
Air Quality Impact Assessment

Proposed Residential Development – Liverpool Road, Prescot

Client: Group D Developments Limited

Reference: 21.071.1.R3

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Prepared by	Olly Hanlon	Olly Hanlon	Olly Hanlon	
Position	Senior Air Quality Consultant	Senior Air Quality Consultant	Senior Air Quality Consultant	
Reviewed by	John Goodwin	John Goodwin	John Goodwin	
Position	Director	Director	Director	
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Professional Consult Limited

hello@professionalconsult.co.uk

07704 672683

www.professionalconsult.co.uk

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EXECUTIVE SUMMARY

This Air Quality Impact Assessment has been undertaken in support of a planning application for a proposed residential development on land off Liverpool Road, Prescott.

The proposals have the potential to cause exposure of future residents to any existing air quality issues at the Site, as well as adverse impacts at sensitive locations during the construction and operational phases. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions, consider location suitability for the proposed end-use and assess potential effects as a result of the scheme.

Potential construction phase air quality impacts from fugitive dust emissions were assessed as a result of demolition, 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.

During the operational phase of the development there is the potential for air quality impacts as a result of traffic exhaust emissions associated with vehicles travelling to and from the Site. These were assessed using standard screening criteria. Due to the low number of vehicle trips predicted from the proposals, road traffic impacts were not predicted to be significant.

The potential for the exposure of future residents to elevated pollution levels was assessed based on the results of a desk-top study. This indicated that pollutant concentrations are likely to be below the relevant criteria at the development location. As such, the Site is considered suitable for the proposed use from an air quality perspective.

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

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1 INTRODUCTION

1.1 Appointment

- 1.1.1 Professional Consult Limited, working with our approved associate consultant Redmore Environmental Ltd, was instructed by Group D Developments Limited ('the Applicant'), to prepare an Air Quality Impact Assessment ('the Assessment') for a proposed residential development ('the Development') on land off Liverpool Road, Prescott, to be referred to hereafter as 'the Site'.

1.2 Background

- 1.2.1 The proposals have the potential to cause exposure of future residents to any existing air quality issues at the Site, as well as adverse impacts at sensitive locations during the construction and operational phases. As such, an Air Quality Impact Assessment was undertaken in order to determine baseline conditions, consider location suitability for the proposed end-use and assess potential effects as a result of the scheme.

1.3 Site Location and Context

- 1.3.1 The Site is located on land off Liverpool Road, Prescott, at approximate National Grid Reference (NGR): 345819, 392745. Reference should be made to Figure 1 for a map of the Site and surrounding area.
- 1.3.2 The proposals comprise demolition of the existing buildings and subsequent construction of 45 residential dwellings alongside associated landscaping and infrastructure. Reference should be made to Figure 2 for a layout of the Site.
- 1.3.3 The development has the potential to cause exposure of future residents to elevated pollutant concentrations, as well as adverse 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, consider site suitability for the proposed end-use and assess potential effects as a result of the proposals. This is detailed in the following report.
- 1.3.4 All acronyms used within this report are defined in the Glossary presented in Appendix 1.

1.4 Confidentiality

- 1.4.1 Professional Consult has prepared this report solely for the use of the Client. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Professional Consult; a charge may be levied against such approval.

2 POLICY & GUIDANCE

2.1 Legislation

2.1.1 The Air Quality Standards Regulations (2010) and subsequent amendments include Air Quality Limit Values (AQLVs) for the following pollutants:

- ☞ Nitrogen dioxide (NO₂);
- ☞ Sulphur dioxide;
- ☞ Lead;
- ☞ Particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀);
- ☞ 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. It should be noted that the AQLV for PM_{2.5} stated in the Air Quality Standards Regulations (2010) was amended in the Environment (Miscellaneous Amendments) (EU Exit) Regulations (2020).

2.1.3 The Air Quality Strategy (AQS) was produced by Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007¹. 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 Table 1 presents the AQOs and AQLVs for pollutants considered within this assessment.

