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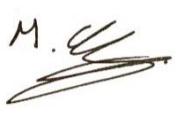
Land between Villiers
Road and Penrhyn
Road Knowsley
Business Park



Pembury Developments Limited

Air Quality Impact Assessment

Document approval

	Name	Signature	Position	Date
Prepared by:	Matt Clegg		Environmental Scientist	14/02/2022
Checked by:	Rosalind Flavell		Senior Environmental Consultant	14/02/2022

Document revision record

Revision no	Date	Details of revisions	Prepared by	Checked by
R0	11/02/2022	First issue- for client review	MJC	RSF
R1	14/02/2022	Final issue following client comments	MJC	RSF
R2	09/06/2022	Update of traffic numbers	HKL	RSF

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Management Summary

Fichtner Consulting Engineers Ltd (Fichtner) has been engaged by Pembury Developments Limited to undertake an Air Quality Impact Assessment to support the planning application for a development on land between Villiers Road and Penrhyn Road Knowsley Business Park, Knowsley (the Proposed Development).

This assessment has been undertaken to determine the impact of the Proposed Development on local air quality, involving assessment to determine:

- the impact of dust from construction activities and identification of appropriate mitigation measures; and
- the impact of road traffic emissions associated with the operational phase.

The assessment has been carried out in a number of stages.

Review of Legislation and Planning Policy

In the UK, the levels of pollution in the atmosphere are controlled by a number of European Directives, which have been fully implemented, and by the National Air Quality Strategy. These have led to the setting of a number of Air Quality Assessment Levels (AQALs) for pollutants. The AQALs are set at a level well below those at which significant adverse health effects have been observed in the general population and in particularly sensitive groups.

There is no prescriptive methodology for air quality assessment outlined in either the National Planning Policy Framework or Planning Practice Guidance. Therefore, practitioners are directed to use guidance provided by other non-governmental organisations. In this case the guidance published by the Institute of Air Quality Management (IAQM) has been applied, in lieu of any supplementary planning guidance from the local authority. This assessment has been carried out to determine the impact of the Proposed Development on air quality to satisfy the requirements of the national Planning Practice Guidance with reference to guidance produced by the IAQM.

Review of baseline conditions

A review has been carried out of baseline monitoring undertaken by Knowsley Metropolitan Borough Council (KMBC), the Department for Environment, Food and Rural Affairs' (Defra) background pollution mapping, and the Pollution Climate Mapping (PCM) model.

This has shown that whilst there is limited baseline monitoring close to the Proposed Development. The baseline concentrations away from the immediate vicinity of the main road network at the Proposed Development are likely to be similar to the mapped background. The PCM model shows that along the roads close to the site the levels of pollution are within the AQALs currently set in legislation.

Assessment

The assessment has considered the impact of construction, earthworks and trackout activities as well as operational phase road vehicles emissions using guidance from the IAQM.

The assessment of the impact of dust generating activities takes into account the type of activities undertaken and the number of sensitive human and ecological receptors within set distances from these activities. The dust risk from construction phase activities is considered to be medium. Mitigation measures have been recommended appropriate for the risk rating of the works in

accordance with the IAQM methodology to ensure that effects are controlled. With the implementation of these recommended measures the residual effect is deemed to be not significant.

The trip generation estimation for the Proposed Development falls below the IAQM criteria for progressing with an assessment of operational phase vehicles. Therefore, the impact on air quality of the operational phase transport emissions is deemed to be negligible and not significant. It is acknowledged that the neighbouring authority of Liverpool City Council has declared a city wide Air Quality Management Area (AQMA) and some vehicles may travel through the city. However, the predominant traffic routing would be from the site on to the M57 for wider distribution and as such it is concluded that any increase in vehicles within the AQMA would be minimal and screened out as negligible.

Conclusion

This assessment has demonstrated that with the appropriate level of mitigation of construction activities the Proposed Development would not result in a significant air quality impact.

Contents

Management Summary	3
1 Introduction.....	6
1.1 Background	6
1.2 Structure of the report.....	6
2 Legislation and Planning Policy Context.....	7
2.1 Legislation	7
2.2 Local Air Quality Management.....	7
2.3 Control of dust and emissions during construction	8
2.4 National Planning Policy Framework	8
2.5 Local Planning Policy	10
2.6 Summary	10
3 Assessment Methodology	12
3.1 Construction phase dust generating activities.....	12
3.2 Operational phase transport emissions.....	13
4 Baseline Conditions	14
4.1 Description of site and surroundings	14
4.2 Air quality review and assessment.....	14
4.3 National modelling – mapped background data.....	14
4.4 Defra’s pollution climate mapping.....	15
4.5 Monitoring data	15
4.6 Summary	16
5 Impact Assessment.....	17
5.1 Construction phase dust generating activities.....	17
5.1.1 Stage one – screening.....	17
5.1.2 Stage two - risk of dust emissions	18
5.1.3 Stage three – identification of mitigation measures	20
5.1.4 Stage four - summary	22
5.2 Operational phase road vehicles.....	22
6 Conclusions.....	23
Appendices	24
A Figures	25
B Construction Phase Dust Assessment Methodology	29
B.1 Background	29
B.2 Dust emission magnitude.....	29
B.3 Sensitivity of the area	30
B.4 Risk of dust impacts	34

1 Introduction

1.1 Background

Fichtner Consulting Engineers Ltd (Fichtner) has been engaged by Pembury Developments Limited to undertake an Air Quality Impact Assessment to support the planning application for the following development on Land between Villiers Road and Penrhyn Road Knowsley Business Park, Knowsley;

Development comprising the erection of a new building for Class E (industrial), B2 general industrial and B8 storage/distribution including ancillary offices, landscaping, yards, access points off Villiers Road, car parking, cycle parking and associated engineering works.

Throughout this report, the above development will be referred to as the 'Proposed Development'.

This assessment has been undertaken to determine the impact of the Proposed Development on local air quality, involving assessment to determine:

- the impact of dust from construction activities and identification of appropriate mitigation measures; and
- the impact of road traffic emissions associated with the operational phase.

1.2 Structure of the report

This report has the following structure:

- National and international air quality legislation and guidance, and local planning policies which relate to air quality, are considered in section 2.
- The assessment methodology is outlined in section 3.
- The current levels of ambient air quality are described in section 4.
- The impact of dust emissions during the construction phase is explained in section 5.
- The conclusions of the assessment can be found in section 6.
- The Appendices include illustrative figures and detailed assessment methodologies.

2 Legislation and Planning Policy Context

2.1 Legislation

European air quality legislation is consolidated under the Ambient Air Quality Directive (AAD) (Directive 2008/50/EC), which came into force on 11 June 2008. This Directive consolidates previous legislation which was designed to deal with specific pollutants in a consistent manner and provides Ambient Air Directive (AAD) Limit Values for nitrogen dioxide, particulate matter (as PM₁₀) and a new AAD Target Value and Limit Value for fine particulates (PM_{2.5}).

The Air Quality Standards Regulations (2010) seek to transpose Directive 2008/50/EC within the United Kingdom (UK). The regulations also extend powers, under Section 85(5) of the Environment Act (1995), for the Secretary of State to give directions to local authorities for the implementation of these Directives. The UK Air Quality Strategy (2007)¹ is the method of implementation of the AAD Limit Values and Targets in England, Scotland, Wales and Northern Ireland. This document builds on the previous Strategy, published in 2000, and a 2003 Addendum. The UK Clean Air Strategy (2019) builds on the UK Air Quality Strategy but does not update any relevant AAD Limit Values or Targets.

