Air Quality Assessment

Copp Lane, Great Eccleston

Client: Baxter Group Ltd

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Executive Summary

Redmore Environmental Ltd was commissioned by Baxter Group Ltd to undertake an Air Quality Assessment in support of a planning application for a residential development on land off Copp Lane, Great Eccleston.

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 undertaken 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 air quality impacts as a result of traffic generated by the development were not predicted to be 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 proposals.

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1.0 INTRODUCTION

1.1 Background

1.1.1 Redmore Environmental Ltd was commissioned by Baxter Group Ltd to undertake an Air Quality Assessment in support of a planning application for a residential development on land off Copp Lane, Great Eccleston.

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 undertaken 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 Copp Lane, Great Eccleston, at approximate National Grid Reference (NGR): 342467, 439974. 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 99 residential units and associated facilities.

1.2.3 The proposals have 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 Legislation

2.1.1 The Air Quality Standards Regulations (2010) came into force on 11th June 2010 and include Air Quality Limit Values (AQLVs) for the following pollutants:

- Nitrogen dioxide (NO_2);
- Sulphur dioxide;
- Lead;
- Particulate matter with an aerodynamic diameter of less than 10µm (PM_{10});
- Particulate matter with an aerodynamic diameter of less than 2.5µm;
- Benzene; and,
- Carbon monoxide.

2.1.2 Target Values were also provided for several additional pollutants.

2.1.3 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 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.

2.1.4 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

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

Pollutant	Air Quality Objective	
	Concentration (μg/m³)	Averaging Period
	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

2.1.5 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
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 Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

2.2 Local Air Quality Management

2.2.1 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.

2.3 Dust

2.3.1 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."

2.3.2 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). 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.

2.4 National Planning Policy

2.4.1 The revised National Planning Policy Framework[3] (NPPF) was published in June 2019 and sets out the Government's planning policies for England and how these are expected to

3 NPPF, Ministry of Housing, Communities and Local Government, 2019.

be applied.

2.4.2 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 adapting to climate change, including moving to a low carbon economy."

2.4.3 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:
>
> […]
>
> e) preventing 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 […]"

2.4.4 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."

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

2.5 National Planning Practice Guidance

2.5.1 The National Planning Practice Guidance[4] (NPPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 and updated on 1st November 2019 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

1. What air quality considerations does planning need to address?
2. What is the role of plan-making 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 considerations be relevant to the development management process?
6. What specific issues may need to be considered when assessing air quality impacts?
7. How detailed does an air quality assessment need to be?
8. How can an impact on air quality be mitigated?

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

2.6 Local Planning Policy

2.6.1 The Wyre Borough Council (WBC) Local Plan[5] was adopted in February 2019 and sets out the strategic framework for the growth and development of Wyre up to 2031.

[4] https://www.gov.uk/guidance/air-quality--3.

[5] WBC Local Plan, WBC, 2019.

2.6.2 A review of the WBC Local Plan indicated the following policy of relevance to this assessment:

> "CDMP1 Environmental Protection
>
> 1. Development will be permitted where in isolation or in conjunction with other planed or committed developments it can be demonstrated that the development:
>
> […]
>
> c) (i) Will not give rise to a deterioration of air quality in a defined Air Quality Management Area or result in the declaration of a new AQMA. Where appropriate an air quality impact assessment will be required to support development proposals.
>
> (ii) Where development will result in, or contribute to, a deterioration in air quality, permission will only be granted where any such harm caused is significantly and demonstrably outweighed by other planning considerations and appropriate mitigation measures are provided to minimise any such harm.
>
> […]"

2.6.3 The above policy was 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, which was agreed with Simon Kirby, Senior Environmental Health Officer at Blackburn with Darwen Borough Council, on behalf of WBC, on 20th May 2021.

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'[6].

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 PM_{10}.

3.2.4 The assessment steps are detailed below.

[6] 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 10,000m^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

Magnitude	Activity	Criteria
	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)
	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, farmland, short term car parks 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	Background Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 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

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

Receptor Sensitivity	Distance from the Source (m)	
	Less than 20	Less than 50
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[7] to reduce potential dust impacts based upon the relevant risk categories

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

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.

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:

- 2019 - 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).

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)[8] on the likely limits of pollutant dispersion from road sources. The criteria provided within DEFRA guidance[9] 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'[10]. 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 Road Vehicle Exhaust Emission Impacts

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[11] provides guidance on determining the overall air quality impact significance of the

8 DMRB Volume 11, Section 3, Part 1, LA 105, Highways England, 2019.

9 Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

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

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

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 guidance[12] suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix 2.

[12] 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), WBC has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean NO_2 concentrations are above the AQO within the borough. As such, one AQMA has been declared. This is described as follows:

> "An area encompassing Chapel Street, in Poulton-le-Fylde, along with the junctions with Higher Green/Queens Square, and BreckRoad/Vicarage Road/Ball Street."

4.2.2 The AQMA is positioned approximately 7.5km west of the development site. It is considered unlikely that 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 WBC 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 WBC throughout their area of jurisdiction. Recent results recorded in the vicinity of the development are shown in Table 11.

Table 11 Monitoring Results - NO_2

Monitoring Site		Monitored NO_2 Concentration (µg/m³)		
		2017	2018	2019
Site 3	5 Bridge Row, St Michaels	25.6	27.4	24.5

4.3.2 As shown in Table 11, annual mean NO_2 concentrations were below the relevant AQO at the Site 3 - 5 Bridge Row, St Michaels monitor in recent years. Reference should be made to Figure 2 for a map of the survey position.

4.3.3 WBC do not undertake PM_{10} monitoring within 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: 342500, 439500. Data for this location was downloaded from the DEFRA website[13] for the purpose of the assessment and is summarised in Table 12.

Table 12 Background Pollutant Concentration Predictions

Pollutant	Predicted Background Pollutant Concentration (µg/m³)		
	2019	2021	2023
NO_2	6.59	6.08	5.70
PM_{10}	10.19	9.92	9.73

4.4.2 As shown in Table 12, predicted background NO_2 and PM_{10} concentrations are below the relevant AQOs at the development site.

13 https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018.

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	More than 100	0
Up to 50	More than 100	0

4.5.4 There are no ecological receptors within 50m of the development boundary or the access route within 500m of the site entrance. 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 to Potential Dust Impacts

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	There are a number of proposed developments in the vicinity of the site. It is therefore possible that there will be concurrent dust generation in the area should the construction phase of these schemes overlap with that of the proposal
Pre-existing screening between the source and the receptors	Trees and shrubs are located along the northern and eastern site boundaries. These may act as a barrier between emission sources and receptors should they be retained during the construction phase
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 north-west, with significant frequencies from the south-east. As such, receptors to the south-east and north-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 likely 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.

