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Gleave Partnership & Network Space

VAN STORAGE PARK

Air Quality Assessment



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Air Quality Assessment

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EXECUTIVE SUMMARY

WSP UK Ltd was commissioned by Gleave Partnership and Network Space to undertake a qualitative air quality assessment to inform the planning application for a proposed van storage park at the Knowsley Industrial Park, Knowsley.

This report presents the findings of the assessment, which addresses the potential air quality impacts during both the construction and operational phases of the Proposed Development. For both phases, the type, source and significance of potential impacts were considered, and the measures that should be employed to minimise these proposed.

The assessment of construction phase impacts associated with fugitive dust and particulate matter (PM₁₀ and PM_{2.5}) emissions has been undertaken with reference to the relevant Institute of Air Quality Management (IAQM) guidance. This identified that there is a **medium risk** of dust soiling impacts and a **low risk** of health impacts relating to increases in particulate matter concentrations due to construction activities. Through good site practice and the implementation of suitable mitigation measures, the effect of dust and particulate matter releases on local air quality is expected to be **not significant**.

A qualitative assessment of the potential air quality impacts associated with traffic generated by the operational phase of the Proposed Development has been completed with reference to published methodologies and technical guidance provided by the Department for Environment, Food and Rural Affairs and IAQM.

For the operational phase, vehicle emissions associated with the redistribution of traffic flows caused by the Proposed Development will not result in exceedances of the relevant long and short term air quality objectives. As such, the potential effect of road vehicle exhaust emissions on local air quality will be **not significant**.

The Site is considered to be suitable for its proposed land use within the context of local air quality. Furthermore, provision for electric vehicle charging points to be installed in the future is included in the Proposed Development. The uptake of electric vehicles would further reduce emissions associated with the operation of the Proposed Development.

Based on the assessment results, the development proposals comply with national and local policy for air quality and there are unlikely to be air quality constraints relating to the Proposed Development during both the construction and operational phases.

1. INTRODUCTION

- 1.1.1. WSP UK Ltd (WSP) was commissioned by Gleave Partnership and Network Space to provide air quality services to inform a joint Planning Application for the development of site for the storage of operational vehicles, including resurfacing, ancillary parking, and ancillary infrastructure at Faraday Road, Knowsley. The Site is 3.5 hectares in size and located at central OS Grid Reference: SJ 42904 97169 (hereby referred to as 'the Proposed Development').
- 1.1.2. The Site lies within the administrative boundary of Knowsley Metropolitan Borough Council (KMBC). It is situated approximately 1.2 km to the north of the town of Knowsley and is located within the Knowsley Industrial Park. It is bounded on all sides by other commercial/industrial land used within the industrial park. A site location plan is shown in **Figure 1**.
- 1.1.3. This report presents the findings of a qualitative assessment of the potential air quality impacts of the Proposed Development during both the construction and operational phases. For both phases, the type, source and significance of potential impacts are considered, and the measures that should be employed to minimise these described.
- 1.1.4. This report is supported by two appendices:
 - Appendix A – Glossary of Terms; and
 - Appendix B – IAQM Construction Assessment Methodology.

2. LEGISLATION, POLICY & GUIDANCE

2.1. EUROPEAN & NATIONAL LEGISLATION

EUROPEAN AMBIENT AIR QUALITY DIRECTIVE 2008

- 2.1.1. The 2008 Ambient Air Quality Directive (2008/50/EC)¹ is the primary driver for managing and improving air quality for each member state of the European Union (EU). The Directive sets legally binding limit values for concentrations in ambient (outdoor) air of pollutants that can impact public health, including nitrogen dioxide (NO₂) and fine particulates (PM₁₀, PM_{2.5}).
- 2.1.2. EU limit values are set for individual pollutants and comprise a concentration value, an averaging time over which it is to be measured, the number of allowed exceedances per year (if any), and a date by which it must be achieved. Some pollutants (e.g. PM₁₀) have more than one limit value covering different averaging times.
- 2.1.3. Member states are required to report on the status of air quality and to assess compliance with the EU Directive on ambient air quality (2008/50/EC)² on an annual basis. Defra carries out this task on behalf of the UK government and published the latest submission to the EU Commission in September 2019. Compliance assessment modelling is carried out using a series of national models known collectively as the Pollution Climate Mapping (PCM) model.
- 2.1.4. Since the UK's departure from the EU, the European Union (Withdrawal) Act³ ensures that the whole body of existing EU environmental law continues to have effect in UK law, since the UK's withdrawal from the EU. For PM_{2.5}, the limit value was amended (tightened) in 2020 by the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020.

AIR QUALITY REGULATIONS

- 2.1.5. Many of the objectives in the AQS have been made statutory in England with the Air Quality (England) Regulations 2000⁴ and the Air Quality (England) (Amendment) Regulations 2002⁵ for Local Air Quality Management (LAQM).
- 2.1.6. These Regulations require that likely exceedances of the AQS objectives are assessed in relation to:
- 2.1.7. *"...the quality of air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present..."*

¹ European Parliament (2008) Council Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe.

² The European Parliament and the Council of the European Union (2008) Directive 2008/50/EC of the European Parliament and of the Council.

³ UK Public General Acts (2018) European Union (Withdrawal) Act.

⁴ Her Majesty's Stationary Office (HMSO) (2000) The Air Quality (England) Regulations 2000. 2000 SI 2000/928.

⁵ HMSO (2002) The Air Quality (England) (Amendment) Regulations 2002. 2002 SI 2002/3043.

- 2.1.8. The Air Quality Standards (Amendment) Regulations 2016⁶ amends the Air Quality Standards Regulations 2010 that transpose the EU Directive on ambient air quality (2008/50/EC)² into law in England.
- 2.1.9. The limit values for NO₂ and PM₁₀ are the same concentration levels as the relevant AQS objectives and the objective for PM_{2.5} is a concentration of 20 µg/m³.

2.2. UK AIR QUALITY STRATEGY

- 2.2.1. Under the Environment Act 1995⁷, the UK Government and the devolved administrations are required to prepare and publish a national Air Quality Strategy. The most recent version of the Strategy was published in 2007⁸ and establishes the UK's air quality standards and objectives, in addition to providing guidance, where needed, on air quality action planning at national, regional and local scales.
- 2.2.2. Air quality standards are concentrations recorded over a given averaging period, which are considered to be acceptable in terms of what is scientifically known about the effects of each pollutant on health and the environment. An objective is the target date on which exceedances of a standard must not exceed a prescribed number.

THE ENVIRONMENT ACT 2021

- 2.2.3. The Environment Act 2021⁹ was brought in to strengthen the Environment Act 1995 on 9th November 2021, after the departure of the UK from the European Union. The act makes provision for new air quality targets and outlines policies that will allow local authorities to enact measures that will assist with ensuring that targets set out in The Air Quality Standards Regulations are met within their administrative boundaries.
- 2.2.4. The Act provides an amendment to Section 80 of the National Air Quality Strategy to state that a review of the strategy shall be required within a 12-month period and thereafter, within each five-year period. A statement is also required to be made yearly by the Secretary of State outlining the progress in meeting the air quality objectives defined in the measures and the steps taken to achieve compliance.
- 2.2.5. Furthermore, where air quality standards are not likely to be met, the Environment Act also outlines the local authorities' responsibilities with regards to designating Air Quality Management Areas (AQMA's) and drafting Air Quality Action Plans to secure improvements in air quality and show how it intends to work towards achieving air quality objectives in the future.

CLEAN AIR STRATEGY

- 2.2.6. The Clean Air Strategy¹⁰ outlines the Government's plan to tackle all sources of air pollution. The strategy sets out the comprehensive action that is required from across all parts of Government and

⁶ HMSO (2016) The Air Quality Standards (Amendment) Regulations 2016. 2016 SI 2016/1184.

