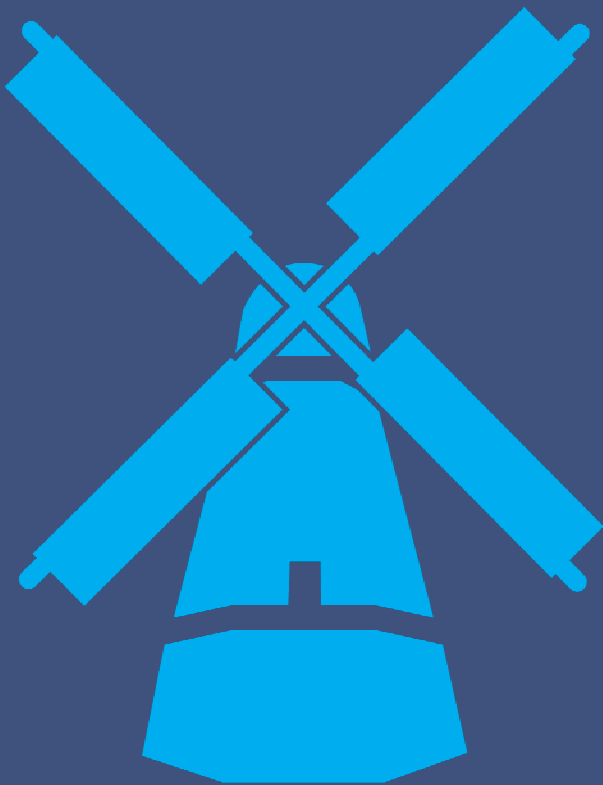


Hindsland, Eastbourne Road Willingdon, East Sussex

Air Quality Assessment



March 2021

Danescroft (FREOF V Willingdon) LLP

Eastbourne Road, Willingdon

**Prepared for
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ACRONYMS AND ABBREVIATIONS

ATC	Automated Traffic Count
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
DEV	Development generated traffic
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
EFT	DEFRA Emissions Factor Toolkit
g/km/s	grams per kilometre per second
ha	Hectares - a unit of measure equal to 2.471 acres or 10,000 m ³
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Managements
MCC	Manual Classified Traffic Count
ms ⁻¹	wind speed in meters per second
NAQO	National Air Quality Objectives (2002)
NSCA	National Society for Clean Air
NO ₂	Nitrogen Dioxide
NO _x	Oxides of Nitrogen
NTM	National Transport Model
PM ₁₀	Particulate matter with an aerodynamic diameter less than 10 microns
PM _{2.5}	Particulate matter with an aerodynamic diameter less than 2.5 microns
SMA	Stuart Michael Associates Limited
TEMPO	Trip End Model Presentation Program
UoK	the University of Kent
WDC	Wealden District Council
µgm ⁻³	Micrograms per cubic meter



1.0 INTRODUCTION

- 1.1 Stuart Michael Associates (SMA), Consulting Engineers, has been appointed by Danescroft (FROF V Willingdon) LLP (the Applicant) to undertake an Air Quality Assessment for the proposed development on Eastbourne Road, Willingdon (refer to **Figure 1.1** for the site location). The development site is situated within the area administered by Wealden District Council (WDC).
- 1.2 This report supports an outline Application, all matters reserved except for Access (excluding internal estate roads beyond the access to serve the Medical Centre Plot), for the demolition of an existing vacant dwelling and erection of up to 180 no. dwellings and a medical centre together with all parking, servicing and onsite open space, hereafter referred to as the 'Site'. The proposed Site Layout Illustrated on OSP Architects drawing number P101C Revision C dated 01.03.2021 has been considered in this air quality assessment. Refer to **Appendix 1** for a copy of the proposed Site Layout.

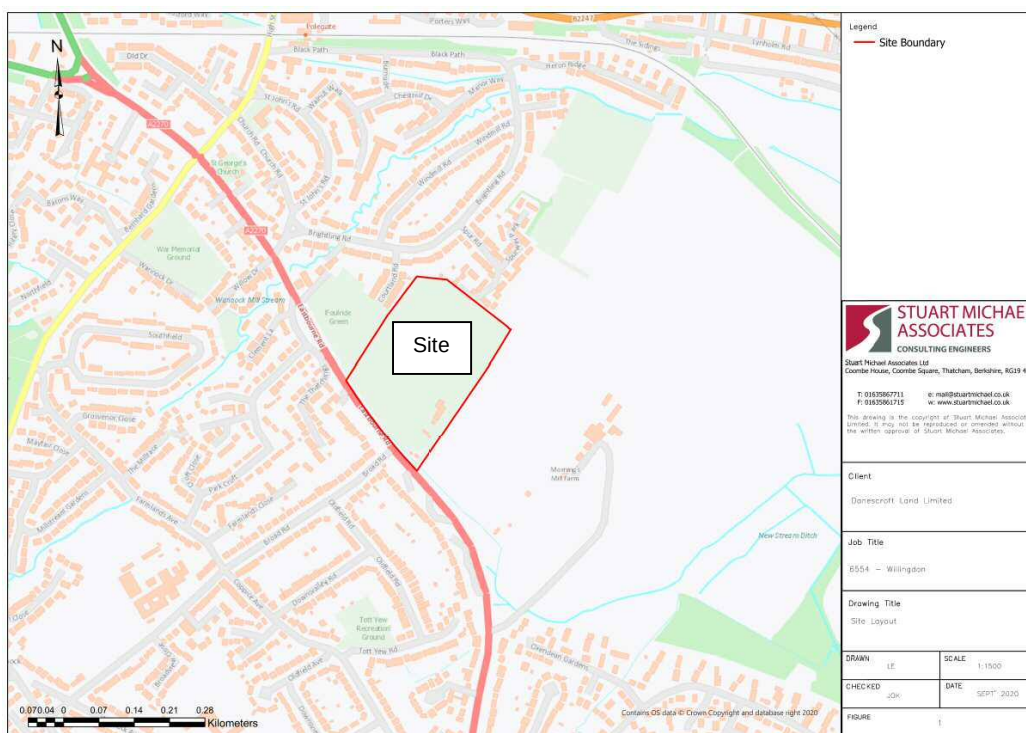


Figure 1.1: Site Location Plan

Site Description

- 1.3 The Site is located at East Bourne Road, Willingdon, BN26 5BE (Grid ref: 558459E , 104149N), approximately 1.6km north of central Willingdon. The site lies to the north east of the A2270 Eastbourne Road, between existing residential dwellings to the north and open agricultural land to the east. On the south west side of Eastbourne Road are existing residential dwellings.



- 1.4 WDC have not declared any Air Quality Management Areas (AQMA), therefore the proposed development site is not located within or close to an Air Quality Management Area AQMA. The site is located approximately 25 km from the Ashdown Forest SPA which is outside the assessment area, but considered in this assessment.

Assessment Methodology

- 1.5 The report addresses the effects of air pollutant emissions from road traffic using the adjacent roads and the way they impact the site and surrounding area. Also considered are the emissions associated with the construction of the proposed Development.
- 1.6 The report has been split into two parts; the first part assesses the impact of the development on surrounding sensitive receptors and the second part assesses the constraints on the development (i.e. how the existing environment will impact on the development).
- 1.7 Road traffic flows on the local highway network have been obtained from permanent automatic traffic counters (ATC) and from surveys undertaken by the Transport Consultants. Where necessary, the surveyed traffic flows have been growthed to the assessment years using TEMPRO and adjusted using NTM.
- 1.8 The dispersion modelling software ADMS Roads has been used to determine the concentrations of pollutants at the development site and assess the likely changes in the concentrations of pollutants. Background concentrations of pollutants have been obtained from the Department for Environment Food and Rural Affairs (DEFRA) website.
- 1.9 Construction dust impacts on local receptors have been assessed using the method detailed in the Institute of Air Quality Management (IAQM) publication *"Guidance on the assessment of dust from demolition and construction"* (2014)
- 1.10 The principles in the IAQM document Land Use Planning & Development Control: Planning for Air Quality January 2017 have been considered and followed where deemed appropriate.
- 1.11 In addition, Sussex-air guidance document, Air quality and emissions mitigation guidance for Sussex (2020), has been considered when recommending appropriate mitigation measures.



Report Outline

- 1.12 The report assesses the overall levels of oxides of nitrogen (NO_x), nitrogen dioxide (NO_2) and particulate matter with an aerodynamic diameter of less than 10 microns (PM_{10}) and 2.5 microns ($\text{PM}_{2.5}$) within the development site and at sensitive receptor locations. The impacts on the Ashdown Forest SPA have also been considered. The base year for the development is 2021 and the future year of assessment is 2030, which is the predicted year of opening. Verification has been undertaken for 2019.



2.0 LEGISLATION AND PLANNING POLICY CONTEXT

Introduction

- 2.1 Poor air quality is the largest environmental risk to public health. Over recent years, UK air quality has improved significantly as a result of concerted action. Total UK emissions of nitrogen oxides (NO_x) have fallen by 74% since 1970. There was a 5.4% reduction in 2018 when compared to 2017 emissions. Between 1990 and 2018 there was an annual reduction of 4.6% which demonstrates that there is a downward trend in NO_x emissions in the UK¹.
- 2.2 In the UK, emissions from road transport account for a substantial proportion of national air pollutant emissions. Road transport accounted for 25% of national carbon dioxide (CO₂) emissions in 2018 even though emissions fell by 3.1% between 2000 and 2018. Emissions from road transport of nitrogen dioxide (NO₂) and particulate matter smaller than 10µm in diameter (PM₁₀) also fell between 2000 and 2018². Total pollutant emissions from cars peaked in 1990/91 and declined to 2009. *“Average CO₂ emissions from cars registered for the first time were steadily falling since 2003, but began to rise from mid-2016 through to 2019. This increase was broadly due to a shift towards registering larger cars (which have higher emissions) and increases in emissions for popular petrol car models. The introduction of WLTP in September 2018 caused a marked increase in average CO₂ emissions. However, changes from September 2018 are not directly comparable with previous periods”*³.
- 2.3 Private car ownership has grown from 24.4 million in 2000 to 38.7 million at the end of 2019. Of the vehicles using the highway network, cars accounted for 82.4%, light goods vehicles (<3.5t) 10.7%, HGV's (>3.5t) 1.3%, motorcycles 3.2%, Bus's and Coaches 0.4%, and “other vehicles” 2.0% of all motor vehicle traffic at the end of 2019⁴. In 2016, 83% of newly registered vehicles fell into one of the lowest five Vehicle Excise Duty (VED) Bands (A to E, up to 140 hkm⁻¹) with 57% in Band C or lower and 15% in Band A. By the end of 2016, 47% of cars fall into Band E or lower. UK emissions of NO_x from road transport fell by over 19% between 2010 and 2015.

