

Report
Air Quality Assessment
Moorgate Point, Knowsley

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1 Introduction

- 1.1 This report has been prepared by Air Quality Consultants Ltd I Part of Logika Group (AQC). The experience of the authors is summarised in Appendix A1. The report describes the potential air quality impacts associated with the proposed commercial development at Moorgate Point, Knowsley.
- 1.2 The proposed development involves the construction of 2 warehouse units. Air quality needs to be considered to ensure that the development does not generate any unacceptable adverse air quality impacts during its construction or operation.
- 1.3 This report considers air quality in relation to public health. It has been prepared taking into account all relevant local and national guidance and regulations.

2 Policy Context

2.1 The following Policy has been followed when preparing this document. For details of each, see Appendix A2.

- Air Quality Strategy 2007
- Air Quality Strategy 2023
- Clean Air Strategy 2019
- Environment Act 2021
- Environmental Improvement Plan 2023
- National Planning Policy Framework (NPPF) Paragraphs 8c, 187, 198 and 199, alongside the air quality Planning Practice Guidance (PPG)
- Local Planning Policy
 - Knowsley Local Plan Core Strategy Policies CS2 and CS7
- National Air Quality Plan

3 Description of the Proposed Development

- 3.1 The proposed development is in Knowsley. It is within an existing industrial estate, approximately 300 m north of the A580, and 200 m east of the A5207. It is surrounded by existing industrial and warehouse units. The nearest residential properties are approximately 250 m to the west, beyond the A5207. The site currently consists of scrub ground and hardstanding, with a small building in the southwest corner.
- 3.2 The site is not within an Air Quality Management Area (AQMA). The closest AQMA is in Liverpool; Liverpool City Council has declared its entire area as an AQMA for exceedances of the annual mean nitrogen dioxide objective.
- 3.3 The proposed development involves the construction of two warehouse units with a combined area of 18,384 m² Gross Internal Area (GIA), along with loading docks and associated car parking and infrastructure. There will be no centralised combustion plant. Site access will be from the A580, via Alchemy Way, which runs directly north-south through Alchemy Business Park.
- 3.4 The setting of the proposed development is shown in Figure 1, along with the Liverpool AQMA.

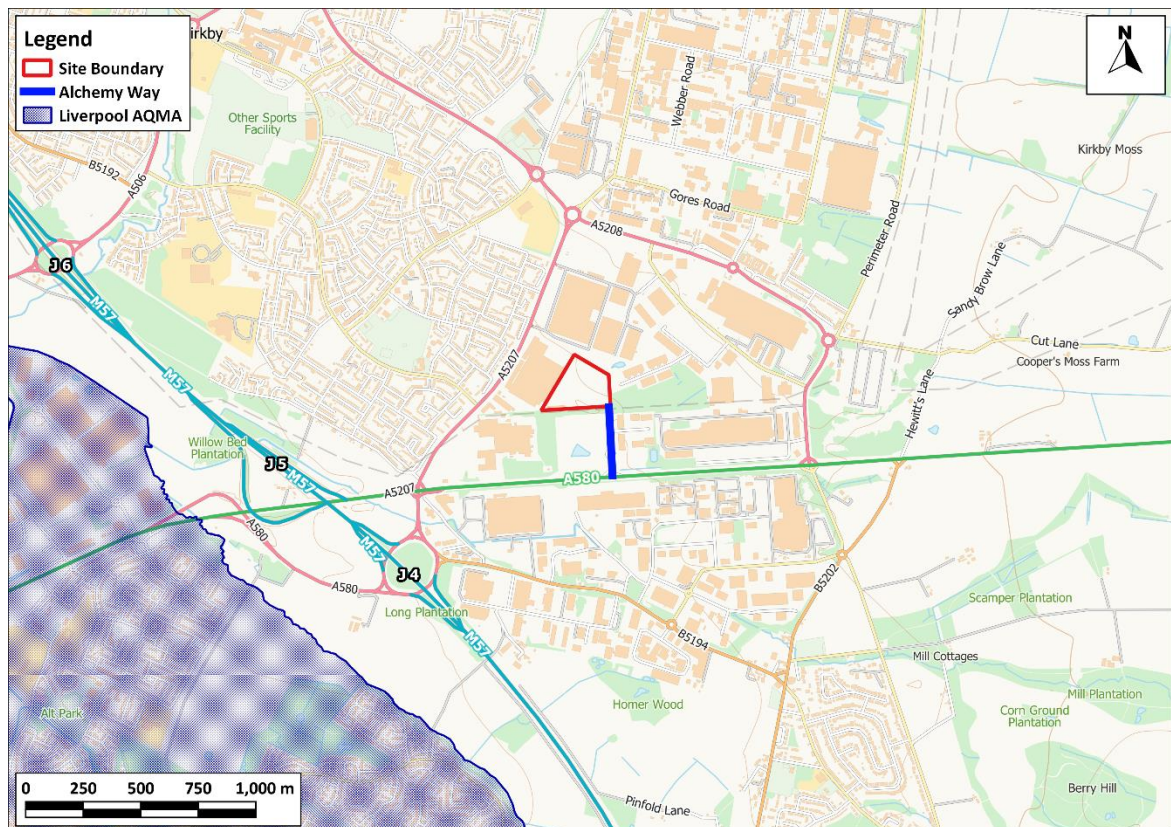


Figure 1: Proposed Development Setting

Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v3.0.

- 3.5 The potential air quality impacts which require assessing are those from emissions during the construction works and those from road traffic once the proposed development is operational.