4.5.7 The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria shown in Section 0, is shown in Table 16.

Table 16 Sensitivity of the Surrounding Area to Potential Dust Impacts

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 17.

Table 17 Operational Phase Road Vehicle Exhaust Emissions Sensitive Receptor Locations

Receptor		NGR (m)	
		X	Y
R1	Residential - A585, Fleetwood Road	339713.2	438897.0
R2	Residential - A585, Fleetwood Road	339550.4	439277.5
R3	Residential - A586, Garstang Road	339663.5	439818.3
R4	Residential - A586, Garstang Road	340297.3	440146.7
R5	Residential - Blackpool Old Road	341961.8	440316.9
R6	Medical Centre - Blackpool Old Road	342286.8	440365.6
R7	Residential - B5293, High Street	342398.3	440271.7
R8	Residential - A586	343373.4	440359.3
R9	Residential - B5293, Raikes Road	343079.3	440254.0
R10	Residential - B5293, High Street	342667.7	440170.7
R11	Residential - Leckonby Street	342672.7	440106.0
R12	Residential - Copp Lane	342672.6	440038.0
R13	Educational Facility - Copp Lane	342147.6	439452.3
R14	Residential - Copp Lane	342518.0	439934.9
R15	Residential - Milestone Drive	342466.4	439889.0

Receptor		NGR (m)	
		X	Y
R16	Residential - Admarsh Drive	342412.7	439817.8
R17	Residential - Copp Lane	342330.2	439765.4

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 roads 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 10,000m^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 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.

<u>Construction</u>

5.2.7 Due to the size of the development, the total building volume is likely to be between 25,000m^3 and 100,000m^3. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from construction is therefore **medium**.

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 **medium** 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.

<u>Trackout</u>

5.2.10 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 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 **medium**. In accordance with 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 18.

Table 18 Summary of Potential Unmitigated Dust Risks

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

5.2.14 As indicated in Table 18, the potential risk of dust soiling is **high** from earthworks and trackout and **medium** from construction. 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[14] 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 or similar if required by the LA.

[14] 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
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	• Carry out regular site inspections, 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 • Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. • Avoid site runoff of water or mud • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used • Keep site fencing, barriers and scaffolding clean using wet methods • 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

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 • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable • Only remove the cover in small areas during work and not all at once
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, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place
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 • Record all inspections of haul routes and any subsequent action in a site log book • Inspect haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably possible • Implement a wheel washing system, if required • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits

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 guidance[15].

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.

5.3.2 The assessment considered the following scenarios:

- 2019 - 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 For the purpose of the assessment traffic data for 2023 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 2019 were utilised within the dispersion model. The use of 2023 traffic data and 2019 emission factors is considered to provide a worst-case scenario and therefore predicted pollution concentrations are likely to overestimate actual levels during the operation of the development.

15 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.

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 20.

Table 20 Predicted Annual Mean NO_2 Concentrations

Receptor		Predicted Annual Mean NO_2 Concentration ($\mu g/m^3$)		
		DM	DS	Change
R1	Residential - A585, Fleetwood Road	24.78	25.79	1.01
R2	Residential - A585, Fleetwood Road	22.57	23.48	0.91
R3	Residential - A586, Garstang Road	11.24	12.22	0.98
R4	Residential - A586, Garstang Road	10.81	11.79	0.98
R5	Residential - Blackpool Old Road	11.26	12.40	1.14
R6	Medical Centre - Blackpool Old Road	9.06	9.62	0.56
R7	Residential - B5293, High Street	10.48	11.91	1.43
R8	Residential - A586	10.79	11.54	0.75
R9	Residential - B5293, Raikes Road	8.99	9.48	0.49
R10	Residential - B5293, High Street	9.45	10.98	1.53
R11	Residential - Leckonby Street	8.62	9.81	1.19
R12	Residential - Copp Lane	8.54	10.04	1.50
R13	Educational Facility - Copp Lane	8.31	9.49	1.18
R14	Residential - Copp Lane	8.24	9.51	1.27
R15	Residential - Milestone Drive	8.20	9.47	1.27
R16	Residential - Admarsh Drive	7.98	8.98	1.00
R17	Residential - Copp Lane	8.26	9.41	1.15

5.3.7 As indicated in Table 20, predicted annual mean NO_2 concentrations were below the relevant AQO at all sensitive receptors in both the DM and DS scenarios.

5.3.8 Annual mean PM_{10} 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 PM_{10} Concentrations

Receptor		Predicted Annual Mean PM_{10} Concentration (µg/m³)		
		DM	DS	Change
R1	Residential - A585, Fleetwood Road	13.45	13.66	0.21
R2	Residential - A585, Fleetwood Road	13.01	13.19	0.18
R3	Residential - A586, Garstang Road	10.99	11.19	0.21
R4	Residential - A586, Garstang Road	10.92	11.12	0.21
R5	Residential - Blackpool Old Road	11.01	11.25	0.24
R6	Medical Centre - Blackpool Old Road	10.55	10.67	0.11
R7	Residential - B5293, High Street	10.81	11.07	0.26
R8	Residential - A586	10.91	11.07	0.16
R9	Residential - B5293, Raikes Road	10.52	10.61	0.09
R10	Residential - B5293, High Street	10.57	10.83	0.26
R11	Residential - Leckonby Street	10.42	10.62	0.20
R12	Residential - Copp Lane	10.42	10.69	0.27
R13	Educational Facility - Copp Lane	10.40	10.64	0.24
R14	Residential - Copp Lane	10.38	10.64	0.25
R15	Residential - Milestone Drive	10.38	10.63	0.25
R16	Residential - Admarsh Drive	10.33	10.53	0.20
R17	Residential - Copp Lane	10.39	10.62	0.23

5.3.9 As indicated in Table 21, predicted annual mean PM_{10} concentrations were below the relevant AQO at all sensitive receptors in both the DM and DS scenarios.

Predicted Impacts

5.3.10 Predicted impacts on annual mean NO_2 concentrations at the sensitive receptor locations are summarised in Table 22.

