MEC Consulting Group

ACOUSTIC AIR

Land East of Wrotham Road, Meopham
Air Quality Assessment
September 2025

Report Ref: 29473-ENV-0402

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REPORT REF: 29473-ENV-0402

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REGISTRATION OF AMENDMENTS

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CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 MEC Consulting Group Ltd (MEC) has been commissioned by Richborough, to undertake an Air Quality Assessment in support a proposed residential development on Land East of Wrotham Road, Meopham (hereafter referred to as 'the Site'). A site location plan is provided in **Appendix A**.

Existing Site

1.2 The Site, comprised of arable land, is bound by Green Lane to the north; arable land to the east; existing residential and further arable land to the south; and Wrotham Road to the west, with various retail uses and Meopham Community Academy located beyond.

1.3 The principal source of emissions affecting the Site will be from Wrotham Road.

Development Proposals

1.4 Development proposals comprise:

Outline application for the erection of up to 350 residential dwellings, public open space and associated works. Approval is sought for the principal means of vehicular access from Wrotham Road and all other matters are reserved

1.5 A parameter plan is provided in **Appendix A**.

Assessment Scope

1.6 The following scope of works has been undertaken:

- Assessment has been undertaken in accordance with Defra's LAQM[1] and the EPUK[2];
- A review of the Local Authority's (LA) published air monitoring and modelling data for the area has been undertaken, so that air pollutant concentrations at the Site and its surroundings can be quantified relative to the relevant air quality objectives governed by the Air Quality (England) Regulations[3];
- Modelling of relevant pollutants; nitrogen dioxide (NO_2) and particulates (PM_{10} and $PM_{2.5}$) concentrations from nearby local roads has been undertaken using ADMS-Roads software, for comparison with the air quality objectives;
- A dust risk assessment has been undertaken in accordance with the IAQM[4] construction guidance; and
- An Emissions Mitigation Statement has been prepared in accordance with Kent and Medway's Air Quality Planning Guidance[5].

[1] Local Air Quality Management Technical Guidance 2022.
[2] Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) – Land-Use Planning & Development Control: Planning for Air Quality 2017.
[3] UK National Air Quality Strategy (AQS) under Section 80 of the Environment Act 1995.
[4] Institute of Air Quality Management (IAQM) *'Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance'* 2014.
[5] Kent & Medway Air Quality Partnership, Air Quality Planning Guidance, December 2015.

1.7 The conclusions of this report aim to demonstrate to the LA that air quality over the Site is acceptable for residential development, and that the development itself will not have any adverse impacts on ambient air quality for existing dwellings.

Disclaimer

1.8 MEC has completed this report for the benefit of the individuals referred to in Paragraph 1.1 and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from MEC.

1.9 MEC accepts no responsibility or liability for:

a) The consequence of this documentation being used for any purpose or project other than that for which it was commissioned;
b) The issue of this document to any third party with whom approval for use has not been agreed.

2.0 STANDARDS AND GUIDANCE

2.1 The principal air quality standards applied within the UK are the standards and objectives that were initially formulated within the Air Quality (England) Regulations 2000 (AQR) as amended in 2002. These were enacted as part of the UK National Air Quality Strategy (AQS) under Section 80 of the Environment Act 1995, and implement relevant directives of the European Union (EU). The latest version of the UK AQS was published in 2007.

2.2 It is important to note the distinction between air quality standards and objectives. Although the AQ Standards (AQS) define concentration levels that will avoid or minimise risks to health, they do not necessarily reflect levels that are presently technically feasible or economically efficient. In contrast, the AQ Objectives (AQO) have been set with regard to what is realistically achievable within a specified timetable. The approach adopted by the Strategy is to apply the objectives, where members of the public, in a non-occupational capacity and at locations close to ground level, are likely to be exposed over the averaging time of the objective, for example, over 1-hour, 24-hour or annual periods as appropriate.

2.3 Under the Environment Act 1995, Local Authorities must review and document local air quality within their areas by way of a staged appraisal and respond accordingly, with the aim of meeting the air quality objectives by the years defined in the Regulations. Where the objectives of the Regulations are not likely to be achieved by the objective year, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it will try to meet air quality standards in future.

2.4 The Strategy's current air quality objectives, for NO_2, PM_{10} and $PM_{2.5}$, for the protection of human health are summarised in Table 2.1 below. Definitions of units and terms used to quantify air pollutant concentrations are provided in **Appendix B**.

Table 2.1: UK Air Quality Objectives for Protection of Human Health

Pollutant	Concentration	Measured as *
Nitrogen dioxide	200 μg/m^3	1 hour mean not to be exceeded more than 18 times per year
	40 μg/m^3	Annual mean
Particles (PM_{10} gravimetric)	50 μg/m^3	Daily mean not to be exceeded more than 35 times a year
	40 μg/m^3	Annual mean
Particles ($PM_{2.5}$ gravimetric)	20 μg/m^3 (target)	Annual mean
	12 μg/m^3	2028 Interim target[(a)]
	10 μg/m^3	Legally binding target 2040[(a)]
[(a)] The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023		

2.5 The UK Government has also set NO_2 objectives for 2010 that must be met by all member states, although these 2010 EU NO_2 objectives are equal to the UK Air Quality Strategy NO_2 2005 objectives.

2.6 The pollutants of most concern to planning authorities in urban areas, due to the high concentrations presently encountered (of which local road traffic makes a large contribution) are NO_2. PM_{10} and $PM_{2.5}$.

National Planning Policy Framework

2.7 The latest National Planning Policy Framework (NPPF), issued by the Ministry of Housing, Communities and Local Government in 2024, sets out the Government's planning policies for England and how these are to be expected to be applied. The NPPF must be taken into account in the preparation of local and neighbourhood plans, and is to be a material consideration in planning decisions.

2.8 Paragraph 187 of the NPPF advises that, planning policies and decisions should contribute to and enhance the natural and local environment by *"...preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans"*.

2.9 Further, paragraph 199 advises 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*".

Planning Practice Guidance

2.10 In 2019, the Department for Communities & Local Government updated its on-line planning guidance to assist with interpretation of the NPPF. The guidance covers general matters such as relevance of air quality issues, role of the Local Plan, information sources, assessment approaches and mitigation. How considerations about air quality fit into the development management process is summarised by the guidance in a flowchart, which is included here in **Appendix C**.

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) – Land-Use Planning & Development Control: Planning for Air Quality 2017

2.11 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have produced this guidance to ensure that air quality is adequately considered in the land-use planning and development control processes.

2.12 The guidance clarifies when an air quality assessment is required and what it should contain. It sets out how impacts should be described and assessed. Importantly it sets out a recommended approach that can be used to assess the significance of the air quality impacts, taking account of the advice issued by IAQM. An

important focus of this guidance is on minimising the air quality impacts of all developments for which air quality assessments have been requested by the planning authority; this will be through good design and application of appropriate mitigation measures.

2.13 Stage 1 of the assessment in the local area seeks to screen out smaller development and/or developments where impacts can be considered to have insignificant effects. The Stage 1 criteria is set out in Table 2.2 and require any of the criteria in row A, coupled with any of the criteria in row B, to apply before an assessment proceeds to Stage 2. If none of the criteria are met then the impacts can be considered to be insignificant and there is no requirement to carry out an air quality assessment.

Table 2.2: Stage 1 Criteria

Criteria to Proceed to Stage 2
If any of the following apply: • 10 or more residential units or a site of more than 0.5 ha • more than 1,000 m^2 of floor space for all other uses or a site area greater than 1 ha
Coupled with any of the following: • the development has more than 10 parking spaces • the development will have a centralised energy facility or other centralised combustion process
Note: Consideration should still be given to the potential impacts of neighbouring sources on the site, even if an assessment of impacts of the development on the surrounding area is screened out.

2.14 The criteria in Table 2.3 provide more specific guidance as to when an air quality assessment is likely to be required to assess the impacts of the proposed development on the local area.

Table 2.3: Indicative Criteria for Requiring an Air Quality Assessment

The development will:	**Indicative Criteria to Proceed to an Air Quality Assessment**
Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans<3.5t gross vehicle weight)	A change of LDV flows of: more than 100 AADT within or adjacent to an AQMA more than 500 AADT elsewhere
Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight)	A change of HDV flows of: more than 25 AADT within or adjacent to an AQMA more than 100 AADT elsewhere
Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA.
Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
Introduce or change a bus station.	Where bus flows will change by: more than 25 AADT within or adjacent to an AQMA more than 100 AADT elsewhere.
Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20m of a relevant receptor Coupled with the car park having more than 100 movements per day (total in and out)
Have one or more substantial combustion processes.	Where the combustion unit is: any centralised plant using bio fuel any combustion plant with single or combined thermal input >300kW

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment
	a standby emergency generator associated with a centralised energy centre (if likely to be tested/used >18 hours a year)
Have a combustion process of any size.	Where the pollutants are exhausted from a vent or stack in a location and at a height that may give rise to impacts at receptors through insufficient dispersion. This criterion is intended to address those situations where a new development may be close to other buildings that could be residential and/or which could adversely affect the plume's dispersion by way of their size and/or height.

2.15 Where an air quality assessment is identified as being required, this may be either a Simple or a Detailed Assessment. A Simple Assessment is one relying on already published information and without quantification of impacts, in contrast to a Detailed Assessment that is completed with the aid of a predictive technique, such as a dispersion model. Passing a criterion in Table 2.3 does not automatically lead to the requirement for a Detailed Assessment. Once again, where none of the criteria are met the impacts can be considered to be insignificant and there is no requirement to carry out an air quality assessment.

2.16 The purpose of the air quality assessment is to define the likely quantitative or qualitative changes in air quality or exposure to air pollution as a result of the proposed development.

2.17 The suggested framework for describing the impacts on the basis set out above is set out in Table 2.4. The term Air Quality Assessment Level (AQAL) is used to include air quality objectives or limit values, where these exist. The Table is only intended to be used with annual mean concentrations, and all % changes are rounded up or down to whole numbers. At exposures less than 75% of the AQAL, the degree of harm is described as likely to be small. As the exposure encroaches and exceeds the AQAL the degree of harm increases, and the change becomes more important when the result is an exposure that is approximately equal to or greater than the AQAL.

Table 2.4: Impact Descriptors for Individual Receptors

Long term average Concentration at receptor 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% of 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

2.18 A judgement of the significance of the impacts is to be made by a competent professional who is suitably qualified, and the reasons for reaching the conclusions should be transparent and set out logically. Whilst the starting point for the assessment of significance is the degree of impact, as defined by Table 2.4, this should be seen as only one of the factors for consideration, not least because the outcome of this assessment procedure applies to a receptor and not the overall impact of the scheme on the locality.

2.19 The guidance also makes it clear that the presence of an AQMA should not halt all development, but where development is permitted, the planning system should ensure that any impacts are minimised as far as is practicable. Even where developments are proposed outside of AQMAs, and where pollutant concentrations are predicted to be below the objectives/limit values, it remains important that the proposed development incorporates good design principles and best practice measures and that emissions are fully minimised.

Construction Dust Nuisance

2.20 There is no specific guidance relating to the assessment of construction dust nuisance within Government documents such as the DMRB. Consequently, guidance from relevant national bodies provides the best advice for establishing the potential impacts from dust. Research carried out by the Buildings Research Establishment (BRE) indicates that the likelihood of complaints concerning dust nuisance is related to the distance of receptors from a construction site and the duration of dust raising activities. This relationship is shown in Table 2.5.

