Wain Homes (North West) Limited

Proposed Residential Development at Mill Lane, Newton Le Willows, St Helens

Air Quality Assessment

Project No: 444766-01 (01)

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RSK GENERAL NOTES

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Title: Proposed Residential Development at Mill Lane, Newton Le Willows, St Helens- Air Quality Assessment

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Abbreviations

AADT	Annual Average Daily Traffic
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Standard
ASR	Annual Status Report
CHP	Combined Heat and Power
CO	Carbon Monoxide
DEFRA	Department for Environment, Food and Rural Affairs
DMP	Dust Management Plan
EC	European Commission
EPUK	Environmental Protection UK
EU	European Union
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LDV	Light Duty Vehicle
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NPPF	National Planning Policy Framework
$PM_{2.5}$	Particulate matter of size fraction approximating to <2.5µm diameter
PM_{10}	Particulate matter of size fraction approximating to <10µm diameter
RSK	RSK Environment Limited
SHC	St Helens Council
VOC	Volatile Organic Compounds

CONTENTS

1 INTRODUCTION

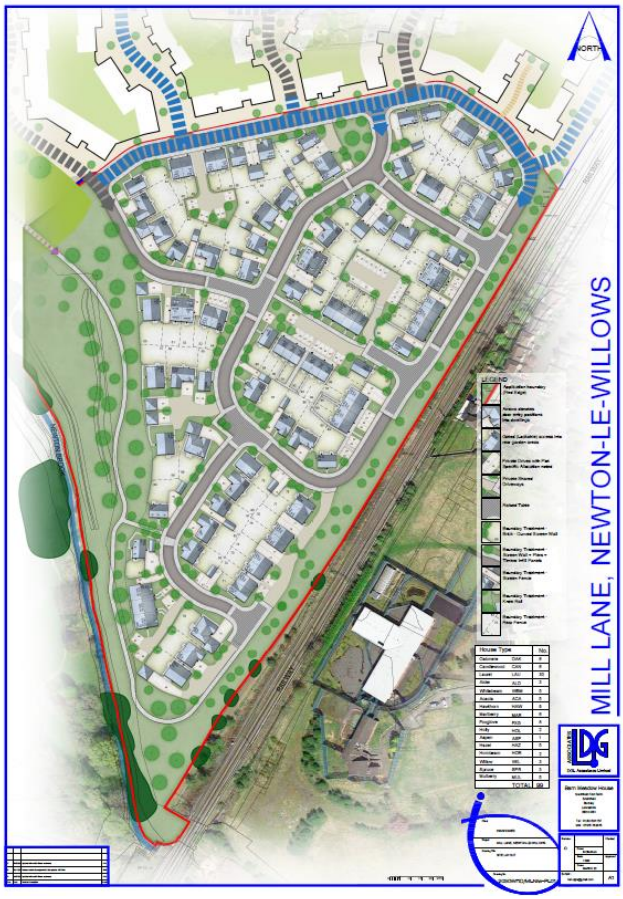
1.1 Background

RSK was commissioned to prepare an assessment of the potential air quality impacts associated with the proposed residential development at Mill Lane, Newton Le Willows, St Helens. Figure 1.1 shows the 'redline' boundary and proposed site layout.

The proposed development comprises the development of 99 residential dwellings. The approximate centre of the site is 359210, 394537. The site is within the administration areas of St Helens Council (SHC).

This report presents the findings of an assessment of existing/baseline air quality conditions, potential air quality impacts during the construction phase of the proposed development and anticipated impacts on local air quality resulting from road traffic emissions associated with the development once it is occupied.

Figure 1.1: Proposed Development Site Location



2 LEGISLATION, PLANNING POLICY & GUIDANCE

2.1 Key Legislation

2.1.1 Air Quality Strategy

UK air quality policy is published under the umbrella of the Environment Act 1995, Part IV and specifically Section 80, the National Air Quality Strategy. The latest *Air Quality Strategy for England, Scotland, Wales and Northern Ireland – Working Together for Clean Air*, published in July 2007 sets air quality standards and objectives for ten key air pollutants to be achieved between 2003 and 2020.

The EU (European Unit) Air Quality Framework Directive (1996) established a framework under which the EU could set limit or target values for specified pollutants. The directive identified several pollutants for which limit or target values have been, or will be set in subsequent 'daughter directives'. The framework and daughter directives were consolidated by Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe, which retains the existing air quality standards and introduces new objectives for fine particulates ($PM_{2.5}$).

The Clean Air Strategy 2019 supersedes the policies outlined in the 2007 strategy. This latest strategy aims to have a more joined-up approach, outlining actions the Government plans to take to reduce emissions from transport, homes, agriculture and industry. However, the air quality objectives remain as previously detailed within the 2007 strategy.

2.1.2 Air Quality Standards

The air quality standards (AQSs) in the United Kingdom are derived from European Commission (EC) directives and are adopted into English law via the Air Quality (England) Regulations 2000 and Air Quality (England) Amendment Regulations 2002. The Air Quality Limit Values Regulations 2003 and subsequent amendments implement the Air Quality Framework Directive into English Law. Directive 2008/50/EC was translated into UK law in 2010 via the Air Quality Standards Regulations 2010.

The relevant[1] AQS to England and Wales to protect human health are summarised in Table 2.1.

[1] Relevance, in this case, is defined by the scope of the assessment.

Table 2.1: Air Quality Standards (AQS) Relevant to the Proposed Development

Substance	Averaging period	Exceedances allowed per year	Ground level concentration limit (µg/m^3)
Nitrogen dioxide (NO_2)	1 calendar year	-	40
	1 hour	18	200
Fine particles (PM_{10})	1 calendar year	-	40
	24 hours	35	50
Fine particles ($PM_{2.5}$)	1 year	-	20

2.1.3 The Environment Act, 1995

These objectives are to be used in the review and assessment of air quality by local authorities under Section 82 of the Environment Act (1995). If exceedances are measured or predicted through the review and assessment process, the local authority must declare an Air Quality Management Area (AQMA) under Section 83 of the act, and produce an Air Quality Action Plan (AQAP) to outline how air quality is to be improved.

