Air Quality Assessment

Pinner Road, Northwood

Client: Polaris Property Developments Limited

Reference: 5673r3

Date: 9th August 2023

Report Issue

Report Title: Air Quality Assessment - Pinner Road, Northwood

Report Reference: 5673

Field	Report Version			
	1	2	3	4
Prepared by	Emily Macey	Emily Macey	Emily Macey	
Position	Senior Air Quality Consultant	Senior Air Quality Consultant	Senior Air Quality Consultant	
Reviewed by	Amelia Leatherbarrow-Hurst	Amelia Leatherbarrow-Hurst	Amelia Reed	
Position	Senior Air Quality Consultant	Senior Air Quality Consultant	Principal Air Quality Consultant	
Issued by	Jethro Redmore	Jethro Redmore	Jethro Redmore	
Position	Director	Director	Director	
Date of Issue	5th July 2022	5th July 2022	9th August 2023	
Comments	Draft for comment	Updated following client comment	Amended site layout	

Serendipity Labs, Building 7, Exchange Quay, Salford, M5 3EP

info@red-env.co.uk | 0161 706 0075 | www.red-env.co.uk

Executive Summary

Redmore Environmental Ltd was commissioned by Polaris Property Developments Ltd to undertake an Air Quality Assessment in support of a planning application for a residential-led development on land off Pinner Road, Northwood.

The proposals have the potential to cause air quality impacts as a result of fugitive dust emissions during construction and road traffic exhaust emissions associated with vehicles travelling to and from the site during operation, as well as expose future occupants to any existing air quality issues. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions, consider site suitability for the proposed end-use and assess potential effects as a result of the scheme.

Potential construction phase air quality impacts from fugitive dust emissions were assessed as a result of demolition, earthworks, construction and trackout activities. It is considered that the use of good practice control measures would provide suitable mitigation for a development of this size and nature and reduce potential impacts to an acceptable level.

Potential impacts during the operational phase of the proposals may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the development. Additionally, future occupants may be exposed to any existing air quality issues. Dispersion modelling was therefore undertaken in order to predict pollutant concentrations at sensitive locations as a result of emissions from the local highway network both with and without the development in place. Results were subsequently verified using local monitoring data.

Review of the dispersion modelling results indicated that air quality impacts as a result of traffic generated by the development were not predicted to be significant at any sensitive location in the vicinity of the site.

The results of the assessment also demonstrated that predicted pollution levels were below the relevant criteria at the proposed building façade. As such, the site is considered suitable for the proposed end-use from an air quality perspective.

Potential emissions from the development were reviewed in the context of the air quality neutral requirements of the London Plan. The results indicated an acceptable level of building and transport emissions from the development. As such, the proposals were considered to be air

quality neutral. Additionally, a number of mitigation measures are to be implemented within the scheme to further offset emissions associated with the operational phase. It is considered with these measures in place the development goes above achieving air quality neutral.

Based on the assessment results, air quality factors are not considered a constraint to planning consent for the development.

Table of Contents

Appendices

1.0 INTRODUCTION

1.1 Background

1.1.1 Redmore Environmental Ltd was commissioned by Polaris Property Developments Ltd to undertake an Air Quality Assessment in support of a planning application for a residential-led development on land off Pinner Road, Northwood.

1.1.2 The proposals have the potential to cause air quality impacts during construction and operation, as well as expose future occupants to any existing air quality issues at the site. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions, consider location suitability for the proposed end-use and assess potential effects as a result of the scheme.

1.2 Site Location and Context

1.2.1 The site is located on land off Pinner Road, Northwood, at approximate National Grid Reference (NGR): 509699, 190716. Reference should be made to Figure 1 for a map of the site and surrounding area.

1.2.2 The proposals comprise demolition of the existing structure and subsequent construction of a part-two, part-three storey building to provide commercial space and car parking at ground floor level and nine residential units at first floor and above.

1.2.3 The development has the potential to cause air quality impacts at sensitive locations. These may include fugitive dust emissions associated with construction works and road traffic exhaust emissions from vehicles travelling to and from the scheme during the operational phase. The proposals may also introduce future occupants to any existing air quality issues at the site. An Air Quality Assessment was therefore undertaken in order to determine baseline conditions, consider location suitability for the proposed end use and consider potential effects as a result of the proposals. This is detailed in the following report.

2.0 LEGISLATION AND POLICY

2.1 Legislation

2.1.1 The Air Quality Standards Regulations (2010) and subsequent amendments include Air Quality Limit Values (AQLVs) for the following pollutants:

- Nitrogen dioxide (NO_2);
- Sulphur dioxide;
- Lead;
- Particulate matter with an aerodynamic diameter of less than 10µm (PM_{10});
- Particulate matter with an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$);
- Benzene; and,
- Carbon monoxide.

2.1.2 Air Quality Target Values have also been provided for several additional pollutants. It should be noted that the AQLV for $PM_{2.5}$ stated in the Air Quality Standards Regulations (2010) was amended in the Environment (Miscellaneous Amendments) (EU Exit) Regulations (2020).

2.1.3 The Air Quality Strategy (AQS) was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published on 28th April 2023[1]. The document contains standards, objectives and measures for improving ambient air quality, including a number of Air Quality Objectives (AQOs). These are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

2.1.4 The Environmental Improvement Plan 2023[2] was published in January 2023, providing long term and Interim Targets in order to reduce population exposure to $PM_{2.5}$. The concentration target for 2040 was subsequently adopted in the Environmental Targets (Fine Particulate Matter) (England) Regulations (2023).

[1] The AQS, DEFRA, 2023.

[2] The Environmental Improvement Plan 2023, DEFRA, 2023.

2.1.5 Table 1 presents the AQOs, AQLV and Interim Target for pollutants considered within this assessment.

Table 1 Air Quality Objectives/ Air Quality Limit Values/Interim Target

Pollutant	Air Quality Objectives/ Limit Value	
	Concentration (µg/m³)	Averaging Period
NO_2	40	Annual mean
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
PM_{10}	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum
$PM_{2.5}$	20[(a)]	Annual mean
	12[(b)]	Annual mean

Note: (a) Current AQLV

(b) Interim Target of 12µg/m³ to be achieved by end of January 2028.

2.1.6 Table 2 summarises the advice provided in the Greater London Authority (GLA) guidance[3] on where the AQOs for pollutants considered within this report apply.

Table 2 Examples of Where the Air Quality Objectives Apply

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
Annual mean	All locations where members of the public might be regularly exposed Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term

[3] London Local Air Quality Management (LLAQM), Technical Guidance 2019 (LLAQM.TG (2019)), GLA, 2019.

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
24-hour mean	All locations where the annual mean objective would apply, together with hotels	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

2.2 Local Air Quality Management

2.2.1 Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure, as summarised in Table 2, are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA the LA is required to produce an Air Quality Action Plan, the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.3 Dust

2.3.1 The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations (2016), such as construction sites, is that provided in Section 79 of Part III of the Environmental Protection Act (1990). The Act defines nuisance as:

> "any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance."

2.3.2 Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (1990). The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practicable means.

2.4 National Planning Policy

2.4.1 The revised National Planning Policy Framework[4] (NPPF) was published in July 2021 and sets out the Government's planning policies for England and how these are expected to be applied.

2.4.2 The purpose of the planning system is to contribute to the achievement of sustainable development. In order to ensure this, the NPPF recognises three overarching objectives, including the following of relevance to air quality:

> "c) An environmental objective - to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

2.4.3 Chapter 15 of the NPPF details objectives in relation to conserving and enhancing the natural environment. It states that:

> "Planning policies and decisions should contribute to and enhance the natural and local environment by:
>
> […]
>
> e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of

[4] NPPF, Ministry of Housing, Communities and Local Government, 2021.

soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality […]"

2.4.4 The NPPF specifically recognises air quality as part of delivering sustainable development and states that:

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

2.4.5 The implications of the NPPF have been considered throughout this assessment.

2.5 National Planning Practice Guidance

2.5.1 The National Planning Practice Guidance[5] (NPPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 and updated on 1st November 2019 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

1. What air quality considerations does planning need to address?
2. What is the role of plan-making with regard to air quality?
3. Are air quality concerns relevant to neighbourhood planning?
4. What information is available about air quality?
5. When could air quality considerations be relevant to the development management process?

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

6. What specific issues may need to be considered when assessing air quality impacts?
7. How detailed does an air quality assessment need to be?
8. How can an impact on air quality be mitigated?

2.5.2 These were reviewed and the relevant guidance considered as necessary throughout the undertaking of this assessment.

2.6 Local Planning Policy

The London Plan

2.6.1 The London Plan 2021[6] is the Spatial Development Strategy for Greater London. It sets out a framework for how London will develop over the next 20-25 years and the Mayor's vision for Good Growth. Review of this document indicated the following of relevance to this report:

> "Policy SI 1 - Improving Air Quality
>
> A. Development plans, through relevant strategic, site specific and area-based policies should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality.
>
> B. To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed.
> 1. Development proposals should not:
> a) lead to further deterioration of existing poor air quality
> b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedence of legal limits
> c) create unacceptable risk of high levels of exposure to poor air quality.
>
> 2. In order to meet the requirements of Part 1, as a minimum:
> a) development proposals must be at least Air Quality Neutral

[6] The London Plan March 2021, GLA, 2021.

b) development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retro-fitted mitigation measures.
c) major development proposals must be submitted with an Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of B1
d) development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people, should demonstrate that design measures have been used to minimise exposure.

C. Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating:

a) How proposals have considered ways to maximise benefits to local air quality, and
b) What measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this.

D. In order to reduce the impact on air quality during the construction and demolition phase development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance.

E. Development proposals should ensure that where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of development on local air quality acceptable, this is done on-site. Where it can be demonstrated that emissions cannot be further reduced by on-site measures, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated within the area affected by the development."

2.6.2 The requirements of these policies have been considered throughout this Air Quality Assessment.

Local Plan

2.6.3 The Local Plan for the London Borough of Hillingdon (LBoH) is provided in two parts, the Hillingdon Local Plan: Part 1 - Strategic Policies[7] and the Hillingdon Local Plan: Part 2 Development Management Policies[8], adopted in November 2012 and January 2020, respectively.

2.6.4 A review of the Hillingdon Local Plan: Part 1 - Strategic Policies indicated the following policy in relation to air quality that is relevant to this assessment:

> "EM8: Land, Water, Air and Noise
>
> […]
>
> All developments should not cause deterioration in the local air quality levels and should ensure the protection of both existing and new sensitive receptors.
>
> All major development within the AQMA should demonstrate air quality neutrality (no worsening impacts) where appropriate; actively contribute to the promotion of sustainable transport measures such as vehicle charging points and the increased provision for vehicles with cleaner transport fuels; deliver increased planting through soft landscaping and living walls and roofs; and provide a management plan for ensuring air quality impacts can be kept to a minimum.
>
> The council seeks to reduce the levels of pollutants referred to in the Government's National Air Quality Strategy and will have regard to the Mayor's Air Quality Strategy. London Boroughs should also take account of the findings of the Air Quality Review and Assessments and Actions plans, in particular where AQMAs have been designated.

7 Hillingdon Local Plan: Part 1 Strategic Policies, LBoH, 2012.

8 Hillingdon Local Plan: Part 2 Development Management Policies, LBoH, 2020.

The Council has a network of Air Quality Monitoring stations but recognises that this can be widened to improve understanding of air quality impacts. The Council may therefore require new major development in an AQMA to fund additional air quality monitoring stations to assist in managing air quality improvements."

2.6.5 A review of the Hillingdon Local Plan: Part 2 Development Management Policies indicated the following policies of relevance to this assessment:

"Policy DEMI 14: Air Quality

A) Development proposals should demonstrate appropriate reductions in emissions to sustain compliance with and contribute towards meeting EU limit values and national air quality objectives for pollutants.

B) Development proposals should, as a minimum:

i) be at least "air quality neutral";
ii) include sufficient mitigation to ensure there is no unacceptable risk from air pollution to sensitive receptors, both existing and new; and
iii) actively contribute towards the improvement of air quality, especially within the Air Quality Management Area."