¹ DEFRA National Statistics Release: Emissions of air pollutants in the UK, 1970 to 2018 – Statistical Release: 24th September 2020

² Department for Transport Statistics: Road Traffic Estimates: Great Britain 2019 – Released 10th September 2020

³ Department for Transport (DfT), Vehicle licensing Statistics: Annual 2019 – Published 30th April 2020

⁴ DfT Statistics - Vehicle Licensing Statistics: Annual 2019



- 2.4 The percentage of different fuel type usage for private cars has significantly changed since the mid-1990s. At the end of 2017 there were 12.4 million diesel cars, accounting for 40% of the total, up from 11% in 1997. Alternative fuel vehicles which include gas, electricity, or a combination such as gas bi-fuel and hybrid electric were up to 492,000 at the end of 2017. Of the 492,000 vehicles, 95,879 were classed as Ultra-Low Emission Vehicles (ULEVs) where tailpipe emissions of CO₂ are less than 75 gkm⁻¹ or fully electric powered.
- 2.5 It should be noted that during 2019, 80,578 new ULEVs were registered for the first time, which is a 26% increase when compared with the previous year. This amounted to 2.7% of all new vehicle registrations in 2019, up from 2.1% in 2018⁵.
- 2.6 Most of this increase has been due to vehicles eligible for plug-in car and van grants. New registrations in 2018 included 47,422 cars and 1,248 LGVs of models that were eligible for these grants, which was 76% of all ULEVs registered for the first time.
- 2.7 It should be noted that due to changes in the plug-in car grant in October 2018 which removed all the previously eligible plug-in hybrids from the grant, only 41% of ULEVs were eligible for plug-in grants during the last quarter of 2018.

National Air Quality Strategy

- 2.8 In 1997 the United Kingdom National Air Quality Strategy (NAQS) was published and for the first time. The document set out an analysis of the magnitude and potential health and environmental problems associated with, amongst other things, air pollutant emissions resulting from road traffic.
- 2.9 It proposed a schedule of air quality objectives which were to be met in the years up to 2005. In setting these objectives, health and socio-economic cost-benefit factors were taken into account, together with consideration of the practical and pragmatic aspects of whether targets would be achievable. Whilst it was identified in the NAQS that the objectives for benzene, 1,3-butadiene, lead (Pb) and carbon monoxide (CO) could be achieved as a result of improvement measures already put in place, complying with targets for NO₂ and PM₁₀ would be more difficult.
- 2.10 Considering the additional measures that would have to be introduced to counter these apparent shortfalls, the Government voiced the following thought:

⁵ DfT Statistics - Vehicle Licensing Statistics: Annual 2019)
STUART MICHAEL ASSOCIATES



“Changes in planning and transport policies (are needed) which would reduce the need to travel and reliance on the car”. With regard to the necessity for encouraging a shift away from private car usage, the Strategy commented, in terms of the new package approach to transport funding:

As a general rule, traffic demand management and restraint measures should be included and this, together with proposals to promote and enhance other modes of transport, should aim to achieve modal shifts away from the private car.”

- 2.11 The Environment Act 1995 sections 82-84 requires that Local Authorities shall carry out reviews of air quality within their administrative areas and, where it is assessed that the air quality objectives may not be complied with in the future, an Air Quality Management Area (AQMA) must be declared. The Local Authority must then formulate an Action Plan, setting out the measures that will be employed to achieve compliance with the objectives.
- 2.12 A review of the UK Air Quality Strategy was undertaken in 1998 and a consultation document was published in January 1999 which outlined proposals for amending the Strategy. In August 1999, in response to the consultation, the Government then published a draft Air Quality Strategy for England, Scotland, Wales and Northern Ireland. The Air Quality Regulations (England) 2000 were enacted in April 2000, and the Air Quality (England) (Amendment) Regulations 2002 gives legal force to the air quality standards set out in the Strategy. A new strategy was released in July 2007 with various amendments to the air quality objectives. The proposals, in brief, consisted of recommendations to adopt the provisions of the EU Air Quality Daughter Directives. The National Air Quality Objectives (NAQO's) included in the Regulations are set out in Appendix 2.
- 2.13 Given the significant influence that motor vehicle exhausts exert on air quality in the UK and the apparent links between elevated levels of certain air pollutants and premature mortality, it is clear that current and emerging Government policy is geared towards several essential objectives, which are:

continued action to reduce pollutant emissions from vehicles across the EU, which can be exemplified by the plethora of Directives concerning limitation of motor vehicle emissions since the 1970's and specific targeted initiatives such as the Auto-Oil Study programme;



concerted action at a National level to reduce private car trips in urban and inter-urban uses and encourage use of alternative forms of transportation;
action at a local level to manage transportation and air quality in order to reduce the number of car trips in urban areas specifically and to aim for compliance with the NAQS by the appointed dates;
and
to ensure that Local Authorities in the execution of their development control responsibilities take account of the consequent air quality impacts.

- 2.14 It is evident that continued growth in private car ownership and usage will result in further deterioration of air quality in urban areas and increasing emissions of greenhouse gases. Whilst current technological improvements will extend the reduction in emissions, additional measures will be required in order to prevent re-growth of emissions, both to meet ambient air quality targets in urban areas and to offer an alternative to the car for urban journeys. Consequently, where new development can be located in relatively close proximity to public transport and local services, a contribution to the UK's target of reducing emissions will have been made.
- 2.15 Levels of lead (Pb) and sulphur dioxide (SO₂) are also controlled by the NAQO. Lead levels have reduced significantly since its reduced use as a fuel additive, and the abolition of four-star petrol in January 2000 means that the amount of Pb in petrol is reduced to a negligible level. SO₂ is predominantly associated with emissions from industrial processes and when assessing the effects of traffic, neither SO₂ nor Pb need be assessed.

Regional Planning Policy

Air Quality and Emissions Mitigation Guidance for Sussex (2020)

- 2.16 Wealden District Council is a member of the Sussex Air Quality Partnership (Sussex-air). Following the changes in national planning policy and the introduction of NPPF, Sussex-air produced guidance for Sussex Authorities on air quality and emission mitigation guidance. *"Air quality is a material consideration in deciding a planning application. The purpose of this document is to:*
- 1) provide clarity to how authorities intend interpreting relevant Local Plan policies.



2) provide advice for developers and their consultants on how to assess and mitigate the impact that new developments may have on local air quality.

3) detail a consistent approach by developers and Local Planning Authorities (LPAs) to:

address impacts on local air quality

ensure optimum scheme design to reduce emissions and/or exposure and

avoid unnecessary delays in the planning process."

Local Council Policy

Wealden District Council Core Strategy

- 2.17 Wealden District Council's (WDC) current statutory development plan consist of the adopted Wealden District Core Strategy Local Plan (February, 2013), the 'saved' policies of the adopted Wealden Local Plan (1998) and the Affordable Housing Delivery Local Plan (May, 2016). At the time of writing this report, the Council is preparing a new local plan for the Wealden District and is in the first stage of the consultation process.

Wealden Local Plan (1998) 'saved' Policy EN1

- 2.18 "EN1 The Council will pursue sustainable development, having regard to the principles contained in Government guidance and its own Strategy for the Environment, in considering the location, layout and design of development, renewable energy and waste management proposals and in assessing the effects of proposals on the environment, including on water and air quality."



3.0 METHODOLOGY AND ASSESSMENT CRITERIA

Assessment of the Prevailing Air Quality

- 3.1 This section summarises the methodology used to consider whether there are “Significant” air pollution impacts on sensitive receptors or constraints on development. In order to determine the extent to which air quality issues will affect the sensitive receptors, the study has considered the following:

Any air quality measurements carried out in Wealden District (which are in the public domain);

The Review and Assessment of air quality carried out by WDC for the area, as submitted to the Department for the Environment, Food and Rural Affairs (DEFRA);

Predictions of air pollutant concentrations adjacent to the site utilising the ADMS Roads dispersion modelling program;

Assessment Criteria

- 3.2 The NAQO levels are derived from air quality standards set to protect health. The objectives address social and economic factors as well as the health standards.
- 3.3 For the purposes of this development proposal, the NAQO will form the basis of the air quality assessment. The NAQO levels are based on an assessment of the effects of each pollutant on public health. Therefore, they are a good indicator in assessing whether the air quality in the vicinity of a road is likely to be detrimental to human health.
- 3.4 The effects of dust generation from construction have been undertaken following the methodology presented in the Institute of Air Quality Management (IAQM) publication “Guidance on the assessment of dust from demolition and construction” (2014).
- 3.5 In determining whether air pollutant levels may constrain development, the results of the study have been compared against the acceptability criteria.

