Wates Developments Limited and the Licensed Trade Charity (LTC)

Land at LVS Hassocks, London Road, Sayers Common, West Sussex

Air Quality Assessment

Report No: 446002-02 (03)

JANUARY 2026

RSK air quality
MODELLING · MONITORING · PERMITTING

RSK GENERAL NOTES

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Title: Land at LVS Hassocks, London Road, Sayers Common, West Sussex – Air Quality Assessment

Client: Wates Developments Limited and the Licensed Trade Charity (LTC)

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Date:	19th January 2026	Date:	19th January 2026

Abbreviations

AADT	Annual Average Daily Traffic
ADMS-Roads	Atmospheric Dispersion Modelling System – Roads (a dispersion modelling software application)
AQAL	Air Quality Assessment Level
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Standard
ASHP	Air Source Heat Pump
ASR	Annual Status Report
CEMP	Construction Environmental Management Plan
CERC	Cambridge Environmental Research Consultants
CHP	Combined Heat and Power
CO_2	Carbon Dioxide
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
LTC	Licensed Trade Charity
MSDC	Mid Sussex District Council
NAQS	National Air Quality Strategy
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NRMM	Non-road mobile machinery
O_3	Ozone
$PM_{2.5}$	Particulate matter of size fraction approximating to <2.5µm diameter
PM_{10}	Particulate matter of size fraction approximating to <10µm diameter
PV	Photovoltaic
RSK	RSK Environment Limited
VOC	Volatile Organic Compounds

CONTENTS

1 INTRODUCTION

1.1 Background

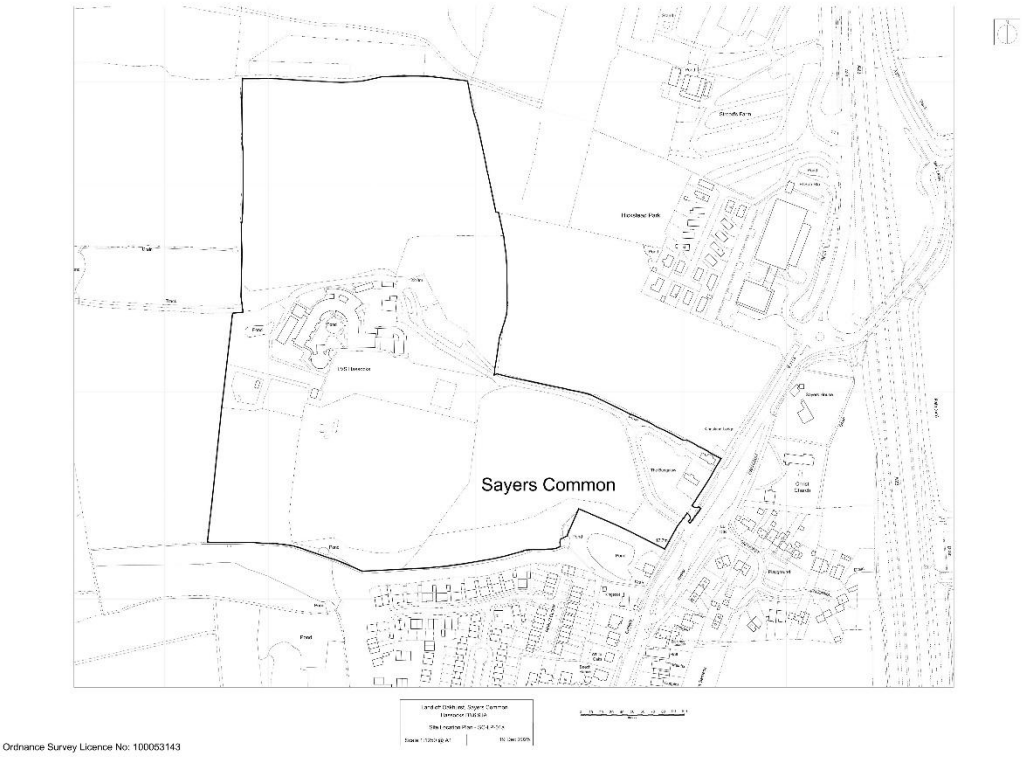
RSK Environment Ltd (RSK) was commissioned by Wates Developments Limited and the Licence Trade Charity to prepare an assessment of the potential air quality impacts associated with proposed development on Land at LVS Hassocks, London Road, Sayers Common, West Sussex. Figure 1.1 shows the proposed development site location.

This report supports the hybrid application for separate and severable elements comprising: demolition of all existing buildings bar the chapel, to retained for use within Use Class F, and a) full planning permission for the development of the north western part of the Land at LVS Hassocks so as to accommodate a new SEN School with associated access from London Road, car parking, landscaping and drainage works; and b) outline planning permission (Appearance, Landscaping, Layout and Scale Reserved) for the development of the rest of the land at LVS Hassocks so as to accommodate up to 210 dwellinghouses (including affordable housing) with associated access, car parking, landscaping, play areas, informal outdoor space and drainage works.

The approximate grid reference for the centre of the site is 526497, 118795. The site is within the administrative area of Mid Sussex District Council (MSDC).

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 increased road traffic emissions associated with the development once operational. Mitigation measures have been recommended where appropriate.

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. It furthermore describes the role of local authorities in carrying out their duties under the Environment Act 1995 (i.e. the Local Air Quality Management (LAQM) regime).

The latest 2023 air quality strategy: Air quality Strategy: framework for local authority delivery, which supersedes the 2007 air quality strategy (in England only), retains the majority of the 2007 strategy but further sets out the actions that Defra expects local authorities to take in support of their long-term air quality goals, including the new $PM_{2.5}$ targets.

2.1.2 The Clean Air Strategy 2019

The Clean Air Strategy 2019 sets out ways that the UK government will seek to tackle major sources of pollution. 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.

2.1.3 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. EU Directives 2008/50/EC and 2004/107/EC set limits values and was translated into English law in 2010 via the Air Quality Standards Regulations 2010.

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

Table 2.1: Air Quality Standards (AQSs) 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

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

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

2.1.4 The Environment Act, 2021

The Environment Act 2021 amends the Environment Act 1995 to establish the use of local air quality management 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. Part 1 of The Environment Act requires targets to be set for fine particulate matter $PM_{2.5}$, and these were introduced in The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023, as follows:

- $PM_{2.5}$ concentration interim target, annual mean of 12µg/m^3 by 2028;
- $PM_{2.5}$ exposure reduction interim target of 22% reduction compared to 2018 by 2028;
- $PM_{2.5}$ concentration binding target of annual mean of 10µg/m^3 by 2040;
- $PM_{2.5}$ exposure reduction binding target of 35% reduction compared to 2018 by 2040.

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

In February 2025, the revised National Planning Policy Framework (NPPF) was published, superseding the previous December 2024 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 "*new and existing 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. 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.*"

With specific regard to air quality, paragraph 187 of the NPPF states that:

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

…. e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans…."

Furthermore, paragraph 199 of 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

Mid Sussex District Plan 2014 – 2031 (adopted March 2018)

The Mid Sussex District Plan 2014 – 2031 sets out broad guidance on the distribution and quality of development in the form of strategic policies and provides the framework for all subsequent planning documents. It includes **DP29: Noise, Air and Light Pollution** which states the following:

> *"Strategic Objectives: 3) To protect valued landscapes for their visual, historical and biodiversity qualities; and 12) To support sustainable communities which are safe, healthy and inclusive.*
>
> *Evidence Base: Data held by Environmental Health, Air Quality Action Plan – Stonepound Crossroads, Hassocks.*
>
> *The environmental, including nationally designated environmental sites, nationally protected landscapes, areas of nature conservation or geological interest, wildlife habitats, and the quality of people's life will be protected from unacceptable levels of noise, light and air pollution by only permitting development where:*
>
> *…*
>
> *Air Pollution:*
>
> - *It does not cause unacceptable levels of air pollution;*
> - *Development on land adjacent to an existing use which generates air pollution or odour would not cause any adverse effects on the proposed development or can be mitigated to reduce exposure to poor air quality to recognised and acceptable levels;*

- *Development proposals (where appropriate) are consistent with Air Quality Management Plans*

…"

Mid Sussex District Council Site Allocations Development Plan Document (June 2022)

The MSDC Site Allocations Development Plan Document sets out additional strategic policies necessary to deliver sustainable development. It includes **Policy SA38: Air Quality** which states the following:

"The Council will require applicants to demonstrate that there is not unacceptable impact on air quality. The development should minimise any air quality impacts, including cumulative impacts from committed developments, both during the construction process and lifetime of the completed development, either through a redesign of the development proposal or, where this is not possible or sufficient, through appropriate mitigation.

Where sensitive development is proposed in areas of existing poor air quality and/ or where major development is proposed, including the development types set out in the Council's current guidance (Air Quality and Emissions Mitigation Guidance for Sussex (2019 or as updated)) an air quality assessment will be required.

Development proposals that are likely to have an impact on local air quality, including those in or within relevant proximity to existing or potential Air Quality Management Areas (AQMAs), will need to demonstrate measures/ mitigation that are incorporated into the design to minimise any impacts associated with air quality.

Mitigation measures will need to demonstrate how the proposal would make a positive contribution towards the aims of the Council's Air Quality Action Plan and be consistent with the Council's current guidance as stated above.

Mitigation measures will be secured either through a negotiation on a scheme, or via the use of planning condition and/ or planning obligation depending on the scale and nature of the development and its associated impacts on air quality.

In order to prevent adverse effects on the Ashdown Forest SPA and SAC, new development likely to result in increased traffic may be expected to demonstrate how any air quality impacts, including in combination impacts, have been considered in relation to the Ashdown Forest SAC. Any development likely to have a significant effect, either alone or in combination with other development, will be required to demonstrate that adequate measures are put in place to avoid or mitigate for any potential adverse effects."

Mid Sussex District Plan 2021 – 2039 Submission Draft (Regulation 19) (December 2023)

At the time of writing, MSDC submitted The District Plan 2021 – 2039 on 8th July 2024 for examination. This plan also set out the vision, strategy, site allocations and policies for the developments within the district. It includes **DPN9: Air Quality** which states the following:

> *"People's health and quality of life and the natural environment will be protected from unacceptable levels of poor air quality.*
>
> *The use of active and sustainable travel measures and green infrastructure to reduce pollution concentrations and exposure is encouraged.*
>
> *Development proposals will need to take into account the Council's air quality guidance.*
>
> *The Council will require applicants to demonstrate that there is not an unacceptable impact on air quality. The development must minimise any air quality impacts, including cumulative impacts from committed developments, both during the construction process and lifetime of the completed development, either through a redesign of the development proposal or, where this is not possible or sufficient, through appropriate mitigation.*
>
> *Where sensitive development is proposed in areas of existing poor air quality and/or where major development is proposed, including the development types set out in the Council's current guidance (Air Quality and Emissions Mitigation Guidance for Sussex (2021 or as updated)) an air quality assessment will be required.*
>
> *Development proposals that are likely to have an impact on local air quality, including those in or within relevant proximity to existing or candidate Air Quality Management Areas (AQMAs) or designated nature conservation areas sensitive to changes in air quality, will need to demonstrate that measures and/or mitigation are incorporated into the design to minimise any impacts associated with air quality.*
>
> *Mitigation measures will need to demonstrate how the proposal would make a positive contribution towards the aims of the Council's Air Quality Action Plan where it is relevant and be consistent with the Council's current guidance as stated above.*
>
> *Mitigation measures will be secured either through a negotiation on a scheme, or via the use of planning condition and/or planning obligation depending on the scale and nature of the development and its associated impacts on air quality.*
> *..."*

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 (Stoaling *et al*., 2024) 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, 2025) ('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.