"Policy DMT 1: Managing Transport Impacts

Development proposals will be required to meet the transport needs of the development and address its transport impacts in a sustainable manner. In order for developments to be acceptable they are required to:

[…]

v) have no significant adverse transport or associated air quality and noise impacts on the local and wider environment, particularly on the strategic road network.

[…]."

"Policy DMT 2: Highways Impacts

Development proposals must ensure that:

[…]

ii) they do not contribute to the deterioration of air quality, noise or local amenity or safety of all road users and residents;

[…]."

2.6.6 The above policies were considered throughout the assessment as necessary.

3.0 METHODOLOGY

3.1 Introduction

3.1.1 The proposed development has the potential to cause air quality impacts during the construction and operational phases, as well as expose future occupants to any existing air quality issues. These issues have been assessed in accordance with the following methodology, which was agreed with Dr Ana Grossinho, Director at Air Quality Experts Global Ltd, on behalf of LBoH, on 29th June 2022.

3.2 Construction Phase Assessment

3.2.1 There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Mayor of London's 'The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance'[9].

3.2.2 Activities on the proposed construction site have been divided into four types to reflect their different potential impacts. These are:

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

3.2.3 The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

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

3.2.4 The assessment steps are detailed below.

[9] The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance, The Mayor of London, 2014.

Step 1

3.2.5 Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the boundary or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment proceeds to Step 2. Additionally, should ecological receptors be identified within 50m of the site or the construction vehicle route up to 500m from the site entrance, then the assessment also proceeds to Step 2.

3.2.6 Should sensitive receptors not be present within the relevant distances then **negligible** impacts would be expected and further assessment is not necessary.

Step 2

3.2.7 Step 2 assesses the risk of potential dust impacts. A site is allocated a risk category based on two factors:

- The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large (Step 2A); and,
- The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (Step 2B).

3.2.8 The two factors are combined in Step 2C to determine the risk of dust impacts without mitigation applied.

3.2.9 Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table 3.

Table 3 Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Demolition	• Total volume of building to be demolished greater than 50,000m^3 • Potentially dusty material (e.g. concrete) • On-site crushing and screening • Demolition activities more than 20m above ground level

Magnitude	Activity	Criteria
	Earthworks	• Total site area greater than 10,000m^2 • Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) • More than 10 heavy earth moving vehicles active at any one time • Formation of bunds greater than 8m in height • More than 100,000 tonnes of material moved
	Construction	• Total building volume greater than 100,000m^3 • On site concrete batching • Sandblasting
	Trackout	• More than 50 Heavy Duty Vehicle (HDV) trips per day • Potentially dusty surface material (e.g. high clay content) • Unpaved road length greater than 100m
Medium	Demolition	• Total volume of building to be demolished between 20,000m^3 and 50,000m^3 • Potentially dusty construction material • Demolition activities 10m to 20m above ground level
	Earthworks	• Total site area 2,500m^2 to 10,000m^2 • Moderately dusty soil type (e.g. silt) • 5 to 10 heavy earth moving vehicles active at any one time • Formation of bunds 4m to 8m in height • Total material moved 20,000 tonnes to 100,000 tonnes
	Construction	• Total building volume 25,000m^3 to 100,000m^3 • Potentially dusty construction material (e.g. concrete) • On site concrete batching
	Trackout	• 10 to 50 HDV trips per day • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50m to 100m
Small	Demolition	• Total volume of building to be demolished less than 20,000m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber) • Demolition activities less than 10m above ground and during wetter months

Magnitude	Activity	Criteria
	Earthworks	• Total site area less than 2,500m^2 • Soil type with large grain size (e.g. sand) • Less than 5 heavy earth moving vehicles active at any one time • Formation of bunds less than 4m in height • Total material moved less than 20,000 tonnes • Earthworks during wetter months
	Construction	• Total building volume less than 25,000m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	• Less than 10 HDV trips per day • Surface material with low potential for dust release • Unpaved road length less than 50m

3.2.10 Step 2B defines the sensitivity of the area around the development to potential dust impacts. The influencing factors are shown in Table 4.

Table 4 Construction Dust - Examples of Factors Defining Sensitivity of an Area

Receptor Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	• Users expect high levels of amenity • High aesthetic or value property • People expected to be present continuously for extended periods of time • Locations where members of the public are exposed over a time period relevant to the AQO for PM_{10}. e.g. residential properties, hospitals, schools and residential care homes	• Internationally or nationally designated site e.g. Special Area of Conservation
Medium	• Users would expect to enjoy a reasonable level of amenity • Aesthetics or value of their property could be diminished by soiling • People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work	• Nationally designated site e.g. Sites of Special Scientific Interest

Receptor Sensitivity	Examples	
	Human Receptors	Ecological Receptors
Low	• Enjoyment of amenity would not reasonably be expected • Property would not be expected to be diminished in appearance • Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, shopping streets, playing fields, farmland, short term car parks and roads	• Locally designated site e.g. Local Nature Reserve

3.2.11 The guidance also provides the following factors to consider when determining the sensitivity of an area to potential dust impacts:

- Any history of dust generating activities in the area;
- The likelihood of concurrent dust generating activity on nearby sites;
- Any pre-existing screening between the source and receptors;
- Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which works will take place;
- Any conclusions drawn from local topography;
- Duration of the potential impact, as a receptor may become more sensitive over time; and,
- Any known specific receptor sensitivities which go beyond the classifications given in the document.

3.2.12 These factors were considered in the undertaking of this assessment.

3.2.13 The criteria for determining the sensitivity of the area to dust soiling effects on people and property is summarised in Table 5.

Table 5 Construction Dust - Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

3.2.14 Table 6 outlines the criteria for determining the sensitivity of the area to human health impacts.

Table 6 Construction Dust - Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Background Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
High	Greater than 32µg/m^3	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m^3	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m^3	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	Less than 24µg/m^3	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	-	More than 10	High	Medium	Low	Low	Low
	-	1- 10	Medium	Low	Low	Low	Low

Receptor Sensitivity	Background Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
Low	-	1 or more	Low	Low	Low	Low	Low

3.2.15 Table 7 outlines the criteria for determining the sensitivity of the area to ecological impacts.

Table 7 Construction Dust - Sensitivity of the Area to Ecological Impacts

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

3.2.16 Step 2C combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts.

3.2.17 Table 8 outlines the risk category from demolition activities.

Table 8 Construction Dust - Dust Risk Category from Demolition Activities

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Medium
Medium	High	Medium	Low
Low	Low	Low	Negligible

3.2.18 Table 9 outlines the risk category from earthworks and construction activities.

Table 9 Construction Dust - Dust Risk Category from Earthworks and Construction Activities

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

3.2.19 Table 10 outlines the risk category from trackout activities.

Table 10 Construction Dust - Dust Risk Category from Trackout Activities

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Low	Negligible
Low	Low	Low	Negligible

Step 3

3.2.20 Step 3 requires the identification of site specific mitigation measures within the Mayor of London's guidance[10] to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with **negligible** risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

Step 4

3.2.21 Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. For almost all construction activity, the aim should be to control effects through the use of

[10] The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance, The Mayor of London, 2014.

effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be **not significant**.

3.2.22 The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. The Mayor of London's guidance[11] suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix 2.

3.3 Operational Phase Assessment

3.3.1 The development has the potential to affect existing air quality as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site, as well as expose future occupants to any existing air quality issues. Potential impacts have been defined by predicting pollutant concentrations at sensitive locations using dispersion modelling for the following scenarios:

- 2019 - Verification;
- Opening year Do-Minimum (DM) (predicted traffic flows in 2024 should the proposals not proceed); and,
- Opening year Do-Something (DS) (predicted traffic flows in 2024 should the proposals be completed).

3.3.2 Reference should be made to Appendix 1 for assessment input data and details of the verification process.

Road Vehicle Exhaust Emission Impacts

3.3.3 Locations sensitive to potential changes in off-site pollutant concentrations were identified within 200m of the highway network in accordance with the guidance provided within the Design Manual for Roads and Bridges (DMRB)[12] on the likely limits of pollutant dispersion from road sources. The criteria provided within GLA guidance[13] on where the AQOs apply, as summarised in Table 2, was worst-case receptor positions in the

[11] The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance, The Mayor of London, 2014.

[12] LA 105: Air quality, Highways England, 2019.

[13] London Local Air Quality Management (LLAQM), Technical Guidance 2019 (LLAQM.TG (19)), GLA, 2019.

vicinity of links likely to be affected by changes in traffic flows as a result of the development.

3.3.4 The significance of predicted air quality impacts was determined in accordance with the guidance provided within the Institute of Air Quality Management (IAQM) document 'Land-Use Planning & Development Control: Planning for Air Quality'[14]. Using this methodology impacts were defined based on the interaction between the predicted pollutant concentration from the DS scenario and the magnitude of change between the DM and DS scenarios, as outlined in Table 11.

Table 11 Road Vehicle Exhaust Emissions - Significance of Impact

Concentration at Receptor in Assessment Year	Predicted Concentration Change as Proportion of AQO (%)			
	1	2 - 5	6 - 10	> 10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76 - 94% of AQO	Negligible	Slight	Moderate	Moderate
95 - 102% of AQO	Slight	Moderate	Moderate	Substantial
103 - 109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

3.3.5 The matrix shown in Table 11 is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which makes it clearer which cell the impact falls within. It should be noted that changes of 0%, i.e. less than 0.5%, are described as **negligible**.

3.3.6 Following the prediction of impacts at discrete receptor locations, the IAQM document[15] provides guidance on determining the overall air quality impact significance of the operation of a development. The following factors are identified for consideration by the assessor:

- The existing and future air quality in the absence of the development;
- The extent of current and future population exposure to the impacts; and,

[14] Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

[15] Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

3.3.7 The IAQM guidance states that an assessment must reach a conclusion on the likely significance of the predicted impact. Where the overall effect is **moderate** or **substantial**, the effect is likely to be considered **significant**, whilst if the impact is **slight** or **negligible**, the impact is likely to be considered **not significant**. It should be noted that this is a binary judgement of either it is **significant** or it is **not significant**.

3.3.8 The determination of significance relies on professional judgement and reasoning has been provided as far as practicable. The IAQM guidance[16] suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix 2.

Potential Future Exposure

3.3.9 The proposal has the potential to expose future occupants to elevated pollutant levels. In order to assess NO_2, PM_{10} and $PM_{2.5}$ concentrations across the development site, detailed dispersion modelling was undertaken. Reference should be made to Appendix 1 for a full description of the assessment input data.

3.3.10 The results of the assessment were compared against the Air Pollution Exposure Criteria (APEC) contained within the London Councils Air Quality and Planning Guidance[17]. These are outlined in Table 12 and allow determination of the significance of predicted pollution levels and associated exposure.

Table 12 Future Exposure Assessment Criteria

Category	Applicable Range		Recommendation
	Annual Mean NO_2 and PM_{10}	24-hour PM_{10}	
APEC - A	Below 5% of the annual mean AQO	> 1-day less than AQO	No air quality grounds for refusal; however, mitigation of any emissions should be considered

16 Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

17 London Councils Air Quality and Planning Guidance, London Councils, 2007.

Category	Applicable Range		Recommendation
	Annual Mean NO_2 and PM_{10}	24-hour PM_{10}	
APEC - B	Between 5% below or above the annual mean AQO	Between 1-day above or below AQO	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered e.g., Maximise distance from pollutant source, proven ventilation systems, parking considerations, winter gardens, internal layout considered and internal pollutant emissions minimised
APEC - C	Above 5% of the annual mean AQO	> 1-day more than AQO	Refusal on air quality grounds should be anticipated, unless the LA has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated. Worker exposure in commercial/industrial land uses should be considered further. Mitigation measures must be presented with air quality assessment, detailing anticipated outcomes of mitigation measures

3.3.11 It should be noted that a significant area of London would fall under APEC - C due to high NO_2 concentrations throughout the city. As such, a presumption against planning consent in these locations may result in large areas of land becoming undevelopable and prevent urban regeneration. The inclusion of suitable mitigation measures to protect future site users is therefore considered an appropriate way to progress sustainable schemes in these locations and has been considered within this assessment.

