80	0.01
R3	Residential - Bradford Road	14.78	14.79	0.01
R4	Residential - Bradford Road	14.93	14.94	0.01
R5	Residential - Northgate	15.35	15.36	0.01
R6	Residential - Grange Road	14.92	14.94	0.01
R7	Residential - Soothill Lane	15.44	15.47	0.03
R8	Residential - Soothill Lane	14.51	14.54	0.04
R9	Residential - Soothill Lane	14.42	14.44	0.01
R10	Lydgate J & I School	14.08	14.09	0.00
R11	Residential - Soothill Lane	15.03	15.06	0.03
R12	Residential - Leeds Road	15.45	15.49	0.04
R13	Residential - Leeds Road	14.95	14.97	0.02
R14	Residential - Heybeck Lane	16.13	16.17	0.04
R15	Residential - Leeds Road	15.75	15.78	0.03
R16	Residential - Leeds Road	15.77	15.80	0.03
R17	Residential - Leeds Road	16.21	16.24	0.03

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R18	Residential - Leeds Road	15.71	15.74	0.03
R19	Residential - Leeds Road	15.76	15.79	0.04
R20	Residential - Wakefield Road	16.13	16.15	0.02
R21	Residential - Wakefield Road	16.02	16.03	0.01
R22	Residential - Wakefield Road	15.42	15.43	0.01
R23	Residential - Highgate Road	15.42	15.43	0.01
R24	Residential - Highgate Road	15.42	15.44	0.02
R25	Residential - Leeds Road	15.54	15.57	0.03
R26	Residential - Leeds Road	15.54	15.57	0.03
R27	Residential - Leeds Road	15.39	15.42	0.03
R28	Residential - Leeds Road	15.09	15.12	0.02
R29	Residential - Leeds Road	15.55	15.58	0.03
R30	Residential - Leeds Road	15.54	15.57	0.03
R31	Eastborough Junior Infant and Nursery School	15.37	15.39	0.02
R32	Residential - Mill Forest Way	14.11	14.11	0.00

5.3.9 As indicated in Table 21, predicted annual mean PM₁₀ concentrations were below the relevant AQO at all sensitive receptors in both the DM and DS scenarios.

5.3.10 Reference should be made to Figures 7 and 8 for graphical representations of annual mean PM₁₀ concentrations across the assessment area for the DM and DS scenarios, respectively.

Predicted Impacts

5.3.11 Predicted impacts on annual mean NO₂ concentrations at the sensitive receptor locations are summarised in Table 22.

Table 22 Predicted Impacts - NO₂

Receptor		Predicted Annual Mean NO ₂ Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - Bradford Road	76 - 94% of AQO	0	Negligible
R2	Residential - Bradford Road	Below 75% of AQO	0	Negligible
R3	Residential - Bradford Road	Below 75% of AQO	0	Negligible
R4	Residential - Bradford Road	Below 75% of AQO	0	Negligible
R5	Residential - Northgate	76 - 94% of AQO	0	Negligible
R6	Residential - Grange Road	Below 75% of AQO	0	Negligible
R7	Residential - Soothill Lane	76 - 94% of AQO	0	Negligible
R8	Residential - Soothill Lane	Below 75% of AQO	0	Negligible
R9	Residential - Soothill Lane	Below 75% of AQO	0	Negligible
R10	Lydgate J & I School	Below 75% of AQO	0	Negligible
R11	Residential - Soothill Lane	Below 75% of AQO	0	Negligible
R12	Residential - Leeds Road	76 - 94% of AQO	0	Negligible
R13	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R14	Residential - Heybeck Lane	76 - 94% of AQO	0	Negligible
R15	Residential - Leeds Road	76 - 94% of AQO	0	Negligible
R16	Residential - Leeds Road	76 - 94% of AQO	0	Negligible
R17	Residential - Leeds Road	76 - 94% of AQO	0	Negligible
R18	Residential - Leeds Road	76 - 94% of AQO	0	Negligible
R19	Residential - Leeds Road	76 - 94% of AQO	0	Negligible
R20	Residential - Wakefield Road	76 - 94% of AQO	0	Negligible
R21	Residential - Wakefield Road	76 - 94% of AQO	0	Negligible
R22	Residential - Wakefield Road	76 - 94% of AQO	0	Negligible
R23	Residential - Highgate Road	76 - 94% of AQO	0	Negligible
R24	Residential - Highgate Road	76 - 94% of AQO	0	Negligible

Receptor		Predicted Annual Mean NO ₂ Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R25	Residential - Leeds Road	76 - 94% of AQO	0	Negligible
R26	Residential - Leeds Road	76 - 94% of AQO	0	Negligible
R27	Residential - Leeds Road	76 - 94% of AQO	0	Negligible
R28	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R29	Residential - Leeds Road	76 - 94% of AQO	0	Negligible
R30	Residential - Leeds Road	76 - 94% of AQO	0	Negligible
R31	Eastborough Junior Infant and Nursery School	76 - 94% of AQO	0	Negligible
R32	Residential - Mill Forest Way	Below 75% of AQO	0	Negligible

5.3.12 As indicated in Table 22, impacts on annual mean NO₂ concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

5.3.13 Predicted impacts on annual mean PM₁₀ concentrations at the sensitive receptor locations are summarised in Table 23.

Table 23 Predicted Impacts - PM₁₀

Receptor		Predicted Annual Mean PM ₁₀ Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - Bradford Road	Below 75% of AQO	0	Negligible
R2	Residential - Bradford Road	Below 75% of AQO	0	Negligible
R3	Residential - Bradford Road	Below 75% of AQO	0	Negligible
R4	Residential - Bradford Road	Below 75% of AQO	0	Negligible
R5	Residential - Northgate	Below 75% of AQO	0	Negligible
R6	Residential - Grange Road	Below 75% of AQO	0	Negligible
R7	Residential - Soothill Lane	Below 75% of AQO	0	Negligible

Receptor		Predicted Annual Mean PM ₁₀ Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R8	Residential - Soothill Lane	Below 75% of AQO	0	Negligible
R9	Residential - Soothill Lane	Below 75% of AQO	0	Negligible
R10	Lydgate J & I School	Below 75% of AQO	0	Negligible
R11	Residential - Soothill Lane	Below 75% of AQO	0	Negligible
R12	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R13	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R14	Residential - Heybeck Lane	Below 75% of AQO	0	Negligible
R15	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R16	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R17	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R18	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R19	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R20	Residential - Wakefield Road	Below 75% of AQO	0	Negligible
R21	Residential - Wakefield Road	Below 75% of AQO	0	Negligible
R22	Residential - Wakefield Road	Below 75% of AQO	0	Negligible
R23	Residential - Highgate Road	Below 75% of AQO	0	Negligible
R24	Residential - Highgate Road	Below 75% of AQO	0	Negligible
R25	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R26	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R27	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R28	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R29	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R30	Residential - Leeds Road	Below 75% of AQO	0	Negligible
R31	Eastborough Junior Infant and Nursery School	Below 75% of AQO	0	Negligible
R32	Residential - Mill Forest Way	Below 75% of AQO	0	Negligible

5.3.14 As indicated in Table 23, impacts on annual mean PM₁₀ concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

West Yorkshire Technical Planning Guidance

5.3.15 The West Yorkshire LAs have produced air quality technical guidance¹⁵ as part of an overarching Low Emissions Strategy to reduce road transport emissions in the county. It is aimed at helping LAs deliver AQO compliance through cost effective service planning brought about by the joint working and relevant Local Plan policies.

5.3.16 The guidance provides a methodology for determining the scale of a development as minor, medium or major and the required air quality mitigation for the relevant banding. Review of the relevant criteria indicated the proposals were classified as **medium** as they include over 50 dwellings but are not predicted to result in an increase in the existing traffic flow on roads of more than 10,000 AADT by 5% or more.

5.3.17 The guidance¹⁶ provides a number of mitigation options that should be considered for inclusion within developments. Those relevant to the proposals include the following:

- Provision of 1 electric vehicle (EV) charging point per residential unit; and,
- Production of a full Travel Plan to encourage the use of non-transport modes and assist with the reduction of development transport related emissions.

5.3.1 It is recommended that the above measures are incorporated into the scheme in response to the assessment. This will assist with minimising air quality effects as a result of vehicle exhaust emissions.

Overall Impact Significance

5.3.2 The overall significance of operational phase road traffic emission impacts was determined as **negligible**. This was based on the overall predicted impacts at discrete

¹⁵ Air Quality and Emissions: Technical Planning Guidance, West Yorkshire Low Emissions Group, 2014.

¹⁶ Air Quality and Emissions: Technical Planning Guidance, West Yorkshire Low Emissions Group, 2014.

receptor locations and the considerations outlined previously. Further justification is provided in Table 24.

Table 24 Overall Impact Significance

Guidance	Comment
The existing and future air quality in the absence of the development	Predicted annual mean NO ₂ and PM ₁₀ concentrations were below the AQOs at all sensitive receptors in the DM scenario. It is considered unlikely that future air quality conditions will change significantly in the absence of the development given the relatively established nature of the area
The extent of current and future population exposure to the impacts	The development is not predicted to affect the population exposed to exceedences of the AQOs
The influence and validity of any assumptions adopted when undertaking the prediction of impacts	The assessment assumed that vehicle exhaust emission rates and background pollutant levels reduce in accordance with pessimistic estimates of future conditions, rather than DEFRA predictions. This ensured a robust analysis of the opening year scenarios Due to the adopted assumptions it is considered the presented results are sufficiently robust for an assessment of this nature

5.3.3 The IAQM guidance¹⁷ states that only if the impact is greater than **slight**, the effect is considered **significant**. As impacts were predicted to be **negligible**, overall effects are considered **not significant**, in accordance with the stated methodology.