2.3.4 Interim Planning Guidance on the consideration of the Environment Act $PM_{2.5}$ targets in planning decisions (2024)

Defra is developing guidance for applicants and Planning Authorities in England to demonstrate that they have appropriately considered the $PM_{2.5}$ targets when making planning applications and planning decisions.

The following questions are designed to be used as prompts to support the interim process, but applicants are welcome to consider measures in addition to those listed below:

1. How has exposure to $PM_{2.5}$ been considered when selecting the development site?

Applicants are advised to consider the following in their application:

- Site proximity to people (particularly large populations and/or vulnerable groups, e.g. schools, hospitals, care homes, areas of deprivation) and the impact of the development on these,

- Site proximity to pollution sources and the impact of these on users of the development,
- Exposure and emissions during both construction and in-use.

2. 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?

Applicants are advised to explain (with evidence where possible) why each measure was implemented. Or, if no mitigation measures have been implemented, why this was not proposed. Actions can refer to, but are not limited to, the following:

- Site layout,
- The development's design,
- Technology used in the construction or installed for use in the development,
- Construction and future use of the development.

2.3.5 Air Quality and Emissions Mitigation Guidance for Sussex (2021)

MSDC is a member of the Sussex Air Quality Partnership. Air Quality and Emissions Mitigation Guidance for Sussex (2021) provides advice to developers on how to assess and mitigate potential air quality impacts from new developments, as well as information required in the air quality assessments.

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 2024 IAQM guidance;
- Advanced dispersion modelling assessment of air quality impacts of the proposed development traffic under the following three scenarios:
  - (i) Scenario 1 (S1) - 'Baseline' scenario representing the 'existing' air quality situation in 2024;
  - (ii) Scenario 2 (S2) - 'Without Development' scenario (2031, the expected year of opening, without the proposed development in place); and
  - (iii) Scenario 3 (S3) - 'With Development' scenario (2031, the expected year of opening and with the proposed development in place).
- Emission mitigation assessment;
- Consideration of possible mitigation measures, where appropriate, to ensure any adverse effects on air quality are minimised; and
- Recommendation for any further work.

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 MSDC and the estimated background data from the LAQM Support website maintained by the Department for Environment, Food and Rural Affairs (Defra). Consideration has also been given to potential sources of air pollution and the presence of AQMAs.

3.3 Construction Phase Assessment

3.3.1 Construction Dust and Particulate Matter

Demolition and 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 PM10; 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 C).

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.

[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 Operational Phase Impact Assessment

3.4.1 Point Source Emissions

It is understood that the energy source for the proposed residential development and the proposed SEN school will be air source heat pump (ASHP). Rooftop photovoltaic (PV) panels are also proposed as part of the scheme. There will be no significant stationary combustion sources, such as combined heat and power (CHP) plant or biomass boiler in the proposed development, as advised by the Project Team. Therefore, this report has not considered emissions related to stationary combustion emissions any further.

3.4.2 Traffic Emissions

The proposed development will generate additional traffic emissions in the local area. NO_2, PM_{10} and $PM_{2.5}$ are generally regarded as the most significant air pollutants released by vehicular combustion processes (as they tend to be more likely to be close to exceeding statutory limits in an urban environment), or subsequently generated by vehicle emissions in the atmosphere through chemical reactions.

The EPUK-IAQM 2017 guidance provides an approach for determining the significance of air quality impacts associated with a development in relation to emissions from traffic. To assess the impacts of a development on the surrounding area, the guidance recommends that the degree of an impact is described by expressing the magnitude of incremental change as a proportion of the relevant assessment level and examining this change in the context of the new total concentration and its relationship with the assessment criterion. The approach is further described in Appendix B including the descriptors for the impact significance.

The following subsectors provide further information regarding proposed methodology and dispersion model input for the air quality impact assessment.

3.4.3 Modelling Software

ADMS-Roads is an advanced dispersion model developed by the UK consultancy CERC (Cambridge Environmental Research Consultants). ADMS-Roads is widely used and validated within the UK and Europe. The model allows for the skewed nature of turbulence within the atmospheric boundary layer. ADMS-Roads is capable of processing hourly sequential meteorological data, whilst taking the turbulence caused by vehicles into account in calculating the dispersion profiles of emitted pollutants. ADMS-Roads enables the user to predict concentrations of pollutants of concern at multiple receptor locations.

ADMS-Roads (Version 5.1.0.2) has been used for assessing potential road traffic emission air quality impacts resulting from the operational phase of the proposed development, and the potential exposure of future residents at the proposed development site to poor air quality.

3.4.4 Modelling Scenarios

The following scenarios have been considered in this assessment:

- Scenario 1 (S1): 2024 Base year model verification;
- Scenario 2 (S2): 2031 Opening year - without the Proposed Development;
- Scenario 3 (S3): 2031 Opening year - with the Proposed Development.

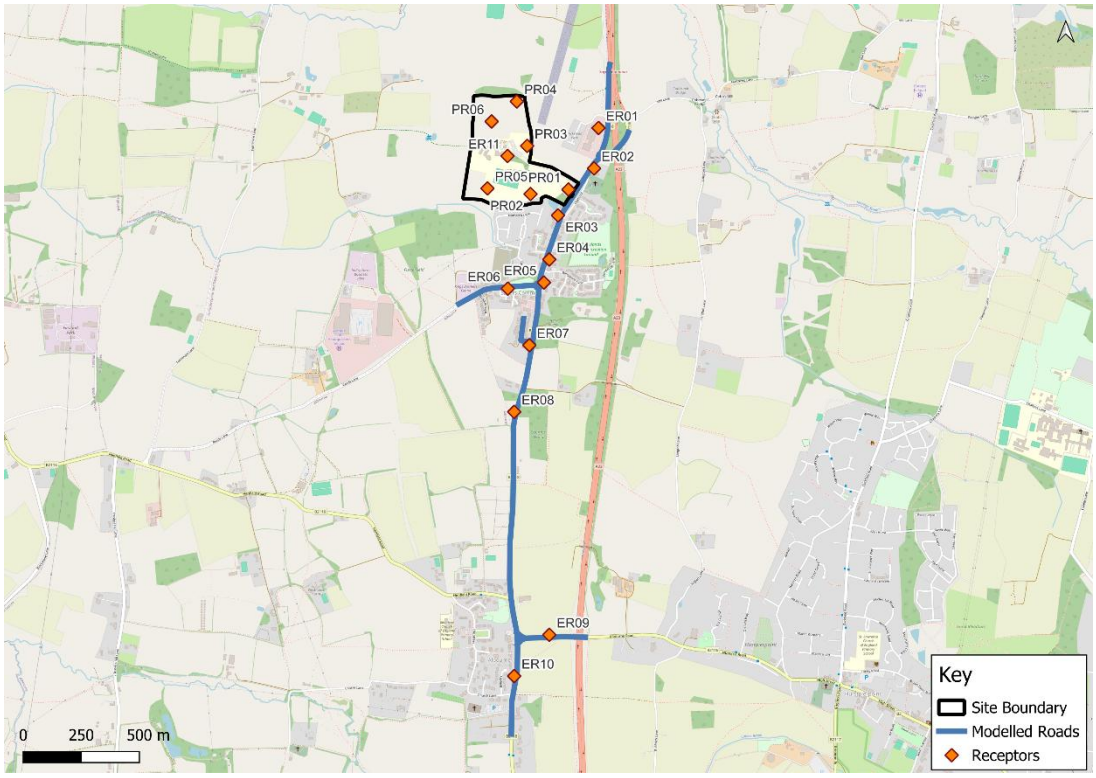
The 2024 base year was used as the baseline year in this assessment, for the purpose of model verification (i.e. S1) as the most recent year in which a full year of bias-adjusted and ratified local monitoring data is available. The development is intended to be completed with full occupancy in 2031. Therefore, 2031 was used as the 'opening year' in this assessment.

3.4.5 Traffic Data

Traffic data used in the air quality assessment were provided by the appointed project transport consultant, i-Transport LLP. The traffic data used in the air quality dispersion modelling are presented in Appendix D. Local speed limits were also provided by i-Transport LLP.

The road network included in the dispersion model is presented in Figure 3.1. Guidance in LAQM TG.22 and professional judgement was used to estimate speeds for use within the assessment, including reduced speeds at junctions.

Figure 3.1: The Roads and Receptors Included in the Dispersion Modelling Assessment



@OpenStreetMap contributors, available under the Open Database Licence

3.4.6 Traffic Emission Factors

Version 13.1 of the Emissions Factor Toolkit (EFT), published by Defra, was used to derive vehicle emissions factors (i.e. the amount of pollution emitted from the average vehicle fleet, in g/km/s) for NO_x, PM_{10} and $PM_{2.5}$. Within the EFT, emission factors are available for 2021 through to 2050.

EFT version 13.1 takes into account the most recent evidence relating to factors such as advances in vehicle and exhaust technology and changes in composition of the vehicle fleet. The emission factors consequently reduce over time. Emission factors for 2024 were used to estimate vehicle emissions for S1 modelling scenario, 2031 emission factors were used for S2 and S3.

