Air Quality Assessment

Sesswick Way, Five Fords, Wrexham

Client: Net World Sports

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Field	Report Version			
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Prepared by	Megan Pond			
Position	Graduate Air Quality Consultant			
Reviewed by	Emily Macey			
Position	Senior Air Quality Consultant			
Authorised by	Emily Pears Ryding			
Position	Director			
Date of Issue	17th April 2025			
Comment	-			

Serendipity Labs, Building 7, Exchange Quay, Salford, M5 3EP

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

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Executive Summary

Redmore Environmental Ltd was commissioned by Net World Sports to undertake an Air Quality Assessment in support of a warehouse development on land off Sesswick Way, Five Fords, Wrexham.

An Air Quality Assessment was undertaken to:

- Assess potential impacts associated with fugitive dust emissions during the construction phase of the proposed development;
- Assess potential impacts associated with road transport emissions during the operational phase of the proposed development; and,
- Identify any requirement for relevant mitigation measures.

Potential construction phase air quality impacts from fugitive dust emissions were assessed as a result of earthworks and construction activities. It is considered that the use of the identified site-specific 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 development. Dispersion modelling was therefore undertaken to predict pollutant concentrations at sensitive locations as a result of emissions from the 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 development.

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1.0 INTRODUCTION

1.1 Instruction

1.1.1 Redmore Environmental Ltd was commissioned by Net World Sports to undertake an Air Quality Assessment in support of a warehouse development on land off Sesswick Way, Five Fords, Wrexham.

1.2 Site Location and Context

1.2.1 The site is located on land off Sesswick Way, Five Fords, Wrexham, at approximate National Grid Reference (NGR): 336960, 347992. The relevant Local Authority (LA) is Wrexham County Borough Council (WCBC). Reference should be made to Figure 1 for a map of the site and surrounding area.

1.2.2 The proposals comprise construction of a B2/B8 split land use warehouse development with 86,642m^2 of floorspace, alongside associated infrastructure and car parking.

1.3 Assessment Scope

1.3.1 The proposals have the potential to cause air quality impacts at sensitive locations. As such, an Air Quality Assessment was undertaken to:

- Assess potential impacts associated with fugitive dust emissions during the construction phase of the development;
- Assess potential impacts associated with road transport emissions during the operational phase of the development; and,
- Identify any requirement for relevant mitigation measures.

1.3.2 This is detailed in the following report.

2.0 LEGISLATION AND POLICY

2.1 Legislation

2.1.1 The Air Quality Standards Regulations (Wales) (2010) and subsequent amendments 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 ($PM_{2.5}$);
- Benzene; and,
- Carbon monoxide.

2.1.2 Air Quality Target Values have also been provided for several additional pollutants.

2.1.3 The Air Quality Strategy (AQS) was produced by the Department for Environment, Food and Rural Affairs (DEFRA) in partnership with the Scottish Executive, Welsh Assembly Government and Department of the Environment (Northern Ireland) and published in July 2007[1]. The document contains standards, objectives and measures for improving ambient air quality, including a number of Air Quality Objectives (AQOs). These 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 The Welsh Government carried out a review of the AQS in 2023 and concluded that it no longer met ambitions to improve air quality in Wales. The National Air Quality Strategy for Wales was subsequently amended in accordance with Section 80 of the Environment Act (1995) by replacing the AQS with the Clean Air Plan[2]. The AQOs set out in the AQS were retained.

[1] The AQS for England, Scotland, Wales and Northern Ireland, DEFRA, Scottish Executive, Welsh Assembly Government and DoE (Northern Ireland), 2007.

[2] Clean Air Plan for Wales: Healthy Air, Healthy Wales, Welsh Government, 2020.

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

Table 1 Air Quality Objectives

Pollutant	Air Quality Objective	
	Concentration (µg/m³)	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
$PM_{2.5}$	25	Annual mean

2.1.6 The Environment (Air Quality and Soundscapes) (Wales) Act (2024) was passed by the Senedd on 28th November 2023 and given Royal Assent on 14th February 2024. It includes provision for the setting of revised air pollutant targets. However, the AQOs outlined in Table 1 remain the adopted air quality standard within Wales until further legislation is implemented.

2.1.7 Table 2 summarises the advice provided in DEFRA guidance[3] 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

[3] Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

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

2.2 Local Air Quality Management

2.2.1 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 Planning Policy Wales[4] was published in February 2024 and sets out the land use planning policies of the Welsh Government, including air quality. Chapter 6, Section 6.7 - Air Quality and Soundscape, provides a framework for addressing air quality and states that:

> "The planning system should maximise its contribution to achieving the well-being goals, and in particular a healthier Wales, by aiming to reduce average population exposure to air and noise pollution alongside action to tackle high pollution hotspots. In doing so, it should consider the long-term effects of current and predicted levels of air and noise pollution on individuals, society and the environment and identify and pursue any opportunities to reduce, or at least, minimise population exposure to air and noise pollution, and improve soundscapes, where it is practical and feasible to do so.
>
> […]
>
> In proposing new development, planning authorities and developers must, therefore:
>
> - address any implication arising as a result of its association with, or location within, air quality management areas, noise action planning priority areas or areas where there are sensitive receptors;
> - not create areas of poor air quality or inappropriate soundscape; and,
> - seek to incorporate measures which reduce overall exposure to air and noise pollution and create appropriate soundscapes."

[4] Planning Policy Wales Edition 12, Welsh Assembly Government, 2024.

2.4.2 This has been considered throughout the assessment.

2.5 Local Planning Policy

2.5.1 The 'Wrexham County Borough Local Development Plan 2013-2028'[5] was adopted by WCBC on 20th December 2023. A review of the document indicated the following policies of relevance to this assessment:

> "Policy DM1: Development Management Considerations
>
> Development proposals, where relevant, must:
>
> […]
>
> iii. Safeguard the environment from the adverse effects of pollution of water, land, noise, light or air, or land instability, arising from development;
>
> […]"
>
> "Policy SP14: Natural Environment
>
> Development will only be permitted where it seeks to protect, conserve and enhance the natural environment including:
>
> […]
>
> - The quality of natural services including water, soundscape, air and soils
>
> […]"

2.5.2 The above policies have been considered throughout the undertaking of this assessment.

[5] Wrexham County Borough Local Development Plan 2013-2028, WCBC, 2023.

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 Paul Campini, Enforcement Officer at WCBC, on 15th April 2025.

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 V2.2'[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 V2.2, IAQM, 2024.

Step 1 - Screen the Need for an Assessment

3.2.5 Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 250m from the boundary or 50m from the construction vehicle route up to 250m 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 250m 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 - Assess the Risk of Dust Impacts

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 110,000m^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 6m in height

Magnitude	Activity	Criteria
	Construction	• Total building volume greater than 75,000m^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 18,000m2 to 110,000m2 • Moderately dusty soil type (e.g. silt) • 5 to 10 heavy earth moving vehicles active at any one time • Formation of bunds 3m to 6m in height
	Construction	• Total building volume 12,000m3 to 75,000m3 • Potentially dusty construction material (e.g. concrete) • On site concrete batching
	Trackout	• 20 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 18,000m2 • Soil type with large grain size (e.g. sand) • Less than 5 heavy earth moving vehicles active at any one time • Formation of bunds less than 3m in height
	Construction	• Total building volume less than 12,000m3 • Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	• Less than 20 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 sensitivities of specific receptors are shown in Table 4.

Table 4 Construction Dust - Sensitivities of People and Ecological Receptors

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 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 250
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low

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

3.2.12 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 250
High	Greater than 32µg/m^3	More than 100	High	High	High	Medium
		10 - 100	High	High	Medium	Low
		1 - 10	High	Medium	Low	Low
	28 - 32µg/m^3	More than 100	High	High	Medium	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low
	24 - 28µg/m^3	More than 100	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	Less than 24µg/m^3	More than 100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	Greater than 32µg/m^3	More than 10	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	28 - 32µg/m^3	More than 10	Medium	Low	Low	Low
		1 - 10	Low	Low	Low	Low

Receptor Sensitivity	Background Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)			
			Less than 20	Less than 50	Less than 100	Less than 250
	24 - 28µg/m^3	More than 10	Low	Low	Low	Low
		1 -10	Low	Low	Low	Low
	Less than 24µg/m^3	More than 10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Low	-	1 or more	Low	Low	Low	Low

3.2.13 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

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

3.2.15 Table 8 outlines the risk category from earthworks, construction and trackout activities.

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

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

Step 3 - Site-specific Mitigation

3.2.16 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 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 - Determine Significant Effects

3.2.17 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**.

3.2.18 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:

- 2023 - Verification;
- Opening year Do-Minimum (DM) (predicted traffic flows in 2027 should the proposals not proceed); and,
- Opening year Do-Something (DS) (predicted traffic flows in 2027 should the proposals be completed).

[7] Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

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 9.

Table 9 Significance of Operational Phase Road Vehicle Exhaust Emissions 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 9 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**.

8 LA 105: Air Quality, National Highways, 2024.

9 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

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

3.3.6 Following the prediction of impacts at discrete receptor locations, the IAQM document[11] provides guidance on determining the overall air quality impact significance of the operation of a development. The following factors are identified for consideration by the assessor:

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

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

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

4.0 BASELINE

4.1 Introduction

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

4.2 Local Air Quality Management

4.2.1 As required by the Environment Act (1995), as amended by the Environment Act (2021), WCBC has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that concentrations of all pollutants considered within the AQS are currently below the relevant AQOs. As such, no AQMAs have been designated within the borough.

