Air Quality Assessment

Lundhill Road, Wombwell

Client: Persimmon Homes West Yorkshire

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Executive Summary

Redmore Environmental Ltd was commissioned by Persimmon Homes West Yorkshire to undertake an Air Quality Assessment in support of a planning application for a residential development on land east of Lundhill Road, Wombwell.

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 well as expose future occupants to elevated pollution levels. As such, an Air Quality Assessment was required in order to determine baseline conditions, consider site suitability for the proposed end-use 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 operational phase impacts from vehicle exhaust emissions were assessed by predicting air quality conditions at sensitive locations both with and without the development in place. Results were subsequently verified using local monitoring data. Further to this, dispersion modelling was undertaken in order to predict pollutant concentrations across the proposed site as a result of emissions from the highway network.

Review of the dispersion modelling results revealed 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.

The results of the assessment also demonstrated that predicted pollution levels were below the relevant air quality standards at all locations across the site. As such, the development is considered suitable for residential use from an air quality perspective.

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 Persimmon Homes West Yorkshire to undertake an Air Quality Assessment in support of a planning application for a residential development on land east of Lundhill Road, Wombwell.

1.1.2 The proposed development has the potential to cause air quality impacts at sensitive locations during the construction and operational phases, as well as expose future occupants to elevated pollution levels. As such, an Air Quality Assessment was required in order to determine baseline conditions, consider site suitability for the proposed end-use and assess potential effects associated with the scheme.

1.2 Site Location and Context

1.2.1 The site is located on land off Lundhill Road, Wombwell, at approximate National Grid Reference (NGR): 440381, 401937. Reference should be made to Figure 1 for a map of the site and surrounding area.

1.2.2 The proposals comprise the development of circa 150 dwellings with associated access, car parking, landscaping, public open space and infrastructure.

1.2.3 The development has the potential to cause 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. Further to this, there are concerns that the proposals may introduce future users to exceedences of the relevant Air Quality Objectives (AQOs) due to the proximity of the development to the A6195. An Air Quality Assessment was therefore undertaken in order to determine baseline conditions, consider site suitability for the proposed end-use 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 (NO_2), oxides of nitrogen (NO_x), sulphur dioxide, lead and particulate matter with an aerodynamic diameter of less than 10µm (PM_{10});
- 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 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 2007[1]. The AQS sets out AQOs that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of 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 guidance[2] 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 (TG16), DEFRA, 2016.

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), 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 practice measures.

2.5 National Planning Policy

2.5.1 The National Planning Policy Framework[3] (NPPF) was published on 27th March 2012 and sets out the Government's core policies and principles with respect to land use planning, including air quality. The document includes the following considerations which are relevant to the proposed development:

> "The planning system should contribute to and enhance the natural and local environment by: […]
>
> Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability"
>
> "Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan."

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

[3] NPPF, Department for Communities and Local Government, 2012.

2.6 National Planning Practice Guidance

2.6.1 The National Planning Practice Guidance[4] (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?
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 Barnsley Metropolitan Borough Council (BMBC) Local Development Plan consists of the Core Strategy, the Barnsley Education Sites Development Plan Document, the Joint Waste Plan and saved policies from the Unitary Development Plan (UDP). The Core Strategy[5] was adopted in September 2011 and sets out the key elements of the planning framework for Barnsley. Review of the Core Strategy revealed the following policies of relevance to this report:

"CSP 40 Pollution Control and Protection

[4] http://planningguidance.planningportal.gov.uk.

[5] Core Strategy, Local Development Framework, BMBC, 2011.

Development will be expected to demonstrate that it is not likely to result, directly or indirectly, in an increase in air, surface water and groundwater, noise, smell, dust, vibration, light or other pollution which would unacceptably affect or cause a nuisance to the natural and built environment or to people.

We will not allow development of new housing or other environmentally sensitive development where existing air pollution, noise, smell, dust, vibration, light or other pollution levels are unacceptable and there is no reasonable prospect that these can be mitigated against.

Developers will be expected to minimise the effects of any possible pollution and provide mitigation measures where appropriate."

"CSP 41 Development in Air Quality Management Areas

Development in air quality management areas will be expected to demonstrate that it will not have a harmful effect on the health or living conditions of any future users of the development in terms of air quality (including residents, employees, visitors and customers), or that any such harmful effects can be mitigated against.

We will only allow residential development in air quality management areas, where the development provides an assessment that shows living conditions will be acceptable for future users.

We will only allow development in air quality management areas which could cause more air pollution, where the development provides an assessment that shows there will not be a significantly harmful effect on air quality."

2.7.2 The Core Strategy supersedes the majority of the Volume 1: Strategy, Policy and Justification UDP[6]. However, some policies from the UDP have been saved until the adoption of the new Local Plan. Review of the UDP saved policies document revealed the following policy of relevance to this report:

"Economic Development and Residential Amenity

6 Volume 1: Strategy, Policy and Justification, Barnsley UDP, BMBC, 2000.

Policy ED4

Proposals for economic development adjoining or close to housing will be assessed with particular regard to the likely impact on residential amenity in terms of:

a) Air Pollution including smell, fumes, smoke, soot, ash, dust or grit.

[…]"

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, as well as expose future occupants to elevated pollution levels. These issues have been assessed in accordance with the following methodology. This was agreed with Chris Shields, Technical Officer for Pollution Control at BMBC, on 20th September 2017.

3.1.2 BMBC have produced 'Air Quality and Emissions Good Practice Planning Guidance'[7] which includes direction on when an air quality assessment will be required and the associated scope of works. The recommendations outlined in the document were applied as necessary throughout the assessment.

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'[8].

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;

[7] Air Quality and Emissions Good Practice Planning Guidance, BMBC, 2014.

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

- Harm to ecological receptors; and,
- The risk of health effects due to a significant increase in exposure to PM_{10}.

3.2.4 The assessment steps are detailed below.

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 10,000m^2 • Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) • More than 10 heavy earth moving vehicles active at any one time • Formation of bunds greater than 8m in height • More than 100,000 tonnes of material moved
	Construction	• Total building volume greater than 100,000m^3 • 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 2,500m^2 to 10,000m^2 • 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 25,000m^3 to 100,000m^3 • 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 2,500m^2 • Soil type with large grain size (e.g. sand) • Less than 5 heavy earth moving vehicles active at any one time • Formation of bunds less than 4m in height • Total material moved less than 20,000 tonnes • Earthworks during wetter months
	Construction	• Total building volume less than 25,000m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber)

Magnitude	Activity	Criteria
	Trackout	• Less than 10 HDV trips per day • Surface material with low potential for dust release • Unpaved road length less than 50m

3.2.10 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 PM_{10}. e.g. residential properties, hospitals, schools and residential care homes	• Internationally or nationally designated site e.g. Special Area of Conservation
Medium	• Users would expect to enjoy a reasonable level of amenity • Aesthetics or value of their property could be diminished by soiling • People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work	• Nationally designated site e.g. Sites of Special Scientific Interest
Low	• Enjoyment of amenity would not reasonably be expected • Property would not be expected to be diminished in appearance • Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, playing fields, farmland, footpaths, short term car park and roads	• Locally designated site e.g. Local Nature Reserve

3.2.11 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.