¹⁷ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

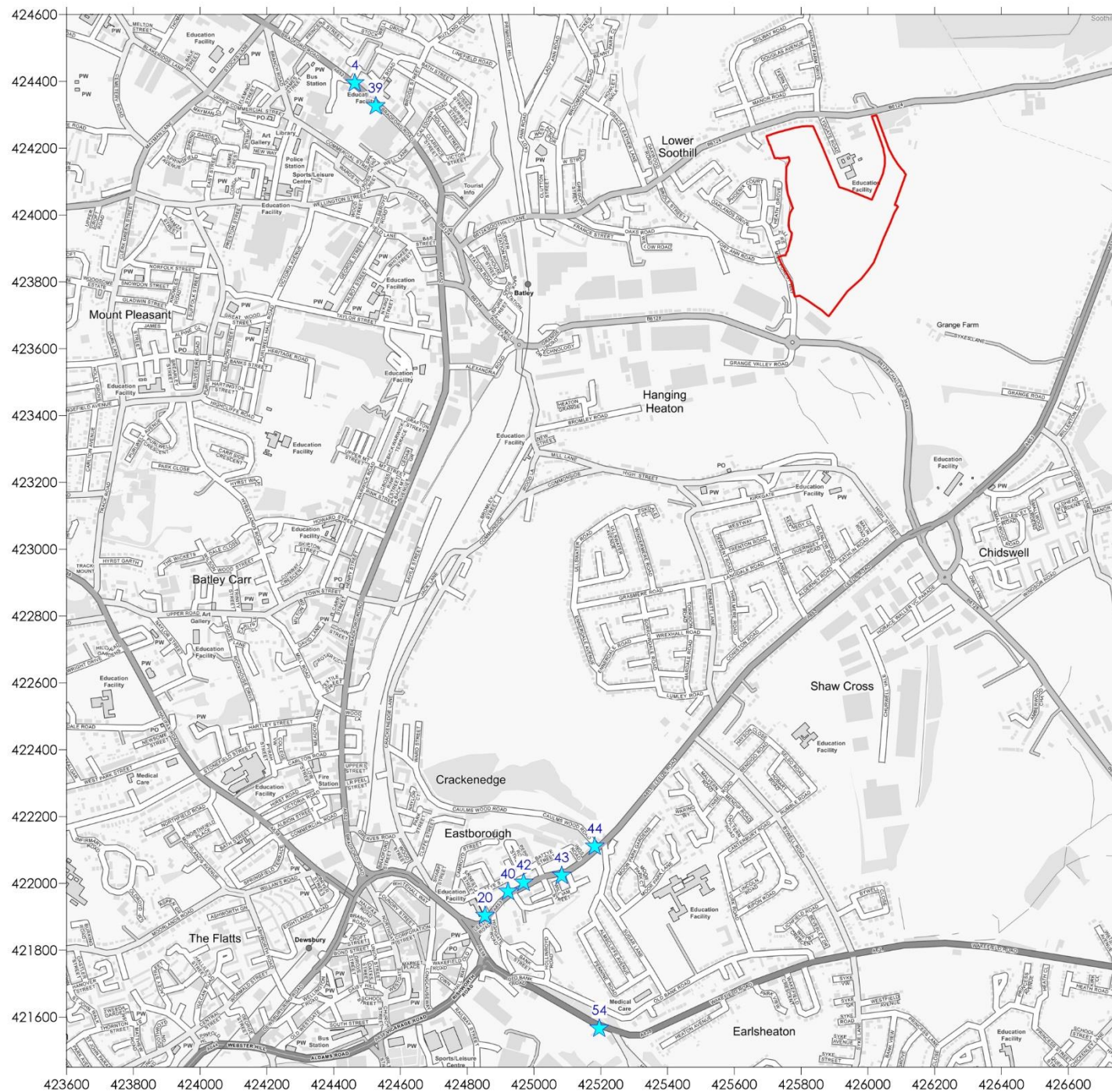
6.0 CONCLUSION

- 6.1.1 Redmore Environmental Ltd was commissioned by Kirklees Council to undertake an Air Quality Assessment in support of a planning application for a residential development on land off Soothill Lane, Batley.
- 6.1.2 The proposals have the potential to cause air quality impacts as a result of fugitive dust emissions during construction and road traffic exhaust emissions associated with vehicles travelling to and from the site during operation. As such, an Air Quality Assessment was required in order to determine baseline conditions and assess potential effects as a result of the scheme.
- 6.1.3 During the construction phase of the development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated by earthworks, construction and trackout activities was predicted to be **not significant**.
- 6.1.4 Potential impacts during the operational phase of the proposals may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the site. Dispersion modelling was therefore undertaken in order to predict pollutant concentrations at sensitive locations as a result of emissions from the local highway network both with and without the development in place. Results were subsequently verified using local monitoring data.
- 6.1.5 Review of the dispersion modelling results indicated that impacts on annual mean NO₂ and PM₁₀ concentrations as a result of traffic generated by the development were predicted to be **negligible** at all sensitive receptor locations. Following consideration of the relevant issues, air quality impacts as a result of the operation of the development were considered to be **not significant**, in accordance with the IAQM guidance.
- 6.1.6 Based on the assessment results, air quality factors are not considered a constraint to the development.

7.0 **ABBREVIATIONS**

AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQAP	Air Quality Action Plan
AQC	Air Quality Consultants
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
CERC	Cambridge Environmental Research Consultants
CURED	Calculator Using Realistic Emissions for Diesels
DEFRA	Department for Environment, Food and Rural Affairs
DM	Do-Minimum
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
DS	Do-Something
EFT	Emissions Factor Toolkit
EU	European Union
EV	Electric Vehicle
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
KC	Kirklees Council
KLP	Kirklees Local Plan
LA	Local Authority
LAQM	Local Air Quality Management
NGR	National Grid Reference
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
PM ₁₀	Particulate Matter with an aerodynamic diameter of less than 10µm
SP	Slow Phase
UDP	Unitary Development Plan
Z ₀	Roughness length

Figures



Legend



Site Boundary



Monitor

Title

Figure 2 - Monitoring Locations

Project

Air Quality Assessment
Soothill Lane, Batley

Project Reference

2439

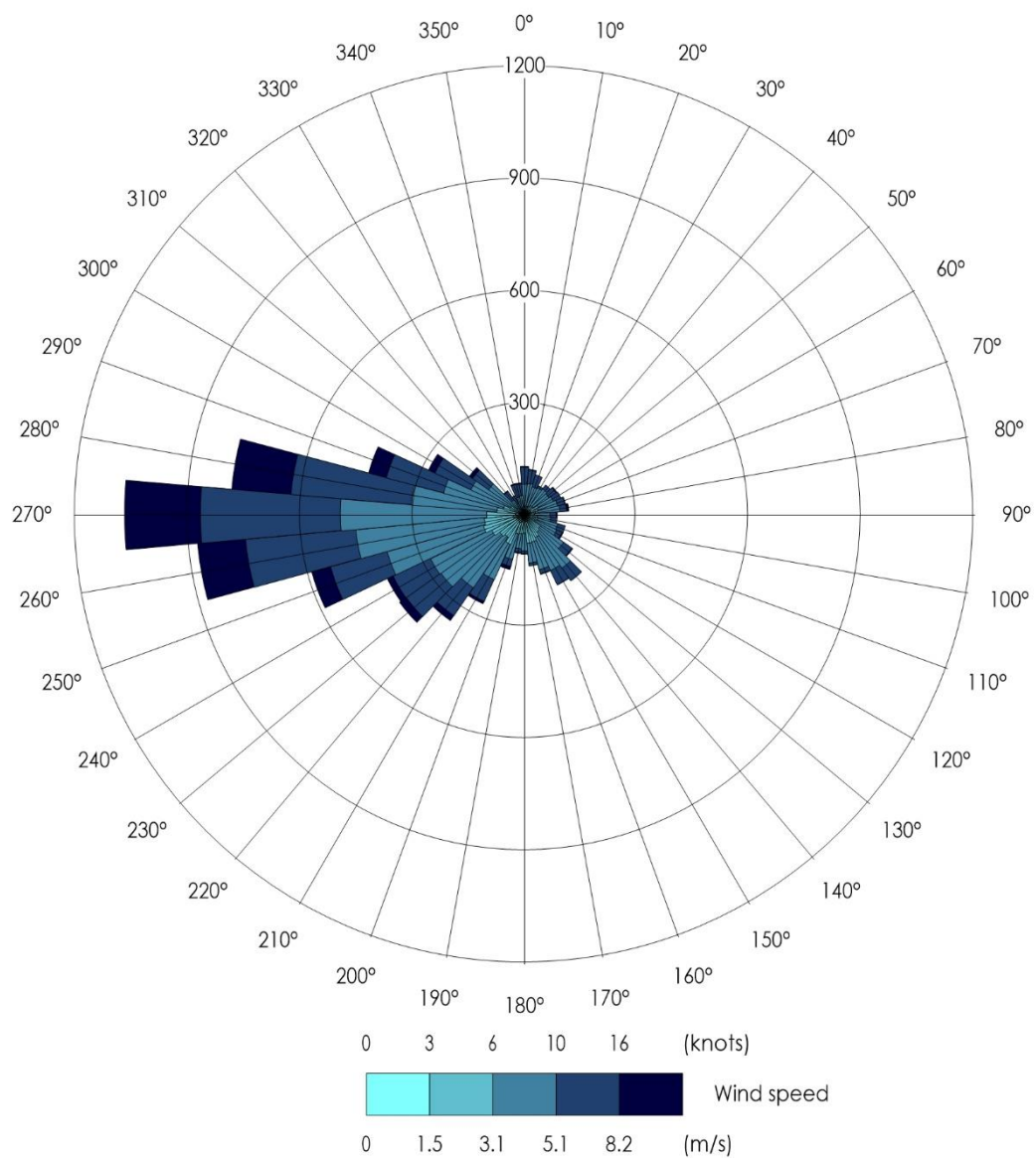
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Title
Figure 3 - Wind Rose of 2017 Leeds
Bradford International Airport
Meteorological Data

