



Land North of Camer Road, Meopham Environmental Statement

Chapter 6: Air Quality

Entran Ltd on behalf of The
McManus Family

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Iceni Projects Ltd.

Da Vinci House, 44 Saffron Hill, London, ECN1 8FH

T: 020 3640 8508 **W:** iceniprojects.com

6. AIR QUALITY

Introduction

- 6.1 This chapter of the ES has been prepared by Entran Ltd and presents an assessment of the likely significant effects of the Proposed Development with respect to air quality. Mitigation measures are identified, where appropriate, to avoid, reduce or offset any significant adverse effects identified and/or enhance likely beneficial effects. Taking into account the mitigation measures, the nature and significance of the likely residual effects are reported.

This chapter is supported by the following technical appendices:

- **Appendix 6.1: Terminology;**
- **Appendix 6.2: Summary of Traffic Data;**
- **Appendix 6.3: Verification and Adjustment of Modelled Concentrations;**
- **Appendix 6.4: Air Quality Assessment Levels; and**
- **Appendix 6.5: Construction Mitigation Measures.**

Legislation and Policy Context

Legislation Context

- 6.2 The following legislation is relevant to the Proposed Development:
- The European Directive on Ambient Air and Cleaner Air for Europe¹;
 - Air Quality Strategy for England, Scotland, Wales & Northern Ireland²;
 - Air Quality (England) Regulations³;
 - Local Air Quality Management (LAQM)⁴; and
 - Control of Dust and Particulates associated with Construction.

National Planning Policy

- 6.3 The following national planning policy is relevant to the Proposed Development:
- National Planning Policy Framework (2025)⁵.

Regional Planning Policy

- 6.4 There are no regional planning policies relevant to the Proposed Development.

Local Planning Policy

- 6.5 The following local planning policy is relevant to the Proposed Development:
- Gravesham Local Plan Core Strategy (2014)⁶.

Guidance

- 6.6 The following guidance is relevant to the Proposed Development:

- Institute of Air Quality Management (IAQM) Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites⁷;
- Environmental Protection UK (EPUK) & IAQM Land Use Planning and Development Control⁸;
- Assessment of Dust from Demolition and Construction⁹; and
- Kent & Medway Air Quality Partnership Air Quality and Planning Guidance¹⁰.

Assessment Methodology and Significance Criteria

- 6.7 This section presents the methodology used to assess the potential effects of the Proposed Development in relation to air quality.

Consultation

- 6.8 **Table 6.1** presents a summary of comment raised in the Council's EIA Scoping Opinion and other discussions with relevant consultees with respect to air quality.

Table 6.1 Summary of Comments

Consultee	Comment	Response
Gravesham Borough Council (GBC)	Both the construction and operational phase impact will be assessed in accordance with IAQM guidance. The applicant should also refer to the Kent & Medway Air Quality Partnership Technical Guidance on Planning and Air Quality.	The construction and operational phases have been assessed in accordance with the IAQM guidance and the Kent & Medway Air Quality Partnership Technical Guidance on Planning and Air Quality has been referred to.
Natural England	The ES should take account of the risks of air pollution and how these can be managed or reduced.	Impacts on ecological receptors have been assessed in accordance with the IAQM guidance.

Study Area and Scope

Study Area

- 6.9 The study area for the operational assessment has been determined based on the traffic data that has been provided by the project's traffic consultants.
- 6.10 The IAQM's guidance to assess the impacts of construction on human and ecological receptors has been followed in carrying out this air quality assessment. The guidance suggests that where a receptor is located within 250m of a site boundary and/or 50m of a route used by construction vehicles, up to 250m from the Site entrance, a dust assessment should be undertaken.

Scope

- 6.11 The following aspects will be considered in the ES as likely significant effects may potentially occur as a result of the Proposed Development:

- Potential increase in dust generated by on-Site activities during the construction phase of the Proposed Development and its effects on human receptors;
- Potential increase in particulate matter (as PM₁₀) concentrations generated by on-Site activities during the Site preparation, earthworks and construction phase of the Proposed Development and its effects on human receptors;
- Potential change in pollutant concentrations (notably NO₂, PM₁₀ and PM_{2.5}) due to exhaust emissions from road traffic generated during the operational phase of the Proposed Development and its effects on human receptors;
- Exposure of future occupants to pollutant concentrations (notably NO₂, PM₁₀ and PM_{2.5}); and
- Potential change in pollutant concentrations (notably Oxides of Nitrogen) due to exhaust emissions from road traffic generated during the operational phase of the Proposed Development and its effects on ecological receptors.

6.12 The following aspects will not be considered in the ES because potential effects on these receptors are not likely to be significant:

- Potential temporary increase in dust generated by on-Site activities during the construction phase of the Proposed Development and its effects on ecological receptors;
- Emissions from industrial sources on existing or proposed receptors; and
- Emissions from railway sources on existing or proposed receptors.

Assessment Methodology

Impact Areas

6.13 The scope of the assessment has been determined in the following way:

- Review of air quality data for the area surrounding the Site and background pollutant maps;
- Review of local mapping to determine the location of nearby areas that may be sensitive to changes in local air quality; and
- Review of the traffic flow data, which has been used as an input to the air quality modelling assessment.

6.14 During construction of the Proposed Development there is the potential for impacts to occur as a result of dust and PM₁₀ emissions. Guidance provided by the IAQM recommends that an assessment is undertaken where there are human receptors within 250m of the Site boundary or within 50m of the routes used by construction vehicles up to 250m from the Site entrance. Human receptors are located within 250m of the Site, therefore an assessment of the impacts of the construction of the Proposed Development on human receptors has been included in the assessment. The guidance also recommends that an assessment is undertaken where there are dust sensitive ecological receptors within 50m of the site boundary or within 50m of the routes used by construction vehicles up to 250m from the Site entrance. There are no dust sensitive ecological habitats within these

distances, therefore an assessment of the impacts on ecological receptors has not been considered further.

- 6.15 Guidance provided by the EPUK & IAQM provides threshold criteria for establishing when significant impacts on local air quality may occur and when a detailed assessment of potential impacts is required. At locations outside an Air Quality Management Area (AQMA), a change in light duty vehicles (LDV) of more than 500 per day and/or a change in heavy duty vehicles (HDV) of more than 100 per day is considered to result in potentially significant impacts on air quality. At locations within or adjacent to an AQMA, a change in LDVs of more than 100 per day and/or a change in HDVs of more than 25 per day is considered potentially significant.
- 6.16 The Site does not fall within an AQMA. Data provided by the transport consultants indicates that the Proposed Development will result in an increase in LDVs in excess of the threshold values for locations outside an AQMA. An assessment of impacts arising from vehicle emissions using the local roads has therefore been included in the assessment. Consideration has also been given to the suitability of the Site for its proposed use.
- 6.17 Details of the assessment methodology and the specific issues considered are provided below.

Construction Phase Methodology

Introduction

- 6.18 To assess the potential impacts associated with dust and PM₁₀ releases during the demolition and construction phase and to determine any necessary mitigation measures, an assessment based on the latest guidance from the IAQM has been undertaken.

This approach divides construction activities into the following four categories:

- Demolition;
 - Earthworks;
 - Construction; and
 - Trackout (the transport of dust and dirt from the construction site onto the public road network).
- 6.19 The risk of dust effects (low, medium or high) is determined by the scale (magnitude) and nature of the works and the proximity of sensitive human and ecological receptors.
- 6.20 The significance of the dust effects is based on professional judgement, taking into account the sensitivity of receptors and existing air quality.