Table 1. Air Quality Objectives/Air Quality Limit Values

Pollutant	Air Quality Objective/Air Quality Limit Value	
	Concentration (µg/m ³)	Averaging Period
NO ₂	40	Annual mean
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
PM ₁₀	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum
PM _{2.5}	20	Annual mean

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

2.1.5 The Environment Act (2021) was published on 9th November 2021 and makes provision for the setting of lower PM_{2.5} targets. The final criteria will be included in legislation to be put before parliament by 31st October 2022. Prior to this time, the AQLV outlined in Table 1 remains the adopted air quality standard within the UK.

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

Table 2. Examples of Where the Air Quality Objectives Apply

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
Annual mean	All locations where members of the public might be regularly exposed Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
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 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 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

- 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 Framework³ (NPPF) was published in July 2021 and sets out the Government's planning policies for England and how these are expected to 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 protect and enhance our natural, built and historic environment; including making effective use of land, improving 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 Guidance⁴ (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:

³ NPPF, Ministry of Housing, Communities and Local Government, 2021.

⁴ <https://www.gov.uk/guidance/air-quality--3>.

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 Knowsley Local Plan: Core Strategy⁵ was adopted Knowsley Metropolitan Borough Council (KMBC) on 6th January 2016. A review of the document indicated the following policy in relation to air quality that is relevant to this assessment:

"Policy CS2

Development Principles

- 1) *New Development in Knowsley and the preparation of subsequent stages of the Local Plan will be expected to support the following development principles:*

Principal 4: Recognise environmental limits, protect and enhance environmental assets, enhance local character and promote air quality of place by:

[...]

e) Mitigating potential negative impacts of traffic growth and road traffic on highway safety, air quality, noise and health;

[...]

j) Minimising negative impact upon flood risk air quality, water quality, land quality, soil quality, and noise or vibration levels and ensuring any negative impacts are appropriately mitigated."

2.6.2 The Knowsley Replacement Unitary Development Plan (UDP)⁶ was adopted in June 2006. Under the transitional arrangements for moving to the Local Plan system, 39 UDP Policies have been saved, these include the following in relation to air quality:

"Policy Env1: Control of Pollution in New Development

Development will not be permitted which is likely to cause significant harm to amenity as a result of impact on any of the following:

Air quality, [...]."

⁵ Knowsley Local Plan: Core Strategy, KMBC, 2016.

⁶ Knowsley Replacement UDP, KMBC, 2006.

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

3 METHODOLOGY

3.1 Introduction

3.1.1 The proposed development has the potential to cause exposure of future residents to any existing air quality issues at the Site, as well as adverse impacts during the construction and operational phases. These issues have been assessed in accordance with the following methodology.

3.2 Construction Phase Assessment

3.2.1 There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction V1.1'⁷.

3.2.2 Activities on the Site have been divided into four types to reflect their different potential impacts. These are:

- ② Demolition;
- ② Earthworks;
- ② Construction; and,
- ② 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:

- ② Annoyance due to dust soiling;
- ② Harm to ecological receptors;
- ② The risk of health effects due to a significant increase in exposure to PM₁₀.

3.2.4 The assessment steps are detailed below.

Step 1

3.2.5 Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the boundary or 50m from the construction vehicle route up to 500m from the Site entrance, then the assessment proceeds to Step 2. Additionally, should ecological receptors be identified within 50m of the Site or the construction vehicle route up to 500m from the Site entrance, then the assessment also proceeds to Step 2.

3.2.6 Should sensitive receptors not be present within the relevant distances then **negligible** impacts would be expected and further assessment is not necessary.

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

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:

- ② The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large (Step 2A);
- ② 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	Demolition	- Total volume of building to be demolished greater than 50,000m³ - Potentially dusty material (e.g. concrete) - On-site crushing and screening - Demolition activities more than 20m above ground level
	Earthworks	- Total site area greater than 10,000m² - Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) - More than 10 heavy earth moving vehicles active at any one time - Formation of bunds greater than 8m in height - More than 100,000 tonnes of material moved
	Construction	- Total building volume greater than 100,000m³ - On site concrete batching - Sandblasting
	Trackout	- More than 50 Heavy Duty Vehicle (HDV) trips per day - Potentially dusty surface material (e.g. high clay content) - Unpaved road length greater than 100m
Medium	Demolition	- Total volume of building to be demolished between 20,000m³ and 50,000m³ - Potentially dust construction material - Demolition activities more than 10m and 20m above ground level
	Earthworks	- Total site area 2,500m² to 10,000m² - Moderately dusty soil type (e.g. silt) 5 to 10 heavy earth moving vehicles active at any one time - Formation of bunds 4m to 8m in height - Total material moved 20,000 tonnes to 100,000 tonnes
	Construction	- Total building volume 25,000m³ to 100,000m³ - Potentially dusty construction material (e.g. concrete) - On site concrete batching
	Trackout	10 to 50 HDV trips per day - Moderately dusty surface material (e.g. high clay content) - Unpaved road length 50m to 100m
Low	Demolition	- Total volume of building to be demolished less than 20,000m³ - Construction material with low potential for dust release (e.g. metal cladding or timber) - Demolition activities less than 10m above ground and during wetter months
	Earthworks	- Total site area less than 2,500m² - Soil type with large grain size (e.g. sand) - Less than 5 heavy earth moving vehicles active at any one time - Formation of bunds less than 4m in height - Total material moved less than 20,000 tonnes

Magnitude	Activity	Criteria
		Earthworks during wetter months
	Construction	- Total building volume less than 25,000m³ - Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	- Less than 10 HDV trips per day - Surface material with low potential for dust release - Unpaved road length less than 50m

3.2.10 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 PM₁₀ e.g. residential properties, hospitals, schools and residential care homes	Internationally or nationally designated site e.g. Special Area of Conservation
Medium	- Users expect to enjoy a reasonable level of amenity - Aesthetic 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, shopping streets, playing fields, 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:

- ② Any history of dust generating activities in the area;
- ② The likelihood of concurrent dust generating activity on nearby sites;
- ② Any pre-existing screening between the source and receptors;
- ② Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which works will take place;
- ② Any conclusions drawn from local topography;

- ② Duration of the potential impact, as a receptor may become more sensitive over time; and,
- ② 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/m ³	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m ³	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m ³	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	Less than 24µg/m ³	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low

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

Table 8. Construction Dust - Dust Risk Category from Demolition Activities

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

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

3.2.18 Table 9 outlines the risk category from earthworks and construction activities.

Table 9. 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

3.2.19 Table 10 outlines the risk category from trackout activities.

Table 10. 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

3.2.20 Step 3 requires the identification of site specific mitigation measures within the IAQM guidance⁸ to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with **negligible** risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

Step 4

3.2.21 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**.

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

3.3 Operational Phase Assessment

Potential Future Exposure

3.3.1 The proposals have the potential to expose future residents to elevated pollutant levels due to the proximity of the Site to the A58 and associated road traffic emissions. Existing air quality conditions at the site were therefore assessed through consideration of the following factors:

- ② AQMA designations; and,
- ② Local monitoring results.

3.3.2 The findings were subsequently used to determine the potential for exceedences of the relevant AQOs at the development location. Should the assessment indicate significant uncertainty over air quality conditions at the Site then further quantitative methods, such as detailed dispersion modelling, could be utilised to refine predictions.

Potential Development Impacts

3.3.3 The proposals have the potential to impact on existing air quality as a result of road traffic exhaust emissions associated with vehicles travelling to and from the Site during the operational phase. A screening assessment was therefore undertaken using the criteria contained within the IAQM 'Land-Use Planning & Development Control: Planning for Air Quality'⁹ guidance to determine the potential for trips generated by the scheme to affect local air quality.

3.3.4 The following criteria are provided to help establish when an assessment of potential impacts on the local area is likely to be considered necessary:

- ② A change of Light Duty Vehicle (LDV) flows of more than 100 Annual Average Daily Traffic (AADT) within or adjacent to an AQMA or more than 500 AADT elsewhere;
- ② A change of HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere;
- ② Realignment of roads where the change is 5m or more and the road is within an AQMA; or,
- ② Introduction of a new junction or removal of an existing junction near to relevant receptors.

3.3.5 Should these criteria not be met, then the IAQM guidance¹⁰ considers air quality impacts associated with a scheme to be **not significant** and no further assessment is required.

3.3.6 Should screening of the relevant data indicate that any of the above criteria are met, then potential impacts at sensitive receptor locations can be assessed by calculating the change in pollutant concentrations as a result of the proposed development. The significance of predicted impacts can then be determined in accordance with the methodology outlined in the IAQM guidance¹¹.