4.3 Air Quality Monitoring

4.3.1 Monitoring of pollutant concentrations is undertaken by WCBC throughout its area of jurisdiction. Recent NO_2 concentrations recorded in the vicinity of the development, as provided in the 'North Wales Authorities (NWA) Collaborative Project 2024 Air Quality Progress Report (AQPR)'[12], are shown in Table 10.

Table 10 Monitoring Results

Monitoring Site		Monitored NO_2 Concentration (µg/m^3)			
		2020	2021	2022	2023
33	Smithfield Road	19.3	21.0	17.4	17.6
41	Marchwiel	10.3	13.0	12.2	11.1
43	Hightown	14.4	16.5	17.5	16.5
58	St Annes School	10.5	10.7	9.7	11.8
59	Cross Lanes	8.4	9.7	8.4	9.6

[12] NWA Collaborative Project 2024 AQPR, NWA, 2024.

4.3.2 As shown in Table 10, annual mean NO_2 concentrations were below the AQO of 40µg/m^3 all monitoring locations in recent years. Reference should be made to Figure 2 for a map of the survey positions.

4.3.3 Pollutant concentrations during 2020 and 2021 were affected by changes to travel patterns associated with the COVID-19 pandemic. The results should therefore be viewed with caution. However, data for 2022 and beyond is now considered representative of post-pandemic conditions. This is supported by the IAQM[13], who have adopted the following position:

> "ambient air quality monitoring data for the year 2022 and beyond is generally considered to represent the current post-pandemic baseline."

4.3.4 Monitoring of PM_{10} or $PM_{2.5}$ concentrations is not undertaken 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 across four grid squares. Data for these locations was downloaded from the DEFRA website[14] for the purpose of the assessment and is summarised in Table 11.

Table 11 Background Pollutant Concentration Predictions

Grid Square (NGR)	Pollutant	Predicted Background Pollutant Concentration (µg/m^3)		
		2023	2025	2027
336500, 347500	NO_2	5.20	4.98	4.77
	PM_{10}	9.99	9.85	9.72
	$PM_{2.5}$	5.42	5.30	5.18
336500, 348500	NO_2	7.17	7.08	6.94
	PM_{10}	10.06	9.93	9.79

[13] Use of 2020 and 2021 Monitoring Datasets - IAQM Position Statement V1.1, IAQM, 2023.

[14] http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021.

Grid Square (NGR)	Pollutant	Predicted Background Pollutant Concentration (µg/m³)		
		2023	2025	2027
	$PM_{2.5}$	5.44	5.32	5.20
337500, 347500	NO_2	5.15	4.94	4.73
	PM_{10}	9.78	9.65	9.51
	$PM_{2.5}$	5.39	5.27	5.15
337500, 348500	NO_2	5.72	5.53	5.33
	PM_{10}	9.92	9.79	9.66
	$PM_{2.5}$	5.50	5.38	5.26

4.4.3 As shown in Table 11, predicted background NO_2, PM_{10} and $PM_{2.5}$ 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 construction 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 250m from the development boundary. These are summarised in Table 12.

Table 12 Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	0	0
Up to 50	0	0
Up to 100	0	-
Up to 250	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 250m of the site access. The review indicated that there are no human or ecological receptors within 50m of the access route within 250m of the site entrance. As such, potential dust impacts from trackout have not been assessed further within this report

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

4.5.5 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.

Operational Phase Sensitive Receptors

4.5.6 Locations sensitive to potential operational phase road vehicle exhaust emission impacts were identified from a desk-top study and are summarised in Table 13.

Table 13 Operational Phase Road Vehicle Exhaust Emission Sensitive Receptor Locations

Receptor		NGR (m)	
		X	Y
R1	Residential - A525	337653.0	346905.8
R2	Residential - B5130	337541.1	346942.3
R3	Residential - B5130	337611.4	346996.4
R4	Residential - Bangor Road	336323.0	347526.8
R5	Residential - Bangor Road	336055.3	347521.6
R6	Residential - Wrexham Road	335688.4	347697.4
R7	Residential - Wrexham Road	335503.9	347800.0
R8	Residential - Kingsmills Road	334516.9	349225.9
R9	Residential - A525 Kingsmills Road	334405.5	349297.7
R10	Residential - A525 Kingsmills Road	334152.3	349551.4
R11	Residential - A525 Kingsmills Road	334003.6	349645.2

Receptor		NGR (m)	
		X	Y
R12	Residential - A525 Kingsmills Road	333878.9	349731.9
R13	Residential - Bridgeway West	337265.6	348820.2
R14	Residential - Cefn Road	336599.0	348496.8
R15	Residential - Cefn Road	336083.0	348967.1
R16	Residential - Cefn Road	335654.5	349197.5
R17	Residential - Cefn Road	335452.0	349420.1
R18	Residential - Cefn Road	335434.9	349616.6
R19	Residential - Cefn Road	335413.7	350135.1
R20	Ysgol Morgan Llwyd	335194.9	350786.4
R21	Plas Rhosnesni Care Home	335237.4	350917.4
R22	Residential - Queensway	335320.2	349529.1
R23	Gwenfro Community Primary School	334987.8	349628.2
R24	Residential - Queensway	334576.2	349858.9
R25	Residential - Montgomery Road	334345.8	350231.4
R26	Residential - Abenbury Road	335288.1	349253.5
R27	Residential - Abenbury Road	335027.6	349157.7
R28	Residential - Abenbury Road	334845.4	349174.2
R29	Residential - Kingsmills Road	334610.1	349215.2
R30	Residential - Bedwell Road	337161.1	348344.8
R31	Residential - Hollie's Farm	337080.1	347408.8

4.5.7 Reference should be made to Figure 3 for a graphical representation of road vehicle exhaust emission sensitive receptor locations.

5.0 CONSTRUCTION PHASE ASSESSMENT

5.1 Introduction

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

5.2 Step 1 - Screen the Need for an Assessment

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.

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 250m of the site boundary. As such, a detailed assessment of potential dust impacts was required.

5.3 Step 2a - Define the Potential Dust Emission Magnitude

Earthworks

5.3.1 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. The area of the proposed site is greater than 110,000m^2. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from earthworks is therefore **large**.

Construction

5.3.2 Due to the size of the development, the total building volume is likely to be greater than 75,000m^3. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from construction is therefore **large**.

5.4 Step 2b - Define the Sensitivity of the Area

Dust Soiling

5.4.1 Table 12 shows that there are no receptors within 100m of the site, with more than 100 **high** sensitivity receptors between 100m and 250m of the site boundary. The sensitivity of the area with respect to dust soiling from earthworks and construction, as defined using the criteria summarised in Table 5, is therefore considered to be **low**.

Human Health

5.4.2 As shown in Table 11, the highest annual mean PM_{10} background concentration at the site is 9.93µg/m^3. As shown in Table 6, where the background annual mean PM_{10} concentration is below 24µg/m^3 and there are more than 100 **high** sensitivity receptors within 250m of the site boundary, the sensitivity of the area to potential human health from earthworks and construction is **low**.

5.5 Step 2c - Define the Risk of Dust Impacts

5.5.1 The derived dust emission magnitude for each activity has been combined with the sensitivity of the area to determine the risk of unmitigated impacts in line with the methodology set out in Table 8. A summary of the risk from each dust generating activity is provided in Table 14.

Table 14 Summary of Potential Unmitigated Dust Risks

Potential Impact	Activity	Step 2A - Dust Emission Magnitude	Step 2B - Sensitivity of the Area	Step 2C - Risk
Dust Soiling	Earthworks	Large	Low	Low
	Construction	Large	Low	Low
Human Health	Earthworks	Large	Low	Low
	Construction	Large	Low	Low

5.5.2 As indicated in Table 14, the potential risk of dust soiling and human health impacts is **low** from earthworks and construction.

5.5.3 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.

5.6 Step 3 - Site-specific Mitigation

5.6.1 The IAQM guidance[15] 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 15. These may be reviewed prior to the commencement of construction works and incorporated into a Construction Environmental Management Plan (CEMP) if required by the LA.

Table 15 Fugitive Dust Emission Mitigation Measures

Issue	Control Measure
Communications	• 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
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	• Erect solid screens or barriers around dusty activities or the site • Avoid site runoff of water or mud

15 Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

Issue	Control Measure
Operating vehicle/machinery and sustainable travel	• Ensure all vehicles switch off engines when stationary - no idling vehicles • Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques • Ensure an adequate water supply on the site for effective dust suppression, using non-potable water where possible and appropriate • Use enclosed chutes and conveyors and covered skips • Minimise drop heights and use fine water sprays wherever appropriate
Waste management	• Avoid bonfires or burning of waste materials

5.7 Step 4 - Determine Significant Effects

5.7.1 Assuming the relevant mitigation measures outlined in Table 15 are implemented, the residual impacts from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance[16].

[16] Guidance on the Assessment of Dust from Demolition and Construction V2.2, IAQM, 2024.

6.0 OPERATIONAL PHASE ASSESSMENT

6.1 Introduction

6.1.1 The development has the potential to increase concentrations of NO_2, PM_{10} and $PM_{2.5}$ as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site during the operational phase. 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.