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

3.2.13 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

3.2.14 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/m³	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m³	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m³	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/m³	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/m³	More than 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	28 - 32µg/m³	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24 - 28µg/m³	More than 10	Low	Low	Low	Low	Low
		1 -10	Low	Low	Low	Low	Low
	Less than 24µg/m³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
Low	-	1 or more	Low	Low	Low	Low	Low

3.2.15 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
Medium	Medium	Low
Low	Low	Low

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

3.2.17 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

3.2.18 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

3.2.19 Step 3 requires the identification of site specific mitigation measures within the IAQM guidance[9] 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

3.2.20 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**.

3.2.21 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.

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

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, as well as expose future occupants to poor air quality. Potential impacts have been defined by predicting pollutant concentrations at sensitive locations using dispersion modelling for the following scenarios:

- 2016 - Verification;
- Opening year Do-Minimum (DM) (predicted traffic flows in 2021 should the proposals not proceed); and,
- Opening year Do-Something (DS) (predicted traffic flows in 2021 should the proposals be completed).

3.3.2 Reference should be made to Appendix 1 for assessment input data and details of the verification process.

Potential Development Impacts

3.3.3 Locations sensitive to potential changes in 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)[10] on the likely limits of pollutant dispersion from road sources. The criteria provided within DEFRA guidance[11] on where the AQOs apply, as summarised in Table 2, was utilised to determine appropriate receptor positions.

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'[12]. 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.

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

11 Local Air Quality Management (TG16), DEFRA, 2016.

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

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**.

3.3.6 Following the prediction of impacts at discrete receptor locations, the IAQM document[13] 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. 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 should be provided as far as practicable. This has been considered throughout the assessment

[13] Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

when defining predicted impacts. The IAQM guidance[14] suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix 2.

Future Exposure

3.3.9 The proposed development has the potential to expose future residents to poor air quality. Pollutant concentrations were therefore quantified across the site using dispersion modelling. The results were subsequently compared with the relevant AQOs to determine the potential for any exceedence.

[14] 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), BMBC has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean concentrations of NO_2 are above the AQO within the borough. Six AQMAs are currently declared, with the closest to the development described as:

> "Barnsley AQMA No.1: An area along the M1 between Junction 35a and Junction 38, including Haigh, Darton, Cawthorne Dike, Higham, Dodworth, Gilroyd, Rockley, Birdwell, and Tankersley. The area extends 100m either side of the central reservation."

4.2.2 The site is located approximately 5.4km north-east of Barnsley AQMA No. 1. It is considered unlikely the proposals would cause air quality impacts over a distance of this magnitude. As such, the AQMA has not been considered further in the context of the assessment.

4.2.3 BMBC 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 BMBC throughout their area of jurisdiction. Recent NO_2 results from the sites nearest to the development are shown in Table 11.

Table 11 BMBC Monitoring Results

Monitoring Site		Monitored NO_2 Concentration (µg/m³)		
		2014	2015	2016
DT46	Near to supermarket site, Wombwell Lane	37.2	37.0	36.6
DT49	Doncaster Road, Ardsley	38.6	37.5	37.3

4.3.2 As shown in Table 11, annual mean NO_2 concentrations were below the AQO at both monitors in recent years.

4.3.3 The development site is located approximately 135m north-west of Rotherham Metropolitan Borough Council's (RMBC's) administrative extents. RMBC also undertake monitoring of pollutant concentrations in the vicinity of the proposed development. Recent results are shown in Table 12.

Table 12 RMBC Monitoring Results

Monitoring Site		Monitored NO_2 Concentration (µg/m³)		
		2014	2015	2016
R11	Wath Rd. Brampton Bierlow	25.8	24.9	25.7
R12	185 Barnsley Rd. W. Melton	26.0	28.7	26.9
R13	2 Hesley Bar	29.3	31.5	25.4
R87	Manvers Way (1)	33.7	39.5	35.6
R88	Manvers Way (2)	35.6	34.9	35.1

4.3.4 As shown in Table 12, annual mean NO_2 concentrations were below the AQO at all monitors in recent years.

4.3.5 BMBC and RMBC do not undertake PM_{10} monitoring within the vicinity of the site.

4.3.6 Reference should be made to Figure 2 for a map of the survey locations.

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: 440500, 401500. Data for this location was downloaded from the DEFRA website[15] for the purpose of the assessment and is summarised in Table 13.

Table 13 Background Pollutant Concentration Predictions

Pollutant	Predicted Background Pollutant Concentration (µg/m³)		
	2016	2017	2021
NO_2	16.67	15.85	13.06
PM_{10}	16.30	16.17	15.74

4.4.2 As shown in Table 13, predicted background NO_2 and PM_{10} 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 14.

15 https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2013.

Table 14 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 15. For the purpose of the assessment it was assumed construction phase traffic would access the site from Lundhill Road.

Table 15 Trackout Dust Sensitive Receptors

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

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 16.

Table 16 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	There is no significant screening around the site boundary

Guidance	Comment
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 south-west. As such, receptors to the north-east of the site 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	The construction phase is likely to last approximately 4 years
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 users would expect to enjoy a reasonable level of amenity, aesthetics or value of their property could be diminished by soiling and people would be expected to be present for extended periods of time e.g. residential properties.

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 17.

Table 17 Sensitivity of the Surrounding Area

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

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 18. Receptor heights were selected to take account for less sensitive land uses, such as ground floor retail units.

Table 18 Sensitive Receptor Locations

Receptor		NGR (m)		Height (m)
		x	y	
R1	Residential - Beech House Road	439797.3	401443.0	1.5
R2	Residential - The Lundhill Tavern	440234.4	401767.4	4.0
R3	Residential - Lundhill Road	440274.3	401998.8	1.5
R4	Residential - Lundhill Road	440479.3	402387.9	1.5
R5	Residential - Lundhill Road	440605.7	402510.4	1.5
R6	Parkside Care Home	440329.8	402836.6	1.5
R7	Residential - Parks Street	440409.6	402700.3	1.5
R8	Residential - Hall Cross Avenue	440887.3	402409.9	1.5
R9	Residential - Wath Road	440769.9	402472.7	1.5
R10	Residential - Brampton Road	440962.9	402351.6	1.5
R11	Residential - Wath Road	441087.0	402430.0	1.5
R12	Residential - Kingfisher Drive	441500.2	402271.3	1.5
R13	Residential - Lundhill Road	440390.1	402302.1	1.5
R14	Residential - Knowllbeck Lane	441261.8	401932.2	1.5
R15	Residential - Beech House Road	439974.9	401524.2	1.5

4.5.9 The sensitive receptors identified in Table 18 represent worst-case locations. However, this is not an exhaustive list and there may be other locations within the vicinity of the site that may experience air quality impacts as a result of the proposals that have not been individually identified above. 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 is estimated to cover an area greater than 10,000m^2. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from earthworks is therefore **large.**

5.2.5 Table 17 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 activities.

5.2.6 Table 17 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 activities.

Construction

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

5.2.8 Table 17 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 17 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 Information on the number of HDV trips to be generated during the construction phase of the development was not available at the time of assessment. However, based on the site area, it is anticipated that the unpaved road length is likely to 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 17 indicates the sensitivity of the area to dust soiling effects on 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 17 indicates the sensitivity of the area to human health impacts is **medium.** In accordance within the criteria outlined in Table 9, the development is considered to be a **medium** 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 19.