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

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

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

4 BASELINE

4.1 Introduction

4.1.1 Existing air quality conditions in the vicinity of the 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), KMBC 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 declared within the borough.

4.3 Air Quality Monitoring

4.3.1 Monitoring of pollutant concentrations is undertaken by KMBC throughout their area of jurisdiction. Recent NO₂ results recorded in the vicinity of the development are shown in Table 11.

Table 11. Monitoring Results

Monitoring Site		Monitored NO ₂ Concentration (µg/m ³)		
		2018	2019	2020
P1a, P1b	LC227 Near Liverpool Road	-	26.8	22.6
P2a, P2b	LC003 Outside 50 Derby Street	-	26.9	22.4

4.3.2 As shown in Table 11, annual mean NO₂ concentrations were below the AQO at both monitoring locations in recent years. Reference should be made to Figure 3 for a map of the survey positions.

4.3.3 It should be noted that pollutant concentrations recorded during 2020 are lower than during 2019 due to a reduction in traffic and associated emissions caused by the COVID-19 pandemic. The results should therefore be viewed with caution.

4.3.4 KMBC do not undertake PM₁₀ or PM_{2.5} 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 Site is located in grid square NGR: 345500, 392500. Data for this location was downloaded from the DEFRA website¹² for the purpose of the assessment and is summarised in Table 12.

¹² <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>.

Table 12. Background Pollutant Concentration Predictions

Pollutant	Predicted 2022 Background Pollutant Concentration ($\mu\text{g}/\text{m}^3$)
NO ₂	17.35
PM ₁₀	13.81
PM _{2.5}	8.88

4.4.2 As shown in Table 12, predicted background NO₂, PM₁₀ and PM_{2.5} concentrations are below the relevant AQOs and AQLV at the Site.

4.5 Sensitive Receptors

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

Construction Phase Sensitive Receptors

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

Table 13. Demolition, Earthworks and Construction Dust Sensitive Receptors

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

4.5.3 Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 500m of the Site access. These are summarised in Table 14.

Table 14. Trackout Dust Sensitive Receptors

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

4.5.4 Construction of 227 residential dwellings (planning ref: 19/00684/FUL) is currently being undertaken adjacent to the northern and eastern Site boundaries. It is considered likely that this will have neared completion upon commencement of the construction phase of the proposals. As such, these residential units have been included as dust sensitive receptor locations throughout the assessment.

4.5.5 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.

4.5.6 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 baseline study indicated that construction of 227 residential dwellings (planning ref: 19/00684/FUL) is currently being undertaken adjacent to the northern and eastern Site boundaries. As such, it is likely there has been a history of dust generating activities in the area
The likelihood of concurrent dust generating activity on nearby sites	A review of the planning portal and satellite imagery indicated that construction is currently underway for a number of developments within 700m of the Site. It is therefore possible that these may result in concurrent dust generation should the construction phases overlap with that of the proposals
Pre-existing screening between the source and the receptors	Trees are located along the Site boundary. 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 4, the predominant wind bearing at the Site is from the north-west, with notable 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 possible it could extend over one year. The sensitivity of the surrounding area is unlikely to change during this period
Any known specific receptor sensitivities which go beyond the classifications given in the document	No specific receptor sensitivities identified during the baseline assessment

4.5.7 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.

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

Table 16. Sensitivity of the Surrounding Area to Potential Dust Impacts

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

5 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 demolition, 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

Demolition

- 5.2.4 Demolition will be undertaken at the start of the construction phase and will primarily involve clearance of existing buildings on Site. It is estimated that the building volume to be demolished is less than 20,000m³. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from demolition is therefore **small**.
- 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 **medium** risk site for dust soiling as a result of demolition activities.

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 **negligible** risk site for human health impacts as a result of demolition activities.

Earthworks

- 5.2.6 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. The Site covers an area greater than 10,000m². In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from earthworks is therefore **large**.
- 5.2.7 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 9, the development is considered to be a **high** risk site for dust soiling as a result of earthworks.
- 5.2.8 Table 16 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 9, the development is considered to be a **low** risk site for human health impacts as a result of earthworks.

