NRG CONSULTING

Central Avenue

Air Quality Assessment

November 2023

Contents

1 INTRODUCTION 4
1.1 Scope 4
1.2 Executive Summary 4
2 POLLUTANTS & LEGISLATION 5
2.1 Pollutant Overview 5
2.2 Air Quality Strategy 5
2.3 Clean Air Strategy 6
2.4 The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 6
2.5 Environment Act 2021 6
2.6 A guide to the assessment of air quality impacts on designated nature conservation sites (May 2020) Version 1.1 (IAQM) 7
2.7 The Conservation of Habitats and Species Regulations (2019). 7
3 PLANNING POLICY & GUIDANCE 8
3.1 National Planning Policy & Guidance 8
3.1.1 National Planning Policy Framework 8
3.1.2 Land-Use Planning & Development Control 8
3.1.3 Planning Practice Guidance – Air Quality 8
3.2 Swale Local Plan (2017) 9
4 ASSESSMENT METHODOLOGY 11
4.1 Operational Phase (Traffic Emissions) 11
4.1.1 Modelled Scenarios 11
4.1.2 ADMS-Roads 11
4.1.3 Emission Factors 11
4.1.4 Traffic Data 11
4.2 Background Concentrations 12
4.3 Meteorological Data 12
4.4 Model Output 13
4.4.1 NOx/NO2 Relationship 13
4.4.2 Predicted Short Term Concentrations 14
4.4.3 Model Verification 14
4.4.4 Receptor Locations 14
4.5 Operational Phase 15
5 AIR QUALITY ASSESSMENT 18
5.1 Impact of Vehicle Emissions 18
5.1.1 Model Verification 18
5.1.3 Nitrogen Dioxide 18
5.1.4 Particulate Matter (PM_{10}) 19
6. AIR QUALITY NEUTRAL ASSESSMENT 20
6.1 Introduction 20
6.2 Building Emissions 20
6.3 Transport Emissions 21
7. CONCLUSIONS AND RECOMMENDATIONS 22
7.1 Impact of Vehicle Emissions 22
7.2 Building Mitigation 22
7.3 Overall Summary 22

LIST OF TABLES

Table 1 – Overview of NO_2 and PM_{10} 5
Table 2 – UK Air Quality Objectives for Nitrogen Dioxide and Particulate Matter 6
Table 3 – Annual Average Daily Traffic Flows, Percentage HDV and Speeds for Modelled Roads 12
Table 4 – Background NOx, NO2, PM_{10} and $PM_{2.5}$ Concentrations 12
Table 5 – Modelled Verification Locations 14
Table 6 – Modelled Receptor Locations 14
Table 7 – Air Pollution Exposure Criteria (APEC) 16
Table 8 – Comparison of Modelled and Monitored NO_2 Concentrations (µg/m³), 2021 18
Table 9 – Predicted NO2 Concentrations, Annual Mean (µg/m³) 18
Table 10 – Predicted PM_{10} Concentrations, Annual Mean (µg/m3) 19
Table 11 – Building Emissions Benchmarks (BEBs 20
Table 12 – Calculation of Benchmarked NOx Emissions Using Building Emissions 20
Table 13 – Calculation of Total Building NOx Emissions 20
Table 14 – Comparison of Total Building NOx Emissions and Building Emissions Benchmarks 21

LIST OF FIGURES

Figure 1 *– Wind Speed and Direction Data, Manston (2022)* 13
Figure 2 *- Modelled (Proposed) Receptor Locations* 15
Figure 3 *- Assessing the Significance of Air Quality Impacts of a Development Proposal* 17

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1 INTRODUCTION

1.1 Scope

NRG Consulting have been commissioned to undertake an Air Quality assessment based on the potential impacts of existing and future traffic levels for a new proposed development located at 1-5 Central Avenue, Sittingbourne, Kent, ME10 4BX.

The development lies within the jurisdiction of Swale Borough Council. The pollutants modelled as part of this assessment are nitrogen oxides (NO_x) and particulate matter (PM_{10}).

The impacts of vehicle emissions have been assessed using the techniques detailed within Volume 11, Section 3 of the Design Manual for Roads and Bridges (DMRB)[1] and the London Local Air Quality Management Technical Guidance (LLAQM.TG(19))[2]. The impact of road traffic emissions will be assessed using the ADMS-Roads air dispersion model. This model has been devised by Cambridge Environmental Research Consultants (CERC) and is described as a "comprehensive tool for investigating air pollution problems due to small networks of roads".

It should be noted that the short-term impacts of NO_2 and PM_{10} emissions have not been modelled as dispersion models are inevitably poor at predicting short-term peaks in pollutant concentrations, which are highly variable from year to year, and from site to site. Notwithstanding this, general assumptions have been made about short term concentrations based on the modelled annual mean concentrations.

1.2 Executive Summary

Based on the findings of this report relating to the Air Quality levels at the proposed development, it is considered that Air Quality does not present a constraint for the grant of planning permission. The scheme falls under APEC "A" classification and no mitigation measures are required to achieve compliance.

[1] Design Manual for Roads and Bridges, Sustainability & Environment Appraisal LA 105 Air Quality – November 2019
[2] https://laqm.defra.gov.uk/air-quality/guidance/technical-guidance/

2 POLLUTANTS & LEGISLATION

2.1 Pollutant Overview

In most areas of the UK, traffic generated pollutants have become the most common pollutants. These are nitrogen dioxide (NO_2), fine particulates (PM_{10}), carbon monoxide (CO), 1,3-butadiene and benzene, as well as carbon dioxide (CO2). This air quality assessment focuses on NO_2 and PM_{10}, as these pollutants are least likely to meet their Air Quality Strategy objectives near roads. Table 1 provides an overview of NO_2 and PM_{10}.