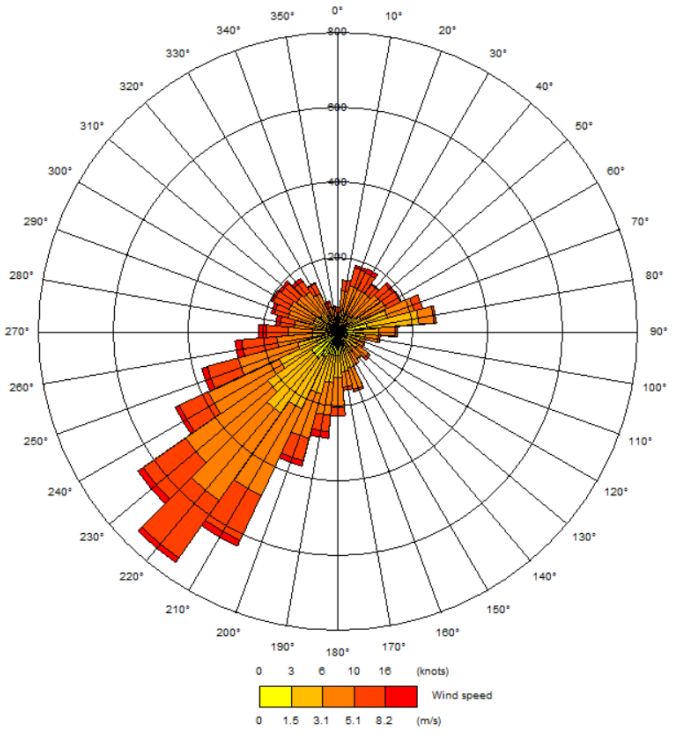
3.4.7 Time-Varying Profile

Vehicle movements vary with time. Diurnal profiles for the roads included within the model were not available and instead the UK National Profile 2024 published by the Department for Transport (DfT) was applied to all of the assessed roads. The diurnal profile is presented in Appendix D. A value of 1 on the y-axis is equivalent to the hourly average flow over 24 hours.

3.4.8 Meteorological Data

2024 hourly sequential meteorological data from the Gatwick meteorological station was employed in the dispersion model. This meteorological station is located approximately 21.9km to the north of the proposed development site and is considered to be representative of the development site condition. The windrose derived from the 2024 dataset is presented in Figure 3.2. The predominant wind direction was from the southwest.

Figure 3.2: Windrose from the Gatwick Meteorological Station in 2024



3.4.9 Sensitive Receptor Locations

Human Receptors

Pollutant concentrations were predicted at a number of human receptors at the proposed site and along the roads included in the study at locations where the greatest changes in traffic flows were predicted due to the operational phase. A height of 1.5m was used for human receptors to represent the approximate average breathing height of an adult. Details of all specific human receptors included in the modelling study (and hence the air quality impacts assessed) are summarised in Table 3.1. The locations of all assessed receptors are shown in Figure 3.1.

Table 3.1 Diffusion Tubes and Receptors Included in the Dispersion Modelling Assessment

Receptor ID	Receptor Location	Grid Reference		Height (m)
		X	Y	
Diffusion tubes used for verification				
MSAQ46	Diffusion tube, Lamp Post London Road Burgess Hill	530806.94	119776.59	2.1
Receptors				
ER01*	Existing receptor, A23 NB On-Slip	526917.75	118875.03	1.5
ER02	Existing residential receptor, B2118 (South of Mill Lane Roundabout)	526902.69	118700.62	1.5
ER03	Existing residential receptor, B2118 (North of Reeds Lane)	526752.19	118495.06	1.5
ER04	Existing residential receptor, B2118 (North of Reeds Lane)	526719.50	118304.63	1.5
ER05	Existing residential receptor, Reeds Lane Roundabout	526698.94	118205.16	1.5
ER06	Existing residential receptor, Reeds Lane	526544.25	118175.06	1.5
ER07*	Existing receptor, Fuzerland Way Roundabout	526642.81	117934.24	1.5
ER08	Existing residential receptor, B2118 (North of Albourne Road)	526584.44	117646.16	1.5
ER09	Existing residential receptor, Albourne Road	526759.12	116691.73	1.5
ER10	Existing residential receptor, B2118 (South of Albourne Road)	526612.06	116510.52	1.5
ER11^	Existing school receptor, B2118 (South of Mill Lane Roundabout)	526529.25	118745.03	1.5
PR01	Proposed receptor	526794.62	118607.37	1.5
PR02	Proposed receptor	526632.06	118583.92	1.5
PR03	Proposed receptor	526612.44	118790.30	1.5
PR04	Proposed receptor	526563.25	118980.22	1.5
PR05	Proposed receptor	526446.25	118603.60	1.5

Receptor ID	Receptor Location	Grid Reference		Height (m)
		X	Y	
PR06	Proposed school receptor	526457.00	118891.59	1.5

*Commercial/industrial receptors. Annual mean NO_2, PM_{10}, $PM_{2.5}$ and 24-hour mean PM_{10} AQSs do not apply.

^The existing school is occupied until the new school is complete, which is anticipated around September 2028. Following completion of the new school, the existing school will be decanted and subsequently demolished.

3.4.10 Background Air Quality Data Used in the Modelling

Diffusion tube MSAQ27 is located in a suburban location and is considered to be representative of the background air quality of the development site as it is located in an area similar to the site conditions and relatively close to the development site. Therefore, the NO_2 monitoring data from MSAQ27 in 2024 will be used for all modelled scenarios.

Given that there are currently no nearby representative background monitoring locations for PM_{10} and $PM_{2.5}$, background concentrations for PM_{10} and $PM_{2.5}$ were obtained from the 2021-based background maps on the Defra LAQM Support website, which provides estimated annual average background concentrations of NO_2, PM_{10} and $PM_{2.5}$ on a 1 km^2 grid basis. The Defra LAQM background concentration maps assume that background concentrations will improve (i.e. reduce) over time, in line with predicted reduction in vehicle emissions as well as reduction in emissions from other sources. For a conservative approach, Defra background data for 2024 has been used for all modelled scenarios. The background concentrations included in the dispersion modelling assessment are presented in Table 3.2.

Table 3.2 Estimated 2024 Background Concentrations Included in the Assessment

Receptor	2024 Annual Average (µg/m³)			Source
	NO_2	PM_{10}	$PM_{2.5}$	
ER01*	12.0	10.5	6.1	NO_2 – 2024 monitoring data at diffusion tube MSAQ27 PM_{10} & $PM_{2.5}$ – 2024 estimated data from Defra 2021 based background maps
ER02	12.0	10.5	6.1	
ER03	12.0	10.5	6.1	
ER04	12.0	10.5	6.1	
ER05	12.0	10.5	6.1	
ER06	12.0	10.5	6.1	
ER07*	12.0	11.3	6.1	
ER08	12.0	11.3	6.1	
ER09	12.0	11.2	6.2	
ER10	12.0	11.2	6.2	
ER11^	12.0	10.5	6.1	
PR01	12.0	10.5	6.1	
PR02	12.0	10.5	6.1	

PR03	12.0	10.5	6.1	
PR04	12.0	10.5	6.1	
PR05	12.0	10.5	6.1	
PR06	12.0	10.5	6.1	
MSAQ46	12.0	10.9	7.0	

*Commercial/industrial receptors. Annual mean NO_2, PM_{10}, $PM_{2.5}$ and 24-hour mean PM_{10} AQSs do not apply

^The existing school is occupied until the new school is complete, which is anticipated around September 2028. Following completion of the new school, the existing school will be decanted and subsequently demolished.

3.4.11 Other Model Input Parameters

In order to represent the nature of the study area and surrounding area, a surface roughness of 0.3 was used in the model. The Monin-Obukhov length (related to atmospheric stability) was assumed to be 10m (small towns < 50,000). Settings were adjusted at the meteorological data site; a surface roughness of 0.5 and a Monin-Obukhov length of 30m (Cities and large towns) were used.

3.4.12 Model Verification and Results Processing

The ADMS-Roads dispersion model has been widely validated for this type of assessment and is considered to be fit for purpose. Model validation undertaken by the software developer will not have included validation in the vicinity of the study area considered in this assessment. To determine the performance of the model at a local level, a comparison of modelled results with the results of monitoring carried out within the study area was undertaken. This process of verification attempts to minimise modelling uncertainty and systematic error by correcting modelled results by an adjustment factor to gain greater confidence in the final results, and was carried out following the methodology specified in LAQM TG.22.

The site is within the administrative area of Mid Sussex District Council (MSDC). There are 1 automatic monitoring station and 35 diffusion tube locations within MSDC. Two of them (MSDC ref: MSAQ26 and MSAQ27) are located within the study area. Since both diffusion tubes are suburban monitors, they have not been included in the modelling study. Diffusion tube MSAQ46 is a roadside monitor located approximately 4.4km from the proposed development site, close to B2036, Fairfield Road, Leylands Road and West Street. Since traffic data for these roads are available from the traffic data provided by i-Transport LLP, diffusion tube MSAQ46 is considered to be representative monitoring location of the development site. Therefore, 2024 monitored annual mean NO_2 concentration from this diffusion tube have been used to verify the predicted road NO_x concentrations.

Full details of the verification calculations are presented within Appendix E.

An adjustment factor of 2.47 was obtained as part of the verification process for NO_2. The adjustment factor was applied to the modelled road-NO_x component before estimation of

annual mean NO_2 concentrations using the NO_x:NO_2 calculator (version 9.1) available from the Defra website.

Local monitoring data are not available for concentrations of PM_{10} and $PM_{2.5}$ and consequently, the predicted road-PM_{10} and road-$PM_{2.5}$ contributions were adjusted using the factor calculated for road-NO_x, before adding the appropriate background concentrations. This approach is consistent with guidance given in LAQM TG.22.

LAQM TG.22 advises that an exceedance of the 1 hour mean NO_2 objective is unlikely to occur where the annual mean concentration is below 60µg/m^3, where road transport is the main source of pollution. This concentration has been used to screen whether the hourly mean objective is likely to be achieved.

Once processed, the predicted concentrations (full results presented in Section 5) were compared against the current statutory limit values and objectives for NO_2, PM_{10} and $PM_{2.5}$ set out in Table 2.1.

The modelling input parameters for the dispersion modelling assessment are presented in Table 3.3.