⁷ UK Public General Acts (1995) Environment Act, Part IV Air Quality

⁸ Department for Environment, Food and Rural Affairs (Defra) and the Devolved Administrations (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2)

⁹ UK Public General Acts (2021) Environment Act. Accessed Via Environment Act 2021 (legislation.gov.uk).

¹⁰ Defra (2019) Clean Air Strategy 2019 [online] <https://www.gov.uk/government/publications/clean-air-strategy-2019>

society. New legislation will create a stronger and more coherent framework for action to tackle air pollution. This will be underpinned by new England-wide powers to control major sources of air pollution, in line with the risk they pose to public health and the environment, plus new local powers to take action in areas with an existing air pollution problem.

2.3. LOCAL AIR QUALITY MANAGEMENT

- 2.3.1. Local authorities in England are required to review air quality within their jurisdiction, under Part IV of the Environment Act 1995⁷, and designate AQMAs where air quality standards are not being met and/or where air quality improvement is needed. Local authorities are then required to work towards achieving the national Air Quality Strategy objectives and standards as prescribed in the Air Quality Standards Regulations 2016⁶.
- 2.3.2. An air quality action plan must be established by the local authority outlining the measures to improve air quality within the designated AQMA. The purpose of these action plans is to contribute to the achievement of air quality limit values at the local level. The Site is not located within an AQMA.

2.4. RELEVANT UK AIR QUALITY OBJECTIVES & EU LIMITS

- 2.4.1. The national air quality objectives and EU limit values that the UK must comply with, specifically for traffic-related pollutants NO₂, PM₁₀, and PM_{2.5}, are presented in **Table 1**.
- 2.4.2. The respective UK objective and EU limit value concentration standards and averaging periods are numerically identical for each pollutant, based on air quality standards set for the protection of human health.

Table 1 - National (England) Air Quality Objectives/EU Limit Values

Pollutant	Applies to	Objective	Measured as	Date to be achieved by and maintained thereafter	European Obligations	Date to be achieved by and maintained thereafter
Nitrogen dioxide (NO ₂)	UK	200 µg/m ³ not to be exceeded more than 18 times a year	hourly mean	31.12.2005	200 µg/m ³ not to be exceeded more than 18 times a year	01.01.2010
	UK	40 µg/m ³	annual mean	31.12.2005	40 µg/m ³	01.01.2010
Particulate Matter (PM ₁₀) (gravimetric) ^A	UK (except Scotland)	40 µg/m ³	annual mean	31.12.2004	40 µg/m ³	01.01.2005
	UK (except Scotland)	50 µg/m ³ not to be exceeded more than 35 times a year	daily mean	31.12.2004	50 µg/m ³ not to be exceeded more than 35 times a year	01.01.2005
Particulate Matter (PM _{2.5})	UK (except Scotland)	20 µg/m ³	annual mean	2020	Target value 20 µg/m ³	2010

- 2.4.3. The Defra Local Air Quality Management Technical Guidance (LAQM.TG22)¹⁶ advises that exceedances of the 1-hour mean NO₂ objective are unlikely to occur where annual mean concentrations are below 60 µg/m³, and it provides guidance on the approach that should be taken if either measured or predicted annual mean NO₂ concentrations are 60 µg/m³ or above.
- 2.4.4. The Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) joint publication¹⁷ and Defra guidance¹⁶ provides an approach to assessing the relationship between annual mean and 24-hour mean concentrations of PM₁₀. Potential exceedances of the 24-hour objective are more likely where the annual mean concentration is over 32 µg/m³.

ENVIRONMENTAL PROTECTION ACT 1990 – CONTROL OF DUST AND PARTICULATES ASSOCIATED WITH CONSTRUCTION

- 2.4.5. Section 79 of the Environmental Protection Act 1990¹¹ gives the following definitions of statutory nuisance relevant to dust and particles:

“Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance”; and

“Any accumulation or deposit which is prejudicial to health or a nuisance”
- 2.4.6. Following this, Section 80 says that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.
- 2.4.7. There are no statutory limit values for dust deposition above which ‘nuisance’ is deemed to exist. Nuisance is a subjective concept and its perception is highly dependent upon the existing conditions and the change which has occurred.

2.5. RELEVANT PLANNING POLICY CONTEXT

NATIONAL PLANNING POLICY FRAMEWORK

- 2.5.1. The Government’s overall planning policies for England are described in the National Planning Policy Framework¹². The core underpinning principle of the Framework is the presumption in favour of sustainable development, defined as:

“... meeting the needs of the present without compromising the ability of future generations to meet their own needs.”
- 2.5.2. One of the three overarching Objectives of the NPPF is that planning should “to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.”
- 2.5.3. In relation to air quality, the following paragraphs in the document are relevant:

¹¹ Environmental Protection Act 1990. Part III Statutory Nuisances: England and Wales

¹² Ministry of Housing, Communities and Local Government (2019). National Planning Policy Framework

- Paragraph 54, which states *“Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition.”*
- Paragraph 103, which states *“Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health.”*
- Paragraph 170, which states *“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, taking into account relevant information such as river basin management plans.”*
- Paragraph 180, which states *“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.”*
- Paragraph 181, which states *“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.”*
- Paragraph 183, which states *“The focus of planning policies and decisions should be on whether Proposed Development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.”*

2.6. LOCAL PLANNING POLICY

KNOWSLEY LOCAL PLAN CORE STRATEGY

- 2.6.1. The KMBC Core Strategy¹³ is the council's primary guidance which directs planning permission in the borough. The Strategy does not contain any air quality specific policies; however, air quality is mentioned in more general environmental policies. Specifically, 'Policy CS2 Development Principles'

¹³ Knowsley Metropolitan Borough Council Local Plan Core Strategy, January 2016

states that the potential negative impacts of traffic growth and road traffic on air quality should be minimised and appropriately mitigated.

- 2.6.2. Similarly, 'Policy CS8 Green Infrastructure' aims to ensure that Knowsley's existing green infrastructure is maintained and enhanced to protect its beneficial functions and also used to mitigate air pollution.

3. SCOPE & METHODOLOGY

3.1.1. This section provides details of the data and information supplied for the purposes of undertaking the air quality assessment. It also describes the adopted methodology for assessing and appraising the potential air quality impacts associated with the Proposed Development.

3.2. KEY DATA & RESOURCES

3.2.1. An index of the key data and resources used within the assessment is presented in **Table 2**.

Table 2 – Key Data & Resources

Data/Resource	Summary	Source/Reference
Annual Mean NO ₂ monitoring data	Data obtained for the study area required to facilitate baseline air quality review and air quality model verification	KMBC 2020 Air Quality Annual Status Report ¹⁴
Defra national background pollutant mapping data	Background 1km x 1km grid pollutant data obtained for the respective grid squares encompassing the study area	Annual mean data sourced from Defra ¹⁵
LAQM Technical Air Quality Guidance	Defra Guidance document on undertaking air quality assessments	Defra (2022) <i>Local Air Quality Management Technical Guidance TG22</i> ¹⁶
Land Use Planning & Development Control Guidance	Guidance provided by Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) that includes air quality impact descriptor criteria	Document published by EPUK/IAQM (2017) <i>Land-Use Planning and Development Control: Planning for Air Quality</i> ¹⁷

3.3. BASELINE AIR QUALITY REVIEW

3.3.1. The 2020 Air Quality Annual Status Report (ASR)¹⁴ published by KMBC was reviewed to establish baseline air quality conditions within the vicinity of the Proposed Development. This review included the identification of air pollutant monitoring locations near to the Proposed Development and the associated reported levels for the previous five years (2015 – 2019).

Background NO₂, PM₁₀ and PM_{2.5} pollutant concentrations corresponding to the 1 km² grid squares covering the associated link roads and identified sensitive receptor locations were obtained from Defra's published national pollutant mapping data for use in the air quality assessment.