4 Pollutants of Concern

- 4.1 The main air pollutants of concern in relation to road traffic are nitrogen dioxide (NO₂) and fine particulate matter (PM₁₀ and PM_{2.5}). In relation to construction dust, the key pollutants of concern are dust soiling, PM₁₀ and PM_{2.5}.
- 4.2 UK-wide objectives for nitrogen dioxide and PM₁₀ were to have been achieved by 2005 and 2004 respectively, and continue to apply in all future years thereafter. The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. Defra explains where these objectives will apply in its Local Air Quality Management Technical Guidance (Defra, 2022). The annual mean objectives for nitrogen dioxide and PM₁₀ apply at the façades of residential properties, schools, hospitals etc. The 24-hour mean objective for PM₁₀ applies at the same locations as the annual mean objective, as well as in gardens of residential properties and at hotels. The 1-hour mean objective for nitrogen dioxide applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets. For PM_{2.5}, the objective set by Defra for local authorities is to work toward reducing concentrations without setting any specific numerical value. In the absence of a numerical objective, it is convention to assess local air quality impacts against the limit value¹, originally set at 25 µg/m³ and currently set at 20 µg/m³. The relevant air quality criteria for this assessment are provided in Table 1.

Table 1: Air Quality Criteria for Nitrogen Dioxide, PM₁₀ and PM_{2.5}

Pollutant	Time Period	Value
Nitrogen Dioxide	1-hour Mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m ³
PM ₁₀	24-hour Mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m ³ ^a
PM _{2.5}	Annual Mean	20 µg/m ³ ^b

^a A proxy value of 32 µg/m³ as an annual mean is used in this assessment to assess the likelihood of the 24-hour mean PM₁₀ objective being exceeded. Measurements have shown that, above this concentration, exceedances of the 24-hour mean PM₁₀ objective are possible (Defra, 2022).

^b There is no numerical PM_{2.5} objective for local authorities (see Paragraph 4.2). Convention is to assess against the UK limit value which is currently 20 µg/m³.

- 4.3 Defra has also set targets for PM_{2.5} concentrations in England under the Environment Act (2021) (Table 2). Achieving these targets is the responsibility of Defra. Rather than requiring a quantitative assessment of new developments against these targets. Defra instead advises applicants to provide

¹ EU Directive 2008/50/EC sets limit values for NO₂, PM₁₀ and PM_{2.5}, and is implemented in UK law through the Air Quality Standards Regulations (2010) (as amended through The Air Quality Standards (Amendment) Regulations 2016 and The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020). The limit values for NO₂ and PM₁₀ are the same numerical concentrations as the UK objectives, but achievement of the limit values is a national obligation rather than a local one and concentrations are reported to the nearest whole number. In the UK, only monitoring and modelling carried out by UK Central Government meets the specification required to assess compliance with the limit values.

evidence that they have considered exposure to PM_{2.5} and taken appropriate action to minimise emissions.

Table 2: Environment Act PM_{2.5} Targets

Metric	Target	Target year
AMCT ^a	Interim target: 12 µg/m ³	2028
	Legally binding target: 10 µg/m ³	2040
PERT ^b	Interim target: 22% reduction in exposure compared to 2018	2028
	Legally binding target: 35% reduction in exposure compared to 2018	2040

^a Annual Mean Concentration Target.

^b Population Exposure Reduction Target.

5 Assessment

Construction Phase

5.1 The potential sources of emissions during the construction phase are:

- road traffic accessing the site;
- emissions from machinery operating in the site;
- dust raised during onsite activities; and
- dust raised from material tracked onto nearby roads.

Road Traffic

5.2 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM)² (Moorcroft and Barrowcliffe et al, 2017) (see Appendix A3) have set out screening criteria, below which it can be assumed that there will not be significant impacts on air quality. The criteria for outside an AQMA are a change in traffic of more than 500 Light Duty Vehicles (LDVs) per day, or more than 100 Heavy Duty vehicles (HDVs) per day. These criteria relate to Annual Average Daily Traffic (AADT) volumes rather than the peak traffic generation on a particular day. Within AQMAs, the criteria reduce to 100 LDVs and 25 HDVs per day.

5.3 Given the scale and nature of the proposed development, it is highly unlikely that its construction would add more than 100 HDVs or 500 LDVs, as AADT, on any roads. It is also highly unlikely that there would be more than 25 HDVs or 100 LDVs, as AADT, on any roads within the Liverpool AQMA, particularly given its location beyond the M57. The effect of emissions from construction traffic will therefore be not significant.

On-site machinery

5.4 Separate guidance from the IAQM (2024) states:

"Experience of assessing the exhaust emissions from on-site plant (also known as non-road mobile machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed".

5.5 The proposed development is relatively small and the nearest residential area is approximately 250 m away. There is no reason to expect significant effects as a result of emissions from on-site machinery.

Dust

5.6 Appendix A4 provides an assessment of the potential for dust impacts during the construction works. Table 3 summarises the outcomes from this assessment. These outcomes have been used to develop a package of mitigation following best-practice guidance (Appendix A5). Guidance from the IAQM is that with appropriate mitigation in place, the residual effect will normally be 'not significant' (IAQM, 2024). It is therefore assumed that there will be no significant effects from dust.

² The IAQM is the professional body for air quality practitioners in the UK.

Table 3: Summary of Risk of Impacts Without Mitigation

Source	Dust Soiling	Human Health	Ecology
Demolition	Negligible	Negligible	N/A
Earthworks	Low Risk	Low Risk	N/A
Construction	Negligible	Negligible	N/A
Trackout	Low Risk	Low Risk	N/A

Operation Phase

Impacts of Existing Air Quality on Future Occupants of the Development

- 5.7 As explained in Section 4, the air quality objectives only apply where members of the public are likely to spend appreciable periods of time. They do not apply in commercial or industrial settings. They do not, therefore, apply within the proposed development.