Table 3.3 Summary of Inputs to the Dispersion Model

Parameter	Brief description	Input into Model
Emission year	Predicted emission rates depend on the year of emission being used	2024 for S1, 2031 for S2 & S3
Road source emissions	Road source emission rates calculated from traffic flow data using an emission factor toolkit from AQC or Defra EFT	EFT V13.1
Time varied emissions	Diurnal variations of emissions applied to road sources	2024 national diurnal profile
Road elevation	Elevation of road above ground level	No terrain file used
Road width	Width of road (m)	Road widths determined based on approximate measurement of roads (internet mapping)
Road type	Selection of different types of road to be assessed, inputted into the emission factor toolkit calculations	'Urban (not London)' settings
Road speeds	Speed of the road effects the vehicle emissions to air	Standard speed limits used and professional judgement with slowing at junctions or bends
Meteorology	Representative hourly sequential meteorological data	Gatwick meteorological station 2024

Latitude	Allows the location of the model area to be determined	50.5º
Surface roughness	This defines the surface roughness of the model area	0.3m at development, 0.5m at the meteorological site
Monin-Obukhov length	A boundary layer parameter required to precisely describe the atmospheric stability conditions and to predict dispersion of pollutants released from road traffic	10m at the development, 30m at the meteorological site

3.5 Uncertainties and Assumptions

The following uncertainties and assumptions have been made in the air quality assessment:

- In the absence of measured NO_2, PM_{10} and $PM_{2.5}$ at the proposed development location, NO_2 monitoring data from diffusion tube MSAQ27 operated by MSDC and estimated background data from the Defra LAQM website were used in the assessment. In reality, baseline air quality levels vary with time and location but in the absence of on-site baseline monitoring data, the assumption that the baseline concentrations obtained from the above-mentioned data source is applicable to the site location, is considered appropriate.
- Emissions from the average vehicle fleet using the local road network cannot be known, and therefore it is assumed those generated by the EFT provide an accurate representation of emissions generated by vehicles which currently use the modelled roads.
- There will be uncertainties introduced because the modelling has simplified real-world processes into a series of algorithms. For example, it has been assumed that wind conditions measured at Gatwick meteorological station in 2024 were representative of wind conditions at the site. Furthermore, it has been assumed that the subsequent dispersion of emitted pollutants will conform to a Gaussian distribution over flat terrain in order to simplify the real-world dilution and dispersion conditions.
- An important step in the assessment is verifying the dispersion model against measured data. The model verification was based on the comparison of model results based on 2024 traffic data with 2024 measured roadside NO_2 diffusion tube data. As no PM_{10} or $PM_{2.5}$ monitoring data were available near the site area, the adjustment factors used for the predicted roadside NO_x concentrations have been applied to the predicted PM_{10} and $PM_{2.5}$ concentrations, as per guidance in LAQM TG.22.
- The national diurnal profile published by the Department for Transport for 2024, has been assumed to be applicable for the roads assessed.
- There is an element of uncertainty in all measured and modelled data. All values presented in this report are best possible estimates.

3.6 Emission Mitigation Assessment

In accordance with the Air Quality and Emissions Mitigation Guidance for Sussex (2021), the development is classified as a major development. Therefore, damage costs calculation has been carried out to quantify the monetised health damage value associated with transport emissions from the proposed development over a 5-year period.

The approach taken for the emission mitigation assessment for the proposed development may be summarised as follows:

- Quantify change in emissions for NO_x and $PM_{2.5}$ using Defra 'Emission Factors Toolkit'; and
- Calculate damage costs for NO_x and $PM_{2.5}$ using Defra 'Air Quality Appraisal: Damage Cost Toolkit'.

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 MSDC, 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 site is located in an area where the main source of air pollution is likely to be road traffic exhaust emissions. The proposed development site is located to the west of B2118 London Road and close to A23 London Road. The site is surrounded by residential development to the south and open land area to the north and west.

It is noted that the site is located near to one existing industrial site with installation permit, Olus Environmental Limited. It is located approximately 2.7km to the west of the proposed development site (Permit ref: EPR/NP3795HH) and its installation permit for recovery or a mix of recovery and disposal of non-hazardous waste involving biological treatment was approved on 8th September 2000. It is assumed that this installation is being operated according to the permit with appropriate air emission abatement measures, and any air emissions from this installation is accounted for in the local baseline air quality monitoring. Given the distance involved, the potential emissions from this installation is considered to be minimal.

Thus, 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

The proposed development site is located within the administrative area of Mid Sussex District Council (MSDC). Mid Sussex Air Quality Management Area (AQMA) No.1 incorporating land at the junction of Stonepound Crossroads, with Hurst Road, Keymer Road, Brighton Road and London Road, Hassocks, located approximately 4.7km to the southeast of the site boundary, was declared by MSDC for the exceedance of annual mean NO_2 Air Quality Objective (AQO). This AQMA was revoked on 10 December 2024 and thus, MSDC currently has not declared any AQMAs. The nearest AQMA is Horsham Cowfold AQMA declared by Horsham District Council (HDC) for the exceedance of annual mean NO_2 Air Quality Objective (AQO), located approximate 6.1km to the northwest of the proposed development site. Therefore, the proposed development site is not located within or close to an AQMA

4.3 Local Authority Air Quality Monitoring Data

According to the MSDC's 2025 Air Quality Annual Status Report (ASR), there was 1 automatic monitoring stations and a network of 35 diffusion tube monitoring locations in the district in 2024.

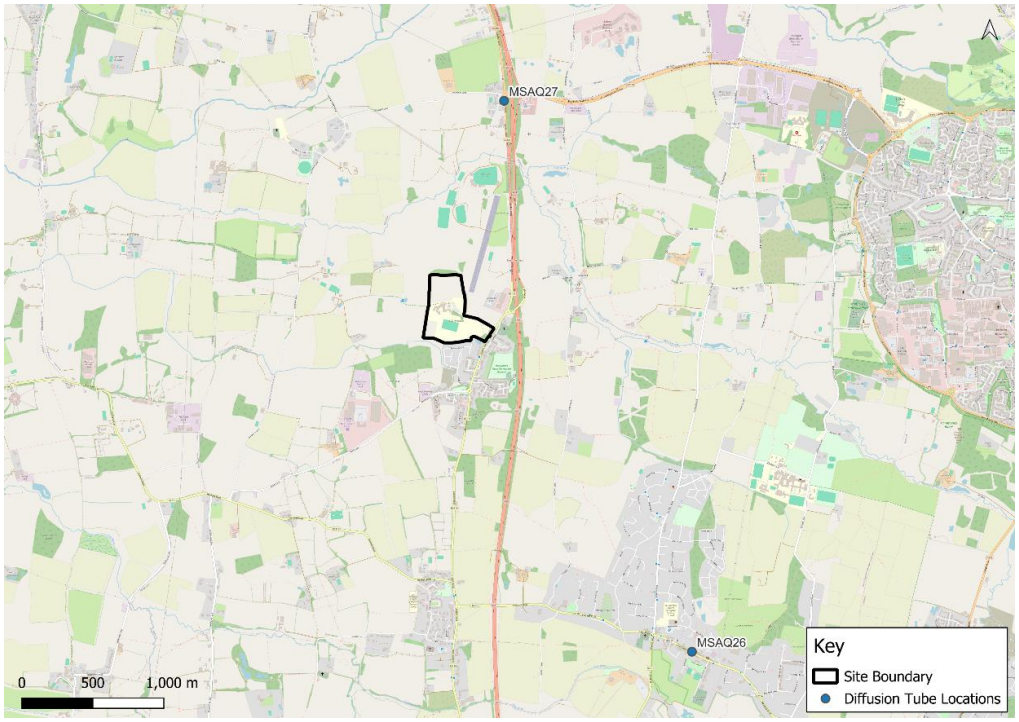
There were two diffusion tubes within 3km of the proposed development site. The 2020-2024 annual average NO_2 concentrations for the diffusion tubes within 3km from the proposed development site are reproduced in Table 4.1 below. Figure 4.1 shows the monitoring locations within 3km of the development site.

The monitoring data from these tubes show that there were no exceedances of the annual mean NO_2 AQO (40µg/m^3) between 2020 and 2024. Particular matter monitoring data are not available in the vicinity of the site.

Table 4.1 Annual Mean NO_2 Concentrations at Diffusion Tube Locations within 3km of the Proposed Development Site

Site ID	Location	Site Type	Approximate Distance from Site (km)	Annual Mean NO_2 Concentrations (µg/m^3)				
				2020	2021	2022	2023	2024
MSAQ26	High Street Hurstpierpoint	Suburban	3.0	16.1	16.8	16.8	15.3	14.8
MSAQ27	Telegraph Pole London Road Hickstead	Suburban	1.5	13.6	14.7	15.4	13.0	12.0

Figure 4.1 Diffusion Tube Monitoring Locations within 3km of the Proposed Development Site



@OpenStreetMap contributors, available under the Open Database Licence

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 4.2 identifies estimated annual average background concentrations for the grid square containing the proposed development site for years from 2025 to 2027. No exceedances of the NO_2, PM_{10} or $PM_{2.5}$ AQOs are predicted. As background concentrations are predicted to fall with time, background concentrations in future years would not be expected to exceed their respective annual mean standards.

Table 4.2: Estimated Background Annual Average NO_2, PM_{10} and $PM_{2.5}$ Concentrations at Proposed Development Site (from 2021 base map)

Assessment Year	Estimated Annual Average Pollutant Concentrations Derived from the LAQM Website (µg/m^3)		
	NO_2	PM_{10}	$PM_{2.5}$
2025	8.2	10.4	6.0
2026	7.9	10.3	5.9
2027	7.6	10.2	5.9
AQO	**40**	**40**	**20**

Note: Presented concentrations for 1 km^2 grid centred on 526500, 118500; approximate centre of development site is 526497, 118795.

4.5 Background Air Quality at the Proposed Site

Based on the local monitoring data and the 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 ~32µg/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 at the site; therefore, no significant air quality impacts are considered to be likely 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. Considering the size of the development, it is estimated that there will be less than 20 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). Although other developments are planned in the local area, the emissions from these developments are also considered unlikely to cause a significant impact on local air quality, as it is assumed that appropriate air emission controls and site management measures are implemented during the construction phase of these developments. Therefore, the cumulative impact on local air quality is considered unlikely to be significant.

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 site is surrounded by residential development to the south and open land area to the north and west. During the construction period, the existing school will remain operational until the proposed new school is completed, which is anticipated around September 2028. Following completion of the new school, the existing school will be decanted and

subsequently demolished. Therefore, both the existing school and the proposed new school, once occupied, are considered as sensitive receptors to both dust soiling and potential health impacts from particulate matter.

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

- Demolition;
- 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 demolition, earthworks, construction and trackout activities are summarised in Tables 5.1, 5.2, 5.3 and 5.4. Risk categories for the four construction activities are summarised in Table 5.5.

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 Demolition Activities (Before mitigation)

Demolition Criteria	Dust Emissions Class	Evaluation of the Effects
Total volume of buildings to be demolished	Small	<12,000m^3
On-site crushing and screening proposed	Large	Yes
Height of demolition activities above ground	Medium	6-12m
Dust potential of demolition materials	Medium	Potentially dusty soil on-site, will be minimised where possible.

Demolition Criteria	Dust Emissions Class	Evaluation of the Effects
Time of year for the demolition works to be undertaken	Medium	Winter or spring
Overall Rating	**Medium**	

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

Earthworks Criteria	Dust Emissions Class	Evaluation of the Effects
Total site area	Large	>110,000m^2
Soil type	Large	Silty clay and sand
Earth moving vehicles at any one time	Medium	5-10
Height of bunds	Small	<3m
Overall Rating	**Large**	

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

Construction Criteria	Dust Emissions Class	Evaluation of the Effects
Total building volume	Medium	12,000-75,000m^3
On-site concrete batching proposed	Small	No
On-site concrete sandblasting proposed	Small	No
Dust potential of construction materials	Medium	Potentially dusty soil on-site, will be minimised where possible.
Overall Rating	**Medium**	

Table 5.4: 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	Small	<20
Surface type of the site	Large	Silty clay with a couple of sand bands
Length of unpaved road	Large	>100m
Overall Rating	**Large**	

Table 5.5: Summary of Dust Emission Magnitude of the Site (Before mitigation)

Construction Activities	Dust Emissions Class
Demolition	Medium
Earthworks	Large
Construction	Medium

Construction Activities	Dust Emissions Class
Trackout	Large

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 demolition/earthworks/construction and trackout buffers, respectively, for identifying the sensitivity of the area. Table 5.6 presents the determined significance of the area. Demolition/earthworks/construction activities are relevant up to 250m 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.