Table 19 Summary of Potential Unmitigated Dust Risks

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

5.2.14 As indicated in Table 19, the potential risk of dust soiling is **high** from earthworks, construction and trackout. The potential risk of human health impacts is **medium** from trackout and **low** from earthworks and construction.

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 guidance[16] 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 20. These may be reviewed prior to the commencement of construction works and incorporated into a Construction Environmental Management Plan if required by the LA.

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

Table 20 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
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 • Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site • Fully enclose 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 and burning of waste materials
Earthworks	• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable • Use Hessian, mulches or tackifiers 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 • Avoid dry sweeping of large areas • Ensure vehicles entering and leaving site are covered to prevent escape of materials • Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable • Record all inspections of haul routes and any subsequent action in a site log book • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned • Implement a wheel washing system • Access gates to be located at least 10m from receptors where possible

Step 4

5.2.17 Assuming the relevant mitigation measures outlined in Table 20 are implemented, the residual impacts from all dust generating activities is predicted to be **not significant**, in accordance with IAQM guidance[17].

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 undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site, as well as consider potential exposure of future occupants to AQO exceedences.

5.3.2 The assessment considered the following scenarios:

- 2016 - Verification;
- 2021 - DM; and,
- 2021 - DS.

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

5.3.4 For the purpose of the assessment traffic data for 2021 was utilised as the development opening year. Air quality is predicted to improve in the future. However, in order to provide a robust assessment, emission factors and background concentrations for 2016 were utilised within the dispersion model. The use of 2021 traffic data and 2016 emission factors and background concentrations is considered to provide a worst-case scenario and therefore a sufficient level of confidence can be placed within the predicted pollution concentrations.

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

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

Potential Development Impacts

Predicted Concentrations

5.3.6 Annual mean NO_2 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 NO_2 Concentrations

Receptor		Predicted Annual Mean NO_2 Concentration (µg/m³)		
		DM	DS	Change
R1	Residential - Beech House Road	19.38	19.51	0.13
R2	Residential - The Lundhill Tavern	22.49	22.61	0.12
R3	Residential - Lundhill Road	20.60	20.85	0.25
R4	Residential - Lundhill Road	21.06	21.39	0.33
R5	Residential - Lundhill Road	25.64	26.04	0.40
R6	Parkside Care Home	23.59	23.67	0.08
R7	Residential - Parks Street	23.69	23.78	0.09
R8	Residential - Hall Cross Avenue	25.43	25.56	0.13
R9	Residential - Wath Road	25.46	25.68	0.22
R10	Residential - Brampton Road	30.27	30.34	0.07
R11	Residential - Wath Road	28.08	28.17	0.09
R12	Residential - Kingfisher Drive	27.89	27.95	0.06
R13	Residential - Lundhill Road	20.97	21.32	0.35
R14	Residential - Knowllbeck Lane	26.45	26.49	0.04
R15	Residential - Beech House Road	21.06	21.31	0.25

5.3.7 As indicated in Table 21, predicted annual mean NO_2 concentrations were below the relevant AQO at all sensitive receptors in both scenarios.

5.3.8 Reference should be made to Figure 5 and 6 for graphical representations of annual mean NO_2 concentrations across the assessment area for the DM and DS scenarios, respectively.

5.3.9 Annual mean PM_{10} concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 22.

Table 22 Predicted Annual Mean PM_{10} Concentrations

Receptor		Predicted Annual Mean PM_{10} Concentration (µg/m³)		
		DM	DS	Change
R1	Residential - Beech House Road	16.81	16.84	0.03
R2	Residential - The Lundhill Tavern	17.35	17.38	0.02
R3	Residential - Lundhill Road	17.04	17.09	0.05
R4	Residential - Lundhill Road	17.15	17.21	0.07
R5	Residential - Lundhill Road	18.01	18.08	0.07
R6	Parkside Care Home	17.69	17.71	0.02
R7	Residential - Parks Street	17.71	17.72	0.02
R8	Residential - Hall Cross Avenue	17.92	17.95	0.02
R9	Residential - Wath Road	18.05	18.10	0.05
R10	Residential - Brampton Road	19.03	19.04	0.01
R11	Residential - Wath Road	18.75	18.77	0.02
R12	Residential - Kingfisher Drive	18.59	18.60	0.01
R13	Residential - Lundhill Road	17.13	17.20	0.07
R14	Residential - Knowllbeck Lane	18.24	18.25	0.01
R15	Residential - Beech House Road	17.13	17.18	0.05

5.3.10 As indicated in Table 22, predicted annual mean PM_{10} concentrations were below the relevant AQO at all sensitive receptors in both scenarios.

5.3.11 Reference should be made to Figure 7 and 8 for graphical representations of annual mean PM_{10} concentrations across the assessment area for the DM and DS scenarios, respectively.

Predicted Impacts

5.3.12 Predicted impacts on annual mean NO_2 concentrations at the sensitive receptor locations are summarised in Table 23.

Table 23 Predicted Impacts - NO_2

Receptor		Predicted Annual Mean NO_2 Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - Beech House Road	Below 75% of AQO	0	Negligible
R2	Residential - The Lundhill Tavern	Below 75% of AQO	0	Negligible
R3	Residential - Lundhill Road	Below 75% of AQO	1	Negligible
R4	Residential - Lundhill Road	Below 75% of AQO	1	Negligible
R5	Residential - Lundhill Road	Below 75% of AQO	1	Negligible
R6	Parkside Care Home	Below 75% of AQO	0	Negligible
R7	Residential - Parks Street	Below 75% of AQO	0	Negligible
R8	Residential - Hall Cross Avenue	Below 75% of AQO	0	Negligible
R9	Residential - Wath Road	Below 75% of AQO	1	Negligible
R10	Residential - Brampton Road	76 - 94% of AQO	0	Negligible
R11	Residential - Wath Road	Below 75% of AQO	0	Negligible
R12	Residential - Kingfisher Drive	Below 75% of AQO	0	Negligible
R13	Residential - Lundhill Road	Below 75% of AQO	1	Negligible
R14	Residential - Knowllbeck Lane	Below 75% of AQO	0	Negligible
R15	Residential - Beech House Road	Below 75% of AQO	1	Negligible

5.3.13 As indicated in Table 23, impacts on annual mean NO_2 concentrations as a result of the proposed development were predicted to be **negligible** at all receptors.

5.3.14 Predicted impacts on annual mean PM_{10} concentrations at the sensitive receptor locations are summarised in Table 24.