Impacts on Existing Air Quality

- 5.8 The proposed development does not include centralised combustion plant. Similarly, the design does not currently include any backup-power or emergency-power generators. It has also been assumed that there will be no significant releases from industrial plant. Should these be added at a later stage, the impacts from the plant emissions may need further assessment.
- 5.9 Sweco UK Ltd., who are the transport consultants for the proposed development, have produced the network schematic reproduced in Figure 2, below. This shows total daily trips (AADT) by car and Heavy Goods Vehicle (HGV) along the M57 (shown by dark blue lines), the A580 (green lines), and the A5207 and A5208 (red lines). Sweco have confirmed that this is a deliberately worst-case assessment which assumes that the development is built out as 100% B2 (general industrial) land use, giving higher trip rates than other potential mixes.
- 5.10 The proposed development will generate 497 car trips along Alchemy Way (i.e. 336 + 161), as well as 42 HGV trips. These trip rates are below the screening thresholds of 500 LDVs and 100 HDVs which apply outside of AQMAs. In any event, there is no relevant exposure in terms of the air quality objectives along Alchemy Way. As development-generated traffic distributes around the road network, the trip rates reduce and are therefore well below the relevant screening thresholds of 500 LDVs and 100 HDVs which apply outside of AQMAs.

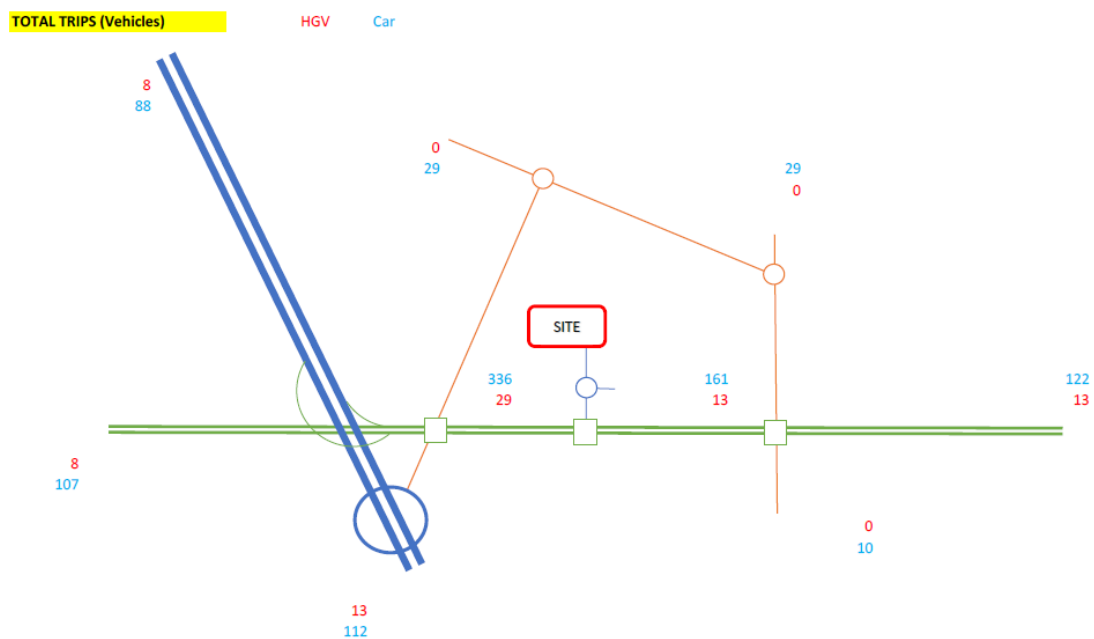


Figure 2: Road Network Schematic and Predicted Flows (AADT split by HGVs and Cars)

- 5.11 As the A580 continues to the west of the M57, it enters the Liverpool AQMA. The predicted increase in traffic along this section is 107 cars and 8 HGVs per day. This marginally exceeds the screening threshold of 100 LDVs per day that applies within AQMAs. However, the guidance (Moorcroft and Barrowcliffe et al, 2017) states that:
- “the presence of an AQMA is taken to indicate the possibility of being close to the objective, but where whole authority AQMAs are present and it is known that the affected roads have concentrations below 90% of the objective, the less stringent criteria are likely to be more appropriate”.*
- 5.12 The screening criteria were set to provide adequate protection in all settings. The criterion of 100 LDVs per day within AQMAs was set on the basis that changes smaller than this would not give rise to significant air quality effects even in dense built-up areas where congestion levels are high, where emitted pollutants are trapped by dense surrounding buildings, and where there are relevant receptors very close to roads.
- 5.13 The Liverpool AQMA covers the entire city irrespective of whether any objectives are exceeded along individual roads. The A580 is a wide open dual carriageway; it is not surrounded by tall buildings which may trap pollutants and therefore cause elevated concentrations. Furthermore, all residential properties are set well back from the road (by more than 8 m) all the way from the M57 to the inner ring road (A5058), some 4 km away.
- 5.14 Liverpool City Council does not publish its air quality monitoring data, but historically it showed that there were no measured exceedances along the A580 between the outer (M57) and inner (A5058) ring roads at locations with relevant exposure to the objectives (Liverpool City Council, 2020). Since that time, concentrations of the relevant pollutants have fallen alongside most roads (AQC, 2022).
- 5.15 On the basis of these points, and given that the ‘within AQMAs’ criterion is only marginally exceeded in any event, it is concluded that there is no requirement for a detailed assessment of road traffic impacts. The proposed development will not have a significant effect on local roadside air quality.

6 Mitigation and Good Design

Consideration of Air Quality in the Development Design

- 6.1 The EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017) advises that good design and best practice measures should be considered whether or not more specific mitigation is required. Furthermore, Defra have set out in their Interim Planning Guidance (2024) two questions designed to consider whether a development supports the targets for PM_{2.5} concentrations set under the Environment Act (2021) (see Section 4). The first question is “How has exposure to PM_{2.5} been considered when selecting the development site?”, whilst the second question is “What actions and/or mitigations have been considered to reduce PM_{2.5} exposure for development users and nearby receptors (houses, hospitals, schools etc.) and to reduce emissions of PM_{2.5} and its precursors?”.
- 6.2 Opportunities to benefit air quality within a development such as this are necessarily limited. However, the nature of the development aligns with that of the surrounding area. It does not introduce new sensitive exposure to an industrial area, and it is located well away from any existing areas of sensitive exposure. Furthermore, the development has good access to the strategic road network; it will allow vehicles to access the A580 and M57 without passing close to any residential areas or locations likely to be sensitive to air quality. In addition, its proximity to several urban areas provides opportunities to limit overall vehicle mileage, alongside provision of showers and cycle storage to encourage employees to use alternatives to private car. The development also does not include any centralised sources of onsite combustion. On this basis, the authors of this report³ consider that the development complies with EPUK/IAQM guidance that good design and best practice measures should be considered. It also complies with the requirements to deliver achievement of the Environment Act (2021) PM_{2.5} targets.