4.0 BASELINE

4.1 Introduction

4.1.1 Existing air quality conditions in the vicinity of the proposed development site were identified in order to provide a baseline for assessment. These are detailed in the following Sections.

4.2 Local Air Quality Management

Air Quality Management Areas

4.2.1 As required by the Environment Act (1995) LBoH has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean NO_2 concentrations are above the AQO within the borough. One AQMA has therefore been declared. This is described as follows:

> "The area from the southern boundary north to the border defined by, the A40 corridor from the western borough boundary, east to the intersection with the Yeading Brook north until its intersection with the Chiltern-Marylebone railway line."

4.2.2 The development is located approximately 1km west of the London Borough of Harrow's (LBoHa) administrative extents. LBoHa has also undertaken Review and Assessment of air quality. This process has indicated that annual mean NO_2 and 24-hour mean PM_{10} concentrations are above the relevant AQOs within the borough. As such, one AQMA has been declared. This is described as follows:

> "The whole borough."

4.2.3 The development is located approximately 4.1km north-east of the LBoH AQMA and 1km west of the LBoHa AQMA. It is considered unlikely the proposals would cause air quality impacts over distances of these magnitudes. As such, the AQMAs have not been considered further in the context of this assessment.

4.2.4 LBoH and LBoHa have concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs. As such, no further AQMAs have been designated.

Air Quality Focus Areas

4.2.5 In association with the GLA, LBoH had identified a number of Air Quality Focus Areas (AQFAs) across the borough, highlighting specific locations where air quality improvements are necessary. The site is located within the Northwood AQFA. As such, there is a requirement for additional mitigation measures to be included within the development in order to reduce potential effects within this sensitive area. This has been considered throughout the assessment.

4.3 Air Quality Monitoring

4.3.1 Monitoring of pollutant concentrations is undertaken by LBoH throughout their area of jurisdiction. Recent NO_2 results recorded in the vicinity of the development are shown in Table 13.

Table 13 Monitoring Results

Monitoring Site		Monitored NO_2 Concentration (µg/m^3)		
		2018	2019	2020
HILL34	177/179 Pinner Road	-(a)	35.9	26.3

Note: (a) monitor commissioned in 2019.

4.3.2 As shown in Table 13, annual mean NO_2 concentrations were below the relevant AQO at HILL34 - 177/179 Pinner Road in recent years. Reference should be made to Figure 2 for a map of the survey position.

4.3.3 Pollutant concentrations during 2020 were lower than previous years due to a reduction in traffic and associated emissions caused by the COVID-19 pandemic. The results should therefore be viewed with caution.

4.3.4 LBoH does not undertake monitoring of PM_{10} or $PM_{2.5}$ within the vicinity of the site.

4.4 Background Pollutant Concentrations

4.4.1 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located in grid square NGR: 509500, 190500. Data for this location was downloaded from the DEFRA website[18] for the purpose of the assessment and is summarised in Table 14.

Table 14 Background Pollutant Concentration Predictions

Pollutant	Predicted Background Pollutant Concentration (µg/m³)		
	2019	2022	2024
NO_2	15.46	13.55	12.57
PM_{10}	14.74	14.06	13.70
$PM_{2.5}$	10.15	9.64	9.36

4.4.2 As shown in Table 14, predicted background NO_2, PM_{10} and $PM_{2.5}$ concentrations are below the relevant AQOs and AQLV at the development site.

4.5 Sensitive Receptors

4.5.1 A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a development. These have been defined for dust and road vehicle exhaust emission impacts in the following Sections.

Construction Phase Sensitive Receptors

4.5.2 Receptors sensitive to potential dust impacts during demolition, earthworks and construction were identified from a desk-top study of the area up to 350m from the development boundary. These are summarised in Table 15.

[18] https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018.

Table 15 Demolition, Earthworks and Construction Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	1 - 10	0
Up to 50	10 - 100	0
Up to 100	More than 100	-
Up to 350	More than 100	-

4.5.3 Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 500m of the site access. These are summarised in Table 16.

Table 16 Trackout Dust Sensitive Receptors

Distance from Site Access Route (m)	Approximate Number of Human Receptors	Approximate Number of Ecological Receptors
Up to 20	More than 100	0
Up to 50	More than 100	0

4.5.4 There are no ecological receptors within 50m of the development boundary or the access route within 500m of the site entrance. As such, ecological impacts have not been assessed further within this report.

4.5.5 A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in Table 17.

Table 17 Additional Area Dust Sensitivity Factors

Guidance	Comment
Whether there is any history of dust generating activities in the area	The baseline study did not indicate any dust generating activities in the local area
The likelihood of concurrent dust generating activity on nearby sites	A review of the planning portal did not indicate any additional development proposals likely to result in concurrent dust generation in the vicinity of the site

Guidance	Comment
Pre-existing screening between the source and the receptors	The Metropolitan London Underground Line is located directly to the south of the site. This is positioned above ground level on a vegetated mound along the southern boundary. This may act as a barrier between emission sources and receptors in this direction
Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place	As shown in Figure 3, the predominant wind bearing at the site is from the south-west. As such, receptors to the north-east of the boundary are most likely to be affected by dust releases
Conclusions drawn from local topography	There are no significant topographical constraints to dust dispersion
Duration of the potential impact, as a receptor may become more sensitive over time	Currently it is unclear as to the duration of the construction phase. However, it is unlikely that it will extend over one year. The sensitivity of nearby receptors is unlikely to change during this time
Any known specific receptor sensitivities which go beyond the classifications given in the document	No specific receptor sensitivities identified during the baseline assessment

4.5.6 Based on the criteria shown in Table 4, the sensitivity of the receiving environment to potential dust impacts was determined as **high**. This was because the identified receptors included residential properties.

4.5.7 The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria shown in Section 3.2, is shown in Table 18.

Table 18 Sensitivity of the Surrounding Area to Potential Dust Impacts

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	Medium	High
Human Health	Low	Low	Low	Medium

Operational Phase Sensitive Receptors

4.5.8 Locations sensitive to potential operational phase road vehicle exhaust emission impacts were identified from a desk-top study and are summarised in Table 19. Receptor heights

were included in order to take account of less sensitive land uses at ground floor level, such as retail space.

Table 19 Operational Phase Road Vehicle Exhaust Emissions Sensitive Receptor Locations

Receptor		NGR (m)		Height (m)
		X	Y	
R1	Residential - Chestnut Avenue	509759.9	190694.0	1.5
R2	Residential - A404 Pinner Road	509731.9	190735.5	3.0
R3	Residential - A404 Pinner Road	509782.4	190714.6	1.5
R4	Residential - A404 Pinner Road	509901.0	190638.9	1.5
R5	Residential - A404 Pinner Road/A4125 High Street	509686.7	190752.5	1.5
R6	Residential - A4125 High Street	509669.7	190777.5	1.5
R7	Residential - A4125 High Street	509696.4	190841.3	1.5
R8	Residential - A4125 High Street	509749.0	190923.9	3.0
R9	Residential - A404 Rickmansworth Road	509566.1	190762.8	1.5
R10	Residential - A404 Rickmansworth Road	509547.1	190801.9	1.5

4.5.9 Reference should be made to Figure 4 for a graphical representation of road vehicle exhaust emissions sensitive receptor locations.

5.0 ASSESSMENT

5.1 Introduction

5.1.1 There is the potential for air quality impacts as a result of the construction and operation of the proposed development. These are assessed in the following Sections.

5.2 Construction Phase Assessment

Step 1

5.2.1 The undertaking of activities such as demolition, excavation, ground works, cutting, construction, concrete batching and storage of materials has the potential to result in fugitive dust emissions throughout the construction phase. Vehicle movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul roads and highway surfaces.

5.2.2 The potential for impacts at sensitive locations depends significantly on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.

5.2.3 The desk-study undertaken to inform the baseline identified a number of sensitive receptors within 350m of the site boundary. As such, a detailed assessment of potential dust impacts was required.

Step 2

Demolition

5.2.4 Demolition will involve clearance of the existing structures on site. It is estimated that the total building volume to be demolished is less than 20,000m^3. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from demolition is therefore **small**.

5.2.5 Table 18 indicates the sensitivity of the area to dust soiling effects on people and property is **medium**. In accordance with the criteria outlined in Table 8, the development is considered to be a **low** risk site for dust soiling as a result of demolition activities.

5.2.6 Table 18 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 8, the development is considered to be a **negligible** risk site for human health impacts as a result of demolition activities.

Earthworks

5.2.7 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. The proposed development site covers an area of less than 2,500m^2. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from earthworks is therefore **small**.

5.2.8 Table 18 indicates the sensitivity of the area to dust soiling effects on people and property is **medium**. In accordance with the criteria outlined in Table 9, the development is considered to be a **low** risk site for dust soiling as a result of earthworks.

5.2.9 Table 18 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 9, the development is considered to be a **negligible** risk site for human health impacts as a result of earthworks.

Construction

5.2.10 The total proposed building volume is estimated to be less than 25,000m^3. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from construction is therefore **small**.

5.2.11 Table 18 indicates the sensitivity of the area to dust soiling effects on people and property is **medium**. In accordance with the criteria outlined in Table 9, the development is considered to be a **low** risk site for dust soiling as a result of construction activities.

5.2.12 Table 18 indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in Table 9, the development is considered to be a

negligible risk site for human health impacts as a result of construction activities.

Trackout

5.2.13 Based on the site area and existing hardstanding, it is anticipated that the unpaved road length will be less than 50m. In accordance with the criteria outlined in Table 3, the magnitude of potential dust emissions from trackout is therefore **small**.

5.2.14 Table 18 indicates the sensitivity of the area to dust soiling effects to people and property is **high**. In accordance with the criteria outlined in Table 10, the development is considered to be a **low** risk site for dust soiling as a result of trackout activities.

5.2.15 Table 18 indicates the sensitivity of the area to human health impacts is **medium**. In accordance with the criteria outlined in Table 10, the development is considered to be a **negligible** risk site for human health impacts as a result of trackout activities.

Summary of the Risk of Dust Effects

5.2.16 A summary of the risk from each dust generating activity is provided in Table 20.

Table 20 Summary of Potential Unmitigated Dust Risks

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	Low	Low
Human Health	Negligible	Negligible	Negligible	Negligible

5.2.17 As indicated in Table 20, the potential risk of dust soiling is **low** from demolition, earthworks, construction and trackout. The potential risk of human health impacts is **negligible** from demolition, earthworks, construction and trackout.

5.2.18 It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location. Risk was predicted based on a worst-case scenario of works being undertaken at the site boundary closest to each sensitive area. Therefore, actual risk is likely to be lower than that predicted during the

majority of the construction phase.

Step 3

5.2.19 The Mayor of London's guidance[19] provides potential mitigation measures to reduce impacts as a result of fugitive dust emissions during the construction phase. These have been adapted for the development site as summarised in Table 21. These may be reviewed prior to the commencement of construction works and incorporated into a Construction Environmental Management Plan if required by the LA.

Table 21 Fugitive Dust Emission Mitigation Measures

Issue	Control Measure
Site management	• Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust issues on the site boundary • Display the head or regional office contact information • Record and respond to all dust and air quality pollutant emissions complaints • Make the complaints log available to the LA upon request • Carry out regular site inspections, record inspection results, and make an inspection log available to the LA upon request • Increase the frequency of site inspections when activities with a high potential to produce dust and emissions and dust are being carried out, and during prolonged dry or windy conditions • Record any exceptional incidents, either on or off the site, and the action taken to resolve the situation is recorded in the log book
Preparing and maintaining the site	• Plan site layout: machinery and dust causing activities should be located away from receptors • Erect solid screens or barriers around dust activities or the site boundary that are, at least, as high as any stockpiles on site
Operating vehicle/machinery and sustainable travel	• Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone • Ensure all Non-Road Mobile Machinery comply with the relevant standards • Ensure all vehicles switch off engines when stationary - no idling vehicles • Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable

[19] The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance, The Mayor of London, 2014.