The MAGIC Maps website indicates that there are no Special Area of Conservation, Special Protection Area, Ramsar site, National Nature Reserve or Local Nature Reserve within 50m of the site boundary or potential routes along which trackout could arise. Therefore, following the IAQM guidance ecological receptors have been screened out of the assessment and are not considered further.

Figure 5.1: Demolition/Earthworks/Construction Activities Buffer Map

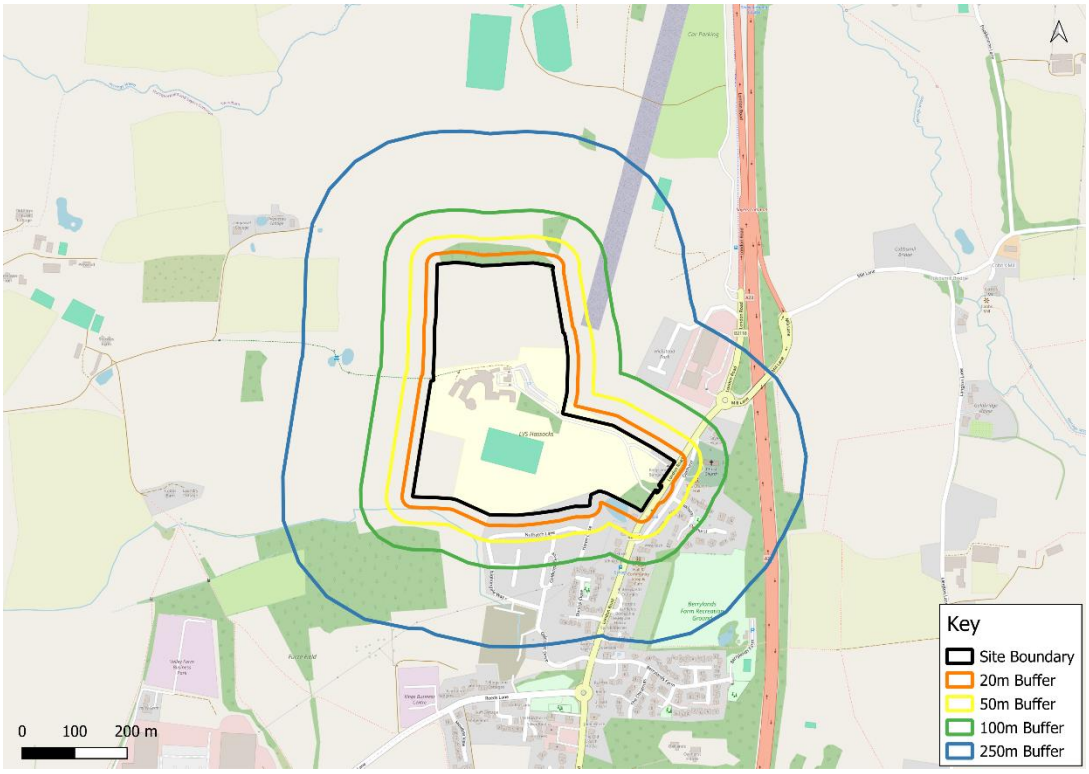


Figure 5.2: Trackout Activities Buffer Map

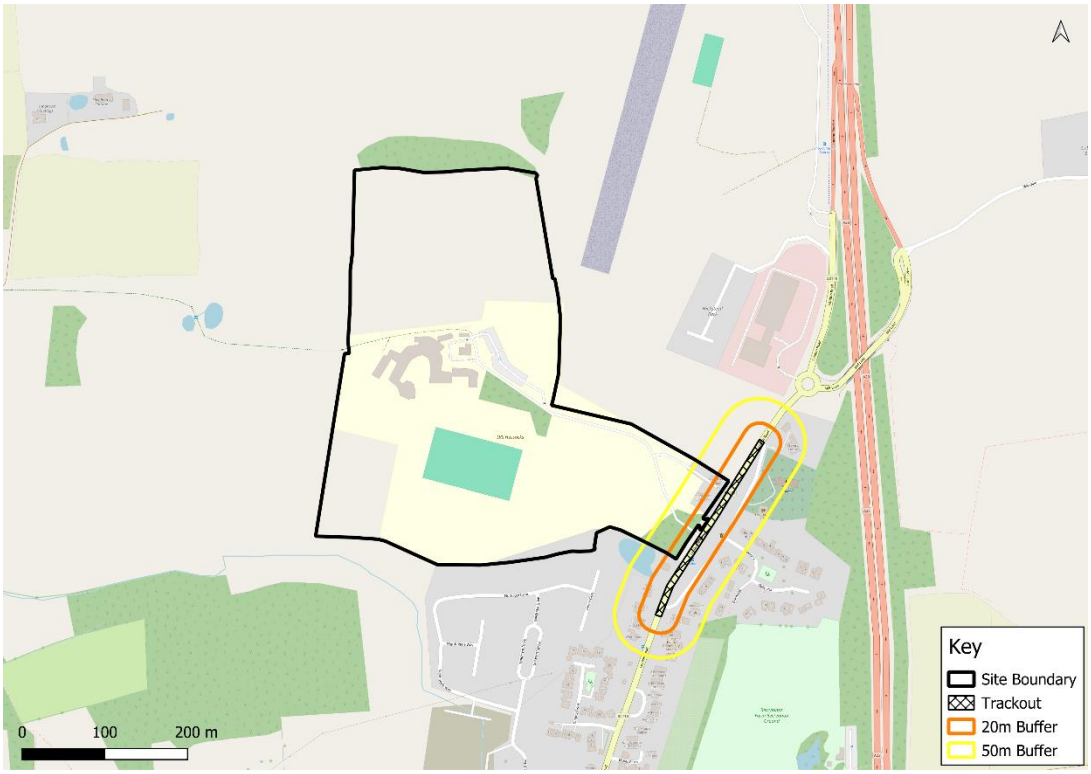


Table 5.6: Sensitivity of the area

Potential Impact		Sensitivity of the surrounding area			
		Demolition	Earthworks	Construction	Trackout
Dust soiling	Receptor sensitivity	High	High	High	High
	Number of receptors	10-100	10-100	10-100	10-100
	Distance from the source	<20m	<20m	<20m	<50m
	Sensitivity of the area	**High**	**High**	**High**	**Medium**
Human health	Receptor sensitivity	High	High	High	High
	Annual mean PM_{10} concentration	<24µg/m³	<24µg/m³	<24µg/m³	<24µg/m³
	Number of receptors	10-100	10-100	10-100	10-100
	Distance from the source	<20m	<20m	<20m	<50m
	Sensitivity of the area	**Low**	**Low**	**Low**	**Low**
Ecological	**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 5.7.

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

Table 5.7: Summary of the Dust Risk from Construction Activities

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

5.2 Operational Phase

5.2.1 Traffic Emission Dispersion Modelling Results

Detailed dispersion modelling has been undertaken with the use of the ADMS-Roads dispersion model software, following guidance in accordance with LAQM TG.22. The

modelled concentrations were 'verified' and results processed as detailed in Section 3 and Appendix E.

5.2.2 Impact of the Proposed Development on Local Air Quality at Human Receptors

Full results are presented in Appendix F and a summary is provided below.

5.2.2.1 Nitrogen Dioxide (NO_2)

The AQS for annual mean NO_2 concentrations is 40µg/m^3. The results of the assessment show that concentrations are predicted to meet the annual mean NO_2 standard at all assessment receptors.

Table 5.8 shows the comparison of annual mean NO_2 concentrations between the 'S2 2031 without proposed development' and 'S3 2031 with proposed development' scenarios at the assessed receptor locations. The percentage changes in annual mean NO_2 concentrations relative to the air quality objective and the classification of impact magnitudes with reference to the EPUK-IAQM guidance are also presented.

The proposed development is not predicted to cause any new exceedances of the annual mean NO_2 AQS.

The changes in annual mean NO_2 concentrations as a result of the proposed development and traffic redistribution are 0% of the air quality assessment level (AQAL) (i.e. UK AQSs; <0.5% and therefore no perceptible change). The impacts of the proposed development on nearby sensitive receptors are predicted to be 'negligible' at all receptor locations.

LAQM TG.22 notes that 'exceedances of the 1-hour mean objective for NO_2 are only likely to occur where annual mean concentrations are 60µg/m^3 or above'. In the opening year of 2031, annual mean NO_2 concentrations (see Table 5.8) are not predicted to exceed 60µg/m^3 at any receptors. Therefore, it is not anticipated that the hourly mean NO_2 objective would be exceeded at the site prior to or when the proposed development becomes operational.

Table 5.8: Predicted Annual Mean NO_2 Impact

Receptor ID	Annual Mean NO_2 Concentration					Impacts**
	AQ-S2 – 2031 Without Development		AQ-S3 - 2031 With Development		Change Between AQ-S2 and AQ-S3 as % of AQAL*	Impact of the proposed development
	NO_2 Concentration ($\mu g/m^3$)	As % of AQAL	NO_2 Concentration ($\mu g/m^3$)	As % of AQAL		
ER01#	12.39	31%	12.40	31%	0%	Negligible
ER02	13.47	34%	13.51	34%	0%	Negligible
ER03	13.03	33%	13.08	33%	0%	Negligible
ER04	13.57	34%	13.64	34%	0%	Negligible
ER05	14.51	36%	14.62	37%	0%	Negligible
ER06	12.73	32%	12.74	32%	0%	Negligible
ER07#	13.35	33%	13.42	34%	0%	Negligible
ER08	13.00	33%	13.05	33%	0%	Negligible
ER09	13.14	33%	13.15	33%	0%	Negligible
ER10	12.62	32%	12.67	32%	0%	Negligible
ER11^	12.06	30%	-	-	-	-
PR01	-	-	12.65	32%	-	-
PR02	-	-	12.14	30%	-	-
PR03	-	-	12.08	30%	-	-
PR04	-	-	12.04	30%	-	-
PR05	-	-	12.06	30%	-	-
PR06	-	-	12.04	30%	-	-

*As recommended in the EPUK-IAQM guidance, percentages have been rounded to whole numbers. Changes less than 0.5% i.e. 0%, have been described as negligible.