Dust Emission Magnitude

- 6.21 The magnitude of the dust impacts for each source is classified as Small, Medium or Large depending on the scale of the proposed works. **Table 6.2** summarises the IAQM criteria that may be used to determine the magnitude of the dust emission. These criteria are used in combination with site specific information and professional judgement.

Table 6.2 Dust Emission Magnitude Criteria

Source	Large	Medium	Small
Demolition	- Total building volume >75,000m³ - Potentially dusty material (e.g. concrete) - Onsite crushing and screening - Demolition activities >12m above ground level	- Total building volume 12,000 - 75,000m³ - Potentially dusty material - Demolition activities 6 - 12m above ground level.	- Total building volume <12,000m³ - Construction material with low potential for dust release - Demolition activities <6m above ground level - Demolition during wetter months
Earthworks	- Total site area >110,000m² - Potentially dusty soil type (e.g. clay) >10 heavy earth moving vehicles active at any one time - Formation of bunds >6m in height	- Total site area 18,000 - 110,000m² - 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	- Total site area <18,000m² - 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	- Total building volume >75,000m³ - On site concrete batching - Sandblasting	- Total building volume 12,000 - 75,000m³ - Potentially dusty construction material (e.g. concrete) - On site concrete batching	- Total building volume <12,000m³ - Material with low potential for dust release (e.g. metal cladding or timber)
Trackout	>50 HGV movements in any one day (a) - Potentially dusty surface material (e.g. high clay content) - Unpaved road length >100m	20 - 50 HGV movements in any one day (a) - Moderately dusty surface material (e.g. silt) - Unpaved road length 50 - 100m	<20 HGV movements in any one day (a) - Surface material with low potential for dust release - Unpaved road length <50m
(a) HGV movements refer to outward trips (leaving the site) by vehicles of over 3.5 tonnes.			

Receptor Sensitivity

6.22 Factors defining the sensitivity of a receptor are presented in **Table 6.3**.

Table 6.3 Factors Defining the Sensitivity of a Receptor

Sensitivity	Human (health)	Human (dust soiling)
High	- Locations where members of the public are exposed over a time period relevant to the air quality objectives for PM₁₀ (a) - Examples include residential dwellings, hospitals, schools and residential care homes.	- Regular exposure - High level of amenity expected. - Appearance, aesthetics or value of the property would be affected by dust soiling. - Examples include residential dwellings, museums, medium and long-term car parks and car showrooms.
Medium	- Locations where workers are exposed over a time period relevant to the air quality objectives for PM₁₀ (a) - Examples include office and shop workers (d)	- Short-term exposure - Moderate level of amenity expected - Possible diminished appearance or aesthetics of property due to dust soiling - Examples include parks and places of work
Low	- Transient human exposure - Examples include public footpaths, playing fields, parks and shopping streets	- Transient exposure - Enjoyment of amenity not expected. - Appearance and aesthetics of property unaffected - Examples include playing fields, farmland (e), footpaths, short-term car parks and roads
Trackout	>50 HGV movements in any one day (a) - Potentially dusty surface material (e.g. high clay content) - Unpaved road length >100m	20 - 50 HGV movements in any one day (a) - Moderately dusty surface material (e.g. silt) - Unpaved road length 50 - 100m
(a) 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. (b) Ecosystems that are particularly sensitive to dust deposition include lichens and acid heathland (for alkaline dust, such as concrete). (c) Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee. (d) Does not include workers exposure to PM₁₀ as protection is covered by Health and Safety at Work legislation. (e) Except commercially sensitive horticulture.		

- 6.23 The sensitivity of a receptor will also depend on a number of additional factors including any history of dust generating activities in the area, likely cumulative dust impacts from nearby construction sites, any pre-existing screening such as trees or buildings and the likely duration of the impacts. In addition, the influence of the prevailing wind direction and local topography may be of relevance when determining the sensitivity of a receptor.

Area Sensitivity

- 6.24 The sensitivity of the area to dust soiling and health impacts is dependent on the number of receptors within each sensitivity class and their distance from the source. In addition, human health impacts are dependent on the existing PM₁₀ concentrations in the area. **Tables 6.4** and **6.5** summarise the criteria for determining the overall sensitivity of the area to dust soiling and health impacts respectively.

Table 6.4 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the source (a)			
		<20m	<50m	<100m	<250m
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) For trackout, the distance is measured from the side of roads used by construction traffic. Beyond 50m, the impact is negligible.

Table 6.5 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ (µg/m ³)	Number of Receptors	Distance from the source (a)			
			<20m	<50m	<100m	<250m
High	> 32	> 100	High	High	High	Medium
		10 - 100	High	High	Medium	Low
		1 - 10	High	Medium	Low	Low
	28 - 32	> 100	High	High	Medium	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low
	24 - 28	> 100	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	< 24	> 100	Medium	Low	Low	Low

Receptor Sensitivity	Annual Mean PM ₁₀ (µg/m ³)	Number of Receptors	Distance from the source (a)			
			<20m	<50m	<100m	<250m
Medium		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
	>32	> 10	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	28-32	> 10	Medium	Low	Low	Low
		1 - 10	Low	Low	Low	Low
	<28	-	Low	Low	Low	Low
	Low	-	Low	Low	Low	Low
(a) For trackout, the distance is measured from the side of roads used by construction traffic. Beyond 50m, the impact is negligible.						

- 6.25 For each dust emission source (demolition, construction, earthworks and trackout), the worst-case area sensitivity is used in combination with the dust emission magnitude to determine the risk of dust impacts.

Risk of Dust Impacts

- 6.26 The risk of dust impacts prior to mitigation for each emission source is presented in **Tables 6.6** and **6.7**.

Table 6.6 Risk of Dust Impacts – Demolition

Value (Sensitivity)	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 6.7 Risk of Dust Impacts – Earthworks, Construction and Trackout

Value (Sensitivity)	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

Construction Traffic

- 6.27 Construction traffic will contribute to existing traffic levels on the surrounding road network. The greatest potential for impacts on air quality from traffic associated with this phase of the Proposed Development will be in the areas immediately adjacent to the principal means of access for construction traffic.
- 6.28 Information regarding construction traffic flows was not available at the time of assessment. A detailed assessment of emissions from the construction traffic has therefore not been possible at this stage. Based on the location of the Proposed Development, construction related traffic flows are not predicted to be significant in terms of total emissions or construction duration.

Operational Phase Methodology

- 6.29 The prediction of local air quality has been undertaken using the Atmospheric Dispersion Modelling System (ADMS) Roads dispersion model (Version 5.0.1.3). This is a commercially available dispersion model and has been widely validated for this type of assessment and used extensively in the Air Quality Review and Assessment process.
- 6.30 The model uses detailed information regarding traffic flows on the local road network and local meteorological conditions to predict pollution concentrations at specific locations selected by the user. Meteorological data from London City Airport Meteorological Station for 2024 has been used for the assessment.
- 6.31 The model has been used to predict road specific concentrations of oxides of nitrogen (NO_x) and Particulate Matter (PM₁₀ and PM_{2.5}) at selected receptors. The predicted concentrations of NO_x have been converted to NO₂ using the NO_x to NO₂ calculator available on the Defra air quality website¹¹.
- 6.32 Traffic data has been provided by the transport consultants for the project. A summary of the traffic data used in the assessment can be found in **Appendix 6.2**. The data includes details of annual average daily traffic flows (AADT), vehicle speeds and percentage Heavy Duty Vehicles (HDV) for the assessment years considered. Low traffic speeds have been assigned to appropriate road links to account for congestion and queuing vehicles.
- 6.33 The following scenarios have been included in the assessment:
- 2024 – baseline traffic (for verification purposes);
 - 2029 – future baseline traffic and committed developments (hereafter referred to as ‘without development’ scenario); and
 - 2029 – future baseline and committed developments and development traffic (hereafter referred to as ‘with development’ scenario).
- 6.34 The emission factors released by Defra in March 2025, provided in the emissions factor toolkit EFT2025 v13.1 have been used to predict traffic related emissions in 2024 (for verification purposes) and 2029 (the proposed opening year of the Proposed Development).