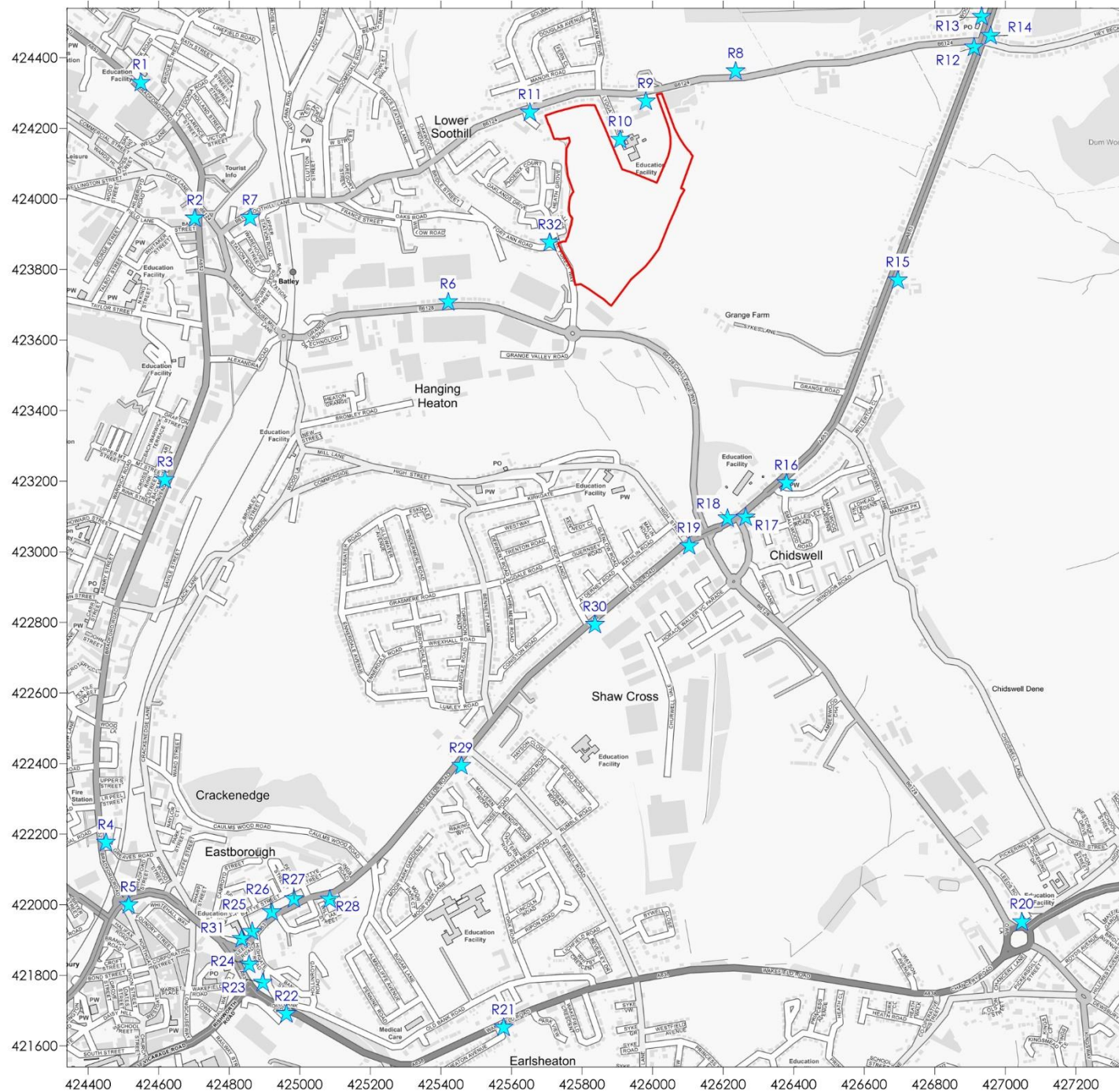
Project
Air Quality Assessment
Soothill Lane, Batley

Project Reference
2439

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Site Boundary



Sensitive Receptor

Title

Figure 4 - Sensitive Receptor Locations

Project

Air Quality Assessment
Soothill Lane, Batley

Project Reference

2439

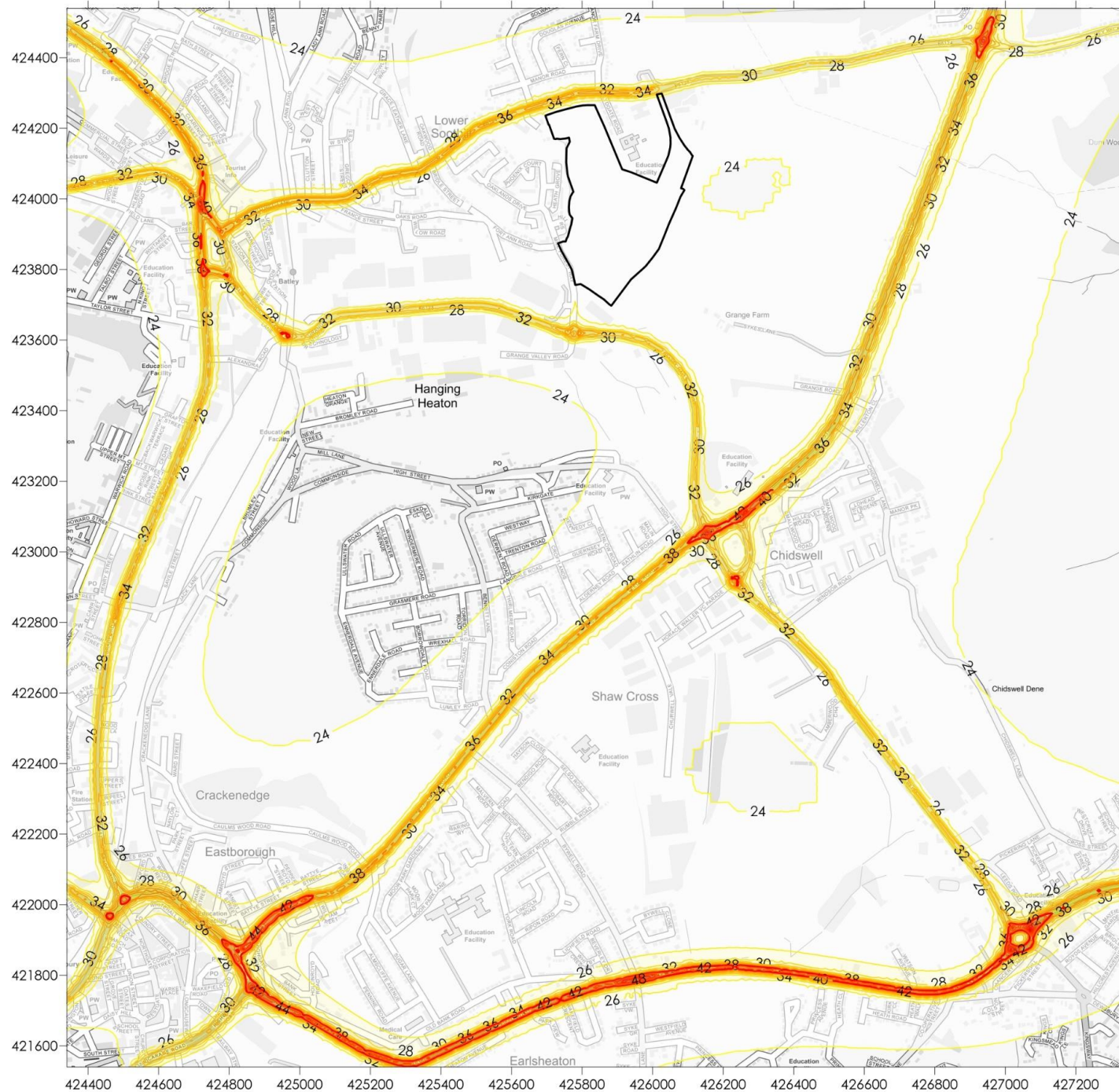
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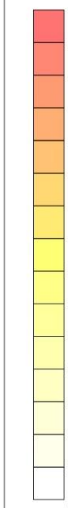
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Legend



Site Boundary



Annual Mean
NO₂ Concentration
(µg/m³)

Title

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

Project

Air Quality Assessment
Soothill Lane, Batley

Project Reference

2439

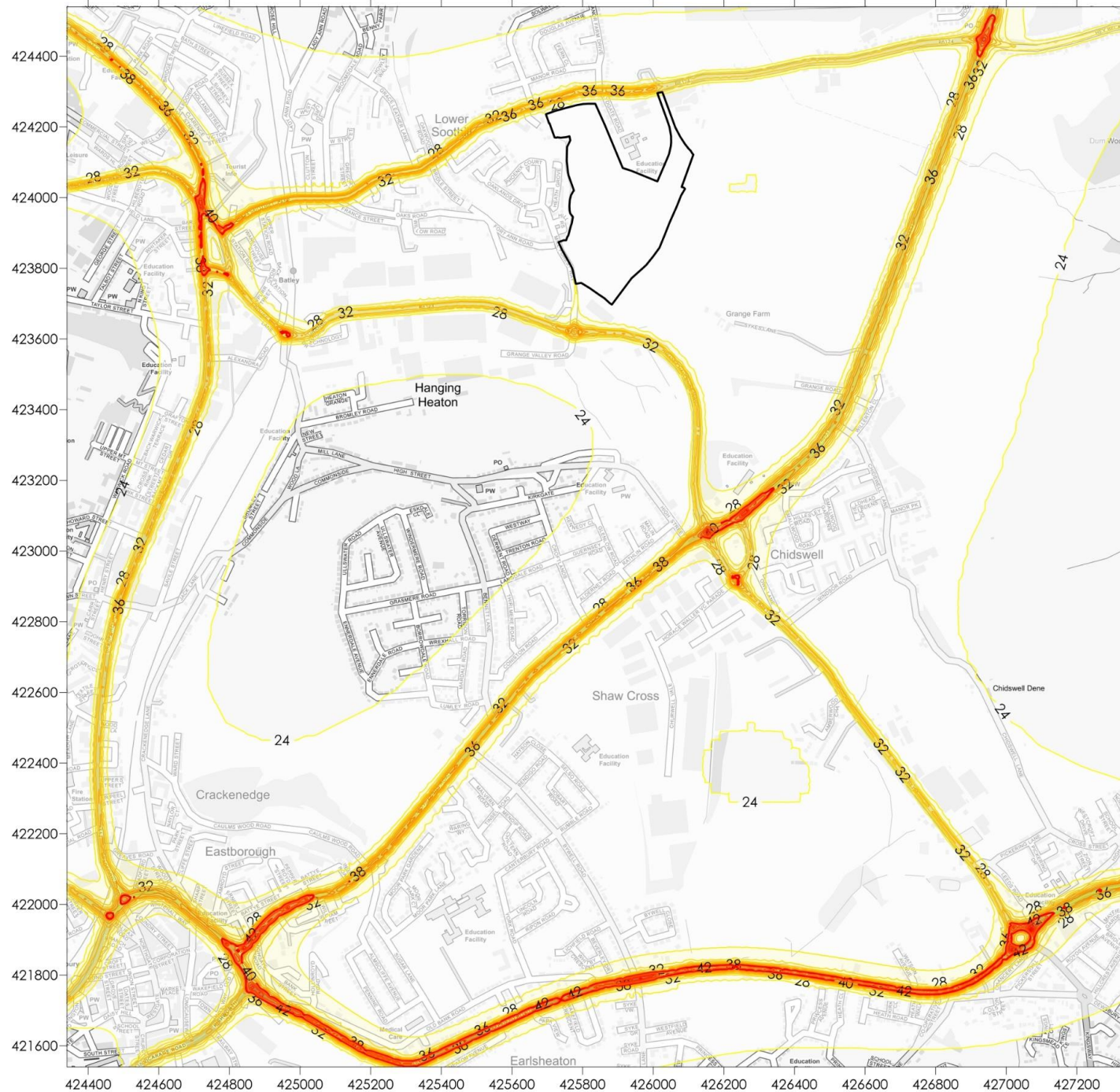
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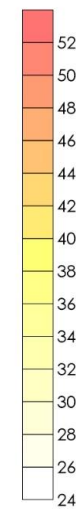
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Legend