3.4. CONSTRUCTION PHASE ASSESSMENT METHODOLOGY

3.4.1. Dust comprises particles typically in the size range 1-75 micrometres (µm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials. The larger dust

¹⁴ Knowsley Metropolitan Borough Council. 2020 Air Quality Annual Status Report. November 2020.

¹⁵ Defra (2020) 2018-based background maps for NO_x, NO₂, PM₁₀ and PM_{2.5} [Online] Accessed via <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>

¹⁶ Defra (2022) Part IV of The Environment Act 1995 as amended by the Environment Act 2021, Executive (Northern Ireland) Order 2002 Part III, Local Air Quality Management Technical Guidance LAQM.TG22.

¹⁷ Environmental Protection UK and Institute of Air Quality Management (Version 1.2 Updated January 2017). Land Use Planning & Development Control: Planning for Air Quality.

particles fall out of the atmosphere quickly after initial release and therefore tend to be deposited in close proximity to the source of emission. Dust therefore, is unlikely to cause long-term or widespread changes to local air quality; however, its deposition on property and cars can cause 'soiling' and discolouration. This may result in complaints of nuisance through amenity loss or perceived damage caused, which is usually temporary.

- 3.4.2. The smaller particles of dust (less than 10µm in aerodynamic diameter) are known as particulate matter (PM₁₀) and represent only a small proportion of total dust released; this includes a finer fraction, known as PM_{2.5} (with an aerodynamic diameter less than 2.5µm). As these particles are at the smaller end of the size range of dust particles they remain suspended in the atmosphere for a longer period of time than the larger dust particles, and can therefore be transported by wind over a wider area. PM₁₀ and PM_{2.5} are small enough to be drawn into the lungs during breathing, which in sensitive members of the public could have a potential impact on health. However, it is worth noting that, according to the Construction Guidance¹⁸, the majority of fugitive particulate emissions arising from construction sites are expected to relate to the coarser fractions (i.e. PM_{2.5-10}) with just 10-15% expected to comprise PM_{2.5}. The Construction Guidance¹⁸ therefore focusses on PM₁₀ for the purposes of assessment.
- 3.4.3. An assessment of the likely significant impacts on local air quality due to the generation and dispersion of dust and PM₁₀ during the construction phase has been undertaken using: the relevant assessment methodology published by the IAQM; the available information for this phase of the Proposed Development provided by the Client and Project Team; and, professional judgement.
- 3.4.4. The IAQM methodology assesses the risk of potential dust and PM₁₀ impacts from the following four sources: demolition; earthworks; general construction activities and track-out. It takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM₁₀ levels to assign a level of risk. Risks are described in terms of there being a low, medium or high risk of dust impacts.
- 3.4.5. Once the level of risk has been ascertained, then site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined. A summary of the IAQM assessment methodology is provided in **Appendix B**.
- 3.4.6. During the construction phase of the Proposed Development, there will be additional construction vehicle movements along the road network. However, the frequency of these movements will be temporary and intermittent relative to existing flows on the local road network.
- 3.4.7. Data relating to the number, type and routing of construction vehicles and non-road mobile machinery (NRMM) were not available at the time of assessment, therefore professional judgement was used to qualitatively assess potential local air quality effects associated with emissions from construction vehicles and NRMM.

¹⁸ Institute of Air Quality Management (IAQM) (Version 1.1 Updated June 2016). Guidance on the Assessment of Dust from Demolition and Construction

3.5. OPERATIONAL PHASE ASSESSMENT METHODOLOGY

- 3.5.1. Potential local air quality impacts associated with the operation of the Proposed Development will predominantly relate to changes in vehicle flows, and thus pollutant emissions, on the local road network, particularly where sensitive receptors (e.g. residential properties) are located adjacent.
- 3.5.2. With respect to potential impacts on local air quality associated with vehicle emissions generated by a new development, the Land Use Planning Guidance¹⁷ stipulates a set of criteria that can be used to inform the need for an air quality assessment to be undertaken. These include specific criteria relating to the change in vehicle movements for developments that are not located within an AQMA, such as the Proposed Development site:
- A change of Light-Duty Vehicle (LDV) flows of more than 500 Annual Average Daily Traffic (AADT) movements; and/or
 - A change of Heavy-Duty Vehicle (HDV) flows of more than 100 AADT movements.
- 3.5.3. Where an air quality assessment is identified as being required, then this may take the form of either a simple assessment or a detailed assessment. Exceeding either of the screening criteria above does not automatically lead to the requirement for a detailed assessment. A simple assessment is appropriate if it can provide the evidence that will lead to a sound conclusion on the presence, or otherwise, of a significant effect on local air quality.
- 3.5.4. Consultation was carried out with the project transport consultant (Vectos) and it was advised that the Proposed Development would have little to no impact on the wider road network in terms of generating additional vehicle flows. This is primarily due to the Proposed Development replacing, and improving on, an existing development within the Knowsley Industrial Park. The Proposed Development is, however, predicted to cause a redistribution in existing traffic flows which could lead to impacts on the local road network, within the Knowsley Industrial Park.
- 3.5.5. Given the above, it was decided to assess the operational phase impacts on a qualitative basis. This qualitative assessment is presented in **Section 5.2**.

3.6. SENSITIVE RECEPTORS

- 3.6.1. Sensitive locations are places where the public or sensitive ecological habitats may be exposed to pollutants resulting from activities associated with the Proposed Development.
- 3.6.2. These will include locations sensitive to an increase in dust deposition and PM₁₀ exposure as a result of on-site construction activities, and locations sensitive to exposure to pollutants emitted from the exhausts of construction and operational vehicles associated with the Proposed Development.

CONSTRUCTION PHASE

- 3.6.3. The construction phase air quality assessment focusses on the following sensitive locations:
- 'human receptors' within 350 m of the site boundary, or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s); and/or,
 - 'ecological receptors' within 50 m of the site boundary, or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).
- 3.6.4. It is within these distances that the impacts of dust soiling and increased particulate matter in the ambient air will have the greatest impact on local air quality at sensitive receptors.

- 3.6.5. There were no ecologically sensitive locations identified within 50 m of the Proposed Development boundary or within 50 m of roads used by construction vehicles and thus were scoped out of the assessment.

OPERATIONAL PHASE

- 3.6.6. Locations that are sensitive to pollutants emitted from vehicles on the local road network, include places where members of the public are likely to be regularly present over the period of time prescribed in the Air Quality Strategy (AQS). For instance, on a footpath where exposure will be transient (for the duration of passage along that path) comparison with a short-term standard (i.e. 15-minute mean or hourly mean) may be relevant. At a school or adjacent to a private dwelling, where exposure may be for longer periods, comparison with a long-term standard (such as daily mean or annual mean) may be more appropriate.
- 3.6.7. For the Proposed Development, the potentially sensitive receptor locations will be those off-site residential properties located adjacent to local roads used to access the Proposed Development.
- 3.6.8. In terms of ecological receptors, the impact of vehicle emissions at designated sites (SSSIs, SPAs, SACs, Ramsar) within 200m of an affected road link should be considered within the air quality assessment, as stipulated by guidance¹⁹ presented by the IAQM for assessment on designated nature sites. There are no designated sites within 200 m of the Proposed Development site and this was therefore scoped out of the assessment.

3.7. SIGNIFICANCE CRITERIA

CONSTRUCTION PHASE

- 3.7.1. The IAQM assessment methodology¹⁸ recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity with appropriate mitigation measures in place. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.
- 3.7.2. For the assessment of the impact of exhaust emissions from plant used on-site and construction vehicles accessing and leaving the Site on local concentrations of NO₂ and particulate matter, the significance of residual effects have been determined using professional judgement and the principles outlined in the Land Use Planning Guidance¹⁷.