**Impacts are determined in accordance with EPUK-IAQM guidance.

#Commercial/industrial receptors. Annual mean NO_2 does not apply. To adopt a conservative approach, this assessment also includes annual mean results for commercial/ industry receptors.

^The existing school is occupied until the new school is complete, which is anticipated around September 2028. Following completion of the new school, the existing school will be decanted and subsequently demolished. Therefore, ER11 will not be exist for S3 with development scenario.

5.2.2.2 Particular Matter (PM_{10})

Table 5.9 shows the comparison of annual mean PM_{10} concentrations between the 'S2 2031 without proposed development' and 'S3 2031 with proposed development' scenarios at the assessed receptor locations. The percentage changes in annual mean PM_{10} concentrations relative to the AQS and the classification of impact magnitudes with reference to the EPUK-IAQM guidance are also presented.

Predicted annual mean concentrations of PM_{10} are all below the AQS of 40µg/m^3 for all modelled scenarios.

The proposed development is not predicted to cause any new exceedances of the annual mean PM_{10} standard.

The changes in annual mean PM_{10} concentrations as a result of the proposed development are 0% of the AQAL (i.e. <0.5% and therefore no perceptible change). The impacts of the proposed development on nearby sensitive receptors in relation to PM_{10} concentrations are predicted to be 'negligible' at all receptor locations.

LAQM TG.22 indicates that the number of annual exceedances of the 24-hour mean PM_{10} AQS can be estimated using the following formula: $-18.5 + 0.00145 \times annual\ mean^3 + (206/annual\ mean)$. Table 5.10 presents results for the 24-hour mean PM_{10} concentrations as number of day greater than 50µg/m^3 for S2 and S3. The objective for 24-hour mean PM_{10} concentrations is 50µg/m^3 to be exceeded no more than 35 times a year. The number of days exceeding 50µg/m^3 predicted is a maximum of 3 day/annum for S2 and S3, which is well below the objective.

The results indicate that in the opening year of 2031, no exceedances of annual mean PM_{10} concentrations are predicted with the proposed development at any of the proposed receptors.

Table 5.9: Predicted Annual Mean PM_{10} Impact

Receptor ID	Annual Mean PM_{10} Concentration					Impacts**
	AQ-S2 – 2031 Without Development		AQ-S3 - 2031 With Development		Change Between AQ-S2 and AQ-S3 as % of AQAL*	Impact of the proposed development
	PM_{10} Concentration ($\mu g/m^3$)	As % of AQAL	PM_{10} Concentration ($\mu g/m^3$)	As % of AQAL		
ER01#	10.66	27%	10.67	27%	0%	Negligible
ER02	11.56	29%	11.59	29%	0%	Negligible
ER03	11.24	28%	11.28	28%	0%	Negligible
ER04	11.65	29%	11.70	29%	0%	Negligible
ER05	12.23	31%	12.31	31%	0%	Negligible
ER06	11.01	28%	11.01	28%	0%	Negligible
ER07#	12.22	31%	12.27	31%	0%	Negligible
ER08	11.69	29%	11.71	29%	0%	Negligible
ER09	11.99	30%	12.00	30%	0%	Negligible
ER10	11.65	29%	11.68	29%	0%	Negligible
ER11^	10.49	26%	-	-	-	-
PR01	-	-	10.93	27%	-	-
PR02	-	-	10.55	26%	-	-
PR03	-	-	10.50	26%	-	-
PR04	-	-	10.48	26%	-	-
PR05	-	-	10.49	26%	-	-
PR06	-	-	10.48	26%	-	-

*As recommended in the EPUK-IAQM guidance, percentages have been rounded to whole numbers. Changes less than 0.5% i.e. 0%, have been described as negligible.

**Impacts are determined in accordance with EPUK-IAQM guidance.

#Commercial/industrial receptors. Annual mean PM_{10} and 24-hour mean PM_{10} AQSs do not apply. To adopt a conservative approach, this assessment also includes annual mean results for commercial/ industry receptors.

^The existing school is occupied until the new school is complete, which is anticipated around September 2028. Following completion of the new school, the existing school will be decanted and subsequently demolished. Therefore, ER11 will not be exist for S3 with development scenario.

Table 5.10: Predicted 24-Hour Mean PM_{10} Impact

Receptor ID	24-Hour Mean PM_{10}* (number of days >50µg/m^3)		
	AQ-S2 - 2031 Without Development	AQ-S3 – 2031 With Development	Change between AQ-S2 and AQ-S3
ER01#	3	3	0
ER02	2	2	0
ER03	2	2	0
ER04	1	1	0
ER05	1	1	0
ER06	2	2	0
ER07#	1	1	0
ER08	1	1	0
ER09	1	1	0
ER10	1	1	0
ER11^	3	-	-
PR01	-	2	-
PR02	-	3	-
PR03	-	3	-
PR04	-	3	-
PR05	-	3	-
PR06	-	3	-

*Rounded to whole days

#Commercial/industrial receptors. Annual mean PM_{10} and 24-hour mean PM_{10} AQSs do not apply. To adopt a conservative approach, this assessment also includes annual mean results for commercial/ industry receptors.

^The existing school is occupied until the new school is complete, which is anticipated around September 2028. Following completion of the new school, the existing school will be decanted and subsequently demolished. Therefore, ER11 will not be exist for S3 with development scenario.

5.2.2.3 Particular Matter ($PM_{2.5}$)

Table 5.11 shows the comparison of annual mean $PM_{2.5}$ concentrations between the 'S2 2031 without proposed development' and 'S3 2031 with proposed development' scenarios at the assessed receptor locations. The results as percentages of the AQAL are also presented which are used in the determination of significance of impacts (based on the EPUK-IAQM guidance).

Predicted annual mean concentrations of $PM_{2.5}$ are all below the AQS of 20µg/m^3 for all modelled scenarios. The proposed development is not predicted to cause any new exceedances of the annual mean $PM_{2.5}$ standard.

In additional to the AQS, the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 introduced an interim target for annual mean $PM_{2.5}$ objective of 12µg/m^3 by 2028. The results of the assessment show that concentrations are predicted to meet the 2028 interim target at all assessment receptors under the S2 and S3 scenarios in 2031.

The changes in annual mean $PM_{2.5}$ concentrations as a result of the proposed development are between 0% of the AQAL (i.e. <0.5% and therefore no perceptible change). The impacts of the proposed development on nearby sensitive receptors in relation to $PM_{2.5}$ concentrations, are predicted to be 'negligible' at all receptor locations.

The results indicate that in the opening year of 2031, no exceedances of annual mean $PM_{2.5}$ concentrations are predicted with the proposed development at any of the proposed receptors.

Table 5.11: Predicted Annual Mean $PM_{2.5}$ Impact

Receptor ID	Annual Mean $PM_{2.5}$ Concentration					Impacts**
	AQ-S2 – 2031 Without Development		AQ-S3 - 2031 With Development		Change Between AQ-S2 and AQ-S3 as % of AQAL*	Impact of the proposed development
	$PM_{2.5}$ Concentration ($\mu g/m^3$)	As % of AQAL	$PM_{2.5}$ Concentration ($\mu g/m^3$)	As % of AQAL		
ER01#	6.22	31%	6.22	31%	0%	Negligible
ER02	6.69	33%	6.70	34%	0%	Negligible
ER03	6.52	33%	6.54	33%	0%	Negligible
ER04	6.73	34%	6.76	34%	0%	Negligible
ER05	7.04	35%	7.08	35%	0%	Negligible
ER06	6.39	32%	6.40	32%	0%	Negligible
ER07#	6.62	33%	6.65	33%	0%	Negligible
ER08	6.36	32%	6.37	32%	0%	Negligible
ER09	6.60	33%	6.60	33%	0%	Negligible
ER10	6.41	32%	6.43	32%	0%	Negligible
ER11^	6.12	31%	-	-	-	-
PR01	-	-	6.35	32%	-	-
PR02	-	-	6.15	31%	-	-
PR03	-	-	6.13	31%	-	-
PR04	-	-	6.11	31%	-	-
PR05	-	-	6.12	31%	-	-
PR06	-	-	6.11	31%	-	-

*As recommended in the EPUK-IAQM guidance, percentages have been rounded to whole numbers. Changes less than 0.5% i.e. 0%, have been described as negligible.

**Impacts are determined in accordance with EPUK-IAQM guidance.

#Commercial/industrial receptors. Annual mean $PM_{2.5}$ AQSs does not apply. To adopt a conservative approach, this assessment also includes annual mean results for commercial/ industry receptors.

^The existing school is occupied until the new school is complete, which is anticipated around September 2028. Following completion of the new school, the existing school will be decanted and subsequently demolished. Therefore, ER11 will not be exist for S3 with development scenario.

5.2.3 Summary

The AQSs for NO_2, PM_{10} and $PM_{2.5}$ are predicted to be met at all receptor locations considered in the assessment. In accordance with EPUK-IAQM guidance, the impacts of the proposed development on NO_2, PM_{10} and $PM_{2.5}$ concentrations at sensitive human receptors, prior to mitigation, are predicted to be 'negligible'. Therefore, the effect of the proposed development on NO_2, PM_{10} and $PM_{2.5}$ concentrations, prior to mitigation, is considered to be not significant.

Predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations at proposed receptors across the proposed development site itself are not predicted to be exposed to air quality exceeding the UK AQSs.

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 effects can be greatly reduced or eliminated.

The dust risk categories identified have been used to define appropriate, site-specific mitigation measures, which are divided into general measures and measures specific to demolition, earthworks, construction and trackout. Depending on the level of risk, different mitigation measures are assigned in accordance with the IAQM construction dust guidance. For general mitigation measures, the highest risk assessed has been applied. More detailed, site-specific mitigation measures are contained in Appendix C.

It is recommended that a dust management plan (DMP) 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 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.

Any emissions from construction plant (i.e. non-road mobile machinery (NRMM)) can be reduced by ensuring that any plant used on-site comply with the NO_x, particulate matter and carbon monoxide emissions standards specified in the Regulation (EU) 2016/1628 of the European Parliament and of the Council (as amended) as a minimum, where they have net power of between 37kW and 560kW. The emissions standards vary depending on the net power the engine produces. The emissions controls should be outlined in the CEMP.

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 period only, and can be suitably controlled by the employment of mitigation measures appropriate to the development project.

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

6.2 Operational Phase Mitigation

As identified in section 5, the proposed development is not expected to expose future users to poor air quality and the impact of the proposed development on air quality is predicted to be not significant.

It is understood that the energy source for the proposed residential development and the proposed SEN school will be ASHP. Rooftop PV panels are also proposed as part of the scheme. There will be no significant stationary combustion sources, such as CHP or biomass boiler in the proposed development, as advised by the Project Team. Therefore, this report has not considered emissions related to stationary combustion emissions any further.