Issue	Control Measure
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques • Ensure an adequate water supply on the site for effective dust/particulate matter mitigation (using recycled water where possible) • Use enclosed chutes and conveyors and covered skips • Minimise drop heights and use fine water sprays wherever appropriate
Waste management	• Reuse and recycle waste to reduce dust from waste materials • Avoid bonfires and burning of waste materials
Demolition	• Ensure 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
Construction	• Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out
Trackout	• Ensure vehicles entering and leaving site are covered to prevent escape of materials

Step 4

5.2.20 Assuming the relevant mitigation measures outlined in Table 21 are implemented, the residual impacts from all dust generating activities is predicted to be **not significant**, in accordance with the Mayor of London's guidance[20].

5.3 Operational Phase Assessment

5.3.1 Vehicle movements associated with the operation of the proposal will generate exhaust emissions on the local and regional road networks. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site, as well as consider potential exposure of future occupants to AQO and AQLV exceedences.

5.3.2 The assessment considered the following scenarios:

[20] The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance, The Mayor of London, 2014.

- 2019 - Verification;
- 2024 - DM; and,
- 2024 - DS.

5.3.3 The DM scenario (i.e. without development) included baseline traffic data, inclusive of anticipated growth, for the relevant assessment year. The DS scenario (i.e. with development) included baseline traffic data, inclusive of anticipated growth, for the relevant assessment year, in addition to predicted vehicle trips associated with the operation of the proposals.

5.3.4 For the purpose of the assessment traffic data for 2024 was utilised as the development opening year. Air quality is predicted to improve in the future. However, in order to provide a robust assessment, emission factors for 2019 were utilised within the dispersion model. The use of 2024 traffic data and 2019 emission factors is considered to provide a worst-case scenario and therefore a sufficient level of confidence can be placed within the predicted pollution concentrations.

5.3.5 Reference should be made to Appendix 1 for full assessment input details.

Road Vehicle Exhaust Emission Impacts

Predicted Concentrations

5.3.6 Annual mean NO_2 concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 22. Exceedences of the relevant AQO are shown in **bold**.

Table 22 Predicted Annual Mean NO_2 Concentrations

Receptor		Predicted Annual Mean NO_2 Concentration (µg/m^3)		
		DM	DS	Change
R1	Residential - Chestnut Avenue	30.50	30.51	0.01
R2	Residential - A404 Pinner Road	30.53	30.56	0.03
R3	Residential - A404 Pinner Road	35.10	35.12	0.02

Receptor		Predicted Annual Mean NO_2 Concentration (µg/m³)		
		DM	DS	Change
R4	Residential - A404 Pinner Road	31.05	31.06	0.01
R5	Residential - A404 Pinner Road/A4125 High Street	**40.95**	**40.99**	0.04
R6	Residential - A4125 High Street	29.19	29.22	0.03
R7	Residential - A4125 High Street	27.36	27.38	0.02
R8	Residential - A4125 High Street	26.64	26.66	0.02
R9	Residential - A404 Rickmansworth Road	22.80	22.81	0.01
R10	Residential - A404 Rickmansworth Road	24.40	24.41	0.01

5.3.7 As indicated in Table 22, predicted annual mean NO_2 concentrations were below the relevant AQO at nine receptors and above at one position in both scenarios. It should be noted that there are no new predicted exceedences in the DS scenario when compared with the DM.

5.3.8 Reference should be made to Figures 5 and 6 for graphical representations of predicted annual mean NO_2 concentrations throughout the assessment extents for the DM and DS scenarios, respectively.

5.3.9 Annual mean PM_{10} concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 23.

Table 23 Predicted Annual Mean PM_{10} Concentrations

Receptor		Predicted Annual Mean PM_{10} Concentration (µg/m³)		
		DM	DS	Change
R1	Residential - Chestnut Avenue	17.69	17.70	0.00
R2	Residential - A404 Pinner Road	17.54	17.54	0.01
R3	Residential - A404 Pinner Road	18.54	18.55	0.00
R4	Residential - A404 Pinner Road	17.65	17.66	0.00
R5	Residential - A404 Pinner Road/A4125 High Street	19.88	19.89	0.01

Receptor		Predicted Annual Mean PM_{10} Concentration (µg/m³)		
		DM	DS	Change
R6	Residential - A4125 High Street	17.13	17.13	0.01
R7	Residential - A4125 High Street	16.84	16.85	0.00
R8	Residential - A4125 High Street	16.71	16.71	0.00
R9	Residential - A404 Rickmansworth Road	16.09	16.10	0.00
R10	Residential - A404 Rickmansworth Road	16.45	16.46	0.00

5.3.10 As indicated in Table 23, predicted annual mean PM_{10} concentrations were below the relevant AQO at all sensitive receptors in both scenarios.

5.3.11 Reference should be made to Figures 7 and 8 for graphical representations of predicted annual mean PM_{10} concentrations throughout the assessment extents for the DM and DS scenarios, respectively.

5.3.12 The number of days with 24-hour PM_{10} concentrations above 50µg/m³ were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 24.

Table 24 Predicted Number of Days with 24-hour Mean PM_{10} Concentrations above 50µg/m³

Receptor		Predicted Number of Days with 24-hour Mean PM_{10} Concentrations above 50µg/m³ (Days)		
		DM	DS	Change
R1	Residential - Chestnut Avenue	1	1	0
R2	Residential - A404 Pinner Road	1	1	0
R3	Residential - A404 Pinner Road	2	2	0
R4	Residential - A404 Pinner Road	1	1	0
R5	Residential - A404 Pinner Road/A4125 High Street	3	3	0
R6	Residential - A4125 High Street	1	1	0
R7	Residential - A4125 High Street	1	1	0

Receptor		Predicted Number of Days with 24-hour Mean PM_{10} Concentrations above 50µg/m³ (Days)		
		DM	DS	Change
R8	Residential - A4125 High Street	1	1	0
R9	Residential - A404 Rickmansworth Road	0	0	0
R10	Residential - A404 Rickmansworth Road	0	0	0

5.3.13 As indicated in Table 24, the number of days with PM_{10} concentrations above 50µg/m³ was below the permitted number of 35 at all sensitive receptors.

5.3.14 Reference should be made to Figures 9 and 10 for graphical representations of the predicted number of days with PM_{10} concentrations above 50µg/m³ throughout the assessment extents for the DM and DS scenarios, respectively.

5.3.15 Annual mean $PM_{2.5}$ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 25.

Table 25 Predicted Annual Mean $PM_{2.5}$ Concentrations

Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration (µg/m³)		
		DM	DS	Change
R1	Residential - Chestnut Avenue	11.94	11.94	0.00
R2	Residential - A404 Pinner Road	11.84	11.85	0.00
R3	Residential - A404 Pinner Road	12.45	12.45	0.00
R4	Residential - A404 Pinner Road	11.91	11.91	0.00
R5	Residential - A404 Pinner Road/A4125 High Street	13.26	13.26	0.01
R6	Residential - A4125 High Street	11.60	11.61	0.00
R7	Residential - A4125 High Street	11.42	11.42	0.00
R8	Residential - A4125 High Street	11.34	11.34	0.00
R9	Residential - A404 Rickmansworth Road	10.96	10.97	0.00
R10	Residential - A404 Rickmansworth Road	11.18	11.18	0.00

5.3.16 As indicated in Table 25, predicted annual mean $PM_{2.5}$ concentrations were below the relevant AQLV at all sensitive receptors in both scenarios.

5.3.17 Reference should be made to Figures 11 and 12 for graphical representations of the predicted annual mean $PM_{2.5}$ concentrations throughout the assessment extents for the DM and DS scenarios, respectively.

Predicted Impacts

5.3.18 Predicted impacts on annual mean NO_2 concentrations at the sensitive receptor locations are summarised in Table 26.

Table 26 Predicted Impacts - NO_2

Receptor		Predicted Annual Mean NO_2 Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - Chestnut Avenue	76 - 94% of AQO	0	Negligible
R2	Residential - A404 Pinner Road	76 - 94% of AQO	0	Negligible
R3	Residential - A404 Pinner Road	76 - 94% of AQO	0	Negligible
R4	Residential - A404 Pinner Road	76 - 94% of AQO	0	Negligible
R5	Residential - A404 Pinner Road/A4125 High Street	103 - 109% of AQO	0	Negligible
R6	Residential - A4125 High Street	Below 75% of AQO	0	Negligible
R7	Residential - A4125 High Street	Below 75% of AQO	0	Negligible
R8	Residential - A4125 High Street	Below 75% of AQO	0	Negligible
R9	Residential - A404 Rickmansworth Road	Below 75% of AQO	0	Negligible
R10	Residential - A404 Rickmansworth Road	Below 75% of AQO	0	Negligible

5.3.19 As indicated in Table 26, impacts on annual mean NO_2 concentrations as a result of the proposed development were predicted to be **negligible** at all receptors.

5.3.20 Predicted impacts on annual mean PM_{10} concentrations at the sensitive receptor locations are summarised in Table 27.

Table 27 Predicted Impacts - PM_{10}

Receptor		Predicted Annual Mean PM_{10} Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - Chestnut Avenue	Below 75% of AQO	0	Negligible
R2	Residential - A404 Pinner Road	Below 75% of AQO	0	Negligible
R3	Residential - A404 Pinner Road	Below 75% of AQO	0	Negligible
R4	Residential - A404 Pinner Road	Below 75% of AQO	0	Negligible
R5	Residential - A404 Pinner Road/A4125 High Street	Below 75% of AQO	0	Negligible
R6	Residential - A4125 High Street	Below 75% of AQO	0	Negligible
R7	Residential - A4125 High Street	Below 75% of AQO	0	Negligible
R8	Residential - A4125 High Street	Below 75% of AQO	0	Negligible
R9	Residential - A404 Rickmansworth Road	Below 75% of AQO	0	Negligible
R10	Residential - A404 Rickmansworth Road	Below 75% of AQO	0	Negligible

5.3.21 As indicated in Table 27, impacts on annual mean PM_{10} concentrations as a result of the proposed development were predicted to be **negligible** at all receptors.

5.3.22 Predicted impacts on the number of days with 24-hour mean PM_{10} concentrations above 50µg/m^3 at the sensitive receptor locations are summarised in Table 28.

Table 28 Predicted Number of Days with 24-hour Mean PM_{10} Concentrations above 50µg/m³

Receptor		Predicted Number of Days with Concentrations above 50µg/m³	Predicted Change in Number of Days as Proportion of Permitted Number (%)	Impact Significance
R1	Residential - Chestnut Avenue	Below 75% of AQO	0	Negligible
R2	Residential - A404 Pinner Road	Below 75% of AQO	0	Negligible
R3	Residential - A404 Pinner Road	Below 75% of AQO	0	Negligible
R4	Residential - A404 Pinner Road	Below 75% of AQO	0	Negligible
R5	Residential - A404 Pinner Road/A4125 High Street	Below 75% of AQO	0	Negligible
R6	Residential - A4125 High Street	Below 75% of AQO	0	Negligible
R7	Residential - A4125 High Street	Below 75% of AQO	0	Negligible
R8	Residential - A4125 High Street	Below 75% of AQO	0	Negligible
R9	Residential - A404 Rickmansworth Road	Below 75% of AQO	0	Negligible
R10	Residential - A404 Rickmansworth Road	Below 75% of AQO	0	Negligible

5.3.23 As indicated in Table 28, impacts on the number of days with 24-hour mean PM_{10} concentrations above 50µg/m³ as a result of the proposed development were predicted to be **negligible** at all locations.

5.3.24 Predicted impacts on annual mean $PM_{2.5}$ concentrations at the sensitive receptor locations are summarised in Table 29.