***Table 1** – Overview of NO_2 and PM_{10}*

Pollutant	Properties	Anthropogenic Sources	Natural Sources	Potential Effects
Particles (PM_{10})	Tiny particulates of solid or liquid nature suspended in the air	Road transport; Power generation plants; Production processes e.g. windblown dust	Soil erosion; Volcanoes; Forest fires; Sea salt crystals	Asthma; Lung cancer; Cardiovascular problems
Nitrogen Dioxide (NO_2)	Reddish-brown coloured gas with a distinct odour	Road transport; Power generation plants; Fossil fuels – extraction & distribution; Petroleum refining	No natural sources, although nitric oxide (NO) can form in soils	Pulmonary oedema; Various environmental impacts e.g. acid rain

2.2 Air Quality Strategy

The UK Government and the devolved administrations published the latest Air Quality Strategy for England, Scotland, Wales and Northern Ireland on 17 July 2007[3]. The Strategy provides an over-arching strategic framework for air quality management in the UK.

With regards to this assessment, the Air Quality Strategy contains national air quality standards and objectives established by the Government to protect human health. The objectives for nitrogen dioxide and particulates (PM_{10} and $PM_{2.5}$) have been set, along with seven other pollutants (benzene, 1,3-butadiene, carbon monoxide, lead, PAHs, sulphur dioxide and ozone). Those which are limit values required by EU Daughter Directives on Air Quality have been transposed into UK law through the Air Quality Standards Regulations 2016[4] which came into force on 31st December 2016. Table 2 provides the UK Air Quality Objectives for NO_2 and PM_{10}.

[3] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Department for Environment, Food and Rural Affairs in partnership with the Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland, July 2007
[4] https://www.legislation.gov.uk/uksi/2016/1184/contents/made

Table 2 – UK Air Quality Objectives for Nitrogen Dioxide and Particulate Matter

Pollutant	Objective	Concentration measured as
Particles (PM_{10})	50µg/m³ not to be exceeded more than 35 times a year	24 hour mean
	40µg/m³	Annual mean
Particles ($PM_{2.5}$)	25µg/m³ (except Scotland)	Annual Mean
Nitrogen Dioxide (NO_2)	200µg/m³ not to be exceeded more than 18 times a year	1 hour mean
	40µg/m³	Annual mean

Objectives for $PM_{2.5}$ were also introduced by the UK Government and the Devolved Administrations in 2010. However, these are not included in Regulations as the Air Quality Strategy has adopted an "exposure reduction" approach for $PM_{2.5}$ in order to seek a more efficient way of achieving further reductions in the health effects of air pollution by providing a driver to improve air quality everywhere in the UK rather than just in a small number of localised hotspot areas. As defined in Table 4, background $PM_{2.5}$ concentrations are well below the limit value of 25.0 µg/m³. As such, no further consideration has been given to $PM_{2.5}$ within this assessment.

2.3 Clean Air Strategy

The Clean Air Strategy[5] was published in January 2019 and sets out the comprehensive action that is required from across all parts of government and society to tackle all sources of air pollution. New legislation will create a stronger and more coherent framework for action to tackle air pollution. This will be underpinned by new England-wide powers to control major sources of air pollution, in line with the risk they pose to public health and the environment, plus new local powers to take action in areas with an air pollution problem. These will support the creation of Clean Air Zones to lower emissions from all sources of air pollution, backed up with clear enforcement mechanisms.

2.4 The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020[6]

The Environment EU Exit Regulations (2020) is an amendment to the Air Quality Standards Regulations (2010) which reduces the threshold for $PM_{2.5}$ from 25 µg/m³ to 20 µg/m³.

2.5 Environment Act 2021

The Environmental Act (2021)[7] is a bill to make provision about targets, plans and policies for improving the natural environment; for statements and reports about environmental protection; for the Office for Environmental Protection; about waste and resource efficiency; about air quality; for the recall of products that fail to meet environmental standards; about water; about nature and biodiversity; for conservation covenants; about the regulation of chemicals; and for connected purposes.

The Act will aim to clean up the country's air, restore natural habitats, increase biodiversity, reduce waste and make better use of our resources. This includes the setting of new legally binding long-term targets to improve air quality and reduce fine particulate ($PM_{2.5}$) emissions by October 2022

[5] Clean Air Strategy 2019, Department for Environment, Food and Rural Affairs, January 2019
[6] https://www.legislation.gov.uk/uksi/2020/1313
[7] https://www.legislation.gov.uk/ukpga/2021/30/enacted

2.6 A guide to the assessment of air quality impacts on designated nature conservation sites (May 2020) Version 1.1 (IAQM).

The principal purpose of this document is to set out a procedure for air quality specialists to follow when evaluating the impacts of airborne pollution at designated sites. Whilst an air quality specialist may be able to conclude that there are no likely significant effects using established thresholds, they will not generally be able to assess the effects of the air pollution on the integrity of the designated site.

Road transport emissions near to designated sites are often the result of many projects and plans located some distance from the site. It is normal in an air quality assessment to include traffic growth estimates using the Department of Transport's TEMPRO36 growth factors or from a strategic transport model that explicitly includes traffic from other projects and/or plans.

A quantitative air quality assessment is required if European Sites are within 200 m of affected roads. Within this context, the distance of the affected road from the designated site is an important consideration. Air pollution levels fall sharply within the first few tens of metres from a road before reducing more slowly with distance. The air quality impact of a given change in traffic on a designated site where the relevant habitat/species is 100 m from a road will be very different to one that abuts the road.

MAGIC website or similar online resources from the relevant SNCO. If local sites are to be assessed, details can be obtained by consulting the Environment Agency or local biodiversity records office who may charge a nominal fee for this service. Sufficient time should be allowed to obtain this data.

A quantitative air quality assessment is required if European Sites are within 200 m of affected roads.