Additional Mitigation

Construction Phase

- 6.3 The site has been identified as a *Negligible Risk* site during demolition and construction, *Low Risk* during earthworks, and *Low Risk* for trackout, as set out in Appendix A4. Comprehensive guidance has been published by IAQM (2024) that describes measures that should be employed, as appropriate, to reduce the impacts. This reflects best practice experience and has been used, together with the professional experience of the consultant who has undertaken the dust impact assessment and the findings of the assessment, to draw up a set of measures that should be incorporated into the specification for the works. These measures are described in Appendix A5.

Operation Phase

- 6.4 The overall air quality effect of the proposed development will be ‘not significant’; it will not introduce any new exposure into areas of unacceptable air quality, nor will the development-generated traffic emissions have a significant impact on local air quality. It is, therefore, not considered appropriate to propose further mitigation measures for this development.

³ see Appendix A1 for the professional experience of those authors.

7 Conclusions

- 7.1 The assessment has considered the impacts of the proposed development on local air quality during the construction and operation phases.

Construction Phase

- 7.2 The construction phase of the proposed development will not generate sufficient traffic to have a significant effect on roadside air quality. Furthermore, emissions from vehicles and machinery operating within the site will not give rise to significant effects. The construction works will, however, generate dust which will require mitigation.

Operation Phase

- 7.3 The proposed development will not introduce new relevant exposure to the air quality objectives. There will be no on-site combustion plant and therefore no significant sources of emissions within the development itself. Furthermore, operation of the proposed development will not generate sufficient traffic to have a significant effect on roadside air quality.

Good Design and Mitigation

Good Design

- 7.4 It has been explained that the design of the development is appropriate with respect to air quality.

Additional Mitigation

- 7.5 A tailored package of measures to control dust during the construction phase has been developed (Appendix A5). No additional mitigation is required for the operation phase.

Significance

- 7.6 The overall operational air quality effects of the proposed development, during both the construction and operation phase, are judged to be 'not significant'.

Policy Implications

- 7.7 Taking into account these conclusions, it is judged that the proposed development is consistent with Paragraph 198 of the NPPF, being appropriate for its location in terms of its effects on local air quality. It is also consistent with Paragraph 199, as it will not affect compliance with relevant limit values or national objectives. The proposed development is also consistent with Policies CS2 and CS7 of the Knowsley Local Plan Core Strategy (KMBC, 2016), as it has minimised negative impacts on air quality, and Policy ENV1 of the Knowsley Replacement Unitary Development Plan (KMBC, 2006), as the proposed development will not significantly harm air quality.
- 7.8 The development complies with the requirements to deliver achievement of the AMCT and PERT by 2040 as best practice principles have been followed.

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9 Glossary

AADT	Annual Average Daily Traffic
AMCT	Annual Mean Concentration Target (for PM _{2.5})
AQC	Air Quality Consultants
AQMA	Air Quality Management Area
CEMP	Construction Environmental Management Plan
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMP	Dust Management Plan
EPUK	Environmental Protection UK
GIA	Gross Internal Floor Area
HDV	Heavy Duty Vehicles (> 3.5 tonnes)
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LDV	Light Duty Vehicles (<3.5 tonnes)
LGV	Light Goods Vehicle
µg/m ³	Microgrammes per cubic metre
NAEI	National Atmospheric Emissions Inventory
NO	Nitric oxide
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxides (taken to be NO ₂ + NO)
NPPF	National Planning Policy Framework
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PERT	Population Exposure Reduction Target (for PM _{2.5})
PM ₁₀	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
PM _{2.5}	Small airborne particles less than 2.5 micrometres in aerodynamic diameter

PPG	Planning Practice Guidance
Standards	A nationally defined set of concentrations for nine pollutants based on assessment of the effects of each pollutant on human health, including the effects on sensitive sub-groups.

10 Appendices

A1 Professional Experience

Dr Ben Marner, BSc (Hons) PhD CSci MEnvSc MIAQM

Dr Marner is the Director of Air Quality Modelling and Assessment at AQC and has more than 25 years' relevant experience. He has been responsible for air quality and greenhouse gas assessments of road schemes, rail schemes, airports, power stations, waste incinerators, commercial developments and residential developments in the UK and abroad. He has acted as expert witness at public inquiries, where he has presented evidence on health-related air quality impacts, the impacts of air quality on sensitive ecosystems, and greenhouse gas impacts. He has developed a range of widely-used air quality models and contributed to the development of best practice. Dr Marner has provided support and advice to foreign governments, Highways England, Transport Scotland, Transport for London, Greater London Authority, the Joint Nature Conservation Committee, the Environment Agency, and numerous local authorities. He is a Member of the Institute of Air Quality Management and a Chartered Scientist. He currently advises the UK Government on air quality as part of its Air Quality Expert Group (AQEG), where his specific area of expertise relates to air quality assessment in the development control process, and has separately provided advice on air quality issues to Defra's Chief Scientific Adviser, the UK Chief Medical Officer, and the UK Chief Planner.

Penny Wilson, BSc (Hons) CSci MEnvSc MIAQM

Ms Wilson is a Technical Director with AQC, with more than 20 years' relevant experience in the field of air quality. She has been responsible for numerous assessments for a range of infrastructure developments including power stations, road schemes, ports, airports and residential/commercial developments. The assessments have covered operational and construction impacts, including dust and odour nuisance. She also provides services to local authorities in support of their LAQM duties, including the preparation of Review and Assessment and Action Plan reports, as well as audits of Air Quality Assessments submitted with planning and DCO applications. She has provided expert evidence to a number of Public Inquiries and civil court, and is a Member of the Institute of Air Quality Management and a Chartered Scientist.