- 6.35 To predict local air quality, traffic emissions predicted by the model must be added to local background concentrations. Background concentrations of NO₂, PM₁₀ and PM_{2.5} have been taken from the 2021 Defra background maps (issued November 2024). The maps provide an estimate of background concentrations between 2021 and 2040. The data used for the modelling assessment are set out in **Table 6.13**.
- 6.36 The residential properties developed within Phase 1 will likely be occupied by the year 2029. The assessment has therefore been based on the year 2029 in terms of emission factors and 2024 in terms of background concentrations, whereas the traffic flows used are the predictions for the year 2042, which is the study year of the Transport Assessment representing a future year scenario where the Proposed Development is fully occupied. Background concentrations and emissions from road vehicles are anticipated to decrease in future years, therefore the assessment presented can be considered a worst-case assessment and in reality the concentrations are likely to be lower.
- 6.37 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 aims to minimise modelling uncertainty and systematic error by correcting the modelled results by an adjustment factor to gain greater confidence in the final results. This process was undertaken using the methodology outlined in Chapter 7, Section 4 of LAQM.TG(22).
- 6.38 A verification factor of 2.17 was determined which indicates that the model is under-predicting in this area. This factor was applied to the modelled road-NO_x concentrations prior to conversion to annual mean NO₂ concentrations using the NO_x to NO₂ calculator. Further details of the determination of the verification factor are provided in **Appendix 6.3**.
- 6.39 Insufficient local roadside monitoring data for PM₁₀ and PM_{2.5} were available in the vicinity of the Site to enable verification of the model for particulates. The modelled pollutant road-contributions for PM₁₀ and PM_{2.5} were therefore adjusted using the verification factors obtained for NO₂ as recommended in the guidance provided in LAQM.TG(22).
- 6.40 A quantitative assessment of air quality in the vicinity of the Proposed Development has been completed against the Air Quality Strategy objectives set out in **Appendix 6.4** for NO₂, PM₁₀ and PM_{2.5}.

Emissions Mitigation Assessment

- 6.41 A projection of traffic generated emissions have been calculated using EFT2025 v13.1. The toolkit has been used to calculate annual emissions of NO_x and PM_{2.5} in 2029 associated with traffic before any mitigation has been implemented.
- 6.42 The calculated annual emissions have then been used to calculate a damage cost using the following formula, which is set out in the Kent and Medway Air Quality Partnership Air Quality Planning Guidance, equivalent to the first 5 years of operation:

Pollution emission cost = (emissions rate per 10km per vehicle type x damage cost x 5)

- 6.43 The damage cost for each pollutant is based on the data issued by Defra in December 2025 relating to road transport emissions from a rural area.
- 6.44 The following damage costs have been used for each pollutant:
- £5,944 per tonne for NO_x; and
 - £49,142 per tonne for PM_{2.5}.
- 6.45 The calculated damage cost has been used to identify the level of mitigation that should be implemented by the developer to reduce impacts on local air quality.

Significance Criteria

- 6.46 The significance criteria used are specific to air quality and therefore differ from the criteria outlined in **Chapter 1: Introduction and EIA Methodology** of this ES.

During Construction

- 6.47 The IAQM assessment methodology recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity following the application of appropriate mitigation measures. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effects will normally be negligible.

During Operation

- 6.48 The significance of the predicted impacts has been determined following the advice provided in the Kent and Medway Air Quality Partnership Air Quality Planning Guidance and the EPUK & IAQM Guidance.
- 6.49 The Kent and Medway Air Quality Partnership Air Quality Planning Guidance suggests that the change in pollution concentrations as a result of the Proposed Development is calculated as a percentage of the relevant objective level and then classified in accordance with the criteria as outlined below.

Table 6.8 Classification of Impacts due to changes in Pollutant Concentrations

Classification of Impact	Concentration change due to the Proposed Development	Or if the Proposed Development contribution causes
Very High	Increase >10%	Worsening of air quality within an existing AQMA Creation of a new AQMA Introduction of new receptors within an existing AQMA
High	Increase > 5< 10%	Exposure to be within 5% of Air Quality Objective
Medium	Increase >1 < 5%	Exposure to be within 10% of Air Quality Objective

Low / Imperceptible	Increase < 1%	-
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6.50 Following classification of the impacts the guidance recommends the actions set out in **Table 6.9** below.

Table 6.9 Recommended Planning Requirements

Magnitude of change in air quality	Likely Requirements	Likely Outcomes
Very High	Require evidence to show that mitigation will cancel out air quality impacts. If impact of development on air quality still very high => strong presumption for recommendation for refusal on air quality grounds.	Environmental Health Officer (EHO) will recommend refusal
High	Seek mitigation to significantly reduce air quality impacts. Mitigation to include reducing exposure through various measures, emissions reduction technologies and/or development redesign.	EHO will recommend refusal unless significant mitigation measures are implemented.
Medium	Seek mitigation to reduce air quality impacts. Mitigation to include reducing exposure through various measures, emissions reduction technologies and/or development redesign.	Ensure mitigation is implemented.
Low / Imperceptible	Recommend the minimum mitigation for development scheme type.	Ensure minimum mitigation is implemented.

6.51 The EPUK & IAQM have also provided guidance with regards to determining the significance of an air quality impact. The guidance recommends that the impact at individual receptors is described by expressing the magnitude of incremental change in pollution concentrations 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 as summarised in **Table 6.10**.

Table 6.10 Impact Descriptors for Individual Receptors

Long Term Average Concentration at Receptor in Assessment Year	% Change in concentration relative to Air Quality Assessment Level (AQAL) (a)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight adverse	Moderate adverse
76-94% of AQAL	Negligible	Slight adverse	Moderate adverse	Moderate adverse
95-102% of AQAL	Slight adverse	Moderate adverse	Moderate adverse	Substantial adverse
103-109% of AQAL	Moderate adverse	Moderate adverse	Substantial adverse	Substantial adverse
110% or more of AQAL	Moderate adverse	Substantial adverse	Substantial adverse	Substantial adverse
(a) a change in concentration of less than 0.5% of the AQAL is considered negligible, however changes between 0.5% and 1% are rounded up to 1%.				

- 6.52 The EPUK & IAQM guidance notes that the criteria in **Table 6.10** should be used to describe impacts at individual receptors and should 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 Proposed 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.
- 6.53 In determining the significance of the impact of the Proposed Development, consideration has been given to both the Kent and Medway Air Quality Partnership's significance criteria and the EPUK & IAQM significance criteria.
- 6.54 In order to determine whether the impacts at the ecological habitats are significant, the Environment Agency (EA) guidance criteria have been used which state that for ecological sites if the long term impact is less than 1% of the environmental standard the impact can be considered to be insignificant. If the impact is greater than 1% of the environmental standard the long term predicted environmental standard (PEC) is calculated. If the PEC is less than 70% of the long-term environmental standard, the impact can be considered to be insignificant.
- 6.55 The EA criteria are intended to screen emissions in order to determine if the impacts are significant. If the screening criteria are exceeded, advice should be sought from a suitably qualified ecologist to determine if the impact is likely to be significant as a result of the sensitivity of the individual habitat to the relevant pollutants.