Based on this guidance, and using the tool provided by DEFRA (Magic[8]) there are no European or UK Designations (Statutory – NNRs, Areas of Outstanding Natural Beauty, Ramsar Sites, SSSIs, SACs, SPAs) within 200m of the site. The closest designation is the Swale (RAMSAR and SSSI) and is 2.4km from the site.

2.7 The Conservation of Habitats and Species Regulations (2019).

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, SI 2019/579 are in force from Implementation Period (IP) completion day. These regulations make changes to the three existing instruments which transpose Directive 92/43/EEC, (the Habitats Directive) and Directive 79/409/EEC, (the Birds Directive) so that they continue to work upon the UK's exit from the EU. The existing instruments are:

- the Conservation of Habitats and Species Regulations 2017, SI 2017/1012
- the Conservation of Offshore Marine Habitats and Species Regulations 2017, SI 2017/1013, and
- the Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001, SI 2001/1754

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, SI 2019/579 also amend section 27 of the Wildlife and Countryside Act 1981 to ensure existing protections continue.
References throughout the regulations are amended to a UK only context. Sites designated under the Habitats Directive and the Birds Directive previously contributed to the EU's Natura 2000 network.

[8] https://magic.defra.gov.uk/MagicMap.aspx

3 PLANNING POLICY & GUIDANCE

3.1 National Planning Policy & Guidance

3.1.1 National Planning Policy Framework

On a national level, air quality can be a material consideration in planning decisions. The updated National Planning Policy Framework (NPPF) for England, updated in September 2023, is considered a key part of the Governments reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth.

Paragraph 105 within the NPPF states that the "The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making.".

It goes on to state in paragraph 183 that "Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan".

3.1.2 Land-Use Planning & Development Control

In January 2017, Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) produced guidance to ensure that air quality is adequately considered in the land-use planning and development control processes[9].

The guidance document is particularly applicable to assessing the effect of changes in exposure of members of the public resulting from residential and mixed-use developments, especially those within urban areas where air quality is poorer. It is also relevant to other forms of development where a proposal could affect local air quality and for which no other guidance exists.

3.1.3 Planning Practice Guidance – Air Quality

In November 2019 the UK Government provided updated guidance[10] on how planning can take account of the impact of new development on air quality.

All development plans can influence air quality in a number of ways, for example through what development is proposed and where, and the provision made for sustainable transport. Consideration of air quality issues at the plan-making stage can ensure a strategic approach to air quality and help secure net improvements in overall air quality where possible.

This planning Practice Guidance also provides routes to the sources used throughout this report, including but not limited to:

[9] Land-Use Planning & Development Control: Planning for Air Quality. Guidance from Environmental Protection UK and the Institute of Air Quality Management for the consideration of air quality within the land-use planning and development control processes. EPUK & IAQM. January 2017

[10] https://www.gov.uk/guidance/air-quality--3

- the UK Air Information Resource (UK-AIR), which contains information on historic and current air quality across the UK, including a GIS portal of Defra's national assessment against relevant Limit Values and air quality management areas;

- air quality management area records and modelled background pollution concentrations;

- the Clean Air Strategy sets out actions for dealing with 5 major sources of air pollution. A detailed National Air Pollution Control Programme was published by the Department for Environment, Food and Rural Affairs in April 2019.

Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity.

Where air quality is a relevant consideration the local planning authority may need to establish:
the 'baseline' local air quality, including what would happen to air quality in the absence of the development;
whether the proposed development could significantly change air quality during the construction and operational phases (and the consequences of this for public health and biodiversity); and
whether occupiers or users of the development could experience poor living conditions or health due to poor air quality.

3.2 Swale Local Plan (2017)[11]

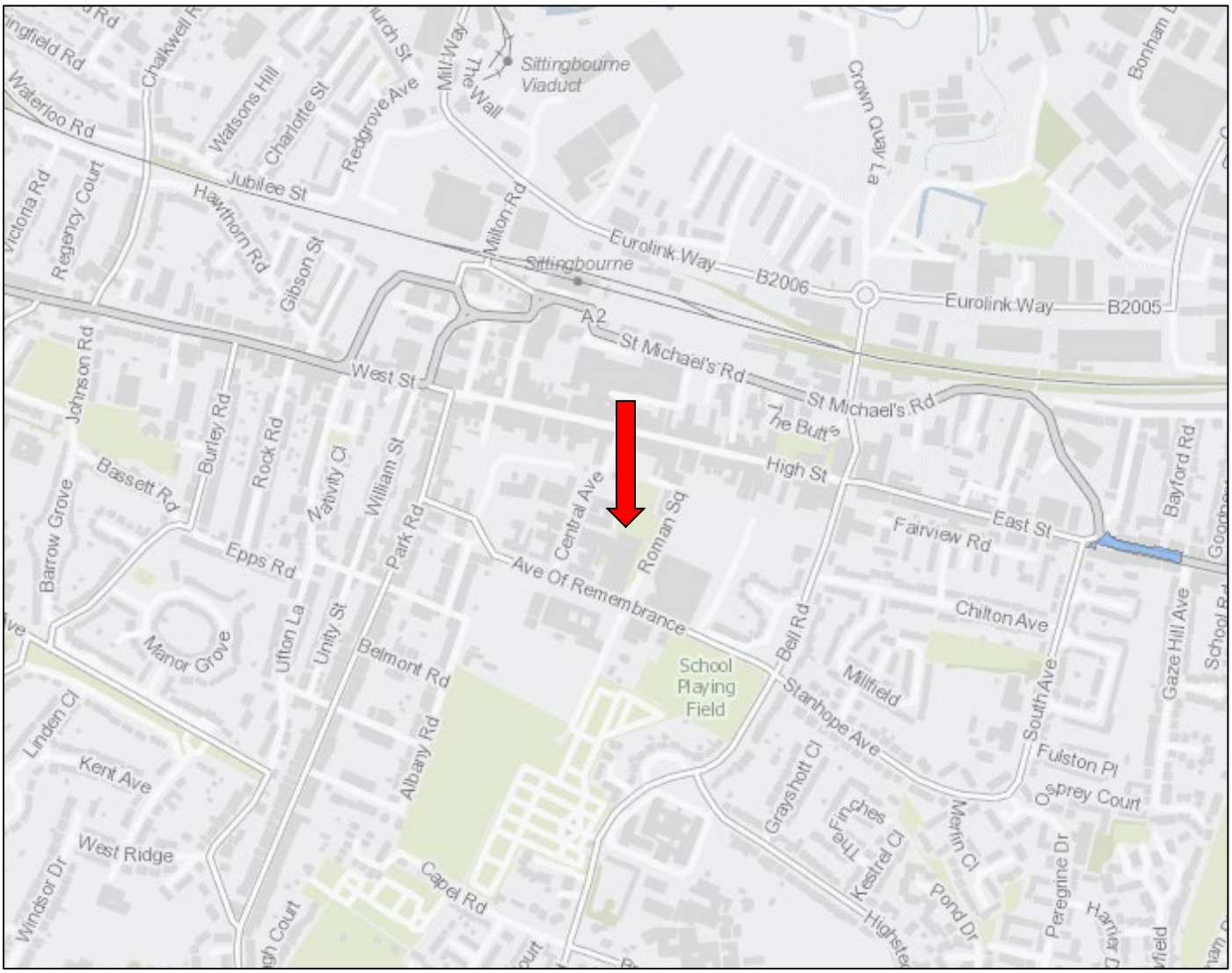
Swale has declared several Air Quality Management Areas (AQMAs) – **This site is not within an AQMA** and no AQMAs are local to the site. However, Swale recognises the impact of the A2 on local air quality which the site lies adjacent to.