Suzanne Hodgson, BSc (Hons) MSc CSci MEnvSc MIAQM

Ms Hodgson is a Principal Consultant with AQC, with more than 16 years' experience in the field of air quality management and assessment. She has been responsible for a wide range of air quality projects covering impact assessments for new residential, commercial and industrial developments, EIA development, local air quality management, ambient air quality monitoring of various pollutants, including data ratification, and the assessment of nuisance odours and construction dust. She has extensive modelling experience, including the modelling of road traffic, energy centres (including energy from waste) and odour sources, and is familiar with preparing stand-alone air quality reports as well as chapters for inclusion within an Environment Statement. Suzanne has worked with a variety of clients to provide expert air quality services and advice, including local authorities, planners, developers and process operators. She is a Member of the Institute of Air Quality Management and is a Chartered Scientist.

Meg Saunders, BSc (Hons) MSc, AMEnvSc, AMIAQM

Miss Saunders is an Assistant Consultant with AQC and joined the company in 2023 where she has delivered on numerous air quality impact assessments. These include assessments of road traffic, combustion plants and construction dust throughout the UK for both standalone assessments and for EIAs to support planning applications and has carried out BREEAM assessments covering air quality for new developments. Previously she completed her MSc degree in Sustainability Science and Practice at Stanford University and went on to complete a summer internship focussed on developing

the foundations for an open-source methodology for urban air quality modelling in collaboration with community partners in the Bay Area.

A2 Policy

Air Quality Strategy 2007

- A2.1 The Air Quality Strategy (Defra, 2007) published by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives.

Air Quality Strategy 2023

- A2.2 The Air Quality Strategy: Framework for Local Authority Delivery 2023 (Defra, 2023a) sets out the strategic air quality framework for local authorities and other Air Quality Partners in England. It sets out their powers and responsibilities, and actions the government expects them to take. It does not replace other air quality guidance documents relevant to local authorities.

Clean Air Strategy 2019

- A2.3 The Clean Air Strategy (Defra, 2019a) sets out a wide range of actions by which the UK Government, in partnership with the Governments of Scotland, Wales and Northern Ireland, will seek to reduce pollutant emissions and improve air quality. Actions are targeted at four main sources of emissions: Transport, Domestic, Farming and Industry. At this stage, there is no straightforward way to take account of the expected future benefits to air quality within this assessment.

Environment Act 2021

- A2.4 The UK's new legal framework for protection of the natural environment, the Environment Act (2021) passed into UK law in November 2021. The Act gives the Government the power to set long-term, legally binding environmental targets. It also establishes an Office for Environmental Protection (OEP), responsible for holding the government to account and ensuring compliance with these targets.
- A2.5 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (SI 2023 No. 96) sets two new targets for future concentrations of PM_{2.5}. These targets are described in Section 4.

Environmental Improvement Plan 2023

- A2.6 Defra published its 25 Year Environment Plan in 2018 (Defra, 2018a). The Environment Act (2021) requires Defra to review this Plan at least every five years. The Environmental Improvement Plan 2023 (Defra, 2023b) is the first revision. This outlines the progress made since 2018 and adds detail to the goals defined in the 2018 Plan, including that of achieving clean air.
- A2.7 The Environmental Improvement Plan 2023 sets out the new air quality targets which have been set for concentrations of PM_{2.5}. These targets, which are described in more detail in Section 4, include the long-term targets in the Statutory Instrument described in Paragraph A2.5, and interim targets to be achieved by 2028.
- A2.8 The 2023 Plan outlines the role of local authorities in helping it meet both its targets and existing commitments. It also outlines the respective roles of industry, agricultural sectors, and the Department for Transport in providing the coordinated action required to meet both its new, and pre-existing targets and commitments.

Planning Policy

NPPF

- A2.9 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2024) sets out planning policy for England. It states that the purpose of the planning system is to contribute to the achievement of sustainable development, and that the planning system has three overarching objectives, one of which (Paragraph 8c) is an environmental objective:

"to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy".

- A2.10 To prevent unacceptable risks from air pollution, Paragraph 187 of the NPPF states that:

"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, taking into account relevant information such as river basin management plans".

- A2.11 Paragraph 198 states:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development".

- A2.12 More specifically on air quality, Paragraph 199 makes clear 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."

- A2.13 The NPPF is supported by Planning Practice Guidance (PPG) (Ministry of Housing, Communities & Local Government, 2019), which includes guiding principles on how planning can take account of the impacts of new development on air quality.

- A2.14 The PPG sets out the information that may be required in an air quality assessment, making clear that:

"Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific".

Local Policies

- A2.15 The Knowsley Local Plan Core Strategy (KMBC, 2016) was adopted in January 2016. Within the Strategy there are two policies relevant to air quality:

- A2.16 Policy CS2, 'Development Principles', states that:

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

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

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

...j) Minimising negative impacts upon...air quality... and ensuring any negative impacts are appropriately mitigated. Development that will have an unacceptable impact upon any of the above will only be permitted where the benefits of the proposal clearly outweigh the harm."

A2.17 Policy CS7, 'Transport Networks', states that:

"Location, Design and Management of New Development

2) New development will be required to be:

...e) Inclusive of measures that will mitigate carbon emissions and improve air quality where appropriate;..."

Air Quality Action Plans

National Air Quality Plan

A2.18 Defra has produced an Air Quality Plan to tackle roadside nitrogen dioxide concentrations in the UK (Defra, 2017); a supplement to the 2017 Plan (Defra, 2018b) was published in October 2018 and sets out the steps Government is taking in relation to a further 33 local authorities where shorter-term exceedances of the limit value were identified. This assessment has principally been carried out in relation to the air quality objectives, rather than the limit values that are the focus of the Air Quality Plan.

Local Air Quality Action Plan

A2.19 Knowsley Council has not declared any AQMAs and thus has not prepared an air quality action plan.