Impact Magnitude and Impact Descriptors (Significance) – Air Quality Assessments

Construction Phase

- 3.6 During the construction phase, there will be a number of activities undertaken that have the potential to generate and/or re-suspend dust and PM₁₀. At the time of assessment, the exact activities to be undertaken during construction



are unknown. However, in order to evaluate the magnitude and extent of potential adverse impacts likely to result from the proposed development, the following construction activities have been assumed:

- storage of materials;
- laying of hard surfaces;
- construction of buildings; and
- vehicle movements to and from the Site.

3.7 The magnitude of the potential impacts of a construction site on air quality is mainly determined by its size, the range of activities undertaken across the site, proximity to sensitive receptors, complexity of terrain and any barriers between sources and receptors.

3.8 A qualitative assessment of the potential impacts during construction has been undertaken using information in guidance documents produced by IAQM.

3.9 According to this guidance; a human receptor refers to any location where a person may experience the annoyance effects of airborne dust or dust soiling or exposure to PM₁₀ over a time period relevant to the air quality objectives. In terms of annoyance effects, this will most commonly relate to residential dwellings and schools.

3.10 Activities on construction sites can be divided into four types to reflect their different potential impacts, with the potential for dust emissions to be assessed only for each activity taking place:

- Site Preparation;
- Earthworks;
- Construction; and
- Trackout.

3.11 The assessment methodology considers three separate dust effects:

- annoyance due to soiling;
- harm to ecological receptors; and
- the risk of health effects due to a significant increase in exposure to PM₁₀.

3.12 Account is also to be taken of the distance of the receptors that may experience these effects. The assessment procedure assumes no mitigation measures are applied except those required by legislation.



- 3.13 The potential dust emission magnitude for the proposed Development Site is determined for the four construction activities using the criteria presented in IAQM guidelines. The magnitude is based on the scale of the anticipated works and classified as “Small”, “Medium” or “Large”.
- 3.14 The “Sensitivity of an Area” to dust soiling effects on people and property is determined by using the criteria presented in **Table 3.1**. The “Sensitivity of an Area” to human health impacts is presented in **Table 3.2**. The “Sensitivity of an Area” and to ecological impacts is presented in **Table 3.3**.

Table 3.1: Sensitivity of the area to dust soiling effects on people and property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low



Table 3.2: Sensitivity of the area to human health impacts

Receptor Sensitivity	Annual Mean PM ₁₀ conc.	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 μgm^{-3} (>18 μgm^{-3} in Scotland)	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 μgm^{-3} (16-18 μgm^{-3} in Scotland)	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 μgm^{-3} (14-16 μgm^{-3} in Scotland)	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 μgm^{-3} (<14 μgm^{-3} in Scotland)	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 μgm^{-3} (>18 μgm^{-3} in Scotland)	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 μgm^{-3} (16-18 μgm^{-3} in Scotland)	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 μgm^{-3} (14-16 μgm^{-3} in Scotland)	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 μgm^{-3} (<14 μgm^{-3} in Scotland)	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>=1	Low	Low	Low	Low	Low

Table 3.3: Sensitivity of the area to ecological impacts

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

3.15 Once the potential dust emissions magnitude and the sensitivity of the area have been determined the results can be combined to define the risks of impact using the criteria in the following tables.



Table 3.4: Risk of Dust Impacts – Demolition

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

Table 3.5: Risk of Dust Impacts – Earthworks and Construction

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

Table 3.6: Risk of Dust Impacts – Trackout

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

- 3.16 The proposed development's site-specific results and significance of these tables are discussed in Section 5 of this Report.

Operational Phase

- 3.17 The impact of local traffic growth, development generated traffic and other potential sources of air pollution have been assessed for the magnitude of change and for the extent to which change in air quality from existing to future levels would be significant.
- 3.18 Descriptors for the magnitude of change in annual mean concentrations of NO₂ and PM₁₀ and the number of days with PM₁₀ concentrations greater than 50 µg m⁻³ are presented in **Table 3.7**.

Table 3.7: Descriptors for the magnitude in changes in annual mean concentrations of NO₂ and PM₁₀ and the number of days with PM₁₀ concentrations greater than 50 µg m⁻³

Magnitude of Change	Annual Mean NO₂/PM₁₀	Days PM₁₀ >50 µg m⁻³
Large	Increase/decrease >4 µg m ⁻³	Increase/decrease >4 days
Medium	Increase/decrease 2 - 4 µg m ⁻³	Increase/decrease 2 - 4 days
Small	Increase/decrease 0.4 - 2 µg m ⁻³	Increase/decrease 1 - 2 days
Imperceptible	Increase/decrease <0.4 µg m ⁻³	Increase/decrease <1 day



3.19 Following on from the determination of the magnitudes of the impact of change of NO₂ and PM₁₀ levels, the assessment of the significance of the impact with reference to the NAQO Levels can be undertaken. Descriptors of the changes to annual mean concentrations of NO₂ and PM₁₀ and the number of days with PM₁₀ concentrations greater than 50 µgm⁻³ are presented in **Table 3.8**.

Table 3.8: Impact descriptors for changes to annual mean concentrations of NO₂ and PM₁₀ and the number of days with PM₁₀ concentrations greater than 50 µgm⁻³

<i>Absolute Concentration in Relation to Objective/Limit Value</i>	Change in Concentration /Number of Days		
	<i>Small</i>	<i>Medium</i>	<i>Large</i>
Increase with Scheme			
Above Objective/Limit Value with Scheme (>40 µgm ⁻³ / >35 days)	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective/Limit Value with Scheme (36-40 µgm ⁻³ / >32-35 days)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value with Scheme (30-36 µgm ⁻³ / >26-32 days)	Negligible	Slight Adverse	Slight Adverse
Well Below Objective/Limit Value with Scheme (<30 µgm ⁻³ / <26 days)	Negligible	Negligible	Slight Adverse
Decrease with Scheme			
Above Objective/Limit Value Without Scheme (>40 µgm ⁻³ / >35 days)	Slight Beneficial	Moderate Beneficial	Substantial Beneficial
Just Below Objective/Limit Value Without Scheme (36-40 µgm ⁻³ / >32-35 days)	Slight Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value Without Scheme (30-36 µgm ⁻³ / >26-32 days)	Negligible	Slight Beneficial	Slight Beneficial
Well Below Objective/Limit Value Without Scheme (<30 µgm ⁻³ / <26 days)	Negligible	Negligible	Slight Beneficial
Note – an “Imperceptible” change would be described as “Negligible”			

3.20 Detailed in Table 3.7 and Table 3.8 are the magnitude and “Significance” of changes in NO₂ and PM₁₀ levels. The tables have been extracted from the Environmental Protection UK (formerly National Society for Clean Air (NSCA)) publication “*Development Control: Planning for Air Quality (2010 Update)* – *Table 5 and Appendix 3*”.



Traffic Data

Road Traffic

- 3.21 The future concentrations of NO_x, NO₂ and PM₁₀ at the locations of WDC diffusion tube W5 and a selection of local sensitive receptors have been predicted using the ADMS Roads dispersion model based on forecast traffic flows for the local road network.
- 3.22 Two “Base” (Do Nothing) and one “Future” (Do Something) scenarios have been assessed along with a 2019 scenario for the verification of the model. The base scenarios are 2021 and 2030 and the future scenario is 2030 + Development.
- 3.23 Road traffic data and development generated traffic has been provided by the transport consultants and from the DfT website.
- 3.24 Where 24hr AADT flows were not available, existing traffic proportions on the highway network have been used to growth the available traffic data.
- 3.25 The “Base” scenario vehicle flows on the local highway network used in the assessment are detailed in **Table 3.9**.

Table 3.9: AADT Traffic flow data (no development generated traffic) 2021

Link Ref.	Description	LGV + Cars	HGV + Buses
1	A2270 Eastbourne Road	19677	541
2	Wannock Road	7190	159
3	High Street	6332	194
4	A2270 Eastbourne Road (S of A27)	23486	553
5	A27 at A2270 junction	21781	763
6	A27 Lewis Road	25840	744
7	A27	28938	992

- 3.26 The local highway network has been modelled as distinctive links where vehicle speeds change, width of roads change and at junctions. Also included are changes in vehicle speed due to pedestrian crossings and traffic lights.

Background Concentrations of Air Pollutants

- 3.27 Background concentrations of air pollutants for the dispersion modelling were obtained from the UK National Air Quality Information Archive (DEFRA website), in accordance with Local Air Quality Management Technical Guidance



TG(16). Data sets for 2017- based background maps for years 2017- 2030 have been published by DEFRA. Identified in **Table 3.10** are the background concentrations of NO_x , NO_2 , PM_{10} and $\text{PM}_{2.5}$ for the years 2021 and 2030.

Table 3.10: Background pollutant concentrations for 2021 and 2030

Grid Reference		2021				2030			
<i>Easting</i>	<i>Northing</i>	<i>NO_x</i>	<i>NO_2</i>	<i>PM_{10}</i>	<i>$\text{PM}_{2.5}$</i>	<i>NO_x</i>	<i>NO_2</i>	<i>PM_{10}</i>	<i>$\text{PM}_{2.5}$</i>
558500	104500	11.29	8.72	13.62	9.38	8.59	6.73	13.05	8.93



4.0 BASELINE CONDITIONS

Air Quality Review and Assessment

- 4.1 As previously indicated, Local Authorities have been required to carry out a review of local air quality within their boundaries to assess areas that may fail to comply with the NAQO. In areas where these objectives are unlikely to be achieved, local authorities must designate these areas as Air Quality Management Areas (AQMA's) and prepare a written Action Plan to achieve the NAQO.
- 4.2 The review of air quality takes on several prescribed stages, of which each stage is reported. The review and assessment of air quality is the responsibility of Wealden District Council (WDC).
- 4.3 WDC have no AQMAs within their administrative boundary. Therefore, the development site is not located in an AQMA.