Table 24 Predicted Impacts - PM_{10}

Receptor		Predicted Annual Mean PM_{10} Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - Beech House Road	Below 75% of AQO	0	Negligible
R2	Residential - The Lundhill Tavern	Below 75% of AQO	0	Negligible
R3	Residential - Lundhill Road	Below 75% of AQO	0	Negligible
R4	Residential - Lundhill Road	Below 75% of AQO	0	Negligible
R5	Residential - Lundhill Road	Below 75% of AQO	0	Negligible
R6	Parkside Care Home	Below 75% of AQO	0	Negligible
R7	Residential - Parks Street	Below 75% of AQO	0	Negligible
R8	Residential - Hall Cross Avenue	Below 75% of AQO	0	Negligible
R9	Residential - Wath Road	Below 75% of AQO	0	Negligible
R10	Residential - Brampton Road	Below 75% of AQO	0	Negligible
R11	Residential - Wath Road	Below 75% of AQO	0	Negligible
R12	Residential - Kingfisher Drive	Below 75% of AQO	0	Negligible
R13	Residential - Lundhill Road	Below 75% of AQO	0	Negligible
R14	Residential - Knowllbeck Lane	Below 75% of AQO	0	Negligible
R15	Residential - Beech House Road	Below 75% of AQO	0	Negligible

5.3.15 As indicated in Table 24, impacts on annual mean PM_{10} concentrations as a result of the proposed development were predicted to be **negligible** at all receptors.

Potential Future Exposure

5.3.16 The proposed development has the potential to cause exposure of future residents to elevated pollution levels. Dispersion modelling was therefore undertaken with the inputs

described in Appendix 1 to quantify air quality conditions at the site. Reference should be made to Figures 6 and 8 for graphical representations of annual mean NO_2 and PM_{10} concentrations, respectively.

5.3.17 As shown in Figure 6, annual mean NO_2 concentrations were predicted to be below the AQO of 40µg/m^3 at all locations across the development. The maximum level at the site boundary was 24.27µg/m^3. As such, future occupants are not predicted to be exposed to NO_2 concentrations above the AQO.

5.3.18 As shown in Figure 8, annual mean PM_{10} concentrations were predicted to be below the AQO of 40µg/m^3 at all locations across the development. The maximum level at the site boundary was 17.67µg/m^3. As such, future occupants are not predicted to be exposed to PM_{10} concentrations above the AQO.

5.3.19 Based on the assessment results, future occupants are not predicted to be exposed to pollutant concentrations above the AQOs at any location within the development.

Mitigation

5.3.20 A number of mitigation measures have been proposed following the methodology provided within the BMBC 'Air Quality and Emissions Good Practice Planning Guidance'[18] document. Review of the relevant criteria identified the development to be a **medium** scale proposal under the following conditions:

- Development provides greater than 50 dwellings; and,
- Development generates greater than 100 two-way vehicle movements per day.

5.3.21 Where a development is classified as **medium**, Type 1 and 2 mitigation is required. As such, the following measures have been proposed in response to the assessment.

Type 1

- Provision of electric vehicle (EV) charging points throughout the development site; and,

[18] Air Quality and Emissions Good Practice Planning Guidance, BMBC, 2014.

- Properties positioned at a stand-off distance from the A6195 to limit exposure of future residents to road vehicle exhaust emissions.

Type 2

- Production of a full Travel Plan to encourage the use of non-transport modes and assist with the reduction of development transport related emissions.

5.3.22 A Travel Plan[19] has been produced by WYG, the Transport Consultants for the scheme. A review of the document identified a number of additional measures which may assist in the reduction of road vehicle exhaust emissions associated with the proposals. These include the following:

- Developer to appoint a Travel Plan Co-Ordinator to assist with the implementation of the Travel Plan;
- Residents provided with a Travel Information Pack upon occupation. This will include methods of travelling to and from the site by walking, cycling and public transport. Leaflets will also be provided to promote car share matching services, benefits of home delivery services and the health and fitness benefits of walking;
- The developer's webpage will contain information on how to travel to the site by various methods of transport and demonstrate a commitment to sustainable travel. This will encourage house purchasers to use the bus, walk or cycle from first occupation and possibly choose to buy a house and limit single occupancy vehicle usage; and,
- All prospective residents will be encouraged to access the site via sustainable transport modes for viewings.

5.3.23 It is considered the above measures are suitable for a development of this nature and are considered to be in accordance with the requirements of the BMBC guidance document[20].

[19] Travel Plan, WYG, 2017.

[20] Air Quality and Emissions Good Practice Planning Guidance, BMBC, 2014.

Overall Impact Significance

5.3.24 The overall significance of operational phase road traffic emission impacts was determined as **negligible**. This was based on the overall predicted impacts at discrete receptor locations and the considerations outlined previously. Further justification is provided in Table 25.

Table 25 Overall Impact Significance

Guidance	Comment
The existing and future air quality in the absence of the development	Exceedence of the annual mean NO_2 and PM_{10} AQOs were not predicted at any receptor 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 suburban 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 will not reduce in future years. This provides worst-case results when compared with DEFRA and Highways Agency methodologies Due to the adopted assumptions it is considered the presented results are sufficiently robust for an assessment of this nature

5.3.25 The IAQM guidance[21] 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.

[21] Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

6.0 CONCLUSION

6.1.1 Redmore Environmental Ltd was commissioned by Persimmon Homes West Yorkshire to undertake an Air Quality Assessment in support of a planning application for a residential development on land east of Lundhill Road, Wombwell.

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 well as expose future residents to any existing air quality issues. 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 The proposed development has the potential to expose future users to elevated pollution levels and impact existing air quality in the vicinity of the site during operation. Dispersion modelling was therefore undertaken using ADMS-Roads in order to predict pollutant concentrations as a result of emissions from the local highway network. Results were subsequently verified using local monitoring data.

6.1.5 Impacts on NO_2 and PM_{10} concentrations as a result of operational phase road vehicle exhaust emissions were predicted to be **negligible** at all sensitive receptor locations.

6.1.6 The results of the dispersion modelling assessment indicated that predicted NO_2 and PM_{10} concentrations were below the relevant AQOs at all locations across the site. The development is therefore considered suitable for residential use from an air quality perspective.