OPERATIONAL PHASE

- 3.7.3. The approach provided in the Land Use Planning Guidance¹⁷ has been used within this assessment to assist in describing the air quality effects of additional emissions from traffic generated by the Proposed Development once operational.
- 3.7.4. Given that a qualitative approach was taken in the operational phase assessment, the impact descriptors provided by Land Use Planning Guidance¹⁷, which are based on quantified air pollutant concentrations, were not applicable and professional judgement has been applied to determine overall significance of the operation of the Proposed Development on local air quality.

¹⁹ IAQM. A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites. Version 1.0, June 2019

3.8. LIMITATIONS & ASSUMPTIONS

3.8.1. The air quality assessment has is subject to the following limitations and assumptions:

- A desk-based, qualitative air quality assessment has been completed. Therefore, predictions of pollutant concentrations and the local air quality impacts associated with the Proposed Development were not completed as detailed quantitative assessment was not deemed necessary due to the reasons provided in the respective construction and operation phase sections of this report;
- It has been assumed that there will be a continued downward trend in background pollutant and modelled PCM concentrations as represented in Defra datasets;
- Due to the limited details on the construction methods and programme, the assessment has been completed using the information that is available and professional judgement on the likely scale of activity and sensitivity of the receiving environment;
- Data relating to the specific number, type and routing of construction vehicles were not available at the time of the assessment. As such, professional judgement was used to qualitatively assess potential local air quality effects associated with these emissions; and
- Address Base data were not utilised during the construction phase assessment to estimate receptor counts as they are low in number. Instead, sensitive receptors were identified using GIS, Google Maps and Google Street View.

4. BASELINE CONDITIONS

4.1. REVIEW & ASSESSMENT OF AIR QUALITY

4.1.1. KMBC has not designated any AQMAs within their administrative area as a consequence of their Review and Assessment work. Neighbouring Liverpool City Council (LCC) has however, declared one AQMA which is located within 2 km of the Site. Details of this AQMA is given below:

- Liverpool City AQMA, declared in 2009 for exceedances of the annual mean objective for NO₂. The AQMA covers the entirety of LCC. The AQMA is located approximately 1.9 km to the west of the Proposed Development.

4.2. LOCAL EMISSION SOURCES

4.2.1. The Site is located in an area where air quality is mainly influenced by emissions from road transport using the local road network. This includes major roads such as the A580 and A5207 as well as the minor roads of the Knowsley Industrial Park such as Faraday Road.

4.2.2. There are several waste treatment and chemical facilities located within the Knowsley Industrial Park, which according to the 2018 Pollution Inventory²⁰ are sources of air pollutant emissions. However, none of these facilities are located within 350 m of the Site boundary. Given the proposed land use for the Proposed Development, emissions from the waste facility are not expected to have any adverse impact within the Site.

4.3. BACKGROUND AIR QUALITY DATA

4.3.1. Background pollutant concentrations for NO₂, PM₁₀ and PM_{2.5} were obtained from Defra's national background maps¹⁵ for the 1 km x 1 km grid square encompassing the Site. Data were obtained for the current year (2023) and two future years (2025 & 2030), as summarised in **Table 3**. All of the annual mean background concentrations are predicted to remain well below the relevant air quality objectives in all years.

Table 3 – Annual Mean Pollutant Background Concentrations for the Site

Grid Square (centred on O.S. Grid Reference)	NO ₂ (µg/m ³)			PM ₁₀ (µg/m ³)			PM _{2.5} (µg/m ³)		
	2023	2025	2030	2023	2025	2030	2023	2025	2030
342500, 397500	15.3	14.3	12.8	14.2	13.9	13.8	10.0	9.8	9.7
343500, 397500	13.2	12.3	11.0	11.8	11.6	11.5	7.8	7.6	7.6
AQS Objective (µg/m ³)	40			40			20		

²⁰ <https://data.gov.uk/dataset/cfd94301-a2f2-48a2-9915-e477ca6d8b7e/pollution-inventory>

4.4. LOCAL AUTHORITY AIR QUALITY MONITORING DATA

- 4.4.1. KMBC carries out continuous (automatic) monitoring at three locations in its jurisdiction. None of these are located within 2 km of the Site. The nearest location, Kirkby, is located 2.2 km to the north west of the Site. It was previously located 1.8 km from the Site before being moved in 2019. Available annual mean pollutant concentrations for the period 2015 to 2019 from these two locations are provided in **Table 4**.

Table 4 – KMBC Continuous Monitoring Data for Annual Mean NO₂, PM₁₀, PM_{2.5}

Site Name	Site Type	Distance from Site (km)	Pollutant	Annual Mean Concentration (µg/m ³)				
				2015	2016	2017	2018	2019
Kirkby (Old Location)	Urban Background	1.8	NO ₂	18.7	17.7	N/A	N/A	N/A
			PM ₁₀	16.5	17.9	19.6	N/A	N/A
			PM _{2.5}	6.8	10.9	8.4	N/A	N/A
Kirkby (New Location)	Roadside	2.2	NO ₂	N/A	N/A	N/A	N/A	24.8
			PM ₁₀	N/A	N/A	N/A	N/A	37.6
			PM _{2.5}	N/A	N/A	N/A	N/A	N/A

- 4.4.2. The data in **Table 4** indicate that all pollutant concentrations recorded by the Kirkby continuous monitor at both locations have been below the respective annual mean objectives from 2015 to 2019.
- 4.4.3. The Kirkby continuous monitor was previously located approximately 1.8 km to the north of the Site in a predominantly residential area. Whilst concentrations from this monitor are not considered to be wholly representative of air quality conditions at the Site, which is located in a more industrial area, a comparison with the 2023 Defra background data (see **Table 3**) indicates that there are unlikely to be significant differences in ambient levels between the two locations.
- 4.4.4. In the new location, higher concentrations of both NO₂ and PM₁₀ have been recorded. However, as this is a roadside location adjacent to the A5208, it is not representative of conditions at the Site.
- 4.4.5. In addition to continuous monitoring, KMBC carries out passive diffusion tube monitoring of NO₂ at twelve locations throughout the borough. However, none of these monitors are located within 8 km of the Site and as such have not been included in this assessment.

4.5. POLLUTION CLIMATE MAPPING MODEL LINKS

- 4.5.1. As part of the UK's responsibility to fulfil the requirements of the Air Quality Directive¹, Defra carries out a range of air pollutant modelling at different spatial scales, one of which is the Pollution Climate Mapping (PCM) model. The PCM is used to project roadside pollutant concentrations adjacent to around 9,000 road links throughout the UK to enable an assessment of compliance with relevant EU limit values, as shown in **Table 1**. The PCM model projects concentrations for all years between 2019 and 2030.

- 4.5.2. The most up to date PCM model²¹ data published by Defra includes sections of the A5207 and A5208, both of which border the Site.
- 4.5.3. Roadside annual mean NO₂ concentrations for the current year (2023) and two future years (2025 and 2030) from these PCM links, are presented in below.

Table 5 - Defra PCM Modelling Results for Roadside Annual Mean NO₂ (µg/m³)

Road	Census Point	Annual Mean NO ₂ Concentration (µg/m ³)		
		2023	2025	2030
A5207	802057010	25	22	18
A5208	802017693	15	14	12
EU Limit Value (µg/m ³)		40		

- 4.5.4. The results from **Table 5** show that the 2023 roadside annual mean NO₂ concentrations from both links are below the NO₂ annual mean limit value. Furthermore, these concentrations are predicted to decrease further in future years 2025 and 2030.