A3 EPUK & IAQM Planning for Air Quality Guidance

A3.1 The guidance issued by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) is comprehensive in its explanation of the place of air quality in the planning regime. Key sections of the guidance not already mentioned above are set out below.

Air Quality as a Material Consideration

“Any air quality issue that relates to land use and its development is capable of being a material planning consideration. The weight, however, given to air quality in making a planning application decision, in addition to the policies in the local plan, will depend on such factors as:

- the severity of the impacts on air quality;
- the air quality in the area surrounding the proposed development;
- the likely use of the development, i.e. the length of time people are likely to be exposed at that location; and
- the positive benefits provided through other material considerations”.

Recommended Best Practice

A3.2 The guidance goes into detail on how all development proposals can and should adopt good design principles that reduce emissions and contribute to better air quality management. It states:

“The basic concept is that good practice to reduce emissions and exposure is incorporated into all developments at the outset, at a scale commensurate with the emissions”.

A3.3 The guidance sets out a number of good practice principles that should be applied to all developments that:

- include 10 or more dwellings;
- where the number of dwellings is not known, residential development is carried out on a site of more than 0.5 ha;
- provide more than 1,000 m² of commercial floorspace;
- are carried out on land of 1 ha or more.

A3.4 The good practice principles are that:

- New developments should not contravene the Council's Air Quality Action Plan, or render any of the measures unworkable;
- Wherever possible, new developments should not create a new “street canyon”, as this inhibits pollution dispersion;
- Delivering sustainable development should be the key theme of any application;
- New development should be designed to minimise public exposure to pollution sources, e.g. by locating habitable rooms away from busy roads;

- The provision of at least 1 Electric Vehicle (EV) "rapid charge" point per 10 residential dwellings and/or 1000 m² of commercial floorspace. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made available;
- Where development generates significant additional traffic, provision of a detailed travel plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety;
- All gas-fired boilers to meet a minimum standard of <40 mgNO_x/kWh;
- Where emissions are likely to impact on an AQMA, all gas-fired CHP plant to meet a minimum emissions standard of:
 - i) Spark ignition engine: 250 mgNO_x/Nm³;
 - ii) Compression ignition engine: 400 mgNO_x/Nm³;
 - iii) Gas turbine: 50 mgNO_x/Nm³.

A3.5 A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of 275 mgNO_x/Nm³ and 25 mgPM/Nm³.

A3.6 The guidance also outlines that offsetting emissions might be used as a mitigation measure for a proposed development. However, it states that:

"It is important that obligations to include offsetting are proportional to the nature and scale of development proposed and the level of concern about air quality; such offsetting can be based on a quantification of the emissions associated with the development. These emissions can be assigned a value, based on the "damage cost approach" used by Defra, and then applied as an indicator of the level of offsetting required, or as a financial obligation on the developer. Unless some form of benchmarking is applied, it is impractical to include building emissions in this approach, but if the boiler and CHP emissions are consistent with the standards as described above then this is not essential".

A3.7 The guidance offers a widely used approach for quantifying costs associated with pollutant emissions from transport. It also outlines the following typical measures that may be considered to offset emissions, stating that measures to offset emissions may also be applied as post assessment mitigation:

- Support and promotion of car clubs;
- Contributions to low emission vehicle refuelling infrastructure;
- Provision of incentives for the uptake of low emission vehicles;
- Financial support to low emission public transport options; and
- Improvements to cycling and walking infrastructures.

Screening

Impacts of the Local Area on the Development

"There may be a requirement to carry out an air quality assessment for the impacts of the local area's emissions on the proposed development itself, to assess the exposure that residents or users might experience. This will need to be a matter of judgement and should take into account:

- the background and future baseline air quality and whether this will be likely to approach or exceed the values set by air quality objectives;
- the presence and location of Air Quality Management Areas as an indicator of local hotspots where the air quality objectives may be exceeded;
- the presence of a heavily trafficked road, with emissions that could give rise to sufficiently high concentrations of pollutants (in particular nitrogen dioxide), that would cause unacceptably high exposure for users of the new development; and
- the presence of a source of odour and/or dust that may affect amenity for future occupants of the development".

Impacts of the Development on the Local Area

A3.8 The guidance sets out two stages of screening criteria that can be used to identify whether a detailed air quality assessment is required, in terms of the impact of the development on the local area. The first stage is that you should proceed to the second stage if any of the following apply:

- 10 or more residential units or a site area of more than 0.5 ha residential use; and/or
- more than 1,000 m² of floor space for all other uses or a site area greater than 1 ha.

A3.9 Coupled with any of the following:

- the development has more than 10 parking spaces; and/or
- the development will have a centralised energy facility or other centralised combustion process.

A3.10 If the above do not apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area. If they do apply then you proceed to stage 2, which sets out indicative criteria for requiring an air quality assessment. The stage 2 criteria relating to vehicle emissions are set out below:

- the development will lead to a change in LDV flows of more than 100 AADT within or adjacent to an AQMA or more than 500 AADT elsewhere;
- the development will lead to a change in HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere;
- the development will lead to a realigning of 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;
- the development will introduce a new junction or remove an existing junction near to relevant receptors, and the junction will cause traffic to significantly change vehicle acceleration/deceleration, e.g. traffic lights or roundabouts;

- the development will introduce or change a bus station where bus flows will change by more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere; and
- the development will have an underground car park with more than 100 movements per day (total in and out) with an extraction system that exhausts within 20 m of a relevant receptor.

A3.11 The criteria are more stringent where the traffic impacts may arise on roads where concentrations are close to the objective. The presence of an AQMA is taken to indicate the possibility of being close to the objective, but where whole authority AQMAs are present and it is known that the affected roads have concentrations below 90% of the objective, the less stringent criteria are likely to be more appropriate.

A3.12 On combustion processes (including standby emergency generators and shipping) where there is a risk of impacts at relevant receptors, the guidance states that:

"Typically, any combustion plant where the single or combined NO_x 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. As a guide, the 5 mg/s criterion equates to a 450 kW ultra-low NO_x gas boiler or a 30kW CHP unit operating at <95mg/Nm³."