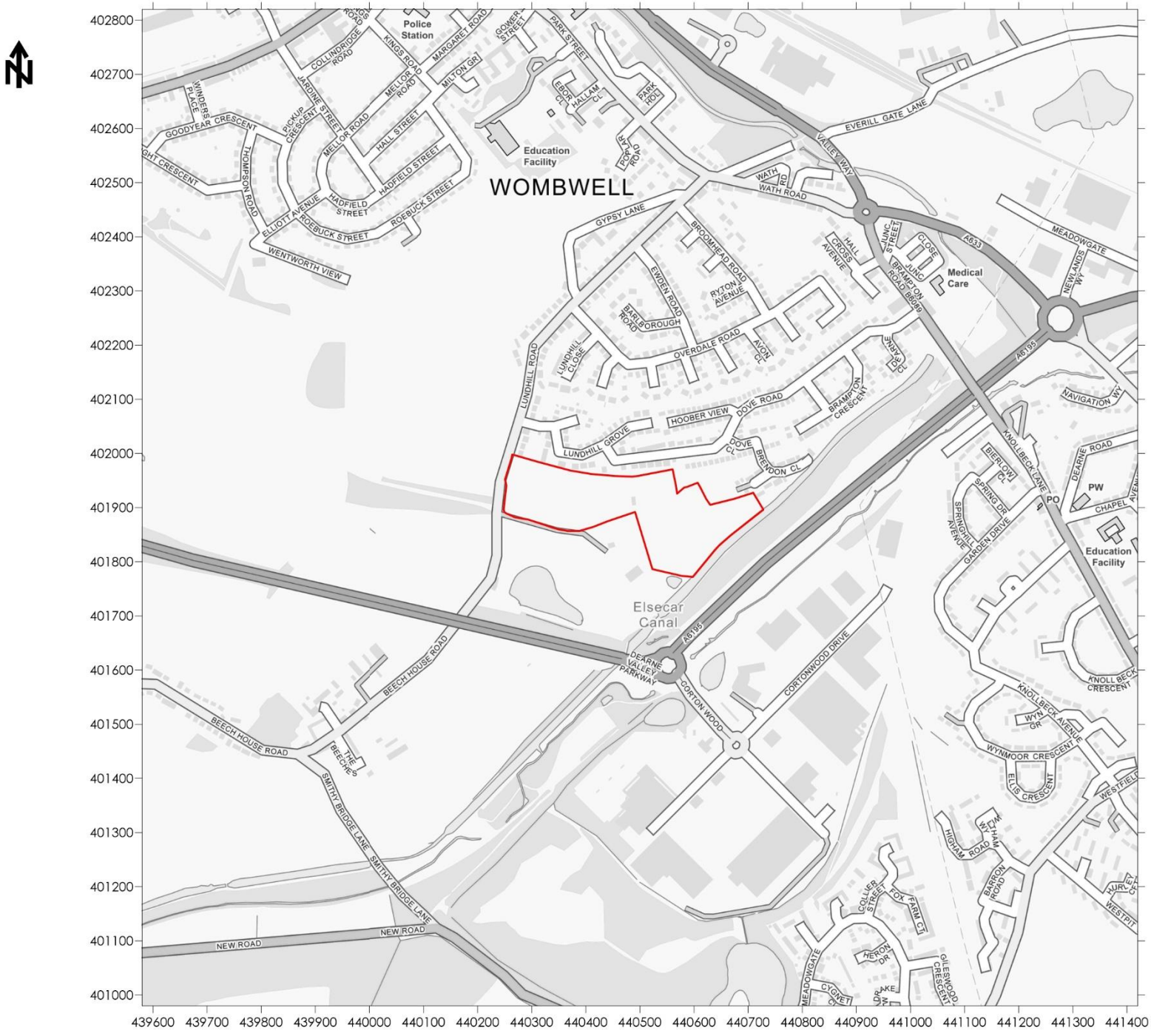
6.1.7 Following consideration of the relevant issues, air quality impacts as a result of the operation of the proposals were considered to be **not significant**, in accordance with the IAQM guidance.

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

7.0 ABBREVIATIONS

AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQAP	Air Quality Action Plan
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
BMBC	Barnsley Metropolitan Borough Council
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DM	Do-Minimum
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
DS	Do-Something
EB	Eastbound
EU	European Union
EV	Electric Vehicle
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
NB	Northbound
NGR	National Grid Reference
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
PM_{10}	Particulate Matter with an aerodynamic diameter of less than 10µm
UDP	Unitary Development Plan
RMBC	Rotherham Metropolitan Borough Council
SB	Southbound
SP	Slow Phase
z_0	Roughness length

Figures



Legend

Site Boundary

Title
Figure 1 - Site Location Plan

Project
Air Quality Assessment
Lundhill Road, Wombwell

Project Reference
1859

Client
Persimmon Homes West Yorkshire

Redmore environmental
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Legend

Site Boundary

Monitor

Title
Figure 2 - Monitoring Locations

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Air Quality Assessment
Lundhill Road, Wombwell

Project Reference
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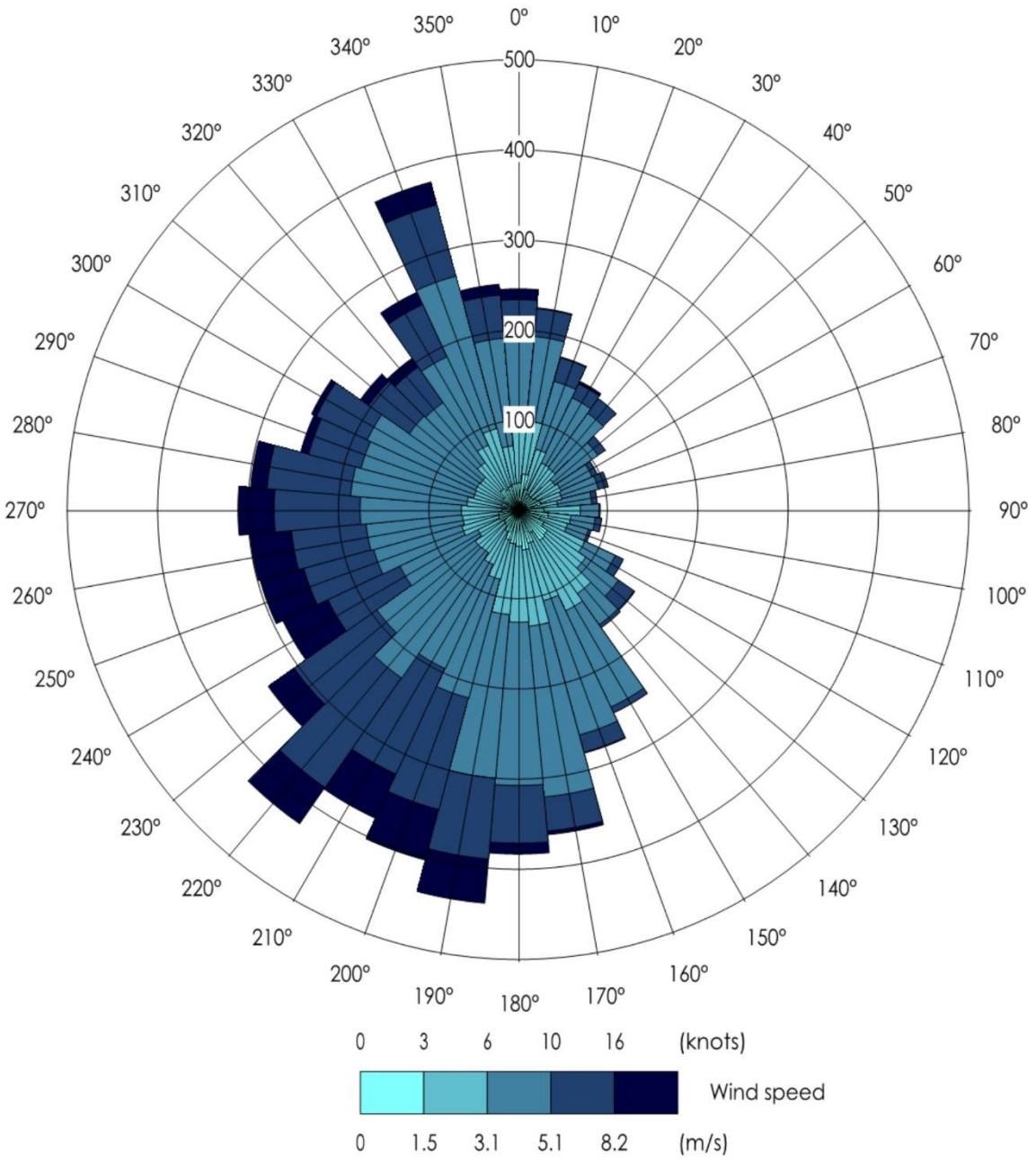