4.6. SUMMARY

- 4.6.1. The Proposed Development is not located within an AQMA. Monitoring data from **Table 4** indicates that there are no recent recorded exceedances of the annual mean objective for NO₂, PM₁₀ or PM_{2.5}, from the nearest monitoring location located 2.2 km from the Site.
- 4.6.2. Defra's background pollutant data (**Table 3**) show that concentrations are expected to remain well below their respective annual mean objectives at and in proximity to the Site. Modelled PCM concentrations adjacent to strategic roads near to the Site (**Table 5**) are below the annual mean NO₂ limit value and predicted to fall further in years 2025 and 2030.
- 4.6.3. Despite the relative lack of local authority monitoring data at the Site, the review of nearby monitoring data, Defra background predictions, and roadside PCM modelling indicates that air quality at the Site is good.

²¹ Defra NO₂ projections data (2018 reference year) [online]

Available at: <https://uk-air.defra.gov.uk/library/no2ten/2020-no2-pm-projections-from-2018-data>

5. ASSESSMENT OF IMPACTS

5.1. CONSTRUCTION PHASE

DUST AND PM₁₀ ARISING FROM ON-SITE ACTIVITIES

- 5.1.1. Construction activities that have the potential to generate and/or re-suspend dust and PM₁₀ include:
- Site clearance and preparation;
 - Preparation of temporary access/egress to the Site and haulage routes;
 - Earthworks;
 - Materials handling, storage, stockpiling, spillage and disposal;
 - Movement of vehicles and construction traffic within the Site;
 - Use of crushing and screening equipment/plant;
 - Exhaust emissions from site plant, especially when used at the extremes of their capacity and during mechanical breakdown;
 - Construction of buildings, roads and areas of hardstanding alongside fabrication processes;
 - Internal and external finishing and refurbishment; and
 - Site landscaping after completion.
- 5.1.2. The majority of the releases are likely to occur during the 'working week'. However, for some potential release sources (e.g. exposed soil produced from significant earthwork activities) in the absence of dust control mitigation measures, dust generation has the potential to occur 24 hours per day over the period during which such activities are to take place.

ASSESSMENT OF POTENTIAL DUST EMISSION MAGNITUDE

- 5.1.3. The IAQM assessment methodology¹⁸ has been used to determine the potential dust emission magnitude for the following four different dust and PM₁₀ sources: demolition; earthworks; construction; and trackout. The construction assessment has been completed using the information that is available and professional judgement as appropriate. The findings of the assessment are presented below.

Demolition

- 5.1.4. No demolition activities will occur at the Site as part of the construction phase of the Proposed Development. Therefore, consideration of the impact of this source on dust soiling and ambient PM₁₀ is not required.

Earthworks

- 5.1.5. The total area of the Proposed Development is more than 10,000m², however, the total amount of material that is expected to be moved and the amount of heavy earth moving vehicles on the site at any one time is not known. Therefore, based on the size of the Site alone, the potential dust emission magnitude is considered to be **large** for earthwork activities, which is a precautionary assumption.

Construction

- 5.1.6. The total volume of construction material at the Site is not yet known. However, to provide a conservative approach, the total volume it is assumed to be between 25,000m³ and 100,000m³.

Therefore, the potential dust emission magnitude is considered to be **medium** for construction activities.

Trackout

- 5.1.7. Information on the number of HDVs associated with this phase of the Proposed Development is not available and therefore professional judgement has been used. Given the size of the Proposed Development area, there are likely to be between 10 and 50 HDV outward movements in any one day. Therefore, the potential dust emission magnitude is considered to be **medium** for trackout activities.
- 5.1.8. A summary of the potential dust emission magnitude determined for each construction activity is presented in **Table 6**.

Table 6 - Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Earthworks	Large
Construction Activities	Medium
Trackout	Medium

ASSESSMENT OF SENSITIVITY OF THE STUDY AREA

- 5.1.9. The prevailing wind direction is from the west. Therefore, receptors located to the east of the Proposed Development are more likely to be affected by dust and particulate matter emitted and re-suspended during the construction phase. The land to the east of the Proposed Development comprises commercial industrial land uses within the Knowsley Industrial Park.
- 5.1.10. Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the activity. There are no highly sensitive receptors within 350 m of the Site boundary.
- 5.1.11. There are properties from the existing commercial/industrial developments in the industrial park that are within 20 m of the site boundary. However, these properties are classed as medium sensitivity with reference to the IAQM assessment methodology¹⁸.
- 5.1.12. The areas that are most sensitive to construction dust deposition are highlighted in **Figure 2**, which depicts 20 m, 50 m, 100 m, 200 m and 350 m distance bands (buffer zones) around the Proposed Development.
- 5.1.13. Taking the above into account and following the IAQM assessment methodology¹⁸, the sensitivity of the area to changes in dust and PM₁₀ has been derived for each of the construction activities considered. The results are shown in **Table 7**.

Table 7 - Sensitivity of the Study Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Medium	Medium	Medium
Human Health	N/A	Low	Low	Low

Risk of Impacts

- 5.1.14. The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. **Table 8** below provides a summary of the risk of dust impacts for the Proposed Development.
- 5.1.15. The risk category identified for each construction activity has been used to determine the level of mitigation required.
- 5.1.16. Overall, there is a **Medium Risk** of dust impacts relating to the expected construction phase activities, prior to mitigation being applied.

Table 8 - Summary Dust Risk Table to Define Site Specific Mitigation

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Medium Risk	Medium Risk	Low Risk
Human Health	N/A	Low Risk	Low Risk	Low Risk

CONSTRUCTION VEHICLES

- 5.1.17. The greatest impact on air quality due to emissions from vehicles and plant associated with the construction phase will be in the areas immediately adjacent to the site access. It is anticipated that construction traffic will access the site via the A5208, Hornhouse Lane and Faraday Road.
- 5.1.18. Due to the size of the Proposed Development and nature of construction works; construction traffic volumes are expected to be low within the context of existing traffic flows on these roads. Furthermore, existing background levels of relevant pollutants (NO₂, PM₁₀ and PM_{2.5}, see **Table 3**) are predicted to be well under the respective annual mean objectives.
- 5.1.19. Therefore, based on the available information and professional judgement, the local air quality impact associated with emissions from construction vehicles is expected to be **negligible**.

5.2. OPERATION PHASE

SIMPLE ASSESSMENT OF OPERATIONAL PHASE TRAFFIC EMISSIONS ON LOCAL AIR QUALITY

- 5.2.1. Daily net trips were provided by Vectos for the local roads associated with the Proposed Development, as summarised in **Table 9**, for the opening year (2023) of the operational development. The locations of the respective road links are shown in **Figure 3**.

Table 9 – Proposed Development Net Trip Road Data Change in the Opening Year of Operation

Road Link	Daily Link Total AADT Change (Net Trip Road Data)
A5208 South Boundary Road	+514
Hornhouse Lane – North of Owen Road	+514
Hornhouse Lane – South of Owen Road	+273
A5208 Coopers Lane	+273

- 5.2.2. The traffic data from **Table 9** shows that the operation of the Proposed Development is expected to lead to LDV increases on all provided road links. These LDV increases are not new trips generated by the Proposed Development but are the result of a redistribution of flows on the local road network within the Knowsley Industrial Park. This is primarily because the Proposed Development will be replacing an existing development within the Knowsley Industrial Park.
- 5.2.3. The redistribution of flows is predicted to lead to exceedances of the IAQM Land Use Planning guidance criteria¹⁷ (see **Paragraph 3.5.2**) on A5208 South Boundary Road and Hornhouse Lane (North of Owen Road). However, the exceedance is very small (14 vehicles), and falls within the margin of error of the traffic model as confirmed by Vectos ($\pm 10\%$). The review of local monitoring data, PCM roadside concentrations ($25 \mu\text{g}/\text{m}^3$ NO_2 at the A5208 roadside in 2023) and background air quality data in **Section 4** confirms that local levels of NO_2 , PM_{10} , and $\text{PM}_{2.5}$ are likely to be well below the respective annual mean air quality objective. As such, the very small increases in vehicle emissions on A5208 South Boundary Road and Hornhouse Lane (North of Owen Road) would not result in any exceedances of the objective.
- 5.2.4. The Land Use Planning¹⁷ and Defra guidance¹⁶ advises that exceedances of the 24-hour PM_{10} objective are more likely where the annual mean concentration is over $32 \mu\text{g}/\text{m}^3$. Defra background concentrations, as summarised in **Table 3**, indicate that concentrations of PM_{10} relevant to the Site are well below the annual mean air quality objective levels. As such, there are not expected to be any exceedances of the short-term objective for PM_{10} at any industrial/commercial receptors.
- 5.2.5. There are sensitive residential receptors adjacent to Spinney Close and Spinney View, which are near to the Southern Boundary Road. However, the change in traffic flows on this road does not exceed the IAQM criteria thresholds detailed in **Paragraph 3.5.2**.