The Air Quality Strategy includes two objectives for nitrogen dioxide, both of which are included in the Air Quality Directive.

- A limit for the one-hour mean of 200 µg/m³, not to be exceeded more than 18 times a year (equivalent to the 99.79th percentile).
- A limit for the annual mean of 40 µg/m³.

The Air Quality Strategy includes two objectives for PM₁₀, both of which are included in the Air Quality Directive.

- A daily limit of 50 µg/m³, not to be exceeded more than 35 times a year (the 90.4th percentile).
- A limit for the annual mean of 40 µg/m³.

The Air Quality Strategy includes an exposure reduction objective for PM_{2.5} in urban areas and a Target Value for PM_{2.5} of 20 µg/m³ as an annual mean. This Target Value is included in the Air Quality Directive.

For the remainder of this report these objectives, Target Values and Limits are collectively referred to as Air Quality Assessment Levels (AQALs).

2.2 Local Air Quality Management

Under Section 82 of the Environment Act (1995) (Part IV) local authorities 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 assessing present and likely future ambient pollutant concentrations against AQALs. If it is predicted that levels at the façade of buildings where members of the public are regularly present (normally residential properties) are likely to be exceeded, the local authority is required to declare an Air Quality Management Area (AQMA). For each AQMA, the local authority is required to produce an

¹ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, CM 7169 NIA 61/06-07, July 2007, Defra – para 17 of Volume 1.

Air Quality Action Plan (AQAP), the objective of which is to reduce pollutants levels in pursuit of the relevant AQALs.

2.3 Control of dust and emissions during construction

The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting Regulations, which would include the project construction site, are those provided in Section 80 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."

Enforcement of the Act, in regard to nuisance, is under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the local authority 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 Act requiring abatement and any necessary works to achieve it.

2.4 National Planning Policy Framework

In terms of air quality, the National Planning Policy Framework (NPPF) states:

"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."

"Planning policies and decisions should contribute to and enhance the natural and local environment by...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..."

"Transport issues should be considered from the earliest stages of plan-making and development proposals, so that...the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains."

"The planning system should actively manage patterns of growth in support of these objectives. 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."

The Air Quality Planning Practice Guidance (PPG) was issued on-line on 6th March 2014 and will be updated by the Government as a live document. The latest update was on 1 November 2019. This describes the circumstances when air quality, odour and dust can be a planning concern requiring assessment.

It states that whether or not air quality is relevant to a planning decision will depend on the Proposed Development and its location. Concerns could arise if the development is likely to generate air quality impact in an area where air quality is known to be poor. It acknowledges that they could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation (including that applicable to wildlife). The steps a local planning authority might take in considering air quality are set out below:

“Considerations that may be relevant to determining a planning application include whether the development would:

- Lead to changes (including any potential reductions) in vehicle related emissions in the immediate vicinity of the proposed development or further afield. This could be through the provision of electric vehicle charging infrastructure; altering the level of traffic congestion; significantly changing traffic volumes, vehicle speed or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; adds to turnover in a large car park; or involve construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more.*
- Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; biomass boilers or biomass fuelled Combined Heat and Power plant; centralised boilers or plant burning other fuels within or close to an air quality management area or introduce relevant combustion with a Smoke Control Area; or extraction systems (including chimney) which require approval or permits under pollution control legislation;*
- Expose people to harmful concentrations of air pollutants, including dust. This could be by building new homes, schools, workplaces or other development in places with poor air quality;*
- Give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations.*
- Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value.”.*

Neither the NPPF nor the PPG is prescriptive on the methodology for assessing air quality effects or describing significance, practitioners continue to use guidance provided by Department for Environment Food and Rural Affairs (Defra) and non-governmental organisations, including the Institute of Air Quality Management (IAQM). However, it is recommended that the following forms part of assessments:

- “a description of baseline conditions and any air quality concerns affecting the area, and how these could change both with and without the proposed development;*
- sensitive habitats (including designated sites of importance for biodiversity;*
- the assessment methods to be adopted and any requirement for the verification of modelling air quality;*
- the basis for assessing impact and determining the significance of an impact;*
- where relevant, the cumulative or in-combination effects arising from several developments;*
- construction phase impacts;*
- acceptable mitigation measures to reduce or remove adverse effects; and*
- measures that could deliver improved air quality even when legally binding limits for concentrations of major air pollutants are not being breached.”*

The assessment includes each of the above recommended aspects.

The Air Quality PPG provides advice on how air quality impacts can be mitigated and notes:

“Mitigation options where necessary will be locationally specific, will depend on the proposed development and should be proportionate to the likely impact. It is important therefore that local planning authorities work with applicants to consider appropriate mitigation so as to ensure the new development is appropriate for its location and unacceptable risks are prevented. Planning conditions and obligations can be used to secure mitigation where the relevant tests are met.

Examples of mitigation include:

- “maintaining adequate separation distances between sources of air pollution and receptors;
- using green infrastructure, in particular trees, where this can create a barrier or maintain separation between sources of pollution and receptors;
- appropriate means of filtration and ventilation;
- including infrastructure to promote modes of transport with a low impact on air quality (such as electric vehicle charging points);
- controlling dust and emissions from construction, operation and demolition; and
- contributing funding to measures, including those identified in air quality action plans and low emission strategies, designed to offset the impact on air quality arising from new development”.

2.5 Local Planning Policy

The Proposed Development is located within Knowsley Metropolitan Borough Councils (KMBCs) area of jurisdiction. The most recent planning document published by KMBC relevant to air quality is the Local Plan, adopted in January 2016 and covers the period up to 2028. It sets out how and where new development and regeneration should take place in an effort to guide and manage the future development of the borough. A list of pertinent policies is detailed below:

- Policy CS2: Development Principle 4e

“Recognise environmental limits, protect and enhance environmental assets, enhance local character and promote quality of place by: mitigating potential negative impacts of traffic growth and road traffic on highway safety, air quality, noise and health”

- Policy CS7: Transport Networks – Location, Design and Management of New Development 2e

“New development will be required to be inclusive of measures that will mitigate carbon emissions and improve air quality where appropriate”

- Policy CS8: Sub-Regional Management Plans, Programmes and Strategies 5.93

“Management plans which support the protection of internationally important sites for biodiversity within the wider Liverpool City Region are those which pertain to Mersey Estuary Special Protection Area (SPA)/Ramsar, Ribble & Alt Estuaries SPA/Ramsar, Liverpool Bay SPA, Mersey Narrows and North Wirral Foreshore SPA/Ramsar, Sefton Coast Special Area of Conservation (SAC), Dee Estuary SPA/SAC/Ramsar and Martin Mere SPA/Ramsar. Strategies and development proposals in Knowsley must mitigate any potential impacts such as: disturbance to qualifying bird species (from recreational pressure and other sources); deterioration in water quality; deterioration in air quality; and loss of supporting habitat.”

At a wider scale, Knowsley resides within the Liverpool City Region Combined Authority (LCRCA) which has developed an Air Quality Action Plan dated December 2020. This includes a series of actions which are short and long term to “clean the air” across the authority. However, no supplementary planning guidance has been produced relating to air quality.

2.6 Summary

This assessment has been carried out in accordance with the principles of the air quality PPG using guidance from the IAQM. There are policies set out in the local plan relating to air quality, but there is no specific supplementary planning guidance relating to air quality. However, there is a requirement to ensure that appropriate measures are in place to prevent the deposit of debris on the local highway network.

This assessment includes a construction dust impact assessment which includes the provision of mitigation measures to prevent this occurring.