Table 29 Predicted Impacts - $PM_{2.5}$

Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration	Predicted Concentration Change as Proportion of AQLV (%)	Impact Significance
R1	Residential - Chestnut Avenue	Below 75% of AQLV	0	Negligible

Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration	Predicted Concentration Change as Proportion of AQLV (%)	Impact Significance
R2	Residential - A404 Pinner Road	Below 75% of AQLV	0	Negligible
R3	Residential - A404 Pinner Road	Below 75% of AQLV	0	Negligible
R4	Residential - A404 Pinner Road	Below 75% of AQLV	0	Negligible
R5	Residential - A404 Pinner Road/A4125 High Street	Below 75% of AQLV	0	Negligible
R6	Residential - A4125 High Street	Below 75% of AQLV	0	Negligible
R7	Residential - A4125 High Street	Below 75% of AQLV	0	Negligible
R8	Residential - A4125 High Street	Below 75% of AQLV	0	Negligible
R9	Residential - A404 Rickmansworth Road	Below 75% of AQLV	0	Negligible
R10	Residential - A404 Rickmansworth Road	Below 75% of AQLV	0	Negligible

5.3.25 As indicated in Table 29, impacts on annual mean $PM_{2.5}$ concentrations as a result of the proposed development were predicted to be **negligible** at all receptor locations.

Potential Future Exposure

5.3.26 The proposed development has the potential to cause the exposure of future occupants to elevated pollution levels. Dispersion modelling was therefore undertaken with the inputs described in Appendix 1 to quantify air quality conditions at the site. Reference should be made to Figures 6, 8, 9 and 11 for graphical representations of annual mean NO_2, annual mean PM_{10}, 24-hour mean PM_{10} and annual mean $PM_{2.5}$ concentrations.

5.3.27 Predicted concentrations above 5% of the annual mean AQO / AQLV are shown in blue on the contour plots. These relate to areas defined as APEC - C within the London Councils Air Quality and Planning Guidance[21]. Predicted concentrations between 5% below and 5% above the AQO are shown in green. These relate to areas defined as APEC - B within the guidance. Predicted concentrations below 5% of the annual mean

[21] London Councils Air Quality and Planning Guidance, London Councils, 2007.

AQO are shown in white on the contour plots. These relate to areas defined as APEC - A within the guidance.

5.3.28 As shown in Figure 6, annual mean NO_2 concentrations were predicted to be below the AQO of 40µg/m^3 at the proposed building façade. The maximum level was 35.51µg/m^3, which is classified as APEC - A in accordance London Councils Air Quality and Planning Guidance[22].

5.3.29 As shown in Figure 8, annual mean PM_{10} concentrations were predicted to be below the AQO of 40µg/m^3 at the proposed building façade. The maximum level was 18.66µg/m^3, which is classified as APEC - A in accordance with the London Councils Air Quality and Planning Guidance[23].

5.3.30 As show in Figure 10, the number of days with PM_{10} concentrations greater than 50µg/m^3 was predicted to be below the permitted number of 35 at the proposed building façade. Levels are classified as APEC - A in accordance with the London Councils Air Quality and Planning Guidance[24].

5.3.31 As shown in Figure 12, annual mean $PM_{2.5}$ concentrations were predicted to be below the AQLV of 20µg/m^3 at the proposed building façade. The maximum level was 12.52µg/m^3, which is classified as APEC - A in accordance with the London Councils Air Quality and Planning Guidance[25]. This is slightly above the Interim Target of 12µg/m^3. However, it is anticipated that vehicle exhaust emission rates and background concentrations will improve in future years through local and national policy initiatives. Therefore, annual mean $PM_{2.5}$ concentrations will reduce across the proposed development site by the Interim Target compliance year of 2028.

5.3.32 Based on the assessment results, the site has been classified as APEC - A. It is therefore considered suitable for the proposed end-use from an air quality perspective without the inclusion of mitigation.

22 London Councils Air Quality and Planning Guidance, London Councils, 2007.

23 London Councils Air Quality and Planning Guidance, London Councils, 2007.

24 London Councils Air Quality and Planning Guidance, London Councils, 2007.

25 London Councils Air Quality and Planning Guidance, London Councils, 2007.

Overall Impact Significance

5.3.33 The overall significance of operational phase road traffic emission impacts was determined as **negligible**. This was based on the overall predicted impacts at discrete receptor locations and the considerations outlined previously. Further justification is provided in Table 30.

Table 30 Overall Operational Phase Road Vehicle Exhaust Emissions Impact Significance

Guidance	Comment
The existing and future air quality in the absence of the development	Predicted annual mean NO_2 concentrations were below the AQO at nine receptors and above at one position in the DM scenario Predicted annual and 24-hour mean PM_{10} and annual mean $PM_{2.5}$ concentrations were below the relevant AQOs and AQLV at all sensitive receptors in the DM scenario. The predicted concentrations are considered unlikely to change significantly in the absence of the proposals given the established nature of the area
The extent of current and future population exposure to the impacts	The development is not predicted to affect the population exposed to exceedences of the AQOs
The influence and validity of any assumptions adopted when undertaking the prediction of impacts	The assessment assumed that vehicle exhaust emission rates and pollutant background concentrations will not reduce in future years. This provides worst-case results when compared with DEFRA and National Highways methodologies Due to the adopted assumptions it is considered the presented results are sufficiently robust for an assessment of this nature

5.3.34 The IAQM guidance[26] states that only if the impact is greater than **slight**, the effect is considered **significant**. As impacts were predicted to be **negligible**, overall effects are considered **not significant**, in accordance with the stated methodology.

[26] Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

6.0 AIR QUALITY NEUTRAL ASSESSMENT

6.1 Introduction

6.1.1 The London Plan[27] requires that all developments are 'air quality neutral' to ensure proposals do not lead to further deterioration of existing poor air quality. In order to support the policy, guidance[28] has been produced by the GLA. The document provides a methodology for determining potential emissions from a development and benchmark values for comparison purposes. Where the benchmark is exceeded then action is required, either locally or by way of off-setting.

6.1.2 The Air Quality Neutral Assessment for the proposed development is outlined below.

6.2 Building Emissions

6.2.1 Heating and hot water for the development will be provided by natural gas fired ecoTEC pro 24 combination boilers. The NO_x emission concentration achieved by these boilers is 27mg/kWh, which is lower than the 40mg/kWh criteria outlined in the guidance[29]. As the development is classified as **minor** in accordance with the Ministry of Housing, Communities and Local Government[30], the proposals are considered air quality neutral from a building emissions perspective.

6.3 Transport Emissions

6.3.1 The Transport Emissions Benchmark (TEB) has been calculated based on the values provided in the 'Air Quality Neutral' guidance[31]. This is shown in Table 31.

27 The London Plan March 2016, GLA, 2016.

28 London Plan Guidance: Air Quality Neutral, GLA, 2023.

29 London Plan Guidance: Air Quality Neutral, GLA, 2023

30 Major and Minor Developments, England, Ministry of Housing, Communities and Local Government, 2015.

31 London Plan Guidance: Air Quality Neutral, GLA, 2023.

Table 31 Benchmark Trip Rate

Land Use	No. dwellings/ Gross Internal Area (GIA) (m^2)	Benchmark Trip Rate	Total Benchmark Trip Rate (trips/year)
Residential	9	447	4,023
Commercial	123.6	274	33,866
Total TEB			37,889

6.3.2 As shown in Table 31, the TEB for the development is 37,889 trips per year.

6.3.3 Information provided by Iceni Projects, the Transport Consultants for the project, indicated that the development is predicted to generate 10,585 Light Duty Vehicles (LDV) trips per annum.

6.3.4 The total annual development trip rate of 10,585 is lower than the TEB of 37,889. As such, the proposals are considered to be air quality neutral from a transport emission perspective and no further mitigation is required.

6.4 Summary

6.4.1 Potential emissions from the development were assessed in order to determine compliance with the air quality neutral requirements of the London Plan.

6.4.2 The results indicated an acceptable level of building and transport emissions from the scheme. As such, the proposed development is considered to be air quality neutral.

6.5 Additional Mitigation

6.5.1 As demonstrated above, the proposals are considered to be air quality neutral. However, consultation[32] with LBoH indicated that the development should achieve better than air quality neutral and consider an air quality positive approach due to the location of the site within the Northwood AQFA. As such, the following mitigation measures are to be implemented as part of the proposals:

[32] Email Consultation, Dr Ana Grossinho, Air Quality Experts Global Ltd, 29th June 2022.

- One Electric Vehicle (EV) charging point per parking space to help encourage the uptake of Ultra Low Emission Vehicles (ULEVs); and,
- The provision of 18 secure cycle spaces for residents and a Sheffield Stand for two visitor bicycles to encourage sustainable transport and also help minimise reliance on private vehicles during operation.

6.5.2 In addition to the above, further measures have been identified in order to minimise air quality impacts during the operational phase. These are as follows:

- Residential apartments have been located away from emission sources as far as practicable through the provision of less sensitive land uses in the form of a commercial unit and car parking at ground level;
- The development is located in an area served by good public transport links, including bus services to Harrow and Northwood with the nearest bus stops located approximately 25m Weston on Pinner Road;
- The site is located within walking distance to Northwood train station providing access to London Underground services;
- The site is also located within walking distance of a range of existing amenities including convenience stores, doctors surgery and schools. This will help minimise reliance on private vehicles during operation; and,
- Pedestrian infrastructure in the vicinity of the site is provided to a good standard. Footpaths are present on both sides of Pinner Road which would encourage the use of walking to nearby facilities.

6.5.3 The above measures will help to minimise air quality impacts associated with road traffic emissions and are considered appropriate for a development of this size and nature. It is considered with these measures in place, the proposals go above achieving air quality neutral. A formal Air Quality Positive Assessment can be secured via planning condition, if required by LBoH.

7.0 CONCLUSION

7.1.1 Redmore Environmental Ltd was commissioned by Polaris Property Developments Ltd to undertake an Air Quality Assessment in support of a planning application for a residential-led development on land off Pinner Road, Northwood.

7.1.2 The proposals have the potential to cause air quality impacts as a result of fugitive dust emissions during construction and road traffic exhaust emissions associated with vehicles travelling to and from the site during operation, as well as expose future occupants to any existing air quality issues. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions, consider site suitability for the proposed end-use and assess potential effects as a result of the scheme.

7.1.3 During the construction phase of the development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the Mayor of London's guidance. Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated by demolition, earthworks, construction and trackout activities was predicted to be **not significant**.

7.1.4 Potential impacts during the operational phase of the proposals may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the site. Additionally, future occupants may be exposed to any existing air quality issues. Dispersion modelling was therefore undertaken in order to predict pollutant concentrations at sensitive locations as a result of emissions from the local highway network both with and without the development in place. Results were subsequently verified using local monitoring data.

7.1.5 Review of the dispersion modelling results indicated that impacts on annual mean NO_2, annual and 24-hour mean PM_{10} and annual mean $PM_{2.5}$ concentrations as a result of traffic generated by the development were predicted to be **negligible** at all sensitive receptor locations.

7.1.6 The results of the dispersion modelling assessment indicated that predicted annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations were below the relevant AQOs and AQLV at the proposed building façade. Pollutant levels were categorised as APEC - A in accordance

with the London Councils Air Quality and Planning Guidance. As such, the site is considered suitable for the proposed end-use from an air quality perspective.

7.1.7 Potential emissions from the development were reviewed in the context of the air quality neutral requirements of the London Plan. The results indicated an acceptable level of building and transport emissions from the development. As such, the proposals were considered to be air quality neutral. Additionally, a number of mitigation measures are to be implemented within the scheme to further reduce impacts associated with the scheme. It is considered with these measures in place the development goes above achieving air quality neutral.