- 5.2.6. The Proposed Development has the potential to increase local emissions from within the proposed van storage park. The Proposed Development will provide approximately 500 storage bays, meaning vehicle emissions from onsite traffic (van) movements and 'cold start' engine emissions from within the site have the potential to contribute to local pollutant concentrations. However, there are no sensitive receptors located within 200 m of the Proposed van storage deck.
- 5.2.7. Given the above, the local air quality impacts associated with the operation of the Proposed Development on existing sensitive receptors are expected to be **negligible**, resulting in **no significant effect**.

6. MITIGATION & RESIDUAL EFFECTS

6.1. MITIGATION

CONSTRUCTION PHASE

- 6.1.1. Based on the assessment results that there will be a medium risk of dust impacts, mitigation will be required. Recommended mitigation measures commensurate to the risk rating are given below.

General Communication

- The name and contact details of person(s) accountable for air quality and dust issues should be displayed on the site boundary. This may be the environment manager/engineer or the site manager. The head or regional office contact information should also be displayed.

Site Management

- All dust and air quality complaints should be recorded and causes identified. Appropriate remedial action should be taken in a timely manner with a record kept of actions taken including of any additional measures put in-place to avoid reoccurrence.
- The complaints log should be made available to the local authority on request.
- Any exceptional incidents that cause dust and/or air emissions, either on- or offsite should be recorded, and then the action taken to resolve the situation recorded in the log book.

Monitoring

- Daily on-site and off-site inspections should be undertaken, where receptors (including roads) are nearby to monitor dust. The inspection results should be recorded and made available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.

Preparing and maintaining the site

- Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Where practicable, erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Where practicable, fully enclose site or specific operations where there is a high potential for dust production and the site is 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 on site. If they are being re-used on-site cover appropriately.
- Where practicable, cover, seed or fence stockpiles to prevent wind whipping.

Operating vehicle/machinery and sustainable travel

- Ensure all vehicle operators 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.

- A maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas should be imposed (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste management

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- Stockpile surface areas should be minimised (subject to health and safety and visual constraints regarding slope gradients and visual intrusion) to reduce area of surfaces exposed to wind pick-up.
- Where practicable, windbreak netting/screening should be positioned around material stockpiles and vehicle loading/unloading areas, as well as exposed excavation and material handling operations, to provide a physical barrier between the Site and the surroundings.
- Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive properties, taking account of the prevailing wind direction.
- During dry or windy weather, material stockpiles and exposed surfaces should be dampened down using a water spray to minimise the potential for wind pick-up.

Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- All construction plant and equipment should be maintained in good working order and not left running when not in use.

Measures Specific to Trackout

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being in frequent use.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Record all inspections of haul routes and any subsequent action in a site log book.

- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

6.1.2. Detailed mitigation measures to control construction traffic should be discussed with KMBC to establish the most suitable access and haul routes for the site traffic. The most effective mitigation will be achieved by ensuring that construction traffic does not pass along sensitive roads (residential roads, congested roads, via unsuitable junctions, etc.) or within an AQMA where possible, and that vehicles are kept clean (through the use of wheel washers, etc.) and sheeted when on public highways. Timing of large-scale vehicle movements to avoid peak hours on the local road network will also be beneficial.

RESIDUAL EFFECTS

- 6.1.3. The residual effects of dust and PM₁₀ generated by construction activities following the application of the construction phase mitigation measures described above, combined with good site practice, are expected to be **not significant**.
- 6.1.4. The residual effects of emissions to air from construction vehicles on local air quality is expected to be **not significant**.

6.2. OPERATIONAL PHASE

MITIGATION

- 6.2.1. Based on the qualitative assessment completed, the impacts of the Proposed Development operation on local air quality will be **negligible** (themselves not warranting the need for mitigation) and will have **no significant effect**.
- 6.2.2. Although no specific operational phase mitigation is advised, provision for electric vehicle charging points to be installed in the future is included in the Proposed Development. However, the specific number is not yet known. The use of electric vehicles would further mitigate any potential air quality impacts as a result of the Proposed Development.

RESIDUAL EFFECTS

- 6.2.3. The implementation of the above operational phase good practice mitigation would provide additional benefit with respect to reducing vehicle emissions associated with the Proposed Development.

7. CONCLUSIONS

- 7.1.1. This report presents the outcomes of a qualitative air quality impact assessment for a proposed van storage park situated in the Knowsley Industrial Park, Knowsley. The assessment has considered potential local air quality impacts associated with both the construction phase and operational phase of the Proposed Development.
- 7.1.2. The Proposed Development is not located within an AQMA. A review of baseline air quality information and monitoring data at and near to the Proposed Development concluded that, despite the lack of extensive local authority monitoring data near to the Site, existing pollutant levels are currently below the relevant annual mean objectives and are expected to remain so in future years.
- 7.1.3. A qualitative assessment of the potential impacts on local air quality from construction site activities has been completed for this phase of the Proposed Development with reference to the IAQM methodology¹⁸. This identified that there is a **medium risk** of dust soiling impacts and a **low risk** of impact to human health at identified sensitive receptors with respect to changes in particulate matter (PM₁₀) concentrations due to construction activities. Through good site practice and the implementation of suitable mitigation measures, the impacts of dust and particulate matter releases on local air quality from construction site activities will be **not significant**.
- 7.1.4. A simple assessment was carried out for the operational phase. In the operational phase, the redistribution of traffic flows caused by the Proposed Development will not lead to exceedances of the relevant long- and short-term pollutant objectives. As the operational phase impacts are deemed to be not significant, there is no specific requirement for mitigation. However, provision for electric vehicle charging points to be installed in the future is included in the Proposed Development (number not known at this stage) and the uptake of electric vehicles would further reduce vehicle emissions associated with the operation of the Proposed Development.
- 7.1.5. Based on the assessment results, the development proposals comply with national and local policy, including the KMBC Core Strategy¹³ policies CS2 and CS8. There are no identified air quality constraints relating to the Proposed Development during both the construction and operational phases.