3 Assessment Methodology

3.1 Construction phase dust generating activities

There is the potential for dust to be released into the atmosphere as a result of construction and demolition phase activities. These fugitive dust emissions have been assessed on a qualitative basis in accordance with the methodology outlined within the IAQM guidance document titled, 'Guidance on the assessment of dust from demolition and construction' (2014). The guidance sets out the methodology for assessing the air quality impacts of construction and demolition and identifies good practice for mitigating and managing air quality impacts. The quantity of dust emitted will be related to the area of land being worked and the nature, magnitude and duration of construction activities.

The assessment methodology is based on the risk of a site giving rise to dust impacts and the sensitivity of the surrounding area. Activities are divided into four types to reflect their different potential impacts. These are:

- demolition;
- earthworks;
- construction; and
- trackout.

"Trackout" is a less well-known term. It is defined by IAQM as:

"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 lorries leave the construction / demolition site with dusty materials, which may then spill onto the road, and/or when lorries transfer dust and dirt onto the road having travelled over muddy ground on site."

The assessment methodology considers three separate dust effects:

- annoyance due to dust soiling;
- harm to ecological receptors; and
- the risk of health effects due to significant increase in exposure to PM₁₀ (particulate matter with a diameter less than 10 µm).

The first stage of the assessment of the impact of fugitive emissions of dust during construction is to determine whether the impact can be screened out as 'negligible', or whether a more detailed assessment is required. The IAQM recommends that the developer will normally be required to undertake a detailed assessment where there is:

- a human receptor within 350 m of the boundary of the site;
- an ecological receptor within 50 m of the boundary of the site; or
- a human or ecological receptor within 50 m of the route(s) used by construction vehicles on the public highway, up to 200 m (medium trackout) from the site entrance(s).

A human receptor, in this context, is any location where a person may experience the annoyance effects of airborne dust or dust soiling or suffer exposure to PM₁₀ over a period of time relevant to the AQALs. This includes:

- residential dwellings;
- schools;

- hospitals;
- care homes;
- hotels;
- gardens (where relevant public exposure is likely i.e. excluding extremities of gardens or front gardens); and
- sensitive commercial premises including vehicle showrooms, food manufacturers, and electronics manufacturers.

Ecological receptors should include statutory and non-statutory designated sites.

If the development can be screened out from undertaking a detailed assessment, the developer is to provide a clear description of the proposed demolition and construction activities, their location and duration, and any phasing of the development.

If a detailed assessment is required, the second stage is to assess the risk of dust effects arising. A site is allocated to a risk category based on two factors; dust emission magnitude; and the sensitivity of the area. These factors are combined to give the risk of dust impact. Full details of the methodology for assessing the risk of dust effects arising is presented in Appendix B.

The third stage is to define appropriate, site-specific, mitigation measures.

The final stage is to determine whether significant effects are likely. For almost all construction activities, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience has shown that this is normally possible through the implementation of suitable mitigation. Hence the residual effect would normally be 'not significant'.

3.2 Operational phase transport emissions

In 2017 the IAQM published the guidance document titled, "*Land-Use Planning & Development Control: Planning for Air Quality*" (referred to within this report as the IAQM 2017 guidance). This has been developed for professionals operating within the planning system. It provides them with a means of reaching sound decisions, having regard to the air quality implications of development proposals. The IAQM 2017 guidance states that an air quality assessment is required where a development would cause a "significant change" in Light Duty Vehicles < 3.5t (LDV) or Heavy Duty Vehicles >3.5 t (HDVs). The indicative criteria to progress to an assessment are:

- A change in LDV flows of:
 - more than 100 Annual Average Daily Traffic (AADT) within or adjacent to an AQMA; or
 - more than 500 AADT elsewhere.
- A change in HDV flows of:
 - more than 25 AADT within or adjacent to an AQMA; or
 - more than 100 AADT elsewhere.

Where the change in numbers is less than these criteria the impact is deemed to be negligible and not significant and further assessment is not required.

4 Baseline Conditions

4.1 Description of site and surroundings

The Proposed Development is located on a 2.14 hectare plot between Villiers Road and Penrhyn Road on Knowsley Business Park, 1 km to the northwest of Knowsley and 10 km to the northeast of Liverpool city centre. The land surrounding the Proposed Development is comprised of commercial and light industrial premises which represents limited sensitivity to changes in air quality.

The location of the Proposed Development is shown in Figure 1 of Appendix A. In this section, the baseline air quality has been reviewed to define appropriate baseline concentrations to be used within this assessment. This has focussed on pollutants associated with construction and transport (namely nitrogen dioxide and particulate matter).

4.2 Air quality review and assessment

As explained in section 2.2, local authorities are required to periodically review and assess air quality within their area of jurisdiction. As of the 2020 ASR, KMBC has no AQMAs declared in their jurisdiction. Monitored nitrogen dioxide concentrations at Whitefield Lane in Huyton with Roby marginally exceeded the AQAL ($40 \mu\text{g}/\text{m}^3$). However, KMBC decided not to declare a formal AQMA at the time due to receding concentrations during the Covid-19 pandemic. In addition, further monitoring is planned for the area in the future. On the whole, monitoring within the borough demonstrates compliance with AQALs although, efforts are still being made to reduce pollution concentrations. This area is located approximately 7.5 km to the south of the Proposed Development.

1.3 km the southwest of the Proposed Development is the Liverpool AQMA (displayed in Figure 1) under the jurisdiction of Liverpool City Council and the LCRCA. This AQMA encompasses the entirety of the Liverpool City Region extending to the eastern rural-urban fringe near the M57 motorway. Due to the combination of rural land use and the prevailing wind direction, it is unlikely that the Proposed Development will have a significant effect on air quality at this AQMA although, it has been considered within the assessment when considering the impact of road vehicle exhaust emissions.

4.3 National modelling – mapped background data

In order to assist local authorities with their responsibilities under LAQM, Defra provides modelled background concentrations of pollutants throughout the UK on a 1 km by 1 km grid. This model is based on known pollution sources and background measurements and is used by local authorities in lieu of suitable monitoring data. The mapped background data is calibrated against monitoring data. For instance, the 2018 mapped backgrounds are based on 2018 meteorological data and are calibrated against monitoring undertaken in 2018.

Mapped background concentrations for 2018 have been downloaded for the grid square containing the development site. Using 2018 data avoids uncertainty as to how background concentrations will change in the future. A summary of the concentrations is presented within Table 1.

Table 1: Mapped Background Data

Pollutant	Annual mean AQAL ($\mu\text{g}/\text{m}^3$)	Mapped background concentration ($\mu\text{g}/\text{m}^3$)	As % of AQAL
Nitrogen dioxide	40	19.8	49.5%
PM ₁₀	40	14.2	35.5%
PM _{2.5}	20	9.16	45.8%

Source: © Crown 2021 copyright Defra via uk-air.defra.gov.uk, licenced under the Open Government Licence (OGL)

As shown, the mapped background concentrations are well below the AQALs set in existing legislation.