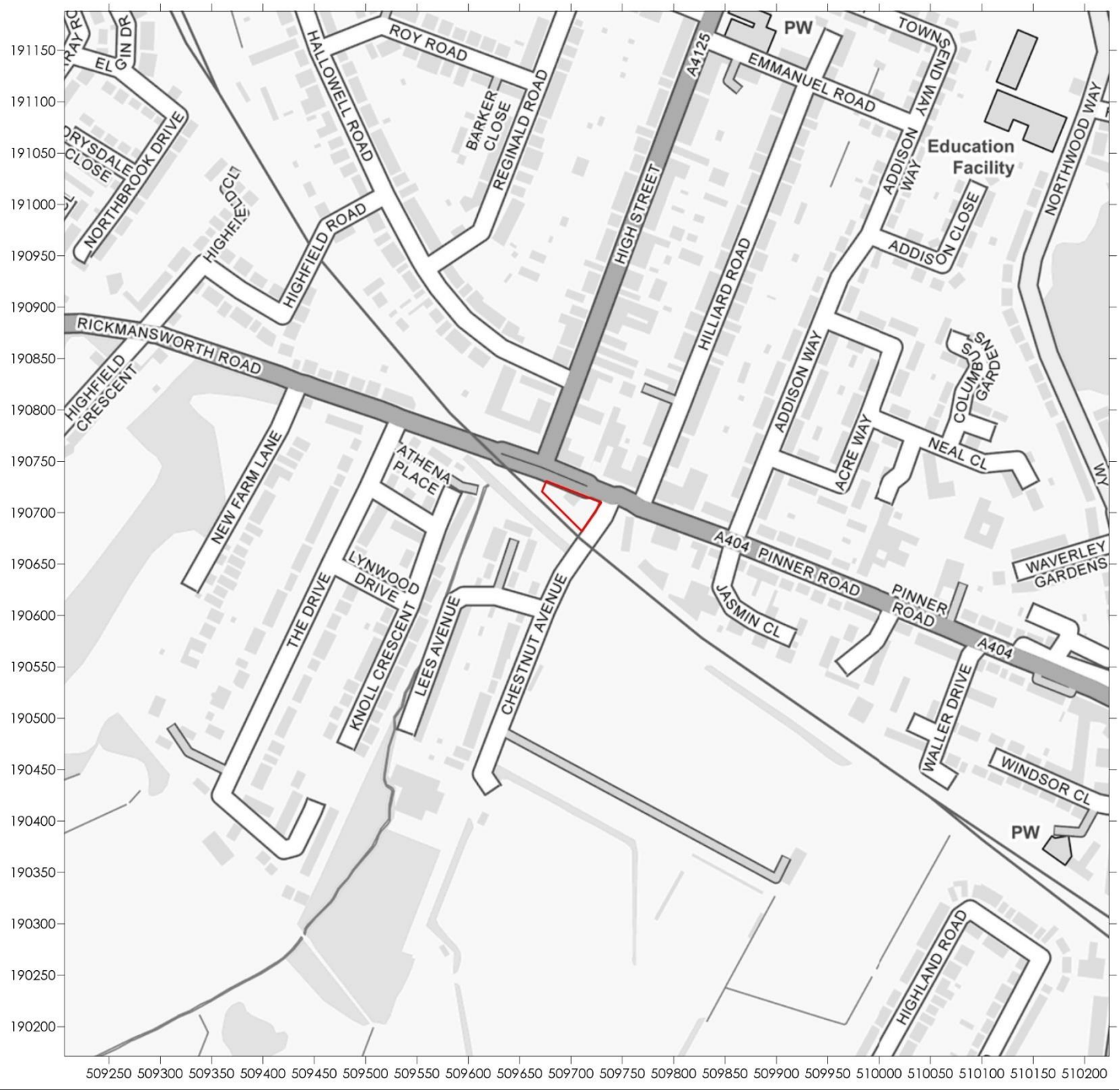
7.1.8 Based on the assessment results, air quality factors are not considered a constraint to planning consent for the development.

8.0 ABBREVIATIONS

AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
APEC	Air Pollution Exposure Criteria
AQAP	Air Quality Action Plan
AQFA	Air Quality Focus Area
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DM	Do-Minimum
DMRB	Design Manual for Roads and Bridges
DS	Do-Something
EV	Electric Vehicle
GLA	Greater London Authority
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LBoH	London Borough of Hillingdon
LBoHa	London Borough of Harrow
LDV	Light Duty Vehicles
NB	Northbound
NGR	National Grid Reference
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10µm
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5µm
SB	Southbound

SPG	Supplementary Planning Guidance
TEBs	Transport Emission Benchmarks
ULEVs	Ultra Low Emission Vehicles
z_0	Roughness length

Figures



Legend

Site Boundary

Title
Figure 1 - Site Location Plan

Project
Air Quality Assessment
Pinner Road, Northwood

Project Reference
5673

Client
Polaris Property Developments Ltd

Redmore environmental
www.red-env.co.uk | 0161 7060075

Legend

Site Boundary

Monitor

Title
Figure 2 - Monitoring Location

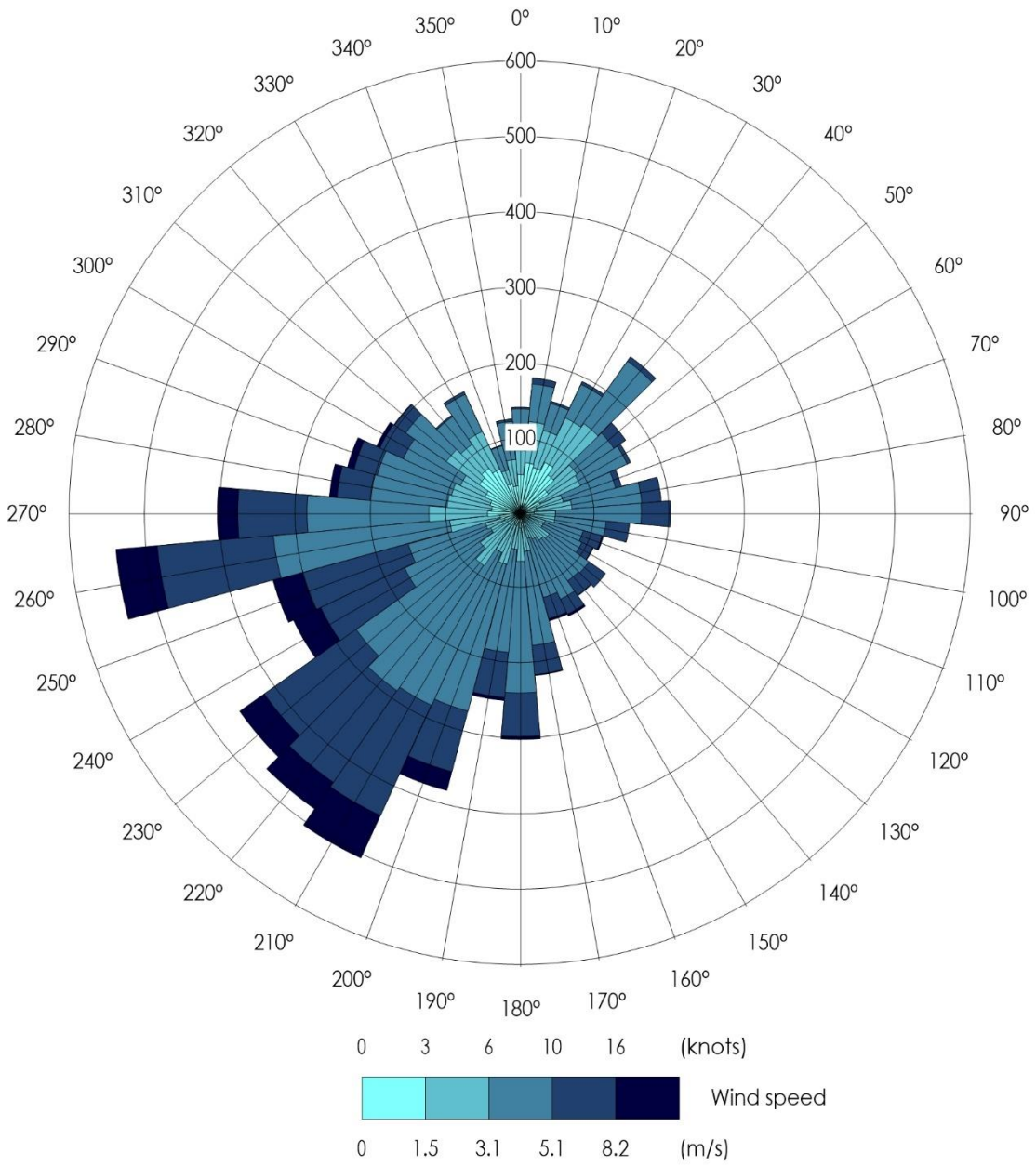
Project
Air Quality Assessment
Pinner Road, Northwood

Project Reference
5673

Client
Polaris Property Developments Ltd

Redmore environmental

www.red-env.co.uk | 0161 7060075



Legend

Title
Figure 3 - Wind Rose of 2019 Heathrow Airport Meteorological Data

Project
Air Quality Assessment
Pinner Road, Northwood

Project Reference
5673

Client
Polaris Property Developments Ltd

Redmore environmental
www.red-env.co.uk | 0161 7060075

Legend

Site Boundary

Receptor

Title
Figure 4 - Road Vehicle Exhaust Emissions Sensitive Receptor Locations

Project
Air Quality Assessment
Pinner Road, Northwood

Project Reference
5673

Client
Polaris Property Developments Ltd

Redmore environmental
www.red-env.co.uk | 0161 7060075

Legend

Site Boundary

Annual Mean NO_2 Concentration ($\mu g/m^3$)

APEC - C

APEC - B

APEC - A

Title
Figure 5 - Predicted Annual Mean NO_2 Concentration ($\mu g/m^3$) Do-Minimum

Project
Air Quality Assessment
Pinner Road, Northwood

Project Reference
5673

Client
Polaris Property Developments Ltd

Redmore environmental
www.red-env.co.uk | 0161 7060075

Legend

- Site Boundary
- Annual Mean NO_2 Concentration ($\mu g/m^3$)
  - 56
  - 52
  - 48
  - 44
  - APEC - C
  - 42
  - 40
  - APEC - B
  - 38
  - 36
  - APEC - A
  - 32
- Proposed Building

Title
Figure 6 - Predicted Annual Mean NO_2 Concentration ($\mu g/m^3$)
Do-Something

Project
Air Quality Assessment
Pinner Road, Northwood

Project Reference
5673

Client
Polaris Property Developments Ltd

Redmore environmental
www.red-env.co.uk | 0161 7060075

Legend

Site Boundary

Annual Mean PM_{10} Concentration ($\mu g/m^3$)

24
23
22
21
20
19
18
17

APEC - A

Title
Figure 7 - Predicted Annual Mean PM_{10} Concentration ($\mu g/m^3$) Do-Minimum

Project
Air Quality Assessment
Pinner Road, Northwood

Project Reference
5673

Client
Polaris Property Developments Ltd

Redmore environmental
www.red-env.co.uk | 0161 7060075

Legend

Site Boundary

Annual Mean PM_{10} Concentration ($\mu g/m^3$)

24
23
22
21 — APEC - A
20
19
18
17

Proposed Building

Title

Figure 8 - Predicted Annual Mean PM_{10} Concentration ($\mu g/m^3$) Do-Something

Project

Air Quality Assessment
Pinner Road, Northwood

Project Reference

5673

Client

Polaris Property Developments Ltd

Redmore environmental
www.red-env.co.uk | 0161 7060075

Legend

Site Boundary

Number of Days with PM_{10} Concentrations greater than 50µg/m³ (Days)

Title
Figure 9 - Predicted Number of Days with PM_{10} Concentrations greater than 50µg/m³ (Days)
Do-Minimum

Project
Air Quality Assessment
Pinner Road, Northwood

Project Reference
5673

Client
Polaris Property Developments Ltd

Redmore environmental
www.red-env.co.uk | 0161 7060075

Legend

Site Boundary

Number of Days with PM_{10} Concentrations greater than 50µg/m³ (Days)

Proposed Building

Title

Figure 10 - Predicted Number of Days with PM_{10} Concentrations greater than 50µg/m³ (Days)
Do-Something

Project

Air Quality Assessment
Pinner Road, Northwood

Project Reference

5673

Client

Polaris Property Developments Ltd

Redmore environmental
www.red-env.co.uk | 0161 7060075

Legend

Site Boundary

Annual Mean $PM_{2.5}$ Concentration ($\mu g/m^3$)

16
15
14
13
12
11

APEC - A

Title

Figure 11 - Predicted Annual Mean $PM_{2.5}$ Concentration ($\mu g/m^3$) Do-Minimum

Project

Air Quality Assessment
Pinner Road, Northwood

Project Reference

5673

Client

Polaris Property Developments Ltd

Redmore environmental
www.red-env.co.uk | 0161 7060075

Legend

Site Boundary

Annual Mean $PM_{2.5}$ Concentration ($\mu g/m^3$)