Limitations and Assumptions

- 6.56 The air quality assessment is based on the traffic data that has been provided by project's transport consultants.

Baseline Conditions

Establishing Baseline Conditions

- 6.57 GBC has carried out detailed assessments of air quality in the area and as a result has declared three AQMAs within the borough due to potential exceedances of the Air Quality Standard (AQS) objective for annual mean NO₂ concentrations. The Site is not located within or near an AQMA; the closest to the AQMA to the Site is the Gravesham A2 AQMA, which is located approximately 2.9km to the north of the Site.
- 6.58 GBC currently monitor air quality within the borough using a network of diffusion tubes and one roadside automatic monitoring site.

Baseline Conditions

Local Monitoring Data

- 6.59 GBC operate one automatic monitor located within the Gravesham A2 AQMA approximately 4.7km to the northwest of the Site, monitoring concentrations of NO₂ and PM₁₀. Monitoring data from this site is summarised in **Table 6.11**. No monitoring of PM_{2.5} is currently undertaken in the borough.

Table 6.11 Pollutant Concentrations measured at the Gravesham A2 Roadside Automatic Monitor ($\mu\text{g}/\text{m}^3$)

Pollutant	Statistic	2020	2021	2022	2023	2024
NO ₂	Annual Mean	23.7	22.8	22.2	19.5	18.6
	Number of 1 hour means >200 $\mu\text{g}/\text{m}^3$	0	0	0	0	0
PM ₁₀	Annual Mean	16.3	16.0	15.3	11.7	10.3
	Number of 24 hour means >50 $\mu\text{g}/\text{m}^3$	1	0	0	0	0
Data obtained from the GBC Air Quality Annual Status Report 2025						

- 6.60 Annual mean NO₂ and PM₁₀ concentrations recorded by the automatic monitor have been consistently below the 40 $\mu\text{g}/\text{m}^3$ objectives since 2020, despite being located within an AQMA.
- 6.61 Exceedances of the 200 $\mu\text{g}/\text{m}^3$ limit for hourly mean NO₂ concentrations have not been recorded during the five years of the monitoring presented, therefore the objective was met in all five monitoring years.
- 6.62 An exceedance of the 50 $\mu\text{g}/\text{m}^3$ limit for 24-hour PM₁₀ concentrations has been recorded by the automatic monitor during the five years of the monitoring presented. However, the objective allows for 35 exceedances of the 50 $\mu\text{g}/\text{m}^3$ limit in any given year therefore the objective was met in all five monitoring years.
- 6.63 Based on the data recorded at these sites, NO₂ and PM₁₀ concentrations are expected to meet the relevant objectives at the Site.

Non-Automatic Local Monitoring Data

- 6.64 NO₂ diffusion tube monitoring is also carried out by GBC. Data from the closest monitoring sites to the Proposed Development is presented in **Table 6.12** below.

Table 6.12 NO₂ Concentrations recorded at the nearest Diffusion Tube Monitors ($\mu\text{g}/\text{m}^3$)

Site Name	Site Type	2020	2021	2022	2023	2024
GR94 Opp The George PH, Wrotham Road, Meopham, DA13 0AJ	Roadside	27.2	25.5	26.6	23.3	19.6
GR147 36/38 The Street, Cobham DA12 3BZ (façade)	Roadside	23.9	25.3	22.1	19.7	17.7
Data obtained from the GBC Air Quality Annual Status Report 2025						

- 6.65 The AQS objective for annual mean NO₂ concentrations has been met over the five-year period at both of the above monitoring sites.
- 6.66 Diffusion tubes cannot monitor short-term NO₂ concentrations, however, as previously discussed, research has concluded¹² that exceedances of the 1-hour mean objective are generally unlikely to occur where annual mean concentrations do not exceed 60 µg/m³. Annual mean NO₂ concentrations were below 60 µg/m³ at both monitoring sites between 2020 and 2024 therefore it is expected that the 1-hour objective is being met at these locations.

Defra Background Maps

- 6.67 Additional information on background concentrations in the vicinity of the Proposed Development has been obtained from the Defra background pollutant maps. The average pollutant concentrations from the grid squares representing the assessment area have been extracted from the maps which include the modelled receptors and road links included in the modelling assessment.
- 6.68 Background concentrations have also been obtained for the grid squares representing the monitoring sites used in the verification of the modelling.
- 6.69 The 2021 Defra background maps, which provide estimated background concentrations between 2021 and 2040, have been used to obtain concentrations for 2024.

Table 6.13 Estimated Annual Mean Background Concentrations from Defra Maps (µg/m³)

Grid Square	Receptor	NO _x	NO ₂	PM ₁₀	PM _{2.5}
565500, 167500	R1, R2, R3, R4, P1	-	10.0	10.8	6.4
566500, 168500	R5	-	10.2	10.6	5.3
566500, 169500	R6, R7		10.9	12.0	6.5
567500, 168500	R8, R9	-	10.2	10.9	6.3
564500, 167500	R10	-	10.3	11.1	6.6
564500, 166500	R11, R12, R13	-	9.9	11.0	6.4
564500, 167500	R14, R15, R16, R17, R18, R19, P2, P3	-	10.3	11.1	6.6
563500, 169500	R20, R21	-	11.1	11.5	6.7
564500, 170500	R22	-	12.6	13.3	6.9
563500, 170500	R23	-	11.7	12.5	7.0

Grid Square	Receptor	NO _x	NO ₂	PM ₁₀	PM _{2.5}
567500, 169500	E1	16.6	-	-	-
568500, 169500	E2	16.8	-	-	-

- 6.70 The data presented in **Table 6.13** shows that estimated annual mean background concentrations of NO₂, PM₁₀ and PM_{2.5} are well below the annual mean objectives for each pollutant in the vicinity of the Site.