4.4 Defra's pollution climate mapping

Defra's Pollution Climate Mapping (PCM) model is a national scale model designed to fulfil part of the UK EU Directive (2008/50/EC) requirements to report on the concentrations of particular pollutants to atmosphere. The model results can be accessed from Defra's Air Information Resources website². The system shows the predicted roadside concentrations of pollutants for main road links in the UK. A review of this has shown that the most local road link to the Proposed Development with PCM data available is the junction between the A580 (E Lancashire Rd) and the A5208 (Coopers Ln) 450 metres to the northeast of the Proposed Development. Predicted annual mean concentrations are:

- PM₁₀ – 13 – 17 $\mu\text{g}/\text{m}^3$ which equates to 33 – 43 % of the AQAL;
- PM_{2.5} – 10 – 12.5 $\mu\text{g}/\text{m}^3$ which equates to 50 – 63 % of the AQAL; and
- Nitrogen dioxide – 20 – 30 $\mu\text{g}/\text{m}^3$ which equates to 50 – 75 % of the AQAL.

This shows that at the roads close to the site the PCM model is predicting that the levels of pollution are within the AQALs set in existing legislation. As main roads have been used, pollution concentrations are likely to be higher than along the site access routes due to correspondingly higher traffic volumes. However, they have still been considered in the assessment as a conservative scenario. Concentrations away from the roads would be lower than this and more aligned to the mapped background.

4.5 Monitoring data

As stated within the 2020 ASR, KMBC operates three continuous automatic monitoring sites which monitor NO₂, PM₁₀ and PM_{2.5}. However, all three monitors are at the roadside locations within 2 metres of a kerb (and therefore nearby road emissions sources). Roadside analysers are only representative of conditions within the vicinity of the analyser. Measured concentrations across the monitors between 2015-2019 recorded annual mean values well in excess of mapped background concentrations stated in Section 4.3, which is expected due to their roadside location. However, all concentrations were below the AQALs. As none of the analysers are close to the Proposed Development or situated in a comparable location the data are not deemed representative of conditions at the Proposed Development and have not been considered further within the assessment.

² <https://uk-air.defra.gov.uk/data/gis-mapping/>

In addition to automatic monitoring, KMBC operates thirty-three non-automatic diffusion tube monitors measuring NO₂ concentrations. Thirty of the diffusion tubes are at roadside locations, whilst the remaining three reside in suburban residential areas at Huyton with Roby; 7.7 km to the south. Suburban monitoring sites are generally representative of a fairly wide area. These sites are located around the junction of the M62 and M57 approximately 150 m from the motorways. The monitored annual mean NO₂ concentrations at these sites between 2017 and 2019 were between 22 and 29 µg/m³. Whilst this is some distance from the Proposed Development it does demonstrate that baseline concentrations in the suburban area around the major junction of the M62 and M57 are below the AQAL. It is likely that concentrations around the junction of the A580 and M57 would be similar if not below this. This is supported by the PCM results.

4.6 Summary

There is no baseline monitoring specifically representative of conditions close to the Proposed Development site. Mapped background concentrations at the site suggest adherence to AQALs currently set in legislation, whilst the PCM model shows that the roads close to the site are also within the AQALs.

5 Impact Assessment

5.1 Construction phase dust generating activities

5.1.1 Stage one – screening

Figure 2 of Appendix A presents the site boundary proximity zones based on the methodology presented in section 3.1.

The IAQM methodology outlined in section 3.1 is based on:

- The risk category for the site – which is based on the type of activity and the distance to the nearest receptor; and
- The sensitivity of the area – which is based on the number of properties within certain distances of the boundary of the works.

The methodology assesses the significance of the site rather than the significance of the impact on an individual receptor. As such, individual receptors have not been identified. However, Table 2 identifies the number of properties within the relevant distance bands. For clarity, the IAQM methodology states that one residential unit is one receptor. Satellite imagery data have been used to determine the number of receptors. The site access route has been defined as the exit from the site to the made road. Rather than from the edge of the redline boundary.

The receptors have been categorised into high and low risk, in accordance with the IAQM guidance. High risk receptors are locations where people are expected to be present continuously, including residential properties, schools, hospitals and care homes. Medium risk receptors include locations where people would not be expected to be continuously present, such as parks or places of work.

Table 2: Dust Sensitive Receptors – Number of Sensitive Receptors

Distance from the source (m)	Estimated number of human receptors			
	From site boundary		From site access routes	
	High risk	Medium risk	High risk	Medium risk
<20	0	3	0	7
<50	0	10	0	13
<100	0	17	-	-
<200	0	27	-	-
<350	1	42	-	-

As the Proposed Development is located in a predominantly industrial area, there are a large number of medium risk human receptors in the form of commercial premises. 3 medium risk receptors fall partially within 20 m of the site boundary leading the sensitivity of the area to be medium. There is one high risk residential property within the screening distances however, it is located approximately 295 m from the site boundary. There are no hospitals, care homes, hotels or sensitive commercial premises that have been identified within the screening distances.

There are no ecological receptors within 50 m of the site boundary. The nearest protected ecological receptors are Acornfield Plantation local nature reserve (LNR) and Croxteth LNR 1.1 km

to the northeast and 1.4 km to southwest respectively. Therefore, the risk of construction dust activities at ecological sites has been screened out from further assessment.

5.1.2 Stage two - risk of dust emissions

The risk of dust emissions from a construction site causing loss of amenity and / or health or ecological effects is typically related to:

- The activities being undertaken (demolition, number of vehicles and plant etc.);
- The duration of these activities;
- The size of the site;
- The meteorological conditions (wind speed, direction and rainfall);
- The proximity of receptors to the activity;
- The adequacy of the mitigation measures applied to reduce or eliminate dust; and
- The sensitivity of the receptors to dust.

The quantity of dust emitted is related to the area of land being worked and the level of construction activities, in terms of the nature, magnitude and duration of those activities. The wind direction, wind speed and rainfall at the time when a construction activity is taking place will also influence whether there is likely to be a dust impact. Atmospheric conditions which promote adverse impacts can occur in any direction from the Proposed Development. However, adverse impacts are more likely to occur downwind of the prevailing wind direction and / or close to the worked areas. Impacts are also more likely to occur during drier periods as rainfall acts as a natural dust suppressant.

The activities to be undertaken are standard construction activities and it is likely that the construction period would occur over a period of approximately 12 months.

Figure 3 of Appendix A presents a wind rose of weather data from Liverpool Speke meteorological station together with the climatic average data set from the Met Office for the Crosby observation station which is the closest climatic station to the Proposed Development. As shown, the prevailing wind direction is from the south-west meaning that receptors located to the northeast of the site are more likely to be located downwind of the areas worked and experience the greatest impacts. The charts show that rainfall rates are fairly constant across the year with the minimum occurring in May and the maximum in December. This shows that it is likely that dust will naturally be suppressed by rain and additional suppression would only be needed during prolonged periods of dry weather.

The dust emission magnitude has been classified for each type of activity using the criteria outlined in Table 5 of Appendix B (Construction Phase Dust Assessment Methodology).

- Demolition – the land on which development is proposed is currently fields with scattered trees and there are no buildings to be demolished. As such an assessment of dust emissions during demolition has been screened out from this assessment.
- Earthworks - The total area of the site is approximately 9,941 m², as such the dust emission magnitude is deemed to be 'medium'.
- Construction – The volume of the building to be constructed is approximately 150,000 m³ based on a 15 m building height. As this is >100,000 m³ set out in the IAQM guidance, the site is classified as a "large" sized construction site (Appendix B). Although, the building material utilised will have a low potential for dust release (metal cladding), as a conservative assumption it has been assumed that the dust emission magnitude is 'medium'.

- Trackout – The anticipated construction phase traffic numbers are not known, however, based on the type of development these would be less than 50 movements per day. On this basis the dust emission magnitude is deemed to be 'medium'.