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".

A3.13 Should none of the above apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area, provided that professional judgement is applied; the guidance importantly states the following:

"The criteria provided are precautionary and should be treated as indicative. They are intended to function as a sensitive 'trigger' for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. This possibility will, self-evidently, not be realised in many cases. The criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement, bearing in mind that the objective is to identify situations where there is a possibility of a significant effect on local air quality".

A3.14 Even if a development cannot be screened out, the guidance is clear that a detailed assessment is not necessarily required:

"The use of a Simple Assessment may be appropriate, where it will clearly suffice for the purposes of reaching a conclusion on the significance of effects on local air quality. The principle underlying this guidance is that any assessment should provide enough evidence that will lead to a sound conclusion on the presence, or otherwise, of a significant effect on local air quality. A Simple Assessment will be appropriate, if it can provide this evidence. Similarly, it may be possible to conduct a quantitative assessment that does not require the use of a dispersion model run on a computer".

A3.15 The guidance also outlines what the content of the air quality assessment should include, and this has been adhered to in the production of this report.

Assessment of Significance

- A3.16 There is no official guidance in the UK in relation to development control on how to describe the nature of air quality impacts, nor how to assess their significance. The approach within the EPUK/IAQM guidance has, therefore, been used in this assessment. This approach involves a two stage process:
- a qualitative or quantitative description of the impacts on local air quality arising from the development; and
 - a judgement on the overall significance of the effects of any impacts.
- A3.17 The guidance recommends that the assessment of significance should be based on professional judgement, with the overall air quality impact of the development described as either 'significant' or 'not significant'. In drawing this conclusion, the following factors should be taken into account:
- the existing and future air quality in the absence of the development;
 - the extent of current and future population exposure to the impacts;
 - the influence and validity of any assumptions adopted when undertaking the prediction of impacts;
 - the potential for cumulative impacts and, in such circumstances, several impacts that are described as '*slight*' individually could, taken together, be regarded as having a significant effect for the purposes of air quality management in an area, especially where it is proving difficult to reduce concentrations of a pollutant. Conversely, a '*moderate*' or '*substantial*' impact may not have a significant effect if it is confined to a very small area and where it is not obviously the cause of harm to human health; and
 - the judgement on significance relates to the consequences of the impacts; will they have an effect on human health that could be considered as significant? In the majority of cases, the impacts from an individual development will be insufficiently large to result in measurable changes in health outcomes that could be regarded as significant by health care professionals.
- A3.18 The guidance is clear that other factors may be relevant in individual cases. It also states that the effect on the residents of any new development where the air quality is such that an air quality objective is not met will be judged as significant. For people working at new developments in this situation, the same will not be true as occupational exposure standards are different, although any assessment may wish to draw attention to the undesirability of the exposure.
- A3.19 A judgement of the significance should be made by a competent professional who is suitably qualified. A summary of the professional experience of the staff contributing to this assessment is provided in Appendix A1.

A4 Construction Dust Mitigation Assessment

Approach

- A4.1 The construction dust mitigation assessment considers the potential for impacts within 250 m of the site boundary, or within 50 m of roads used by construction vehicles. The assessment methodology is that provided by IAQM (2024). This follows a sequence of steps. Step 1 is a basic screening stage, to determine whether the more detailed assessment provided in Step 2 is required. Step 2a determines the potential for dust to be raised from on-site works and by vehicles leaving the site. Step 2b defines the sensitivity of the area to any dust that may be raised. Step 2c combines the information from Steps 2a and 2b to determine the risk of dust impacts without appropriate mitigation. Step 3 uses this information to determine the appropriate level of mitigation required to ensure that there should be no significant impacts.
- A4.2 The construction works will give rise to a risk of dust impacts during demolition, earthworks and construction, as well as from trackout of dust and dirt by vehicles onto the public highway. Step 1 of the assessment procedure is to screen the need for a risk assessment. There are receptors within the distances set out in the guidance (IAQM, 2024) thus a detailed assessment is required. The following section sets out Step 2 of the assessment procedure.

Potential Dust Emission Magnitude

Demolition

- A4.3 There will be a requirement to demolish the small buildings in the southwest corner of the site. These have a combined volume of less than 12,000 m³ and therefore, following the relevant guidance, (IAQM, 2024), the dust emission class for demolition is *small*.

Earthworks

- A4.4 The characteristics of the soil at the site have been defined using the British Geological Survey's UK Soil Observatory website (British Geological Survey, 2024), as set out in Table A4-1. Overall, it is considered that, when dry, this soil has the potential to be moderately dusty.

Table A4-1: Summary of Soil Characteristics

Category	Record
Soil Layer Thickness	Deep
Soil Parent Material Grain Size	Mixed (Argillic - Rudaceous ^a)
European Soil Bureau Description	Glacial Till
Soil Texture	Loam to Clayey Loam ^b

^a variable clay, silt, sand and gravel subsoil

^b loam is composed mostly of sand and silt.

- A4.5 The site covers approximately 45,000 m² and most of this will be subject to earthworks, involving breaking up of the existing hardstanding, removal of the foundations of the demolished buildings and excavation of the vegetated areas. Dust will arise mainly from vehicles travelling over unpaved ground and from the handling of dusty materials (such as dry soil). Following the relevant guidance, (IAQM, 2024), the dust emission class for earthworks is *medium*.

Construction

- A4.6 The proposed development involves the construction of two metal-clad warehouses, including offices, and laying of hardstanding. Dust will arise from vehicles travelling over unpaved ground, the handling and storage of dusty materials, and from the cutting of concrete. Taking account of the metal construction, and following the relevant guidance, (IAQM, 2024) the dust emission class for construction is *small*.

Trackout

- A4.7 The number of heavy vehicles accessing the site, which may track out dust and dirt, is currently unknown, but given the size of the site, and following the relevant guidance, (IAQM, 2024), the dust emission class for trackout is considered to be *medium*.