Site Boundary



Annual Mean
NO₂ Concentration
(µg/m³)

Title

Figure 6 - Predicted Annual Mean
NO₂ Concentrations (µg/m³)
Do-Something

Project

Air Quality Assessment
Soothill Lane, Batley

Project Reference

2439

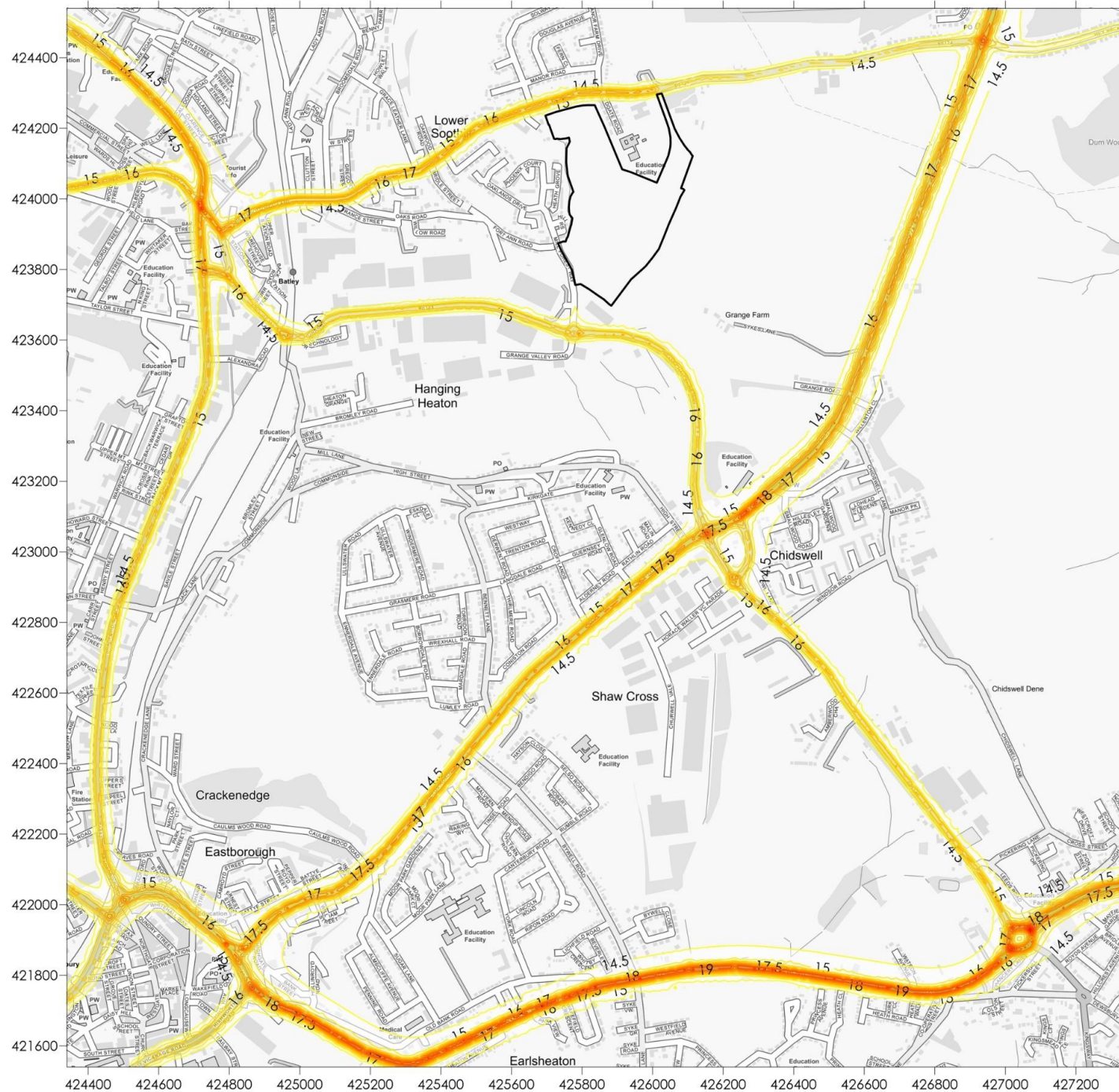
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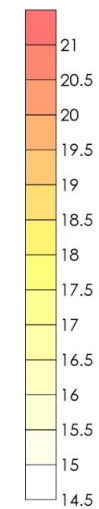
www.red-env.co.uk | 0161 7060075



Legend



Site Boundary



Annual Mean
PM₁₀ Concentration
(µg/m³)

Title

Figure 7 - Predicted Annual Mean
PM₁₀ Concentrations (µg/m³)
Do-Minimum

Project

Air Quality Assessment
Soothill Lane, Batley

Project Reference

2439

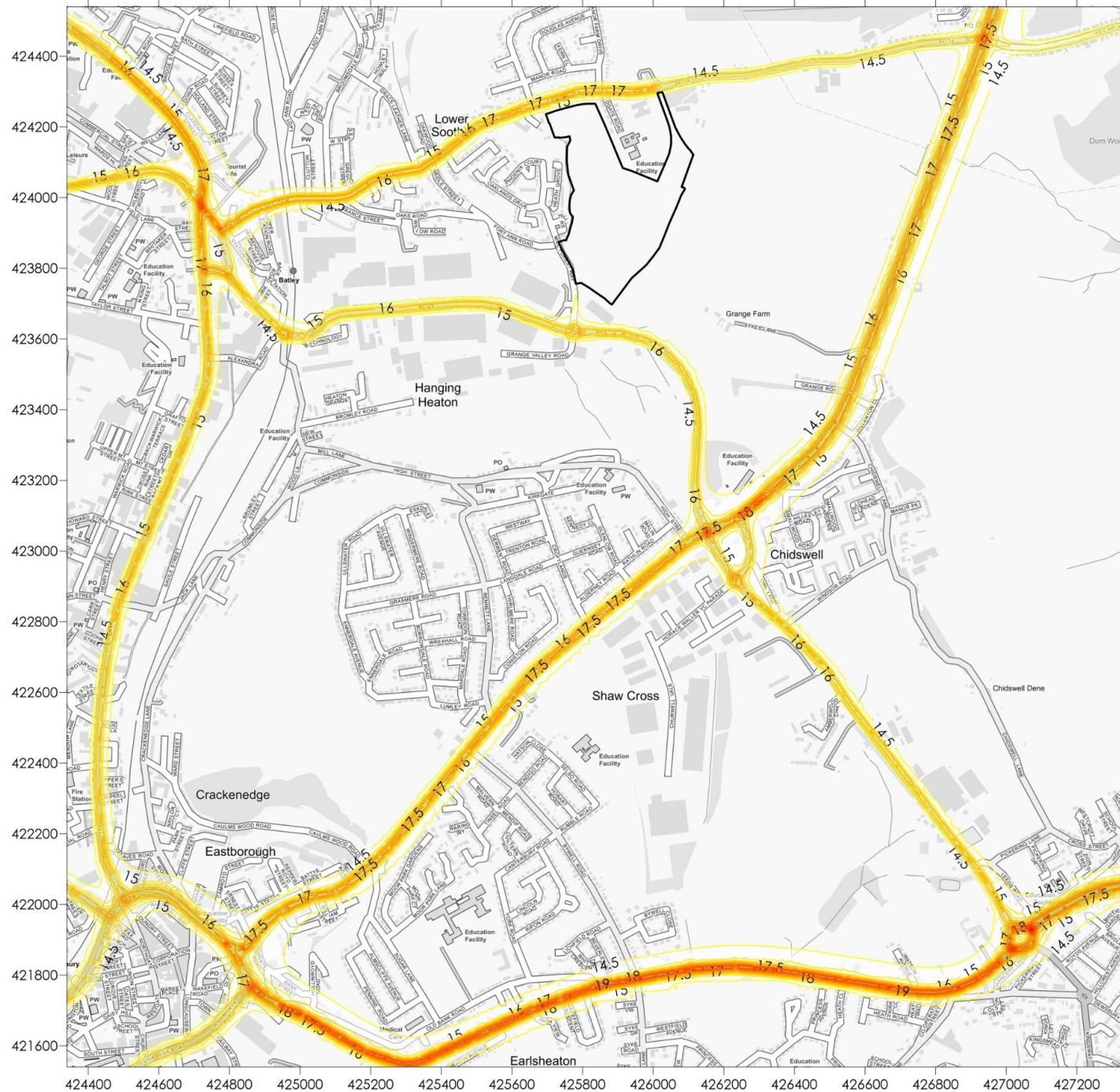
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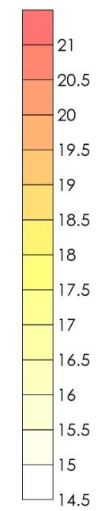
www.red-env.co.uk | 0161 7060075



Legend



Site Boundary



Annual Mean
PM₁₀ Concentration
($\mu\text{g}/\text{m}^3$)

Title

Figure 8 - Predicted Annual Mean
PM₁₀ Concentrations ($\mu\text{g}/\text{m}^3$)
Do-Something

Project

Air Quality Assessment
Soothill Lane, Batley

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Legend

-  Site Boundary
-  Output Grid
-  Road Link

Title

Figure 9 - ADMS-Roads Inputs

Project

Air Quality Assessment
Soothill Lane, Batley

Project Reference

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Appendix 1 - Assessment Input Data

Introduction

The proposed development has the potential to cause air quality impacts as a result of vehicles travelling to and from the site. In order to assess NO₂ and PM₁₀ concentrations at sensitive locations, detailed dispersion modelling was undertaken in accordance with the following methodology.