Swale lists its main air pollution issues below:

"Transport and industry are the Borough's main air pollution emitters and a number of Air Quality Management Areas (AQMAs) have been declared at Newington, Teynham, Ospringe, St Paul's Street and at East Street/Canterbury Road in Sittingbourne. Applicants proposing development that could have an impact on air quality levels within the AQMAs should contact the Council's Environmental Protection Team regarding the preparation of an Air Quality Impact Assessment. Developers should also refer to The Kent and Medway Air Quality Partnership's document, Air Quality and Planning Technical Guidance, July 2011 and any updated versions of this document."

[11] https://services.swale.gov.uk/media/files/localplan/adoptedlocalplanfinalwebversion.pdf

Figure 1 *– Map showing location of site*



4 ASSESSMENT METHODOLOGY

4.1 Operational Phase (Traffic Emissions)

4.1.1 Modelled Scenarios

Two scenarios have been modelled as part of this assessment. These are as follows:

- Scenario 1 (2022) – existing levels of air quality / model verification; and
- Scenario 2 (2027) – future impact of traffic emissions on the proposed development

Data used for these scenarios can be seen in the below table:

Datapoint	Latest Available Year
Meteorological Data (Met Office and Stations)	2022
Traffic Data (Road Vehicles – DFT)	2022 (projected to 2027 using TEMPRO)
Background Concentrations (DEFRA)	2021
Monitoring Data (Diffusion Tubes & Automatic Monitoring –Swale Council)	2021

As such, 2022 is still chosen as the 'baseline' year and relies on previous yearly datasets where none for 2022 are available.

A future year has been chosen (2027) representing the baseline year plus 5 years and will provide an assessment of the future impact of traffic emissions on the proposed development once completed and fully occupied.

4.1.2 ADMS-Roads

Modelling the impact of traffic emissions on the proposed development has been undertaken using the latest version of the ADMS-Roads model[12]. ADMS-Roads is significantly more advanced than that of most other air dispersion models in that it incorporates the latest understanding of the boundary layer structure and goes beyond the simplistic Pasquill- Gifford stability categories method with explicit calculation of important parameters. The model uses advanced algorithms for the height-dependence of wind speed, turbulence and stability to produce improved predictions.

4.1.3 Emission Factors

Defra and the Devolved Administrations have provided an updated Emission Factors Toolkit (Version 11) which incorporates updated NOx emissions factors and vehicle fleet information[13]. These emission factors have been integrated into the latest ADMS-Roads modelling software.

4.1.4 Traffic Data

Baseline traffic flows along the local roads are available from the Department for Transport (DfT)[14]. Baseline data has been projected to 2027 from converted or existing 2022 data. Projection of traffic data has been undertaken using growth factors specific to Swale, obtained from TEMPro[15]. The projected flow rates are provided in Table 3. It is assumed that the percentage HDV and speed will remain unchanged in future years.

[12] Model Version: 5.0.0.1 Interface Version 5.0.0.5313 (16/02/2020)
[13] https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html
[14] http://www.dft.gov.uk/traffic-counts/
[15] TEMPro (Trip End Model Presentation Program) version 7, Department for Transport

The modelled speeds have been derived from the National Atmospheric Emissions Inventory (NAEI), specifically for major road networks and local roads. However, where a link approaches a junction a speed of 20 kph has been modelled in order to represent queuing traffic at a junction.

Table 3 – Annual Average Daily Traffic Flows, Percentage HDV and Speeds for Modelled Roads

Link Name	AADT - 2022	AADT - 2027	HDV (%)	Speed (kph)
School Lane	1048	1079	0.76	32
A249	44413	45745	12.67	32
M2	60572	62389	12.05	32
A2	10903	11230	4.17	32

4.2 Background Concentrations

Background NOx, NO_2 and PM_{10} concentrations have been obtained from Defra[16]. These 1 km x 1 km grid resolution maps are derived from a base year of 2021 (for NOx, NO_2, PM_{10} and $PM_{2.5}$ only), Background concentrations of NOx, NO2, PM_{10} and $PM_{2.5}$ derived from Defra are provided in Table 4.