Table 22 Predicted Impacts - NO_2

Receptor		Predicted Annual Mean NO_2 Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - A585, Fleetwood Road	Below 75% of AQO	2 - 5	Negligible
R2	Residential - A585, Fleetwood Road	Below 75% of AQO	2 - 5	Negligible
R3	Residential - A586, Garstang Road	Below 75% of AQO	2 - 5	Negligible
R4	Residential - A586, Garstang Road	Below 75% of AQO	2 - 5	Negligible
R5	Residential - Blackpool Old Road	Below 75% of AQO	2 - 5	Negligible
R6	Medical Centre - Blackpool Old Road	Below 75% of AQO	1	Negligible
R7	Residential - B5293, High Street	Below 75% of AQO	2 - 5	Negligible
R8	Residential - A586	Below 75% of AQO	2 - 5	Negligible
R9	Residential - B5293, Raikes Road	Below 75% of AQO	1	Negligible
R10	Residential - B5293, High Street	Below 75% of AQO	2 - 5	Negligible
R11	Residential - Leckonby Street	Below 75% of AQO	2 - 5	Negligible
R12	Residential - Copp Lane	Below 75% of AQO	2 - 5	Negligible
R13	Educational Facility - Copp Lane	Below 75% of AQO	2 - 5	Negligible
R14	Residential - Copp Lane	Below 75% of AQO	2 - 5	Negligible
R15	Residential - Milestone Drive	Below 75% of AQO	2 - 5	Negligible
R16	Residential - Admarsh Drive	Below 75% of AQO	2 - 5	Negligible
R17	Residential - Copp Lane	Below 75% of AQO	2 - 5	Negligible

5.3.11 As indicated in Table 22, impacts on annual mean NO_2 concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

5.3.12 Predicted impacts on annual mean PM_{10} concentrations at the sensitive receptor locations are summarised in Table 23.

Table 23 Predicted Impacts - PM_{10}

Receptor		Predicted Annual Mean PM_{10} Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - A585, Fleetwood Road	Below 75% of AQO	1	Negligible
R2	Residential - A585, Fleetwood Road	Below 75% of AQO	0	Negligible
R3	Residential - A586, Garstang Road	Below 75% of AQO	1	Negligible
R4	Residential - A586, Garstang Road	Below 75% of AQO	1	Negligible
R5	Residential - Blackpool Old Road	Below 75% of AQO	1	Negligible
R6	Medical Centre - Blackpool Old Road	Below 75% of AQO	0	Negligible
R7	Residential - B5293, High Street	Below 75% of AQO	1	Negligible
R8	Residential - A586	Below 75% of AQO	0	Negligible
R9	Residential - B5293, Raikes Road	Below 75% of AQO	0	Negligible
R10	Residential - B5293, High Street	Below 75% of AQO	1	Negligible
R11	Residential - Leckonby Street	Below 75% of AQO	1	Negligible
R12	Residential - Copp Lane	Below 75% of AQO	1	Negligible
R13	Educational Facility - Copp Lane	Below 75% of AQO	1	Negligible
R14	Residential - Copp Lane	Below 75% of AQO	1	Negligible
R15	Residential - Milestone Drive	Below 75% of AQO	1	Negligible
R16	Residential - Admarsh Drive	Below 75% of AQO	0	Negligible
R17	Residential - Copp Lane	Below 75% of AQO	1	Negligible

5.3.13 As indicated in Table 23, impacts on annual mean PM_{10} concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

Mitigation

5.3.14 There are a number of mitigation options available to reduce or off-set potential air quality impacts. However, all techniques have financial implications and may therefore affect scheme viability. As such, they should only be included if necessary. As air quality impacts associated with the proposals were predicted to be **negligible**, further mitigation to control effects is not considered necessary. However, a number of additional measures have been included within the scheme in accordance with the requirements of the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'[16] to encourage the use of sustainable transport modes, manage vehicle flow and reduce pollution around the site. Table 24 describes the good practice principles detailed in the IAQM guidance along with how each has been addressed with regards to the proposals.

Table 24 Good Practice Design Principles

Phase	Principle	Action
Design Phase	New developments should not contravene the Council's Air Quality Action Plan[17], or render any of the measures unworkable	It is confirmed that the proposals will not contravene WBC's Air Quality Action Plan, or render any of the measures unworkable
	Wherever possible, new developments should not create a new "street canyon", or a building configuration that inhibits effective pollution dispersion	The proposals will not lead to the generation of a street canyon
	Delivering sustainable development should be the key theme of any application	The proposals have been designed to encourage sustainable behaviours, such as active and public transport, due to its close proximity to local bus routes and amenities
	New development should be designed to minimise public exposure to pollution sources, e.g. by locating habitable rooms away from busy roads, or directing combustion generated pollutants through or chimney stacks	The proposed development is distanced from major pollutant sources and is not located within an Air Quality Management Area. As such, it is considered unlikely that residents will be exposed to exceedences of the relevant AQOs with the development in place

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

17 Wyre Council Air Quality Action Plan (WCAQAP), WBC, 2011.

Phase	Principle	Action
Operational Phase	The provision of at least 1 Electric Vehicle (EV) "rapid charge" point per 10 residential dwellings and/or 1,000m^2 of commercial floor space. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made	The number of EV charging points to be provided within the development has not been finalised. However, it is recommended that seven EV charging points are installed to represent 10% of available parking spaces
	Where development generates significant additional traffic, provision of a detailed Travel Plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety	A full Travel Plan may be prepared in support of the development, should it be requested by WBC
	All gas-fired boilers to meet a minimum standard of <40mgNO_x/kWh. All gas-fired CHP plant to meet a minimum emissions standard of: • Spark ignition engine: 250mgNO_x/Nm^3; • Compression ignition engine: 400mgNO_x/Nm^3; • Gas turbine: 50mgNO_x/Nm^3. A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of: • Solid biomass boiler: 275mgNO_x/Nm^3 and 25mgPM/Nm^3	Any boilers to be included in the development will be provisioned in accordance with the relevant requirements

5.3.15 It is considered the above methods would further reduce potential impacts associated with the proposals. Specific mitigation suited to the proposals may be stipulated as a planning condition if deemed necessary by the LA.

Overall Impact Significance

5.3.16 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	Predicted annual mean NO_2 and PM_{10} concentrations were below the relevant AQOs at all locations in the DM scenario. This is unlikely to change in the absence of the proposals 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 will not reduce in future years. This provides worst-case results when compared with DEFRA and Highways England methodologies Due to the adopted assumptions it is considered the presented results are sufficiently robust for an assessment of this nature

5.3.17 The IAQM guidance[18] 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.

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

6.0 CONCLUSION

6.1.1 Redmore Environmental Ltd was commissioned by Baxter Group Ltd to undertake an Air Quality Assessment in support of a planning application for a residential development on land off Copp Lane, Great Eccleston.