Construction

- 5.2.9 The total proposed building volume to be constructed was estimated to be less than 25,000m². In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from construction is therefore **small**.
- 5.2.10 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 **low** risk site for dust soiling as a result of construction activities.
- 5.2.11 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 **negligible** risk site for human health impacts as a result of construction activities.

Trackout

- 5.2.12 Based on the Site area, it is anticipated that the unpaved road length will be between 50m and 100m. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from trackout is therefore **medium**.
- 5.2.13 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 10, the development is considered to be a **medium** risk site for dust soiling as a result of trackout activities.
- 5.2.14 Table 16 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 10, the development is considered to be a **low** risk site for human health impacts as a result of trackout activities.

Summary of the Risk of Dust Effects

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

Table 17. Summary of Potential Unmitigated Dust Risks

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

- 5.2.16 As indicated in Table 18, the potential risk of dust soiling is **high** from earthworks, **medium** from demolition and trackout and **low** from construction. The potential risk of human health impacts is **low** from earthworks and trackout and **negligible** from demolition and construction.
- 5.2.17 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

5.2.18 The IAQM guidance¹³ provides potential mitigation measures to reduce impacts as a result of fugitive dust emissions during the construction phase. These have been adapted for the Site as summarised in Table 18. These may be reviewed prior to the commencement of construction works and incorporated into a Construction Environmental Management Plan (CEMP) or similar if required by the LA.

Table 18. Fugitive Dust Emission Mitigation Measures

Issue	Control Measure
Communications	- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager - Display the head or regional office contact information - Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the LA
Site management	- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken - Make the complaints log available to the LA upon request - Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book
Monitoring	- Undertake daily on-site and off-site inspection to monitor dust, record inspection results, and make the log available to the LA upon request - Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the LA upon request - Increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions
Site preparation	- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible - Fully enclose site or specific operations where there is a high potential for dust production and they are active for an extensive period - Avoid site runoff of water or mud - Keep site fencing, barriers and scaffolding clean using wet methods - Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used - Cover, seed or fence stockpiles to prevent wind whipping
Operating vehicle/machinery and sustainable travel	- Ensure all vehicles switch off engines when stationary - no idling vehicles - Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable
Operations	- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques - Ensure an adequate water supply on the site for effective dust suppression, using non-potable water where possible and appropriate - Use enclosed chutes and conveyors and covered skips - Minimise drop heights and use fine water sprays wherever appropriate - Ensure equipment is available to clean any dry spillages, and clean up spillages as soon as reasonably practicable using wet cleaning methods
Waste management	Avoid bonfires or burning of waste materials
Demolition	- Soft strip inside buildings before demolition - Ensure effective water suppression is used during demolition operations - Avoid explosive blasting, using appropriate manual or mechanical alternatives - Bag and remove any biological debris or damp down such material before demolition
Earthworks	- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable - Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or over with topsoil, as soon as practicable - Only remove the cover in small areas during work and not all at once

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

Issue	Control Measure
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
Trackout	- Use water-assisted dust sweeper on access and local roads, if required - Avoid dry sweeping of large areas - Ensure vehicles entering and leaving site are covered to prevent escape of materials - Implement a wheel washing system, if required

Step 4

5.2.19 Assuming the relevant mitigation measures outlined in Table 18 are implemented, the residual impact from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance¹⁴.

5.3 Operational Phase Assessment

Potential Future Exposure

5.3.1 The proposed development has the potential to introduce new receptors into an area of poor air quality. Existing conditions at the Site are therefore considered in the following Section.

5.3.2 The Site is not located within an AQMA. As the development is located within a residential area it would be anticipated that there would be a need for an AQMA to cover nearby housing if exceedences of the AQOs has been recorded or predicted locally. As this is not the case, it is considered that exceedences of the AQOs are unlikely to occur at the proposals.

5.3.3 As outlined in Table 11, KMBC undertook monitoring of NO₂ concentrations at two locations within the vicinity of the Site during 2019. Review of the positions indicated that the P1a/P1b - Liverpool Road monitor is situated approximately 50m to the south of the Site, adjacent to Liverpool Road and the A57 roundabout, similarly to the proposals. As such, pollution levels are considered to be comparable at these two locations. The recorded annual mean NO₂ concentration at the P1a/1b sampler in 2019 was 26.8µg/m³. Similar levels would be expected at the Site. As such, exceedences of the relevant AQO are not predicted at the development.