Legend

Title
Figure 3 - Wind Rose of 2016
Robin Hood Airport
Meteorological Data

Project
Air Quality Assessment
Lundhill Road, Wombwell

Project Reference
1859

Client
Persimmon Homes West Yorkshire

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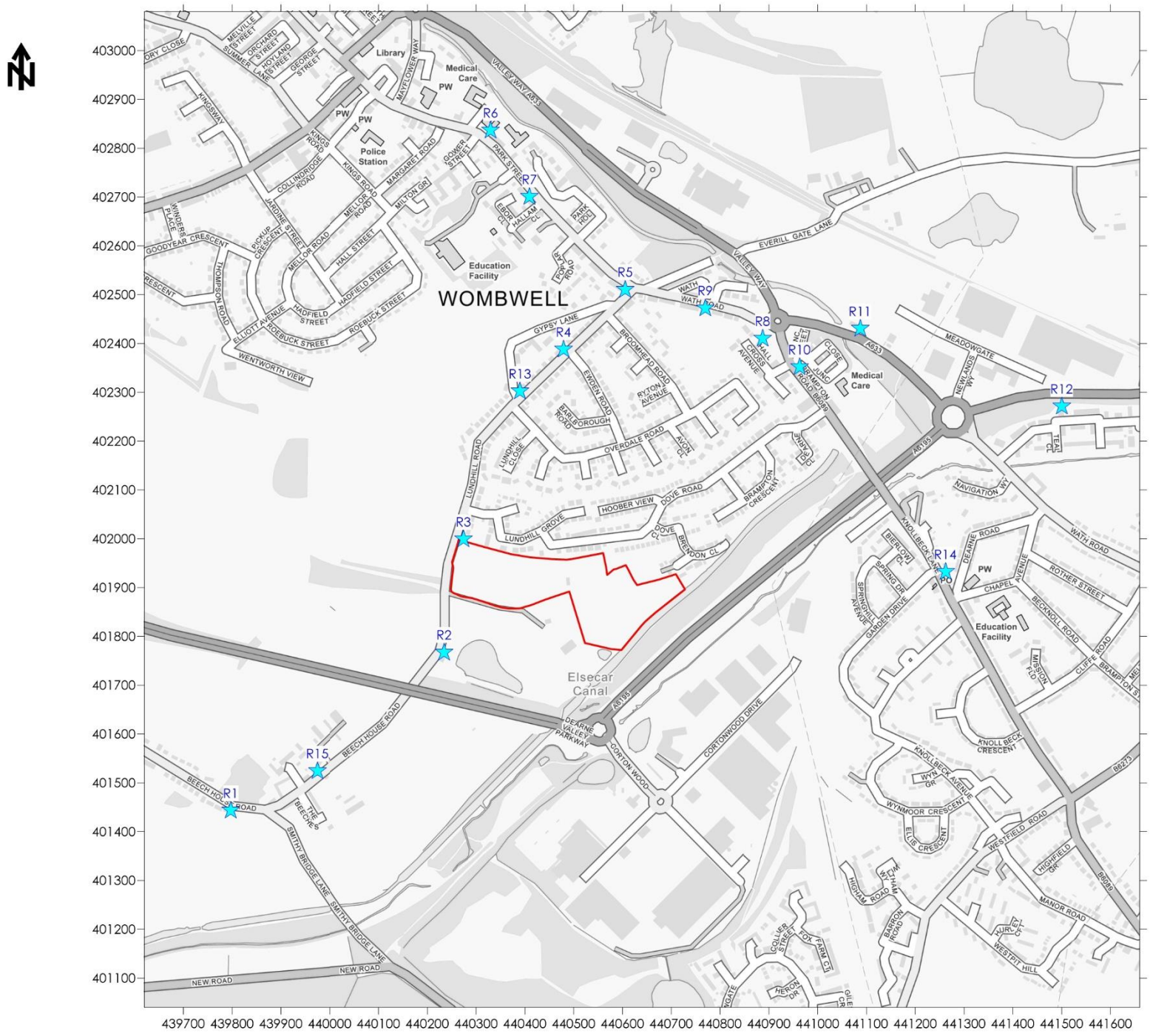

Legend

Site Boundary

Receptor

Title
Figure 4 - Sensitive Receptor Locations

Project
Air Quality Assessment
Lundhill Road, Wombwell

Project Reference
1859

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Persimmon Homes West Yorkshire

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Legend

Site Boundary

Predicted Annual Mean NO_2 Concentrations ($\mu g/m^3$)

68
64
60
56
52
48
44
40
36
32
28
24
20

Title

Figure 5 - Predicted Annual Mean NO_2 Concentrations ($\mu g/m^3$) Do-Minimum

Project

Air Quality Assessment
Lundhill Road, Wombwell

Project Reference

1859

Client

Persimmon Homes West Yorkshire

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Legend

Site Boundary

Predicted Annual Mean NO_2 Concentrations ($\mu g/m^3$)

68
64
60
56
52
48
44
40
36
32
28
24
20

Title

Figure 6 - Predicted Annual Mean NO_2 Concentrations ($\mu g/m^3$) Do-Something

Project

Air Quality Assessment
Lundhill Road, Wombwell

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Legend

Site Boundary

Predicted Annual Mean PM_{10} Concentrations ($\mu g/m^3$)

28
27
26
25
24
23
22
21
20
19
18
17

Title

Figure 7 - Predicted Annual Mean PM_{10} Concentrations ($\mu g/m^3$) Do-Minimum

Project

Air Quality Assessment
Lundhill Road, Wombwell

Project Reference

1859

Client

Persimmon Homes West Yorkshire

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Legend

Site Boundary

Predicted Annual Mean PM_{10} Concentrations ($\mu g/m^3$)

28
27
26
25
24
23
22
21
20
19
18
17

Title

Figure 8 - Predicted Annual Mean PM_{10} Concentrations ($\mu g/m^3$) Do-Something

Project

Air Quality Assessment
Lundhill Road, Wombwell

Project Reference

1859

Client

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Legend

Site Boundary

Output Grid

Road Link

Title
Figure 9 - ADMS-Roads Inputs

Project
Air Quality Assessment
Lundhill Road, Wombwell

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, as well as expose future occupants to elevated pollution levels. In order to assess NO_2 and PM_{10} 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

The assessment area was defined based on the development location, the anticipated access routes and the positioning of residential properties. Ambient concentrations were predicted over the area NGR: 439635, 401175 to 441635, 403175. 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 graphical representation of the assessment grid extents.

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

Traffic Flow Data

Traffic data for use in the assessment was obtained from WYG, the Transport Consultants for the scheme, and the Department for Transport (DfT). The DfT web tool enables the user to view and download traffic flows on every link of the 'A' road and motorway network in Great Britain for the years 1999 to 2016. It should be noted that the DfT web tool is referenced in DEFRA guidance[22] 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.