Table 2.5: Likelihood of Dust Complaints by Distance

Duration of dust raising activity onsite	Distance from site			
	< 20 m	20 – 50 m	50 – 100 m	100 – 150 m
	Likelihood of complaint			
> 12 months	Very Likely	Very Likely	Likely	Potential Likelihood
6 – 12 months	Very Likely	Likely	Likely	Potential Likelihood
< 6 months	Very Likely	Likely	Potential Likelihood	Not Likely

Note: Beyond 150 m dust nuisance is considered largely unlikely (Upton & Kukadia, 2002, Measurements of PM_{10} from a Construction Site: A Case Study, prepared by BRE Environment for National Society for Clean Air).

2.21 Further empirically derived measures of the maximum distance from a source of airborne dust within which significant adverse effects are likely to be observed, are presented in Table 2.6. These values reflect qualitative estimates derived from historical data presented within environmental assessment reports and expert evidence.

Table 2.6: Qualitative Construction Dust Assessment Criteria

Source Descriptors		Zone for Potentially Significant Effects (Distance from Source)	
Source	Duration	Soiling	PM_{10}*
Large construction sites	1 year or more	100 m	25-50 m
Moderate sized construction sites	Months	50 m	15-30 m
Minor construction sites	Weeks	25 m	10-20 m

*Based on 35 permitted exceedances of 50 µg/m^3 in a year, as defined in The Air Quality (England) Regulations.
Source: Adapted from Thames Gateway Bridge – Environmental Statement (Laxen, 2004)

Dust Risk Assessment

2.22 The Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction, January 2024, provides a framework for the assessment of risk.

2.23 The guidance divides activities on construction sites into four types to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

2.24 The assessment methodology considers the following three separate dust effects, with account being taken of the distance of the receptors that may experience these effects.

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

2.25 The assessment procedures and risk categories for each of the four phases of construction where the potential for dust is high, i.e., those listed above, are summarised in **Appendix D**.

2.26 Step 1 establishes that an assessment will normally be required where there are dwellings within 250m of the site boundary.

3.0 LOCAL AUTHORITY AIR QUALITY REVIEW AND ASSESSMENT

Gravesham Borough Council

3.1 There are currently three Air Quality Management Areas (AQMA) within the Gravesham Borough Council (GBC) area. The AQMA were declared due to exceedances to the annual mean nitrogen dioxide (NO_2) objectives, and are located as follows:

- Gravesham A2 (AQMA No.1): located approximately 4km north of the Site;
- Gravesham A226 One-way System (AQMA No.3): located approximately 7km north of the Site; and
- Gravesham A227 Wrotham Road / B261 Old Road West (AQMA No.4): located approximately 6km north of the Site.

3.2 GBC's most recently published 2024 Annual Status Report (ASR) states:

"During 2023, 66 passive monitoring locations reported a decrease in NO_2 concentrations relative to 2022, with the remaining 1 reporting an increase from 2022. GR142 (36.9 µg/m^3) reported the only concentration within 10% of the NO_2 AQS, however fall-off with distance calculations were required to predict the concentration to the nearest relevant receptor, the estimated concentration is 28.4 µg/m^3....

AQMA No.1 (A2 Trunk) has achieved 1 year of compliance, 4 out of 9 passive monitoring locations have 5 years compliance. The remaining 5 sites reported one and two years of compliance (excluding COVID years 2020/2021). Taking into account fall off with distance calculations, GR142 has now been compliant for 1 year, therefore the council will need to maintain monitoring at these locations until at earliest to the end of 2025 for revocation to be considered.

AQMA No.3 (A226 One-Way System Gravesend AQMA) has achieved 1 year of compliance, 5 out of 12 sites have 5 years of compliance, 6 sites with two years of compliance (excluding COVID years 2020/2021), and 1 site with 1 year compliance. Therefore, it is expected that revocation at earliest would need 3 more years of monitoring with GR13 currently reporting one year of compliance.

AQMA No.4 (A227/B261 Wrotham Road/Old Road West Junction AQMA) has achieved 2 years of compliance, both sites have 2 years of compliance (excluding COVID years 2020/2021). Therefore, it is expected that revocation at earliest would need 2 more years of monitoring."

3.3 GBC operates a comprehensive network of 2 automatic (continuous) monitoring sites and 67 non-automatic (passive) diffusion tube locations throughout the district, including 1 diffusion tube located near to the Site in Meopham (ID: GR94), and the concentrations for this tube are presented in Table 3.1.

Table 3.1: GBC Monitoring Data

Site ID	OS Co-ordinates	Annual Mean Concentrations (µg/m^3)				
		2019	2020	2021	2022	2023
GR94	564392,166836	36.1	27.2	25.5	26.6	23.3

3.4 The information in Table 3.1 indicates that concentrations within Meopham lie well below the annual mean objective levels of 40 µg/m^3.

3.5 In conclusion, air quality within the GBC area is generally good, with air quality objective levels met throughout the Council's administrative area. Since 'relevant exposure' is already present adjacent to the Site, i.e., existing residential dwellings are present adjacent to the Site and local roads, and these have already been considered within GBC's reviews and assessments, the same conclusions will apply for new dwellings on the Site. Namely, all air quality objectives will be satisfied on the Site and at dwellings adjacent to the routes to the Site.

3.6 Nevertheless, it will be important that any air quality assessment for the proposed development looks at the potential effects of traffic generated by development upon existing dwellings adjacent to local roads to establish that there will be no adverse effects upon their existing standards of air quality. This matter will be addressed in due course, when traffic flow data to enable assessment becomes available.

4.0 METHODOLOGY

General

4.1 The assessment has been undertaken using the atmospheric dispersion modelling package ADMS-Roads Air Quality Management System Version 5.1, developed by Cambridge Environmental Research Consultants Ltd (CERC), to establish air pollutant concentrations at the proposed development.

4.2 The assessment has been undertaken with reference to guidance set out within Defra's LAQM.TG(22), the IAQM and EPUK's 'Guidance on Land-Use Planning and Development Control: Planning for Air Quality 2017 (v1.2)'.

4.3 Specifically, ADMS-Roads has been used to disperse emissions of NO_x and PM_{10} from local road sources and derive resultant road contributions to the concentrations of these pollutants at specific existing receptor locations. When added to the background concentration, this provides an indication of the resulting air quality at each receptor location.

4.4 The ADMS-Roads model requires the input of background pollutant concentration data, hourly traffic flows, annual average vehicle speed, vehicle classification broken down into light and heavy duty vehicles (LDV/HDV), information on the type of road and meteorological data (model inputs are discussed in turn later).

4.5 Current guidance has led to some changes in the way in which NO_2 concentrations should be modelled. In accordance with LAQM.TG(22) the ADMS-Roads model has been used to derive road-based concentrations of NOx at specific receptor locations. To convert the modelled road-based NO_x to annual NO_2 the 'NO_x to NO_2' calculator (Version 9.1) (available from https://laqm.defra.gov.uk/air-quality/air-quality-assessment/nox-to-no2-calculator/) has been applied to all modelled results.

Assessment Scenarios

4.6 For the purpose of an Air Quality Assessment, sensitive receptors can be thought of as areas within 200m of the roadside where people may be subject to change in air quality. Beyond 200m from the roadside, atmospheric dispersion (and chemistry) effect render emissions from road traffic negligible.

4.7 The assessment considers the potential impact of emissions from development-related traffic upon NO_2, PM_{10} and $PM_{2.5}$ concentrations at individual receptor locations as shown in **Appendix E**. The following scenarios, informed by available GBC NO_2 monitoring data and the Transport Assessment work, have been included in the assessment:

- 2023 Baseline (for verification);
- 2030 'Do Nothing' (i.e., Baseline + Committed Development); and
- 2030 'Do Something' (i.e., 2030 DN + Proposed Development.

4.8 The future year scenarios have been modelled using future year traffic flow data, together with 2025 background and emissions data, to account for current uncertainty in future year projections. Background

concentrations and vehicle emission factors are projected to decrease year on year due to fleet composition and technological changes. Using 2025 data therefore provides a conservative case for the future scenarios.

Local Road Network

4.9 Local road sources have been input into the model using the interface between ADMS-Roads and the ADMS-Roads mapper, which enables roads to be input according to their geographic location using OS base mapping of the local area. Road/carriageway widths have been informed from OS base and aerial mapping.

Traffic Data & Emissions

4.10 To inform emissions from each road source included within the model, traffic flows for the local road network have been provided by project's Transport Consultant; Hub Transport Planning Ltd. The available traffic flow data, % HGV and average speed assumptions for each assessment scenario are provided in **Appendix F** for information.

4.11 Emission rates for each road source have been derived from traffic flow data using the Emission Factor Toolkit (EFT), Version 12.0, published by Defra and the devolved administrations in December 2023. The EFT is incorporated within ADMS-Roads Extra, Emissions have been calculated and included within the software. The EFT allows users to calculate road vehicle pollutant emission rates for pollutants for a specified year, road type, and vehicle speed and vehicle fleet composition.

Background Concentrations

4.12 Background concentrations of NO_2, NO_x, PM_{10} and $PM_{2.5}$ have been obtained from the 2021-based maps available on the Defra website (https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021) which provide estimated background pollutant concentrations for each 1kmx1km grid square in the UK.

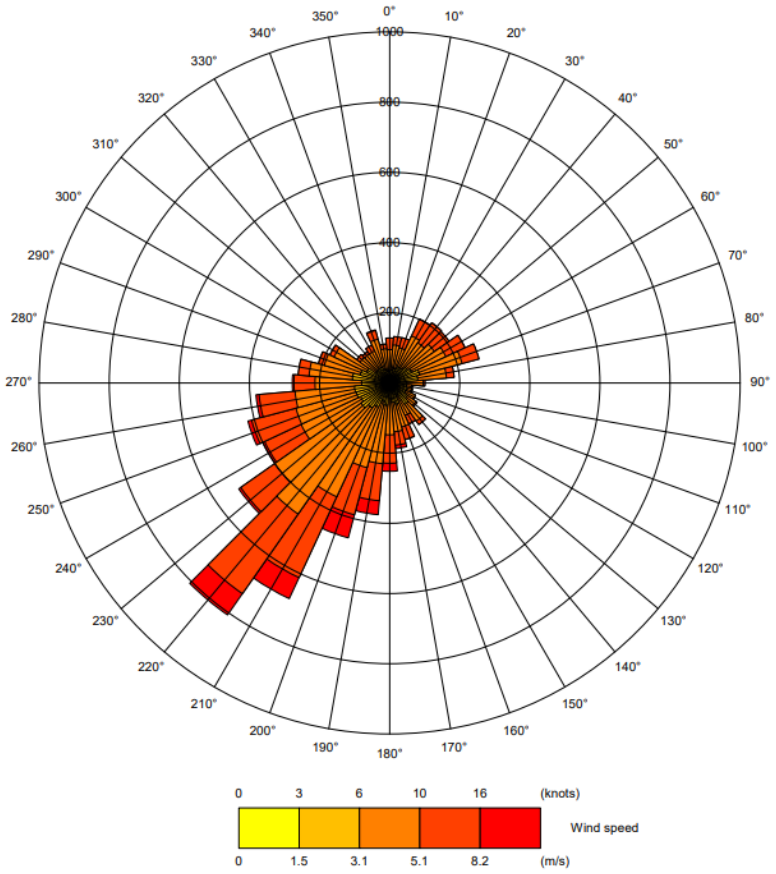
4.13 As the background maps provide data for individual pollutant sectors, those sectors relating to road traffic have been removed to avoid double counting of road emissions. As only total background concentrations are provided for NO_2, the NO_2 map has been adjusted using the online NO_2 Adjustment for NO_x Sector Removal Tool (Version 9.0), https://laqm.defra.gov.uk/air-quality/air-quality-assessment/no2-adjustment-for-nox-sector-removal-tool/.