2.1.4 The Environment Act, 2021

On the 10th of November 2021, the new Environment Act (2021) passed royal assent, which amends the Environment Act (1995) to reinforce the local air quality management (LAQM) framework in order to encourage cooperation at the local level and broaden the range of organisations that play a role in improving local air quality. The Environment Act requires targets to be set for fine particulate matter $PM_{2.5}$, but at the time of writing, these have not been finalised.

2.2 Planning Policy

The land use planning process is a key means of improving air quality, particularly in the long term, through the strategic location and design of new developments. Any air quality concern that relates to land use and its development can, depending on the details of the proposed development, be a material consideration in the determination of planning applications.

2.2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was revised and published in July 2021, superseding the previous NPPF with immediate effect. The NPPF includes a presumption in favour of sustainable development.

Section 15 of the NPPF deals with Conserving and Enhancing the Natural Environment, and states that the intention is that the planning system should prevent '*development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability*' and goes on to state that '*new development* [should be] *appropriate for its location' and 'the effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account*.'

With specific regard to air quality, the NPPF states that: *"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."*

2.2.2 Local Planning Policy

St Helens Borough Local Plan Up To 2037 (July 2022)

SHC policies for managing developments are laid out in the St. Helens Borough Local Plan, which include SHC policies relating to air quality. Policy LPD09 Air Quality states the following:

"1. Development proposals must demonstrate that they will not:

a) impede the achievement of any objective(s) or measures(s) set out in an Air Quality Management Area (AQMA) Action Plan; or

b) introduce a significant new source of any air pollutant, or new development whose users or occupiers would be particularly susceptible to air pollution, within an AQMA; or

c) lead to a significant deterioration in local air quality resulting in unacceptable effects on human health, local amenity, or the natural environment, that would require a new AQMA to be created; or

d) having regard to established local and national standards, lead to an unacceptable decline in aur quality in any area.

2. Major development schemes should demonstrably promote a shift to the use of sustainable modes of transport to minimise the impact of vehicle emissions on air quality.

3. New development that would result in increased traffic flows on the M62 past Manchester Mosses Special Area of Conservation (SAC) of more than 1000 vehicles per day or 200 Heavy Good Vehicles (HGVs) per day must be accompanied by evidence identifying whether the resultant impacts on air quality would cause a significant effect on ecological interests within the SAC. Where such effects are identified they would need to be considered in accordance with Policy LPC06."

2.3 Best Practice Guidance

2.3.1 Guidance on the Assessment of Dust from Demolition and Construction

The Institute of Air Quality Management (IAQM) published a guidance document (Holman *et al*., 2014) on the assessment of construction phase impacts (herein the 'IAQM construction dust guidance'). The guidance was produced to provide advice to developers, consultants and environmental health officers on how to assess the

impacts arising from construction activities. The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM_{10} impacts on public exposure and impact upon sensitive ecological receptors) and to identify mitigation measure appropriate to the level of risk identified.

2.3.2 Local Air Quality Management Review and Assessment Technical Guidance

The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities in their air quality review and assessment work. This guidance, referred to in this document as the Local Air Quality Management Technical Guidance (Defra, 2022) ('LAQM TG.22').

2.3.3 Land-Use Planning & Development Control: Planning for Air Quality

Environmental Protection UK's (EPUK) and the IAQM jointly published a revised version of the guidance note 'Land-Use Planning & Development Control: Planning for Air Quality' in 2017 (herein the 'EPUK-IAQM guidance') to facilitate consideration of air quality within local development control processes. It provides a framework for air quality considerations, promoting a consistent approach to the treatment of air quality issues within development control decisions.

The guidance includes methods for undertaken an air quality assessment and an approach for assessing the significance of effects. The guidance note is widely accepted as an appropriate reference method for this purpose.

3 ASSESSMENT SCOPE

3.1 Overall Approach

The approach taken for assessing the potential air quality impacts of the proposed development may be summarised as follows:

- Baseline characterisation of local air quality;
- Qualitative impact assessment of the construction phase of the development using the 2014 IAQM guidance;
- Qualitative assessment of the operational phase of the development, with reference to the 2017 EPUK-IAQM guidance; and
- Recommendation of mitigation measures, where appropriate, to ensure any adverse effects on air quality are minimised.

3.2 Baseline Characterisation

Existing or baseline air quality refers to the concentrations of relevant substances that are already present in ambient air. These substances are emitted by various sources, including road traffic, industrial, domestic, agricultural and natural sources.

A desk-based study has been undertaken including a review of monitoring data available from SHC and estimated background data from the LAQM Support website maintained by Defra. Consideration has also been given to potential sources of air pollution and the presence of AQMA.

3.3 Construction Phase Assessment

3.3.1 Construction Dust and Particulate Matter

Construction works for the proposed development have the potential to lead to the release of fugitive dust and particulate matter. An assessment of the likely significant effects of construction phase dust and particulate matter at sensitive receptors has therefore been undertaken following the IAQM's construction dust guidance.

Three separate dust impacts were considered:

- Disamenity to dust soiling;
- The risk of health effects due to an increase in exposure to PM_{10}; and
- Harm to ecological receptors.

In order to assess the potential impacts of construction, activities are divided into four types:

- Demolition;
- Earthworks;
- Construction; and

- Trackout[2].

The risk of dust and PM_{10} arising to cause disamenity and/or health or ecological impacts was based on an assessment of likely emissions magnitude and the sensitivity of the surrounding environment. The risk category may be different for each of the four 'construction' activities.

Appendix A sets out the construction dust assessment methodology in detail as per IAQM construction dust guidance. Once the level of risk has been determined, then site specific mitigation proportionate to the level of risk can be identified (as detailed in Appendix B).

The Magic Map application available online by Defra was used to identify statutory ecological receptors near the proposed development site area.