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 undertaken 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.

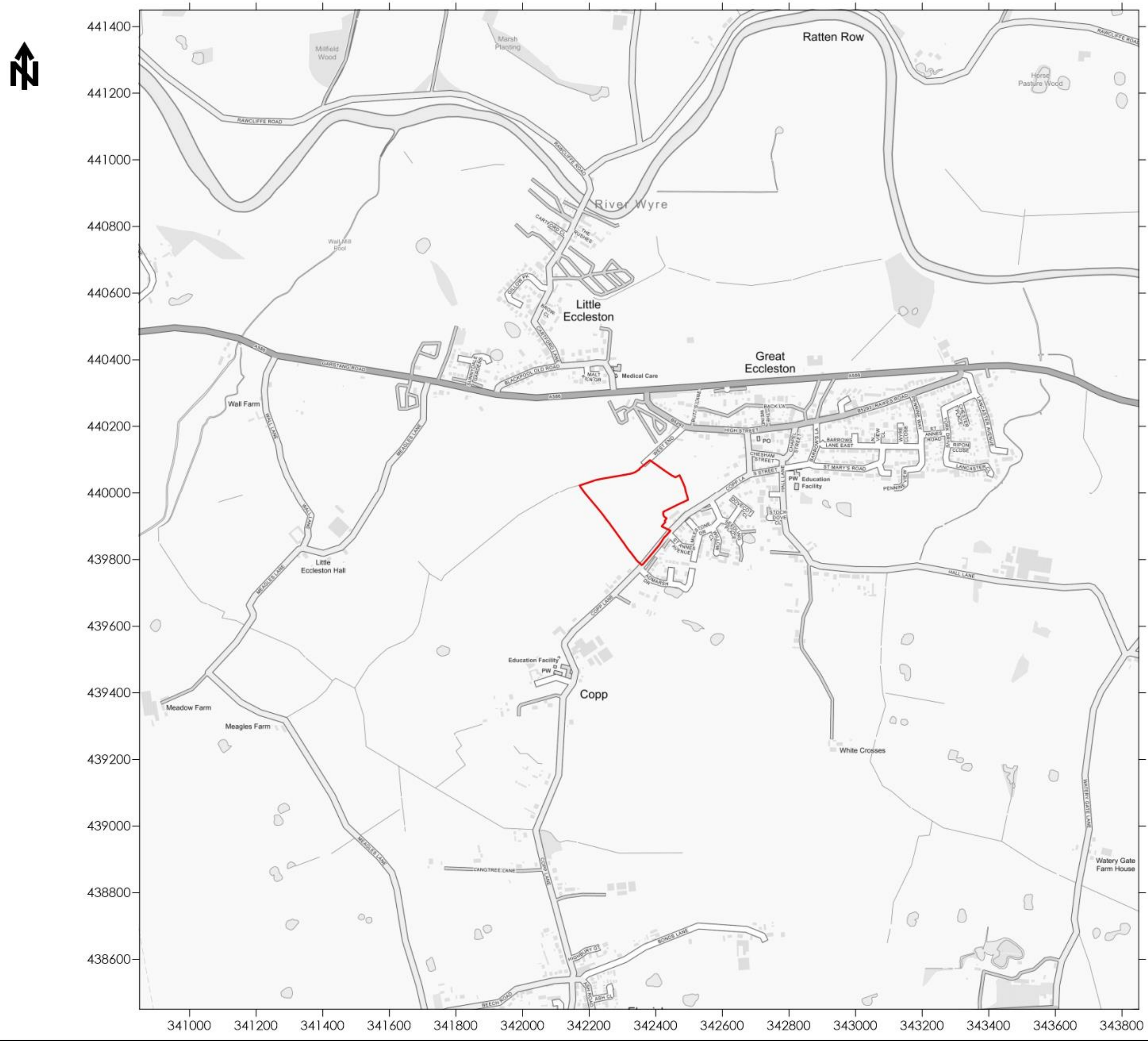
6.1.5 Review of the dispersion modelling results indicated that impacts on annual mean NO_2 and PM_{10} concentrations as a result of traffic generated by the development were predicted to be **negligible** at all sensitive receptor locations. Following consideration of the relevant issues, air quality impacts as a result of the operation of the development were predicted 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
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
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
EFT	Emission Factor Toolkit
EV	Electric Vehicle
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
NGR	National Grid Reference
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10µm
SP	Slow Phase
WBC	Wyre Borough Council
z_0	Roughness length