6.1.2 The assessment considered the following scenarios:

- 2023 - Verification;
- 2027 - DM; and,
- 2027 - DS.

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

6.1.4 For the purpose of the assessment, traffic data for 2027 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 2023 were utilised within the dispersion model. The use of 2027 traffic data and 2023 emission factors is considered to provide a conservative scenario and therefore a sufficient level of confidence can be placed within the predicted pollution concentrations.

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

6.2 Potential Development Impacts

Predicted Concentrations

6.2.1 Annual mean NO_2 concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 16.

Table 16 Predicted Annual Mean NO_2 Concentrations

Receptor		Predicted Annual Mean NO_2 Concentration (µg/m^3)		
		DM	DS	Change
R1	Residential - A525	9.83	10.75	0.92
R2	Residential - B5130	10.56	11.41	0.85
R3	Residential - B5130	9.03	9.37	0.34
R4	Residential - Bangor Road	8.16	8.20	0.04
R5	Residential - Bangor Road	8.00	8.03	0.03
R6	Residential - Wrexham Road	11.00	11.04	0.04
R7	Residential - Wrexham Road	12.80	12.85	0.05
R8	Residential - Kingsmills Road	10.37	11.04	0.67
R9	Residential - A525 Kingsmills Road	12.79	13.43	0.64
R10	Residential - A525 Kingsmills Road	13.58	14.31	0.73
R11	Residential - A525 Kingsmills Road	10.47	10.86	0.39
R12	Residential - A525 Kingsmills Road	15.58	16.52	0.94
R13	Residential - Bridgeway West	7.87	7.98	0.11
R14	Residential - Cefn Road	8.03	8.44	0.41
R15	Residential - Cefn Road	9.82	11.13	1.31
R16	Residential - Cefn Road	9.03	9.92	0.89
R17	Residential - Cefn Road	10.90	11.97	1.07
R18	Residential - Cefn Road	10.22	10.92	0.70
R19	Residential - Cefn Road	8.52	8.84	0.32
R20	Ysgol Morgan Llwyd	7.59	7.69	0.10

Receptor		Predicted Annual Mean NO_2 Concentration (µg/m³)		
		DM	DS	Change
R21	Plas Rhosnesni Care Home	9.12	9.56	0.44
R22	Residential - Queensway	8.82	9.23	0.41
R23	Gwenfro Community Primary School	7.65	7.75	0.10
R24	Residential - Queensway	8.94	9.34	0.40
R25	Residential - Montgomery Road	7.83	7.98	0.15
R26	Residential - Abenbury Road	10.68	11.49	0.81
R27	Residential - Abenbury Road	9.12	9.55	0.43
R28	Residential - Abenbury Road	9.61	10.14	0.53
R29	Residential - Kingsmills Road	9.95	10.89	0.94
R30	Residential - Bedwell Road	8.48	9.39	0.91
R31	Residential - Hollie's Farm	7.59	7.67	0.08

6.2.2 As indicated in Table 16, predicted annual mean NO_2 concentrations were below the AQO of 40µg/m³ at all receptor locations in both scenarios.

6.2.3 Annual mean PM_{10} concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 17.

Table 17 Predicted Annual Mean PM_{10} Concentrations

Receptor		Predicted Annual Mean PM_{10} Concentration (µg/m³)		
		DM	DS	Change
R1	Residential - A525	10.73	10.90	0.17
R2	Residential - B5130	10.84	10.98	0.14
R3	Residential - B5130	10.52	10.58	0.06
R4	Residential - Bangor Road	10.32	10.32	0.01
R5	Residential - Bangor Road	10.27	10.28	0.01
R6	Residential - Wrexham Road	11.02	11.04	0.01
R7	Residential - Wrexham Road	11.55	11.57	0.02

Receptor		Predicted Annual Mean PM_{10} Concentration (µg/m³)		
		DM	DS	Change
R8	Residential - Kingsmills Road	10.83	11.01	0.18
R9	Residential - A525 Kingsmills Road	11.57	11.76	0.18
R10	Residential - A525 Kingsmills Road	11.82	12.03	0.21
R11	Residential - A525 Kingsmills Road	10.95	11.05	0.11
R12	Residential - A525 Kingsmills Road	12.40	12.68	0.28
R13	Residential - Bridgeway West	10.23	10.26	0.03
R14	Residential - Cefn Road	10.28	10.39	0.11
R15	Residential - Cefn Road	10.77	11.13	0.36
R16	Residential - Cefn Road	10.55	10.79	0.24
R17	Residential - Cefn Road	11.03	11.33	0.30
R18	Residential - Cefn Road	10.86	11.05	0.19
R19	Residential - Cefn Road	10.41	10.50	0.08
R20	Ysgol Morgan Llwyd	10.17	10.20	0.03
R21	Plas Rhosnesni Care Home	10.57	10.69	0.12
R22	Residential - Queensway	10.50	10.61	0.11
R23	Gwenfro Community Primary School	10.19	10.21	0.03
R24	Residential - Queensway	10.50	10.60	0.10
R25	Residential - Montgomery Road	10.23	10.27	0.04
R26	Residential - Abenbury Road	11.01	11.23	0.22
R27	Residential - Abenbury Road	10.58	10.69	0.12
R28	Residential - Abenbury Road	10.71	10.85	0.14
R29	Residential - Kingsmills Road	10.77	11.03	0.26
R30	Residential - Bedwell Road	10.31	10.48	0.17
R31	Residential - Hollie's Farm	10.17	10.18	0.01

6.2.4 As indicated in Table 17, predicted annual mean PM_{10} concentrations were below the AQO of 40µg/m³ at all receptor locations in both scenarios.

6.2.5 Annual mean $PM_{2.5}$ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 18.

Table 18 Predicted Annual Mean $PM_{2.5}$ Concentrations

Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration (µg/m³)		
		DM	DS	Change
R1	Residential - A525	5.80	5.90	0.10
R2	Residential - B5130	5.87	5.95	0.08
R3	Residential - B5130	5.69	5.73	0.03
R4	Residential - Bangor Road	5.58	5.59	0.01
R5	Residential - Bangor Road	5.55	5.56	0.00
R6	Residential - Wrexham Road	5.97	5.97	0.01
R7	Residential - Wrexham Road	6.25	6.26	0.01
R8	Residential - Kingsmills Road	5.87	5.97	0.10
R9	Residential - A525 Kingsmills Road	6.26	6.35	0.10
R10	Residential - A525 Kingsmills Road	6.38	6.50	0.11
R11	Residential - A525 Kingsmills Road	5.92	5.97	0.06
R12	Residential - A525 Kingsmills Road	6.70	6.85	0.15
R13	Residential - Bridgeway West	5.54	5.55	0.01
R14	Residential - Cefn Road	5.57	5.63	0.06
R15	Residential - Cefn Road	5.83	6.03	0.20
R16	Residential - Cefn Road	5.70	5.83	0.13
R17	Residential - Cefn Road	5.97	6.12	0.16
R18	Residential - Cefn Road	5.87	5.98	0.10
R19	Residential - Cefn Road	5.63	5.68	0.04
R20	Ysgol Morgan Llwyd	5.50	5.52	0.01
R21	Plas Rhosnesni Care Home	5.72	5.78	0.06
R22	Residential - Queensway	5.68	5.74	0.06
R23	Gwenfro Community Primary School	5.51	5.52	0.01

Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration (µg/m³)		
		DM	DS	Change
R24	Residential - Queensway	5.68	5.73	0.06
R25	Residential - Montgomery Road	5.53	5.55	0.02
R26	Residential - Abenbury Road	5.95	6.07	0.12
R27	Residential - Abenbury Road	5.72	5.78	0.06
R28	Residential - Abenbury Road	5.79	5.87	0.08
R29	Residential - Kingsmills Road	5.83	5.97	0.14
R30	Residential - Bedwell Road	5.59	5.69	0.10
R31	Residential - Hollie's Farm	5.50	5.51	0.01

6.2.6 As indicated in Table 18, predicted annual mean $PM_{2.5}$ concentrations were below the AQO of 25µg/m³ at all receptor locations in both scenarios.

Predicted Impacts

6.2.7 Predicted impacts on annual mean NO_2 concentrations at the sensitive receptor locations are summarised in Table 19.