Table 4 – Background NOx, NO2, PM_{10} and $PM_{2.5}$ Concentrations

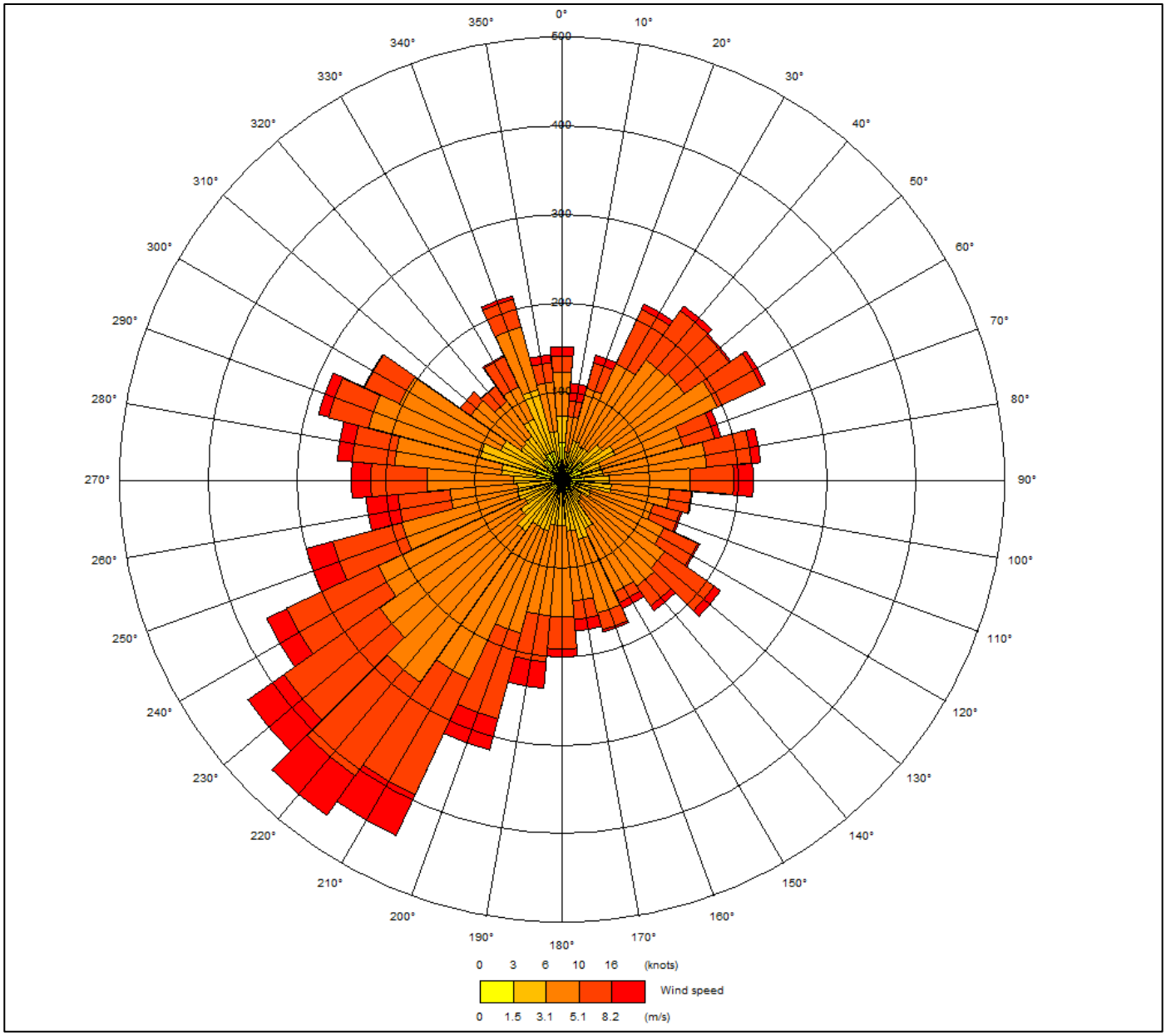
Location	Pollutant	2022
Proposed Development	NO_2	13.31
	NOx	17.95
	PM_{10}	11.98
	$PM_{2.5}$	7.74

4.3 Meteorological Data

Hourly sequential meteorological data from Manston meteorological station has been used. Wind speed and direction data from the Manston meteorological station has been plotted as a wind rose in Figure 1.

[16] https://uk-air.defra.gov.uk/data/gis-mapping/

Figure 1 *– Wind Speed and Direction Data, Manston (2022)*



4.4 Model Output

4.4.1 NOx/NO2 Relationship

Following recent evidence that shows the proportion of primary NO2 in vehicle exhaust has increased[17]. As such, a new (version 8.1) NOx to NO_2 calculator has been devised[18]. This new calculator has been used to determine NO_2 concentrations for this assessment, based on predicted NOx concentrations using ADMS-Roads. Converted NO_2 concentrations are initially compared to local monitoring data in order to verify the model output. If the model performance is considered unacceptable then the NOx concentrations are adjusted before conversion to NO_2.

[17] Trends in Primary Nitrogen Dioxide in the UK, Air Quality Expert Group, 2007

[18] https://laqm.defra.gov.uk/documents/Updated_NOx_from_NO2_Calculator_fno2_v8.1.pdf: https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc.