16
15
14
13
12
11

APEC - A

Proposed Building

Title

Figure 12 - Predicted Annual Mean $PM_{2.5}$ Concentration ($\mu g/m^3$) Do-Something

Project

Air Quality Assessment
Pinner Road, Northwood

Project Reference

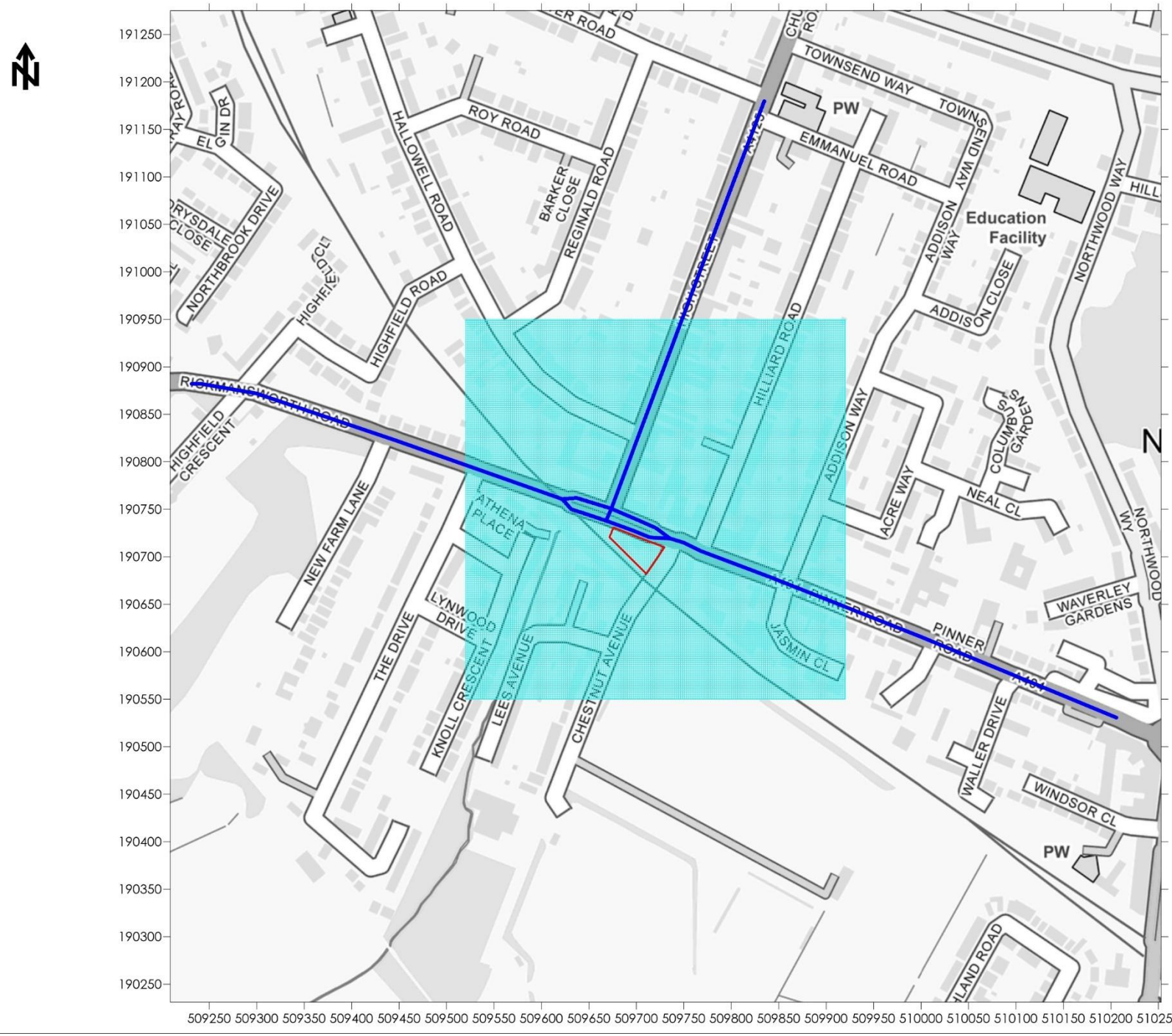
5673

Client

Polaris Property Developments Ltd

Redmore environmental

www.red-env.co.uk | 0161 7060075



Legend

Site Boundary

Road Link

Output Grid

Title
Figure 13 - ADMS-Roads Inputs

Project
Air Quality Assessment
Pinner Road, Northwood

Project Reference
5673

Client
Polaris Property Developments Ltd

Redmore environmental
www.red-env.co.uk | 0161 7060075

Appendix 1 - Assessment Input Data

Introduction

The proposed development has the potential to cause air quality impacts as a result of exhaust emissions associated with vehicles travelling to and from the development, as well as expose future occupants to any existing air quality issues at the site. In order to assess NO_2, PM_{10} and $PM_{2.5}$ concentrations at sensitive locations, detailed dispersion modelling was undertaken in accordance with the following methodology.

Dispersion Model

Dispersion modelling was undertaken using the ADMS-Roads dispersion model (version 5.0.1.3). ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

The model requires input data that details the following parameters:

- Traffic flow data;
- Vehicle emission factors;
- Spatial co-ordinates of emissions;
- Street width;
- Meteorological data;
- Roughness length (z_0); and,
- Monin-Obukhov length.

The relevant inputs are detailed in the following Sections.

Assessment Area

Ambient concentrations were predicted over the area NGR: 509520, 190550 to 509920, 190950. One Cartesian grid was used within the model to produce data suitable for contour plotting using the Surfer software package.

Reference should be made to Figure 13 for a graphical representation of the assessment grid extents.

Receptors potentially sensitive to changes in pollutant concentrations were included in the assessment as outlined in the main report text.

Traffic Flow Data

Baseline traffic data for use in the assessment, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition, was obtained from the London Atmospheric Emissions Inventory (LAEI). The LAEI was produced by the GLA and provides traffic flows throughout London for a number of scenarios. It should be noted that the LAEI is referenced in GLA guidance[33] as being a suitable source of data for air quality assessments and is therefore considered to provide a reasonable estimate of traffic flows in the vicinity of the site.

The baseline traffic data was converted to the opening year of the development utilising a factor obtained from TEMPro (Version 7.2). This software package has been developed by the Department for Transport (DfT) to calculate future traffic growth throughout the UK.

Development trip generation rates as a result of the development were provided by Iceni Projects, the Transport Consultants. These were added to the relevant links to provide an estimation of traffic flows with the development in place.

A summary of the traffic data used is provided in Table A1.1

Table A1.1 Traffic Data

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)		
		Verif.	2024 DM	2024 DS	Verif.	2024 DM	2024 DS
L1	A404 Pinner Road	35,053	36,911	36,943	4.48	4.48	4.49
L2	A404 Pinner Road east of site access northbound (NB)	15,667	16,497	16,529	4.57	4.57	4.58
L3	A404 Rickmansworth Road west of site access NB	15,667	16,497	16,529	4.57	4.57	4.58
L4	A404 Rickmansworth Road north of A4125 High Street NB	8,006	8,430	8,462	3.22	3.22	3.25

33 London Local Air Quality Management (LLAQM), Technical Guidance 2019 (LLAQM.TG (19)), GLA, 2019.

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)		
		Verif.	2024 DM	2024 DS	Verif.	2024 DM	2024 DS
L5	A404 Rickmansworth Road NB	16,522	17,398	17,430	3.11	3.11	3.12
L6	A404 Rickmansworth Road west of site access southbound (SB)	8,517	8,968	9,000	3.02	3.02	3.04
L7	A404 Pinner Road west of site access SB	17,023	17,925	17,957	4.54	4.54	4.54
L8	A404 Pinner Road east of site access SB	17,023	17,925	17,957	4.54	4.54	4.54
L9	A4125 High Street/A404 Pinner Road	17,144	18,053	18,085	5.89	5.89	5.89
L10	A4125 High Street Slow Phase	17,144	18,053	18,085	5.89	5.89	5.89
L11	A4125 High Street	17,144	18,053	18,085	5.89	5.89	5.89

Reference should be made to Figure 13 for a graphical representation of the road link locations.

Road widths were estimated from aerial photography and UK highway design standards. A summary of the link parameters is provided in Table A1.2.

Table A1.2 Road Parameters

Link		Road Width (m)	Average Vehicle Speed (km/h)
L1	A404 Pinner Road	8.8	35
L2	A404 Pinner Road east of site access NB	6.6	35
L3	A404 Rickmansworth Road west of site access NB	6.4	35
L4	A404 Rickmansworth Road north of A4125 High Street NB	6.4	45
L5	A404 Rickmansworth Road NB	10.1	45
L6	A404 Rickmansworth Road west of site access SB	5.8	35
L7	A404 Pinner Road west of site access SB	5.3	45
L8	A404 Pinner Road east of site access SB	4.7	35
L9	A4125 High Street/A404 Pinner Road	14.3	30
L10	A4125 High Street Slow Phase	7.6	25
L11	A4125 High Street	7.6	35

Emission Factors

The emission factors were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 11.0). This has been produced by DEFRA and incorporates COPERT 5.3 vehicle emission factors and fleet information.

There is current uncertainty over NO_2 concentrations within the UK, with the implementation of new vehicle emission standards not resulting in the previously expected reduction in roadside levels. Therefore, 2019 emission factors were utilised in preference to the development opening year in order to provide robust model outputs. As predictions for 2019 were verified, it is considered the results are a robust indication of worst case concentrations for the future year.

Meteorological Data

Meteorological data used in the assessment was taken from Heathrow Airport meteorological station over the period 1st January 2019 to 31st December 2019 (inclusive). Heathrow Airport is located at NGR: 506947, 176515, which is approximately 24.2km south-west of the development site. It is anticipated that conditions would be reasonably similar over a distance of this magnitude. The data was therefore considered suitable for an assessment of this nature.

All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 3 for a wind rose of utilised meteorological data.

Roughness Length

The z_0 is a modelling parameter applied to allow consideration of surface height roughness elements. A z_0 of 0.5m was used to describe the modelling extents. This value is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'parkland, open suburbia'.

A z_0 of 0.3m was used to describe the meteorological site. This value is considered appropriate for the morphology of the area due to the large expanse of surrounding flat land use, such as runways and grassland and is suggested within ADMS-Roads as being suitable for 'agricultural areas (max)'.

Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 100m was used to describe the modelling extents and meteorological site. This value is considered appropriate for the nature of both areas and is suggested within ADMS-Roads as being suitable for 'large conurbations < 1 million'.

Background Concentrations

Annual mean NO_2, PM_{10} and $PM_{2.5}$ background concentrations for use in the assessment were taken from the DEFRA mapping study for the grid square containing the site, as shown in Table 14.

NO_x to NO_2 Conversion

Predicted annual mean NO_x concentrations were converted to NO_2 concentrations using the spreadsheet (version 8.1) provided by DEFRA, which is the method detailed within GLA guidance[34].

Prediction of 24-hour PM_{10} Concentrations

Predicted annual mean PM_{10} concentrations were converted to the number of days with PM_{10} concentrations above 50µg/m^3 using the equation outlined in the GLA guidance[35].

Verification

The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons, including:

- Estimates of background concentrations;
- Uncertainties in source activity data such as traffic flows and emission factors;
- Variations in meteorological conditions;
- Overall model limitations; and,

34 London Local Air Quality Management (LLAQM), Technical Guidance 2019 (LLAQM.TG (19)), GLA, 2019.

35 London Local Air Quality Management (LLAQM), Technical Guidance 2019 (LLAQM.TG (19)), GLA, 2019.

- Uncertainties associated with monitoring data, including locations.

Model verification is the process by which these and other uncertainties are investigated and where possible minimised. In reality, the differences between modelled and monitored results are likely to be a combination of all of these aspects.

For the purpose of the assessment, model verification was undertaken for 2019 using traffic data, meteorological data and monitoring results from this year. The choice of 2019 as the verification year aligns with the IAQM position statement 'Use of 2020 and 2021 Monitoring Datasets'[36], which states:

> "If you are carrying out an air quality study that includes validation against monitoring data, use 2019 monitoring data as the last typical year."