Meteorology

4.1 The closest meteorological station to the Site is Biggin Hill Observation Station, located at a distance of approximately 23km.

4.2 The windrose for Biggin Hill Observation Station is presented in Figure 4.1. The predominant wind direction, which is associated with the highest wind speeds, is shown to be from the southwest.

Figure 4.1: Biggin Hill Observation Station Windrose, 2023



Verification

4.3 To determine how well the model is performing and to correct any over or under estimation of pollutant concentrations, LAQM.TG(22) recommends a verification process that should be applied. Verification involves a comparison between predicted and measured 'road traffic contributions' at one or more local sites and adjustment of the modelled concentrations if necessary.

4.4 Modelled pollutant concentrations have been verified against GBC's 2023 NO_2 monitoring results, as shown in Table 4.1 below.

Table 4.1: GBC Monitoring Data Used in Verification

Site ID	OS Co-ordinates	2023 Annual Mean Concentrations (µg/m^3)
GR94	564392,166836	23.3
GR142	567500,169836	36.9

4.5 A derived adjustment factor of 4.1 has been applied to all modelled road contribution NO_x and PM. Details of this verification process are included in **Appendix G**. In order to get to the verification factors shown above, a reduction of assumed road speeds along the existing roads has been applied.

4.6 In addition to this, a Root Mean Square Error (RMSE) has been calculated to determine the error within the calculations. The calculations for the RMSE are provided in **Appendix G**. The calculated RMSE is 0.6 µg/m^3,

which correlates to an error ratio of 2%. The RMSE means that modelled results could be under or over predicting pollution concentrations by between +/- 0.6 µg/m^3.

4.7 It is considered that any attempts to reduce the verification factor further would lead to unrealistic speeds along the links in question, which would be unrepresentative of the average daily speed on the relevant road. Nevertheless, a calculated RMSE of 2% shows a good correlation for assessment purposes.

5.0 AIR QUALITY AND CONSTRUCTION DUST RISK ASSESSMENT

General

5.1 This section of the report outlines the findings of the assessment discussed in Section 4.0. Having established the likely change in pollutant concentrations arising from the 'do something' assessment scenarios, the potential local air quality impact of the proposed development has been described using the approach set out in the IAQM and EPUK 'Guidance on Land-Use Planning and Development Control: Planning for Air Quality 2017'.

5.2 EPUK Guidance suggests a two-stage process to be followed in the assessment:

- A qualitative or quantitative description of the impacts on local air quality arising from the development; and
- A judgement on the overall significance of the effects of any impacts.

5.3 For air quality impacts on the surrounding area (i.e., existing receptors), a practical way of assigning a meaningful description to the degree of an impact is to express the magnitude of incremental change as a proportion of the relevant assessment level and then to examine this change in the context of the new total concentration and its relationship with the assessment criterion. The suggested IAQM/EPUK framework for describing the impacts on the basis set out above is shown in Table 2.4.

Results

5.4 The findings of the assessment of pollutant concentrations at each of the receptor locations for the modelled scenarios are discussed below.

5.5 These results should be compared with the objectives listed in Table 2.1, and summarised as follows:

- NO_2 average annual mean not to exceed 40 µgm^3;
- PM_{10} average annual mean not to exceed 40 µgm^3; and
- $PM_{2.5}$ average annual mean not to exceed the 2028 – 2040 interim target of 12 µgm^3.

Nitrogen Dioxide (NO_2)

5.6 The results in **Appendix H** indicate that for a baseline do-nothing scenario in 2030, receptors adjacent to all roads have values well below the current annual mean air quality objectives (40 µg/m^3) for NO_2, which is consistent with GBC's air quality and review data.

5.7 With traffic generated by development, i.e., the do-something scenario in 2030, the absolute concentrations remain below the current air quality objectives and the incremental change due to traffic generated by development is small (1 µg/m^3 or less to annual mean concentrations of NO_2), which would not have a significant impact upon local air quality.

5.8 The impact significance in accordance with the EPUK/IAQM guidance is also presented in **Appendix H** for each receptor. For all receptors, the impact due to development is classed as 'Negligible' and none of the changes exceed 3% of the AQAL.

5.9 With regard to the 1-hour mean objective LAQM.TG(22) advises that *"A study carried out on behalf of Defra and the Devolved Administrations identified that exceedances of the NO_2 1-hour mean are unlikely to occur where the annual mean is below 60 µg/m³"*. As the results in **Appendix H** indicate annual mean concentrations of NO_2 will remain below 60 µg/m³, it is considered that the NO_2 1-hour objective will not be exceeded at any receptor.

Particulate Matter (PM_{10})

5.10 The results in **Appendix H** indicate that for a baseline do-nothing scenario in 2030, receptors adjacent to all roads have values below the current annual mean air quality objectives (40 µg/m³) for PM_{10}.

5.11 With traffic generated by development, i.e., the do-something scenario in 2030, the absolute concentrations remain below the current air quality objectives and the incremental change due to traffic generated by development is small (0.2 µg/m³ or less to annual mean concentrations of PM_{10}), which would not have a significant impact upon local air quality.

5.12 The impact significance in accordance with the EPUK/IAQM guidance indicates that for all receptors, impact due to development is classed as 'Negligible', and none of the changes exceed 1% of the AQAL.

Particulate Matter ($PM_{2.5}$)

5.13 The results in **Appendix H** indicate that for a baseline do-nothing scenario in 2030, receptors adjacent to all roads have values below the interim target level (12 µg/m³) for $PM_{2.5}$.

5.14 With traffic generated by development, i.e., the do-something scenario in 2030, the absolute concentrations remain below the current air quality objectives and the incremental change due to traffic generated by development is small (0.1 µg/m³ or less to annual mean concentrations of $PM_{2.5}$), which would not have a significant impact upon local air quality.

5.15 The impact significance in accordance with the EPUK/IAQM guidance indicates that for all receptors, impact due to development is classed as 'Negligible', and none of the changes exceed 1% of the AQAL.

5.16 It should be noted that the above effects reflect a worst-case scenario, with the 2030 future year modelled using 2030 traffic flow data, together with 2025 background and emissions data, to account for current uncertainty in future year projections. Background concentrations and vehicle emission factors are projected to decrease year on year, as new Euro standards and UK fleet turnover are assumed. Using 2025 data therefore provides a conservative case for the future year scenarios. In reality, pollutant concentrations may be lower.

5.17 Using the significance flowchart in **Appendix C**, air quality is not considered to be a significant consideration and the proposed development can proceed to a planning decision with conditions where appropriate.

5.18 Since the air quality assessment indicates that the annual mean air quality objective will be met at the most exposed receptor locations, and since the actual changes due to traffic generated by development are small

and not significant, it can be concluded that the air quality at the Site is acceptable for development, and that development traffic will not lead to significant adverse impact upon existing air quality.

Construction Dust Risk Assessment

5.19 Nuisance dust impacts are likely to be temporary and episodic (most noticeable during dry windy conditions) and would not persist beyond completion of construction.

5.20 Where dust raising activities are present for 12 months or more, dust complaints are considered to be very likely for those closest receptors to the site that lie between 10-30m from the site boundary. Therefore, appropriate dust mitigation measures will be required to minimize dust emissions from the Site.

5.21 In addition, the qualitative dust assessment criteria in Table 2.6 indicates that existing premises adjacent to the Site will lie within the zone for potentially significant effects for soiling and ambient concentrations of PM_{10}.

5.22 Applying IAQM risk assessment procedures as set out in **Appendix D** requires an assessment where there are sensitive receptors within 250m of the site boundary of the works and/or within 100m of the routes used by construction vehicles on the public highway up to 500m from the site entrance. Existing premises fall within 250m zone which triggers the initial screening criterion.

5.23 The stages considered by the dust risk assessment are presented in Table 5.1. The assessments and conclusions are based upon the classifications for a 'Medium' construction site for earthworks, and 'Large' for construction and track-out, as the total working area for the various activities lies above the respective thresholds. However, not all of the Site would require intensive earthworks, nor would it require large numbers of plant or significant amounts of spoil removal, nor are the types of construction work or soil conditions likely to lead to anything more than being 'moderately dusty'. There are no demolition requirements for the Site, and no known ecological areas within 50m of the works.

Table 5.1: Dust Risk Assessment

Step	Consideration	Demolition	Earthworks	Construction	Track-out
2a	Scale/nature of works	-	Medium	Large	Large
2b	Sensitivity of area:				
	To dust soiling	-	Medium	Medium	Medium
	To PM_{10} health effects	-	Low	Low	Low
	To ecological effects	-	-	-	-
2c	Risk of Dust Impacts	-	Medium Risk	Medium Risk	Medium Risk

5.24 The assessments in Table 5.1 and the IAQM matrices have been used to define the Site-specific mitigation requirements for the construction phases and the overall risk assessment for dust from the construction works is summarised in Table 5.2.

Table 5.2: Summary of Dust Risk Table to Define Site-Specific Mitgation

Source	Dust Soiling Effects	PM_{10} Effects	Ecological Effects
Demolition	-	-	-
Earthworks	Medium Risk	Low Risk	-
Construction	Medium Risk	Low Risk	-
Trackout	Medium Risk	Low Risk	-

5.25 With regard to dust soiling, the risk assessment indicates that on the basis of no mitigation being present, all phases would present a 'Medium Risk'.

5.26 With regard to PM_{10} effects, the risk assessment indicates that on the basis of no mitigation being present, all phases would present a 'Low Risk' to health.

5.27 The IAQM guidance on the mitigation measures needed to deal with low, medium or high risk effects is set out in **Appendix I**.

6.0 EMISSIONS MITIGATION STATEMENT

General

6.1 With regard to NO_2 and PM_{10}, assessment has shown that the annual mean air quality objectives will be met at the most exposed receptor locations, and the Site is acceptable for residential development. It is therefore considered that development-specific mitigation will not be required to reduce or offset road traffic emissions.

6.2 Nevertheless, to assist in offsetting incremental creep in pollutant emissions, a number of sustainable measures have been considered as part of the transport assessment work, which include, but are not limited to:

- Measures to support public transport, cycling and walking infrastructure such as provision of new footways, crossing points and links to existing infrastructure.

6.3 In addition to any measures considered as part of the transport assessment work, the following measures should be included as standard:

- Electric vehicle charging – in accordance with Approved Document S; and
- Low NO_x heating and boilers.

Damage Cost Analysis

6.4 To identify the pollutant damage costs associated with the Site, calculation has been undertaken to estimate the additional pollutant emissions from proposed development traffic, using the methodology provided by Defra (Air quality appraisal: damage cost guidance - GOV.UK (www.gov.uk)).

6.5 The calculation process is summarised below:

- Development AADT – 1890;
- Development %HGV – 1;
- Price base year – 2025;
- Calculation of the additional emissions (kg/annum) for the pollutants of concern (NO_x and $PM_{2.5}$) using the latest Defra Emissions Factor Toolkit (v12.0.1), and assuming an average distance of 10km per trip and an average speed of 50kph; and
- Estimate damage cost using DEFRA's Damage Cost Appraisal Toolkit, 2023.