Table 19 Predicted Impacts - NO_2

Receptor		Predicted Annual Mean NO_2 Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - A525	Below 75% of AQO	2 - 5	Negligible
R2	Residential - B5130	Below 75% of AQO	2 - 5	Negligible
R3	Residential - B5130	Below 75% of AQO	1	Negligible
R4	Residential - Bangor Road	Below 75% of AQO	0	Negligible
R5	Residential - Bangor Road	Below 75% of AQO	0	Negligible
R6	Residential - Wrexham Road	Below 75% of AQO	0	Negligible
R7	Residential - Wrexham Road	Below 75% of AQO	0	Negligible

Receptor		Predicted Annual Mean NO_2 Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R8	Residential - Kingsmills Road	Below 75% of AQO	2 - 5	Negligible
R9	Residential - A525 Kingsmills Road	Below 75% of AQO	2 - 5	Negligible
R10	Residential - A525 Kingsmills Road	Below 75% of AQO	2 - 5	Negligible
R11	Residential - A525 Kingsmills Road	Below 75% of AQO	1	Negligible
R12	Residential - A525 Kingsmills Road	Below 75% of AQO	2 - 5	Negligible
R13	Residential - Bridgeway West	Below 75% of AQO	0	Negligible
R14	Residential - Cefn Road	Below 75% of AQO	1	Negligible
R15	Residential - Cefn Road	Below 75% of AQO	2 - 5	Negligible
R16	Residential - Cefn Road	Below 75% of AQO	2 - 5	Negligible
R17	Residential - Cefn Road	Below 75% of AQO	2 - 5	Negligible
R18	Residential - Cefn Road	Below 75% of AQO	2 - 5	Negligible
R19	Residential - Cefn Road	Below 75% of AQO	1	Negligible
R20	Ysgol Morgan Llwyd	Below 75% of AQO	0	Negligible
R21	Plas Rhosnesni Care Home	Below 75% of AQO	1	Negligible
R22	Residential - Queensway	Below 75% of AQO	1	Negligible
R23	Gwenfro Community Primary School	Below 75% of AQO	0	Negligible
R24	Residential - Queensway	Below 75% of AQO	1	Negligible
R25	Residential - Montgomery Road	Below 75% of AQO	0	Negligible
R26	Residential - Abenbury Road	Below 75% of AQO	2 - 5	Negligible
R27	Residential - Abenbury Road	Below 75% of AQO	1	Negligible
R28	Residential - Abenbury Road	Below 75% of AQO	1	Negligible
R29	Residential - Kingsmills Road	Below 75% of AQO	2 - 5	Negligible
R30	Residential - Bedwell Road	Below 75% of AQO	2 - 5	Negligible
R31	Residential - Hollie's Farm	Below 75% of AQO	0	Negligible

6.2.8 As indicated in Table 19, impacts on annual mean NO_2 concentrations as a result of the proposed development were predicted to be **negligible** at all receptors.

6.2.9 Predicted impacts on annual mean PM_{10} concentrations at the sensitive receptor locations are summarised in Table 20.

Table 20 Predicted Impacts - PM_{10}

Receptor		Predicted Annual Mean PM_{10} Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - A525	Below 75% of AQO	0	Negligible
R2	Residential - B5130	Below 75% of AQO	0	Negligible
R3	Residential - B5130	Below 75% of AQO	0	Negligible
R4	Residential - Bangor Road	Below 75% of AQO	0	Negligible
R5	Residential - Bangor Road	Below 75% of AQO	0	Negligible
R6	Residential - Wrexham Road	Below 75% of AQO	0	Negligible
R7	Residential - Wrexham Road	Below 75% of AQO	0	Negligible
R8	Residential - Kingsmills Road	Below 75% of AQO	0	Negligible
R9	Residential - A525 Kingsmills Road	Below 75% of AQO	0	Negligible
R10	Residential - A525 Kingsmills Road	Below 75% of AQO	1	Negligible
R11	Residential - A525 Kingsmills Road	Below 75% of AQO	0	Negligible
R12	Residential - A525 Kingsmills Road	Below 75% of AQO	1	Negligible
R13	Residential - Bridgeway West	Below 75% of AQO	0	Negligible
R14	Residential - Cefn Road	Below 75% of AQO	0	Negligible
R15	Residential - Cefn Road	Below 75% of AQO	1	Negligible
R16	Residential - Cefn Road	Below 75% of AQO	1	Negligible
R17	Residential - Cefn Road	Below 75% of AQO	1	Negligible
R18	Residential - Cefn Road	Below 75% of AQO	0	Negligible
R19	Residential - Cefn Road	Below 75% of AQO	0	Negligible

Receptor		Predicted Annual Mean PM_{10} Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R20	Ysgol Morgan Llwyd	Below 75% of AQO	0	Negligible
R21	Plas Rhosnesni Care Home	Below 75% of AQO	0	Negligible
R22	Residential - Queensway	Below 75% of AQO	0	Negligible
R23	Gwenfro Community Primary School	Below 75% of AQO	0	Negligible
R24	Residential - Queensway	Below 75% of AQO	0	Negligible
R25	Residential - Montgomery Road	Below 75% of AQO	0	Negligible
R26	Residential - Abenbury Road	Below 75% of AQO	1	Negligible
R27	Residential - Abenbury Road	Below 75% of AQO	0	Negligible
R28	Residential - Abenbury Road	Below 75% of AQO	0	Negligible
R29	Residential - Kingsmills Road	Below 75% of AQO	1	Negligible
R30	Residential - Bedwell Road	Below 75% of AQO	0	Negligible
R31	Residential - Hollie's Farm	Below 75% of AQO	0	Negligible

6.2.10 As indicated in Table 20, impacts on annual mean PM_{10} concentrations as a result of the proposed development were predicted to be **negligible** at all receptors.

6.2.11 Predicted impacts on annual mean $PM_{2.5}$ concentrations at the sensitive receptor locations are summarised in Table 21.

Table 21 Predicted Impacts - $PM_{2.5}$

Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - A525	Below 75% of AQO	0	Negligible
R2	Residential - B5130	Below 75% of AQO	0	Negligible
R3	Residential - B5130	Below 75% of AQO	0	Negligible
R4	Residential - Bangor Road	Below 75% of AQO	0	Negligible

Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R5	Residential - Bangor Road	Below 75% of AQO	0	Negligible
R6	Residential - Wrexham Road	Below 75% of AQO	0	Negligible
R7	Residential - Wrexham Road	Below 75% of AQO	0	Negligible
R8	Residential - Kingsmills Road	Below 75% of AQO	0	Negligible
R9	Residential - A525 Kingsmills Road	Below 75% of AQO	0	Negligible
R10	Residential - A525 Kingsmills Road	Below 75% of AQO	0	Negligible
R11	Residential - A525 Kingsmills Road	Below 75% of AQO	0	Negligible
R12	Residential - A525 Kingsmills Road	Below 75% of AQO	1	Negligible
R13	Residential - Bridgeway West	Below 75% of AQO	0	Negligible
R14	Residential - Cefn Road	Below 75% of AQO	0	Negligible
R15	Residential - Cefn Road	Below 75% of AQO	1	Negligible
R16	Residential - Cefn Road	Below 75% of AQO	1	Negligible
R17	Residential - Cefn Road	Below 75% of AQO	1	Negligible
R18	Residential - Cefn Road	Below 75% of AQO	0	Negligible
R19	Residential - Cefn Road	Below 75% of AQO	0	Negligible
R20	Ysgol Morgan Llwyd	Below 75% of AQO	0	Negligible
R21	Plas Rhosnesni Care Home	Below 75% of AQO	0	Negligible
R22	Residential - Queensway	Below 75% of AQO	0	Negligible
R23	Gwenfro Community Primary School	Below 75% of AQO	0	Negligible
R24	Residential - Queensway	Below 75% of AQO	0	Negligible
R25	Residential - Montgomery Road	Below 75% of AQO	0	Negligible
R26	Residential - Abenbury Road	Below 75% of AQO	0	Negligible
R27	Residential - Abenbury Road	Below 75% of AQO	0	Negligible
R28	Residential - Abenbury Road	Below 75% of AQO	0	Negligible
R29	Residential - Kingsmills Road	Below 75% of AQO	1	Negligible

Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R30	Residential - Bedwell Road	Below 75% of AQO	0	Negligible
R31	Residential - Hollie's Farm	Below 75% of AQO	0	Negligible

6.2.12 As indicated in Table 21, impacts on annual mean $PM_{2.5}$ concentrations as a result of the proposed development were predicted to be **negligible** at all receptors.

6.3 Overall Impact Significance

6.3.1 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 22.

Table 22 Overall Impact Significance

Guidance	Comment
The existing and future air quality in the absence of the development	Predicted annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations were below the relevant AQOs at all locations in the DM scenario The predicted concentrations are considered unlikely to change significantly in the absence of the proposals given the established nature of the area. This is supported by the results of the assessment as detailed in Section 6.2.
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	It was assumed that vehicle exhaust emission rates and background concentrations will not reduce in future years. This provides robust results when compared with DEFRA and National Highways methodologies Due to the adopted assumptions it is considered the presented results are sufficiently robust for an assessment of this nature

6.3.2 The IAQM guidance[17] states that only if the impact is above **slight**, the effect is considered **significant**. As impacts were predicted to be **negligible**, overall effects are considered **not significant**, in accordance with the stated methodology.

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

7.0 CONCLUSION

7.1.1 Redmore Environmental Ltd was commissioned by Net World Sports to undertake an Air Quality Assessment in support of a warehouse development on land off Sesswick Way, Five Fords, Wrexham.

7.1.2 The 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 as a result of the construction and operation of the proposals.

7.1.3 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. Site-specific dust control measures were subsequently determined. Following implementation, the residual significance of potential air quality impacts from dust generated by earthworks and construction activities are predicted to be **not significant**.

7.1.4 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 highway network both with and without the development in place. Results were subsequently verified using local monitoring data.