Baseline traffic data was converted to the site opening year utilising factors obtained from TEMPro (version 7.2). This software package has been developed by the DfT to calculate future traffic growth throughout the UK.

A summary of the traffic flows is provided in Table A1.1. Road widths were estimated from aerial photography and UK highway design standards.

Table A1.1 Traffic Flows

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Average Vehicle Speed (km/h)
		Verif.	2021 DM	2021 DS			
L1	Beech House Road, West of Smithy Bridge Lane	2,747	2,962	3,178	2.54	5.7	45
L2	Beech House Road, East of Smithy Bridge Lane	2,747	2,962	3,247	2.54	4.8	45
L3	Lundhill Road, South of Site Access	2,747	2,962	3,247	2.54	6.8	45
L4	Lundhill Road, North of Site Access	2,747	2,962	3,360	2.54	7.2	45

22 Local Air Quality Management (TG16), DEFRA, 2016.

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Average Vehicle Speed (km/h)
		Verif.	2021 DM	2021 DS			
L5	Lundhill Road, North of Site Access, Slow Phase (SP)	2,747	2,962	3,360	2.54	7.9	25
L6	Park Street, West of Lundhill Road	7,391	7,969	8,064	2.54	7.1	45
L7	Park Street, West of Lundhill Road, SP	7,391	7,969	8,064	2.54	8.4	35
L8	Wath Road, East of Lundhill Road	7,500	8,087	8,390	2.54	7.7	45
L9	Wath Road, East of Lundhill Road, SP	7,500	8,087	8,390	2.54	12.8	25
L10	A633 Valley Way, North of A633, SP	15,120	16,304	16,419	2.54	10.5	80
L11	A633 Valley Way, North of A633	15,120	16,304	16,419	2.54	7.7	80
L12	A633 Valley Way, Mid-section	15,120	16,304	16,419	2.54	18.9	80
L13	A633 Valley Way, East of B6096	15,120	16,304	16,419	2.54	9.6	80
L14	A633 Mitchells Way	19,014	20,503	20,618	4.00	6.7	65
L15	A633 Wath Road, East of Roundabout, SP	15,120	16,304	16,459	2.54	12.2	25
L16	A633 Wath Road	15,120	16,304	16,459	2.54	9.3	65
L17	A633 Wath Road, West of Roundabout, SP	15,120	16,304	16,459	2.54	14.1	25
L18	A6195 Dearne Valley Parkway, Eastbound (EB)	10,950	11,807	11,842	4.50	7.8	110
L19	A6195 Dearne Valley Parkway, EB, SP	10,950	11,807	11,842	4.50	7.8	40
L20	A6195 Dearne Valley Parkway, Westbound	10,950	11,807	11,842	4.50	7.8	110
L21	A6195 Dearne Valley Parkway, Northbound (NB)	10,950	11,807	11,807	4.50	7.8	110
L22	A6195 Dearne Valley Parkway, NB, SP	10,950	11,807	11,807	4.50	7.8	40
L23	A6195 Dearne Valley Parkway, Southbound (SB), SP	10,950	11,807	11,807	4.50	7.8	40
L24	A6195 Dearne Valley Parkway, SB	10,950	11,807	11,807	4.50	7.8	110
L25	A6195, East of Wath Roundabout, SP	25,117	27,084	27,239	4.15	11.9	30
L26	A6195, between roundabouts	25,117	27,084	27,239	4.15	7.9	95

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Average Vehicle Speed (km/h)
		Verif.	2021 DM	2021 DS			
L27	A6195, West of Broomhill Roundabout, SP	25,117	27,084	27,239	4.15	13.4	30
L28	A6195, North of Broomhill Roundabout, SP	25,274	27,253	27,331	4.54	12.7	30
L29	A6195, North of Broomhill Roundabout	25,274	27,253	27,331	4.54	7.7	95
L30	A633 Manvers Way, East of Broomhill Roundabout, SP	16,504	17,796	17,874	4.81	17	25
L31	A633 Manvers Way, East of Broomhill Roundabout	16,504	17,796	17,874	4.81	16.1	65
L32	A633 Manvers Way, between roundabouts	16,504	17,796	17,874	4.81	10.1	65
L33	A633 Manvers Way, West of Dearne Lane Roundabout, SP	16,504	17,796	17,874	4.81	15.7	25
L34	A633 Manvers Way, East of Dearne Lane Roundabout, SP	16,504	17,796	17,874	4.81	15.9	25
L35	A633 Manvers Way, between roundabouts	16,504	17,796	17,874	4.81	10.3	65
L36	A633 Manvers Way, West of Roundabout, SP	16,504	17,796	17,874	4.81	13.1	25
L37	A633 Manvers Way, East of Roundabout, SP	16,504	17,796	17,874	4.81	13.2	25
L38	A633 Manvers Way, East of Roundabout	16,504	17,796	17,874	4.81	10	65
L39	B6089 Brampton Road, SP	8,900	9,597	9,625	2.54	13.9	25
L40	B6089 Brampton Road	8,900	9,597	9,625	2.54	15.1	45
L41	B6089 Brampton Road, South of Chapel Avenue	8,900	9,597	9,625	2.54	7.2	45
L42	A633 Mitchells Way/Valley Way Roundabout	17,067	18,403	18,518	4.00	10.9	30
L43	A6195 Dearne Valley Parkway Roundabout	10,950	11,807	11,842	4.50	9.6	35
L44	A633 Valley Way Roundabout	11,660	12,573	12,874	2.54	11.4	35
L45	A6195/A633 Roundabout	15,534	16,750	16,906	4.50	9.8	35

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Average Vehicle Speed (km/h)
		Verif.	2021 DM	2021 DS			
L46	A633 Roundabout	22,298	24,044	24,200	4.81	8.5	35
L47	A633/Dearne Lane Roundabout	16,504	17,796	17,874	4.81	8.5	35
L48	A633/Rotary Drive Roundabout	16,504	17,796	17,874	4.81	8.3	35

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

Emission Factors

The emission factors were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 7.0). This has been produced by DEFRA and incorporates updated COPERT4v11 vehicle emission factors and fleet information.

There is current uncertainty over NO_2 concentrations within the UK, with the implementation of new vehicle emission standards not resulting in the previously expected reduction in roadside levels. Therefore, 2016 emission factors were utilised in preference to the development opening year in order to provide robust model outputs. As predictions for 2016 were verified, it is considered the results are a robust indication of worst case concentrations for the future year.

Meteorological Data

Meteorological data used in the assessment was taken from Robin Hood Airport meteorological station over the period 1st January 2016 to 31st December 2016 (inclusive). Robin Hood Airport is located at NGR: 465930, 398920 which is approximately 25.8km east 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

A z_0 of 0.5m 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 'parkland, open suburbia'.

A z_0 of 0.2m 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 (min)'.

Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 10m 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 'small towns <50,000'.

Background Concentrations

Background NO_2 and PM_{10} concentrations for use in the assessment were obtained from the DEFRA mapping study for the grid square containing the development site, as shown in Table 13.