Figures



Legend

Site Boundary

Title

Figure 1 - Site Location Plan

Project

Air Quality Assessment
Copp Lane, Great Eccleston

Project Reference

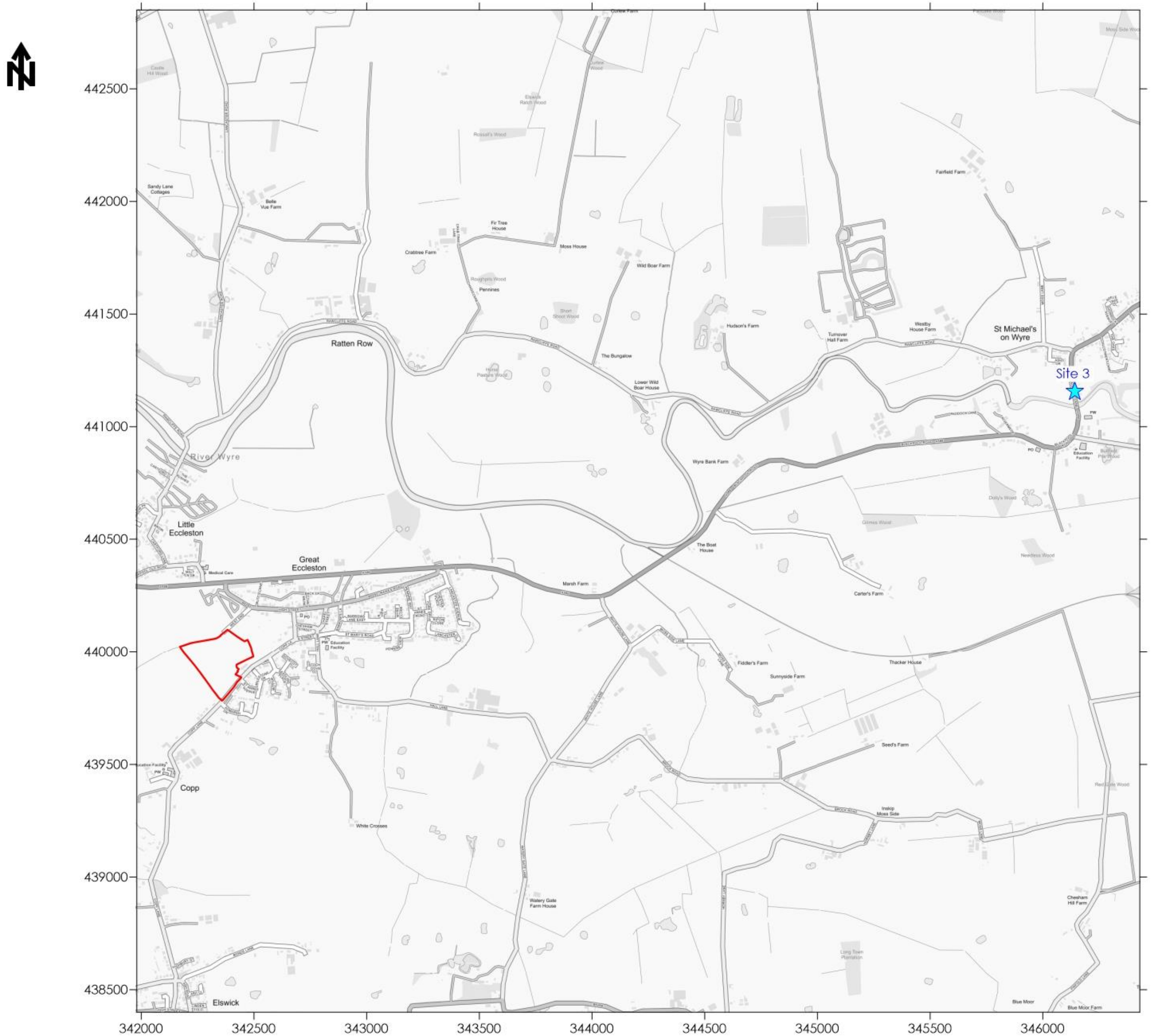
4564

Client

Baxter Group Ltd

Redmore environmental

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



Legend

Site Boundary

Monitor

Title

Figure 2 - Monitoring Location

Project

Air Quality Assessment
Copp Lane, Great Eccleston

Project Reference

4564

Client

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Redmore environmental

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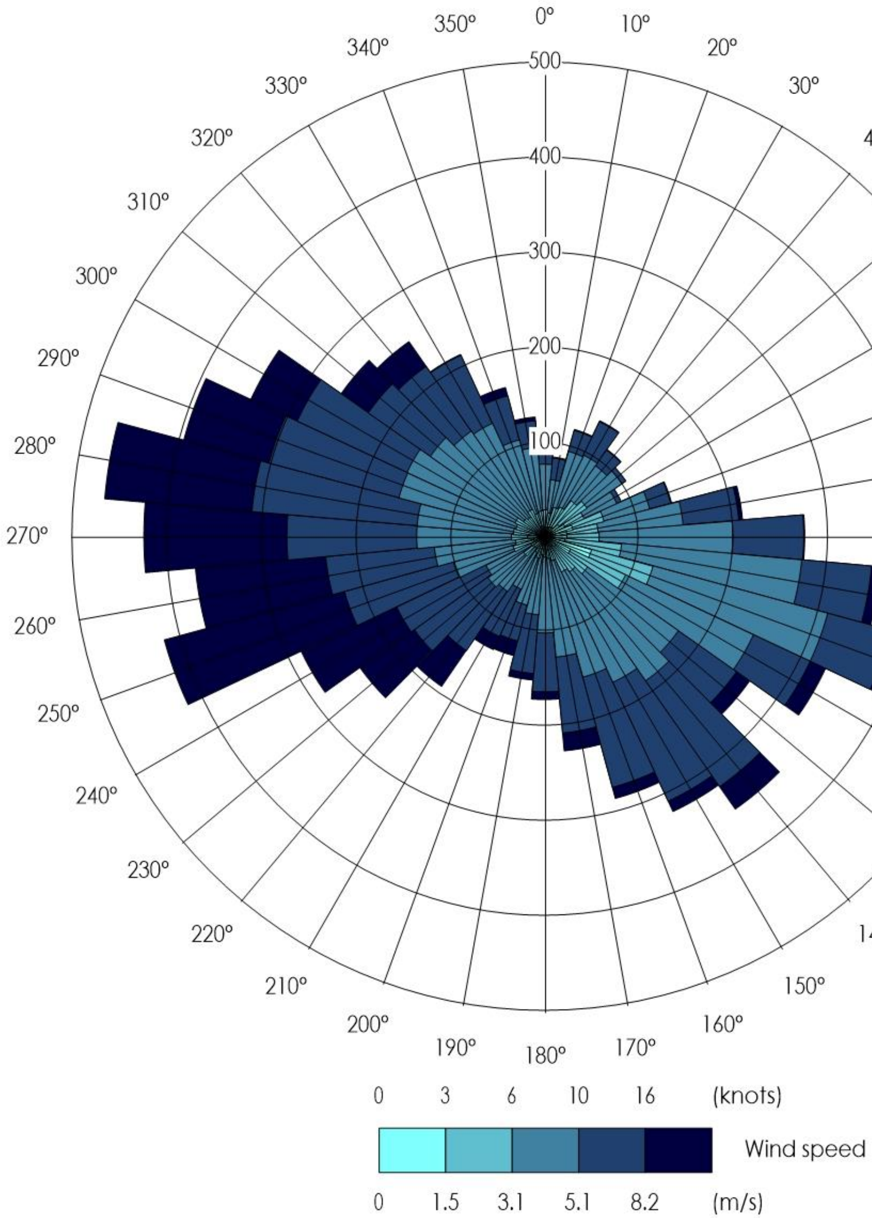