3.3.2 Emissions to Air from Construction Traffic and Plant

Exhaust emissions from construction phase vehicles and plant may have an impact on local air quality adjacent to the routes used by these vehicles to access the proposed development site and in the vicinity of the proposed development site itself. Detailed information on the number of vehicles and plant associated with the construction phase is not available at this stage (and would not be until after appointment of the main construction contractors). Therefore, a qualitative impact assessment has been undertaken based on professional judgement and considering the following factors:

- The likely duration of the construction phase;
- The potential number and type of construction traffic and plant that could be required; and
- The number and proximity of sensitive receptors to the proposed development site and along the likely construction vehicle routes.

3.4 Operational Phase Impact Assessment

3.4.1 Emissions to Air from Operational Phase Traffic

The EPUK-IAQM guidance provides indicative criteria for when an air quality assessment is likely to be required. If none of the criteria are exceeded, it is considered unlikely that there will be any significant impacts on air quality during the operational phase. A screening level assessment against these criteria has been undertaken in Section 5 of this report.

3.4.2 Emissions to Air from Operational Phase Combustion Plant

It is understood that no significant combustion sources such as combined heat and power (CHP) plant or biomass boilers are proposed as part of the scheme. Domestic space and water heating will be supplied by individual gas boilers.

[2] Trackout is defined as the transport of dust and dirt from the construction / demolition sites onto public road network, where it may be deposited and then re-suspended by vehicles using the network.

3.4.3 Exposure of Future Occupants to Air Pollution

The potential exposure of future users of the proposed development has been considered by reviewing the baseline conditions (Section 4) and the locations of sensitive receptors within the proposed development, as well as considering the EPUK-IAQM guidance.

4 BASELINE AIR QUALITY CHARACTERISATION

Existing or baseline air quality refers to the concentrations of relevant substances that are already present in ambient air. These substances are emitted by various sources, including road traffic, industrial, domestic, agricultural and natural sources. Baseline air quality data employed in this study have been obtained from monitoring stations maintained by SHC and the LAQM Support website operated by the Department for Environment, Food and Rural Affairs (Defra).

4.1 Emissions Sources and Key Air Pollutants

The application site is located in an area where the main source of air pollution is likely to be road traffic emissions. The proposed development is situated between the communication route of the A49 Mill Lane and the watercourse Newton Brook.

The site is in proximity to railway line, however LAQM TG.22 does not identify the railway line as experiencing a high number of diesel locomotives, therefore, further assessment of railway emissions is not considered necessary.

The principal pollutants relevant to this assessment are considered to be NO_2, PM_{10} and $PM_{2.5}$, generally regarded as the most significant air pollutants released by vehicular combustion processes, or subsequently generated by vehicle emissions in the atmosphere through chemical reactions.

4.2 Presence of AQMAs

SHC currently has four declared Air Quality Management Areas (AQMAs). The nearest AQMA to the proposed development site is the Newton High Street AQMA. The northern most boundary of the proposed development site is approximately 0.7km from the boundary of the Newton High Street AQMA. Therefore, the proposed development site is not located adjacent to or within an AQMA.

4.3 Baseline Monitoring Data

According to the SHC's 2021 Air Quality Annual Status Report (ASR), there were four automatic monitoring stations and a network of 32 diffusion tube monitoring locations across the district in 2020.

There were two automatic monitoring locations within 1.5km of the proposed development site. Table 4.1 presents the available monitoring data for NO_2 at these locations for years 2016-2020. Apart from automatic monitoring station, there were twelve NO_2 diffusion tubes within 1.5km of the proposed development site. The monitoring data from these sites are reproduced in Table 4.2 below. Figure 4.1 shows all fourteen monitoring locations within 1.5km of the development site.

Particulate matter monitoring data is not available in the vicinity (within 3km) of the proposed site.

The monitoring data show that, exceedances of the annual mean NO_2 AQS were recorded during 2016-2020 at one monitoring location, SR, within 1.5km of the development site for years 2016-2019. Both the automatic monitors are located roadside, within the AQMA, and concentrations recorded at these locations are not considered representative of conditions at the application site.

Diffusion tube 6 is located at a 'suburban' location, roadside to theA49 Mill Lane and it is considered that NO_2 concentrations monitored at diffusion tube 6 are likely to be broadly representative of conditions at the development site. No exceedance of the annual mean NO_2 objective concentration was recorded at this location during 2016 to 2020 and all annual means were below 25 µg/m^3, and therefore 'well below' the objective.