Air Quality Monitoring

- 4.4 WDC undertakes passive monitoring of NO₂ at a number of sites within its administrative boundary and works with the neighbouring borough of Eastbourne (EBC) to monitor PM₁₀, PM_{2.5} and O₃. Detailed below are the results of the passive monitoring of NO₂ and the continuous monitoring results of NO₂, PM₁₀, PM_{2.5} and O₃ from EBC up to the end of 2019.

Passive Monitoring - Diffusion Tubes

- 4.5 WDC operates a network of non-automatic (passive) monitoring sites within its administrative boundary and at the end of 2019 there were 10 active sites monitoring NO₂ via diffusion tube (DT). Refer to **Figure 4.1** for the locations of the diffusion tubes within WDC.



Figure 4.1: Non-Automatic (DT) Monitoring Sites within Wealden DC and the Continuous Monitor (CM) in Eastbourne BC



- 4.6 The DT locations within WDC administrative area are a mixture of “Kerbside”, “Roadside”, “Background” and “Urban Background” concentrations. The closest DT to the development site is W5 locate adjacent to Eastbourne Road, Polegate and records “Roadside” concentrations.
- 4.7 Presented in **Table 4.1** are recorded concentrations of NO₂ available for 2015 to 2019 and where concentrations are at or above the NAQO level the cells have been shaded light grey.

Table 4.1: Measured Annual Mean NO₂ Concentrations (µg/m³) – DT

Site ID	Location	Within AQMA?	Annual mean concentrations (µg/m ³)				
			2015	2016	2017	2018	2019
W5	Eastbourne Road, Polegate	No	30	29.3	30	32.6	27.4

- 4.8 From Table 4.1 it can be seen that annual mean concentrations of NO₂ at W5 were below the NAQO level of 40 µg/m³ up to the end of 2019.
- 4.9 Presented in **Figure 4.2** is the annual trend in NO₂ concentrations since 2015 at W5 Eastbourne Road, Polegate (Roadside).

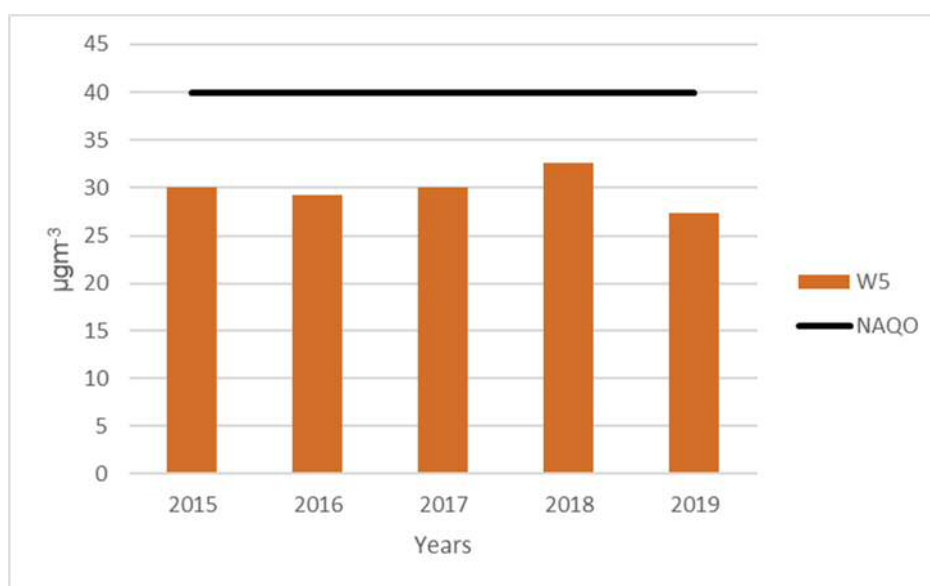


Figure 4.2: Annual Trends in NO₂ Concentrations Since 2015 at the Non-Automatic (Passive) Monitoring Site W5 Eastbourne Road, Polegate (Roadside)

- 4.10 From Figure 4.2 it can be seen that concentrations of NO₂ at W5 have been below the NAQO level of 40 µg/m³ for the past five years. It can also be seen that there is a slight downward trend in concentrations.



Continuous Monitoring

- 4.11 Eastbourne BC undertook continuous monitoring of NO₂, PM₁₀ and O₃ at one site (Site ID: EB1 – Devonshire Park, Eastbourne) and NO₂, PM₁₀ and PM_{2.5} at a second site (Site ID: EB3 – Holly Place AURN) within their administrative boundary. EB1 incorporates a chemiluminescent type monitor recording NO₂, an FDMS recording PM₁₀ and UV absorption recording O₃ and is located in an “Urban Background” setting. EB2 incorporates a chemiluminescent type monitor recording NO₂ and two TEOM FDMS recording PM₁₀ and PM_{2.5} respectively and is located in an “Urban Background” setting. Refer to Figure 4.1 for the location of the automatic monitoring sites in EBC.
- 4.12 Presented in **Table 4.2** are recorded concentrations of NO₂ and PM₁₀ available for 2015 to 2019 at EB1 and where concentrations are at or above the NAQO level the cells have been shaded light grey.

Table 4.2: Measured Annual Mean NO₂ Concentrations (µg/m³) – EB1

Site ID	Location	Within AQMA?	Annual mean concentrations (µg/m ³)				
			2015	2016	2017	2018	2019
			NO ₂				
EB1	Eastbourne – Devonshire Park	NO	-	-	16.1	14.5	15
			PM ₁₀				
EB1	Eastbourne – Devonshire Park	NO	-	-	18.9	18.5	17.2

- 4.13 From Table 4.2 it can be seen that annual mean concentrations of NO₂ and PM₁₀ were well below the NAQO level of 40 µg/m³.
- 4.14 Presented in **Table 4.3** are recorded concentrations of NO₂ and PM₁₀ available for 2015 to 2019 at EB3 and where concentrations are at or above the NAQO level the cells have been shaded light grey.



Table 4.3: Measured Annual Mean NO₂ Concentrations (µg/m³) – EB3

Site ID	Location	Within AQMA?	Annual mean concentrations (µg/m ³)				
			2015	2016	2017	2018	2019
			NO ₂				
EB3	Holly Place AURN	NO	10.6	12	12.3	10.7	10.8
			PM ₁₀				
EB3	Holly Place AURN	NO	18.1	18	-	-	15.5
			PM _{2.5}				
EB3	Holly Place AURN	NO	10.4	12.7	11.3	12.7	10.5

- 4.15 From Table 4.3 it can be seen that annual mean concentrations of NO₂ and PM₁₀ were well below the NAQO level of 40 µg/m³ and annual mean concentrations of PM_{2.5} were below the NAQO level of 25 µg/m³.
- 4.16 Presented in **Figure 4.3** are the annual trends in NO₂ concentrations since 2000 at the Lullington Heath (LL1) and Holly Place (EB3) AURNs and at Devonshire Park, Eastbourne (EB1).

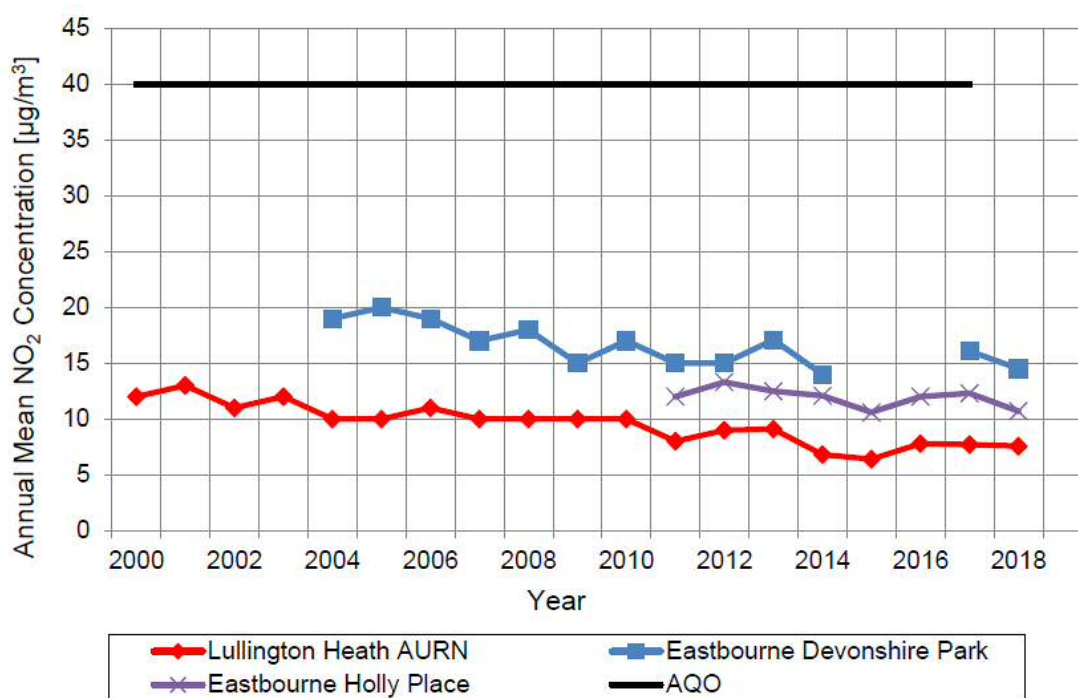


Figure 4.3: Annual Trends in NO₂ Concentrations Since 2000 in Eastbourne BC and Lullington Heath

- 4.17 Presented in **Figure 4.4** are the annual trends in PM₁₀ concentrations since 2000 at Holly Place AURN (EB3) and at Devonshire Park, Eastbourne (EB1).