The modelling predicts annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ are below the relevant AQSs. Therefore, the effect on air quality at existing sensitive human receptors and future occupiers of the proposed development is judged to be negligible. Nevertheless, best practice mitigation measures should be considered to further reduce any residual effects on air quality, which could include but are not limited to:

- Implementation of a travel plan;
- A Welcome Pack available to all new residents online and as a booklet, containing information and incentives to encourage the use of sustainable transport modes from new residential occupiers;
- A school travel plan for the occupiers of the proposed SEN school, which includes a comprehensive package of active and sustainable transport measures; and
- The provision of car club vehicles within the site.

6.2.1 Emission Mitigation Assessment

In accordance with Air Quality and Emissions Mitigation Guidance for Sussex (2021), the development is classified as a major development. Therefore, damage costs calculation has been undertaken to provide a valuation of additional emissions related to traffic from the development scheme, including the proposed residential development and proposed SEN school. The following tools were used for the damage cost calculation:

- Defra 'Emission Factors Toolkit V13.1' (available online at: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/); and
- Defra 'Air quality appraisal: damage cost toolkit' (available online at: https://www.gov.uk/government/publications/assess-the-impact-of-air-quality).

Step 1: Quantify change in emissions for NO_x and $PM_{2.5}$

- **Pollutants: NO_x and $PM_{2.5}$** – road traffic is expected to be the main source of air pollutants once the development is operational. The principal pollutants relevant to this assessment are therefore considered to be NO_x and particulate matter (PM), which are generally regarded as the most significant air pollutant released by

vehicular combustion processes. $PM_{2.5}$ has been used for PM in line with the Defra Air Quality Appraisal guidance.

- **Road Type:** Urban (not London)
- **Traffic Flow:** 790 Annual Average Daily Trips (AADT) for Light Duty Vehicles (LDVs), 0 Annual Average Daily Trips (AADT) for Heavy Duty Vehicles (HDVs) – data provided by project Transport Consultant, i-Transport LLP
- **Average speed: 50 kph** (in accordance with Air Quality and Emissions Mitigation Guidance for Sussex (2021))
- **Trip length used:** 10 km
- **Years:** 2031-2035 - 2031 is the anticipated opening year of the development. 5 years of emissions, in line with the Air Quality and Emissions Mitigation Guidance for Sussex (2021), have then been used up to 2035.

Table 6.1 presents the EFT output with the emissions converted from kg/yr to tonnes/yr.

Table 6.1: Converted EFT output

Emissions (tonnes/yr)					
Pollutant	**2031**	**2032**	**2033**	**2034**	**2035**
NO_x	0.224	0.188	0.158	0.134	0.114
$PM_{2.5}$	0.0473	0.0469	0.0465	0.0461	0.0458

Step 2: Calculate damage costs for NO_x and $PM_{2.5}$

The Defra Damage Cost Appraisal Toolkit (updated February 2023) was used with the following input:

- Start year: 2031
- End year: 2035
- Price Based Year: 2025
- Number of Pollutants: 2 (NO_x and $PM_{2.5}$)
- Source: Road transport

Table 6.2 presents the damage cost calculation outputs. The damage cost calculation is considered to provide a basis for quantifying the financial commitment required for offsetting potential development-generated emissions. The calculated central damage cost value over a five-year period is **£30,144**.

Table 6.2 Damage Cost Appraisal Toolkit Output

Output from Damage Cost Appraisal Toolkit						
	2031	2032	2033	2034	2035	Total
Central Value NO_x	£2,777	£2,297	£1,899	£1,582	£1,333	**£9,888**
Central Value $PM_{2.5}$	£4,244	£4,141	£4,045	£3,955	£3,871	**£20,256**
					Total Central Value Costs	**£30,144**

The damage cost calculation is considered to provide a basis for quantifying the financial commitment required for offsetting potential development-generated emissions. The calculated central damage cost value over a five-year period is £30,144, which can be used to fund onsite mitigation measures or towards off site mitigation measures. It should be noted that, how the money is allocated will need to be discussed and agreed with MSDC, and the extent of the total money for Air Quality mitigation should be equal to/greater than the value determined by the damage cost calculation (i.e. £30,144). Table 6.3 presents the mitigation measures that could be considered to mitigate or offset transport emission related to the operational phase of the proposed development.

Table 6.3: Recommended Mitigation Measures for Minimising or Offsetting Operational Phase Traffic Emissions

Mitigation Measures
• Invest in EV charging infrastructure within the development over and above the current recommended parking standards • Provide vouchers for alternatives to private car use • Provide public transport subsidy for residents • Set up a car club within the development or contribute to the cost of a local car club • Set up or join an existing car sharing scheme for residents • Designate parking spaces for car club/car sharing vehicles • Designate parking spaces for low emission vehicles • Improve infrastructure and links to existing pedestrian and cycle network • Provide secure cycle storage • Invest in additional evergreen infrastructure to reduce particulates and other pollutants • Work with bus operator to enhance local public transport provision • Provide safe and secure cycle parking to encourage bicycle ownership and use • Implement and manage a site-specific Travel Plan

6.3 $PM_{2.5}$ Targets

In addition, when considering the new $PM_{2.5}$ targets set out in the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023, as referenced in section 2, the above construction and operational mitigation measures have looked to reduce the main

sources of $PM_{2.5}$ emissions as much as is practically possible. The modelling results indicate no exceedances of the concentration targets. The location of the development is judged to be suitable, with respect to the new targets.

7 CONCLUSIONS

A detailed air quality assessment has been undertaken for the proposed development on Land at LVS Hassocks, London Road, Sayers Common, West Sussex, 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 methodology within the IAQM construction dust guidance. Mitigation measures have been recommended to reduce the risk of dust and particulate matter being generated and re-suspended. With the implementation of the appropriate measures, no significant impacts are anticipated during the construction phase of the proposed development, including the proposed residential dwellings and the proposed SEN school.

The principal air quality impact once the proposed development is complete and operational is likely to be emissions from the increased traffic on local roads surrounding the site. An assessment of operational phase impacts has been undertaken using the ADMS-Roads atmospheric dispersion model.

Concentrations of the key pollutants (NO_2, PM_{10} and $PM_{2.5}$) were predicted at the existing sensitive human receptors and future occupiers of the proposed development, for the base year and for the proposed opening year 2031 without and with the proposed development in place. The air quality impacts were assessed as 'negligible' with respect to annual mean NO_2, PM_{10} and $PM_{2.5}$ at all assessed human receptors. The cumulative impact of the proposed development on local air quality is also considered unlikely to be significant. Therefore, it is not considered that any specific mitigation measures will be required. Nevertheless, it is recommended that best practice mitigation measures, as detailed in Section 6, should be included to minimise the potential impact of the development on local air quality.

It is understood that the energy source for the proposed residential development and the proposed SEN school will be ASHP. Rooftop PV panels are also proposed as part of the scheme. There will be no significant stationary combustion sources, such as CHP or biomass boiler in the proposed development, as advised by the Project Team. Therefore, this report has not considered emissions related to stationary combustion emissions any further.

In accordance with Air Quality and Emissions Mitigation Guidance for Sussex (2021), the proposed development is classified as a major development. Therefore, an emission mitigation assessment has also been undertaken for the proposed development. The damage cost calculation has been undertaken for both NO_x and PM, as these are the major pollutants associated with road traffic emission. The calculated central damage cost value is £30,144. Various types of mitigation measures have been recommended in Section 6. It should be noted that, how the money is allocated will need to be discussed and agreed with MSDC, and the extent of the total money for air quality mitigation should

be equal to/greater than the value determined by the damage cost calculation (i.e. £30,144).

On the basis of this assessment, the proposed development is unlikely to have a significant impact on local air quality. With appropriate mitigation, the proposed development complies with relevant national, and local planning policies and there are no air quality constraints for the development proposal.

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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:
  - 250m of the boundary of the site; or
  - 50m of the route used by construction vehicles on the public highway, up to 250m 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 250m 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 >75,000m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12m above ground level;
- **Medium**: Total building volume 12,000m^3 – 75,000m^3, potentially dusty construction material, demolition activities 6m – 12m above ground level; and
- **Small**: Total building volume <12,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6m 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 >110,000m^2, potentially dusty soil type (e.g. clay), >10 heavy earth moving vehicles active at any one time, formation of bunds >6m in height;

- **Medium**: Total site area 18,000 – 110,000m^2, moderately dusty soil type (e.g. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 3 – 6m in height; and
- **Small**: Total site area < 18,000m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3m in height.

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 >75,000m^3, on site concrete batching, sandblasting;
- **Medium**: Total building volume 12,000 – 75,000m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- **Small**: Total building volume <12,000m^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**: 20 – 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**: <20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

Step 2B: 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	<250
High	>32μg/m³	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 μg/m³	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 μg/m³	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 μg/m³	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32μg/m³	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 μg/m³	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 μg/m³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 μg/m³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	>1	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	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

APPENDIX B OPERATIONAL PHASE IMPACT SIGNIFICANCE CRITERIA

This appendix contains the significance criteria used in the assessment for the operational impact assessment from the 2017 EPUK-IAQM guidance.

To assess the impacts of a development on the surrounding area, the EPUK-IAQM 2017 guidance recommends that the degree of an impact is described by expressing the magnitude of incremental change as a proportion of the relevant assessment level and examining this change in the context of the new total concentration and its relationship with the assessment criterion. Table B1 presents the suggested framework, provided within the EPUK/IAQM guidance, for describing the impacts.

Table B1: Impact Descriptors for Individual Receptors

Long term average concentration at receptors in assessment year	% Change in Concentration Relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial
Notes AQAL = Air Quality Assessment Level, which for this assessment related to the UK Air Quality Strategy Objectives. Where the % change in concentrations is <0.5%, the change is described as 'negligible' regardless of the concentration. Where concentrations increase the impact is described as adverse, and where it decrease as beneficial.				

The EPUK/IAQM guidance notes that the criteria in Table C1 should be used to describe impacts at individual receptors and should only be considered as a starting point to make a judgement on significance of effects, as other influences may need to be accounted for. The EPUK/IAQM guidance states that the assessment of overall significance should be based on professional judgement, taking into account several factors, including:

- The existing and future air quality in the absence of the development;
- The extent of current and future population exposure to the impacts; and
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

The EPUK/IAQM guidance states that for most road transport related emissions, long-term average concentrations are the most useful for evaluating the severity of impacts.

APPENDIX C SITE SPECIFIC MIGATION MEASURES

Site-specific mitigation measures are divided into general measures, applicable to all sites and measures specific to 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 'high 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 5.7. 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. 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.
- Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimized. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.

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, or, if it a large site, before work on a phase commences.