Table 4.1: NO_2 Monitoring Results at Automatic Monitoring Stations HS and SR

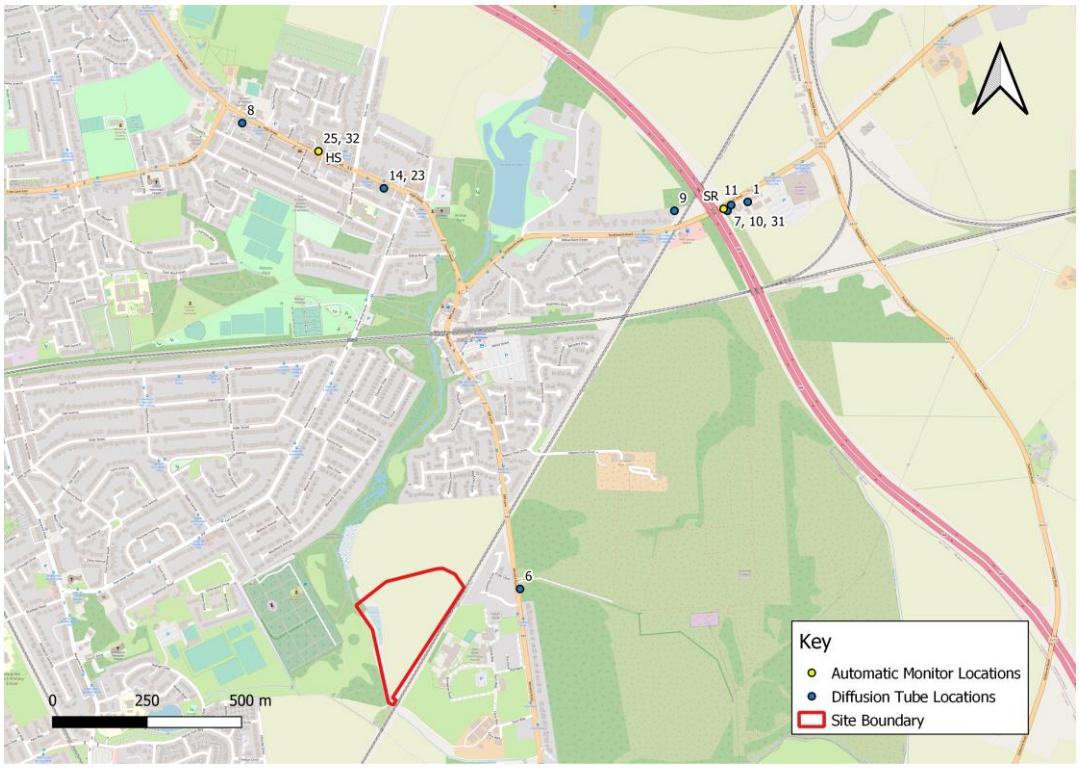
Site ID	Location	Result Type	Site Description	Approximate Distance from Site (km)	Monitoring Result				
					2016	2017	2018	2019	2020
HS	St Helens High Street	Annual Mean NO_2 Concentration ((µg/m^3)	Roadside	1.3	38	31	35	31	30
		Number of Hours NO_2 >200µg/m^3			0	0	0	0	0
SR	St Helens Southworth Road	Annual Mean NO_2 Concentration ((µg/m^3)	Roadside	1.4	**51**	**50**	**45**	**43**	34
		Number of Hours NO_2 >200µg/m^3			3	3	0	0	0

Note: Results shown in **bold** exceed the air quality objective.

Table 4.2: Annual Mean NO_2 Concentrations at the Diffusion Tube Locations within 1.5km of the Proposed Development Site

Site ID	Location	Site type	Approximate Distance from Site (km)	Annual Mean NO_2 Concentrations (µg/m³)				
				2016	2017	2018	2019	2020
6	Parkside Lampost	Suburban	0.3	24.3	23.6	21.3	21.5	17.3
14, 23	19 High Street	Roadside	1.2	33.7	33.3	31.6	30.7	28.0
9	3 Waterworks Cottages	Roadside	1.3	24.1	20.9	21.8	21.7	16.7
25, 32	High Street Monitor	Roadside	1.3	32.6	30.7	31.5	30.0	24.7
1	170 Southworth Road	Roadside	1.4	29.2	26.5	25.0	24.9	23.2
7, 10, 31	160 Southworth Road	Roadside	1.4	34.7	37.7	34.9	31.4	31.5
8	157 High Street	Roadside	1.4	25.5	22.5	24.1	23.0	19.8
11	Southworth Road LP 11	Roadside	1.4	-	-	-	34.0	31.7

Figure 4.1 Monitoring Locations within 1.5km of the Proposed Development Site



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4.4 LAQM Background Data

In addition to the local monitoring data, estimated background air quality data available from the Local Air Quality Management (LAQM) website operated by Defra, may also be used to establish likely background air quality conditions at the proposed development site.

This website provides estimated annual average background concentrations of NO_2, PM_{10} and $PM_{2.5}$ on a 1km^2 grid basis. Table 4.3 reproduces estimated annual average background concentrations for the grid square containing the proposed development site for years from 2022 to 2024. No exceedances of the NO_2, PM_{10} or $PM_{2.5}$ AQSs are predicted. As background concentrations are predicted to fall with time, background concentrations in future years would not be expected to exceed their respective AQSs.

Table 4.3: Estimated Background Annual Average NO_2, PM_{10} and $PM_{2.5}$ Concentrations at Proposed Development Site (from 2018 base map)

Assessment Year	Estimated Annual Average Pollutant Concentrations Derived from the LAQM Website (µg/m^3)		
	NO_2	PM_{10}	$PM_{2.5}$
2022	11.3	11.4	7.3
2023	10.9	11.3	7.2
2024	10.5	11.2	7.1
Air Quality Objective	**40**	**40**	**20**

Note: Presented concentrations for 1 km^2 grid centred on 359500, 394500; approximate centre of development site is 359210, 394537.

4.5 Background Air Quality at the Proposed Development Site

Based on the local monitoring data and estimated background concentrations from Defra, the annual mean NO_2, PM_{10} and $PM_{2.5}$ air quality objectives are considered unlikely to be exceeded at the site.

The EPUK-IAQM 2017 guidance indicates that the annual mean PM_{10} concentrations tend to be greater than ~31µg/m^3 for an exceedance of the daily mean PM_{10} AQS to be likely.

LAQM TG.22 indicates that the annual mean NO_2 concentrations tend to be greater than 60µg/m^3 for an exceedance of the hourly mean NO_2 AQS to be likely.

Based on the monitoring data available and the estimated background concentrations of NO_2 and PM_{10}, it is considered unlikely that short-term NO_2 and PM_{10} AQSs would be exceeded at or in close proximity to the proposed development site.

Overall, exceedances of any of the relevant AQSs are not anticipated, and air quality is considered likely to be good at the proposed development site.

5 ASSESSMENT OF IMPACTS

5.1 Construction Phase

Atmospheric emissions from construction activities will depend on a combination of the potential for emissions (the type of activity and prevailing conditions) and the effectiveness of control measures. In general terms, there are two sources of emissions that will need to be controlled to minimise the potential for adverse environmental effects:

- exhaust emissions from site plant, equipment and vehicles; and
- fugitive dust emissions from site activities.

5.1.1 Exhaust Emissions from Plant and Vehicles

The operation of vehicles and equipment powered by internal combustion engines results in the emission of exhaust gases containing the pollutants NO_x, PM_{10}, volatile organic compounds (VOCs) and carbon monoxide (CO). The quantities emitted depend on factors such as engine type, service history, pattern of usage and fuel composition.