Receptors

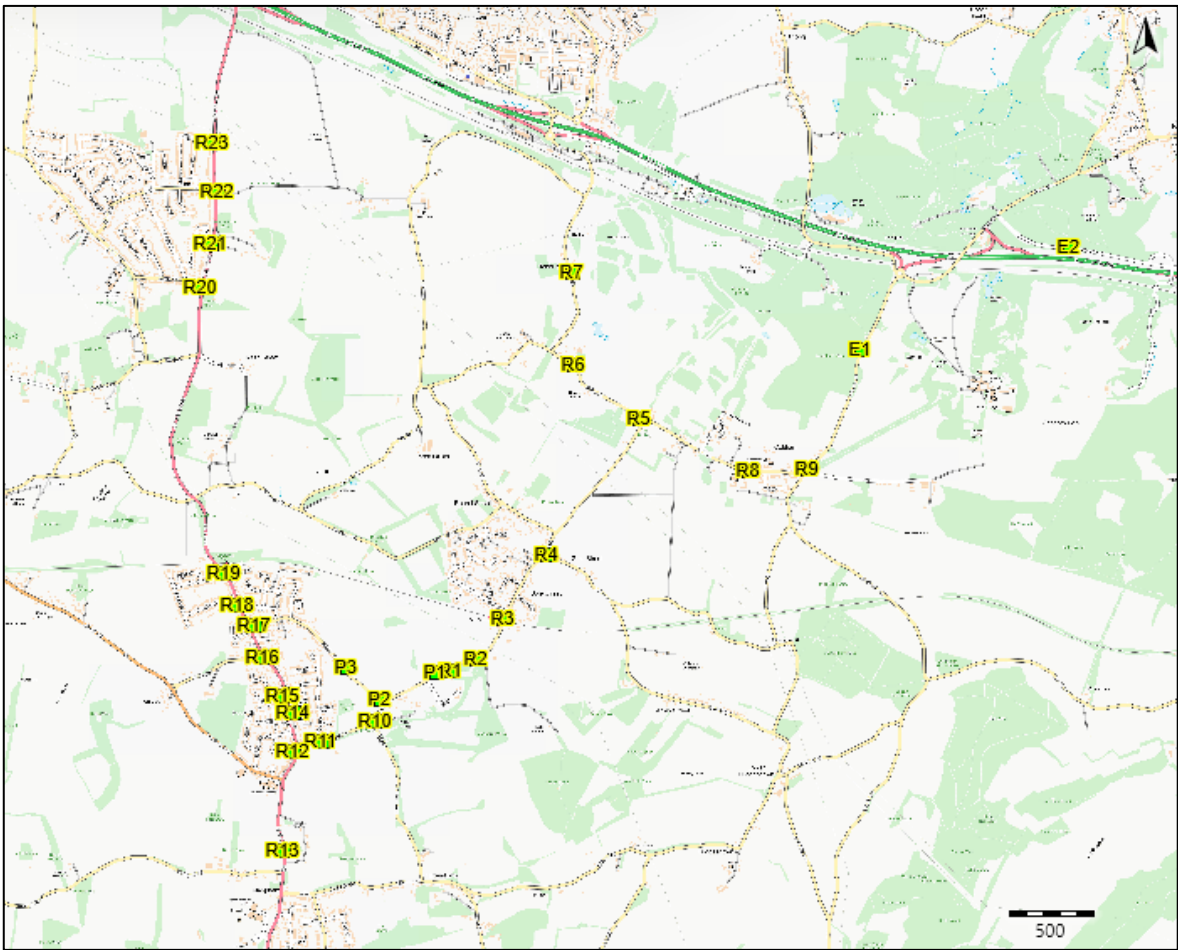
- 6.71 LAQM.TG(22) describes in detail typical locations where consideration should be given to pollutants defined in the Regulations. Generally, the guidance suggests that all locations '*where members of the public are regularly present*' should be considered. At such locations, members of the public will be exposed to pollution over the time that they are present, and the most suitable averaging period of the pollutant needs to be used for assessment purposes.
- 6.72 For instance, on a footpath, where exposure will be transient (for the duration of passage along that path) comparison with short-term standard (i.e. 15-minute mean or 1-hour mean) may be relevant. For private dwellings, however; where exposure may be for longer periods, comparison with long-term (such as 24-hour mean or annual mean) standards may be most appropriate. In general terms, concentrations associated with long-term standards are lower than short-term standards owing to the chronic health effects associated with exposure to low level pollution for longer periods of time.
- 6.73 To assess the impact of emissions arising from the traffic generated by the Proposed Development concentrations have been predicted at 25 existing sensitive receptors within the vicinity of the Site including nearby residential properties and ecological sites. Details of these sensitive receptors are presented in **Table 6.14** and the locations are illustrated in **Figure 6.1**.
- 6.74 The modelling assessment also predicted concentrations at three locations representing locations within the Site itself to assess the suitability of the Site for the proposed end use.

Table 6.14 Location of Sensitive Receptors

ID	Receptor	Type	Easting	Northing
R1	Camer Road	Residential	565357	167294
R2	4 Camer Road	Residential	565508	167356
R3	1 Sole Street	Residential	565659	167589
R4	Sole Street/Gold Street	Residential	565910	167956
R5	Sole Street/Jeskyns Road	Residential	566437	168730
R6	2 Jeskyns Road	Residential	566059	169035

ID	Receptor	Type	Easting	Northing
R7	Henhurst Road	Residential	566048	169563
R8	The Street	Residential	567051	168428
R9	Halfpence Lane	Residential	567392	168438
R10	Camer Road/Camer Park Road	Residential	564926	167007
R11	Green Lane/Tradescant Drive	Residential	564617	166888
R12	Wrotham Road	Residential	564462	166833
R13	Wrotham Road	Residential	564404	166263
R14	Cedar Close	Residential	564459	167052
R15	Wrotham Road	Residential	564406	167149
R16	Wrotham Road/Melliker Lane	Residential	564290	167368
R17	Norwood Lane	Residential	564236	167553
R18	Wrotham Road	Residential	564138	167669
R19	Wrotham Road	Residential	564071	167845
R20	Lewis Road	Residential	563928	169479
R21	Bracondale Avenue	Residential	563988	169724
R22	Wrotham Road	Residential	564024	170025
R23	Wrotham Road	Residential	563998	170302
P1	Façade of the Proposed Development	Proposed	565269	167284
P2	Façade of the Proposed Development	Proposed	564960	167125
P3	Façade of the Proposed Development	Proposed	564765	167311
E1	North Kent Woods and Downs National Nature Reserve (NNR)/Shorne and Ashenbank Woods Site of Special Scientific Interest (SSSI)	Ecological	567700	169125
E2	North Kent Woods and Downs NNR/Shorne and Ashenbank Woods SSSI	Ecological	568888	169709

Figure 6.1: Location of Receptors Considered within ADMS Model



6.75 Details of the sensitivity of the existing and future receptors is included in **Table 6.15**.

Table 6.15 Existing and Future Sensitive Receptors

Receptor	Sensitivity
Existing Receptors	
Existing Residents within 250m of the Proposed Development (Construction Phase)	High
Existing Residents in Study Area (Operational Phase)	High
Future Receptors	
Future Residents and Proposed School (Operational Phase)	High
Future Residents within 250m of the Proposed Development (Construction Phase)	High

Future Baseline

- 6.76 Baseline air quality is likely to improve in future years as a result of improvements in vehicle emissions technology, regardless of whether the Proposed Development comes forward or not. To provide a worst-case assessment of potential impacts, the existing baseline pollutant concentrations are assumed to be representative of future air quality at sensitive receptor locations.

Assessment of Effects (Construction and Operational)

Environmental Design and Management

- 6.77 The following mitigation measures have already been taken into account within the design of the Proposed Development:
- Energy and Sustainability Strategy.

Effects During Construction

Area Sensitivity

- 6.78 The Site is currently occupied by open fields, therefore there are no buildings requiring demolition at the Site. An assessment of dust effects associated with demolition have not therefore been included within this assessment.
- 6.79 The assessment of dust impacts is dependent on the proximity of the most sensitive receptors to the Site boundary. The construction works will be completed in three phases; throughout the construction phase a number of properties on-Site will be occupied. A summary of the receptor and area sensitivity to health and dust soiling impacts is presented in **Table 6.16**.