6.6 The estimated damage cost to offset vehicle emissions associated with the Site are presented in **Appendix J**, and summarised below in Table 6.1.

Table 6.1: Estimated Damage Cost

Central Present Total 5-year Value (2024 – 2028)		
NO_x	**$PM_{2.5}$**	**Total**
£77,629	£57,257	**£134,886**

6.7 The total cost associated with development generated road traffic from the Site is £134,886, and this value can be used as a measure against any proposed sustainable mitigation measures that do not constitute national requirements, which are being considered as part of the Transport Assessment work for the Site.

6.8 Additional mitigation measures can include, but are not limited to, the following:

- Contribution to low emission vehicle refuelling infrastructure;
- Low emission bus service provision or waste collection services;
- Bike/e-bike hire schemes;
- Contribution to renewable fuel and energy generation projects; and
- Incentives for the take-up of low emission technologies and fuels.

Construction Dust Mitigation

6.9 The relevant mitigation presented in **Appendix I** appropriate for 'Medium Risk' site would be routinely included in the Site's dust management plan for the relevant phase of construction. Key measures known to minimize dust emissions and represent good practice guidance are summarized in Table 6.2.

Table 6.2: Key Dust Mitigation Measures

Aspect	Mitigation Measures
Site Planning	No bonfires
	Plan site layout - machinery and dust causing activities should be located away from sensitive receptors
Construction Traffic	All vehicles should switch off engines when not in active use – no idling vehicles
	Wash or clean all vehicles effectively before leaving the site if close to sensitive receptors
	All loads entering and leaving site to be covered
	No site runoff of water or mud
	All non-road mobile machinery (NRMM) to use ultra low sulphur tax-exempt diesel (ULSD) where available
Site Activities	To employ best practicable means in the control of dust
	Minimise dust generation activities
	Use water as dust suppressant where possible
	Keep stockpiles for the shortest possible times
Site Management	Appointment of a site agent whose contact details are provided to the LPA's Environmental Health Department and local residents prior to construction works starting.
	Agent to provide immediate response to any complaints by logging details of complaint and investigating source of complaint to establish whether routine mitigation measures have been properly implemented. If necessary, appropriate steps to be taken to mitigate against any adverse effects, and details of actions to be logged.

7.0 CONCLUSIONS

7.1 MEC, has been commissioned by Richborough, to undertake an Air Quality Assessment for a proposed residential development on Land East of Wrotham Road, Meopham.

7.2 This Air Quality Assessment has sought to examine the impact of development traffic road emissions from the proposed development upon existing and future sensitive receptors. The key traffic related pollutants considered are nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$).

7.3 The assessment has been undertaken with reference to the advice provided within the Land-Use Planning and Development Control: Planning for Air Quality, and 'Guidance from Environmental Protection UK, the Institute of Air Quality Management for the consideration of air quality within the land-use planning and development control processes', May 2017 and the 'Guidance on the assessment of dust from demolition and construction' 2024.

7.4 The following scenarios have been included in the assessment:

- 2023 Baseline (for verification);
- 2030 Do Nothing (DN), i.e., Baseline + Committed Development; and
- 2030 Do Something, i.e., 2030 DN + Proposed Development.

7.5 The future year scenarios have been modelled using future year traffic flow data, together with 2025 background and emissions data, to account for current uncertainty in future year predictions.

7.6 The model has been verified using 2023 NO_2 monitoring data provided by GBC. The verification has derived an adjustment factor 4.1, which has been applied to all modelled outputs.

Nitrogen Dioxide (NO_2)

7.7 The assessment results indicate that for a baseline do-nothing scenario in 2030, receptors adjacent to all roads have values well below the current annual mean air quality objectives (40 µg/m^3) for NO_2, which is consistent with GBC's air quality and review data.

7.8 With traffic generated by development, i.e., the do-something scenario in 2030, the absolute concentrations remain below the current air quality objectives and the incremental change due to traffic generated by development is small (1 µg/m^3 or less to annual mean concentrations of NO_2), which would not have a significant impact upon local air quality.

7.9 On this basis, the development's impact on local NO_2 concentrations is defined as 'Negligible', as none of the changes exceed 3% relative to the AQAL.

7.10 With regard to the 1-hour mean objective LAQM.TG(22) advises that *"A study carried out on behalf of Defra and the Devolved Administrations identified that exceedances of the NO_2 1-hour mean are unlikely to occur where the annual mean is below 60 µg/m^3"*. As the results indicate annual mean concentrations of NO_2 will

remain well below 60 µg/m^3, it is considered that the NO_2 1-hour objective will not be exceeded at any receptor.

Particulate Matter (PM_{10})

7.11 Annual mean PM_{10} concentrations are also expected to remain below the annual mean objective (40 µg/m^3) at all assessed receptor locations, and the development's impact on local concentrations is defined as 'Negligible' for all assessed receptors, with none of the changes exceeding 1% of the AQAL.

Particulate Matter ($PM_{2.5}$)

7.12 Similarly, annual mean $PM_{2.5}$ concentrations are expected to remain below the interim target level (12 µg/m^3) at all assessed receptor locations, and the development's impact on local concentrations is defined as 'Negligible' for all assessed receptors, with none of the changes exceeding 1% of the AQAL.

7.13 It should be noted that the above effects reflect a worst-case scenario, with the future year modelled using 2030 traffic flow data, together with 2025 background and emissions data, to account for current uncertainty in future year projections. Background concentrations and vehicle emission factors are projected to decrease year on year, as new Euro standards and UK fleet turnover are assumed. Using 2025 data therefore provides a conservative case for the future year scenarios. In reality, pollutant concentrations may be lower.

7.14 Therefore, since the air quality assessment indicates that the annual mean air quality objective will be met at the most exposed receptor locations, and since the actual changes due to traffic generated by development are small and not significant, it can be concluded that the air quality at the Site is acceptable for development, and that development traffic will not lead to significant adverse impact upon existing air quality.

7.15 Mitigation measures commensurate to the scale of the development have been proposed to minimise the potential effects associated with increased air pollutant concentrations.

Construction Dust

7.16 With regard to dust soiling, the risk assessment indicates that on the basis of no mitigation being present, all phases would present a 'Medium Risk'.

7.17 With regard to PM_{10} effects, the risk assessment indicates that on the basis of no mitigation being present, all phases would present a 'Low Risk' to health.

7.18 The relevant mitigation measures present in the IAQM guidance for a 'Medium Risk' site would be routinely included in the Site's dust management plan for the relevant phases.

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APPENDICES

APPENDIX A

Barn
Evenden House
THE PIPPINS
Hurstmere
Cleeve Ho
Shamwood
Kintyre
Greenthorne
Lhaago Lodge
Chimney Court
STRAND CLOSE
St Paul's RC Church
TCB
Adams
CEDAR CLOSE
POPLAR WALK
Homemead
Wigmore House
Epmarket
Bernamy
BEECHWAY
Beech Tree Cottage
The Beeches
Mandhara
The Laurels
St Briavels
Camer Cottage
Galini
The Cherries
Orchid House
El Sub Sta
Pine Trees
The Sheiling
Tel Ex
Dean Park Lodge
Corner Ways
Churchway Wood
MULBERRY CLOSE
LILAC PLACE
DORMERS DRIVE
Holts Shaw
GREEN LANE
Olive Shaw
Priestfield Shaw
AZZI
St David's
Shirley
Mavron House
Glenmore
Shearwater
Inglewood
Oaklynn
Katary
Holly House
St Catherine
Camer-Lea
Betchwpth
Earrach
Parkview
HUNTINGFIELD ROAD
LANKES CLOSE
Car Park
SCHOOL CLOSE
The Parade
Watmough House
El Sub Sta
Meopham Community Primary School
WROTHAM ROAD
North Lodge
The Coach House
North House
Stable Cottage
Trees
The Laurels
The Cedars
St John's Centre
Meopham Court South
Church Cottages
St John The Baptist's Church
Graveyard
South Lodge
Pond
The Glebe
The Rectory
LB
Camer Farm Barn
Stable Cottage
The Great Yard
Bailiff's House
West Lodge
Car Park
PC
Play Area
CAMER PARK ROAD
Foxendown Cottage
Camp Site
El S

KEY

SITE LOCATION
15.84 HECTARES / 39.14 ACRES

OTHER LAND IN OWNERSHIP
9.93 HECTARES / 24.54 ACRES

N 0 50 100 m

REV A : RLB UPDATED. 01.09.25 (SB)
REV B : RLB UPDATED. 17.09.25 (RL)

WROTHAM ROAD, MEOPHAM – SITE BOUNDARY

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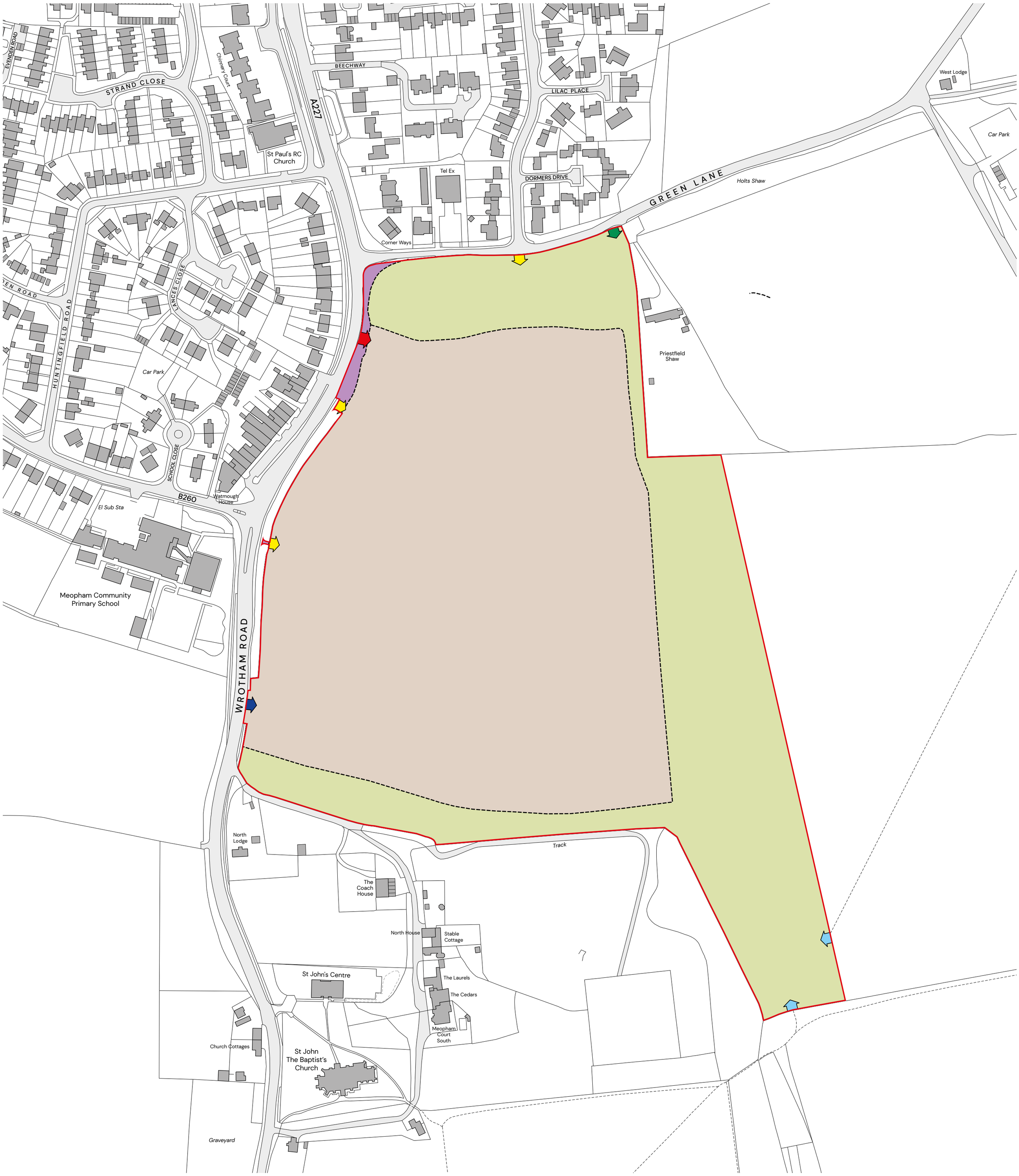
PEGASUSGROUP.CO.UK | TEAM/DRAWN BY: RL/SB | APPROVED BY: JW | DATE: 07.07.25 | SCALE: 1:2500@A2 | DRWG: P25-0485_DE_1001_B_1 | CLIENT: RICHBOROUGH |