Construction traffic will comprise haulage/construction vehicles and vehicles used for workers' trips to and from the application site. The greatest impact on air quality due to emission from construction phase vehicles will be in areas adjacent to the application site access and nearby road network.

At this stage, detailed information regarding construction phase traffic flow is not available, however considering the size of the development, it is estimated that there will be 10-50 HDV outward movements per day, which is considered unlikely to cause a significant impact on local air quality, in accordance with the IAQM guidance.

The operation of site equipment and machinery will result in emissions to atmosphere of exhaust gases, but with suitable controls and site management such emissions are unlikely to be significant (as per LAQM.TG.22).

5.1.2 Fugitive Dust Emissions

Fugitive dust emissions arising from construction activities are likely to be variable in nature and will depend upon the type and extent of the activity, soil type and moisture content, road surface conditions and weather conditions. Periods of dry weather combined with higher than average wind speeds have the potential to generate more dust.

The construction activities anticipated as part of the proposed development that are often the most significant potential sources of fugitive dust emissions are:

- Earthworks comprising of levelling, construction of foundations, haulage, tipping, stockpiling, landscaping and tree removal;
- Construction of proposed development and hard landscaped areas; and,

- Trackout, involving the movement of vehicles over surfaces where muddy materials have been transferred off-site (for example, on to public highways).

Fugitive dust arising from construction and demolition activities is mainly of a particle size greater than the PM_{10} fraction (that which can potentially impact upon human health). However, it is noted that demolition and construction activities may contribute to local PM_{10} concentrations. Appropriate dust control measures can be highly effective for controlling emissions from potentially dust generating activities identified above, and adverse effects can be greatly reduced or eliminated.

See Appendix A for further explanation of the tendency of dust to remain airborne.

5.1.3 Potential Dust Emission Magnitude

With reference to the IAQM guidance criteria outlined in Appendix A, the dust emissions magnitude for earthworks, construction and trackout activities are summarised in Tables 5.1, 5.2 and 5.3. There is no demolition proposed, hence the assessment for demolition is not included. Risk categories for the construction activities are summarised in Table 5.4.

Worst-case assumptions have been made, where information is not currently available, for a conservative assessment.

Table 5.1: Summary of Dust Emissions Magnitude of Earthworks Activities (Before mitigation)

Earthworks Criteria	Dust Emissions Class	Evaluation of the Effects
Total site area	Large	>10,000 m^2
Soil type	Small	Soil, sand
Earth moving vehicles at any one time	Small	<5
Height of bunds	Small	<4 m
Total material moved	Small	<20,000 tonnes
Work times	Large	Dry seasons
Overall Rating	**Medium**	Conservative rating based on professional judgement

Table 5.2: Summary of Dust Emissions Magnitude of Construction Activities (Before mitigation)

Construction Criteria	Dust Emissions Class	Evaluation of the Effects
Total building volume	Medium	25,000-100,000m^3
On-site concrete batching or sandblasting proposed	Small	No
Dust potential of construction materials	Medium	Yes
Overall Rating	**Medium**	Conservative rating based on professional judgement

Table 5.3: Summary of Dust Emissions Magnitude of Trackout Activities (Before mitigation)

Trackout Criteria	Dust Emissions Class	Evaluation of the Effects
Number of HDV>3.5t per day	Medium	10-50
Overall Rating	**Medium**	Conservative rating based on professional judgement

Table 5.4: Summary of Dust Emission Magnitude of the Site (Before mitigation)

Construction Activities	Dust Emissions Class
Demolition	N/A
Earthworks	Medium
Construction	Medium
Trackout	Medium

5.1.4 Sensitivity of the Area

As per the IAQM Guidance, the sensitivity of the area takes into account a number of factors, including:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of PM_{10}, the local background concentration; and
- Site specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

Consideration is given to human and ecological receptors, distances are calculated from the construction site boundary and the trackout route proposed. Where necessary, for example, if the trackout route is not yet known, a conservative view on the likely route has been taken.

Figures 5.1 and 5.2 show maps indicating the earthworks/construction and trackout buffers, respectively, for identifying the sensitivity of the area. Table 5.5 presents the determined sensitivity of the area. Construction activities are relevant up to 350m from the proposed development site boundary whereas trackout activities are only considered relevant up to 50m from the edge of the road, as per the IAQM guidance. Only 20m and 50m buffers have been included for trackout for this reason.

No designated ecological receptors have been identified within 50m of the application site boundary or the anticipated trackout route, therefore following the IAQM guidance ecological receptors have been screened out of the assessment and are not considered further.