The sensitivity of the area to dust effects from demolition, earthworks, construction and trackout for the three separate dust effects has been determined as set out in the Table 3, using the criteria set out in section B.3 of Appendix B. The baseline analysis has shown that away from main roads concentrations of PM₁₀ are likely to be similar to the mapped background concentration which is less than 24 µg.m³. The majority of dust from construction works would be in the PM₁₀ fraction rather than the finer PM_{2.5} fraction which is associated with combustion and road vehicle exhaust emissions. Therefore, when considering the health impacts reference is made to the baseline PM₁₀ concentrations.

Table 3: Sensitivity of the Area to Dust Effects

Effect	Sensitivity	Justification
Demolition		
Dust soiling	-	Screened out due to no demolition works.
Human health impacts	-	Screened out due to no demolition works.
Ecological effects	-	Screened out due to no demolition works.
Earthworks		
Dust soiling	Medium	There is more than 1 medium sensitivity property within 20 m of the site boundary.
Human health impacts	Low	There are more than 10 medium sensitivity properties within 100 m of the site boundary and baseline PM ₁₀ concentrations are < 24 µg/m ³ .
Ecological effects	-	Screened out due to no ecological sites identified within the screening zone.
Construction		
Dust soiling	Medium	There is more than 1 medium sensitivity property within 20 m of the site boundary.
Human health impacts	Low	There are more than 10 medium sensitivity properties within 100 m of the site boundary and baseline PM ₁₀ concentrations are < 24 µg/m ³ .
Ecological effects	-	Screened out due to no ecological sites identified within the screening zone.
Trackout		
Dust soiling	Low	No properties of high sensitivity have been identified within 20 m of the routes which could be used by construction vehicles on the public highway, up to 200 m from the site access point. However, 13 medium sensitivity receptors have been identified within 50 m of the route.
Human health impacts	Low	No properties of high sensitivity have been identified within 20 m of the routes which could be used by construction vehicles on the public highway, up to

Effect	Sensitivity	Justification
		200 m from the site access point. Background annual mean PM ₁₀ concentrations are <24 µg/m ³ .
Ecological effects	-	Screened out due to no ecological sites identified within the screening zone.

The risk of dust impacts from demolition, construction, earthworks and trackout is summarised using the criteria outlined in Table 12 presented in Appendix B. This is based on the dust emission magnitude and the sensitivity of the area.

Table 4: Summary of Dust Risk

Effect	Dust soiling	Human health impacts	Ecological effects
Demolition	Negligible	Negligible	Negligible
Earthworks	Medium Risk	Low Risk	Negligible
Construction	Medium Risk	Low Risk	Negligible
Trackout	Low Risk	Low Risk	Negligible

5.1.3 Stage three – identification of mitigation measures

The dust assessment has identified that the highest risk category for the Proposed Development is 'medium risk' during earthworks and construction. The following appropriate mitigation measures to minimise any impacts as a result of construction are based on best practice for a site of this nature:

- 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) account-able 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.
- 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 local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book.
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Agree dust deposition, dust flux, or real-time PM₁₀ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.

- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose 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 as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.
- 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.
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- 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.
- Avoid bonfires and burning of waste materials.
- 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.
- 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 continuously in use.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

5.1.4 Stage four - summary

The site has been assessed to be of medium risk for dust impacts as a result of earthworks and construction, and low risk for trackout activities. Appropriate mitigation measures have been identified for the level of risk. Therefore, with the implementation of the measures identified it is considered that any residual impacts would not be significant.

5.2 Operational phase road vehicles

Following consultation with Knowsley Council, and updated trip generation estimation has been carried out on TRICS utilising comparisons to similar commercial warehousing developments by the Steer Group (the transport consultants for the project). The site search criteria used were as specified by Knowsley Highways.

This has quantified that the trip generation would equate 362 total vehicles per day, of which 295 would be LDVs and 67 would be HDVs. Due to the location of the site with reference to the Liverpool AQMA, it cannot be ruled out that any vehicle would travel through an AQMA. However, given the planned land use of the Proposed Development, it is expected that the majority of traffic movements would travel along the main truck roads of the A580 and the M57 motorway to the west. It is unlikely that significant number of vehicles (in excess of the IAQM screening criteria for AQMAs) would travel into the nearby Liverpool AQMA. Therefore, the impact on air quality of the operational phase transport emissions is deemed to be negligible and not significant.

6 Conclusions

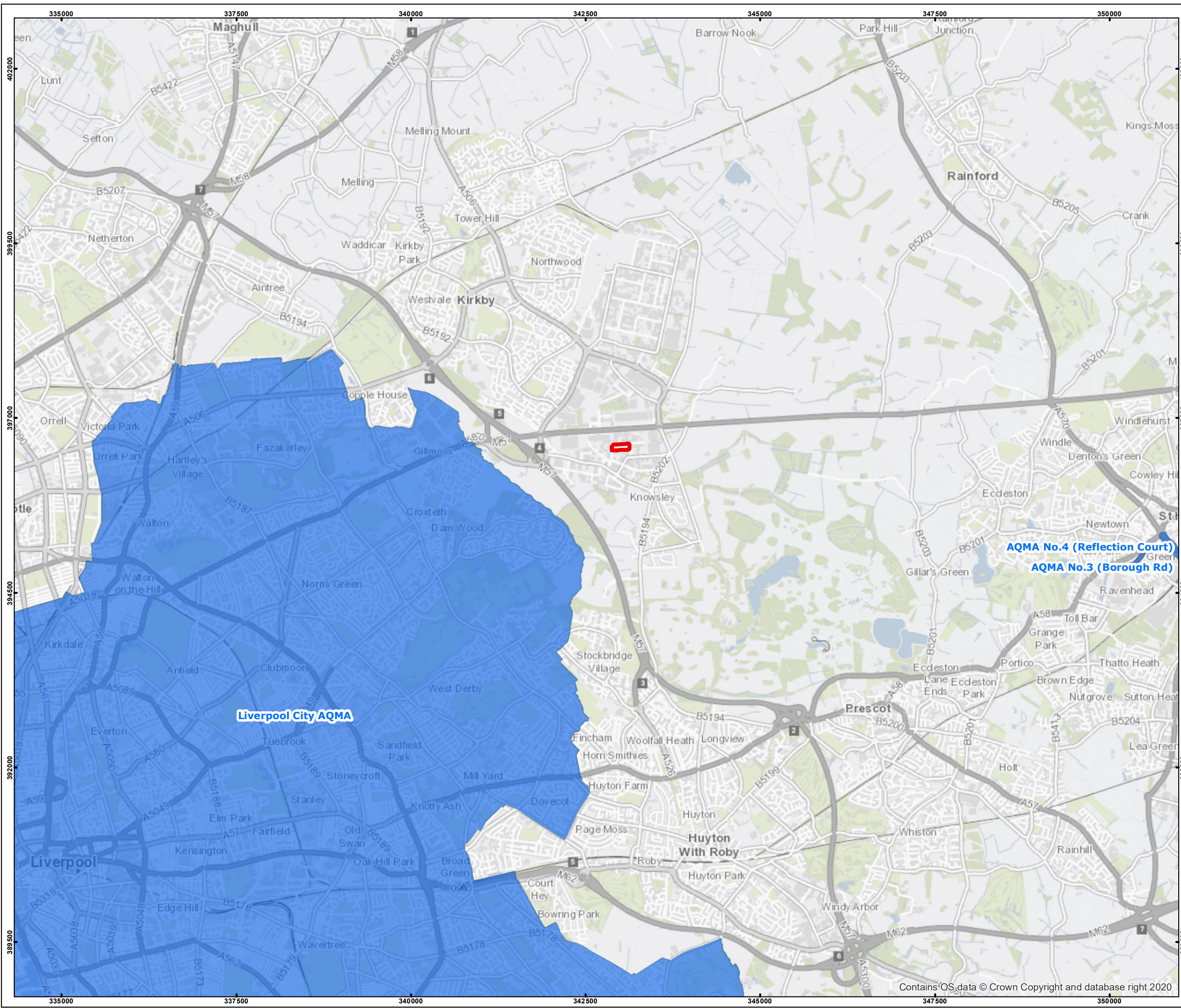
This Air Quality Impact Assessment has been undertaken to support the planning application for the Proposed Development, in Knowsley. This assessment has considered the generation of dust as a result of earthworks, construction and trackout activities and operational phase vehicle emissions.