LEGEND

Site boundary

LAND USE PARAMETERS

- Indicative area of land required for the proposed access, not within the residential land use (subject to detailed design)
- Proposed residential development (Use Class C3) (including roads, footpaths, private drives, amenity and incidental open space and other associated infrastructure, subject to detailed design)
- Proposed open space (including amenity green space, children's play provision, allotments, orchard, landscaping, footpaths, drainage and other associated infrastructure, subject to detailed design)

ACCESS PARAMETERS

- Proposed access/egress for all modes (subject to detailed design)
- Potential access/egress for cyclists and pedestrians only (subject to detailed design)
- Potential access/egress for pedestrians only (subject to detailed design)
- Existing public right of way access retained
- Potential emergency access for emergency vehicles and access/egress for cyclists and pedestrians (subject to detailed design)

Note: All features and areas are subject to detailed design and to a tolerance of 10m.

N

0 100m

REV C: Amended access and red line boundary	19.09.2025 CM
REV B: Amended land use areas	04.09.2025 CM
REV A: Amended access and land use areas	03.09.2025 CM
FIRST ISSUE: For client comment	27.08.2025 CM

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DESIGN | ECONOMICS | ENVIRONMENT | HERITAGE | LAND & PROPERTY | PLANNING | TRANSPORT & INFRASTRUCTURE

WROTHAM ROAD, MEOPHAM | **PARAMETER PLAN**

TEAM/DRAWN BY: CM | APPROVED BY: JW | DATE: 27/08/2025 | SCALE: 1:2000 @ A2 | DRAWING REF: P25-0485_DE_1006 | SHEET: 1 | REV: C | CLIENT: RICHBOROUGH

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APPENDICES

APPENDIX B

DEFINITION OF AIR QUALITY TERMS AND UNITS

ppm	parts per million - defines the units of pollution in every million (10^6) units of air.
ppb	parts per billion - defines the units of pollution in every billion (10^9) units of air.
$\mu g/m^3$	microgrammes per cubic metre - one microgramme is one millionth of a gram.
ng/m^3	nanogrammes per cubic metre – one nanogramme is one milliardth (i.e. one thousand millionth of a gram (10^{-9}))
Annual mean	the average of the concentrations measured for one year.
1-hour mean	the average of the concentrations measured for one hour.
24-hour mean	the average of the concentrations measured for twenty four hours.
Running mean	the mean or series of means calculated for overlapping time periods. For example, an 8-hour running mean is calculated every hour and averages the values for eight hours. The period of averaging is stepped forward by one hour for each subsequent value so that a degree of overlap exists between successive values. Non-running means are calculated for consecutive time periods so that there is no overlap.
Percentile	a value that establishes a particular threshold in a collection of data. For example, the 90^{th} percentile of yearly values is the value that 90% of all the data in the year fall below or equal.
Exceedance	a period of time when the concentration of a pollutant is greater than, or equal to, the relevant air quality standard.

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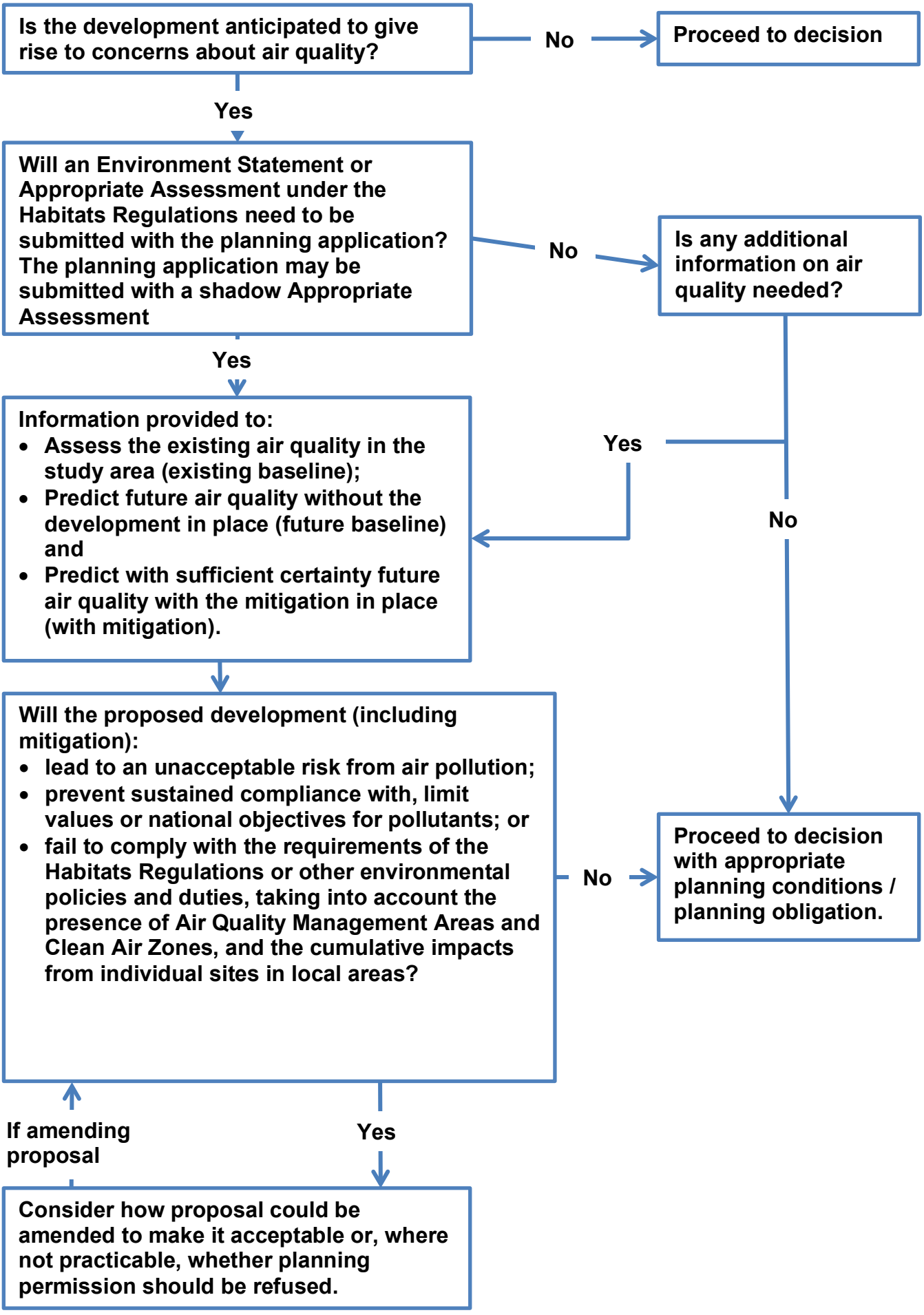
APPENDICES

APPENDIX C


Is the development anticipated to give rise to concerns about air quality?
No
Proceed to decision
Yes
Will an Environment Statement or Appropriate Assessment under the Habitats Regulations need to be submitted with the planning application? The planning application may be submitted with a shadow Appropriate Assessment
No
Is any additional information on air quality needed?
Yes
Information provided to:
• Assess the existing air quality in the study area (existing baseline);
• Predict future air quality without the development in place (future baseline) and
• Predict with sufficient certainty future air quality with the mitigation in place (with mitigation).
Yes
No
Will the proposed development (including mitigation):
• lead to an unacceptable risk from air pollution;
• prevent sustained compliance with, limit values or national objectives for pollutants; or
• fail to comply with the requirements of the Habitats Regulations or other environmental policies and duties, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas?
No
Proceed to decision with appropriate planning conditions / planning obligation.
If amending proposal
Yes
Consider how proposal could be amended to make it acceptable or, where not practicable, whether planning permission should be refused.

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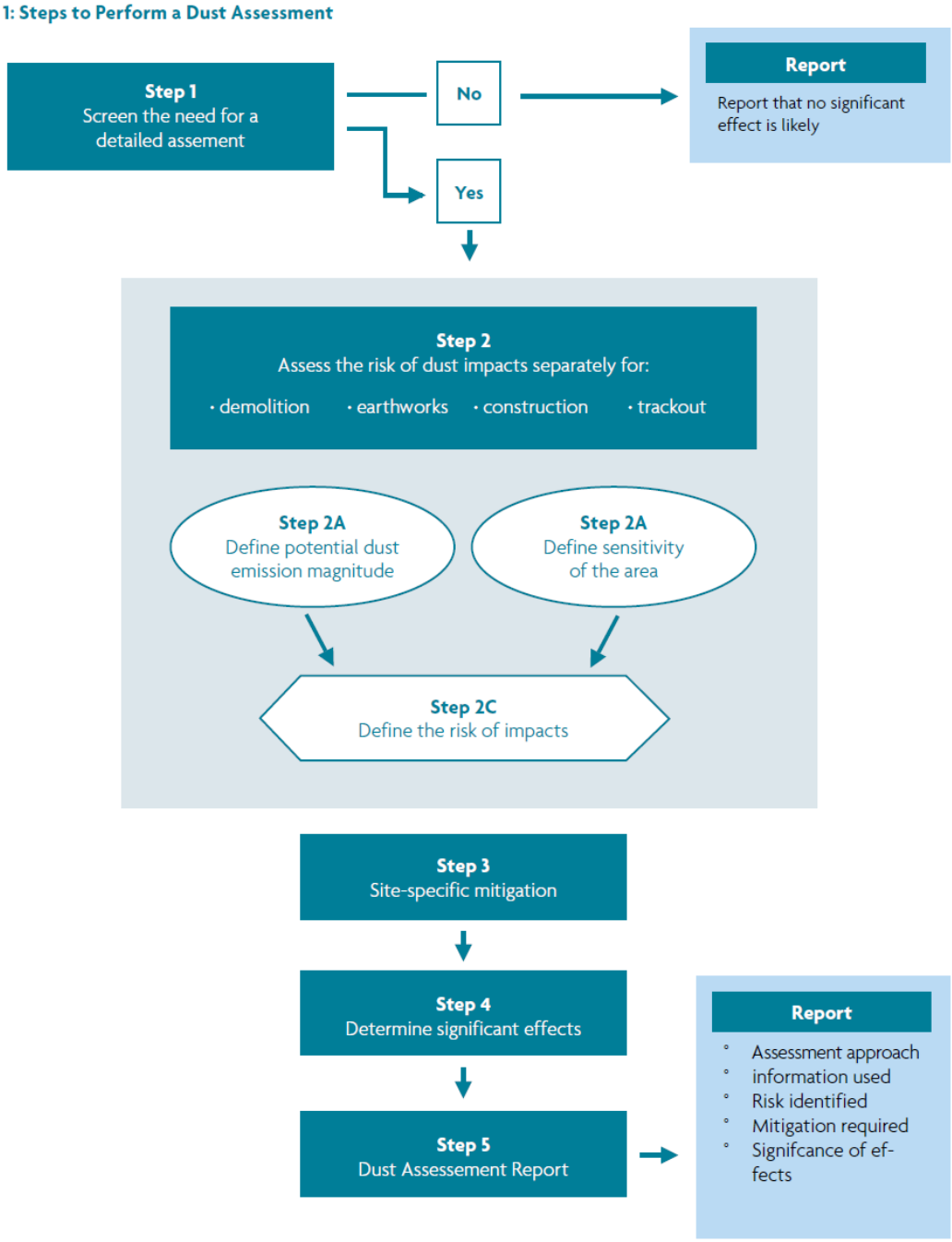
APPENDICES