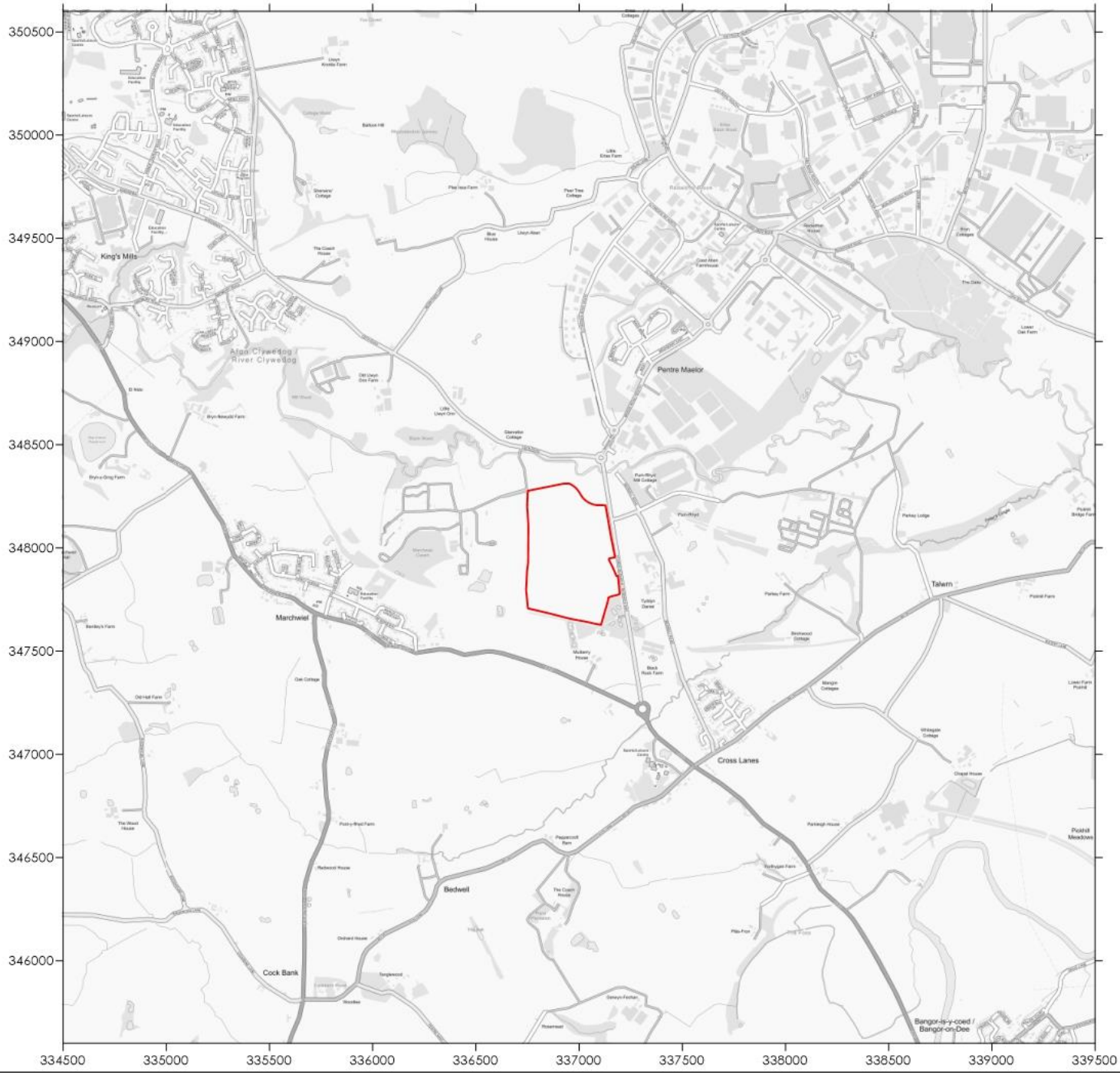
7.1.5 Review of the dispersion modelling results indicated that impacts on annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations as a result of traffic generated by the development were predicted to be **negligible** at all sensitive receptor locations. Following consideration of the relevant issues, impacts as a result of the operation of the development were considered to be **not significant**, in accordance with the IAQM guidance.

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

8.0 ABBREVIATIONS

AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQMA	Air Quality Management Area
AQLV	Air Quality Limit Value
AQO	Air Quality Objective
AQPR	Air Quality Progress Report
AQS	Air Quality Strategy
CEMP	Construction Environmental Management Plan
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DM	Do-Minimum
DMRB	Design Manual for Roads and Bridges
DS	Do-Something
EFT	Emissions Factor Toolkit
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
NB	Northbound
NGR	National Grid Reference
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NWA	North Wales Authorities
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10µm
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5µm
SB	Southbound
SP	Slow Phase
WCBC	Wrexham County Borough Council
z_0	Roughness length

Figures



Legend

Site Boundary

Title
Figure 1 - Site Location Plan

Project
Air Quality Assessment
Sesswick Way, Five Fords, Wrexham

Project Reference
8180

Client
Net World Sports

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Legend

Site Boundary

Monitor

Title
Figure 2 - Monitoring Locations

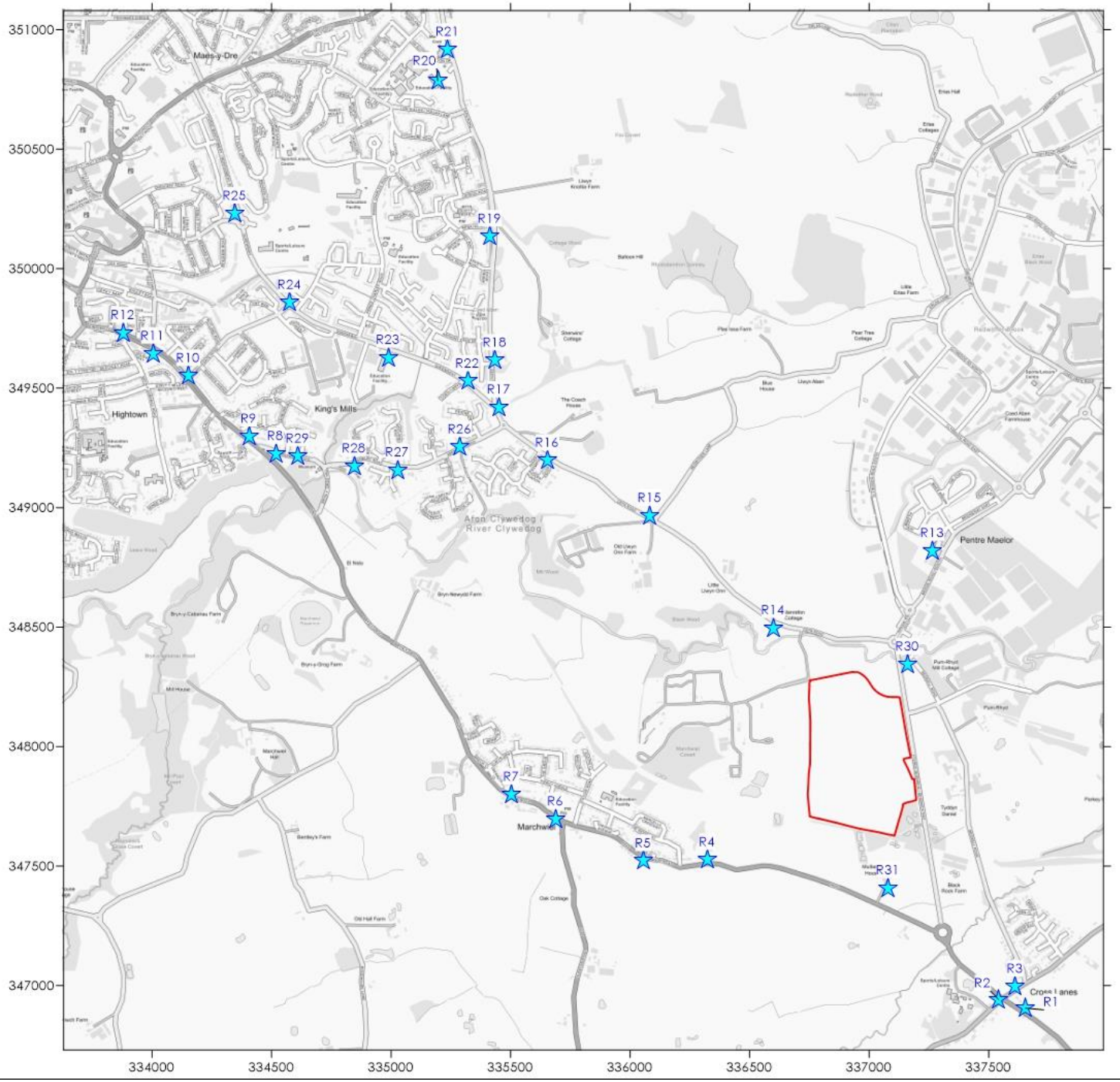
Project
Air Quality Assessment
Sesswick Way, Five Fords, Wrexham

Project Reference
8180

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Legend

Site Boundary

Receptor

Title
Figure 3 - Operational Phase Road Vehicle Exhaust Emission Sensitive Receptor Locations