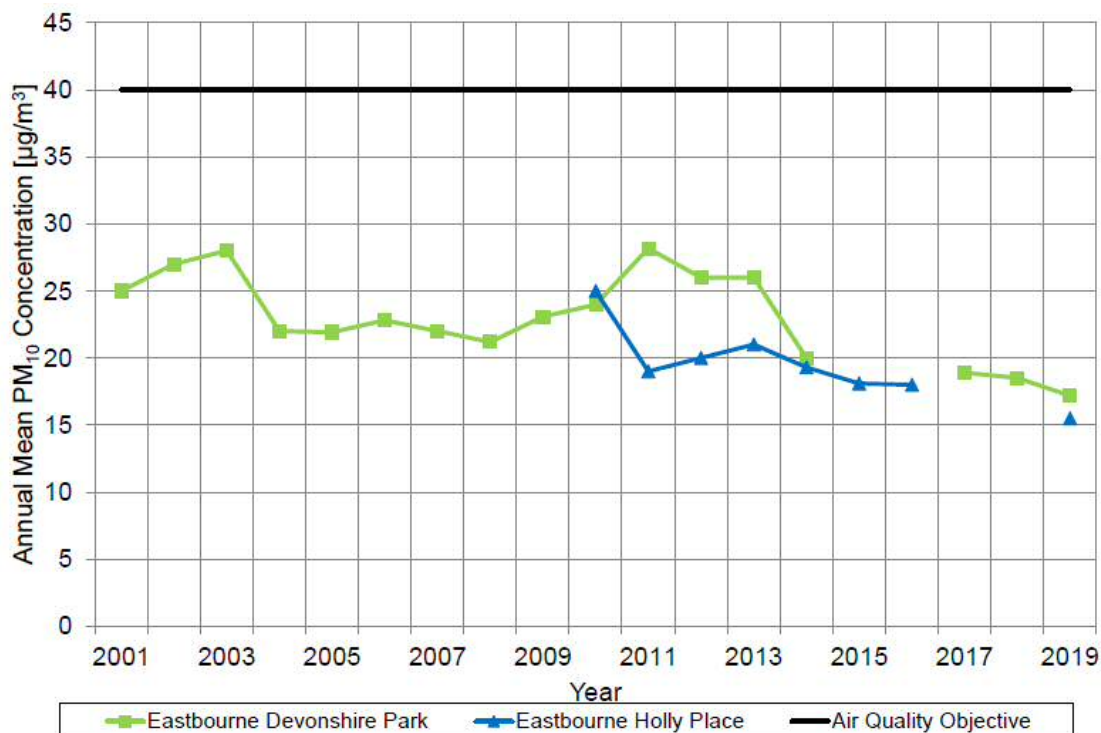


Figure 4.4: Annual Trends in PM₁₀ Concentrations Since 2000 in Eastbourne BC and Lullington Heath

4.18 Presented in **Figure 4.5** are the annual trends in PM_{2.5} concentrations since 2000 at Holly Place AURN (EB3).

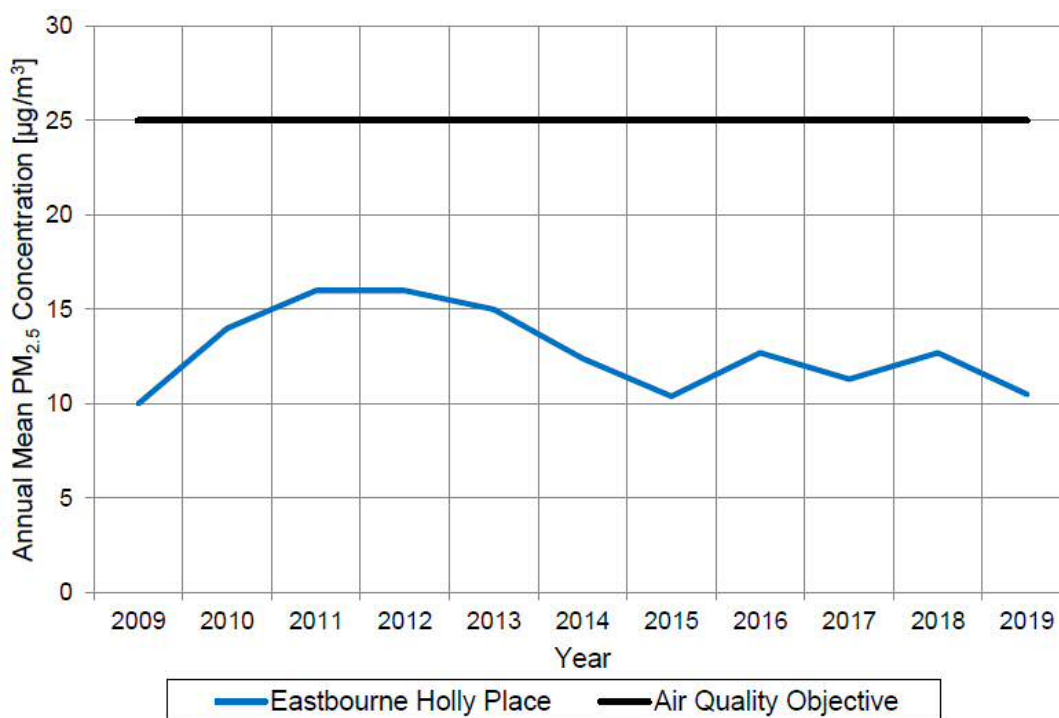


Figure 4.5: Annual Trends in PM₁₀ Concentrations Since 2000 in Eastbourne BC



4.19 From Figures 4.3 and 4.4 it can be seen that there is an overall downward trend in concentrations of NO₂ and PM₁₀ over the past ten years. From Figure 4.5 it can be seen that over the past ten years there has been no downward or upward trend in concentrations of PM_{2.5}.

4.20 Wealden's 2020 ASR concluded that:

4.21 *"This Annual Status Report confirms that concentrations within Wealden continue to be well within the NO₂ annual mean air quality objective at relevant locations. No significant changes in emissions sources within the Council's area have been identified in the last year."*

Dispersion Modelling – ADMS Roads

4.22 The existing and future concentrations of pollutants within the assessment area for all scenarios have been modelled using ADMS Roads. The software is PC based and models the release of pollutants from road sources into the atmosphere.

4.23 Meteorological data for 2019 was obtained from ADM Ltd. The most representative observation station for the development site is Herstmonceux. The MET data has been used for the verification of the model, base modelling and future years and a wind rose for Herstmonceux is presented in **Appendix 3**.

4.24 Background pollutant concentrations for the kilometre squares covering the assessment area were obtained from the Defra website and the concentrations for 2019 (Verification), 2021 and 2030.

Model Verification

4.25 Model verification has been undertaken using the guidance provided in LAQM.TG (16). The process requires the comparison of the monitored roadside contribution of NO₂ with the modelled roadside contribution of NO₂. The site type definitions have been taken from WDC's 2020 ASR.

4.26 Within the assessment area there is one diffusion tube (refer to previous paragraphs). ADMS Roads has been used to calculate NO_x and NO₂ concentrations for 2019 which have been verified against the recorded NO₂ and NO_x levels at W5 for 2019. The results from the monitoring and the ADMS Roads modelling are presented in **Table 4.4**.



Table 4.4: Comparison of the monitored (DT) and unadjusted modelled (ADMS) concentrations of NO₂

Site ID	Monitor Type	Site Type	Site Description	Background NO ₂	2019 Monitored NO ₂	2019 Modelled NO ₂	Difference [(monitored - modelled)/monitored] x100 (%)
W5	DT	R	Eastbourne Road, Polegate	11.5	27.4	16.7	-39.1
Notes: CM = Continuous Monitor, R = Roadside, K = Kerbside							

- 4.27 From Table 4.4 it can be seen that the model is significantly under predicting concentrations by 39.1%.
- 4.28 Within TG(16) there is guidance on how to apply an adjustment factor to the road contribution NO_x to reduce the inaccuracy of the results from the modelling. Using the TG(16) 'Box 7.15' method, the modelled road contribution NO_x is not predicting an accurate contribution of NO_x to the overall contribution. Therefore, a correction factor will need to be applied to the modelled road contribution NO_x to bring it to within comparable levels with the monitored data.
- 4.29 A Road-NO_x adjustment factor of 1.2922 was determined as the slope of the best fit between the 'measured' road contribution and 'modelled' road contribution NO_x, forced through zero.
- 4.30 Presented in **Table 4.5** is the comparison of the monitored NO₂ concentrations and the adjusted ADMS Roads modelled NO₂ concentrations.



Table 4.5: Comparison of the monitored (CMS and DT) and the adjusted modelled (ADMS Roads) concentrations of NO₂

Site ID	Monitor Type	Site Type	Site Description	Background NO ₂	2019 Monitored NO ₂	2019 Adjusted Modelled NO ₂	Difference [(monitored - modelled)/monitored] x100 (%)
W5	DT	R	Eastbourne Road, Polegate	11.5	27.4	29.95	9.3
Notes: DT = Diffusion Tube, R = Roadside, K = Kerbside							

Pollutant Concentrations

- 4.31 To characterise the air pollutant concentrations adjacent to the roads that would be affected by the proposed development traffic, predictions have been made at W5 and five sensitive receptors adjacent to the site.
- 4.32 The first receptor is opposite the Proposed Development site access at Oak Lodge and Hill View care home (R1).
- 4.33 The second receptor is adjacent to the junction of Eastbourne Road, Wannock Road and High Street, at 273 Eastbourne Road (R2).
- 4.34 The third receptor is adjacent to the junction of Eastbourne Road and the A27 at Southdown Court, Old Drive (R3).
- 4.35 The fourth receptor is south of the Proposed Development site access at 88 Eastbourne Road (R4).
- 4.36 The fifth receptor is adjacent to High Street at 2 Church Road (R5).
- 4.37 Refer to **Figure 4.6** for the sensitive receptors adjacent to the site access and the roads which will be impacted by development generated traffic.