Similarly to emission factors, the background concentrations from 2016 were utilised in preference to the future year. This provided a robust assessment and is likely to overestimate pollutant concentrations during the operation of the proposal.

NO_x to NO_2 Conversion

Predicted annual mean NO_x concentrations were converted to NO_2 concentrations using the spreadsheet (version 5.1) provided by DEFRA, which is the method detailed within DEFRA guidance[23].

[23] Local Air Quality Management (TG16), DEFRA, 2016.

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 2016 using traffic data, meteorological data and monitoring results from this year.

Review of the BMBC monitoring locations revealed the nearest monitors to the site are situated approximately 4.2km north-east of the boundary. Due to the distance between the two positions, it is considered unlikely that recorded pollution levels would be representative of the development location. As such, this source of data was excluded from the verification process.

RMBC undertook monitoring of NO_2 concentrations at five locations within the modelling extents during 2016. Review of the positions revealed that diffusion tubes R11 - Wath Rd. Brampton Bierlow, R12 - 185 Barnsley Rd. W. Melton and R13 - 2 Hesley Bar, were a considerable distance from roads included within the model. As such, these sites were removed from the verification process in order to prevent an underestimation of pollutant emissions. Results from the remaining monitors were obtained and the road contributions to total NO_x concentrations calculated following the methodology contained within DEFRA guidance[24]. The monitored annual mean NO_2 concentrations and calculated road NO_x concentrations are summarised in Table A1.2.

[24] Local Air Quality Management (TG16), DEFRA, 2016.

Table A1.2 Verification - Monitoring Results

Monitoring Location		Monitored NO_2 Concentration ($\mu g/m^3$)	Calculated Road NO_x Concentration ($\mu g/m^3$)
R87	Manvers Way (1)	35.6	39.67
R88	Manvers Way (2)	35.1	38.52

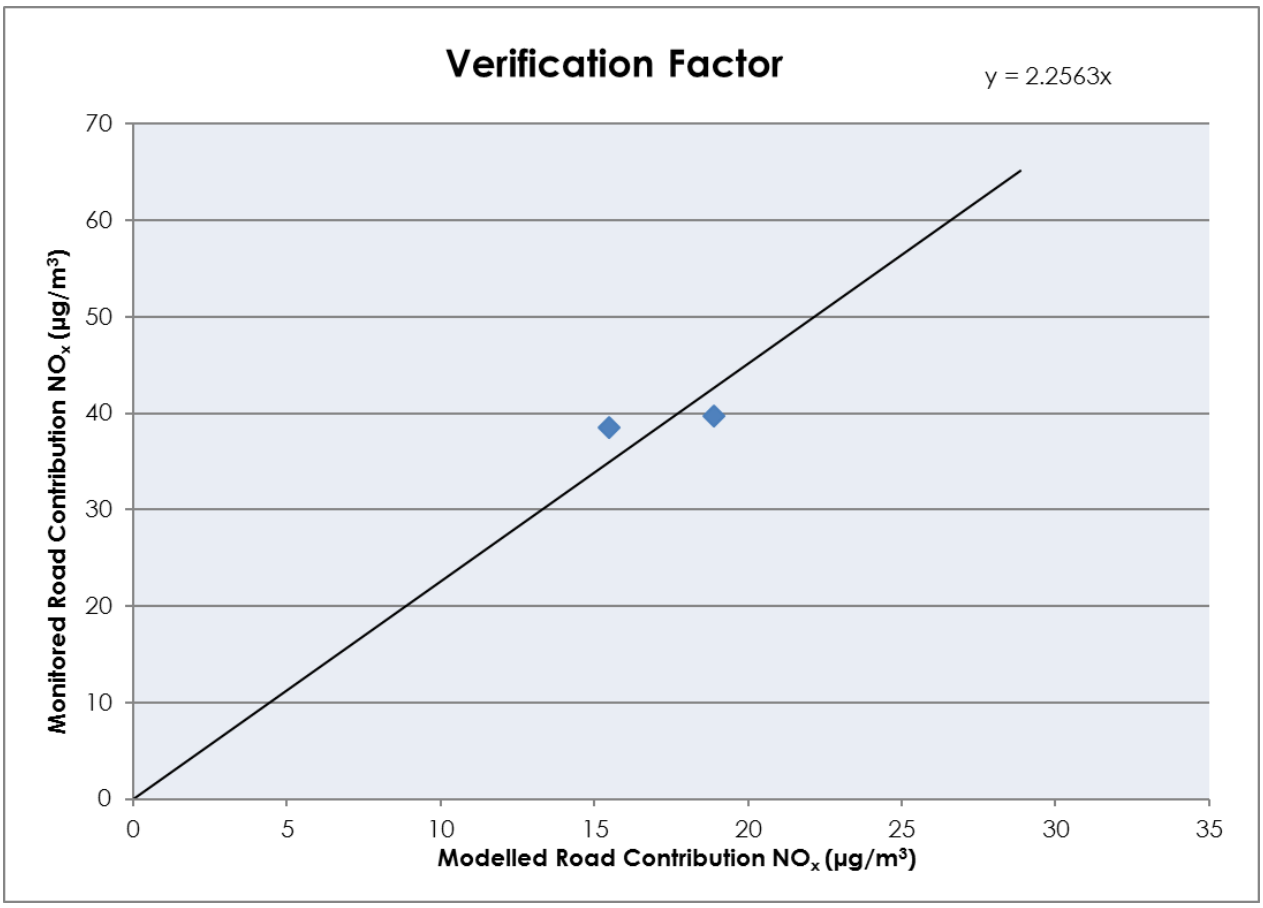
The annual mean road NO_x concentrations predicted from the dispersion model and the 2016 road NO_x concentrations calculated from the monitoring results are summarised in Table A1.3.

Table A1.3 Verification - Modelling Results

Monitoring Location		Calculated Road NO_x Concentration ($\mu g/m^3$)	Modelled Road NO_x Concentration ($\mu g/m^3$)
R87	Manvers Way (1)	39.67	18.88
R88	Manvers Way (2)	38.52	15.50

The monitored and modelled road NO_x concentrations were graphed and the equation of the trendline based on linear progression though zero calculated. This indicated that a verification factor of 2.2563 was required to be applied to all road NO_x modelling results, as shown in Graph 1.

Graph 1 Verification Factor



Monitoring of PM_{10} concentrations is not undertaken within the assessment extents. The NO_x verification factor was therefore used to adjust PM_{10} model predictions in lieu of more accurate data in accordance with DEFRA guidance[25].

[25] Local Air Quality Management (TG16), DEFRA, 2016.

Appendix 2 - Curricula Vitae

JETHRO REDMORE

Director

BEng (Hons), MSc, MIAQM, MIEnvSc, PIEMA, CEnv

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.

PEARL POULTON

Air Quality Consultant

BSc (Hons), GradIEMA

Tel: 0161 706 0075 | Email: pearl.poulton@red-env.co.uk

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 NO_2 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. NO_2 and PM_{10} 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 NO_2 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 NO_2 concentrations across the site to be below the air quality objective and therefore deemed suitable for residential use.