Figure 5.1: Earthworks/Construction Activities Buffer Map

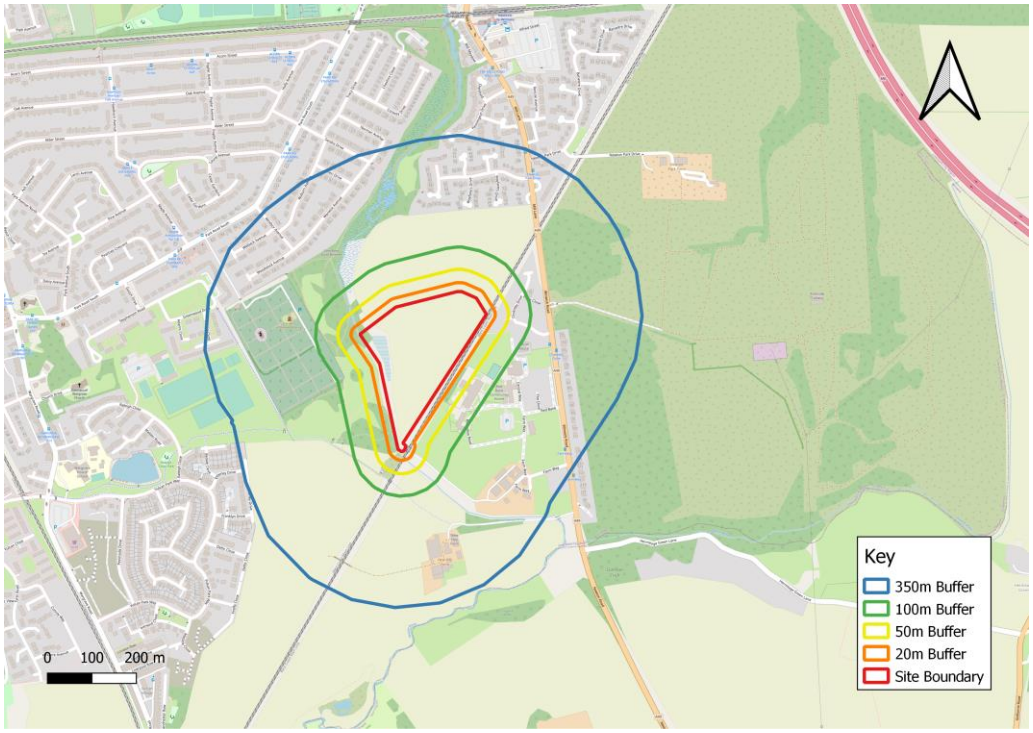

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Figure 5.2: Trackout Activities Buffer Map

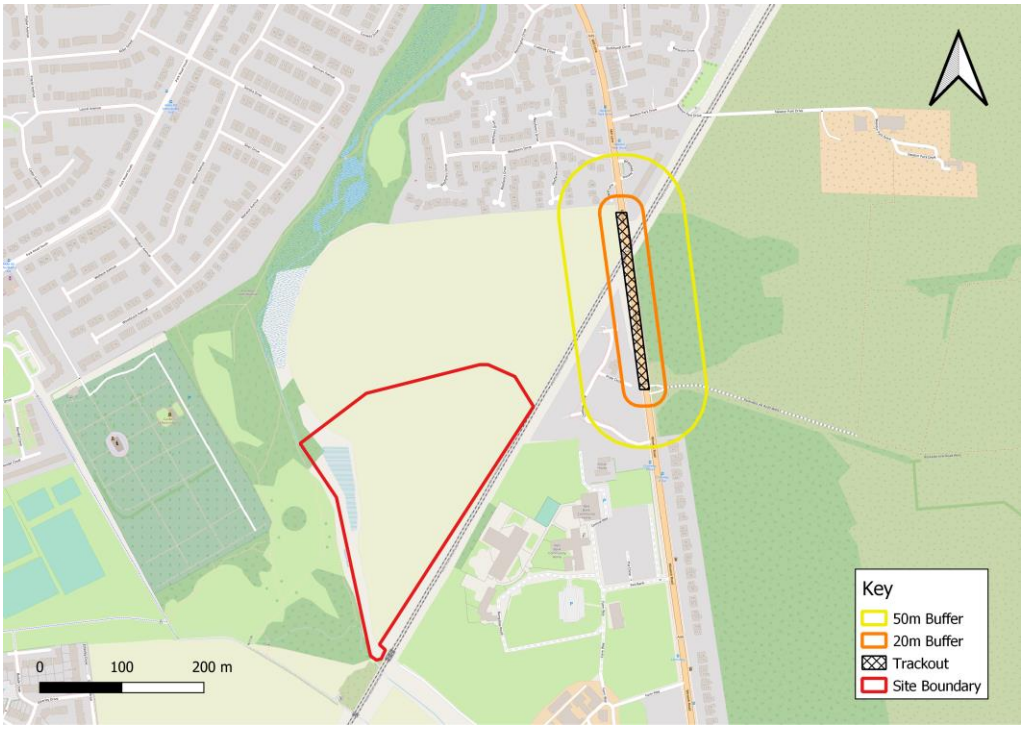

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Table 5.5: Sensitivity of the area

Potential Impact		Sensitivity of the surrounding area			
		Demolition	Earthworks	Construction	Trackout
Dust soiling	Receptor sensitivity	N/A	High	High	High
	Number of receptors	N/A	10-100	10-100	1-10
	Distance from the source	N/A	<50m	<50m	<20m
	Sensitivity of the area	**N/A**	**Medium**	**Medium**	**Medium**
Human health	Receptor sensitivity	N/A	High	High	High
	Annual mean PM_{10} concentration	N/A	<24μg/m^3	<24μg/m^3	<24μg/m^3
	Number of receptors	N/A	10-100	10-100	1-10
	Distance from the source	N/A	<50m	<50m	<20m
	Sensitivity of the area	**N/A**	**Low**	**Low**	**Low**
Ecological	Receptor sensitivity	N/A			

5.1.5 Risk of Impacts

The dust emission magnitude is combined with the sensitivity of the area to determine the risk of impacts of construction activities before mitigation; these are evaluated based on risk categories of each activity in Appendix A. The risk of dust impacts from construction activities is identified in Table 5.6.

Site specific mitigation measures to reduce construction phase impacts are defined based on this assessment in Section 6 and Appendix B.

Table 5.6: Summary of the Dust Risk from Construction Activities

Potential Impact	Dust Risk Impact			
	Demolition	Earthworks	Construction	Trackout
Dust soiling	N/A	Medium Risk	Medium Risk	Low Risk
Human health	N/A	Low Risk	Low Risk	Low Risk
Ecological	N/A			

5.2 Operational Phase

5.2.1 Emissions to Air from Operational Phase

No significant combustion sources such as combined heat and power (CHP) plant or biomass boilers are proposed as part of the scheme. At this stage energy required for heating and hot water are proposed to be supplied by individual gas boilers.

The principal operational phase air quality impact is likely to be associated with traffic emissions as a result of any changes in traffic flows or flow composition the development may bring.

Table 5.7 presents the EPUK-IAQM 2017 guidance screening criteria for when an air quality assessment might be required.

Based on the traffic data provided by the project transport consultant, SCP, it is understood that the proposed development is not expected to cause an increase of more than 500 annual average daily traffic (AADT) of light duty vehicles (LDVs) and no additional heavy duty vehicles (HDVs).