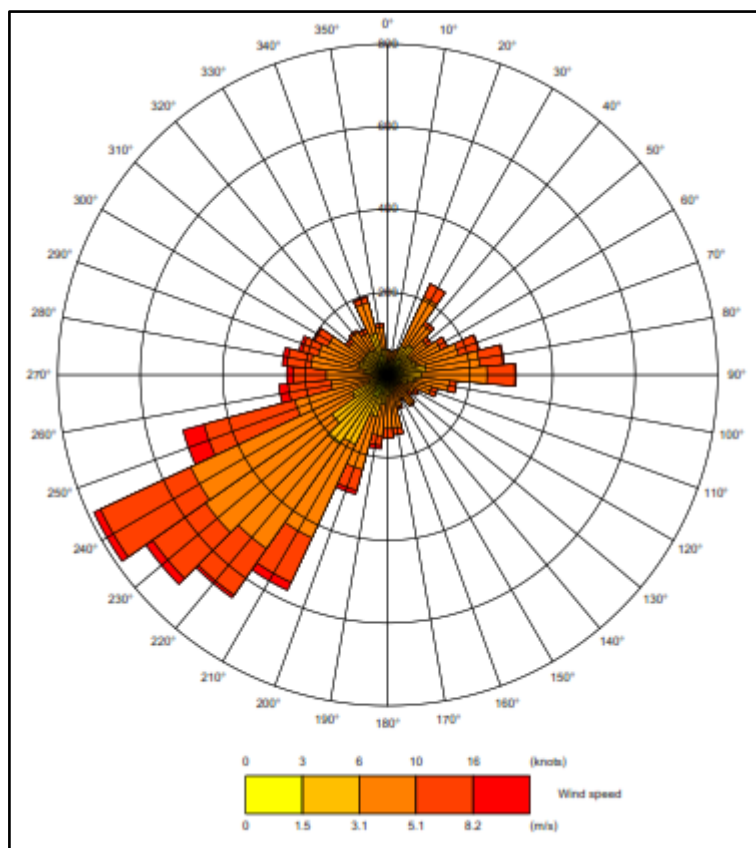
Table 6.16 Sensitivity of Receptors and the Local Area to Dust Impacts

Receptor	Distance from Site Boundary (m)	Approx. Number of Receptors	Sensitivity to Health Impacts (a)		Sensitivity to Dust Soiling Impacts	
			Receptor	Area	Receptor	Area
Phase One						
Residential Properties	<20m	1-10	High	Low	High	Medium
	<50m	1-10	High	Low	High	Low
Overall Sensitivity of the Area			Low		Medium	
Phase Two						
Residential Properties (Including Future Residents)	<20m	1-10	High	Low	High	Medium
	<50m	10-100	High	Low	High	Medium
Overall Sensitivity of the Area			Low		Medium	
Phase Three						

Receptor	Distance from Site Boundary (m)	Approx. Number of Receptors	Sensitivity to Health Impacts (a)		Sensitivity to Dust Soiling Impacts	
			Receptor	Area	Receptor	Area
Residential Properties (Including Future Residents)	<20m	10-100	High	Low	High	High
Proposed School	100-250m	>100	High	Low	High	Low
Overall Sensitivity of the Area			Low		High	
(a) Estimated background PM ₁₀ concentration is 11.1 µg/m³.						

- 6.80 It is understood that construction traffic will travel along Camer Road to gain access to the Site. Within the IAQM guidance it is indicated that the impact declines with distance from the Site, and it is only necessary to consider trackout impacts up to 50m from the edge of the road. There are several sensitive receptors along the roads within this distance, therefore the sensitivity of the area to impacts from trackout is considered to be high for dust impacts and low for human health impacts.
- 6.81 The precise behaviour of the dust, its residence time in the atmosphere, and the distance it may travel before being deposited will depend upon a number of factors. These include wind direction and strength, local topography and the presence of intervening structures (buildings, etc.) that may intercept dust before it reaches sensitive locations. Furthermore, dust would be naturally suppressed by rainfall.
- 6.82 A wind rose from London City Airport is provided in **Figure 6.2**, which shows that the prevailing wind is from the southwest, therefore receptors to the northeast of the Site are the most likely to experience dust impacts from the Proposed Development. The area to the northeast of the Site is predominantly residential (Sole Street).

Figure 6.2 Windrose for London City Airport Meteorological Station (2024)



Dust Emission Magnitude

Phase One

- 6.83 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling of the Site and landscaping. Based on the size of the Site (>110,000m²), the magnitude of the dust emission for the earthworks phase is considered to be large.
- 6.84 Dust emissions during construction will depend on the scale of the works, method of construction, construction materials and duration of build. Based on the overall size of the Proposed Development the dust emission magnitude is considered to be large.
- 6.85 Factors influencing the degree of trackout and associated magnitude of effect include vehicle size, vehicle speed, vehicle numbers, geology and duration. Construction traffic will likely access the Proposed Development Site via Camer Road. The number of HGV movements (leaving the Site) is expected to be more than 50 per day, therefore dust emission magnitude due to trackout is considered to be large.

Phase Two

- 6.86 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling of the Site and landscaping. Based on the size of the Site (>110,000m²), the magnitude of the dust emission for the earthworks phase is considered to be large.

- 6.87 Dust emissions during construction will depend on the scale of the works, method of construction, construction materials and duration of build. Based on the overall size of the Proposed Development the dust emission magnitude is considered to be large.
- 6.88 Factors influencing the degree of trackout and associated magnitude of effect include vehicle size, vehicle speed, vehicle numbers, geology and duration. Construction traffic will likely access the Proposed Development Site via Camer Road. The number of HGV movements (leaving the Site) is expected to be more than 50 per day, therefore dust emission magnitude due to trackout is considered to be large.

Phase Three

- 6.89 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling of the Site and landscaping. Based on the size of the Site (>110,000m²), the magnitude of the dust emission for the earthworks phase is considered to be large.
- 6.90 Dust emissions during construction will depend on the scale of the works, method of construction, construction materials and duration of build. Based on the overall size of the Proposed Development the dust emission magnitude is considered to be large.
- 6.91 Factors influencing the degree of trackout and associated magnitude of effect include vehicle size, vehicle speed, vehicle numbers, geology and duration. Construction traffic will likely access the Proposed Development Site via Camer Road. The number of HGV movements (leaving the Site) is expected to be more than 50 per day, therefore dust emission magnitude due to trackout is considered to be large.

Dust Risk Effects

- 6.92 A summary of the potential dust risk effects prior to mitigation are presented in **Table 6.17** below.

Table 6.17 Summary of Dust Risk Effects Prior to Mitigation

Source	Dust Soiling Effects	PM ₁₀ Effects
Phase One		
Demolition	-	-
Earthworks	Medium Risk	Low Risk
Construction	Medium Risk	Low Risk
Trackout	High Risk	Low Risk
Phase Two		
Demolition	-	-
Earthworks	Medium Risk	Low Risk

Source	Dust Soiling Effects	PM ₁₀ Effects
Construction	Medium Risk	Low Risk
Trackout	High Risk	Low Risk
Phase Three		
Demolition	-	-
Earthworks	High Risk	Low Risk
Construction	High Risk	Low Risk
Trackout	High Risk	Low Risk

Effects Once the Proposed Development is Operational

Predicted NO₂ Concentrations

- 6.93 Annual mean NO₂ concentrations predicted at the selected receptor locations are set out in **Table 6.18**. The concentrations include the estimated 2024 background NO₂ concentrations as indicated in **Table 6.13**.

Table 6.18 Predicted Annual Mean NO₂ Concentrations (µg/m³)

Receptor	Completed Development at Year 2029		
	Without Development	With Development	Impact (% of Objective)
R1	11.2	11.4	0.6
R2	12.2	12.7	1.2
R3	11.8	12.1	0.9
R4	11.5	11.8	0.7
R5	11.9	12.2	0.9
R6	12.5	12.8	0.9
R7	12.8	13.3	1.2
R8	14.2	14.5	0.9
R9	11.5	11.6	0.2
R10	12.4	12.8	1.1
R11	11.5	11.9	0.9

Receptor	Completed Development at Year 2029		
	Without Development	With Development	Impact (% of Objective)
R12	11.8	11.8	0.1
R13	13.3	13.3	0.2
R14	11.9	12.0	0.3
R15	11.9	12.1	0.3
R16	12.6	12.8	0.4
R17	12.1	12.3	0.4
R18	12.5	12.7	0.4
R19	13.0	13.2	0.5
R20	12.6	12.7	0.3
R21	13.2	13.3	0.4
R22	15.8	16.0	0.6
R23	13.4	13.6	0.4
P1	-	11.6	-
P2	-	11.1	-
P3	-	10.6	-

- 6.94 The results of the assessment indicate that there are no exceedances of the annual mean AQS objective level for NO₂ at any of the existing sensitive receptors either with or without the Proposed Development.
- 6.95 According to the EPUK & IAQM criteria outlined in **Table 6.10**, which are the nationally accepted air quality criteria, the impact at all of the sensitive receptors included in the assessment is classed as negligible.
- 6.96 Kent and Medway have produced an air quality planning guidance which also contains significance criteria as detailed in **Table 6.8**. It should be noted that these criteria consider only the magnitude of the change in concentration, they do not take into account the overall pollutant concentrations in the area in comparison to the air quality objectives. For completeness discussion of the impacts determined using these criteria are included below. However, it is considered that the nationally accepted criteria provided by the EPUK & IAQM which include consideration of the overall concentrations compared to the relevant objective levels are more appropriate in order to establish the impact of a proposed development.