5.3.4 Based on the above, exposure of future residents to exceedences of the relevant AQOs is not considered likely. As such, the Site is considered suitable for the proposed use from an air quality perspective.

Potential Development Impacts

5.3.5 Any vehicle movements associated with the Site will generate exhaust emissions on the local and regional road networks. Information provided by Curtins, the Transport Consultants for the project, indicated that the scheme is predicted to generate 152 daily vehicle movements.

5.3.6 Based on the above information, the proposals are not predicted to result in an increase in LDV flows of more than 500 AADT and there will not be more than 100 HDV movements per day. In addition, the proposals do not include significant highway realignment or the introduction of a junction. As such, potential air quality impacts

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

associated with operational phase road vehicle exhaust emissions are predicted to be **not significant**, in accordance with the IAQM screening criteria¹⁵ shown in Section 3.3.

¹⁵ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

6 CONCLUSION

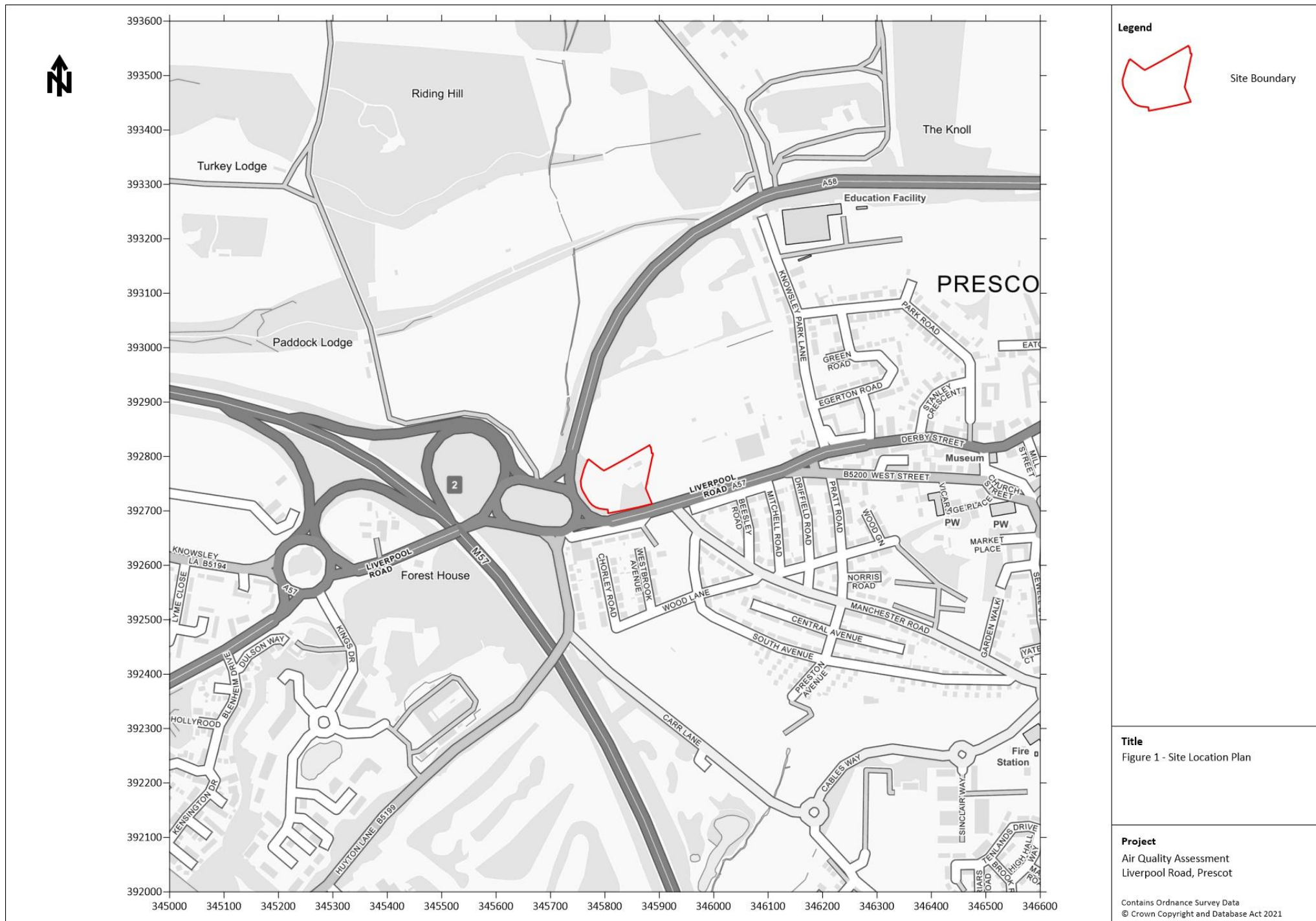
- 6.1.1 Professional Consult Limited, working with our approved associate consultant Redmore Environmental Ltd, was instructed by Group D Developments Limited to prepare an Air Quality Impact Assessment for a proposed residential development on land off Liverpool Road, Prescot.
- 6.1.2 The proposals have the potential to cause exposure of future residents to any existing air quality issues at the Site, as well as adverse impacts at sensitive locations during the construction and operational phases. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions, consider location suitability for the proposed end-use 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 demolition, earthworks, construction and trackout activities was predicted to be **not significant**.
- 6.1.4 The potential for exposure of future residents to exceedences of the AQOs was assessed based on the AQMA designation and local monitoring results. This indicated that concentrations of NO₂ and PM₁₀ are likely to be below the relevant AQOs at the development location. As such, the Site is considered suitable for the proposed end use from an air quality perspective.
- 6.1.5 During the operational phase of the development there is the potential for air quality impacts as a result of traffic exhaust emissions associated with vehicles travelling to and from the Site. These were assessed against the screening criteria provided within the IAQM¹⁶ guidance. Due to the low number of vehicle trips predicted from the proposals, road traffic exhaust impacts were predicted to be **not significant**.
- 6.1.6 Based on the assessment results, air quality factors are not considered a constraint to the development