APPENDIX D

Figure 1: Steps to Perform a Dust Assessment



Demolition

Examples:

- **Large:** Total building volume >75,000m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activates >12m above ground level;
- **Medium:** Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material, demolition activities 6-12 m above ground level; and
- **Small:** Total building volume <12,000 m^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

Examples:

- **Large:** Total site area >110,00 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds <6m in height;
- **Medium:** Total site area 18,000 m^2 – 110,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3m – 6m in height; and
- **Small:** Total site area <18,000 m^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

Examples:

- **Large:** Total building volume >75,000 m^3, on site concrete batching sandblasting;
- **Medium:** Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- **Small:** Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber)

Trackout

Examples:

- **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 lengths 50m-100m;
- **Small:** <20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

These numbers are for vehicles that leave the site after moving over unpaved ground, where they will accumulate mud and dirt that can be tracked out onto the public highway.

Sensitivity of the Area to Dust Soiling Effects on People and Property[ab]

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)[c]			
		<20	<50	<100	<250
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

[a] The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout. See **STEP 2B**, **Box 6** and **Box 9.**

[b] Estimate the total number of receptors within the stated distance. Only the highest level of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitivity receptors <20m of the source and 95 high sensitivity receptors between 20 and 50 m, then the total of number of receptors <50 m is 102. The sensitivity of the area in this case would be high.

[c] For trackout, the distance should be measured from the side of the roads used by construction traffic. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

Sensitivity of the Area to Human Health Impacts [ab]

Receptor Sensitivity	Annual Mean PM_{10} concentration[c]	Number of Receptors	Distance from the Source (m)[c]			
			<20	<50	<100	<250
High	>32 µg/m^3 (>18 µg/m^3 in Scotland)	>100	High	High	High	Low
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 µg/m^3 (16-18 µg/m^3 in Scotland)	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m^3 (14-16 µg/m^3 in Scotland)	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m^3 (<14 µg/m^3 in Scotland)	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32 µg/m^3 (>18 µg/m^3 in Scotland)	>100	High	Medium	Low	Low
		10-100	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m^3 (16-18 µg/m^3 in Scotland)	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 µg/m^3 (14-16 µg/m^3 in Scotland)	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m^3 (<14 µg/m^3 in Scotland)	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

[a] The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout. See **STEP 2B**, **Box 7** and **Box 9.**

[b] Estimate the total within the stated distance (e.g. the total within 250m and not the number between 100 and 250 m), noting that only the highest level of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitivity receptors <20m of the source and 95 high sensitivity receptors between 20 and 50 m, then the total of number of receptors <50 m is 102. If annual mean PM_{10} concentrations is 29 µg/m^3, the sensitivity of the area would be high.

[c] Most straightforwardly taken from the national background maps, but should also take account of local sources. The values are based on 32 µg/m^3 being the annual mean concentration at which an exceedance of the 14-hour objective is likely in England, Wales and Northern Ireland. In Scotland there is an annual mean objective of 18µg/m^3

[d] In the case of high sensitivity receptors with high occupancy (such as schools or hospitals) approximate the number of people likely to be present. In the case of residential dwellings, just include the number of properties.

[e] For trackout, the distance should be measured from the side of the roads used by construction traffic. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

Sensitivity of the Area to Ecological Impacts [ab]

Receptor Sensitivity	Distance from the Source (m)[c]	
	<20	**<50**
High	High	Medium
Medium	Medium	Low
Low	Low	Low

[a] The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout and for each designated site. See **STEP 2B**, **Box 8** and **Box 9**.
[b] Only the highest level of area sensitivity from the table needs to be considered.
[c] For trackout, the distances should be measured from the side of the roads used by construction traffic. The impact declines with distance from the site.

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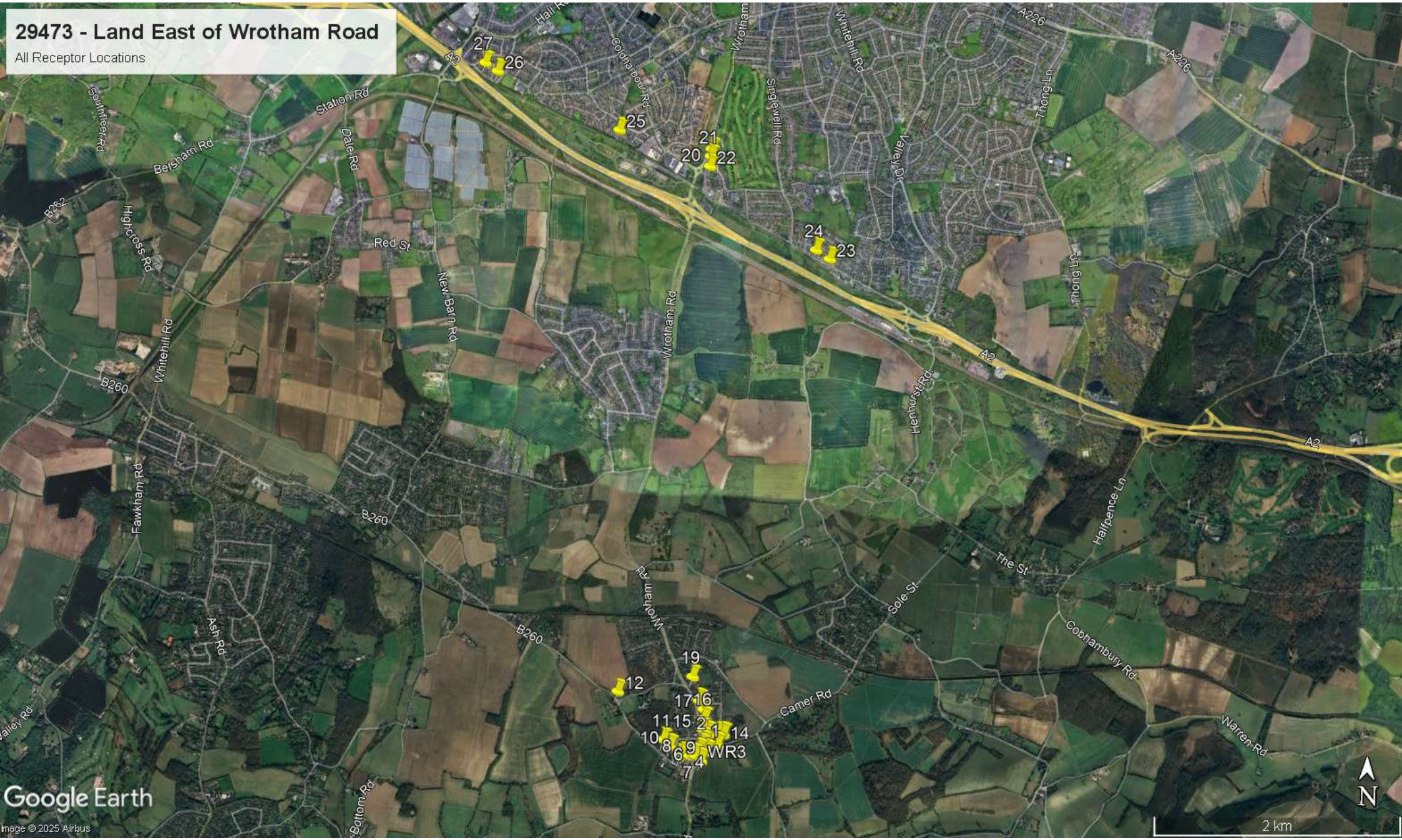
APPENDICES

APPENDIX E


29473 - Land East of Wrotham Road
All Receptor Locations
27
26
25
21
20
22
24
23
19
12
17
16
11
15
2
1
14
10
8
9
WR3
6
4
7
A2
A226
Station Rd
Bersham Rd
Dale Rd
Red St
New Barn Rd
Wrotham Rd
Whitehill Rd
Singlewell Rd
Thong Ln
Henhurst Rd
Halfpence Ln
B260
Fawkham Rd
Ash Rd
The St
Sole St
Cobhambury Rd
Camer Rd
Warren Rd
Google Earth
Image © 2025 Airbus
N
2 km


29473 - Land East of Wrotham Road
Receptors WR1 to 3, 1 to 19
Norwood Ln
Norwood Ln
Norwood Ln
B260
Melliker Ln
Denesway
Tradescant Dr
Camer Rd
Green Ln
Camer Park Rd
Camer Park Rd
19
12
18
17
16
15
3
14
13
1
2
11
WR1
10
4
WR2
8
5
6
9
7
WR3
N
400 m
Google Earth
Image © 2025 Airbus


29473 - Land East of Wrotham Road
Receptors 20 to 27
Perry St
Old Rd E
Springhead Rd
Hall Rd
Wrotham Rd
Whitehill Rd
Valley Dr
Cobham Rd
Singlewell Rd
New Barn Rd
A2
27
26
25
21
20
22
24
23
Hever Ct Rd
N
1 km
Google Earth

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APPENDICES

APPENDIX F

2023 Verification

Link ID	DfT ID	Link Name	AADT	LGV	Hourly	%HGV	HGV	Hourly	Speed (Kph)	Link Width (m)
V1	81431	South Street	10565	10234	426	3%	331	14	10-35	6
V2	56098	A2	133656	123055	5127	8%	10601	442	112(90)	35-40
V3	802078	Darnley Lodge Lane	2689	2680	112	0%	9	0	35-75	6


29473
Road Links for Verification
V1
V2
V3
A2
M2
A289
Pearfree Ln
Thong Ln
Henhurst Rd
Wrotham Rd
New Barn Rd
Halfpence Ln
The St
Sole St
Cobhambury Rd
Warren Rd
Bush Rd
Sundridge Hill
Bligh Way
Camer Rd
B260
A228
Wouldham Rd
Google Earth
Image © 2025 Airbus
2 km
N

2030 Do Nothing

Link ID	Link Name	AADT	LGV	Hourly	%HGV	HGV	Hourly	Speed (Kph)	Link Width (m)
1	Wrotham Road (North of Huntingfield Road)	15531	15203	633	2%	328	14	15-40	10
2	Wrotham Road (South of Longfield Road)	17685	17134	714	3%	551	23	15-35	6
3	Green Lane	4734	4574	191	3%	160	7	20-40	10
4	Longfield Road (West of Huntingfield Road)	4954	4890	204	1%	64	3	15-85	10
5	A2 (East of Wrotham Road)	153881	142027	5918	8%	11854	494	110(90)	35
6	A2 (West of Wrotham Road)	145098	134789	5616	7%	10309	430	110(90)	35
7	Wrotham Road (North of A2)	32194	31028	1293	4%	1166	49	10-60	10