Project
Air Quality Assessment
Sesswick Way, Five Fords, Wrexham

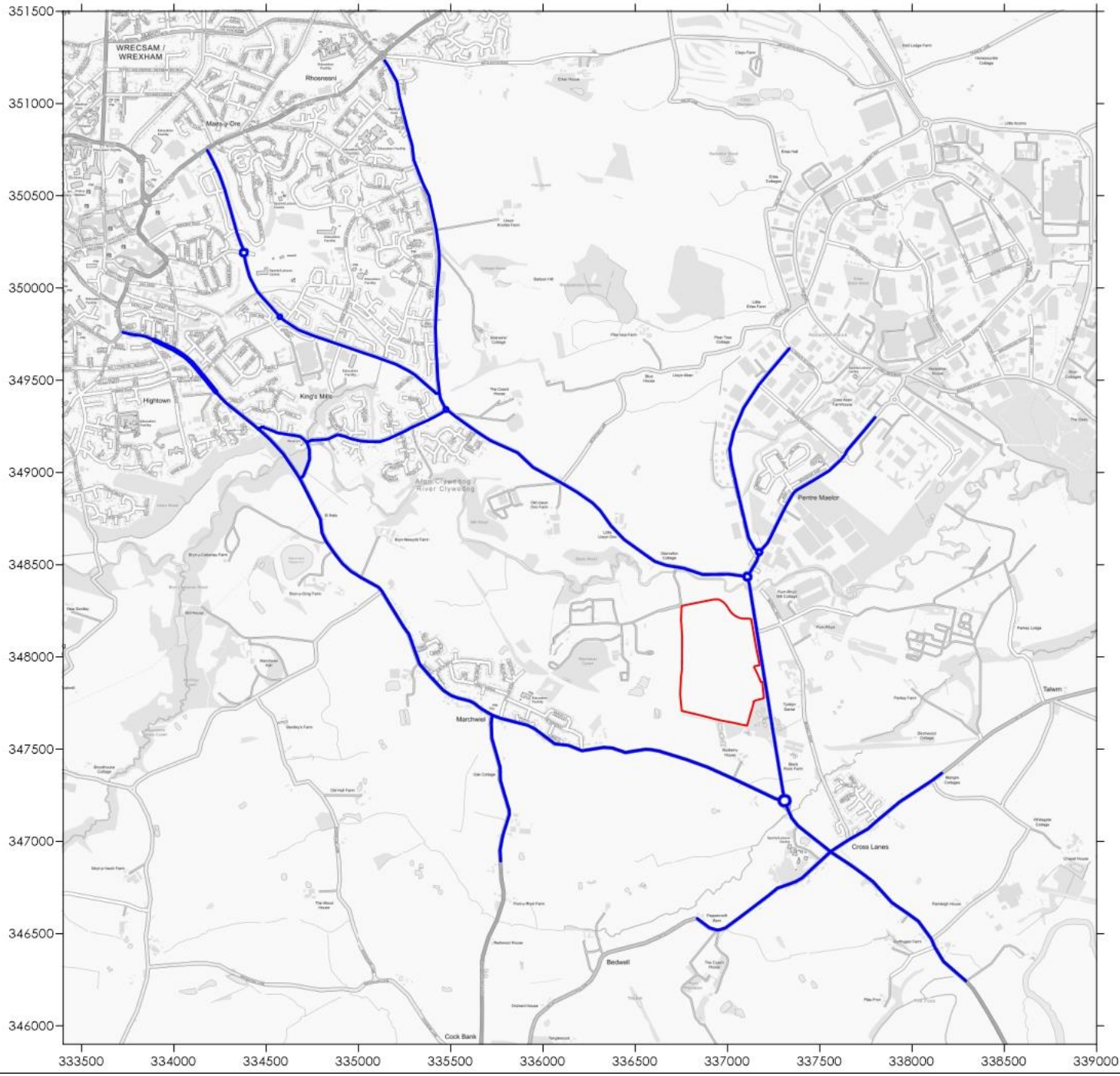
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Legend

Site Boundary

Road Link

Title
Figure 4 - ADMS-Roads Inputs

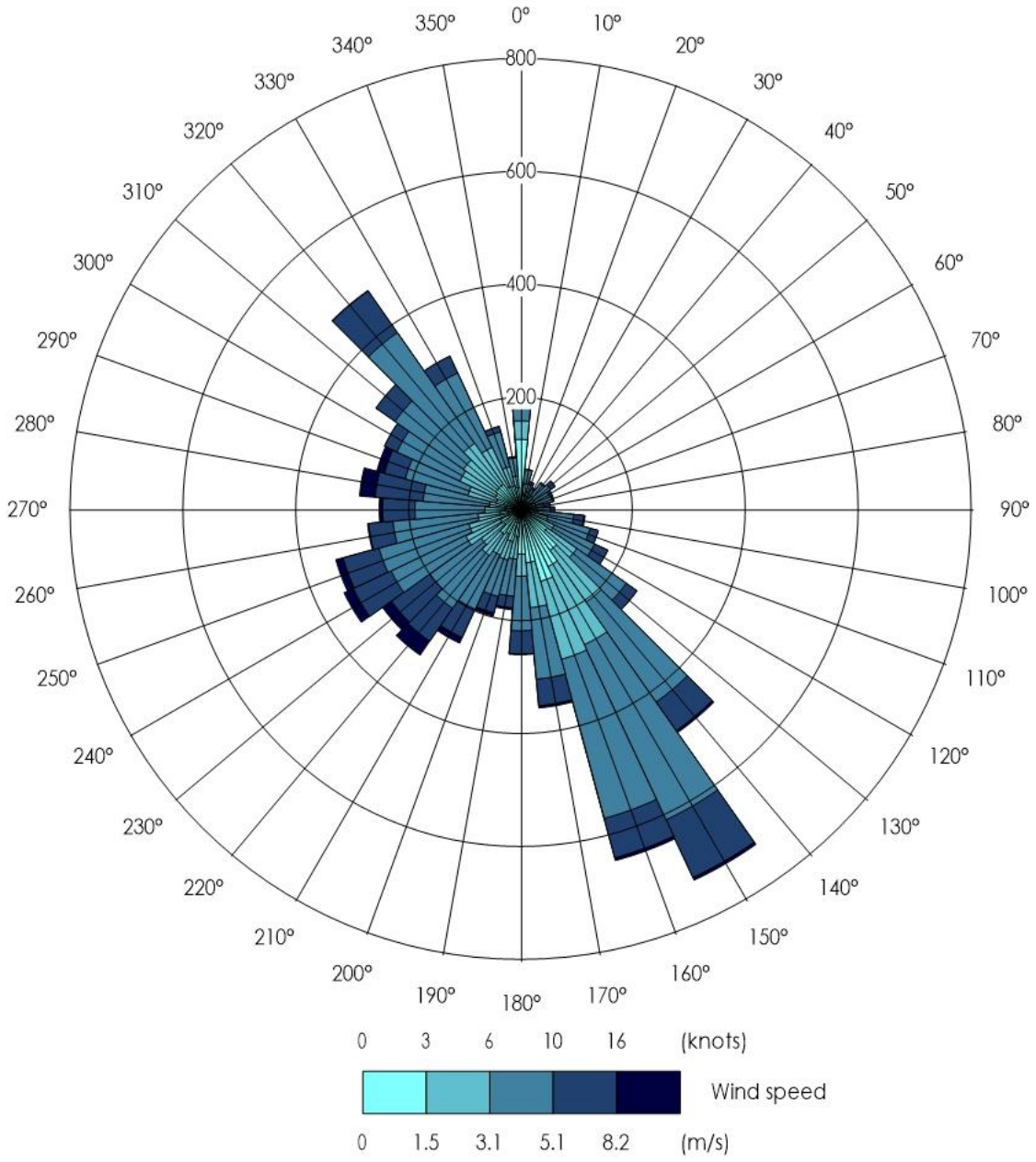
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Sesswick Way, Five Fords, Wrexham

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Legend

Title
Figure 5 - Wind Rose of 2023
Hawarden Meteorological Data

Project
Air Quality Assessment
Sesswick Way, Five Fords, Wrexham

Project Reference
8180

Client
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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 emissions associated with vehicles travelling to and from the site. In order to assess NO_2, PM_{10} and $PM_{2.5}$ 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 5.0.1.3). 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.

The relevant inputs are detailed in the following Sections.

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 Cora IHT Ltd, the Transport Consultants for the scheme.

Traffic data for a number of links was not available from the Transport Consultant. It was considered necessary to include emissions from these roads within the model in order to provide

a robust assessment. As such, data was supplemented with information from the Department for Transport (DfT)[18]. The DfT web tool enables the user to view and download traffic flows on every link of the 'A' road and motorway network, as well as selected minor roads, in Great Britain for the years 1999 to 2023. It should be noted that the DfT web tool is referenced in DEFRA guidance[19] 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 opening year of the development utilising a factor obtained from TEMPro (version 8.0). This software package has been developed by the DfT to calculate future traffic growth throughout the UK.

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

Table A1.1 Traffic Data

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	
		Verif.	2027 DM	2027 DS	Verif. and DM	2027 DS
L1	Sesswick Way, south of site access	5,486	5,631	6,468	4.36	10.17
L2	A525, east of Sesswick Way	5,923	6,079	6,843	3.42	9.06
L3	A525, adjacent B130 Slow Phase (SP)	5,923	6,079	6,843	3.42	9.06
L4	A525, east of B130	5,923	6,079	6,843	3.42	9.06
L5	B5130, south of A525	2,179	2,253	2,253	2.75	2.75
L6	B5130 SP	2,179	2,253	2,253	2.75	2.75
L7	B5130, north of A525	2,179	2,253	2,253	2.75	2.75
L8	A525, west of Sesswick way	2,477	2,542	2,616	2.86	2.78
L9	A525 Bangor Road	2,477	2,542	2,616	2.86	2.78
L10	A525 Wrexham Road	7,902	8,170	8,243	1.48	1.47
L11	A525 Bryn-Y-Grog	7,902	8,170	8,243	1.48	1.47
L12	Sesswick Way, north of site access	5,486	5,631	9,866	4.36	6.67

[18] https://roadtraffic.dft.gov.uk/#6/55.254/-6.053/basemap-regions-countpoints.