In conclusion:

1. The assessment of dust generating activities has deemed that the site is of medium risk to dust nuisance and low risk to health effects. Suitable mitigation measures have been recommended. With the implementation of these measures, the effect of dust generated by construction activities will be not significant.
2. The number of vehicles expected during the operation of the Proposed Development is not expected to exceed the IAQM criteria for conducting an assessment and as such the impact is deemed to be negligible and not significant.
3. The Proposed Development does not conflict with any local planning policy relating to air quality.

Appendices

A Figures



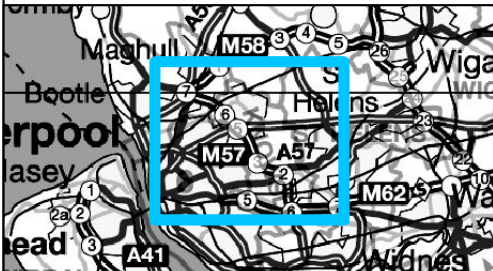
Legend

-  Site Boundary
-  AQMAs

Client:	Pembury Developments Limited
Site:	Knowsley Business Park
Project:	3559-01
Title:	

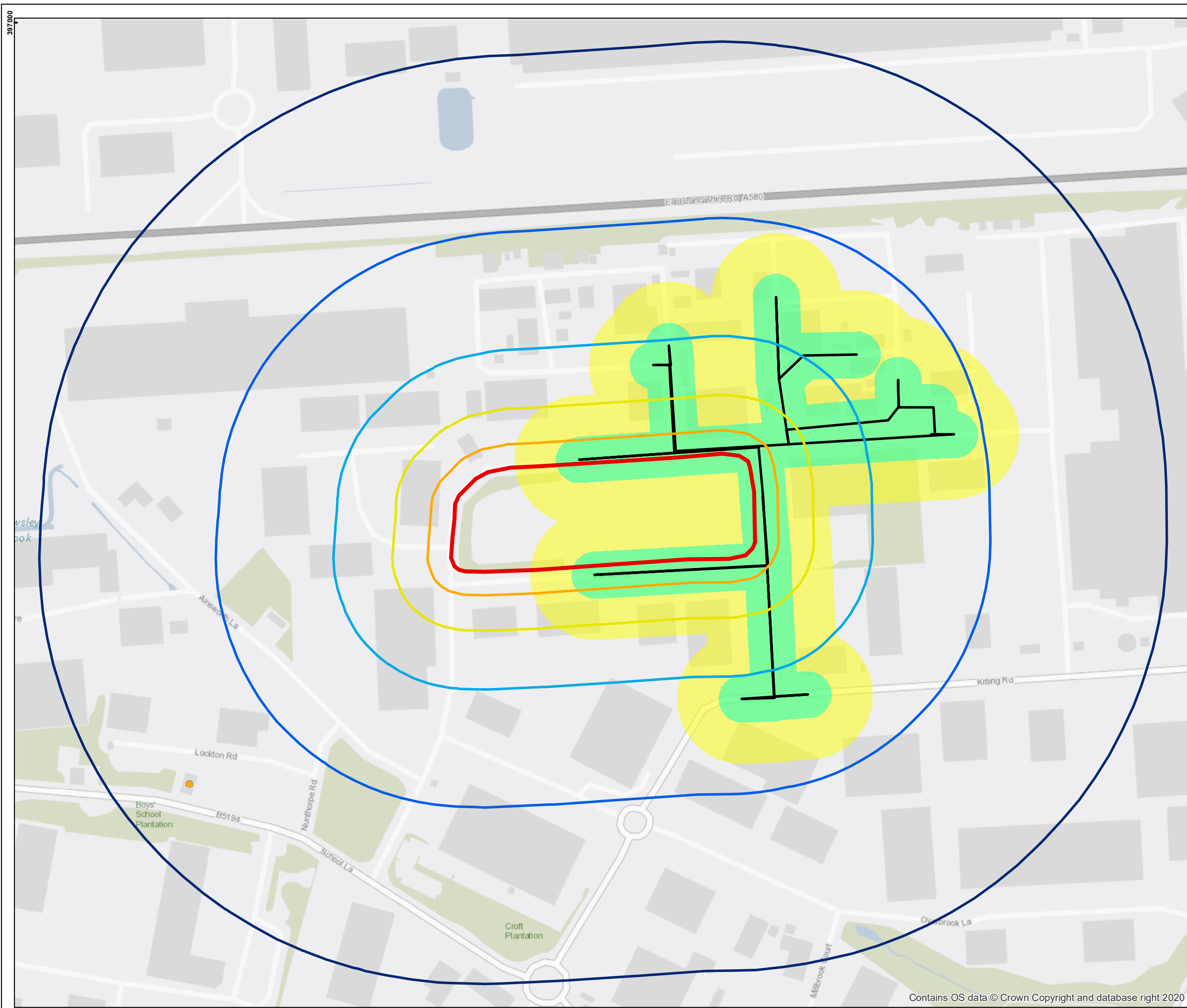
Figure 1. Site Location & AQMAs

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Stockport, Cheshire, SK4 1LW
Tel: 0161 476 0032
Fax: 0161 474 0618



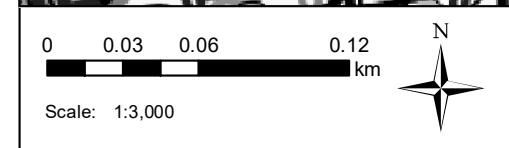
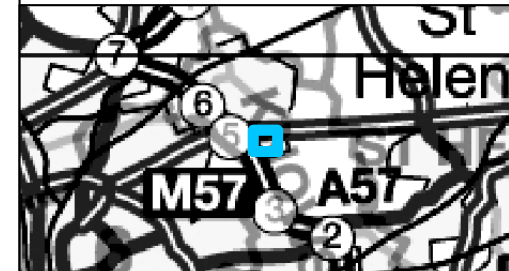
Legend

- Residential Properties
- Site Boundary
- 20 m buffer
- 50 m buffer
- 100 m buffer
- 200 m buffer
- 350 m buffer
- Trackout (200 m from site access point)
- Trackout 20 m buffer
- Trackout 50 m buffer

Client:	Pembury Developments Limited
Site:	Knowsley Business Park
Project:	3559-01
Title:	