4.4.2 Predicted Short Term Concentrations

As discussed in the introduction, it has not been possible to model the short-term impacts of NO2 and PM_{10}. Research undertaken in 2003[19] has indicated that the hourly NO2 objective is unlikely to be exceeded at a roadside location where the annual mean NO2 concentration is less than 60 µg/m^3. For PM_{10}, a relationship between the annual mean and the number of 24-hour mean exceedances has been devised and is as follows:

- No. 24-hour mean exceedances = -18.5 + 0.00145 x annual mean3 + (206/annual mean)

This relationship has been applied to the modelled annual mean concentrations in order to estimate the number of 24-hourly exceedances.

4.4.3 Model Verification

The Council undertakes monitoring of NO2 automatic monitoring stations within Swale. One of these monitoring sites below is in close proximity to the proposed development, as well as a diffusion tube. Monitored concentrations from these sites have been used for the purposes of model verification during the baseline year (2022).

Table 5 – Modelled Verification Locations

Monitoring ID	Location
SW152	Sittingbourne
ZW8	Sittingbourne

4.4.4 Receptor Locations

In order to assess the potential impact of the traffic emissions from the local road network, a number of receptors have been identified representing the different facades of the proposed development. The location of these receptors, together with their height above ground level is provided in Table 6 and represented in Figure 2.

Proposed receptors above the first floor have not been modelled as predicted concentrations at the lower floors will provide a worst-case assessment, this is due to the dispersion of air polluting particles as elevation increases.

Table 6 – Modelled Receptor Locations

AQA ID	Height (m)	Description
R1	4.5	First Floor
R2		
R3		
R4		

[19] Analysis of Relationship between 1-Hour and Annual Mean Nitrogen Dioxide at UK Roadside and Kerbside Monitoring Sites, Laxen and Marner, 2003

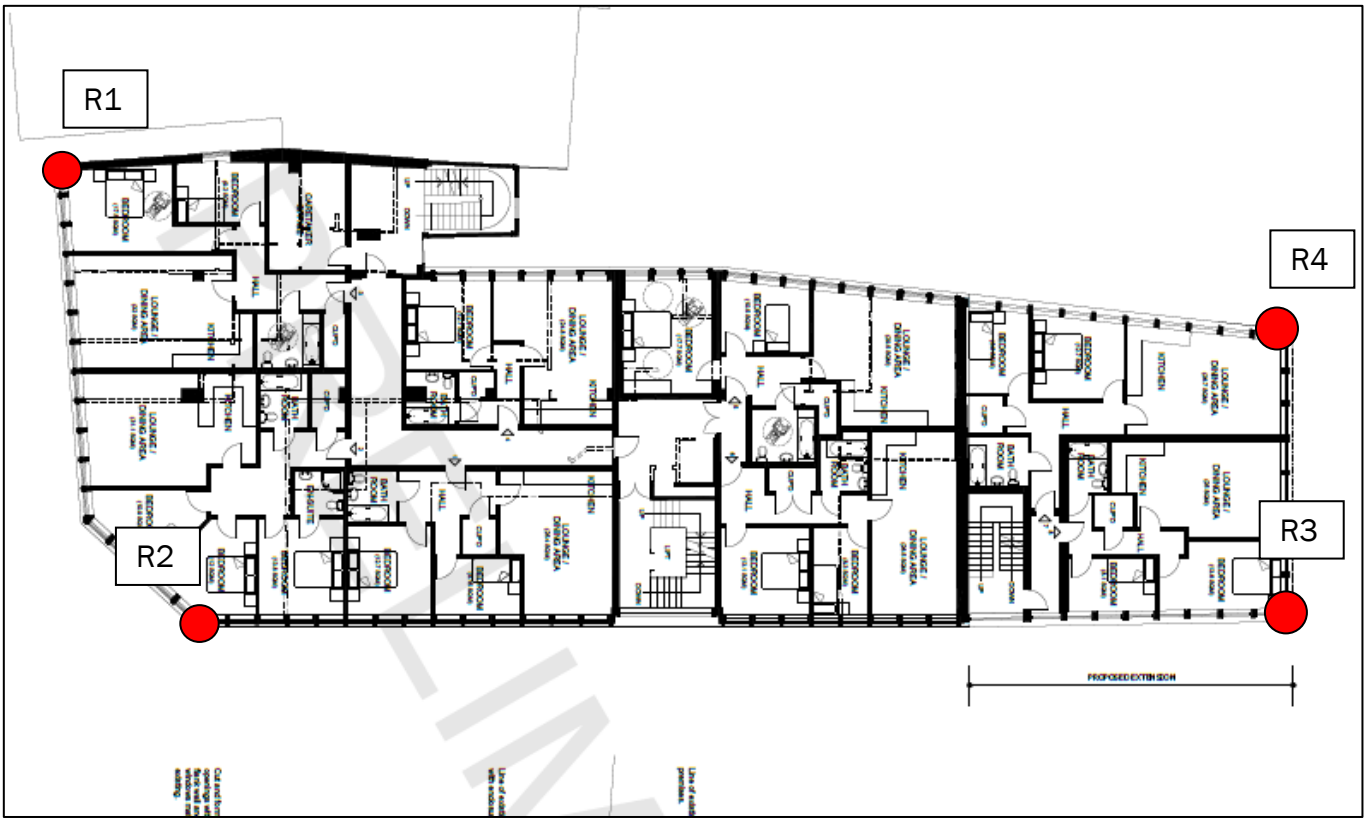


Figure 2 - Modelled (Proposed) Receptor Locations

Locations marked in red are modelled receptor positions within development. For this development this is only at the first floor.

4.5 Operational Phase

The significance of emissions will be determined by comparing the predicted results to the Air Pollution Exposure Criteria (APEC) detailed in the Air Quality and Planning Guidance written by the London Air Pollution Planning and the Local Environment (APPLE) working group[20]. The Air Pollution Exposure Criteria is considered appropriate to describe the significance of the impacts predicted, together with an indication as to the level of mitigation required in order for the development to be approved. The APEC table is provided below.