Figure 1 – Site Location Plan & Local Monitoring

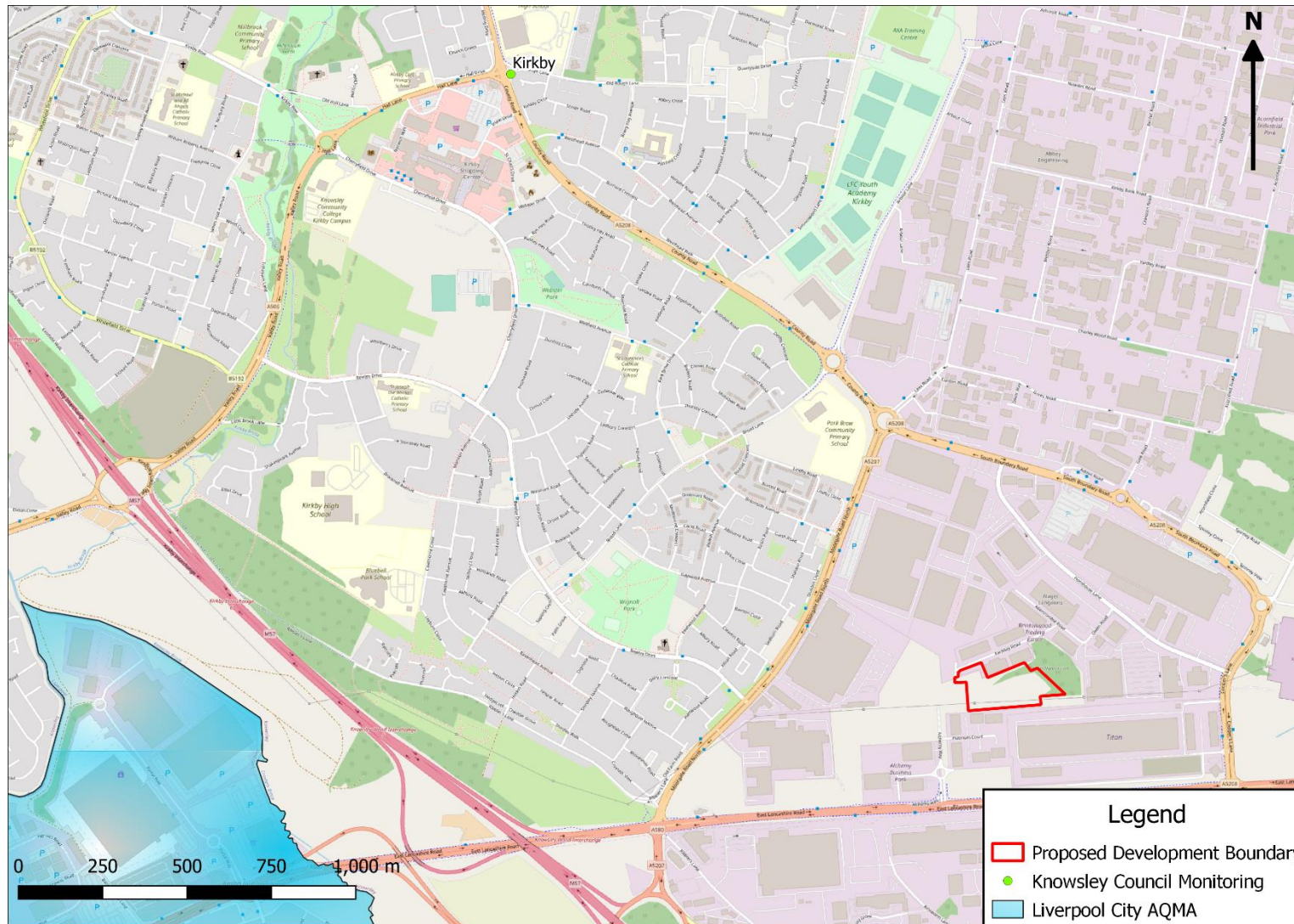


Figure 2 – Construction Phase Assessment Buffers

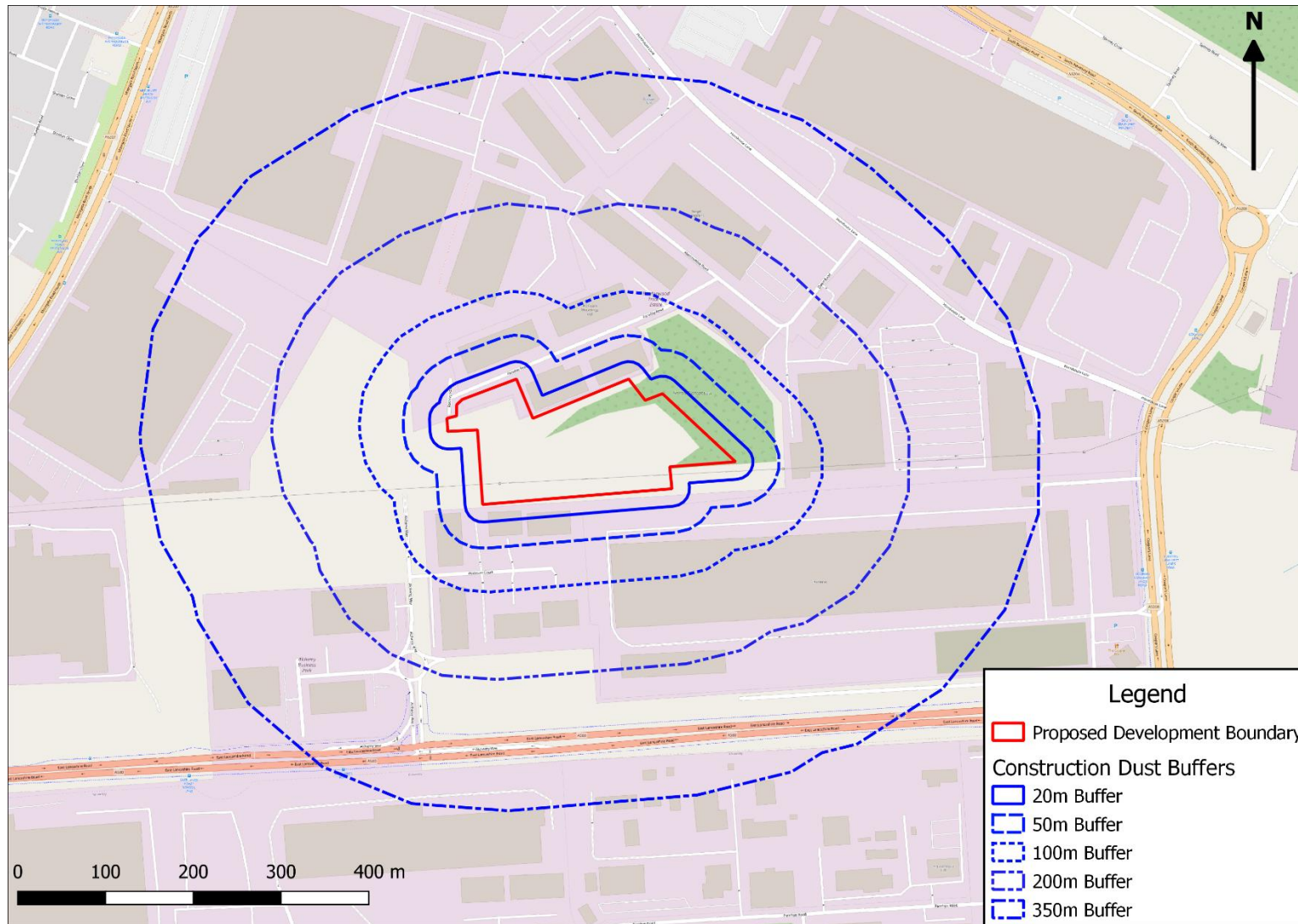
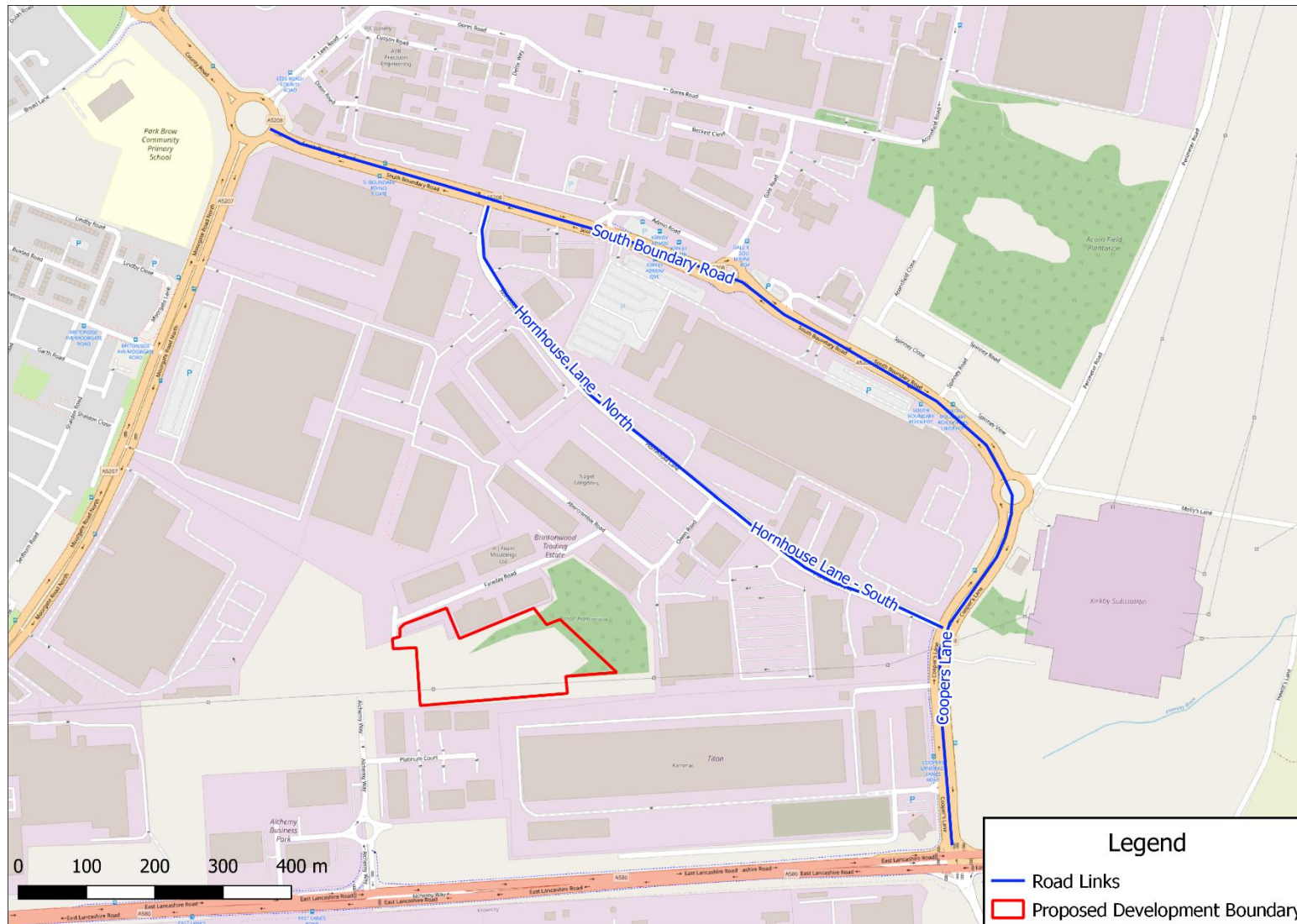