Overall

- A4.8 Table A4-2 summarises the dust emission magnitude for the proposed development.

Table A4-2: Summary of Dust Emission Magnitude

Source	Dust Emission Magnitude
Demolition	Small
Earthworks	Medium
Construction	Small
Trackout	Medium

Sensitivity of the Area

- A4.9 This assessment step combines the sensitivity of individual receptors to dust effects with the number of receptors in the area and their proximity to the site. It also considers additional site-specific factors such as topography and screening, and in the case of sensitivity to human health effects, baseline PM₁₀ concentrations.
- A4.10 The IAQM guidance explains that residential properties are 'high' sensitivity receptors to dust soiling. 'Medium' sensitivity receptors are places where users would expect to enjoy a reasonable level of amenity, or where aesthetics or value could be diminished by dust soiling. 'Low' sensitivity receptors are those where enjoyment of amenity would not reasonably be expected and soiling would not diminish the value of property.
- A4.11 Residential properties are also classified as being of 'high' sensitivity to human health effects, while places of work are classified as being of 'medium' sensitivity.
- A4.12 There are no residential properties within 250 m of the site, but the back gardens of approximately 20 properties backing onto the A5207 are just within 250 m from the site boundary. These are classed as of 'high' sensitivity to dust soiling and 'high' sensitivity to human health effects. The rest of the area within 250 m of the site is industrial/commercial, and any impacts from dust soiling are likely to be restricted to soiling to parked cars etc. Because of the industrial nature of the area, these receptors have been classed as being of 'low' sensitivity to dust soiling. They are of 'medium' sensitivity to human health effects. There are approximately 16 premises within 250 m of the site boundary.
- A4.13 The IAQM guidance (IAQM, 2024) explains that there is a risk of material being tracked 250 m from the site exit. Alchemy Way is more than 250 m long, meaning that material will not be tracked onto

the A580 and will remain within the industrial area. There are three industrial/commercial premises within 50 m of Alchemy Way.

Sensitivity of the Area to Effects from Dust Soiling

- A4.14 Using the information set out in Paragraphs A4.10 and A4.13 alongside the matrices set out in the guidance (IAQM, 2024), the area is of 'low' sensitivity to dust soiling from both onsite activities and trackout.

Sensitivity of the Area to any Human Health Effects

- A4.15 The matrix in the guidance (IAQM, 2024), requires information on the baseline annual mean PM₁₀ concentration in the area. The properties nearest the site are well away from main roads and the existing annual mean PM₁₀ concentration is best described by the background concentration contained in Defra's 2021-based background maps (Defra, 2024a). The maximum predicted background PM₁₀ concentrations in 2025 anywhere in Knowsley is 15 µg/m³. Concentrations in future years are predicted to be lower than this. Using the information set out in Paragraphs A4.10 and A4.13 alongside the matrices set out in the guidance (IAQM, 2024), the area is of 'low' sensitivity to human health effects from both onsite works and trackout.

Sensitivity of the Area to any Ecological Effects

- A4.16 The guidance only considers designated ecological sites within 50 m to have the potential to be impacted by the construction works. There are no designated ecological sites within 50 m of the site boundary or those roads along which material may be tracked.

Summary of the Area Sensitivity

- A4.17 Table A4-3 summarises the sensitivity of the area around the proposed construction works.

Table A4-3: Summary of the Area Sensitivity

Effects Associated With:	Sensitivity of the Surrounding Area	
	On-site Works	Trackout
Dust Soiling	Low Sensitivity	Low Sensitivity
Human Health	Low Sensitivity	Low Sensitivity
Ecological	N/A	N/A

Risk and Significance

- A4.18 The dust emission magnitudes in Table A4-2 have been combined with the sensitivities of the area in Table A4-3 using the matrix in the guidance (IAQM, 2024) to assign a risk category to each activity. The resulting risk categories for the four construction activities, without mitigation, are set out in Table A4-4. These risk categories have been used to determine the appropriate level of mitigation as set out in Section 6 (step 3 of the assessment procedure).

Table A4-4: Summary of Risk of Impacts Without Mitigation

Source	Dust Soiling	Human Health	Ecology
Demolition	Negligible	Negligible	N/A
Earthworks	Low Risk	Low Risk	N/A
Construction	Negligible	Negligible	N/A
Trackout	Low Risk	Low Risk	N/A

A4.19 The IAQM guidance does not provide a method for assessing the significance of effects before mitigation, and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant' (IAQM, 2024).

A5 Construction Mitigation

A5.1 Table A5-1 sets out a list of best-practice measures from the IAQM guidance (IAQM, 2024) that should be incorporated into the specification for the works. These measures should ideally be written into a Dust Management Plan. Some of the measures may only be necessary during specific phases of work, or during activities with a high potential to produce dust, and the list should be refined and expanded upon in liaison with the construction contractor when producing the Dust Management Plan.

Table A5-1: Best-Practice Mitigation Measures Recommended for the Works

Measure	Desirable	Highly Recommended
Communications		
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environmental manager/engineer or the site manager		✓
Display the head or regional office contact information		✓
Dust Management Plan		
Develop and implement a Dust Management Plan (DMP) approved by the Local Authority which documents the mitigation measures to be applied, and the procedures for their implementation and management	✓	
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 inspections 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 100 m of the site boundary, with cleaning to be provided if necessary	✓	
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		✓

Measure	Desirable	Highly Recommended
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 or, if it is a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction (IAQM, 2018)		✓
Preparing and Maintaining the Site		
Plan the site layout so that machinery and dust-causing activities are located away from receptors, as far as is 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 Vehicle/Machinery and Sustainable Travel		
Ensure all vehicles switch off their 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 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate)	✓	
Operations		
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems		✓

Measure	Desirable	Highly Recommended
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, conveyors and covered skips		✓
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate		✓
Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods	✓	
Waste Management		
Avoid bonfires and burning of waste materials		✓
Measures Specific to 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 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)	✓	



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