STUART MICHAEL ASSOCIATES



5.0 AIR QUALITY ASSESSMENT

- 5.1 The assessment has been split into two parts, the potential “Impacts” of development generated traffic and construction activities and the “Constraints” on the development.
- 5.2 The “Impact” section of the assessment assesses whether development generated traffic flows on the highway network are likely to result in a significant change in annual mean concentration of NO₂ and PM₁₀ at sensitive off-site receptors. Also assessed are the potential dust impacts and PM₁₀ changes on sensitive receptors.
- 5.3 The “Constraints” part of the assessment compares the predicted concentration of NO₂ and PM₁₀ within the development site against NAQO levels and assesses whether predicted levels within the site are above the objective levels.

Impacts

Dust Assessment: Predicted Construction Impacts

- 5.4 The main sources of dust and PM₁₀ during construction activities are:
- Haulage routes, vehicles and construction traffic;
 - Materials handling, storage, stockpiling, potential spillage and disposal;
 - Exhaust emissions from site plant;
 - Site preparation;
 - Construction and fabrication processes; and
 - Internal and external finishing and refurbishment.
- 5.5 The majority of the releases are likely to occur during the typical “working-week”. The construction impact assessment has been split into two sections. The first deals with the potential impacts from dust soiling and changes in PM₁₀ concentrations due to on-site works and the second deals with the effect of emissions from construction traffic.

Dust soiling and changes in PM₁₀ concentrations

- 5.6 The site will require earthworks, construction and trackout of vehicles associated with all phases of the Site. The resulting dust emission magnitudes are:



Demolition – **Small**: (Total building volume <20,000 m³, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months;

Earthworks – **Large** (Total site area >10,000 m², moderately dusty soil type, 5-10 heavy earth moving vehicles active at any one-time, total material moved greater than 100,000 tonnes);

Construction – **Medium** (Total building volume 25,000 m³ - 100,000 m³, potentially dusty construction material (e.g. concrete), on site concrete batching);

Trackout – **Medium** (10-50 HGV outward movements in any one day, moderately dusty surface material).

- 5.7 Using the information presented in Section 3 and the criteria presented in Table 3.1, Table 3.2 and Table 3.3, the sensitivity of the construction for the proposed development can be defined. The results of defining the sensitivity of the area are presented in **Table 5.1**.

Table 5.1: Outcome of Defining the Sensitivity of an Area

Potential Impact	Sensitivity of the Surrounding Area			
	<i>Demolition</i>	<i>Earthworks</i>	<i>Construction</i>	<i>Trackout</i>
<i>Dust Soiling</i>	Medium	Medium	Low	Low
<i>Human Health</i>	Low	Low	Low	Low
<i>Ecological</i>	Negligible	Negligible	Negligible	Negligible

- 5.8 From Table 5.1 it can be seen that the predicted sensitivity of the surrounding area to dust soiling is “Medium” during the demolition and earthworks phases and “Low” during the construction phase and during trackout. The sensitivity of the surrounding area to changes in PM₁₀ affecting human health is “Low” during the demolition, construction and earthworks phase and during trackout. As there are no ecological receptors within 50m of the development, the predicted sensitivity impact is “Negligible”.

- 5.9 The dust emission magnitude determined in paragraph 5.6 is combined with the sensitivity of the area summarised in Table 5.1 to determine the risk of impacts with no mitigation applied. The risk of impacts is summarised in **Table 5.2**.



Table 5.2: Summary Dust Risk Table to Define Site-Specific Mitigation

Potential Impact	Risk			
	<i>Demolition</i>	<i>Earthworks</i>	<i>Construction</i>	<i>Trackout</i>
<i>Dust Soiling</i>	Low	Medium	Low	Low
<i>Human Health</i>	Negligible	Low	Low	Low
<i>Ecological</i>	Negligible	Negligible	Negligible	Negligible

- 5.10 During the Demolition phase, there is a 'Low' risk of annoyance caused by dust soiling and a 'Negligible' risk to health effects and ecological impacts due to an increase exposure in PM₁₀.
- 5.11 During the Earthworks phase, there is a 'Medium' risk of annoyance caused by dust soiling, a 'Low' risk to health effects and 'Negligible' ecological impacts due to an increase exposure in PM₁₀. Therefore, mitigation may be required.
- 5.12 During the Construction phase and Trackout, there is a 'Low' risk of annoyance caused by dust soiling and health effects and 'Negligible' ecological impacts due to an increase exposure in PM₁₀.
- 5.13 For those cases where the risk category is Negligible (i.e. ecological), no specific mitigation measures is required beyond specific legislation.

Predicted Operational Impacts

- 5.14 The air quality impact of the proposed development on the surrounding area has been assessed by considering the changes in traffic flows which will occur on the existing highway network with the development in place.
- 5.15 Potential impacts from the proposed development would occur following the opening of the proposed development in 2030. Therefore, the year of assessment is 2030 "Do Nothing" and "Do Something".

Traffic Generation – 2030 with development

- 5.16 Development generated road traffic data for 2030 on the local highway network has been provided by the Transport Consultants. Development generated traffic has then been added to the 2030 traffic flows and a summary is presented in **Table 5.3**.



Table 5.3: Changes in traffic flow “with” and “without” the development in 2030

Link Ref.	Description	2030 AADT			
		“do nothing”	“do something”	Change	% Change
1	A2270 Eastbourne Road	24739	25756	1017	4.1
2	Wannock Road	7449	7449	0	0.0
3	High Street	6614	6614	0	0.0
4	A2270 Eastbourne Road (S of A27)	27949	28795	847	3.0
5	A27 at A2270 junction	25341	25914	573	2.3
6	A27 Lewis Road	29341	29873	533	1.8
7	A27	33022	33621	599	1.8

5.17 From Table 5.3 it can be seen that road traffic flows are predicted to change by 4.1% or less due to development generated traffic.

ADMS Roads Assessment – 2030 with development

5.18 Sensitive receptors adjacent to the development site and where there is predicted to be an impact from the development have been assessed for the two scenarios, “do nothing” and “do something”. The results from the assessment are presented in **Table 5.4** and **Table 5.5**.



**Table 5.4: Predicted air quality concentrations at sensitive receptors in 2030
“Do Nothing”**

Receptor Number and Name		NO _x	NO ₂	PM ₁₀		PM _{2.5}
		Annual mean µgm ⁻³	Annual mean µgm ⁻³	Annual mean µgm ⁻³	Days >50 µgm ⁻³	Annual mean µgm ⁻³
R1	Oak Lodge & Hill View Care Home	18.74	12.91	16.18	0.37	11.47
R2	273 Eastbourne Road	21.44	14.34	16.52	0.51	11.67
R3	Southdown Court, Old Drive	21.75	14.51	16.75	0.61	11.79
R4	88 Eastbourne Road	19.22	13.17	16.32	0.42	11.55
R5	2 Church Road	19.31	13.22	16.20	0.38	11.49
W5	W5	29.67	18.58	17.44	1.01	12.20
NAQO			40	40	35	25

**Table 5.5: Predicted air quality concentrations at sensitive receptors in 2030
“Do Something”**

Receptor Number and Name		NO _x	NO ₂	PM ₁₀		PM _{2.5}
		Annual mean µgm ⁻³	Annual mean µgm ⁻³	Annual mean µgm ⁻³	Days >50 µgm ⁻³	Annual mean µgm ⁻³
R1	Oak Lodge & Hill View Care Home	18.83	12.96	16.20	0.38	11.49
R2	273 Eastbourne Road	21.60	14.42	16.55	0.52	11.69
R3	Southdown Court, Old Drive	21.89	14.58	16.78	0.63	11.81
R4	88 Eastbourne Road	19.34	13.23	16.35	0.44	11.57
R5	2 Church Road	19.35	13.24	16.21	0.39	11.49
W5	W5	30.11	18.81	17.51	1.05	12.24
NAQO		40	40	35	25	40

5.19 Presented in **Table 5.6** are the predicted change in concentrations of NO₂ and PM₁₀ and the change in the number of days where concentrations of PM₁₀ are greater than 50 µgm⁻³.



Table 5.6: Predicted change in air quality concentrations at sensitive receptors in 2030 “Do Something”

Receptor Number and Name		NO ₂	PM ₁₀	
		Change in annual mean μgm^{-3}	Change in annual mean μgm^{-3}	Change in days >50 μgm^{-3} (%)
R1	Oak Lodge & Hill View Care Home	0.05	0.02	0.01
R2	273 Eastbourne Road	0.08	0.03	0.01
R3	Southdown Court, Old Drive	0.07	0.03	0.02
R4	88 Eastbourne Road	0.06	0.03	0.01
R5	2 Church Road	0.02	0.01	0.00
W5	W5	0.23	0.07	0.05

5.20 From Table 5.6 it can be seen that predicted changes in NO₂ concentration are 0.23 μgm^{-3} or less and 0.07 μgm^{-3} or less in concentration of PM₁₀. It can also be seen that there is predicted to be 0.05 days or “No Change” in the number of days where the concentration of PM₁₀ are more than 50 μgm^{-3} .

Magnitude of Change – 2030 with development

5.21 Comparing the results in Table 5.6 with the magnitude of change in Table 3.7 it can be seen that all the receptors are predicted to experience a change in annual mean NO₂ concentrations which is “Imperceptible” (<0.4 μgm^{-3}).

5.22 It can also be seen that all the receptors are predicted to experience a change in annual mean PM₁₀ concentrations and the number of days where PM₁₀ levels are greater than 50 μgm^{-3} which is “Imperceptible” (<0.4 μgm^{-3}) or “No Change”.