Figure 3 – Road links associated with operational phase traffic data



Appendix A

GLOSSARY



Term	Definition
AADT Annual Average Daily Traffic	A daily total traffic flow (24 hrs), expressed as a mean daily flow across all 365 days of the year.
Accuracy	A measure of how well a set of data fits the true value.
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year.
AQMA	Air Quality Management Area.
AURN	Automatic Urban and Rural (air quality monitoring) Network, managed by contractors on behalf of Defra
Conservative	Tending to over-predict the impact rather than under-predict.
Data capture	The percentage of all the possible measurements for a given period that were validly measured.
Defra	Department for Environment, Food and Rural Affairs.
Dust	Dust comprises particles typically in the size range 1-75 micrometres (μm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials
Exceedance	A period of time where the concentrations of a pollutant is greater than the appropriate air quality standard.
HDV/HGV	Heavy Duty Vehicle/Heavy Goods Vehicle.
LAQM	Local Air Quality Management.
Minor roads	Non A roads of Motorways.
NO ₂	Nitrogen dioxide.
NO _x	Nitrogen oxides.
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.
Road link	A length of road which is considered to have the same flow of traffic along it. Usually, a link is the road from one junction to the next.

Term	Definition
Trackout	The transport of dust and dirt from the construction / demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction / demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.
$\mu\text{g}/\text{m}^3$ microgrammes per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of $1\mu\text{g}/\text{m}^3$ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

Appendix B

IAQM CONSTRUCTION ASSESSMENT METHODOLOGY



STEP 1 – SCREENING THE NEED FOR A DETAILED ASSESSMENT

An assessment will normally be required where there are:

- ‘Human receptors’ within 350m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s); and/or
- ‘Ecological receptors’ within 50m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is “negligible”.

STEP 2A – DEFINE THE POTENTIAL DUST EMISSION MAGNITUDE

The following are examples of how the potential dust emission magnitude for different activities can be defined. (Note that not all the criteria need to be met for a particular class). Other criteria may be used if justified in the assessment.

Table 2A: Examples of Human Receptor Sensitivity to Construction Phase Impacts

Dust Emission Magnitude	Activity
Large	Demolition >50,000m ³ building demolished, dusty material (e.g. concrete), on-site crushing/screening, demolition >20m above ground level
	Earthworks >10,000m ² site area, dusty soil type (e.g. clay), >10 earth moving vehicles active simultaneously, >8m high bunds formed, >100,000 tonnes material moved
	Construction >100,000m ³ building volume, on site concrete batching, sandblasting
	Trackout >50 HDVs out / day, dusty surface material (e.g. clay), >100m unpaved roads
Medium	Demolition 20,000 - 50,000m ³ building demolished, dusty material (e.g. concrete) 10-20m above ground level
	Earthworks 2,500 - 10,000m ² site area, moderately dusty soil (e.g. silt), 5-10 earth moving vehicles active simultaneously, 4m - 8m high bunds, 20,000 -100,000 tonnes material moved
	Construction 25,000 - 100,000m ³ building volume, dusty material e.g. concrete, on site concrete batching
	Trackout 10 - 50 HDVs out / day, moderately dusty surface material (e.g. clay), 50 -100m unpaved roads

Dust Emission Magnitude	Activity
Small	Demolition <20,000m ³ building demolished, non-dusty material (e.g. metal cladding), <10m above ground level, work during wetter months
	Earthworks <2,500m ² site area, soil with large grain size (e.g. sand), <5 earth moving vehicles active simultaneously, <4m high bunds, <20,000 tonnes material moved, earthworks during wetter months
	Construction <25,000m ³ , non-dusty material (e.g. metal cladding or timber)
	Trackout <10 HDVs out / day, non-dusty soil, < 50m unpaved roads

STEP 2B – DEFINE THE SENSITIVITY OF THE AREA

The tables below present the IAQM assessment methodology to determine the sensitivity of the area to dust soiling, human health and ecological impacts respectively. The IAQM guidance provides guidance to allow the sensitivity of individual receptors to dust soiling and health effects to assist in the assessment of the overall sensitivity of the study area.

Table 2Ba: Sensitivity of the Area to Dust Soiling Effects

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

Table 2Bb: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration (µg/m ³)	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350

High	>32	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table 2Bc: Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from the Sources (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

STEP 2C – DEFINE THE RISK OF IMPACTS

The dust emissions magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts without mitigation applied. For those cases where the risk category is ‘negligible’ no mitigation measures beyond those required by legislation will be required.

Table 2C: Risk of Dust Impacts

Sensitivity of surrounding area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks and Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

STEP 3 –SITE SPECIFIC MITIGATION

Having determined the risk categories for each of the four activities it is possible to determine the site-specific measures to be adopted. These measures will be related to whether the site is considered to be a low, medium or high risk site. The IAQM guidance details the mitigation measures required for high, medium and low risk sites as determined in Step 2C.

STEP 4 – DETERMINE SIGNIFICANT EFFECTS

Once the risk of dust impacts has been determined in Step 2C and the appropriate dust mitigation measures identified in Step 3, the final step is to determine whether there are significant effects arising from the construction phase. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.



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