[19] Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	
		Verif.	2027 DM	2027 DS	Verif. and DM	2027 DS
L13	Bridge Road (South), between roundabouts	7,189	7,379	8,216	3.58	8.24
L14	Bridge Road (South)	3,002	3,081	3,081	7.09	7.09
L15	Clywedog Road South	2,954	3,032	3,869	1.78	12.06
L16	Cefn Road	5,895	6,167	9,565	1.28	0.83
L17	Cefn Road, north of Clos Ascot	5,895	6,167	9,565	1.28	0.83
L18	Cefn Road, north of Abenbury Road	5,476	5,729	7,585	1.42	1.07
L19	Cefn Road, north of Queensway	5,476	5,729	7,120	1.42	1.14
L20	Queensway SP	1,833	1,917	2,383	0.05	0.04
L21	Queensway	1,833	1,917	2,383	0.05	0.04
L22	Queensway, north of Whitegate Road	1,833	1,917	2,383	0.05	0.04
L23	Montgomery Road	1,833	1,917	2,383	0.05	0.04
L24	Abenbury Road	6,072	6,353	7,895	0.18	0.14
L25	Bryn-Y-Grog Hill	3,036	3,177	3,177	0.18	0.18
L26	Kingsmills Road	3,036	3,177	4,718	0.18	0.12
L27	Kingsmills Road SP	3,036	3,177	4,718	0.18	0.12
L28	A525 Kingsmills Road	12,709	13,296	14,911	0.26	0.23
L29	A525 Northbound (NB)	6,354	6,648	7,455	0.26	0.23
L30	A525 Southbound (SB)	6,354	6,648	7,455	0.26	0.23
L31	A525 Kingsmills Road, north of dual carriageway	12,709	13,296	14,911	0.26	0.23
L32	A528 Overton Road SP	4,933	5,100	5,100	4.84	4.84
L33	A528 Overton Road	4,933	5,100	5,100	4.84	4.84
R1	A525 Roundabout	2,961	3,040	3,458	4.36	10.17
R2	Sesswick Way Roundabout	3,595	3,689	5,807	4.36	8.24
R3	Bridge Road (South) Roundabout	3,595	3,689	4,108	7.09	12.06

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)	
		Verif.	2027 DM	2027 DS	Verif. and DM	2027 DS
R4	Cefn Road Roundabout	3,036	3,177	4,875	1.42	1.07
R5	Queensway Mini Roundabout	916	959	1,191	0.05	0.04
R6	Queensway Roundabout	916	959	1,191	0.05	0.04

Reference should be made to Figure 4 for a graphical representation of the road link locations.

Road parameters for input into the model were based on the following:

- Road widths were estimated from aerial photography and UK highway design standards;
- Vehicle speeds were estimated as an average for the relevant road link over the course of a 24-hour period;
- Vehicle speeds were determined following review of speed limits within the study extents, as well as congestion data available from GoogleMaps;
- Vehicle speeds specific to slow phases were determined using the methodology outlined in the DEFRA guidance[20];
- Necessary adjustments to slow phase vehicle speeds were based upon congestion data available from GoogleMaps; and,
- The length for slow phases were derived using the approaching distance of 25m outlined in the DEFRA guidance[21], and adjusted accordingly based on aerial photography and congestion data available from GoogleMaps.

A summary of the link parameters in are provided in Table A1.2.

Table A1.2 Road Parameters

Link		Road Width (m)	Average Vehicle Speed (km/h)
L1	Sesswick Way, south of site access	7.2	90
L2	A525, east of Sesswick Way	7.2	30

[20] Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

[21] Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

Link		Road Width (m)	Average Vehicle Speed (km/h)
L3	A525, adjacent B130 SP	5.3	20
L4	A525, east of B130	5.9	30
L5	B5130, south of A525	5.1	30
L6	B5130 SP	9.5	20
L7	B5130, north of A525	7.3	30
L8	A525, west of Sesswick way	7.2	60
L9	A525 Bangor Road	6.6	30
L10	A525 Wrexham Road	6.3	30
L11	A525 Bryn-Y-Grog	6.5	80
L12	Sesswick Way, north of site access	10.6	90
L13	Bridge Road (South), between roundabouts	16.6	60
L14	Bridge Road (South)	6.2	30
L15	Clywedog Road South	6.7	60
L16	Cefn Road	8.3	60
L17	Cefn Road, north of Clos Ascot	7.0	30
L18	Cefn Road, north of Abenbury Road	8.5	30
L19	Cefn Road, north of Queensway	5.7	30
L20	Queensway SP	11.4	20
L21	Queensway	6.6	30
L22	Queensway, north of Whitegate Road	6.5	30
L23	Montgomery Road	6.0	30
L24	Abenbury Road	8.2	30
L25	Bryn-Y-Grog Hill	6.2	30
L26	Kingsmills Road	7.2	30
L27	Kingsmills Road SP	19.0	20
L28	A525 Kingsmills Road	7.4	30
L29	A525 NB	4.8	30

Link		Road Width (m)	Average Vehicle Speed (km/h)
L30	A525 SB	3.9	30
L31	A525 Kingsmills Road, north of dual carriageway	6.0	30
L32	A528 Overton Road SP	11.5	20
L33	A528 Overton Road	6.5	90
R1	A525 Roundabout	9.2	20
R2	Sesswick Way Roundabout	8.9	20
R3	Bridge Road (South) Roundabout	8.5	20
R4	Cefn Road Roundabout	7.2	20
R5	Queensway Mini Roundabout	5.4	20
R6	Queensway Roundabout	9.0	20

Emission Factors

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (EFT) (version 13.0). This has been produced by DEFRA and incorporates COPERT 5.8 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, 2023 emission factors were utilised in preference to the development opening year in order to provide robust model outputs. As predictions for 2023 were verified, it is considered the results are a robust indication of conservative concentrations for the future year.

Meteorological Data

Meteorological data used in the assessment was taken from Hawarden meteorological station over the period 1st January 2023 to 31st December 2023 (inclusive). Hawarden is located at NGR: 334586, 364102, which is approximately 16.6km north of the development. It is anticipated that conditions would be reasonably similar over a distance of this magnitude. The data was therefore considered suitable for an assessment of this nature.

All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 5 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 0.5m was used to describe the modelling extents and the meteorological site. This value is considered appropriate for the morphology of both areas and is suggested within ADMS-Roads as being suitable for 'parklands, open suburbia'.

Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 30m was used to describe the modelling extents and the meteorological site. This is considered appropriate for the morphology of both areas and is suggested within ADMS-Roads as being suitable for 'mixed urban/industrial'.

Background Concentrations

Annual mean NO_2, PM_{10} and $PM_{2.5}$ background concentrations for use in the assessment were taken from the DEFRA mapping study for the grid square containing the site, NGR: 336500, 348500, as shown in Table 11. These values were chosen as they were the highest of the four grid squares covering the site.

Similarly to emission factors, background concentrations from 2023 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 9.1) provided by DEFRA, which is the method detailed within DEFRA guidance[22].

[22] Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

Verification

The results from a dispersion model may differ from measures 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 2023 using traffic data, meteorological data and monitoring results from this year.

Monitoring of NO_2 concentrations was undertaken at three locations within the vicinity of roads included in the model during 2023. The results were obtained and the road contributions to total NO_x concentrations calculated following the methodology contained within DEFRA guidance[23]. The monitored annual mean NO_2 concentrations and calculated road NO_x concentrations are summarised in Table A1.3.

Table A1.3 NO_x Verification - Monitoring Results

Monitoring Location		Monitored NO_2 Concentration ($\mu g/m^3$)	Calculated Road NO_x Concentration ($\mu g/m^3$)
41	Marchwiel	11.1	8.14
43	Hightown	16.5	20.11
59	Cross Lanes	9.6	4.98

The annual mean road NO_x concentrations predicted from the dispersion model and the 2023 road NO_x concentrations calculated from the monitoring results are summarised in Table A1.4.