“Significance” of Change – 2030 with development

5.23 The “Significance” of the predicted changes in NO₂ and PM₁₀ annual mean concentrations are presented in **Table 5.7**.



Table 5.7: NO₂ – Significance of change in annual mean concentrations following the completion of the proposed development in 2030

Receptor Number and Name		NO ₂		
		Change in annual mean (µgm ⁻³)	Magnitude of change	“Significance” of change
R1	Oak Lodge & Hill View Care Home	0.05	Imperceptible	Negligible
R2	273 Eastbourne Road	0.08	Imperceptible	Negligible
R3	Southdown Court, Old Drive	0.07	Imperceptible	Negligible
R4	88 Eastbourne Road	0.06	Imperceptible	Negligible
R5	2 Church Road	0.02	Imperceptible	Negligible
W5	W5	0.23	Imperceptible	Negligible

5.24 With reference to the overall concentration of NO₂ presented in Table 5.5 being below to the NAQO level of 40 µgm⁻³ and the magnitude of change being “Imperceptible”, the “Significance” of change in NO₂ concentrations is considered “Negligible”.

Table 5.8: PM₁₀ – Significance of change in annual mean concentrations following the completion of the proposed development in 2030

Receptor Number and Name		PM ₁₀		
		Change in annual mean (µgm ⁻³)	Magnitude of change	“Significance” of change
R1	Oak Lodge & Hill View Care Home	0.02	Imperceptible	Negligible
R2	273 Eastbourne Road	0.03	Imperceptible	Negligible
R3	Southdown Court, Old Drive	0.03	Imperceptible	Negligible
R4	88 Eastbourne Road	0.03	Imperceptible	Negligible
R5	2 Church Road	0.01	Imperceptible	Negligible
W5	W5	0.07	Imperceptible	Negligible

5.25 With reference to the overall concentrations of PM₁₀ presented in Table 5.5 being well below the objective level of 40 µgm⁻³ and the magnitude of change presented in Table 5.8 being “Imperceptible”, the “Significance” of change in PM₁₀ concentration is considered to be “Negligible”.



DEFRA Emissions Factor Toolkit (EFT)

Development Transport Related Pollutants

5.26 This section of the report uses the DEFRA Emissions Factor Toolkit (EFT) to calculate the amount of transport related pollutant emissions from the proposed development site (version 10.1).

5.27 The EFT calculation uses the following development traffic input data:

the relevant road type: Urban (not London)

traffic flows: 1017

% HDV: 0%

Speed: 48kph

number of hours: 24

Link length data: 10km (National Travel Survey UK average)

Gradient: 0%

Flow direction: Two way traffic

Percentage Load: 0%

5.28 The first step is to quantify the change in emissions for NO_x and PM_{2.5} for 5 years of scheme operation.

Table 5.9: EFT Output (tonne/annum)

	2021	2022	2023	2024	2025
NO _x	0.9461	0.8548	0.7768	0.7034	0.6346
PM _{2.5}	0.0677	0.0667	0.0659	0.0653	0.0649

Costs of Mitigating Development Transport Related Pollutants

5.29 The second step is to calculate damage costs for NO_x and PM_{2.5} for 5 years of scheme operation. The costs per tonne are as follows: £6,199* tonne (NO_x) + £105,836* tonne (PM_{2.5}).

Table 5.10: Output from Damage Cost Appraisal Toolkit (£)**

	2021	2022	2023	2024	2025	Total
NO _x	5,864.82	5,299.18	4,815.39	4,360.30	3,933.85	24,273.54
PM _{2.5}	7,165.70	7,057.47	6,974.62	6,912.38	6,865.96	34,976.13
Total	13,030.52	12,356.65	11,790.01	11,272.68	10,799.81	59,249.67

* DEFRA IGCB Air Quality Damage Costs

** DEFRA Emissions Factor Toolkit

5.30 From Table 5.10 it can be seen that the calculated costs for mitigating the transport related emissions for the proposed development is £59,249.67p.



Constraints

- 5.31 The concentrations of NO₂ and PM₁₀ have not been modelled within the development site as there will not be any significant levels of pollutants, based on the background pollutants concentrations and the proximity of main roads.
- 5.32 With reference to Table 5.9 which provides the EFT output data based on the proposed development with 180 residential dwellings, and the output from the damage cost appraisal toolkit, Table 5.10, the proposed air quality mitigation or compensation required will be to the value of £59,249.67p.



6.0 MITIGATION

Construction Phase

- 6.1 Monitoring during the construction phase should be considered in the management of operations to ensure that the nuisance thresholds are not exceeded at nearby sensitive locations. However, it is important to note that such limits are subjective (as “nuisance” caused by dust does not currently have a statutory limit applied to it).
- 6.2 Monitoring of dust could be achieved using a variety of sampling techniques, for example deposit (“Frisbee”) gauges, glass slides or high-volume air samplers located around the site perimeter and at the sensitive locations up to 400 metres from the site boundary.
- 6.3 In addition, there are a number of Best Practice mitigation measures that can be used by contractors to ensure that the impacts experienced in close proximity to the construction site are minimal. Sample mitigation:
- 6.4 Specific to demolition (for information only):
- Ensure effective water suppression is used during demolition operations;
 - Avoid explosive blasting, using appropriate manual or mechanical alternatives;
 - Bag and remove any biological debris or damp down such material before demolition; and
- 6.5 Effective site planning:
- Erect solid barriers to site boundary;
 - Dust generating activities to be located away from sensitive receptors;
 - All site personnel will be fully trained;
 - There will be a trained and responsible manager on site during working times to maintain a logbook and carry out site inspections;
 - There will be no run off of mud or water from the site;
 - Relevant legislation and guidance will be adhered to; and



6.6 Construction Traffic

All vehicles to switch off engines (no idling);
On road vehicles will comply to set emission standards;
Effective vehicle cleaning and specific wheel-washing on leaving site;
All loads entering site must be covered;
All non-road mobile machinery (NRMM) should use ultra-low sulphur diesel where available; and

6.7 Site Activities

Minimise dust generating activities where possible;
Use water as a dust suppressant where applicable;
Stockpiles will be covered, enclosed, seeded or kept them sheeted;
and
If applicable, any concrete crushers/batchers will have the required permits.

6.8 It is recommended that liaison with Wealden District Council Health Department be maintained throughout the construction process. In addition, the main contractor should nominate a representative (possibly the site manager) to act as a point of contact with the Council, the construction team and the local community to ensure that any air quality related issues that occur during the construction period can be dealt with efficiently, effectively and promptly.

6.9 All other site sub-contractors should also nominate or appoint a suitable team member responsible for liaison with the lead contractor's representative and to ensure that sub-contractor construction activities are managed effectively.

6.10 Details of the proposed methodology for achieving this and procedures to follow should be set out in a Construction Environmental Management Plan (CEMP). This would be held on-site and would include relevant contact names, details, lines of communication and mitigation action plans. The document should be available to all site personnel who should be made aware of its existence and provide an undertaking that they will adhere to the guidance provided therein.

6.11 The mitigation of PM₁₀ releases due to material disturbance will be achieved in the same manner as the control of dust releases. By achieving effective control of sources of dust release, PM₁₀ releases can be minimised.



- 6.12 The most effective control of particulate releases from site plant will be achieved by ensuring that it is maintained in good working order and is of the appropriate capacity and specification for the job being carried out. It should also be located away from the site perimeter, thereby maximizing the distance between source and receptor.
- 6.13 There may be occasions where breakdown of site plant could cause short-term releases of excess particulate matter (smoke) and odour. Short-term releases may also occur during start up (of diesel engines, etc.). Regular visual checks and routine maintenance should be applied in accordance with the plant specification, to ensure that these releases are minimised. Faulty site plant should be decommissioned until repairs have been carried out and have been tested and found to be operating satisfactorily.
- 6.14 Detailed mitigation measures to control construction traffic should be discussed with officers from Wealden District Council, in order to establish the most suitable access routes for the site traffic and service vehicles. The most effective mitigation will be achieved by ensuring that construction traffic vehicles are kept clean and sheeted when on public highways (through the use of wheel washers) and avoid using sensitive roads. Timing of large-scale vehicle movements to avoid peak hours on the local road network would also be beneficial. Clear signposting to the site access for construction traffic should also be provided and direct traffic along routes agreed with the Council.
- 6.15 Early morning delivery vehicles, which may arrive prior to the site opening, should be prevented from waiting on the approach roads to the site. If site deliveries arrive prior to the site opening, they should wait at a suitable location, and if possible, turn the engine off.
- 6.16 With the implementation of the appropriate mitigation measures detailed above, but not restricted to the information detailed above, the residual effects will normally be “Not Significant”.

Operational Phase

- 6.17 Taking into the account predicted “Negligible” increases in NO_2 and PM_{10} concentrations at sensitive receptors due to the development generated traffic following the completion of the development, and the fact that concentrations of NO_2 and PM_{10} are predicted to be well below the NAQO level of $40 \mu\text{g m}^{-3}$, no additional mitigation is proposed.



- 6.18 Within the development site, concentrations of NO₂ and PM₁₀ are predicted to be well below the NAQO level of 40 µgm⁻³. Therefore, there are no proposals to mitigate air quality within the site.

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- 6.19 The proposed air quality mitigation or compensation required will therefore be to the value of £59,249.67p.
- 6.20 Effective on-site mitigation measures through 'Good Design' are the preferred option. However, if mitigation measures are not available or are not suitable, the Local Planning Authority can seek compensation for any amount less than the amount stated above (through the use of a Section 106 Agreement).
- 6.21 A Major development, as defined by Town and Country Planning (Development Management Procedure) Order (England) 2015, is greater than 50 dwellings. The proposed development is up to 180 dwellings and is therefore considered Major.