[20] Air Quality and Planning Guidance, written by the London Air Pollution Planning and the Local Environment (APPLE) working group, January 2007

Table 7 – Air Pollution Exposure Criteria (APEC)

APEC Category	NO_2	PM_{10}	Recommendations
A	>5% below national annual mean objective	>5% below national annual mean objective >1-day less than national 24-hour objective	No air quality grounds for refusal; however, mitigation of any emissions should be considered.
B	Between 5% below or above national annual mean objective	Between 5% above or below national annual mean objective Between 1-day above or below national 24-hour objective	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered
C	>5% above national annual mean objective	>5% above national annual mean objective >1-day more than national 24-hour objective	Refusal on air quality grounds should be anticipated, unless the Local Authority has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated

Furthermore, the guidance released by Environmental Protection UK also provides steps for a Local Authority to follow in order to assess the significance of air quality impacts of a development proposal. This procedure, shown in Figure 3, has also been applied to the modelled results.

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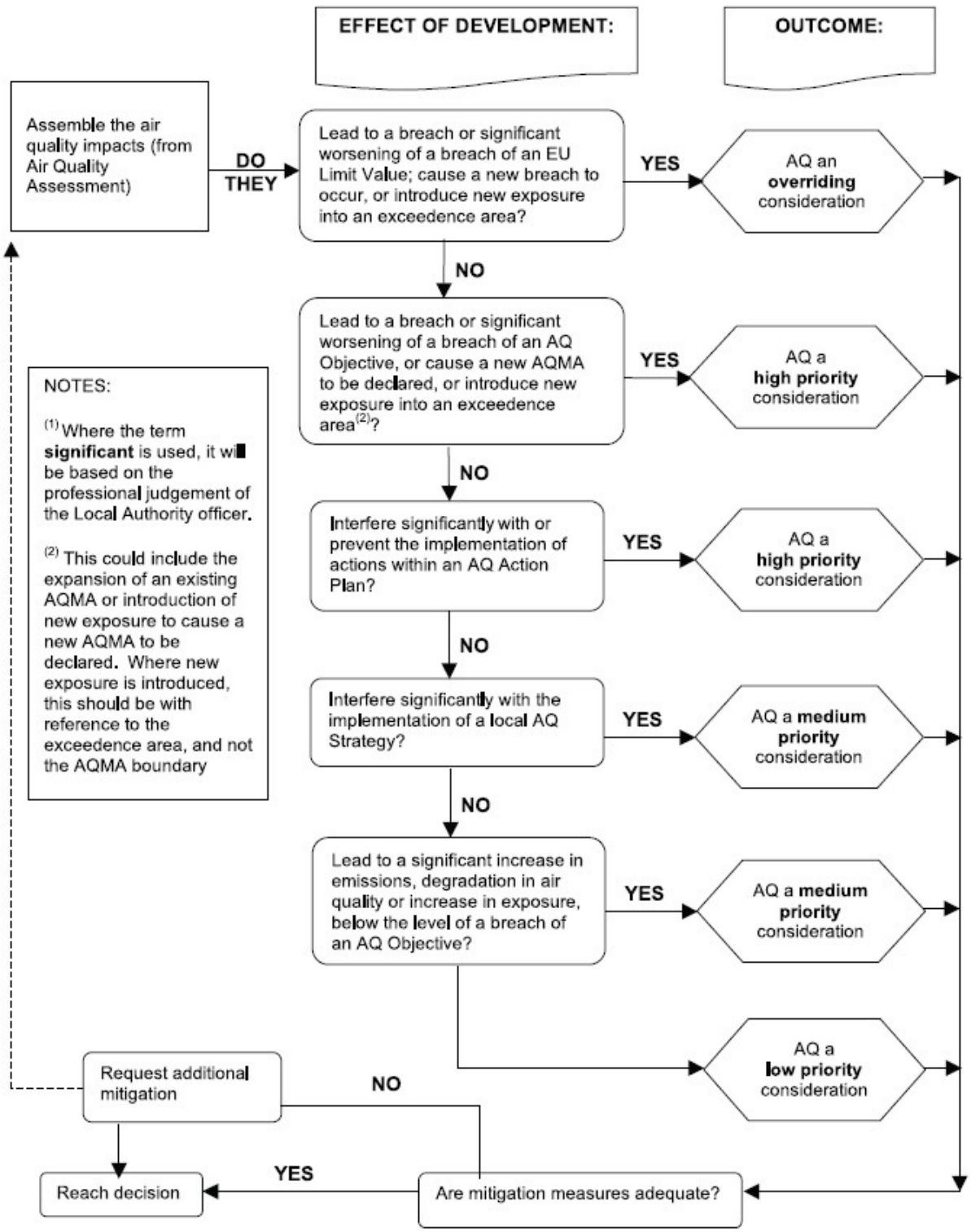
Figure 3 - Assessing the Significance of Air Quality Impacts of a Development Proposal



5 AIR QUALITY ASSESSMENT

5.1 Impact of Vehicle Emissions

5.1.1 Model Verification

The modelled output has been verified against the monitoring data obtained from the site listed in Table 5. The following tables provide a summary of the model verification process for NOx/NO_2 concentrations.

*Table 8 – Comparison of Modelled and Monitored NO_2 Concentrations (µg/m³), **2021***

Verification Location	Modelled Concentration	Monitored Concentration	Difference [(modelled - monitored)/ monitored] x100
SW152	14.02	12.75	9.06%
ZW8	18.81	17.75	5.64%

As described in the Technical Guidance (LLAQM.TG19), in order to provide more confidence in the model predictions and the decisions based on these, the majority of results should be within ±25% (ideally ±10%) of the monitored concentrations. Based on the outcomes of Table 8 it can be stated that the model provides good confidence within the reasonable within the ideal range of 10%.