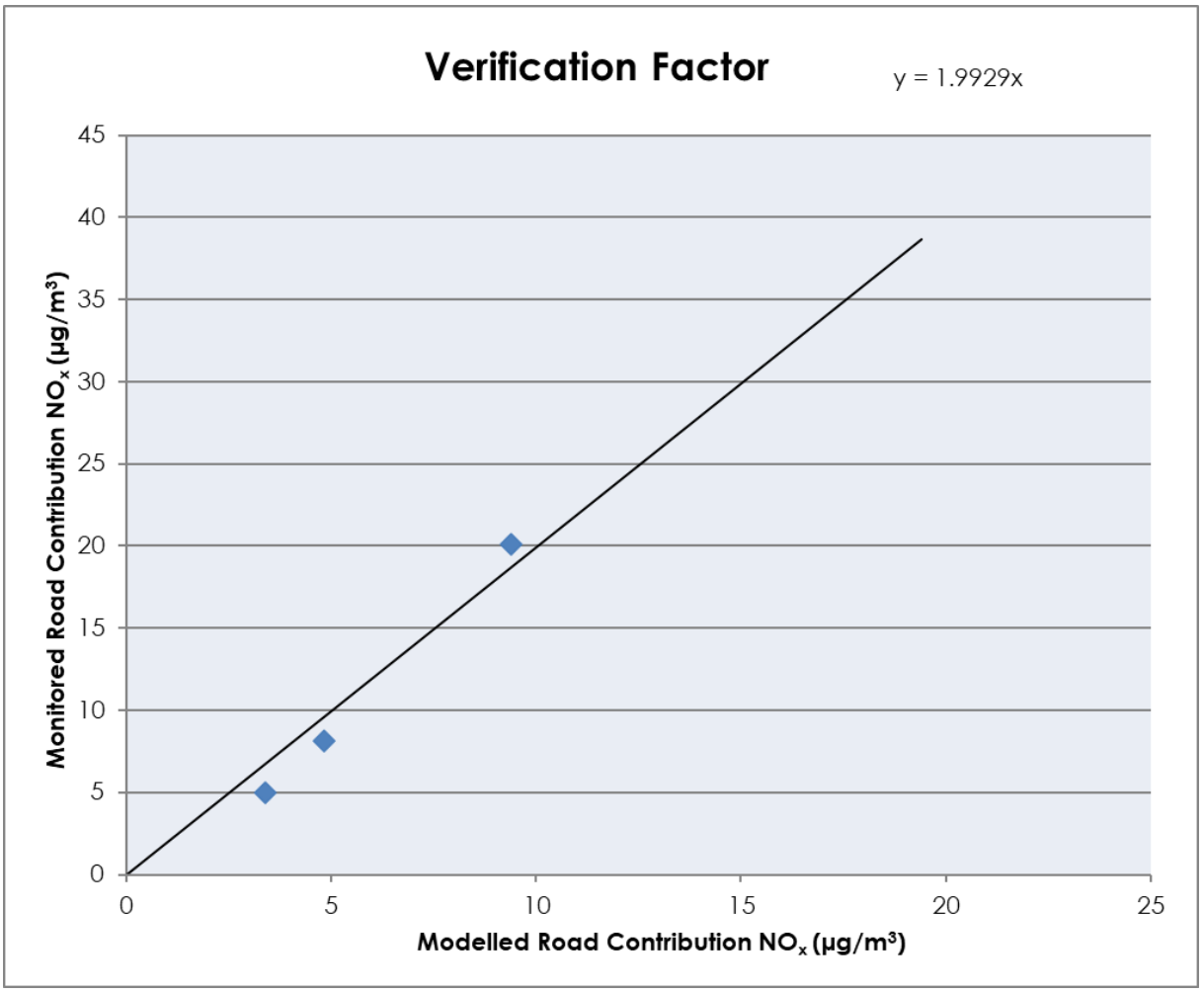
[23] Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

Table A1.4 NO_x Verification - Modelling Results

Monitoring Location		Calculated Road NO_x Concentration (µg/m³)	Modelled Road NO_x Concentration (µg/m³)
41	Marchwiel	8.14	4.82
43	Hightown	20.11	9.40
59	Cross Lanes	4.98	3.38

The monitored and modelled road NO_x concentrations were graphed and the equation of the trendline based on linear progression through zero calculated. This indicated that a verification factor of 1.9929 was required to be applied to all modelling results, as shown in Graph 1.

Graph 1 NO_x Verification Factor



Monitoring of PM_{10} and $PM_{2.5}$ concentrations is not undertaken within the assessment extents. The NO_x verification factor was therefore used to adjust model predictions of these species in lieu of more accurate data in accordance with DEFRA guidance[24].

[24] Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

Appendix 2 - Curricula Vitae

EMILY PEARS-RYDING

Director

BSc (Hons), MIAQM, MIEnvSc

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

KEY EXPERIENCE:

Emily is a Director 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 and industrial emissions using ADMS-Roads and ADMS-5. 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.
- Assessment of fugitive dust impacts from a range of mineral extraction developments.
- Assessment of petrol stations to address benzene concentrations and their impact on adjacent developments.
- Production of air quality mitigation strategies specifically tailored to address issues at individual sites.
- Assessment of potential effects associated with network realignment schemes and highway developments.

SELECT PROJECTS SUMMARY:

Broad Street, Birmingham

Air Quality Assessment in support of a residential-led development on land at Broad Street, Birmingham. The proposals were located adjacent to a section of the Midland Metro Westside which runs along Broad Street. Consideration was made to the potential for re-alignment of the local road network as a result of the Metro to effect pollution levels at the development. The assessment indicated NO_2 concentrations exceeded air quality criteria from ground to third floor level as a result of road vehicle exhaust emissions. Mitigation was therefore specified for the affected units.

Home Farm, Forest Road, Warfield

Ecological Air Quality Assessment in support of a residential development. Natural England held concerns regarding potential impacts at sensitive ecological designations as a result of traffic exhaust emissions associated with the development. The predicted change in NO_x and ammonia concentrations and nitrogen and acid deposition was below the relevant criteria at all locations within the ecological designations. Impacts were therefore not considered to be significant.

Saltcoats Road, Stevenston

Air Quality Assessment in support of an educational campus and associated energy centre. Impacts associated with emissions from the proposed gas and biomass boilers were assessed through detailed dispersion modelling. This indicated impacts on annual mean NO_2 and PM_{10} concentrations were predicted to be not significant.

Blackthorn & Piddington

Environmental Impact Assessment in support of a railway embankment scheme on land at the Network Railway Embankment between Piddington and Blackthorn. Due to the extensive stabilisation works a Fugitive Dust Emissions Assessment was undertaken in addition to consideration of road vehicle exhaust emissions. Due to the location of the site in relation to nearby sensitive receptors, potential impacts associated with construction works were not considered to be significant.

Blackmoorfoot Road, Huddersfield

Air Quality in support of a residential-led development in close proximity to an operational minerals facility. Due to the presence of the Johnsons Wellfield Quarry to the south of the site a Fugitive Dust Emissions Assessment was undertaken to determine potential impacts. Dispersion modelling of road vehicle exhaust emissions was also undertaken in support of the scheme. Results indicated the overall significance of fugitive dust emissions from the quarry and air quality impacts associated with operation of the development itself were not significant.

Lockwood Bar, Huddersfield

Air Quality Assessment for the proposed highway realignment scheme along Lockwood Road, Huddersfield. Changes in pollution levels were considered at sensitive receptors as a result of variations to road geometry and associated redistribution of vehicle trips across the local area. Results of the dispersion modelling study indicated air quality impacts as a result of the scheme were not significant.

EMILY MACEY

Senior Air Quality Consultant

BSc (Hons), MSc, MIEnvSc, MIAQM

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

KEY EXPERIENCE:

Emily is a Senior 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 at all locations.

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 revealed pollutant concentrations were below the relevant standards across the site and impacts associated with the development were not significant.

MEGAN POND

Graduate Air Quality Consultant

BSc (Hons), AMIAQM, AMIEnvSc

Tel: 0117 2441912 | Email: megan.pond@red-env.co.uk

KEY EXPERIENCE:

Megan 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 impact assessments 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 sites.
- Production of Air Quality Neutral Assessments in accordance with The London Plan.
- Installation and management of diffusion tube monitoring campaigns in order to determine the potential for exposure of sensitive receptors to poor air quality.

SELECT PROJECTS SUMMARY:

Whitebirk, Blackburn

Air Quality Assessment in support of a residential development comprising demolition of existing buildings and construction of 152 dwellings on land at the Whitebirk Estate, Blackburn. The development had the potential to expose future occupants to any existing air quality issues and cause impacts at sensitive locations. Dispersion modelling was undertaken using ADMS-Roads. A construction dust assessment was also performed to provide mitigation for proposed dust generating activities. Results of the study indicated that air quality impacts and fugitive dust emissions were not significant.

Willow Lane, Mitcham

Air Quality Assessment in support of an industrial development off Willow Lane, Mitcham. 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 at all locations. An Air Quality Neutral Assessment was also undertaken in accordance with the London Plan. Following implementation of relevant mitigation measures, the development was considered Air Quality Neutral.

Harrow Road, London

Air Quality Assessment in support of a nursery. Detailed dispersion modelling, including advanced canyon inputs, was undertaken to evaluate the potential for exposure of future occupants to any existing issues at the site. The results indicated air quality conditions did not present an issue to planning consent.

The Green, Cheadle

Air Quality Assessment in support of a new Aldi store off the Green, Cheadle. Following concerns from the Local Authority regarding the potential for traffic generated by the proposals to cause air quality impacts, dispersion modelling was undertaken in order to quantify changes in pollutant concentrations at sensitive locations in the vicinity of the site. Results revealed negligible impacts at all locations.

Holloway Road, London

Kitchen Odour Assessment undertaken in line with the EMAQ+ and DEFRA guidance in support of a new restaurant on Holloway Road, London. Site-specific odour abatement options were identified in order to conform with best practice guidance. Based on the inclusion of the specified mitigation, odour effects associated with the development were not considered a constraint to planning consent.

Wyebridge Motors, Hereford

Ambient Air Quality Monitoring in support of a residential development. The Local Authority raised concerns regarding the exposure of future residents to poor air quality as a result of pollution from the adjacent A49. Due to the irregular topography of the area, a scheme of diffusion tube monitoring was undertaken to determine baseline NO_2 concentrations at the site. Results indicated that concentrations were below the Air Quality Objective at the building façade and as such, the risk for exposure of future residents to poor air quality was not considered significant.