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

APPENDIX 1: GLOSSARY

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
CEMP	Construction Environmental Management Plan
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMP	Dust Management Plan
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
KMBC	Knowsley Metropolitan Borough Council
LA	Local Authority
LAQM	Local Air Quality Management
LDV	Light Duty Vehicle
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
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm
UDP	Unitary Development Plan

APPENDIX 2: FIGURES





group:d

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NOTE: DO NOT SCALE FROM THIS DRAWING

REV	DESCRIPTION	DATE	DRAWN
1	FOR PLAN - 12/21	24/07/21	PT
2	FOR LOCAL PLAN	19/07/21	PT
3	FOR LOCAL PLAN	19/07/21	PT
4	FOR LOCAL PLAN	19/07/21	PT
5	FOR LOCAL PLAN	19/07/21	PT

APT-BLOCK-A:
18no. Apartments
8no. 2 Bed / 10no. 1 bed
2 Storey

APT-BLOCK-B:
6no. Apartments
1 Bed
3 Storey

HT1:
3 Bed
2.5 Storey

Semi-detached
and mews variants

HT2:
2 Bed
2 Storey

Semi-detached
and mews variants

TOTAL 45 No. UNITS
TOTAL 71 No. PARKING SPACES

- Local Authority Access/Maintenance - 2.5m
- Brook - 8m offset zone (top of bank)
- Pump station - 15m offset zone
- Refuse - 3 bins per house
- Electric car charging point. One per house and 50% for apartment parking
- Close boarded timber fence - 1.8m
- Post and rail fence - 1.1m
- Covered secure cycle storage (2no. bikes per house & 1min. per apt)

NOTES

Plot numbers denoted in black
Associated parking denoted in orange
Landscaping indicative - see landscape scheme
To be read in conjunction other supporting drawings, reports and information submitted as part of this planning application