- 6.97 In accordance with the Kent and Medway planning criteria, a medium adverse impact is predicted at receptors R2, R7 and R10. At the remaining sensitive receptors the impact is classed as low / imperceptible in accordance with the Kent and Medway planning criteria.

Within the Site itself, the highest predicted annual mean NO₂ concentration is 11.6 µg/m³. As concentrations are predicted to be well below (less than 75% of) the relevant AQS objective level, the impact with regards to new exposure is considered to be negligible.

- 6.98 Concentrations of annual mean NO₂ predicted within the study area are all well below 60 µg/m³ therefore it is considered likely that the AQS objective level for hourly mean NO₂ concentrations will also be met. Therefore, the impact of the Proposed Development on the surrounding existing receptors and with regards to new exposure for hourly mean NO₂ concentrations is also considered to be negligible.

Predicted PM₁₀ Concentrations

- 6.99 Annual mean PM₁₀ concentrations predicted at the selected receptor locations are set out in **Table 6.19**. The concentrations include the estimated 2024 background PM₁₀ concentrations as indicated in **Table 6.13**.

Table 6.19 Predicted Annual Mean PM₁₀ Concentrations (µg/m³)

Receptor	Completed Development at Year 2029		
	Without Development	With Development	Impact (% of Objective)
R1	11.2	11.2	0.1
R2	11.5	11.6	0.3
R3	11.7	11.9	0.4
R4	11.6	11.8	0.4
R5	11.4	11.5	0.4
R6	12.4	12.5	0.2
R7	12.5	12.6	0.3
R8	12.6	12.7	0.4
R9	11.7	11.7	0.1
R10	11.7	11.8	0.2
R11	11.8	12.0	0.5
R12	12.0	12.0	0.0

Receptor	Completed Development at Year 2029		
	Without Development	With Development	Impact (% of Objective)
R13	12.8	12.9	0.1
R14	11.9	12.0	0.2
R15	12.0	12.1	0.2
R16	12.4	12.5	0.3
R17	12.1	12.2	0.2
R18	12.3	12.4	0.2
R19	12.6	12.7	0.3
R20	12.2	12.3	0.1
R21	12.5	12.5	0.2
R22	14.9	15.0	0.3
R23	13.4	13.4	0.2
P1	-	11.3	-
P2	-	11.3	-
P3	-	11.2	-

- 6.100 The results of the assessment indicate that there are no exceedances of the annual mean AQS objective level for PM₁₀ at any of the existing sensitive receptors either with or without the Proposed Development.
- 6.101 According to the EPUK & IAQM criteria, which are the nationally accepted air quality criteria, the impact all locations within the study area is classed as negligible.
- 6.102 According to the Kent and Medway Air Quality Partnership Air Quality Planning Guidance criteria, the impact of the Proposed Development on local air quality with regard to annual mean PM₁₀ concentrations is considered to be low / imperceptible.
- 6.103 Within the Site itself, the highest predicted annual mean PM₁₀ concentration is 11.3µg/m³. As concentrations are predicted to be well below (less than 75% of) the relevant AQS objective level, the impact with regards to new exposure is considered to be negligible.
- 6.104 LAQM.TG(22) provides a relationship between predicted annual mean concentrations and the likely number of exceedances of the short-term (24-hour mean) PM₁₀ objective of 50 µg/m³ (N), where:

$$N = -18.5 + 0.00145 \times \text{annual mean}^3 + (206/\text{annual mean}).$$

- 6.105 The objective allows 35 exceedances per year, which is equivalent to an annual mean of 32 µg/m³.
- 6.106 Based on the above approach, the maximum number of days where PM₁₀ concentrations are predicted to exceed 50µg/m³ at an existing sensitive receptor is 2 with a change of less than 1 day. The impact on 24-hour PM₁₀ concentrations is therefore also considered to be negligible.
- 6.107 Within the Site itself, the maximum number of days where PM₁₀ concentrations are predicted to exceed 50µg/m³ is less than 2 days. The impact of the Proposed Development with regards new exposure to 24 hour PM₁₀ concentrations is considered to be negligible.

Predicted PM_{2.5} Concentrations

- 6.108 Annual mean PM_{2.5} concentrations predicted at the selected receptor locations are set out in **Table 6.20**. The concentrations include the estimated 2024 background PM_{2.5} concentrations as indicated in **Table 6.13**.

Table 6.20 Predicted Annual Mean PM_{2.5} Concentrations (µg/m³)

Receptor	Completed Development at Year 2029		
	Without Development	With Development	Impact (% of Objective)
R1	6.6	6.6	0.2
R2	6.7	6.8	0.4
R3	6.9	7.0	0.5
R4	6.8	6.9	0.4
R5	6.7	6.8	0.5
R6	6.7	6.8	0.3
R7	6.8	6.9	0.3
R8	7.2	7.3	0.5
R9	6.9	6.9	0.1
R10	6.9	7.0	0.3
R11	6.9	6.9	0.5
R12	6.9	6.9	0.0
R13	7.4	7.4	0.1
R14	7.0	7.0	0.2
R15	7.0	7.1	0.2

Receptor	Completed Development at Year 2029		
	Without Development	With Development	Impact (% of Objective)
R16	7.2	7.3	0.3
R17	7.1	7.1	0.3
R18	7.2	7.3	0.3
R19	7.4	7.4	0.3
R20	7.1	7.2	0.1
R21	7.3	7.3	0.2
R22	7.8	7.9	0.3
R23	7.4	7.4	0.2
P1	-	6.6	-
P2	-	6.7	-
P3	-	6.6	-

- 6.109 The results of the assessment indicate that there are no exceedances of the annual mean AQS objective level for PM_{2.5} at any of the existing sensitive receptors either with or without the Proposed Development.
- 6.110 According to the EPUK & IAQM criteria, which are the nationally accepted air quality criteria, the impact all locations within the study area is classed as negligible.
- 6.111 According to the Kent and Medway Air Quality Partnership Air Quality Planning Guidance significance criteria, the impact of the Proposed Development on local air quality with regard to annual mean PM_{2.5} concentrations is considered to be *low / imperceptible*.
- 6.112 Within the Site itself, the highest predicted annual mean PM_{2.5} concentration is 6.7µg/m³. As concentrations are predicted to be well below (less than 75% of) the relevant AQS objective level, the impact with regards to new exposure is considered to be negligible.
- 6.113 New legislation in 2023 has introduced an additional target for PM_{2.5} of 10µg/m³ to be achieved by the year 2040 and an interim target of 12µg/m³ to be achieved by 2028. The predicted annual mean PM_{2.5} concentrations at the selected receptors are below the 10µg/m³ target, therefore it is considered that the Proposed Development will not hinder the achievement of the future targets for PM_{2.5}.