Legend

Title
Figure 3 - Wind Rose of 2019 Blackpool Airport Meteorological Data

Project
Air Quality Assessment
Copp Lane, Great Eccleston

Project Reference
4564

Client
Baxter Group Ltd

Redmore environmental

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Legend

Site Boundary

Receptor

Title

Figure 4 - Road Vechicle Exhaust Emissions Sensitive Receptor Locations

Project

Air Quality Assessment
Copp Lane, Great Eccleston

Project Reference

4564

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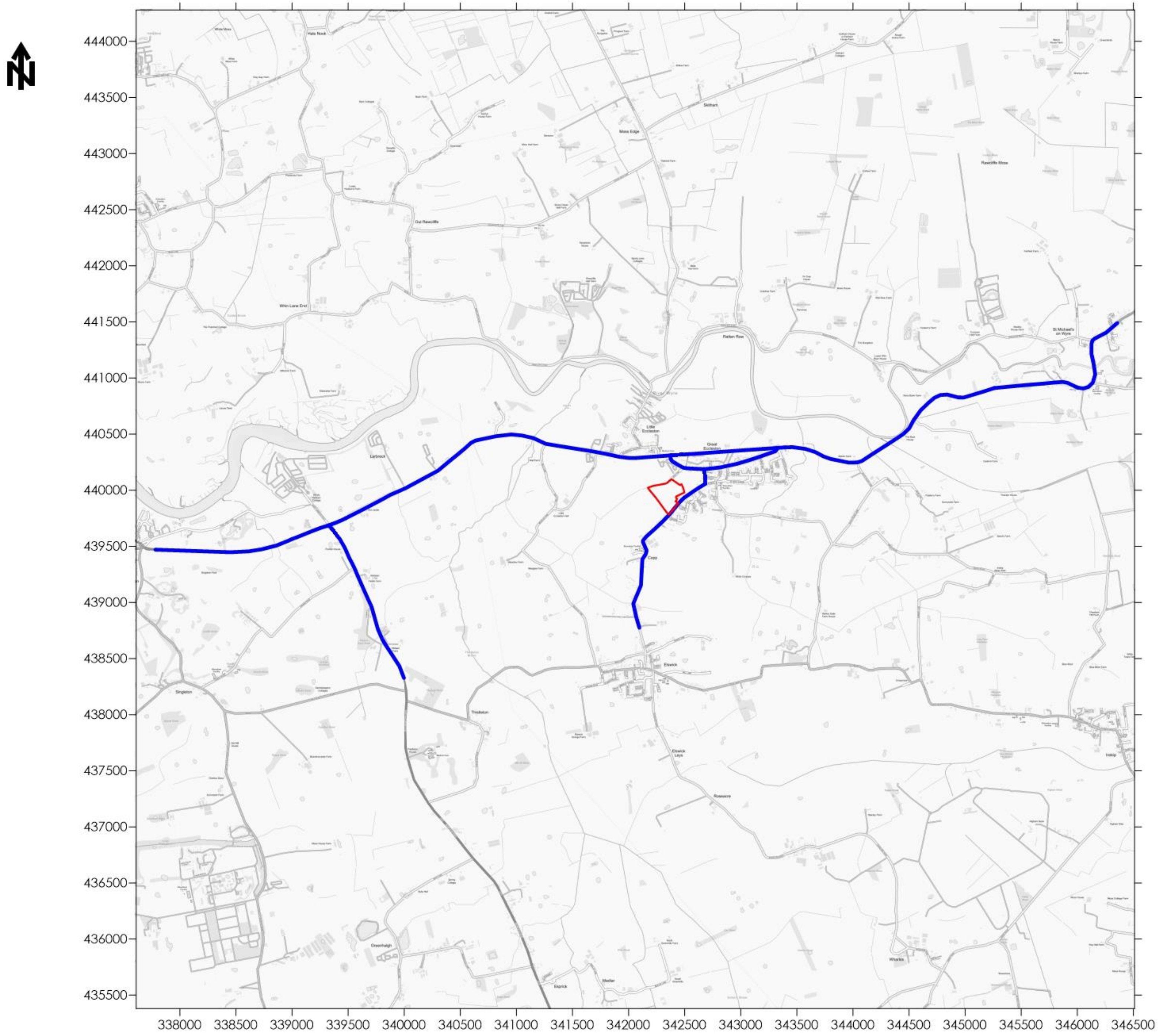

Legend

Site Boundary

Road Link

Title

Figure 5 - ADMS-Roads Inputs

Project

Air Quality Assessment
Copp Lane, Great Eccleston

Project Reference

4564

Client

Baxter Group Ltd

Redmore environmental

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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 exhaust emissions associated with vehicles travelling to and from the site. 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 5.0.0.1). 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.

Additional options can also be selected within the ADMS-Roads interface to take account of site specific characteristics that may affect model output, such as canyons.

The following Sections detail the relevant inputs utilised in the assessment.

Traffic Flow Data

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

Several planning applications have been submitted within the vicinity of the proposed site. Traffic generation associated with the following schemes was therefore incorporated into the DM and DS scenarios in order to ensure consideration of cumulative impacts from developments within the local area:

- Copp Lane schemes (183 dwellings);
- Metacare site;
- High Street Great Eccleston (Ref:18/00540/FULMAJ) 13 Dwellings;
- Back Lane. Great Eccleston. (Ref:16/00651/OUTMAJ) 22 Dwellings; and,
- Elswick 100 dwellings.

The baseline traffic data was converted to the site opening year utilising a factor obtained from TEMPro (version 7.2). This software package has been development by the Department for Transport (DfT) to calculate future traffic growth throughout the UK.

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

Table A1.1 Traffic Data

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Average Vehicle Speed (km/h)
		2019	2023 DM	2023 DS			
L1	A585, Garstang New Road, West of Windy Harbour Road	27,117	27,415	28,778	5.31	9.3	60
L2	A585, Garstang New Road, West of Windy Harbour Road, Slow Phase (SP)	27,117	27,415	28,778	5.31	25.6	25
L3	A586, Garstang Road, West of Site Entrance	10,618	10,959	13,968	3.65	6.2	75
L4	A586, Garstang Road, West of B5293	10,618	10,959	13,968	3.65	8.8	60
L5	A586, Garstang Road, East of B5293	8,682	8,778	10,000	3.96	9.4	60
L6	A586, Between B5296, High Street and B5296, Raikes Road	8,682	8,778	10,000	3.96	9.0	65
L7	A586, West of Raikes Road	8,682	8,778	10,000	3.96	9.3	60
L8	A586, East of Raikes Road	9,005	9,104	10,968	3.61	12.2	60
L9	A586, Blackpool Road, East of B5296	9,005	9,104	10,968	3.61	7.7	65