DYE HOUSE, PRESCOT

PROPOSED SITE PLAN - ROOF

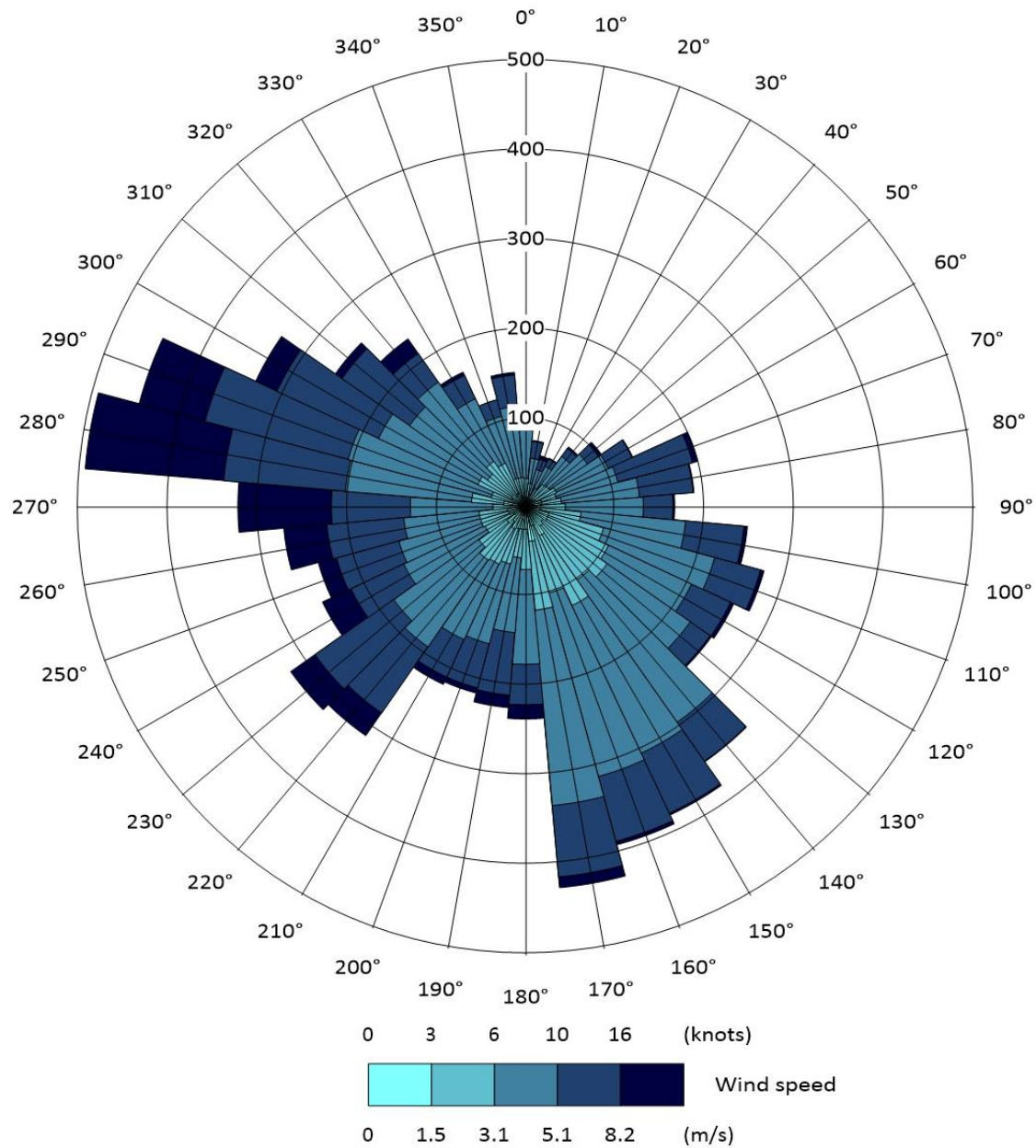
Group D Developments Ltd
4 St Paul's Sq
Liverpool
L3 9SU
T: 0151 542 3027

DWG: 0002020-GDA-22-47-DR-A-2220-P12
DATE: 27.07.22
SCALE: 1:500 @ A3 DRAWN: PT



- Tree Removed
- Tree Retained
- Tree special measures (see supporting ARB information)





Legend

Title
Figure 4 - Wind Rose of 2019 Liverpool
Airport Meteorological Data

Project
Air Quality Assessment
Liverpool Road, Prescot