Dispersion Model

Dispersion modelling was undertaken using the ADMS-Roads dispersion model (version 4.1.1.0). ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

The model requires input data that details the following parameters:

- Assessment area;
- Traffic flow data;
- Vehicle emission factors;
- Spatial co-ordinates of emissions;
- Street width;
- Meteorological data;
- Roughness length (z_0); and,
- Monin-Obukhov length.

These are detailed in the following Sections.

Assessment Area

Ambient concentrations were predicted over the area NGR: 424340, 421540 to 427340, 424540. One Cartesian grid was used within the model to produce data suitable for contour plotting using the Surfer software package.

Reference should be made to Figure 9 for a map of the assessment area.

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

Traffic Flow Data

Baseline traffic data for use in the assessment, including 24-hour Average Annual Daily Traffic (AADT) flows and fleet composition as HDV proportion, was provided by Vectos, the Transport Consultants for the project.

Traffic data was not available for the A638 Halifax Road, A638 Dewsbury Ring Road, A638 Wakefield Road and A644 Rishworth Road as they were outside the extents of the Transport Assessment. As such, data for these links were obtained from the Department for Transport (DfT)¹⁸. The DfT web tool enables the user to view and download traffic flows on every link of the 'A' road and motorway network, as well as selected minor roads, in Great Britain for the years 1999 to 2017. It should be noted that the DfT web tool is referenced in DEFRA guidance¹⁹ 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.

Traffic generation associated with the proposals was provided Vectos. This was applied to the relevant road links to establish the DS scenario, based on the predicted traffic distribution patterns from the site.

It should be noted that the traffic data includes vehicles movements associated with the following committed developments:

- Land adjacent Dewsbury Rams RLFC Owl Lane, Dewsbury - Application Reference: 2014/90780;
- Land off Westerton Road and Haigh Moor Road, West Ardsley - Application Reference: 17/08262/OT; and,
- Chidswell Mixed Use Allocation - Local Plan Allocation Site Reference; MX1905.

A summary of the traffic flows is provided in Table A1.1.

¹⁸ <http://www.dft.gov.uk/traffic-counts/>.

¹⁹ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

Table A1.1 Traffic Data

Link		24-hour AADT Flow			HDV Proportion (%)		
		Verif.	2023 DM	2023 DS	Verif.	2023 DM	2023 DS
L1	Heybeck Lane	4,720	5,824	5,824	3.44	2.99	2.99
L2	Heybeck Lane, Slow Phase (SP)	4,720	5,824	5,824	3.44	2.99	2.99
L3	B6124 Soothill Lane, East of Site Access, SP	7,473	8,307	8,980	3.99	3.93	3.63
L4	B6124 Soothill Lane, East of Site Access	7,473	8,307	8,980	3.99	3.93	3.63
L5	B6124 Soothill Lane, West of Site Access	15,467	16,890	17,358	3.84	3.77	3.67
L6	B6124 Soothill Lane, East of Station Road	15,467	16,890	17,358	3.84	3.77	3.67
L7	B6124 Soothill Lane, East of Station Road, SP	15,467	16,890	17,358	3.84	3.77	3.67
L8	Hick Lane	12,707	13,798	13,798	4.10	4.07	4.07
L9	Hick Lane, SP	12,707	13,798	13,798	4.10	4.07	4.07
L10	B6124 Station Road	15,266	16,720	17,185	3.95	3.88	3.77
L11	B6124 Rouse Mill	6,936	7,499	7,499	4.85	4.82	4.82
L12	B6124 Rouse Mill, SP	6,936	7,499	7,499	4.85	4.82	4.82
L13	B6128 Rouse Mill Lane, West of Rouse Mill, SP	13,247	14,598	14,793	5.70	5.56	5.49
L14	B6128 Rouse Mill Lane, East of Rouse Mill	9,971	11,130	11,324	7.46	7.22	7.10
L15	B6128 Rouse Mill Lane, East of Rouse Mill, SP	9,971	11,130	11,324	7.46	7.22	7.10
L16	B6128 Grange Road, East of Rouse Mill, SP	9,971	11,130	11,324	7.46	7.22	7.10
L17	B6128 Grange Road	9,971	11,130	11,324	7.46	7.22	7.10
L18	B6128 Grange Road, SP	9,971	11,130	11,324	7.46	7.22	7.10
L19	B6128 Challenge Way, East of Mill Forest Way, SP	9,567	10,696	10,975	8.30	8.02	7.82
L20	B6128 Challenge Way, East of Mill Forest Way	9,567	10,696	10,975	8.30	8.02	7.82

Link		24-hour AADT Flow			HDV Proportion (%)		
		Verif.	2023 DM	2023 DS	Verif.	2023 DM	2023 DS
L21	B6128 Challenge Way, North of Leeds Road, SP	9,567	10,696	10,975	8.30	8.02	7.82
L22	B6128, South of Leeds Road, SP	9,553	11,062	11,062	8.44	8.19	8.19
L23	B6128, South of Leeds Road	9,553	11,062	11,062	8.44	8.19	8.19
L24	B6128, South of Owl Lane, SP	9,553	11,794	11,794	8.44	7.70	7.70
L25	B6128, North of Wakefield Road	9,553	11,794	11,794	8.44	7.70	7.70
L26	B6128, North of Wakefield Road, SP	9,553	11,794	11,794	8.44	7.70	7.70
L27	Owl Lane, South of Leeds Road, SP	7,498	8,789	8,789	8.17	7.51	7.51
L28	Owl Lane	7,498	8,789	8,789	8.17	7.51	7.51
L29	Owl Lane, North of B6128, SP	7,498	8,789	8,789	8.17	7.51	7.51
L30	A638 Halifax Road	15,245	16,380	16,380	2.83	2.83	2.83
L31	A638 Halifax Road, SP	15,245	16,380	16,380	2.83	2.83	2.83
L32	A652 Bradford Road, SP	18,871	20,455	20,841	5.12	5.10	5.00
L33	A652 Bradford Road	18,871	20,455	20,841	5.12	5.10	5.00
L34	A652 Bradford Road, North of Hick Lane, SP	18,871	20,455	20,841	5.12	5.10	5.00
L35	A652 Bradford Road, South of Hick Lane, SP	17,879	19,275	19,553	5.09	5.10	5.03
L36	A652 Bradford Road, South of Rouse Mill Lane, SP	13,951	15,295	15,502	5.45	5.34	5.27
L37	A652 Bradford Road, South of Rouse Mill Lane	13,951	15,295	15,502	5.45	5.34	5.27
L38	A652 Bradford Road, Jack Lane Junction, SP	13,951	15,295	15,502	5.45	5.34	5.27
L39	A652 Bradford Road, South of Jack Lane	13,951	15,295	15,502	5.45	5.34	5.27
L40	A652 Bradford Road, North of Dewsbury Ring Road, SP	13,951	15,295	15,502	5.45	5.34	5.27
L41	A638 Wakefield Road, East of B6128	26,461	30,328	30,569	5.53	5.36	5.32

Link		24-hour AADT Flow			HDV Proportion (%)		
		Verif.	2023 DM	2023 DS	Verif.	2023 DM	2023 DS
L42	A638 Wakefield Road, East of B6128, SP	26,461	30,328	30,569	5.53	5.36	5.32
L43	A638 Wakefield Road, West of B6128, SP	26,461	28,798	29,039	5.53	5.50	5.46
L44	A638 Wakefield Road, West of B6128	26,461	28,798	29,039	5.53	5.50	5.46
L45	A638 Wakefield Road, West of B6128, SP	26,461	28,798	29,039	5.53	5.50	5.46
L46	A638 Wakefield Road, East of Rishworth Road	26,461	28,798	29,039	5.53	5.50	5.46
L47	A638 Wakefield Road, East of Rishworth Road, SP	26,461	28,798	29,039	5.53	5.50	5.46
L48	A638 Rishworth Road	14,481	15,761	15,893	5.05	5.04	4.99
L49	A638 Dewsbury Ring Road, North of Rishworth Road, SP	23,491	25,808	26,182	2.73	2.75	2.71
L50	A638 Dewsbury Ring Road, South of Leeds Road, SP	23,491	25,604	25,845	2.73	2.73	2.70
L51	A638 Dewsbury Ring Road, North of Leeds Road, SP	21,248	22,995	23,107	2.66	2.64	2.63
L52	A638 Dewsbury Ring Road, North of Leeds Road	21,248	23,359	23,707	2.66	2.68	2.64
L53	A638 Dewsbury Ring Road, East of Bradford Road	21,248	23,359	23,707	2.66	2.68	2.64
L54	A638 Dewsbury Ring Road, West of Bradford Road, SP	18,458	19,973	20,068	3.93	3.90	3.88
L55	A638 Dewsbury Ring Road, South of Halifax Road	15,552	16,850	16,946	3.29	3.26	3.24
L56	A638 Dewsbury Ring Road, South of Wellington Road	15,552	16,850	16,946	3.29	3.26	3.24
L57	Mill Forest Way, North	1,235	1,361	1,361	3.73	6.15	6.15
L58	Mill Forest Way, South	1,235	1,361	1,835	3.73	6.15	4.56
L59	A653 Leeds Road, North of Heybeck Lane	26,116	30,422	30,874	6.34	5.86	5.77