LBoH undertook monitoring of NO_2 concentrations at one location within the modelling extents during 2019. The result was obtained and the road contribution to total NO_x concentration calculated following the methodology contained within GLA guidance[37]. The monitored annual mean NO_2 concentration and calculated road NO_x concentration is summarised in Table A1.5.

Table A1.5 Verification - Monitoring Result

Monitoring Location		Monitored NO_2 Concentration (µg/m³)	Calculated Road NO_x Concentration (µg/m³)
HILL34	177/179 Pinner Road	35.9	44.11

The annual mean road NO_x concentration predicted from the dispersion model and the 2019 road NO_x concentration calculated from the monitoring result is summarised in Table A1.6.

Table A1.6 Verification - Modelling Result

Monitoring Location		Calculated Road NO_x Concentration (µg/m³)	Modelled Road NO_x Concentration (µg/m³)
HILL34	177/179 Pinner Road	44.11	20.42

[36] Use of 2020 and 2021 Monitoring Datasets, IAQM, 2021.

[37] London Local Air Quality Management (LLAQM)), Technical Guidance 2019 (LLAQM.TG (19)), GLA, 2019.

The monitored and modelled road NO_x concentrations were compared to calculate the associated ratio. This indicated a verification factor of 2.1597 was required to be applied to all modelling results.

Monitoring of PM_{10} or $PM_{2.5}$ concentrations is not undertaken within the assessment extents. The NO_x verification factor was therefore used to adjust model predictions of these species in lieu of more accurate data in accordance with the guidance provided within GLA guidance[38].

[38] London Local Air Quality Management (LLAQM), Technical Guidance 2019 (LLAQM.TG (19)), GLA, 2019.

Appendix 2 - Curricula Vitae

JETHRO REDMORE

Director

BEng (Hons), MSc, MIAQM, MIEnvSc, PIEMA, CEnv

KEY EXPERIENCE:

Jethro is a Chartered Environmentalist and Director of Redmore Environmental with specialist experience in the air quality and odour sectors. His key capabilities include:

- Production and management of Air Quality, Dust and Odour Assessments for a wide-range of clients from the retail, residential, infrastructure, commercial and industrial sectors.
- Production and co-ordination of Environmental Permit applications for a variety of industrial sectors.
- Detailed dispersion modelling of road vehicle and industrial emissions using ADMS-Roads, ADMS-5, AERMOD-PRIME and BREEZE-ROADS. Studies have included impact assessment of ground level pollutant and odour concentrations and assessment of suitability of development sites for proposed end-use.
- Project management and co-ordination of Environmental Impact Assessments and scoping reports for developments throughout the UK.
- Provision of expert witness services at Planning Inquiries.
- Design and project management of pollutant monitoring campaigns.
- Co-ordination and management of large-scale multi-disciplinary projects and submissions.
- Provision of expert advice to local government and international environmental bodies, as well as involvement in production of industry guidance.

SELECT PROJECTS SUMMARY:

Industrial

Shanks Waste Management - Odour Assessments of two waste management facilities to support Environmental Permit Applications.

Tatweer Petroleum - dispersion modelling of Bahrain oil field.

Doha South Sewage Treatment Works - AQA for works extension in Qatar.

IRIS Environmental Appraisal Report Reviews, Isle of Man Government - odour assessment reviews.

Lankem, Greater Manchester - Environmental Permit Application for chemical manufacturing plant.

Newport Docks Bulk Drying, Pelleting and CHP Facility - air quality EIA for gas CHP.

Springshades, Leicester - Environmental Permit Variation Application for textile manufacturing plant.

Valspar, Chester - Odour Assessment and production of Odour Management Plan for a paint manufacturing plant in response to neighbour complaints.

Agrivert - dispersion modelling of odour and CHP emissions from numerous AD plants.

James Cropper Paper Mill, Cumbria - air quality EIA, Environmental Permit Variation and Human Health Risk Assessment for new biomass boiler adjacent to SSSI.

Rigg Approach, Leyton - Air Quality Assessment in support of waste transfer site.

Lynchford Lane Waste Transfer Station - biomass facility energy recovery plant.

Barnes Wallis Heat and Power, Cobham - biomass facility adjacent to AQMA.

Residential

Wood St Mill, Bury - residential development adjacent to scrap metal yard.

Hyams Lane, Holbrook - Odour Assessment to support residential development adjacent to sewage works.

North Wharf Gardens, London - peer review of EIA undertaken for large residential development.

Loxford Road, Alford - Air Quality EIA for residential development, included consideration of impacts from associated package sewage works

Elephant and Castle Leisure Centre - baseline AQA for redevelopment.

Carr Lodge, Doncaster - EIA for large residential development.

Queensland Road, Highbury - residential scheme including CHP.

Bicester Ecotown - dispersion modelling of energy centre.

Castleford Growth Delivery Plan - baseline air quality constraints assessment for town redevelopment.

York St, Bury - residential development adjacent to AQMA.

Temple Point Leeds - residential development adjacent to M1.

Commercial and Retail

Etihad Stadium - Air Quality EIA for the extension to the capacity of the Etihad Stadium, Manchester.

Wakefield College - redevelopment of city centre campus in AQMA.

Manchester Airport Cargo Shed - commercial development.

Manchester Airport Apron Extension - EIA including aircraft emission modelling.

National Youth Theatre, Islington - redevelopment to provide new arts space and accommodation.

AMELIA REED

Principal Air Quality Consultant

BSc (Hons), AMIEnvSc, AMIIAQM

Tel: 0161 706 0075 | Email: amelia.reed@red-env.co.uk

KEY EXPERIENCE:

Amelia is a Principal Environmental Consultant with specialist experience in the air quality sector. Her key capabilities include:

- Production of Air Quality Assessments in accordance with Department for Environment, Food and Rural Affairs (DEFRA) methodologies for a range of residential, commercial and industrial sectors.
- Detailed dispersion modelling of road vehicle exhaust emissions using ADMS-Roads. Studies have included assessment of road traffic exhaust emissions on sensitive receptors and exposure of new residents to poor air quality.
- Advanced canyon modelling to evaluate the impact of altered urban topography on air quality in built up areas.
- Assessment of construction dust impacts from a range of development sizes.
- Definition of baseline air quality and identification of sensitive areas across the UK.
- Production of air quality mitigation strategies specifically tailored to address issues at individual sites.
- Air quality monitoring at industrial sites to quantify pollutant concentrations
- Odour surveys to assess amenity and suitability of sites for potential future development for residential use.

SELECT PROJECTS SUMMARY:

Eagle House, South Ruislip

Air Quality Assessment for the change of use from an office block to a hotel in an Air Quality Management Area (AQMA). Concerns were raised regarding the exposure of future occupants to poor air quality due to road traffic emissions. Detailed dispersion modelling was undertaken using ADMS-roads to assess PM_{10} and NO_2 concentrations across the site as well as an Air Quality Neutral Assessment in accordance with the London Plan requirements. Results revealed that pollution levels were below the air quality standards across the development.

Parr Bridge, Tyldesley

Air Quality Assessment to support a residential development of 154 units. Dispersion modelling was undertaken due to the proximity of the site to an AQMA. Using sensitive receptors located in areas where increased road traffic may affect NO_2 levels, a comparison was made between concentrations with and without the development in place. Results indicated the impacts were not significant.

St James's Street, Westminster

Air Quality Assessment in support of a mixed-use development in an AQMA. Dispersion modelling was undertaken at several different heights reflective of residential units within the development. Predicted concentrations of NO_2 were found to exceed air quality criteria from ground to third floor level. As such, mitigation was specified for the affected units to ensure future residents would not be exposed to poor air quality.

Rookery Avenue, Whiteley, Farnborough

Odour Impact Assessment in support of a hot food takeaway with a drive thru facility in Whiteley. The assessment considered a number of factors, including the scale and nature of potential emissions, the location of nearest receptors and the proposed cooking type in accordance with the relevant DEFRA guidance. An appropriate ventilation system was identified and described on the basis of the assessment results.

Hoole Way, Chester

Air Quality Assessment in support an eight-storey student accommodation block to provide circa 373 units on land off Hoole Way, Chester. Concerns had been raised in relation to the potential exposure of future occupants to elevated pollution concentrations. An assessment was therefore undertaken using dispersion modelling in order to quantify air quality conditions across the site. The results revealed that the use of good practice control measures would provide suitable mitigation for the development.

St James Place, Liverpool

Air Quality Assessment in support of a residential-led development located across three different sites in an AQMA on land off St James Place, Liverpool. Detailed dispersion modelling was undertaken with the inclusion of advanced canyon modelling to evaluate the impact of the urban topography within the locality on the dispersion of traffic related pollutants. The results revealed pollutant concentrations were below the relevant standards across the site.

EMILY MACEY

Senior Air Quality Consultant

BSc (Hons), MSc, MIAQM, MIEnvSc

Tel: 0161 706 0075 | Email: emily.macey@red-env.co.uk

KEY EXPERIENCE:

Emily is a Senior Environmental Consultant with specialist experience in the air quality sector. Her key capabilities include:

- Production of Air Quality Assessments in accordance with Department for Environment, Food and Rural Affairs (DEFRA) methodologies for a range of residential, commercial and industrial sectors.
- Detailed dispersion modelling of road vehicle exhaust emissions using ADMS-Roads. Studies have included assessment of road traffic exhaust emissions on sensitive receptors and exposure of new residents to poor air quality.
- Advanced canyon modelling to evaluate the impact of altered urban topography on air quality in built up areas.
- Assessment of construction dust impacts from a range of development sizes.
- Definition of baseline air quality and identification of sensitive areas across the UK.
- Production of air quality mitigation strategies specifically tailored to address issues at individual sites.
- Air quality monitoring at industrial sites to quantify pollutant concentrations
- Odour surveys to assess amenity and suitability of sites for potential future development for residential use.

SELECT PROJECTS SUMMARY:

Bowlers Yard, Manchester

Air Quality Assessment in support of an eleven storey residential development to provide circa 65 units on land known as Bowlers Yard, Manchester. The site was located in an Air Quality Management Area (AQMA) and concerns were raised regarding the exposure of future occupants to poor air quality due to road traffic emissions. Detailed dispersion modelling was undertaken using ADMS-roads to assess $PM_{2.5}$, PM_{10} and NO_2 concentrations across the site. Results indicated that pollution levels were below the air quality objectives across the development.

Freemasons Arms Hotel, Heywood

Air Quality Assessment to support a residential-led development in an AQMA. Detailed dispersion modelling was undertaken with the inclusion of advanced canyon modelling to evaluate the impact of the urban topography within the locality on the dispersion of traffic related pollutants. Predicted concentrations of NO_2 were found to exceed air quality criteria at the building façade fronting Market Place at first floor level. As such, mitigation was specified for the affected units to ensure future residents would not be exposed to poor air quality.

Griffin Road, London

Air Quality Assessment in support of a residential development located in an AQMA. Detailed dispersion modelling was undertaken using ADMS-roads to assess PM_{10} and NO_2 concentrations across the site. Results indicated that pollution levels were classified as APEC - A in accordance with the London Councils Air Quality and Planning Guidance.

High Street, Dudley

Odour Impact Assessment in support of a proposed residential-led development. Due to the location of the site, being above an existing hot food takeaway, odour surveys were required to assess the level of odour across the development. A risk assessment was also undertaken in accordance with the relevant odour guidance. An appropriate ventilation system was identified on the basis of the assessment results.

East Common Lane, Selby

Air Quality Assessment in support of an industrial development on land associated with Access 63 Business Park, East Common Lane Selby. Due to the size of the development it was possible that traffic generated from the scheme may cause negative impacts on sensitive receptors nearby. NO_2 and PM_{10} concentrations were quantified at specific receptor points to ensure there would be no significant increases in pollution levels. Results revealed negligible impacts.

Wharton Road, Winsford

Air Quality Assessment in support of a residential development of circa 138 units on land off Wharton Road, Winsford. Using sensitive receptors, located in areas where increased road traffic may affect NO_2 concentrations, a comparison was made between overall concentrations with and without the development in place. Results indicated pollutant concentrations were below the relevant standards across the site and impacts were not significant.