The distribution of development traffic estimates approximately 159 AADT is likely to travel through the Newton High Street AQMA, located 0.7km from the proposed development site. Therefore, the screening criteria is exceeded for LDV flows within an AQMA. However, as noted in Paragraph 6.16 of the EPUK-IAQM guidance, "*exceeding a screening criterion in Table 6.2 does not automatically lead to the requirement for a Detailed Assessment*".

The air quality monitoring data for the three A572/High Street nitrogen dioxide monitoring locations (Section 4) have been consistently comfortably below the objective concentration for the last five years and the minor development contribution of 159 light duty vehicles per day is considered very unlikely to result in an exceedance of the objective, and unlikely to result in a significant impact on air quality in the AQMA.

Table 5.7: Air Quality Screening Criteria from EPUK-IAQM 2017 Guidance

The Development will	Indicative Criteria to Proceed to an Air Quality Assessment	Is the Indicative Criteria Exceeded?
Cause a significant change in Light Duty Vehicle (LDV) traffic slows on local roads with relevant receptors.	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.	**Criterion is exceeded.** The proposed development is not expected to generate a change of LDV flows of more than 500 AADT (refer to Appendix C), but approximately 159 AADT is likely to travel through the Newton High Street AQMA, located 0.7km from the proposed development site. The screening criteria is exceeded for LDV flows within an AQMA.
Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors.	A Change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100AADT elsewhere.	**Criterion not exceeded.** The proposed development is not expected to generate any HDV movements once operational.
Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA	**Criterion not exceeded.** Road realignment is not proposed.
Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.	**Criterion not exceeded.** New junction and new traffic system are not proposed.
Introduce or change a bus station.	Where bus flows will change by: - more than 25 AADT within or adjacent to an AQMA - more than 100AADT elsewhere.	**Criterion not exceeded.** None proposed.
Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).	**Criterion not exceeded.** None proposed.
Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors.	Typically, any combustion plant where the single or combined NOx emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates. Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.	**Criterion not exceeded.** None proposed at the time of writing this report.

6 MITIGATION MEASURES

6.1 Construction Phase Mitigation

The dust emitting activities outlined in Section 5.1 can be effectively controlled by appropriate dust control measures and any adverse affects can be greatly reduced or eliminated.

The dust risk categories identified have been used to recommend mitigation methods. These should be translated into a dust management plan (DMP, which may be as part of a Construction Environmental Management Plan (CEMP)) for the construction phase should be prepared and agreed with the Local Authority to ensure that the potential for adverse environmental effects on local receptors is minimised. The DMP should include *inter alia*, measures for controlling dust and general pollution from site construction operations and include details of any monitoring scheme, if appropriate. Controls should be applied throughout the construction period to ensure that emissions are mitigated.

The traffic effects of the proposed development during the construction phase will be limited to a relatively short period and will be along traffic routes employed by haulage/construction vehicles and workers. Any effects on air quality will be temporary i.e. during the construction and demolition period only, and can be suitably controlled by the employment of mitigation measures appropriate to the development project.

With implementation of the proposed construction phase mitigation measures (detailed in Appendix B), the residual impacts are considered to be negligible.

6.2 Operational Phase Mitigation

The assessment predicted that the operational phase of the proposed development is not expected to have a significant effect on local air quality. Moreover, based on monitoring data and predicted background concentrations, future users of the proposed development are not expected to be exposed to poor air quality.

Nonetheless, best practice measures should be used to minimise the effects of the development on local air quality, including:

- Specification of electric or ‘low NOx’ boilers for domestic space and water heating;
- Provision of electric vehicle charging points or infrastructure;
- Provision of a Travel Plan to future residents to promote the use of public and active transport options; and
- Use of green infrastructure, in particular trees.

7 CONCLUSIONS

An air quality assessment for the proposed residential development at Mill Lane, Newton Le Willows, St Helens has been prepared with reference to existing air quality in the area and relevant air quality legislation, policy and guidance.

An assessment of construction phase impacts has been undertaken following the IAQM construction dust guidance. Mitigation measures are recommended to reduce the risk of dust and particulate matter being generated and re-suspended. With implementation of the appropriate measures, no significant impacts are anticipated during the construction phase.

A qualitative assessment of the operational impacts has been undertaken by comparing the traffic data of the development against the screening criteria outlined in the EPUK-IAQM guidance. Based on the traffic data provided by the project transport consultant, it is considered unlikely that the development will have a significant impact on local air quality once operational. The distribution of development traffic estimates an increase of approximately 159 AADT through the Newton High Street AQMA, however the results for the three A572/High Street nitrogen dioxide monitoring locations have been consistently comfortably below the objective concentration for the last five years and the minor development contribution of 159 light duty vehicles per day is highly unlikely to result in an exceedance of the objective, and unlikely to result in a significant impact on air quality in the AQMA. Therefore, the overall air quality impact of the development is considered to be ‘not significant’.

Nonetheless, best practice measures should be used to minimise the effects of the development on local air quality, including:

- Specification of electric or ‘low NOx’ boilers for domestic space and water heating;
- Provision of electric vehicle charging points or infrastructure;
- Provision of a Travel Plan to future residents to promote the use of public and active transport options; and
- Use of green infrastructure, in particular trees.

Based on the results of the assessment, it is judged that with appropriate mitigation, the proposed development complies with relevant national and local planning policies and that there are no air quality constraints.

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APPENDIX A
CONSTRUCTION DUST ASSESSMENT METHODOLOGY

This appendix contains the construction dust assessment methodology used in the assessment.

To assess the potential impacts, construction activities are divided into demolition, earthworks, construction and trackout. The descriptors included in this section are based upon the IAQM construction dust guidance. The assessment follows the steps recommended in the guidance.