Link		24-hour AADT Flow			HDV Proportion (%)		
		Verif.	2023 DM	2023 DS	Verif.	2023 DM	2023 DS
L60	A653 Leeds Road, North of Heybeck Lane, SP	26,116	30,422	30,874	6.34	5.86	5.77
L61	A653 Leeds Road, South of Heybeck Lane, SP	24,121	27,146	27,632	6.46	6.17	6.06
L62	A653 Leeds Road, South of Heybeck Lane, 40mph	24,121	27,146	27,632	6.46	6.17	6.06
L63	A653 Leeds Road, South of Heybeck Lane, 30mph	24,121	27,146	27,632	6.46	6.17	6.06
L64	A653 Leeds Road, East of Owl Lane	24,121	27,146	27,632	6.46	6.17	6.06
L65	A653 Leeds Road, East of Owl Lane, SP	24,121	27,146	27,632	6.46	6.17	6.06
L66	A653 Leeds Road, West of Owl Lane, SP	17,080	18,810	19,297	8.18	8.07	7.87
L67	A653 Leeds Road, West of B6128, SP	18,526	20,674	21,175	5.22	5.22	5.09
L68	A653 Leeds Road, West of B6128	18,526	20,674	21,175	5.22	5.22	5.09
L69	A653 Leeds Road, South of Bywell Road	18,526	20,674	21,175	5.22	5.22	5.09
L70	A653 Leeds Road, East of Dewsbury Ring Road, SP 1	18,526	20,674	21,175	5.22	5.22	5.09
L71	A653 Leeds Road, East of Dewsbury Ring Road, SP 2	18,526	20,674	21,175	5.22	5.22	5.09
L72	A653 Leeds Road, East of Dewsbury Ring Road, SP 3	18,526	20,674	21,175	5.22	5.22	5.09
L73	A653 Leeds Road, Northbound from A638	4,631	5,109	5,313	5.22	5.29	5.09
L74	A653 Leeds Road, Southbound to Dewsbury Ring Road	4,631	5,109	5,313	5.22	5.29	5.09
L75	A653 Leeds Road, Eastbound from Dewsbury Ring Road	9,263	10,188	10,549	5.22	5.28	5.10
R1	Grange Road/Challenge Way/Mill Forest Way Roundabout	6,925	7,856	8,330	7.63	7.28	6.87
R2	B6128 Owl Lane Roundabout	8,868	11,425	11,425	8.37	7.46	7.46

Link		24-hour AADT Flow			HDV Proportion (%)		
		Verif.	2023 DM	2023 DS	Verif.	2023 DM	2023 DS
R3	A638/B6128 Roundabout	20,825	22,376	22,617	5.97	5.97	5.91
R4	Rouse Mill Lane/Grange Road Roundabout	9,971	11,130	11,324	7.46	7.22	7.06

Reference should be made to Figure 9 for a graphical representation of the road link locations.

Road widths and vehicle speeds were estimated from aerial photography and UK highway design standards. A summary of the link parameters is provided in Table A1.2.

Table A1.2 Road Parameters

Link		Average Vehicle Speed (km/h)	Road Width (m)
L1	Heybeck Lane	45	8.9
L2	Heybeck Lane, SP	25	8.6
L3	B6124 Soothill Lane, East of Site Access, SP	25	9.9
L4	B6124 Soothill Lane, East of Site Access	45	9.1
L5	B6124 Soothill Lane, West of Site Access	45	8.5
L6	B6124 Soothill Lane, East of Station Road	45	7.7
L7	B6124 Soothill Lane, East of Station Road, SP	25	8.9
L8	Hick Lane	45	7.1
L9	Hick Lane, SP	25	8.2
L10	B6124 Station Road	35	6.7
L11	B6124 Rouse Mill	35	7.6
L12	B6124 Rouse Mill, SP	25	7.7
L13	B6128 Rouse Mill Lane, West of Rouse Mill, SP	25	10.5
L14	B6128 Rouse Mill Lane, East of Rouse Mill	45	7.1
L15	B6128 Rouse Mill Lane, East of Rouse Mill, SP	25	9.8
L16	B6128 Grange Road, East of Rouse Mill, SP	25	13.7

Link		Average Vehicle Speed (km/h)	Road Width (m)
L17	B6128 Grange Road	45	7.7
L18	B6128 Grange Road, SP	25	10.2
L19	B6128 Challenge Way, East of Mill Forest Way, SP	25	10.5
L20	B6128 Challenge Way, East of Mill Forest Way	45	7.3
L21	B6128 Challenge Way, North of Leeds Road, SP	25	16
L22	B6128, South of Leeds Road, SP	25	11.6
L23	B6128, South of Leeds Road	45	10.7
L24	B6128, South of Owl Lane, SP	25	12.9
L25	B6128, North of Wakefield Road	60	7.1
L26	B6128, North of Wakefield Road, SP	25	14.1
L27	Owl Lane, South of Leeds Road, SP	25	9.1
L28	Owl Lane	45	8.1
L29	Owl Lane, North of B6128, SP	25	11.3
L30	A638 Halifax Road	40	9.9
L31	A638 Halifax Road, SP	25	16.2
L32	A652 Bradford Road, SP	35	14.2
L33	A652 Bradford Road	40	9.2
L34	A652 Bradford Road, North of Hick Lane, SP	25	8.9
L35	A652 Bradford Road, South of Hick Lane, SP	30	8.8
L36	A652 Bradford Road, South of Rouse Mill Lane, SP	25	9.6
L37	A652 Bradford Road, South of Rouse Mill Lane	45	9.3
L38	A652 Bradford Road, Jack Lane Junction, SP	25	9.4
L39	A652 Bradford Road, South of Jack Lane	45	10.3
L40	A652 Bradford Road, North of Dewsbury Ring Road, SP	25	17.1
L41	A638 Wakefield Road, East of B6128	80	16.6
L42	A638 Wakefield Road, East of B6128, SP	25	19.3

Link		Average Vehicle Speed (km/h)	Road Width (m)
L43	A638 Wakefield Road, West of B6128, SP	25	19.1
L44	A638 Wakefield Road, West of B6128	60	9.2
L45	A638 Wakefield Road, West of B6128, SP	25	8.8
L46	A638 Wakefield Road, East of Rishworth Road	45	9.5
L47	A638 Wakefield Road, East of Rishworth Road, SP	25	16.8
L48	A638 Rishworth Road	35	17.1
L49	A638 Dewsbury Ring Road, North of Rishworth Road, SP	25	20.6
L50	A638 Dewsbury Ring Road, South of Leeds Road, SP	25	17.8
L51	A638 Dewsbury Ring Road, North of Leeds Road, SP	25	17.3
L52	A638 Dewsbury Ring Road, North of Leeds Road	40	15.6
L53	A638 Dewsbury Ring Road, East of Bradford Road	35	21.2
L54	A638 Dewsbury Ring Road, West of Bradford Road, SP	25	22.4
L55	A638 Dewsbury Ring Road, South of Halifax Road	35	20.4
L56	A638 Dewsbury Ring Road, South of Wellington Road	45	8.2
L57	Mill Forest Way, North	35	6.5
L58	Mill Forest Way, South	35	6.5
L59	A653 Leeds Road, North of Heybeck Lane	60	19.4
L60	A653 Leeds Road, North of Heybeck Lane, SP	25	18.7
L61	A653 Leeds Road, South of Heybeck Lane, SP	25	18.8
L62	A653 Leeds Road, South of Heybeck Lane, 40mph	60	17.6
L63	A653 Leeds Road, South of Heybeck Lane, 30mph	45	15.3
L64	A653 Leeds Road, East of Owl Lane	35	9.2
L65	A653 Leeds Road, East of Owl Lane, SP	25	9.2
L66	A653 Leeds Road, West of Owl Lane, SP	25	12.4
L67	A653 Leeds Road, West of B6128, SP	25	12.8
L68	A653 Leeds Road, West of B6128	45	9.8

Link		Average Vehicle Speed (km/h)	Road Width (m)
L69	A653 Leeds Road, South of Bywell Road	45	9.8
L70	A653 Leeds Road, East of Dewsbury Ring Road, SP 1	20	9.7
L71	A653 Leeds Road, East of Dewsbury Ring Road, SP 2	15	10.5
L72	A653 Leeds Road, East of Dewsbury Ring Road, SP 3	15	10.2
L73	A653 Leeds Road, Northbound from A638	15	12.8
L74	A653 Leeds Road, Southbound to Dewsbury Ring Road	15	7.6
L75	A653 Leeds Road, Eastbound from Dewsbury Ring Road	25	5.5
R1	Grange Road/Challenge Way/Mill Forest Way Roundabout	25	7.4
R2	B6128 Owl Lane Roundabout	25	7.9
R3	A638/B6128 Roundabout	35	9.3
R4	Rouse Mill Lane/Grange Road Roundabout	25	10.1

Reference should be made to Figure 9 for a graphical representation of the road link locations.

Emission Factors

In 2016, Air Quality Consultants Ltd (AQC) produced a spreadsheet entitled 'Calculator Using Realistic Emissions for Diesels' (CURED, versions V1A and V2A). This provided an alternative emissions calculator which took account of the large amount of evidence from real-world emissions tests showing that the European Environment Agency's COPERT and DEFRA's Emissions Factor Toolkit (EFT) were incorrect²⁰.

Since this time, a new EFT (v8.0.1) has been released by DEFRA. This includes COPERT 5 vehicle emission factors and fleet information, which now better reflect the predictions made by CURED V1A and V2A. However, AQC note there remains some uncertainty regarding how well the future vehicle fleet will perform in the real world. As such, in January 2018 AQC released CURED V3A²¹. This has been formulated to simulate failure of Euro 6d to provide any benefits over and above

²⁰ Emissions of Nitrogen Oxides from Modern Diesel Vehicles, AQC, 2016.

²¹ Development of the CURED V3A Emissions Model, AQC, 2018.

those of Euro6c, providing a more pessimistic view of the performance of post-2019 diesel cars and vans. As such, CURED V3A was utilised in the dispersion modelling in order to provide a worst-case representation of future year NO_x emission factors.

As PM₁₀ emission factors do not require adjustment, factors were calculated for the relevant traffic flows using the EFT (version 8.0.1) produced by DEFRA.