Ecological Receptors

Oxides of Nitrogen

- 6.114 Predicted NO_x concentrations at receptors under each scenario are set out in **Table 6.21**. The process contribution (PC) has been added to background concentrations to give the total concentration of NO_x at each receptor. The increased PC as a result of the Proposed Development has also been expressed as a percentage of the Critical Load (CL).
- 6.115 Within the NNR/SSSI, the Proposed Development is predicted to result in an increase in NO_x concentrations of up to 0.2 µg/m³, which equates to 0.7% of the CL. As the increase is less than 1% of the CL the impact is considered to be insignificant in accordance with the EA significance criteria.

Table 6.21 Impact of Proposed Development on Oxides of Nitrogen within the NNR/SSSI (µg/m³)

Receptor	Background NO _x	2029 Without Development	2029 With Development	Change due to Development	Increased Contribution as a percentage of the CLE (30 µg/m ³)
E1	16.6	20.0	20.2	0.2	0.7
E2	16.8	55.2	55.4	0.1	0.5

N-deposition

- 6.116 Data presented on the APIS website gives the current N-deposition rate within the NNR/SSSI of 23.8 kgN/ha/yr. The Proposed Development is predicted to increase N-deposition rates by a maximum of 0.06 kgN/ha/yr, which equates to 0.4% of the CLd. The impact is very small in comparison to the background N-deposition rate and the CL_d, therefore the impact of the Proposed Development on N-deposition rates is considered to be insignificant.

Table 6.22 Impact of Proposed Development on Nitrogen Deposition within the NNR/SSSI (µg/m³)

Receptor	2029 Without Development – N-deposition (kgN/ha/yr)	2029 With Development – N-deposition (kgN/ha/yr)	Change due to Development	Increased Contribution as a percentage of the CLO (15 kgN/ha/yr)
E1	24.8	24.8	0.06	0.4
E2	34.9	34.9	0.04	0.3

Emissions Mitigation Statement

- 6.117 Based on the traffic data provided the number of annual trips generated by the operational development would be 1,630,455 per annum.
- 6.118 Using the Emissions Factor Toolkit (EFT) emission data, the total annual emissions of NO_x and PM_{2.5} have been calculated as set out in **Table 6.23** below. The assessment has assumed an average speed of 48kph and an average distance travelled of 10km per vehicle. The emissions have been calculated based on a 2029 operational year.

Table 6.23 Calculated Annual Emissions from Operational Development

Pollutant	Annual Emissions (kg/yr)
NO _x	1,994.05
PM _{2.5}	283.67

- 6.119 Using the formula and damage costs for both NO_x and PM_{2.5} set out in earlier within this chapter the total damage cost for the Proposed Development over the first 5 years is calculated as £59,263.08 for NO_x and £69,699.67 for PM_{2.5}, giving a total damage cost of £128,962.75. This is the total cost which should be spent on mitigation measures aimed at reducing emissions to air from the operational development.

Mitigation Measures

Mitigation During Construction

- 6.120 The control of dust emissions from construction site activities relies upon management provision and mitigation techniques to reduce emissions of dust and limit dispersion. Where dust emission controls have been used effectively, construction operations have been successfully undertaken without impacts to nearby properties.
- 6.121 Overall, the Proposed Development is considered to be a high risk of dust impacts, and low risk to human health from particulate matter concentrations at nearby receptors during the construction phase. Appropriate mitigation measures for the Proposed Development have been identified following the IAQM guidance and based on the risk effects presented in **Table 6.17**. It is recommended that the 'highly recommended' measures set out in **Appendix 6.5** are incorporated into a Dust Management Plan (DMP) and approved by GBC prior to commencement of any work on the Site.
- 6.122 Following implementation of the 'highly recommended' measures outlined in the IAQM guidance and reproduced in **Appendix 6.5**, the impact of emissions during construction of the Proposed Development would be negligible.

Mitigation Once the Proposed Development is Operational

- 6.123 In line with EPUK & IAQM criteria, the Proposed Development is predicted to result in a negligible impact on local air quality and concentrations of relevant pollutants (NO₂, PM₁₀ and PM_{2.5}) within the Proposed Development and at nearby sensitive receptors will meet the relevant air quality objectives in the opening year.
- 6.124 In accordance with the advice provided in the Kent & Medway Guidance, mitigation measures will be implemented to reduce operational emissions.
- 6.125 The following mitigation measures will be included within the Proposed Development:
- 1 Electric Vehicle charging point per dwelling with dedicated parking or 1 charging point per 10 spaces (unallocated parking);
 - A proposed bus route thorough the Site;
 - Travel Pack will be produced promoting alternative modes of transport to be distributed to all residents staff and pupils / parents;
 - Provision of Travel Information Boards;
 - Travel surveys will be undertaken to monitor travel behaviour;
 - Improved cycle paths to link cycle network;
 - Adequate provision of secure cycle storage; and
 - Travel plan including mechanisms for discouraging high emission vehicle use and encouraging the uptake of low emission fuels and technologies.
- 6.126 The cost of implementing the above mitigation measures will exceed the Damage Cost figure calculated in **Table 6.23** by a significant margin. The implementation of the above mitigation measures should further reduce the impact of emissions during operation of the Proposed Development.

Residual Effects and Monitoring

- 6.127 The residual effects arising from the Proposed Development are summarised in **Table 6.24** below.

Table 6.24 Summary of Residual Effects

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect	Mitigation and Monitoring	Residual Effect
Construction Effects						
Dust Nuisance	Existing and Future Residential Properties (High)	Local Temporary	Large	High Risk	Mitigation measures follow the IAQM guidance. These measures will be incorporated into a DMP and approved by GBC prior to commencement of any work on-Site.	Negligible
PM ₁₀ Health Impacts	Existing and Future Residential Properties (Low)	Local Temporary	Large	Low Risk	Mitigation measures follow the IAQM guidance. These measures will be incorporated into a DMP and approved by GBC prior to commencement of any work on-Site.	Negligible
Operational Effects						
NO ₂ , PM ₁₀ , and PM _{2.5} Concentrations	Future and Existing Residents	Local Permanent	Negligible	Negligible	Encourage sustainable modes of transport.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect	Mitigation and Monitoring	Residual Effect
N-deposition and airborne NO _x	Ecological Sites	Local Permanent	Negligible	Negligible	Encourage sustainable modes of transport.	Negligible

Notes: * incorporating environmental design and management, ** incorporating mitigation and monitoring measures

Likely Significant Environmental Effects

- 6.128 There are no significant effects arising from the Proposed Development.

Summary and Conclusions

- 6.129 An assessment of the potential impacts during the construction phase has been carried out. This has shown that during this phase of the Proposed Development releases of dust and PM₁₀ are likely to occur during site activities, particularly during demolition activities. Through good site practice and the implementation of suitable mitigation measures, the impact of dust and PM₁₀ releases may be effectively mitigated and the resultant impacts are considered to be negligible.
- 6.130 The ADMS Roads model has been used to assess the operational impacts associated with the Proposed Development as well as the likely exposure of future users of the Proposed Development to air pollution. This has shown that operational traffic associated with the development would have a negligible impact on local air quality. Future occupants of the Proposed Development would not be exposed to pollutant concentrations above the relevant objective levels. Traffic generated by the Proposed Development is predicted to have an insignificant impact on N-deposition rates and airborne NO_x concentrations within nearby ecological sites. The impact of the Proposed Development with regards to new exposure to air quality is considered to be negligible. Mitigation measures are recommended in line with the Kent and Medway Air Quality Planning Guidance.

References

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