2030 Do Something

Link ID	Link Name	AADT	LGV	Hourly	%HGV	HGV	Hourly	Speed (Kph)	Link Width (m)
1	Wrotham Road (North of Huntingfield Road)	17105	16761	698	2%	344	14	15-40	10
2	Wrotham Road (South of Longfield Road)	17944	17391	725	3%	554	23	15-35	6
3	Green Lane	4759	4598	192	3%	160	7	20-40	10
4	Longfield Road (West of Huntingfield Road)	4986	4922	205	1%	64	3	15-85	10
5	A2 (East of Wrotham Road)	153985	142130	5922	8%	11855	494	110(90)	35
6	A2 (West of Wrotham Road)	146232	135912	5663	7%	10320	430	110(90)	35
7	Wrotham Road (North of A2)	32529	31360	1307	4%	1169	49	10-60	10


29473
Road Links for Assessment
1
2
3
4
5
6
7
Google Earth
Image © 2025 Airbus
2 km
N
A2
M2
A226
B260
B262
Station Rd
Betsham Rd
Dale Rd
Red St
New Barn Rd
Wrotham Rd
Whitehill Rd
Singlewell Rd
Thong Ln
Henhurst Rd
Halfpence Ln
The St
Sole St
Cobhambury Rd
Warren Rd
Camer Rd
Ash Rd
Hartley Bottom Rd
Fawkham Rd
Highcross Rd
Southfleet Rd
Hall Rd
N Ash Rd

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APPENDICES

APPENDIX G

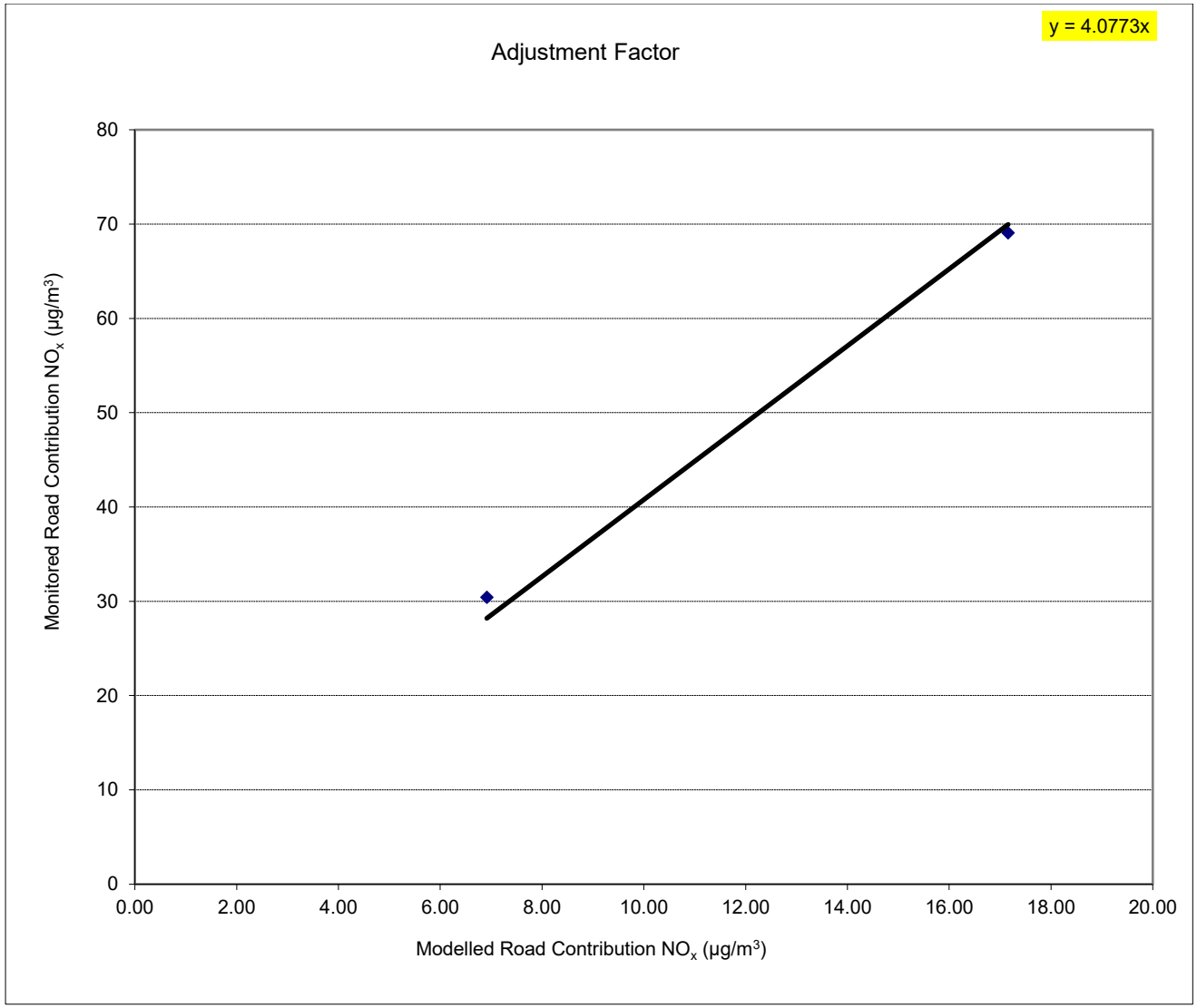

29473
Verification Locations
GR142
GR94
A2
A2
Henhurst Rd
Halfpence Ln
The St
Sole St
Wrotham Rd
B260
Cobhambury Rd
Camer Rd
Warren Rd
Google Earth
Image © 2025 Airbus
N
1 km

Verification (LAQM.TG 22)

	564500, 166500	567500, 169500
Background NO_2	10.00	10.61
Background NO_x	13.08	13.89

Site ID	Location		Modelled Road Contribution NO_x (ex-background)	Monitored Total NO_2	Monitored Road Contribution Nox*	Monitored Total NO_x	Ratio of Monitored Road Contribution NO_x / Modelled Road Contribution NO_x
	X (m)	Y (m)					
GR94	564392	166836	6.92	23.3	30.43	43.5	4.4
GR142	567500	169836	17.16	36.9	69.06	83.0	4.0

Verification Factor	4.1


y = 4.0773x
Adjustment Factor
Monitored Road Contribution NOx (µg/m3)
Modelled Road Contribution NOx (µg/m3)
0
10
20
30
40
50
60
70
80
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00

Root Mean Square Error (RMSE)

$$RMSE = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(Obs_i - Pred_i)^2}$$

Name	Observations	Predictions	Observations – Predictions	Squared	Total	Average	RMSE	%
GR94	23.3	22.42	0.88	0.77	0.84	0.4	0.6	2%
GR142	36.9	37.16	-0.26	0.07				

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APPENDICES

APPENDIX H

NO_2										
Receptor Name	**X(m)**	**Y(m)**	**Z(m)**	**2030 DN**	**2030 DS**	**DS-DN**	**% Change**	**AQAL**	**AQAL**	**Impact Descriptor**
GR94	564392	166012	2.8	25.59	25.76	0.17	0%	64%	64%	Negligible
GR142	567500	169836	2.4	35.65	35.67	0.02	0%	89%	89%	Negligible
LR1	563884.7	166881.2	1.5	10.27	10.28	0.01	0%	26%	26%	Negligible
LR2	5641135	166786.4	1.5	9.81	9.81	0.00	0%	25%	25%	Negligible
WR1	564576.9	166804.7	1.5	11.25	11.39	0.14	0%	28%	28%	Negligible
WR2	564490.7	166741.7	1.5	12.75	13.01	0.26	1%	32%	33%	Negligible
WR3	564449.6	166668.9	1.5	12.96	13.11	0.15	0%	32%	33%	Negligible
1	564462	166840	1.5	14.39	15.07	0.68	2%	36%	38%	Negligible
2	564461	166815	1.5	14.43	15.54	1.11	3%	36%	39%	Negligible
3	564501	166889	1.5	15.69	16.17	0.48	1%	39%	40%	Negligible
4	564451	166788	1.5	14.2	15.06	0.86	2%	36%	38%	Negligible
5	564430	166747	1.5	14.92	15.38	0.46	1%	37%	38%	Negligible
6	564394	166705	4	13.64	13.86	0.22	1%	34%	35%	Negligible
7	564356	166699	1.5	13.25	13.36	0.11	0%	33%	33%	Negligible
8	564298	166708	1.5	13.21	13.27	0.06	0%	33%	33%	Negligible
9	564272	166692	1.5	11.8	11.84	0.04	0%	30%	30%	Negligible
10	564193	166770	1.5	11.95	11.98	0.03	0%	30%	30%	Negligible
11	564136	166819	1.5	11.76	11.79	0.03	0%	29%	29%	Negligible
12	563745	167187	1.5	11.63	11.64	0.01	0%	29%	29%	Negligible
13	564582	166889	1.5	12.78	12.92	0.14	0%	32%	32%	Negligible
14	564620	166890	1.5	12.98	13.08	0.10	0%	32%	33%	Negligible
15	564448	166918	1.5	13.22	13.52	0.30	1%	33%	34%	Negligible
16	564458	167009	1.5	15.96	16.48	0.52	1%	40%	41%	Negligible
17	564449	167081	1.5	14.49	14.88	0.39	1%	36%	37%	Negligible
18	564406	167150	1.5	14.58	14.97	0.39	1%	36%	37%	Negligible
19	564343	167341	1.5	14.74	15.15	0.41	1%	37%	38%	Negligible
20	564254	171606	1.5	22.59	22.67	0.08	0%	56%	57%	Negligible
21	564250	171547	1.5	21.83	21.9	0.07	0%	55%	55%	Negligible
22	564248	171467	1.5	19.49	19.54	0.05	0%	49%	49%	Negligible
23	565259	170773	1.5	22.67	22.68	0.01	0%	57%	57%	Negligible
24	565145	170840	1.5	22.02	22.03	0.01	0%	55%	55%	Negligible
25	563499	171719	1.5	16.75	16.79	0.04	0%	42%	42%	Negligible
26	562487	172137	1.5	26.91	27	0.09	0%	67%	68%	Negligible
27	562383	172200	1.5	28.01	28.12	0.11	0%	70%	70%	Negligible