Meteorological Data

Meteorological data used in the assessment was taken from Leeds/Bradford International Airport meteorological station over the period 1st January 2017 to 31st December 2017 (inclusive). Leeds/Bradford International Airport meteorological station is located at NGR: 422676, 441150 which is approximately 17.2km north of the development. It is anticipated that conditions would be reasonably similar over a distance of this magnitude. The data was therefore considered suitable for an assessment of this nature.

All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 3 for a wind rose of utilised meteorological data.

Roughness Length

The z_0 is a modelling parameter applied to allow consideration of surface height roughness elements. A z_0 of 1m was used to describe the modelling extents. This value of z_0 is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'cities, woodlands'.

A z_0 of 0.3m was used to describe the meteorological site. This value of z_0 is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'agricultural areas (max)'.

Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 30m was used to describe the modelling extents and meteorological

site. This value is considered appropriate for the nature of both areas and is suggested within ADMS-Roads as being suitable for 'cities and large towns'.

Background Concentrations

Annual mean NO₂ and PM₁₀ background concentrations for use in the assessment were taken from the DEFRA mapping study for the grid square containing the 40 - Leeds Road, Dewsbury diffusion tube, NGR: 424500, 4211500. These are shown in Table A1.3.

Background levels of NO_x and NO₂ have been adjusted in accordance with the approach provided by AQC²² when using the CURED V3A emissions spreadsheet. This method uplifts the background concentrations predicted by DEFRA. The NO_x and NO₂ concentrations before and after adjustment are outlined in Table A1.3. It should be noted that adjustment of PM₁₀ concentrations is not required.

Table A1.3 Background Pollutant Concentrations - Modelling Extents

Pollutant	Predicted Background Pollutant Concentration (µg/m ³)	
	2017	2023
NO _x - Unadjusted	-	31.88
NO _x - Adjusted	-	32.96
NO ₂ - Unadjusted	25.48	21.97
NO ₂ - Adjusted	27.17	23.43
PM ₁₀	12.97	13.90

The values shown in Table A1.3 were chosen to represent concentrations throughout the dispersion modelling extents without the contribution from road vehicles as they were higher than the DEFRA background for the grid square containing the site, as shown in Table 12.

²² Adjusting Background NO₂ Maps for CURED, AQC, 2016.

NO_x to NO₂ Conversion

Predicted annual mean NO_x concentrations were converted to NO₂ concentrations using the spreadsheet (version 6.1) provided by DEFRA, which is the method detailed within DEFRA guidance²³.

Verification

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

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

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

For the purpose of the assessment, model verification was undertaken for 2017 using traffic data, meteorological data and monitoring results from this year.

Monitoring of NO₂ concentrations was undertaken at eight locations within the modelling extents during 2017. Review of the data indicated that the 4 - Princess Street, Batley, diffusion tube had 42% data capture. The monitored value was therefore not considered representative of the annual mean and the site was not considered further within the verification process. Results were obtained from the remaining positions and the road contributions to total NO_x concentrations calculated following the methodology contained within DEFRA guidance²⁴. The monitored annual mean NO₂ concentrations and calculated road NO_x concentrations are summarised in Table A1.4.

²³ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

²⁴ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

Table A1.4 Verification - Monitoring Results

Monitoring Location		Monitored NO ₂ Concentration (µg/m ³)	Calculated Road NO _x Concentration (µg/m ³)
20	Rockley Street, Dewsbury	35.69	17.47
39	Bradford Road, Batley	36.41	19.01
40	Leeds Road, Dewsbury	53.44	59.07
42	Leeds Road, Dewsbury - 2	45.94	40.56
43	John Street, Dewsbury	38.59	23.75
44	Calmswood Road, Eastborough	34.44	14.81
54	Wakefield Road, Dewsbury	35.00	16.00

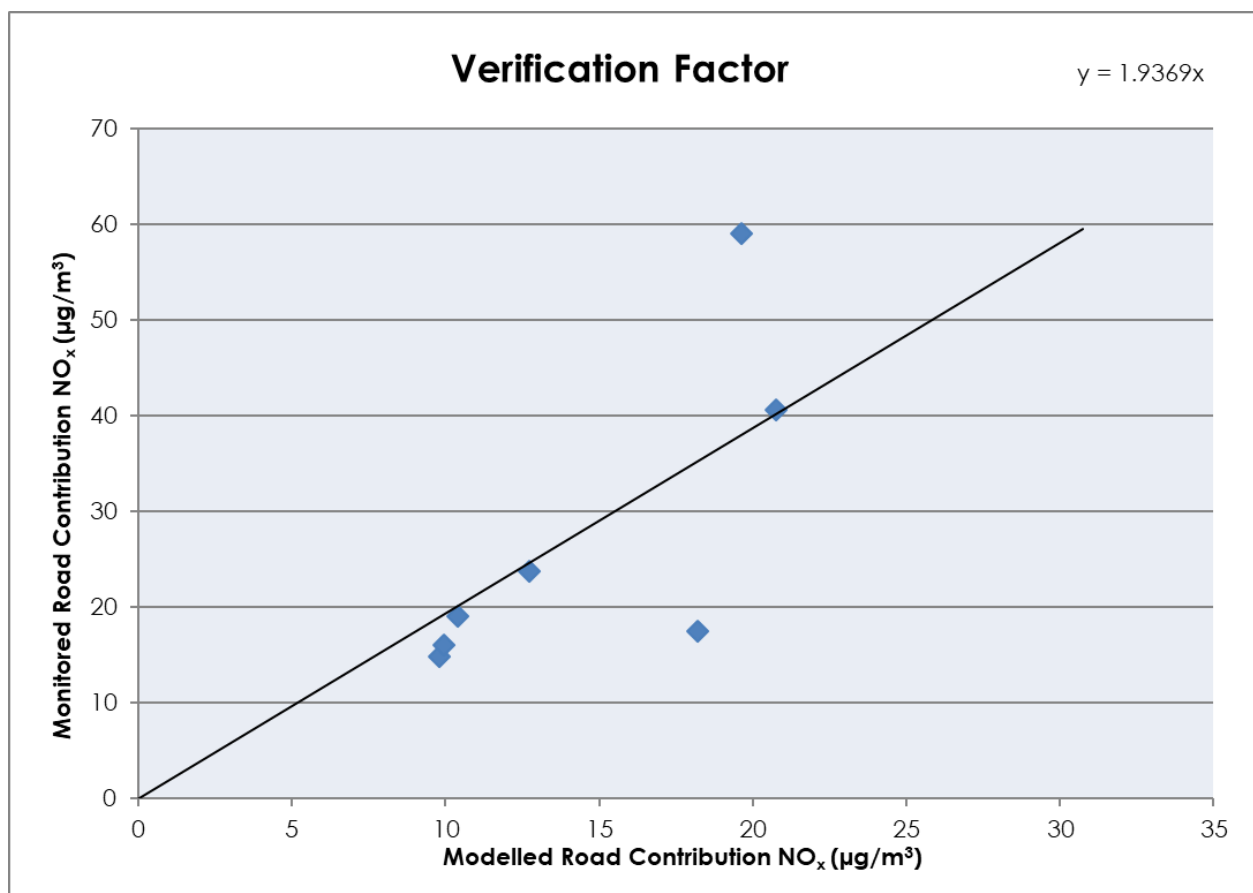
The annual mean road NO_x concentrations predicted from the dispersion model and the 2017 road NO_x concentrations calculated from the monitoring results are summarised in Table A1.5.

Table A1.5 Verification - Modelling Results

Monitoring Location		Calculated Road NO _x Concentration (µg/m ³)	Modelled Road NO _x Concentration (µg/m ³)
20	Rockley Street, Dewsbury	17.47	18.21
39	Bradford Road, Batley	19.01	10.40
40	Leeds Road, Dewsbury	59.07	19.63
42	Leeds Road, Dewsbury - 2	40.56	20.75
43	John Street, Dewsbury	23.75	12.74
44	Calmswood Road, Eastborough	14.81	9.79
54	Wakefield Road, Dewsbury	16.00	9.95

The monitored and modelled road NO_x concentrations were graphed and the equation of the trendline based on linear progression through zero calculated. This indicated that a verification factor of 1.9369 was required to be applied to all NO_x modelling results, as shown in Graph 1.

Graph 1 - NO_x Verification Factor



Further analysis of model performance is recommended in DEFRA guidance²⁵ in order to provide additional confidence in assessment predictions. As such, a comparison of the modelled and monitored NO₂ concentrations was undertaken. The NO_x verification factor was therefore applied to the modelled road NO_x concentrations at the monitoring locations and the total NO₂ concentrations calculated using the NO_x to NO₂ spreadsheet. This is summarised in Table A1.6.

Table A1.6 NO₂ Verification - Difference between Monitored and Modelled NO₂ Concentrations

Monitoring Location		Modelled Road NO _x Concentration - Verified (µg/m³)	Modelled NO ₂ Concentration (µg/m³)	Monitored NO ₂ Concentration (µg/m³)	Difference between Monitored and Modelled NO ₂ Concentration (%)
20	Rockley Street, Dewsbury	35.27	43.69	35.69	+22.42

²⁵ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

Monitoring Location		Modelled Road NO _x Concentration - Verified (µg/m ³)	Modelled NO ₂ Concentration (µg/m ³)	Monitored NO ₂ Concentration (µg/m ³)	Difference between Monitored and Modelled NO ₂ Concentration (%)
39	Bradford Road, Batley	20.14	36.93	36.41	+1.43
40	Leeds Road, Dewsbury	38.02	44.86	53.44	-16.06
42	Leeds Road, Dewsbury - 2	40.19	45.78	45.94	-0.35
43	John Street, Dewsbury	24.68	39.01	38.59	+1.09
44	Calmswood Road, Eastborough	18.97	36.39	34.44	+5.66
54	Wakefield Road, Dewsbury	19.27	36.53	35.00	+4.37

As shown in Table A1.6, the difference between the modelled and monitored NO₂ concentrations at the diffusion tubes ranged between -16.06% and +22.42%. DEFRA guidance²⁶ states that the majority of modelled results should be within 25% of the monitored concentrations. The model is therefore considered to be performing to an acceptable level.

Monitoring of PM₁₀ concentrations is not undertaken within the assessment extents. The NO_x verification factor was therefore used to adjust PM₁₀ model predictions in lieu of more accurate data in accordance with DEFRA guidance²⁷.