Standard Mitigation for All Major Developments

- 6.22 From the Air quality and emissions mitigation guidance for Sussex (2020), all Major residential developments should provide mitigation in the form of:

All gas-fired boilers to meet a minimum standard of
<40mgNO_x/kWh;

1 Electric Vehicle charging point per dwelling with dedicated parking
or 1 charging point per 10 spaces (unallocated parking).

- 6.23 In addition to the above, the Council will also seek mitigation of Proposed Development air quality impacts in the form of but not limited to:

Invest in EV charging infrastructure within the development over and
above the current recommended standards;

Provide vouchers for alternatives to private car use;

Set up a car club within the development or contribute to the cost of
a local car club;

Set up or join an existing car sharing scheme for residents;

Designate parking spaces for car club/car sharing vehicles;

Designate parking spaces for low emission vehicles;

Provide electric bikes;

Improve cycle paths to link to the existing local cycle network;

Provide secure cycle storage; and



Invest in additional evergreen infrastructure to reduce particulates and other pollutants.



7.0 SUMMARY AND CONCLUSIONS

- 7.1 Stuart Michael Associates has been engaged by Danescroft (FROF V Willingdon) LLP) to undertake an Air Quality assessment at the proposed development site at Eastbourne Road, Willingdon.
- 7.2 The assessment has been undertaken to demonstrate the impact on concentrations of NO₂ and PM₁₀ at sensitive receptors as a result of development generated traffic. Annual average concentrations have been compared to the National Air Quality Objective Levels and the magnitude and significance of change has also been assessed against national guidelines.
- 7.3 Constraints on development have been assessed using background concentrations, existing and future emissions from road traffic at the proposed development site.
- 7.4 Also assessed are the likely impacts from the construction of the development. The impact assessment has been undertaken using the method detailed in the Institute of Air Quality Management (IAQM) publication "Guidance on the assessment of dust from demolition and construction" (2014).
- 7.5 Concentrations of NO₂ and PM₁₀ at one diffusion tubes (DT) and five sensitive receptors have been assessed using ADMS Roads. The 2019 NO₂ concentrations from the one DT (W5) has been used to verify the results from the modelling.
- 7.6 Base concentrations have been calculated for 2021 and two scenarios have been assessed for the future year 2030. The first is a "Do Nothing" scenario with committed development generated traffic but no development generated traffic and the second scenario is "Do Something" with committed development generated traffic and development generated traffic. The two scenarios have been assessed to gauge the magnitude of change in concentrations NO₂ and PM₁₀ and the significance of those changes.
- 7.7 Road traffic flows on the local highway network have been obtained from permanent automatic traffic counters (ATC) and from surveys undertaken by the Transport Consultants. Where necessary, the surveyed traffic flows have been growthed to the assessment years using TEMPRO and adjusted using NTM. Development generated road traffic data has been supplied by the Transport Consultants.



- 7.8 Following the completion of the development, there is predicted to be an increase of 4.1% or less in 24-hour traffic flows along the links within the assessment area.
- 7.9 The concentrations of NO₂ in 2030 are predicted to be below the objective level of 40 µgm⁻³. The magnitude of change in annual mean concentrations at all the receptors due to development generated traffic is predicted to be “Imperceptible”. Therefore the “Significance” of change is considered to be “Negligible”.
- 7.10 Concentrations of PM₁₀ are predicted to be below the objective level of 40 µgm⁻³ at the receptor locations and experience “Imperceptible” due to development generated traffic. Therefore the “Significance” of change is considered to be “Negligible”.
- 7.11 During the Demolition, Earthworks, Construction phases of development, it has been assessed that there is a Medium to Low Risk of potential annoyance to people and property caused by dust soiling and a Low Risk of health effects due to an increase exposure in PM₁₀. Therefore, mitigation may be required.
- 7.12 During the Trackout processes, there is a Low Risk of dust soiling and a Low Risk to human health effects due to an increase exposure in PM₁₀.
- 7.13 For those cases where the risk category is Negligible (i.e. ecological), no specific mitigation measures is required beyond specific legislation.
- 7.14 With regard to potential impacts to the Ashdown Forest SPA, it has been demonstrated that impacts adjacent to the development site are “Negligible”. Therefore, any impacts at the SPA which is 25 km from the site will be “Negligible”.
- 7.15 Within the development site concentrations of NO₂ are predicted to be well below the NAQO levels 40 µgm⁻³.
- 7.16 Based on the results of the AQA, it has been concluded that with appropriate mitigation, air quality concentrations are acceptable for future residents of the Proposed Development. Moreover, the impact of development on local sensitive receptors is predicted to be negligible during both construction and operational phases. Therefore, in terms of the planning application, the proposed Eastbourne Road development is acceptable from an air quality perspective.

8.0 APPENDICES

Appendix 1 Proposed Site Layout –





Appendix 2 National Air Quality Objectives (NAQO)

National air quality objectives and European Directive limit and target values for the protection of human health						
Pollutant	Applies	Objective	Concentration measured as ¹⁰	Date to be achieved by (and maintained thereafter)	European Obligations	Date to be achieved (by and maintained thereafter)
Particulates (PM ₁₀)	UK	50 µg/m ³ not to be exceeded more than 35 times a year	24 hour mean	31 December 2004	50 µg/m ³ not to be exceeded more than 35 times a year	1 January 2005
	UK	40 µg/m ³	annual mean	31 December 2004	40 µg/m ³	1 January 2005
	Indicative 2010 objectives for PM ₁₀ (from the 2000 strategy and Addendum) have been replaced by an exposure reduction approach for PM _{2.5} (except in Scotland – see below)					
	Scotland	50 µg/m ³ not to be exceeded more than 7 times a year	24 hour mean	31 December 2010	50 µg/m ³ not to be exceeded more than 35 times a year	1 January 2005
	Scotland	18 µg/m ³	annual mean	31 December 2010	40 µg/m ³	1 January 2005
Particulates (PM _{2.5}) Exposure Reduction	UK (except Scotland)	25 µg/m ³	annual mean	2020	Target value - 25 µg/m ³	2010
	Scotland	10 µg/m ³		31 December 2020	Limit value - 25 µg/m ³	1 January 2015
	UK urban areas	Target of 15% reduction in concentrations at urban background		Between 2010 and 2020	Target of 20% reduction in concentrations at urban background.	Between 2010 and 2020

National air quality objectives and European Directive limit and target values for the protection of human health						
Pollutant	Applies	Objective	Concentration measured as ¹	Date to be achieved by (and maintained thereafter)	European Obligations	Date to be achieved by (and maintained thereafter)
Nitrogen dioxide	UK	200 µg/m ³ not to be exceeded more than 18 times a year	1 hour mean	31 December 2005	200 µg/m ³ not to be exceeded more than 18 times a year	1 January 2010
	UK	40 µg/m ³	annual mean	31 December 2005	40 µg/m ³	1 January 2010
Ozone	UK	100 µg/m ³ not to be exceeded more than 10 times a year	8 hour mean	31 December 2005	Target of 120 µg/m ³ not to be exceeded by more than 25 times a year averaged over 3 years	31 December 2010
Sulphur dioxide	UK	266 µg/m ³ not to be exceeded more than 35 times a year	15 minute mean	31 December 2005	-	-
	UK	350 µg/m ³ not to be exceeded more than 24 times a year	1 hour mean	31 December 2004	350 µg/m ³ not to be exceeded more than 24 times a year	1 January 2005
	UK	125 µg/m ³ not to be exceeded more than 3 times a year	24 hour mean	31 December 2004	125 µg/m ³ not to be exceeded more than 3 times a year	1 January 2005
Polycyclic Aromatic Hydrocarbons	UK	0.25 ng/m ³ B[a]P	as annual average	31 December 2012	1.0 ng/m ³	31 December 2012



National air quality objectives and European Directive limit and target values for the protection of human health						
Pollutant	Applies	Objective	Concentration measured as ¹	Date to be achieved by (and maintained thereafter)	European Obligations	Date to be achieved by (and maintained thereafter)
Benzene	UK	16.25 µg/m ³	running annual mean	31 December 2003	-	-
	England and Wales	5 µg/m ³	annual average	31 December 2010	5 µg/m ³	1 January 2010
	Scotland, Northern Ireland	3.25 µg/m ³	running annual mean	31 December 2010	-	-
1,3-butadiene	UK	2.25 µg/m ³	running annual mean	31 December 2003	-	-
Carbon monoxide	UK	10 mg/m ³	maximum daily running 8 hour mean/in Scotland as running 8 hour mean	31 December 2003	10 mg/m ³	1 January 2005
Lead	UK	0.5 µg/m ³	annual mean	31 December 2004	0.5 µg/m ³	1 January 2005
		0.25 µg/m ³	annual mean	31 December 2008	-	-

National air quality objectives and European Directive limit and target values for the protection of vegetation and ecosystems						
Pollutant	Applies	Objective	Concentration measured as ¹	Date to be achieved by (and maintained thereafter)	European Obligations	Date to be achieved by (and maintained thereafter)
Nitrogen oxides	UK	30 µg/m ³	annual mean	31 December 2000	30 µg/m ³	19 July 2001
Sulphur dioxide	UK	20 µg/m ³	annual mean	31 December 2000	20 µg/m ³	19 July 2001
	UK	20 µg/m ³	winter average	31 December 2000	20 µg/m ³	19 July 2001
Ozone: protection of vegetation and ecosystems	UK	Target value of 18,000 µg/m ³ based on AOT40 to be calculated from 1 hour values from May to July, and to be achieved, so far as possible, by 2010	Average over 5 years	1 January 2010	Target value of 18,000 µg/m ³ based on AOT40 to be calculated from 1 hour values from May to July, and to be achieved, so far as possible, by 2010	1 January 2010



Appendix 3 - Herstmonceux wind rose for 2019