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	Road Width (m)	Average Vehicle Speed (km/h)
		2019	2023 DM	2023 DS			
L10	A586, Blackpool Road	9,005	9,104	10,968	3.61	9.6	65
L11	A586, Blackpool Road, East of Rivermede	9,005	9,104	10,968	3.61	7.8	45
L12	A586, Blackpool Road, Intersection with Hall Lane	9,005	9,104	10,968	3.61	10.3	40
L13	A586, Blackpool Road, North of Hall Lane	9,005	9,104	10,968	3.61	6.2	40
L14	A586, Blackpool Road, South of Rawcliffe Road	9,005	9,104	10,968	3.61	5.6	40
L15	A586, Blackpool Road/Garstang Road	9,005	9,104	10,968	3.61	6.6	45
L16	B5293, Raikes Road, East of Leckonby Street	2,023	2,048	2,677	3.21	5.7	40
L17	B5293, Raikes Road, East of Leckonby Street, SP	2,023	2,048	2,677	3.21	11.2	25
L18	B5293, High Street, South of A586, SP	2,166	2,192	3,937	2.03	7.9	25
L19	B5293, High Street, West of Leckonby Street	2,166	2,192	3,937	2.03	6.4	35
L20	Leckonby Street, South of Chesham Street	2,090	2,115	4,402	3.01	4.6	30
L21	Leckonby Street, North of Chesham Street	2,090	2,115	4,402	3.01	4.2	30
L22	Leckonby Street, South of B2593, High Street	2,090	2,115	4,402	3.01	5.1	30
L23	Leckonby Street, Intersection with B2593, High Street, SP	2,090	2,115	4,402	3.01	6.2	25
L24	Copp Lane, East of Site Entrance	1,610	1,630	3,979	2.36	5.5	55
L25	Copp Lane, West of South Street	1,610	1,630	3,979	2.36	6.8	40
L26	Copp Lane, West of Site Entrance	1,610	1,630	3,372	2.36	5.2	55
L27	A586, Blackpool Road, Intersection with Hall Lane	26,145	26,433	28,079	5.35	10.3	40
L28	A586, Blackpool Road, North of Hall Lane	26,145	26,433	28,079	5.35	6.2	40

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

Canyons

Where buildings or walls surround roads, pollutant dispersion patterns are altered which can lead to high pollutant concentrations. These street canyons can significantly influence air quality along a road and therefore it is important to take consideration of their effects when undertaking dispersion modelling.

The release of ADMS-Roads version 4.0.1.0 in December 2015 incorporated a number of new features including an advanced street canyon module, which have been retained in version 5.0.0.1. Advanced street canyon modelling allows a number of parameters to be included in the dispersion model in order to predict pollutant dispersion patterns which better reflect air flow within complex urban geometries.

Canyons have five principle effects on dispersion which can influence pollutant concentrations. These are:

- Pollutants are channelled along street canyons;
- Pollutants are dispersed across street canyons by circulating flow at road height;
- Pollutants are trapped in recirculation regions;
- Pollutants leave the canyon through gaps between buildings - as if there was no canyon; and,
- Pollutants leave the canyon from the canyon top.

The combined modelling of these effects will result in concentration patterns unique to each canyon.

The canyon parameters used in the assessment are outlined in Table A1.2. It should be noted that the “left” parameters of L14 and the "right" parameters of L22 were purposefully included at 0m as buildings are only present on one side of the road on these links.

Table A1.2 Canyon Parameters

Link	Parameter (m)					
	Canyon Width to Left	Average Height of Buildings to Left	Building Length Left	Canyon Width Right	Average Height of Buildings to Right	Building Length Right
L14	0.0	0.0	0.0	4.0	4.5	42.6
L21	3.1	5.0	20.6	5.8	5.0	50.3
L22	3.6	6.5	10.4	0.0	0.0	0.0

A choice of two modes is provided for use in the advanced canyon module. Standard mode assumes that each road is part of a continuous network of roads with similar canyon properties. Network mode analyses the road network to determine transport of pollutants between adjoining street canyons, allows for varying concentrations along the canyon and accounts for transport of pollutants out of the end of a canyon. Network mode is considered most accurate for detailed local analysis and as such was selected for use in the model.

Emission Factors

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (EFT) (version 10.1). This has been produced by DEFRA and incorporates updated COPERT 5.3 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, 2019 emission factors were utilised in preference to the development opening year in order to provide robust model outputs. As predictions for 2019 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 Blackpool Airport meteorological station over the period 1st January 2019 to 31st December 2019 (inclusive). Blackpool Airport is located at NGR: 332308, 430915, which is approximately 13.8km south-west of the development site. 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 0.3m was used to describe the modelling extents. This is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'agricultural areas (max)'.

A z_0 of 0.1m was used to describe the meteorological site. This is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'root crops'.

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. This value is considered appropriate for the nature of the area and is suggested within ADMS-Roads as being suitable for 'small towns <50,000'.

Monin-Obukhov length of 30m was used to describe the meteorological site. This value is considered appropriate for the nature of the area and is suggested within ADMS-Roads as being suitable for 'cities and large towns'.

Background Concentrations

Annual mean NO_2 and PM_{10} background concentrations for use in the assessment were taken from the DEFRA mapping study for the grid square containing the Site 3 - 5 Bridge Row, St Michaels monitor, NGR: 346500, 441500. These are shown in Table A1.3.

Table A1.3 Background Pollutant Concentrations - Modelling Extents

Pollutant	Predicted 2019 Background Pollutant Concentration (μg/m^3)
NO_2	7.01
PM_{10}	10.14

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.

Similarly to emission factors, the background concentrations from 2019 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 8.1) provided by DEFRA, which is the method detailed within DEFRA guidance[19].

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.

19 Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

For the purpose of the assessment, model verification was undertaken for 2019 using traffic data, meteorological data and monitoring results from this year.

Monitoring of NO_2 concentrations was undertaken at one location in the vicinity of roads included within the model. The result was obtained and the road contribution to total NO_x concentration calculated following the methodology contained within DEFRA guidance[20]. The monitored annual mean NO_2 concentration and calculated road NO_x concentration is summarised in Table A1.4.

Table A1.4 Verification - Monitoring Result

Monitoring Location		Monitored NO_2 Concentration (µg/m^3)	Calculated Road NO_x Concentration (µg/m^3)
Site 3	5 Bridge Row, St Michaels	24.5	33.19

The annual mean road NO_x concentration predicted from the dispersion model and the 2019 road NO_x concentration calculated from the monitoring result is summarised in Table A1.5.