²⁶ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

²⁷ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

Appendix 2 - Curricula Vitae

KEY EXPERIENCE:

Jethro is a Chartered Environmentalist and Director of Redmore Environmental with specialist experience in the air quality and odour sectors. His key capabilities include:

- Production and management of Air Quality, Dust and Odour Assessments for a wide-range of clients from the retail, residential, infrastructure, commercial and industrial sectors.
- Production and co-ordination of Environmental Permit applications for a variety of industrial sectors.
- Detailed dispersion modelling of road vehicle and industrial emissions using ADMS-Roads, ADMS-5, AERMOD-PRIME and BREEZE-ROADS. Studies have included impact assessment of ground level pollutant and odour concentrations and assessment of suitability of development sites for proposed end-use.
- Project management and co-ordination of Environmental Impact Assessments and scoping reports for developments throughout the UK.
- Provision of expert witness services at Planning Inquiries.
- Design and project management of pollutant monitoring campaigns.
- Co-ordination and management of large-scale multi-disciplinary projects and submissions.
- Provision of expert advice to local government and international environmental bodies, as well as involvement in production of industry guidance.

SELECT PROJECTS SUMMARY:

Industrial

Shanks Waste Management - Odour Assessments of two waste management facilities to support Environmental Permit Applications.

Tatweer Petroleum - dispersion modelling of Bahrain oil field.

Doha South Sewage Treatment Works - AQA for works extension in Qatar.

IRIS Environmental Appraisal Report Reviews, Isle of Man Government - odour assessment reviews.

Lankem, Greater Manchester - Environmental Permit Application for chemical manufacturing plant.

Newport Docks Bulk Drying, Pelleting and CHP Facility - air quality EIA for gas CHP.

Springshades, Leicester - Environmental Permit Variation Application for textile manufacturing plant.

Valspar, Chester - Odour Assessment and production of Odour Management Plan for a paint manufacturing plant in response to neighbour complaints.

Agrivert - dispersion modelling of odour and CHP emissions from numerous AD plants.

James Cropper Paper Mill, Cumbria - air quality EIA, Environmental Permit Variation and Human Health Risk Assessment for new biomass boiler adjacent to SSSI.

Rigg Approach, Leyton - Air Quality Assessment in support of waste transfer site.

Lynchford Lane Waste Transfer Station - biomass facility energy recovery plant.

Barnes Wallis Heat and Power, Cobham - biomass facility adjacent to AQMA.

Residential

Wood St Mill, Bury - residential development adjacent to scrap metal yard.

Hyams Lane, Holbrook - Odour Assessment to support residential development adjacent to sewage works.

North Wharf Gardens, London - peer review of EIA undertaken for large residential development.

Loxford Road, Alford - Air Quality EIA for residential development, included consideration of impacts from associated package sewage works

Elephant and Castle Leisure Centre - baseline AQA for redevelopment.

Carr Lodge, Doncaster - EIA for large residential development.

Queensland Road, Highbury - residential scheme including CHP.

Bicester Ecotown - dispersion modelling of energy centre.

Castleford Growth Delivery Plan - baseline air quality constraints assessment for town redevelopment.

York St, Bury - residential development adjacent to AQMA.

Temple Point Leeds - residential development adjacent to M1.

Commercial and Retail

Etihad Stadium - Air Quality EIA for the extension to the capacity of the Etihad Stadium, Manchester.

Wakefield College - redevelopment of city centre campus in AQMA.

Manchester Airport Cargo Shed - commercial development.

Manchester Airport Apron Extension - EIA including aircraft emission modelling.

National Youth Theatre, Islington - redevelopment to provide new arts space and accommodation.

KEY EXPERIENCE:

Pearl is an Environmental Consultant with specialist experience in the air quality sector. Her key capabilities include:

- Production of Air Quality Assessments in accordance with Department for Environment, Food and Rural Affairs (DEFRA) methodologies for a range of residential, commercial and industrial sectors.
- Detailed dispersion modelling of road vehicle exhaust emissions using ADMS-Roads. Studies have included assessment of road traffic exhaust emissions on sensitive receptors and exposure of new residents to poor air quality.
- Assessment of construction dust impacts from a range of development sizes.
- Assessment of fugitive dust impacts from a range of mineral extraction developments.
- Production of air quality mitigation strategies specifically tailored to address issues at individual sites.
- Definition of baseline air quality and identification of sensitive areas across the UK.
- Odour surveys to assess amenity and suitability of sites for potential future development for residential use.
- Odour monitoring at industrial sites to quantify odour emission rates.

SELECT PROJECTS SUMMARY:

Maid Marian House, Nottingham

Air Quality Assessment for a change of use from office units to residential use. Concerns were raised regarding the exposure of future occupants to poor air quality due to road traffic emissions from the A6008 Maid Marian Way. Dispersion modelling took place at several different heights reflective of residential units within the development. Predicted concentrations of NO₂ were found to exceed air quality criteria at numerous levels of the proposed building. Mechanical ventilation was specified in the appropriate units within the development as a form of mitigation.

Victoria Quarter, London

Air Quality Assessment in support of residential development in an AQMA. Dispersion modelling was undertaken to consider the potential impact of development generated vehicles and CHP/Boiler emissions on air quality at sensitive receptor locations within the vicinity of the site. Different heights within the development, reflective of the proposed residential units, were also considered. The assessment identified a range of impacts, as such, a range of mitigation was specified. Mechanical ventilation was also specified in the appropriate units predicted to be exposed to poor levels of air quality.

Monks Farm, Townsend Grove

Air Quality EIA in support of residential development comprising 456 dwellings and primary school. NO₂ and PM₁₀ concentrations were predicted to be below the air quality objectives at the sensitive receptors considered. Air quality effects as a result of the proposals was determined to be not significant.

Stanton Harcourt, West Oxford

Odour Assessment for the redevelopment of the former Stanton Harcourt Airfield to residential properties. Due to the location of the site, being adjacent to a recently capped landfill, odour surveys were required to assess the level of odour across the site. A risk assessment was also undertaken in accordance with appropriate odour guidance. Taking into account the results of the odour surveys, recent odour complaint history and odour risk assessment the potential for odour effects across the site was determined to be not significant.

Hunter Street, Chester

Air Quality Assessment in support of a development for student accommodation. Concerns were raised regarding the exposure of future occupants to poor air quality due to road traffic emissions from the A5268. Dispersion modelling took place at several different heights of the proposed building. Predicted concentrations of NO₂ were found to exceed air quality criteria at ground to first floor level for those apartments facing the A5268. Mechanical ventilation was specified in these units as a form of mitigation.

Botley Road, West End, Southampton

Co-ordination and management of a six month diffusion study in support of a proposed residential development. Concerns were raised regarding the exposure of future residents to poor air quality due to road traffic emissions from the M27. The results of the monitoring study identified NO₂ concentrations across the site to be below the air quality objective and therefore deemed suitable for residential use.

KEY EXPERIENCE:

Emily is an Environmental Consultant with specialist experience in the air quality sector. Her key capabilities include:

- Production of Air Quality Assessments in accordance with Department for Environment, Food and Rural Affairs (DEFRA) methodologies for a range of residential, commercial and industrial sectors.
- Detailed dispersion modelling of road vehicle exhaust emissions using ADMS-Roads. Studies have included assessment of road traffic exhaust emissions on sensitive receptors and exposure of new residents to poor air quality.
- Assessment of construction dust impacts from a range of development sizes.
- Assessment of fugitive dust impacts from a range of mineral extraction developments.
- Assessment of petrol stations to address benzene concentrations and their impact on adjacent developments.
- Production of air quality mitigation strategies specifically tailored to address issues at individual sites.
- Definition of baseline air quality and identification of sensitive areas across the UK.
- Odour surveys to assess amenity and suitability of sites for potential future development for residential use.

SELECT PROJECTS SUMMARY:

Station Road, West Drayton

Air Quality Assessment for a change of use from office units to a hotel in an Air Quality Management Area (AQMA). Concerns were raised regarding the exposure of future occupants to poor air quality due to road traffic emissions and an adjacent petrol station. Detailed dispersion modelling was undertaken using ADMS-roads to assess PM₁₀ and NO₂ concentrations across the site. Results revealed that pollution levels were below the air quality standards across the development. A qualitative assessment of benzene emissions took place to assess the potential effects of the petrol station. A screening process indicated that due to the change of use of the existing building into a hotel, future occupants would not be exposed for periods long enough to affect human health.

Holloway Lane, Harmondsworth

Air Quality Assessment in support of a mineral extraction site located within an AQMA. The proposals involved a processing and concrete plant which had the potential to cause air quality impacts as a result of fugitive dust emissions. An assessment was undertaken and revealed that the use of good practice control measures would provide suitable mitigation for the development.

Dulcote Quarry, Wells

Air Quality Assessment for the redevelopment of Dulcote Quarry to provide a Food Manufacturing Campus. An assessment of road traffic emissions, fugitive dust emissions and odour was undertaken. Impacts of road traffic emissions and fugitive dust on sensitive receptors were negligible at all locations. The risk of potential odour effects was also determined to be negligible.

Queens Road, London

Air Quality and Odour Assessments in support of residential development in an AQMA. Dispersion modelling took place at several different heights reflective of residential units within the development. Predicted concentrations of NO₂ were found to exceed air quality criteria from ground to second floor level. As such, mitigation was specified for the affected units to ensure future residents would not be exposed to poor air quality.

Anerley Road, Penge

Air Quality Assessment for a residential scheme located in an AQMA. Due to the location of the site at the foot of a hill, detailed calculations took place to take account of the gradient which would increase the amount of emissions produced by road traffic. Results revealed that NO₂ concentrations exceeded air quality criteria across part of the development fronting Anerley Road. Mechanical ventilation was specified in the appropriate units within the development as a form of mitigation.

The Crescent, Salford

Air Quality Assessment for the redevelopment of the former Salford Police Headquarters to residential properties. Using sensitive receptors, located in areas where increased road traffic may affect NO₂ concentrations, a comparison was made between overall concentrations with and without the development in place. Results revealed pollutant concentrations were below the relevant standards across the site and impacts associated with the development were not significant.