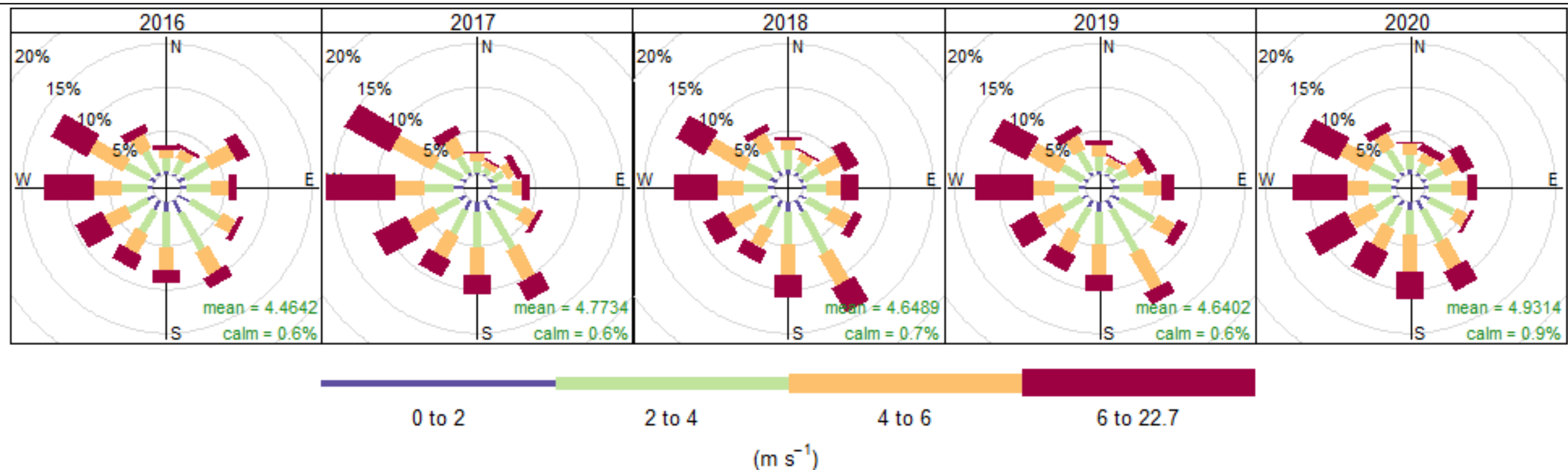
Figure 2. Dust Impact Zones

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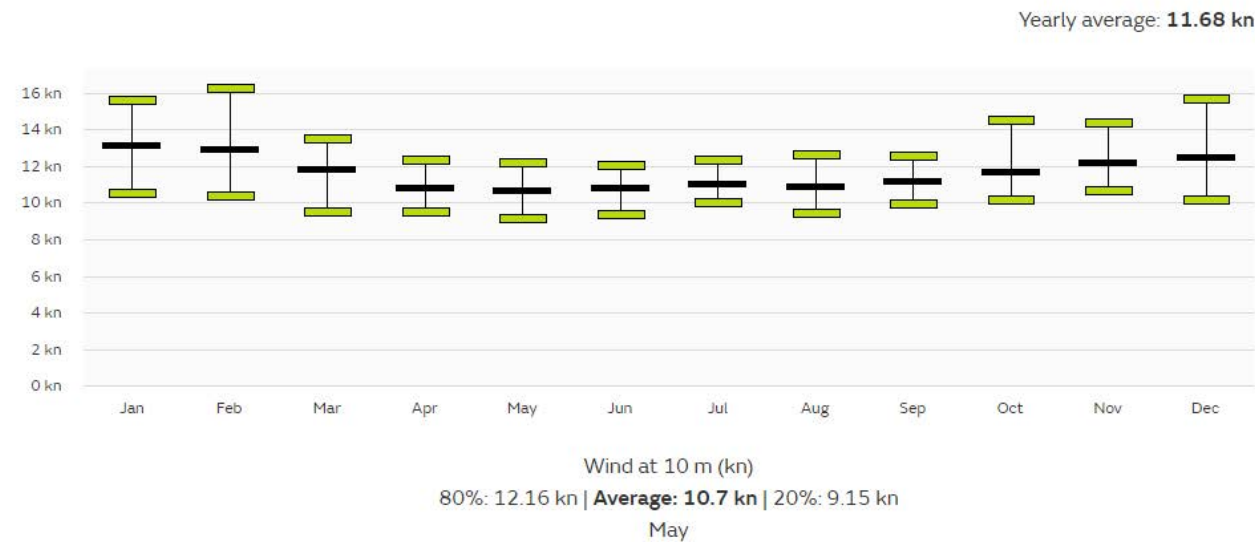
FICHTNER
Consulting Engineers Limited

Kingsgate, Wellington Road North,
Stockport, Cheshire, SK4 1LW
Tel: 0161 476 0032
Fax: 0161 474 0618

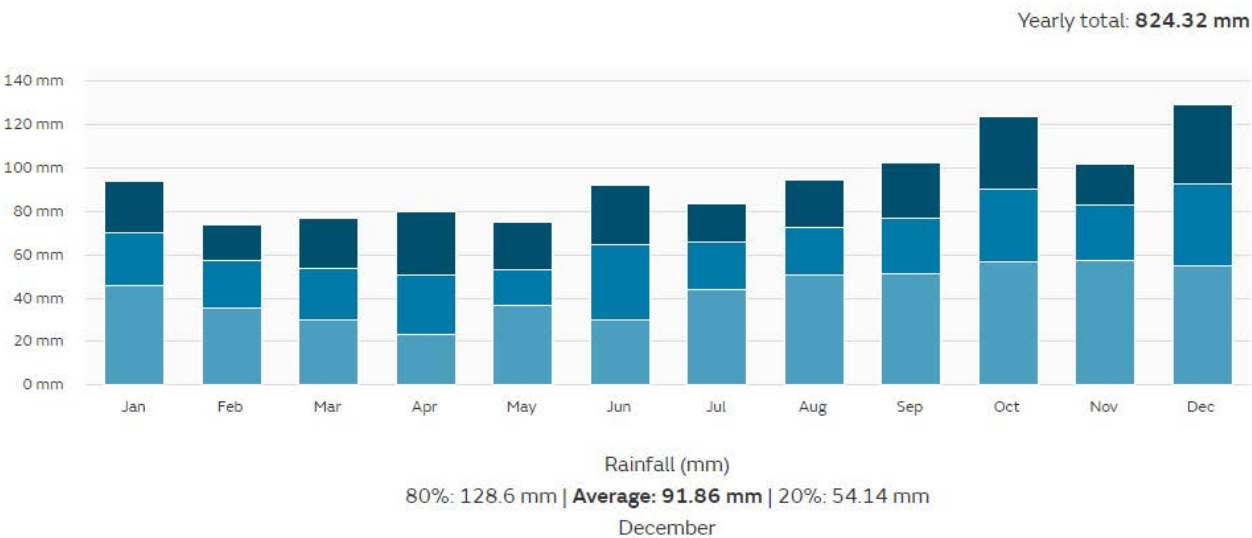


Frequency of counts by wind direction (%)

Station: Crosby
Wind at 10 m, 1991-2020



Station: Crosby
Rainfall, 1991-2020

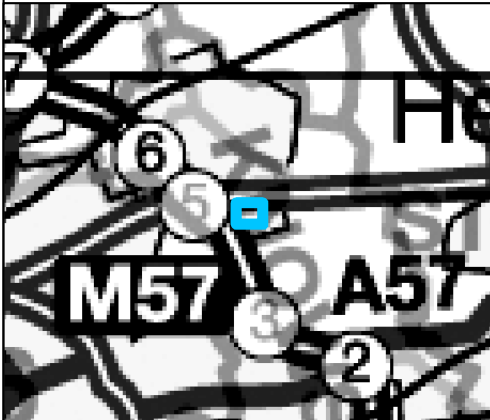


Legend

Client:	Pembury Developments Limited
Site:	Knowsley Business Park
Project:	3559-01
Title:	

Figure 3. Climatic Data

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FICHTNER
Consulting Engineers Limited

Kingsgate, Wellington Road North,
Stockport, Cheshire, SK4 1LW
Tel: 0161 476 0032
Fax: 0161 474 0618

B Construction Phase Dust Assessment Methodology

B.1 Background

The assessment is based on the risk of a construction site giving rise to dust impacts and the sensitivity of the surrounding area. The risk of dust emissions from a construction site causing loss of amenity and / or health or ecological effects is related to:

- The activities being undertaken (demolition, number of vehicles and plant etc.);
- The duration of these activities;
- The size of the site;
- The meteorological conditions (wind speed, direction and rain]fall);
- The proximity of receptors to the activity;
- The adequacy of the mitigation measures applied to reduce or eliminate dust; and
- The sensitivity of the receptors to dust.