Table A1.5 Verification - Modelling Result

Monitoring Location		Calculated Road NO_x Concentration (µg/m^3)	Modelled Road NO_x Concentration (µg/m^3)
Site 3	5 Bridge Row, St Michaels	33.19	12.64

The monitored and modelled road NO_x concentrations were compared to calculate the associated ratio. This indicated a verification factor of 2.625 was required to be applied to all modelling results.

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[21].

20 Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

21 Local Air Quality Management Technical Guidance (TG16), DEFRA, 2021.

Appendix 2 - Curricula Vitae

JETHRO REDMORE

Director

Redmore environmental

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.

AMELIA LEATHERBARROW-HURST

Senior Air Quality Consultant

BSc (Hons), AMIEnvSc, AMIIAQM

Tel: 0161 706 0075 | Email: amelia.leatherbarrow-hurst@red-env.co.uk

KEY EXPERIENCE:

Amelia 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.
- Advanced canyon modelling to evaluate the impact of altered urban topography on air quality in built up areas.
- Assessment of construction dust impacts from a range of development sizes.
- Definition of baseline air quality and identification of sensitive areas across the UK.
- Production of air quality mitigation strategies specifically tailored to address issues at individual sites.
- Air quality monitoring at industrial sites to quantify pollutant concentrations
- Odour surveys to assess amenity and suitability of sites for potential future development for residential use.

SELECT PROJECTS SUMMARY:

Eagle House, South Ruislip

Air Quality Assessment for the change of use from an office block 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. Detailed dispersion modelling was undertaken using ADMS-roads to assess PM_{10} and NO_2 concentrations across the site as well as an Air Quality Neutral Assessment in accordance with the London Plan requirements. Results revealed that pollution levels were below the air quality standards across the development.

Parr Bridge, Tyldesley

Air Quality Assessment to support a residential development of 154 units. Dispersion modelling was undertaken due to the proximity of the site to an AQMA. Using sensitive receptors located in areas where increased road traffic may affect NO_2 levels, a comparison was made between concentrations with and without the development in place. Results indicated the impacts were not significant.

St James's Street, Westminster

Air Quality Assessment in support of a mixed-use development in an AQMA. Dispersion modelling was undertaken at several different heights reflective of residential units within the development. Predicted concentrations of NO_2 were found to exceed air quality criteria from ground to third floor level. As such, mitigation was specified for the affected units to ensure future residents would not be exposed to poor air quality.

Rookery Avenue, Whiteley, Farnborough

Odour Impact Assessment in support of a hot food takeaway with a drive thru facility in Whiteley. The assessment considered a number of factors, including the scale and nature of potential emissions, the location of nearest receptors and the proposed cooking type in accordance with the relevant DEFRA guidance. An appropriate ventilation system was identified and described on the basis of the assessment results.

Hoole Way, Chester

Air Quality Assessment in support an eight-storey student accommodation block to provide circa 373 units on land off Hoole Way, Chester. Concerns had been raised in relation to the potential exposure of future occupants to elevated pollution concentrations. An assessment was therefore undertaken using dispersion modelling in order to quantify air quality conditions across the site. The results revealed that the use of good practice control measures would provide suitable mitigation for the development.

St James Place, Liverpool

Air Quality Assessment in support of a residential-led development located across three different sites in an AQMA on land off St James Place, Liverpool. Detailed dispersion modelling was undertaken with the inclusion of advanced canyon modelling to evaluate the impact of the urban topography within the locality on the dispersion of traffic related pollutants. The results revealed pollutant concentrations were below the relevant standards across the site.

EMILY BELL

Air Quality Consultant

BSc (Hons), MSc, GradIEMA

Tel: 0161 706 0075 | Email: emily.bell@red-env.co.uk

Redmore environmental

KEY EXPERIENCE:

Emily is a Graduate 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.
- Advanced canyon modelling to evaluate the impact of altered urban topography on air quality in built up areas.
- Assessment of construction dust impacts from a range of development sizes.
- Definition of baseline air quality and identification of sensitive areas across the UK.
- Production of air quality mitigation strategies specifically tailored to address issues at individual sites.
- Air quality monitoring at industrial sites to quantify pollutant concentrations
- Odour surveys to assess amenity and suitability of sites for potential future development for residential use.

SELECT PROJECTS SUMMARY:

Bowlers Yard, Manchester

Air Quality Assessment in support of an eleven storey residential development to provide circa 65 units on land known as Bowlers Yard, Manchester. The site was located in an Air Quality Management Area (AQMA) and concerns were raised regarding the exposure of future occupants to poor air quality due to road traffic emissions. Detailed dispersion modelling was undertaken using ADMS-roads to assess $PM_{2.5}$, PM_{10} and NO_2 concentrations across the site. Results indicated that pollution levels were below the air quality objectives across the development.

Freemasons Arms Hotel, Heywood

Air Quality Assessment to support a residential-led development in an AQMA. Detailed dispersion modelling was undertaken with the inclusion of advanced canyon modelling to evaluate the impact of the urban topography within the locality on the dispersion of traffic related pollutants. Predicted concentrations of NO_2 were found to exceed air quality criteria at the building façade fronting Market Place at first floor level. As such, mitigation was specified for the affected units to ensure future residents would not be exposed to poor air quality.

Griffin Road, London

Air Quality Assessment in support of a residential development located in an AQMA. Detailed dispersion modelling was undertaken using ADMS-roads to assess PM_{10} and NO_2 concentrations across the site. Results indicated that pollution levels were classified as APEC - A in accordance with the London Councils Air Quality and Planning Guidance.

High Street, Dudley

Odour Impact Assessment in support of a proposed residential-led development. Due to the location of the site, being above an existing hot food takeaway, odour surveys were required to assess the level of odour across the development. A risk assessment was also undertaken in accordance with the relevant odour guidance. An appropriate ventilation system was identified on the basis of the assessment results.

East Common Lane, Selby

Air Quality Assessment in support of an industrial development on land associated with Access 63 Business Park, East Common Lane Selby. Due to the size of the development it was possible that traffic generated from the scheme may cause negative impacts on sensitive receptors nearby. NO_2 and PM_{10} concentrations were quantified at specific receptor points to ensure there would be no significant increases in pollution levels. Results revealed negligible impacts.

Wharton Road, Winsford

Air Quality Assessment in support of a residential development of circa 138 units on land off Wharton Road, Winsford. Using sensitive receptors, located in areas where increased road traffic may affect NO_2 concentrations, a comparison was made between overall concentrations with and without the development in place. Results indicated pollutant concentrations were below the relevant standards across the site and impacts were not significant.