PM10										
Receptor Name	X(m)	Y(m)	Z(m)	2030 DN	2030 DS	DS-DN	% Change	AQAL	AQAL	Impact Descriptor
GR94	564392	166012	2.8	15.26	15.32	0.06	0%	38%	38%	Negligible
GR142	567500	169836	2.4	18.52	18.53	0.00	0%	46%	46%	Negligible
LR1	563884.7	166881.2	1.5	11.41	11.41	0.00	0%	29%	29%	Negligible
LR2	5641135	166786.4	1.5	10.88	10.88	0.00	0%	27%	27%	Negligible
WR1	564576.9	166804.7	1.5	11.39	11.42	0.03	0%	28%	29%	Negligible
WR2	564490.7	166741.7	1.5	12.01	12.08	0.07	0%	30%	30%	Negligible
WR3	564449.6	166668.9	1.5	11.94	11.99	0.05	0%	30%	30%	Negligible
1	564462	166840	1.5	12.45	12.58	0.13	0%	31%	31%	Negligible
2	564461	166815	1.5	12.65	12.81	0.16	0%	32%	32%	Negligible
3	564501	166889	1.5	12.82	12.95	0.14	0%	32%	32%	Negligible
4	564451	166788	1.5	12.60	12.75	0.15	0%	32%	32%	Negligible
5	564430	166747	1.5	12.88	13.04	0.16	0%	32%	33%	Negligible
6	564394	166705	4	12.19	12.26	0.07	0%	30%	31%	Negligible
7	564356	166699	1.5	12.17	12.20	0.03	0%	30%	31%	Negligible
8	564298	166708	1.5	12.23	12.25	0.02	0%	31%	31%	Negligible
9	564272	166692	1.5	11.64	11.65	0.01	0%	29%	29%	Negligible
10	564193	166770	1.5	11.71	11.72	0.01	0%	29%	29%	Negligible
11	564136	166819	1.5	11.57	11.58	0.01	0%	29%	29%	Negligible
12	563745	167187	1.5	11.73	11.74	0.00	0%	29%	29%	Negligible
13	564582	166889	1.5	12.01	12.04	0.04	0%	30%	30%	Negligible
14	564620	166890	1.5	12.12	12.14	0.03	0%	30%	30%	Negligible
15	564448	166918	1.5	12.17	12.28	0.11	0%	30%	31%	Negligible
16	564458	167009	1.5	13.45	13.68	0.22	1%	34%	34%	Negligible
17	564449	167081	1.5	12.81	12.98	0.17	0%	32%	32%	Negligible
18	564406	167150	1.5	12.86	13.03	0.17	0%	32%	33%	Negligible
19	564343	167341	1.5	12.93	13.11	0.18	0%	32%	33%	Negligible
20	564254	171606	1.5	16.90	16.93	0.03	0%	42%	42%	Negligible
21	564250	171547	1.5	16.06	16.08	0.02	0%	40%	40%	Negligible
22	564248	171467	1.5	15.30	15.31	0.01	0%	38%	38%	Negligible
23	565259	170773	1.5	16.25	16.26	0.00	0%	41%	41%	Negligible
24	565145	170840	1.5	16.12	16.12	0.00	0%	40%	40%	Negligible
25	563499	171719	1.5	15.70	15.71	0.01	0%	39%	39%	Negligible
26	562487	172137	1.5	16.78	16.80	0.02	0%	42%	42%	Negligible
27	562383	172200	1.5	17.04	17.06	0.02	0%	43%	43%	Negligible

$PM_{2.5}$										
Receptor Name	**X(m)**	**Y(m)**	**Z(m)**	**2030 DN**	**2030 DS**	**DS-DN**	**% Change**	**AQAL**	**AQAL**	**Impact Descriptor**
GR94	564392	166012	2.8	8.61	8.64	0.03	0%	72%	72%	Negligible
GR142	567500	169836	2.4	10.01	10.01	0.00	0%	100%	100%	Negligible
LR1	563884.7	166881.2	1.5	6.32	6.33	0.00	0%	63%	63%	Negligible
LR2	5641135	166786.4	1.5	6.31	6.31	0.00	0%	63%	63%	Negligible
WR1	564576.9	166804.7	1.5	6.58	6.59	0.02	0%	66%	66%	Negligible
WR2	564490.7	166741.7	1.5	7.00	7.04	0.04	0%	70%	70%	Negligible
WR3	564449.6	166668.9	1.5	6.87	6.89	0.02	0%	69%	69%	Negligible
1	564462	166840	1.5	7.13	7.20	0.07	1%	71%	72%	Negligible
2	564461	166815	1.5	7.23	7.32	0.09	1%	72%	73%	Negligible
3	564501	166889	1.5	7.32	7.40	0.07	1%	73%	74%	Negligible
4	564451	166788	1.5	7.21	7.29	0.08	1%	72%	73%	Negligible
5	564430	166747	1.5	7.35	7.44	0.08	1%	74%	74%	Negligible
6	564394	166705	4	7.00	7.03	0.04	0%	70%	70%	Negligible
7	564356	166699	1.5	6.98	7.00	0.02	0%	70%	70%	Negligible
8	564298	166708	1.5	7.01	7.02	0.01	0%	70%	70%	Negligible
9	564272	166692	1.5	6.71	6.71	0.01	0%	67%	67%	Negligible
10	564193	166770	1.5	6.74	6.75	0.01	0%	67%	67%	Negligible
11	564136	166819	1.5	6.68	6.69	0.00	0%	67%	67%	Negligible
12	563745	167187	1.5	6.59	6.59	0.00	0%	66%	66%	Negligible
13	564582	166889	1.5	6.90	6.92	0.02	0%	69%	69%	Negligible
14	564620	166890	1.5	6.96	6.97	0.01	0%	70%	70%	Negligible
15	564448	166918	1.5	6.98	7.04	0.06	1%	70%	70%	Negligible
16	564458	167009	1.5	7.75	7.87	0.12	1%	78%	79%	Negligible
17	564449	167081	1.5	7.42	7.51	0.09	1%	74%	75%	Negligible
18	564406	167150	1.5	7.44	7.53	0.09	1%	74%	75%	Negligible
19	564343	167341	1.5	7.48	7.57	0.09	1%	75%	76%	Negligible
20	564254	171606	1.5	8.96	8.98	0.02	0%	90%	90%	Negligible
21	564250	171547	1.5	8.51	8.52	0.01	0%	85%	85%	Negligible
22	564248	171467	1.5	8.12	8.12	0.01	0%	81%	81%	Negligible
23	565259	170773	1.5	8.48	8.48	0.00	0%	85%	85%	Negligible
24	565145	170840	1.5	8.40	8.40	0.00	0%	84%	84%	Negligible
25	563499	171719	1.5	7.89	7.90	0.00	0%	79%	79%	Negligible
26	562487	172137	1.5	9.10	9.11	0.01	0%	91%	91%	Negligible
27	562383	172200	1.5	9.25	9.26	0.01	0%	92%	93%	Negligible

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APPENDICES

APPENDIX I

Mitigation for all sites: Communications

Mitigation measure	Low Risk	Medium Risk	High Risk
1. Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	N	H	H
2. Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	H	H	H
3. Display the head or regional office contact information	H	H	H

Mitigation for all sites: Dust Management

Mitigation measure	Low Risk	Medium Risk	High Risk
4. Develop and implement a Dust Management Plan (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 in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real-time PM10 continuous monitoring and/or visual inspections.	D	H	H
Site Management			
5. 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.	H	H	H
6. Make the complaints log available to the local authority when asked.	H	H	H
7. 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.	H	H	H
8. 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 minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.	N	N	H
Monitoring			
9. 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.	D	D	H
10. Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked	H	H	H
11. 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.	H	H	H
12. 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. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	N	H	H
Preparing and maintaining the site			
13. Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	H	H	H
14. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	H	H	H
15. Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period	D	H	H
16. Avoid site runoff of water or mud.	H	H	H
17. Keep site fencing, barriers and scaffolding clean using wet methods.	D	H	H

Mitigation measure	Low Risk	Medium Risk	High Risk
18. 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.	D	H	H
19. Cover, seed or fence stockpiles to prevent wind whipping.	D	H	H
Operating vehicle/machinery and sustainable travel			
20. Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable	H	H	H
21. Ensure all vehicles switch off engines when stationary - no idling vehicles.	H	H	H
22. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	H	H	H
23. Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate)	D	D	H
24. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	N	H	H
25. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)	N	D	H
Operations			
26. 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.	H	H	H
27. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	H	H	H
28. Use enclosed chutes and conveyors and covered skips.	H	H	H
29. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	H	H	H
30. 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.	D	H	H
Waste management			
31. Avoid bonfires and burning of waste materials.	H	H	H

Measures specific to demolition

Mitigation measure	Low Risk	Medium Risk	High Risk
32. Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	D	D	H
33. 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.	H	H	H
34. Avoid explosive blasting, using appropriate manual or mechanical alternatives.	H	H	H
35. Bag and remove any biological debris or damp down such material before demolition.	H	H	H

Measures specific to earthworks

Mitigation measure	Low Risk	Medium Risk	High Risk
36. Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable..	N	D	H
37. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable	N	D	H
38. Only remove the cover in small areas during work and not all at once	N	D	H

Measures specific to construction

Mitigation measure	Low Risk	Medium Risk	High Risk
39. Avoid scabbling (roughening of concrete surfaces) if possible	D	D	H
40. 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.	D	H	H
41. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	N	D	H
42. For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	N	D	D

Measures specific to trackout

Mitigation measure	Low Risk	Medium Risk	High Risk
43. 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.	D	H	H
44. Avoid dry sweeping of large areas.	D	H	H
45. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	D	H	H
46. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	N	H	H
47. Record all inspections of haul routes and any subsequent action in a site log book.	D	H	H
48. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	N	H	H
49. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	D	H	H
50. 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.	N	H	H
51. Access gates to be located at least 10m from receptors where possible.	N	H	H

Key to Tables:

H	Highly recommended
D	Desirable
N	Not required

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APPENDICES

APPENDIX J

NOx Road Transport

Year	2025	2026	2027	2028	2029
Reduction in emissions (tonnes)	1.239820253	1.2651227	1.2909415	1.3172873	1.3441707
Central Damage Costs (£)	12390	12390	12390	12390	12390
Central Benefit (£)	15361	15675	15995	16321	16654
Discounted Central Benefit (£)	15361	15443	15525	15608	15691
Central Present Value	£77,629				
Low Sensitivity Damage Costs (£)	2063	2063	2063	2063	2063
Low Sensitivity Benefit (£)	2558	2610	2663	2717	2773
Discounted Low Sensitivity Benefit (£)	2558	2571	2585	2599	2612
Low Sensitivity Present Value	£12,925				
High Sensitivity Damage Costs (£)	47648	47648	47648	47648	47648
High Sensitivity Benefit (£)	59074	60280	61510	62765	64046
Discounted High Sensitivity Benefit (£)	59074	59389	59706	60024	60344
High Sensitivity Present Value	£298,536				

PM2.5 Road Transport

Year	2025	2026	2027	2028	2029
Reduction in emissions (tonnes)	0.126357	0.128935	0.131567	0.134252	0.136992
Central Damage Costs (£)	89667	89667	89667	89667	89667
Central Benefit (£)	11330	11561	11797	12038	12284
Discounted Central Benefit (£)	11330	11390	11451	11512	11573
Central Present Value	£57,257				
Low Sensitivity Damage Costs (£)	35563	35563	35563	35563	35563
Low Sensitivity Benefit (£)	4494	4585	4679	4774	4872
Discounted Low Sensitivity Benefit (£)	4494	4518	4542	4566	4590
Low Sensitivity Present Value	£22,709				
High Sensitivity Damage Costs (£)	257460	257460	257460	257460	257460
High Sensitivity Benefit (£)	32532	33196	33873	34564	35270
Discounted High Sensitivity Benefit (£)	32532	32705	32879	33055	33231
High Sensitivity Present Value	£164,401				

- CIVIL ENGINEERING
- TRANSPORT
- FLOOD RISK & DRAINAGE
- STRUCTURES
- GEO-ENVIRONMENTAL
- ACOUSTIC AIR
- UTILITIES
- GEOMATICS
- LIGHTING
- EXPERT WITNESS

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