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 (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).
- 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

- *Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).*
- Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

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 scape of material and overfilling during delivery.*
- *For smaller supplies of fine powder materials 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.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

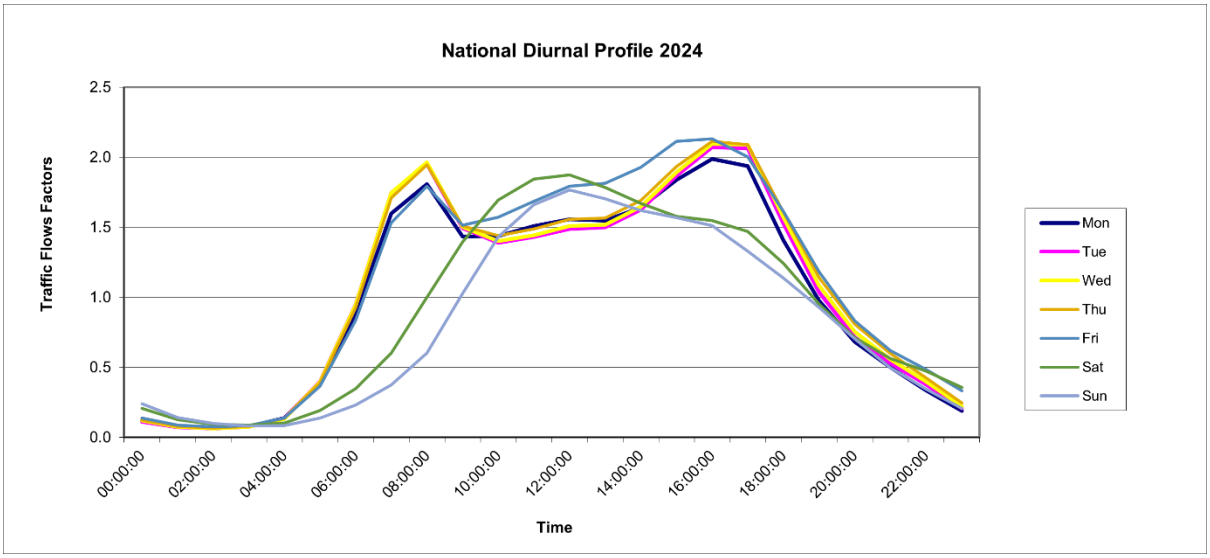
APPENDIX D ROAD TRAFFIC DATA

This appendix contains the traffic data used in the dispersion modelling assessment. The data was provided by the project transport consultant, I-Transport LLP. Included are traffic flow data in AADT and the percentage Heavy Duty Vehicles (HDV), the speed included for each road link and the diurnal profile used. Reduced speeds were used at junctions, roundabout, roads with traffic light and pedestrian lane.

Table D1: 24-hour Traffic Flow (AADT) and Speed Data used in the Dispersion Modelling Assessment

Ref	Road Link	Average Speed (mph)	(S1) 2024 Base year		(S2) 2031 Without Development		(S3) 2031 With Development	
			Total AADT	HDV%	Total AADT	HDV%	Total AADT	HDV%
1	B2118 (South of Albourne Road)	40	5448	2.9%	5858	2.9%	6351	2.7%
2	Albourne Road	40	5755	3.1%	6188	3.1%	6246	3.1%
3	B2118 (North of Albourne Road)	60	8147	4.2%	8760	4.2%	9297	3.9%
4	Furzeland Way	30	102	0.0%	110	0.0%	110	0.0%
5	B2118 (North of Furzeland Way Roundabout)	30	6855	4.4%	7371	4.4%	7908	4.1%
6	Reeds Lane	30	3734	2.9%	4016	2.9%	4016	2.9%
7	B2118 (North of Reeds Lane)	30	9432	3.9%	10142	3.9%	10679	3.7%
8	B2118 (South of Mill Lane Roundabout)	30	9143	3.6%	9832	3.6%	10084	3.6%
9	Mill Lane	60	4731	4.4%	5087	4.4%	5166	4.3%
10	Mill Lane Roundabout	30	9143	2.4%	9832	2.4%	10084	2.3%
11	A23 NB On-Slip	60	4701	2.3%	5055	2.3%	5229	2.2%
12	Reeds Lane Roundabout	30	9432	3.9%	10142	3.9%	10679	3.7%
13	Fuzerland Way Roundabout	30	8147	4.2%	8760	4.2%	9297	3.9%
14	Fairfield Road	30	652	1.2%	701	1.2%	701	1.2%
15	West Street	30	4317	2.8%	4642	2.8%	4642	2.8%
16	Leylands Road	30	12102	3.0%	13013	3.0%	13013	3.0%
17	London Road	30	12393	3.9%	13326	3.9%	13326	3.9%
18	Leysland Road Roundabout	30	12393	3.9%	13326	3.9%	13326	3.9%
19	West Street Roundabout	30	12102	3.0%	13013	3.0%	13013	3.0%

Figure D1 Diurnal Profile Included in the Dispersion Modelling Assessment



APPENDIX E MODELLING OF OPERATIONAL PHASE – VERIFICATION METHODOLOGY

The dispersion model results were verified following the relevant guidance in LAQM.TG.22. Predicted results from a dispersion model may differ from measured concentrations for a variety of reasons, these are identified in LAQM.TG.22 to include:

- Estimates of background concentrations;
- Meteorological data uncertainties;
- Uncertainties in source data for example, traffic flow data, stack emissions and emission factors;
- Model input parameters such as roughness length, minimum Monin-Obukhov and overall model limitations; and,
- Uncertainties associated with monitoring data, including locations.

As discussed in section 3, Diffusion tube MSAQ46 is roadside monitor situated close to roads, where traffic data is available. Tables E1- E2 present details of the monitoring locations used and the dispersion model verification process.

Table E1: Monitoring Location used in Verification Process

Site ID	Location	Site Type	Grid Reference		Height (m)
			X	Y	
MSAQ46	Lamp Post, London Road Burgess Hill	Roadside	530806.94	119776.59	2.1

Table E2: Modelled versus Monitored NO_x/NO_2

Site ID	Monitored total NO_2	Background NO_2	Monitored Road Contribution NO_x	Modelled road contribution NO_x	Ratio of Modelled and Measured Road NO_x
MSAQ46	18.0	12.0	13.02	5.26	2.47
Overall Adjustment Factor					2.47

An adjustment factor of **2.47** was obtained for the monitoring locations. The verified annual mean modelled road contribution NO_x concentrations have then been converted into annual mean road NO_2 by using the Defra NO_x to NO_2 spreadsheet; a comparison of monitored and model adjusted NO_2 is presented in Table E3. This shows that, following adjustment, the modelled NO_2 result is within +/- 25% of monitored NO_2 concentrations. In accordance with the LAQM.TG.22 guidance, it is not considered that further verification is required.

Table E3: Difference between Monitored and Modelled Following Adjustment

Site ID	Adjustment factor for modelled road contribution	Adjusted modelled road contribution NO_x	Modelled total NO_2 (based on empirical NO_x/NO_2 relationship)	Monitored Total NO_2	% Difference [(modelled - monitored)/monitored] x100
MSAQ46	2.47	13.02	18.0	18.0	0

Measured annual PM_{10} and $PM_{2.5}$ concentrations were not available therefore, as per the recommendations in LAQM.TG.22, the same factor was applied to the modelled PM_{10} and $PM_{2.5}$ concentrations.

Verified model results are shown in Appendix F.

APPENDIX F MODEL RESULTS

Table F1: Predicted Pollutant Concentrations at Proposed Receptor Locations (2024 meteorological data, background concentrations included): S1, S2 and S3

Receptor	Annual Mean NO_2 Concentrations ($\mu g/m^3$)			Annual Mean PM_{10} Concentrations ($\mu g/m^3$)			Number of days when 24 Hour PM_{10} Concentrations >50$\mu g/m^3$ (days)			Annual Mean $PM_{2.5}$ Concentrations ($\mu g/m^3$)		
	S1 2024	S2 2031	S3 2031	S1 2024	S2 2031	S3 2031	S1 2024	S2 2031	S3 2031	S1 2024	S2 2031	S3 2031
ER01#	12.90	12.39	12.40	10.67	10.66	10.67	3	3	3	6.22	6.22	6.22
ER02	15.41	13.47	13.51	11.60	11.56	11.59	2	2	2	6.71	6.69	6.70
ER03	14.41	13.03	13.08	11.27	11.24	11.28	2	2	2	6.54	6.52	6.54
ER04	15.64	13.57	13.64	11.68	11.65	11.70	1	1	1	6.76	6.73	6.76
ER05	17.79	14.51	14.62	12.30	12.23	12.31	1	1	1	7.09	7.04	7.08
ER06	13.71	12.73	12.74	11.03	11.01	11.01	2	2	2	6.41	6.39	6.40
ER07#	15.12	13.35	13.42	12.26	12.22	12.27	1	1	1	6.65	6.62	6.65
ER08	14.16	13.00	13.05	11.70	11.69	11.71	1	1	1	6.38	6.36	6.37
ER09	14.53	13.14	13.15	12.01	11.99	12.00	1	1	1	6.62	6.60	6.60
ER10	13.41	12.62	12.67	11.67	11.65	11.68	1	1	1	6.42	6.41	6.43
ER11^	12.15	12.06	-	10.49	10.49	-	3	3	-	6.12	6.12	-
PR01	-	-	12.65	-	-	10.93	-	-	2	-	-	6.35
PR02	-	-	12.14	-	-	10.55	-	-	3	-	-	6.15
PR03	-	-	12.08	-	-	10.50	-	-	3	-	-	6.13
PR04	-	-	12.04	-	-	10.48	-	-	3	-	-	6.11
PR05	-	-	12.06	-	-	10.49	-	-	3	-	-	6.12
PR06	-	-	12.04	-	-	10.48	-	-	3	-	-	6.11
Air Quality Objective	**40**			**40**			**35 days**			**20** **12 (Interim target by 2028)**		

Receptor	Annual Mean NO_2 Concentrations ($\mu g/m^3$)			Annual Mean PM_{10} Concentrations ($\mu g/m^3$)			Number of days when 24 Hour PM_{10} Concentrations >50$\mu g/m^3$ (days)			Annual Mean $PM_{2.5}$ Concentrations ($\mu g/m^3$)		
	S1 2024	S2 2031	S3 2031	S1 2024	S2 2031	S3 2031	S1 2024	S2 2031	S3 2031	S1 2024	S2 2031	S3 2031
#Commercial/ industry receptors where annual mean NO_2, PM_{10} and $PM_{2.5}$ AQS does not apply. To adopt a conservative approach, this assessment also includes annual mean results for commercial/ industry receptors. ^The existing school is occupied until the new school is complete, which is anticipated around September 2028. Following completion of the new school, the existing school will be decanted and subsequently demolished. Therefore, ER11 will not be exist for S3 with development scenario.												