The quantity of dust emitted is related to the area of land being worked and the level of construction activities, in terms of the nature, magnitude and duration of those activities. The wind direction, wind speed and rainfall at the time when a construction activity is taking place will also influence whether there is likely to be a dust impact. Atmospheric conditions which promote adverse impacts can occur in any direction from a site. However, adverse impacts are more likely to occur downwind of the prevailing wind direction and / or close to the worked areas. Impacts are also more likely to occur during drier periods as rainfall acts as a natural dust suppressant.

For developments where a detailed assessment is required, a risk category is determined based on two factors;

1. dust emission magnitude (Table 5); and
2. the sensitivity of the area (Table 6 to Table 11).

These factors are combined to give the risk of dust impacts (Table 12) in the absence of any mitigation measures.

B.2 Dust emission magnitude

The dust emission magnitude is based on the scale of the anticipated works and should be classified as Small, Medium or Large. The following are example of how the potential dust emissions magnitude for different activities can be defined:

Table 5: Dust Emission Magnitude Criteria

Magnitude	Description
Demolition Activities	
Large	total building volume > 50,000m ³ , potentially dusty construction material (i.e. concrete), on-site crushing and screening, demolition activities > 20m above ground level
Medium	total building volume 20,000 - 50,000m ³ , potentially dusty construction material, demolition activities 10 – 20m above ground level

Magnitude	Description
Small	total building volume < 20,000m ³ , construction material with low potential for dust release (i.e. metal cladding or timber), demolition activities <10m above ground level, demolition during wetter months
Earthworks	
Large	total size area > 10,000m ² , potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), > 10 heavy earth moving vehicles active at any one time, formation of bunds > 8m in height, total material moved > 100,000 tonnes
Medium	total size area 2,500 – 10,000m ² , moderately dusty soil type (i.e. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8m in height, total material moved 20,000 – 100,000 tonnes
Small	total size area < 2,500m ² , soil type with large grain size (i.e. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4m in height, total material moved < 10,000 tonnes, earthworks during wetter months
Construction Activities	
Large	total building volume > 100,000m ³ , piling, on site concrete batching, sandblasting
Medium	total building volume 25,000 – 100,000m ³ , potentially dusty construction material (e.g. concrete), piling, on site concrete batching
Small	total building volume < 25,000m ³ , construction material with low potential for dust release (e.g. metal cladding or timber)
Trackout	
Large	> 50 HDV (> 3.5t) trips in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m
Medium	10 – 50 HDV (> 3.5t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 – 100 m
Small	< 10 HDV (> 3.5t) trips in any one day, surface material with low potential for dust release, unpaved road length < 50 m

Only receptors within 50 m of the routes(s) used by vehicles on the public highway and up to 500 m from the site entrance(s) are considered to be at risk from the effects of dust.

B.3 Sensitivity of the area

The sensitivity of the area takes account of a number of factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;
- in the case of PM₁₀, the local background concentration; and
- site-specific factors, such as whether there are natural shelters, such as trees or other vegetation, to reduce the risk of wind-blown dust.

The type of receptors at different distances from the site boundary or, if known, from the dust generating activities, should be included. Consideration should also be given to the number of 'human receptors'. Exact counting of the number of 'human receptors' is not required. Instead, the guidance recommends that judgement is used to determine the receptors (a residential unit is one receptor) within each distance band.

There is no unified sensitivity classification scheme that covers the different potential effects on property, human health and ecological receptors. However, the following guidance is provided on the sensitivity of different types of receptors. For the sensitivity of people and their property to soiling, it is recommended that professional judgement is used to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the principles presented in Table 6.

Table 6: Sensitivity to Dust Soiling Effects

Sensitivity	Justification
High	Users can reasonably expect an enjoyment of a high level of amenity; or The appearance, aesthetics or value of their property would be diminished by dust deposition; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods as part of the normal pattern of use of the land. Indicative examples include dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms.
Medium	Users would expect to enjoy a reasonable level of amenity but would not reasonably expect to enjoy the same level of amenity as in their home; or The appearance, aesthetic or value of their property could be diminished by dust deposition; or The people or property would not reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land; Indicative examples include parks and places of work.
Low	The enjoyment of amenity would not reasonably be expected; or Property would not reasonably be expected to be diminished in appearance, aesthetics or value by dust deposition; or There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short-term car parks and roads.

For the sensitivity of people to the health effects of PM₁₀ the IAQM Guidance recommends that there are three sensitivities based on whether or not the receptor is likely to be exposed to elevated concentrations over a 24-hour period as presented in Table 7.

Table 7: Sensitivity to Health Effects of PM₁₀

Sensitivity	Justification
High	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM ₁₀ (in the case of the 24-hour

Sensitivity	Justification
	objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.
Medium	Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM ₁₀ (in the case of the 24- hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM ₁₀ , as protection is covered by Health and Safety at Work legislation.
Low	Locations where human exposure is transient. Indicative examples include public footpaths, playing fields, parks and shopping streets

Table 8 provides an example of possible sensitivities of receptors to ecological effects.

Table 8: Sensitivity to Ecological Effects

Sensitivity	Justification
High	Locations with an international or national designation and the designated features may be affected by dust deposition; or Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain. Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
Medium	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or Locations with a national designation where the features may be affected by dust deposition. Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	Locations with a local designation where the features may be affected by dust deposition. Indicative example is a local Nature Reserve with dust sensitive features.

Table 9, Table 10 and Table 11 show how sensitivity of the area should be determined for dust deposition, human health and ecosystem impacts respectively. The sensitivity of the is then derived for construction, earthworks and track out.

Table 9: Sensitivity of the Area to Dust and Soiling Impacts on People and Property

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 10: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Conc.	No. of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m ³	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28 - 32 µg/m ³	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24 - 28 µg/m ³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m ³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg/m ³	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28 - 32 µg/m ³	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24 - 28 µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table 11: Sensitivity of the Area to Ecological Impacts

Receptor sensitivity	Distance from the source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

B.4 Risk of dust impacts

The dust magnitude and sensitivity of the area are then combined using the following matrices to determine the risk of impacts with no mitigation applied. For the cases where the risk category is 'negligible', no mitigation measures beyond those required by accepted best practice would be necessary.

Table 12: Risk of Dust Impacts – Level of Mitigation Required

Sensitivity of area	Dust emission magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Earthworks			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
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

ENGINEERING  CONSULTING

FICHTNER

Consulting Engineers Limited

Kingsgate (Floor 3), Wellington Road North,
Stockport, Cheshire, SK4 1LW,
United Kingdom

t: +44 (0)161 476 0032

f: +44 (0)161 474 0618

www.fichtner.co.uk