5.1.3 Nitrogen Dioxide

Predicted annual mean concentrations for NO_2 in **2022** and **2027** are provided in Table 9. As mentioned in Section 4 NO2 concentrations have been calculated from the predicted NOx concentrations using the latest NOx-NO_2 conversion spreadsheet available from the Air Quality Archive.

Table 9 – Predicted NO2 Concentrations, Annual Mean (µg/m³)

Receptor ID	2022	2027
	GF	GF
R1	26.73	27.73
R2	27.14	27.86
R3	26.55	27.01
R4	26.46	26.84
Objective	40	

The ADMS predictions for annual mean NO2 concentrations in 2022 and 2027 indicate that the annual mean objective (40 µg/m³) would not be breached at all of the facades of the location at any floor and therefore does not present a constraint for planning.

Nitrogen dioxide also has an hourly objective of 200 µg/m3 not to be exceeded more than 18 times in one year. However, the hourly mean concentration has not been calculated directly by ADMS Roads. This is as a result of an evaluation of

continuous monitoring data from across the UK that revealed that the relationship between the annual mean and hourly mean NO_2 concentrations was very weak.

Nonetheless, research undertaken in 2003[21] has indicated that the hourly NO2 objective is unlikely to be exceeded at a roadside location where the annual mean NO_2 concentration is less than 60 µg/m³.

Given that predicted NO_2 concentrations in 2022 and 2027 are below 60 µg/m³ at all modelled receptors the likelihood of the short-term objective for NO_2 being exceeded is considered low.

5.1.4 Particulate Matter (PM_{10})

Predicted annual mean concentrations for PM_{10} in 2022 and 2027 are provided in Table 10.

***Table 10** – Predicted PM_{10} Concentrations, Annual Mean (µg/m3)*

The ADMS predictions for annual mean PM_{10} concentrations in 2022 and 2027 indicate that the annual mean objective (40 µg/m³) would be achieved at all the modelled receptor locations.

The maximum number of days when PM_{10} concentrations are more than 50 µg/m³ is 0, less than the 35 exceedances allowed in the regulations.

Receptor ID	2022	2027
	GF	GF
R1	12.28	12.36
R2	12.25	12.3
R3	12.13	12.24
R4	12.2	12.31
Objective	40	

[21] Analysis of Relationship between 1-Hour and Annual Mean Nitrogen Dioxide at UK Roadside and Kerbside Monitoring Sites, Laxen and Marner, 2003

6. AIR QUALITY NEUTRAL ASSESSMENT

6.1 Introduction

Being "air quality neutral" assesses a development's energy and transport impacts to ensure that new developments do not lead to further deterioration of existing poor air quality by heating choices or increasing traffic flow to an extent that would create air pollution issues to local residents.

While not in London, this air quality neutral assessment has followed the methodology outlined in the London Planning Guidance[22] as this provides up to date and best practice guidance on assessing a developments Air Quality Neutral status. Within these documents, benchmarks have been provided in relation to building and transport emissions, together with a methodology for calculating the building and transport related emissions for a particular development.

6.2 Building Emissions

The Building Emissions Benchmarks (BEBs) for the land use category applicable to residential properties are provided in Table 11. Emissions of PM10 and PM2.5 have not been considered as oil and/or solid fuel are not proposed to be used at the development. The development will be using Electric Heating and therefore will have an overall NOx and PM10 local contribution of zero. This is because these systems to not produce local NOx or PM10 emissions.

Table 11 *– Building Emissions Benchmarks (BEBs)*

Land Use Class	NOx (gNOx/m²/annum)
C3 (Residential)	3.5

Using the method described within the London Plan Guidance, the site-specific benchmarked emissions have been calculated using the emission rate in Table 11. These are summarised in Table 12.

Table 12 *– Calculation of Benchmarked NOx Emissions Using Building Emissions*

Land Use	Dwellings	Building Emissions Benchmarks (gNOx/Dwellings/annum)	Benchmarked Emissions (gNOx/annum)
C3	22	3.5	77

Table 13 *– Calculation of Total Building NOx Emissions*

Land Use	Estimated Gas Usage (MWh/annum)	NOx Emission Rate (mg / KWh)	Total Building Emissions (mg/annum)
C3	0	40	0

22 https://www.london.gov.uk/sites/default/files/air_quality_neutral_lpg_-_consultation_draft_0.pdf

Based on the comparison between the total building emissions and Building Emissions Benchmarks (see Table 14) the proposed development meets the air quality neutral requirements, and no mitigation is required.

Table 14 *– Comparison of Total Building NOx Emissions and Building Emissions Benchmarks*

Total Benchmarked Emissions (gNOx/annum)	Total Building Emissions (mg/annum)	Difference
77	0	-77

6.3 Transport Emissions

The Transport Emissions Benchmarks (TEBs) are calculated by multiplying the relevant tip rate (by location) by the number of residential properties.

As there are no new parking spaces, with 7 existing spaces being retained for development. The Transport contribution for the proposed development with respect to TEBs is therefore negligible as there is no change from existing to proposed.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 Impact of Vehicle Emissions

The predicted concentrations of PM_{10} in all modelled years are below the relevant objectives. Predicted concentrations at all the modelled receptors fall within APEC Category A, which states that there are "no air quality [PM_{10}] grounds for refusal, however, mitigation of any emissions should be considered".

The ADMS predictions for annual mean NO_2 concentrations in 2022 and 2027 indicate that the annual mean concentration would not be exceeded along any of the façades of the new development. Predicted concentrations at these receptors fall within APEC Category A.

7.2 Building Mitigation

Based on the results of this assessment there is no need to consider building mitigation.

7.3 Overall Summary

Based on the findings of this report relating to the Air Quality levels at the proposed development, it is considered that Air Quality does not present a constraint for the grant of planning permission.