Step 1: Screen the requirement for assessment

The first step is to screen out the requirement for a construction dust assessment, this is usually a somewhat conservative level of screening. An assessment is usually required where there is:

- a 'human receptor' within:
  - 350m of the boundary of the site; or
  - 50m of the route used by construction vehicles on the public highway, up to 500m from the site entrance(s).
- an 'ecological receptor':
  - 50m of the boundary of the site; or
  - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

Step 2A: Defining the Potential Dust Emission Magnitude

Demolition

The dust emission magnitude category for demolition is varied for each site in terms of timing, building type, duration and scale. Examples of the potential dust emission classes are provided in the guidance as follows:

- **Large**: Total building volume >50,000m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20m above ground level;
- **Medium**: Total building volume 20,000m^3 – 50,000m^3, potentially dusty construction material, demolition activities 10m – 20m above ground level; and
- **Small**: Total building volume <20,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.

Earthworks

The dust emission magnitude category for earthworks is varied for each site in terms of timing, geology, topography and duration. Examples of the potential dust emission classes are provided in the guidance as follows:

- **Large**: Total site area >10,000m^2, potentially dusty soil type (e.g. clay), >10 heavy earth moving vehicles active at any one time, formation of bunds >8m in height, total material moved >100,000 tonnes;

- **Medium**: Total site area 2,500 – 10,000m^2, moderately dusty soil type (e.g. 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; and
- **Small**: Total site area < 2,500m^2, soil type with large grain size (e.g. 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

The dust emission magnitude category for construction is varied for each site in terms of timing, building type, duration, and scale. Examples of the potential dust emissions classes are provided in the guidance as follows:

- **Large**: Total building volume >100,000m^3, on site concrete batching, sandblasting;
- **Medium**: Total building volume 25,000 – 100,000m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- **Small**: Total building volume <25,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout

Factors which determine the dust emission magnitude class of trackout activities are vehicle size, vehicle speed, vehicle number, geology and duration. Examples of the potential dust emissions classes are provided in the guidance as follows:

- **Large**: >50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- **Medium**: 10 – 50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 – 100m; and
- **Small**: <10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

<u>Step 2B</u>: Defining the Sensitivity of the Area

The sensitivity of the area is defined for dust soiling, human health and ecosystems. The sensitivity of the area takes into account the following factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of PM_{10}, the local background concentration; and
- Site-specific factors, such as whether here are natural shelters such as trees, to reduce the risk of wind-blown dust.

Table A1 has been used to define the sensitivity of different types of receptors to dust soiling, health effects and ecological effects.

Table A1: Sensitivity of the Area Surrounding the Site

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
High	• Users can reasonably expect enjoyment of a high level of amenity. • The appearance, aesthetics or value of their property would be diminished by soiling. • 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. • Examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.	• 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 objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day) • 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.	• Locations with an international or national designation *and* the designated features may be affected by dust soiling. • 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. • 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	• 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. • The appearance, aesthetics or value of their property could be diminished by soiling. • The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. • Examples include parks and places of work.	• 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). • 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.	• Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown. • Locations with a national designation where the features may be affected by dust deposition. • Example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	• The enjoyment of amenity would not reasonably be expected. • Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling. • 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. • Examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.	• Locations where human exposure is transient. • Indicative examples include public footpaths, playing fields, parks and shopping streets.	• Locations with a local designation where the features may be affected by dust deposition. • Example is a local Nature Reserve with dust sensitive features.

Based on the sensitivities assigned of the different types of receptors surrounding the site and numbers of receptors within certain distances of the site, a sensitivity classification for the area can be defined for each. Tables A2 to A4 indicate the method used to determine the sensitivity of the area for dust soiling, human health and ecological impacts, respectively.

For trackout, as per the IAQM construction dust guidance, it is only considered necessary to consider trackout impacts up to 50m from the edge of the road.

Table A2: Sensitivity of the area to dust soiling effects on people and property

Receptor Sensitivity	Number of Receptors	Distances 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 A3: Sensitivity of the area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Conc.	Number of Receptors	Distances from the Source (m)				
			<20	<50	<100	<200	<350
High	>32μg/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32μg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28μg/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	>32μg/m^3	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32μg/m^3	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28μg/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 A4: Sensitivity of the area to Ecological Impacts

Receptor Sensitivity	Distances from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Step 2C: Defining the Risk of Impacts

The final step is to use both the dust emission magnitude classification with the sensitivity of the area, to determine a potential risk of impacts for each construction activity, before the application of mitigation. Tables A5 to A7 indicate the method used to assign the level of risk for each construction activity.

Table A5: Risk of Dust Impacts from Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table A6: Risk of Dust Impacts from Earthworks/Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table A7: Risk of Dust Impacts from Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

APPENDIX B
SITE-SPECIFIC MITIGATION MEASURES

Site-specific mitigation measures are divided into general measures, applicable to all sites and measures specific to demolition, earthworks, construction and trackout. Depending on the level of risk assigned to each site, different mitigation is assigned. The method of assigning mitigation measures as detailed in the IAQM guidance has been used.

For those mitigation measures that are general, the highest risk has been applied. In this case, the 'medium risk' site mitigation measures have been applied, as determined by the dust risk assessment in Section 5. There are two categories of mitigation measure – 'highly recommended' and 'desirable', which are indicated according to the dust risk level identified in Table 5.6. Desirable measures are presented in *italics*.

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Display the name and contact details of people accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- Display the head or regional office contact information.

Dust Management

- Develop and implement a DMP, which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/ or visual inspections.

Site Management

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the 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.

Monitoring

- *Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log 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.*

- Carry out regular site inspections to monitor compliance with the dust management plan, 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 PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site.

Preparing and maintaining the site

- 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.

Operating Vehicles/Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- *Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas.*
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- *Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking and car-sharing).*

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 or burning of waste material.

Specific to Demolition

No demolition is proposed.

Specific to Earthworks

- *Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.*
- *Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.*
- *Only remove the cover in small areas during work and not all at once.*

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.
- *Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.*
- *For similar supplies of fine powder material ensure bags are sealed after use and stored appropriately to prevent dust.*

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 continuously in use.*
- *Avoid any 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).*

APPENDIX C
ROAD TRAFFIC DATA