Air Quality Assessment

Tavistock Road, Yiewsley

Client: Heatons

Reference: 6975r2

Date: 6th December 2023

Report Issue

Report Title: Air Quality Assessment - Tavistock Road, Yiewsley

Report Reference: 6975

Report Version	Issue Date	Issued By	Comments
1	5th December 2023	Jethro Redmore	Draft for comment
2	6th December 2023	Jethro Redmore	-

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Executive Summary

Redmore Environmental Ltd was commissioned by Heatons to undertake an Air Quality Assessment in support of a planning application for a waste transfer station on land off Tavistock Road, Yiewsley.

The proposals have the potential to cause air quality impacts as a result of fugitive dust and road vehicle exhaust emissions during operation. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions and assess potential effects as a result of the scheme.

Potential air quality impacts may occur due to fugitive dust emissions during operation. A risk assessment was therefore undertaken which included consideration of a number of factors including the scale and nature of emissions from the site, the location and sensitivity of nearby receptors and prevailing meteorological conditions. Following consideration of the relevant factors, overall effects as a result of fugitive dust emissions were not predicted to be significant.

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. Dispersion modelling was therefore undertaken in order to predict pollutant concentrations at sensitive locations as a result of emissions from the 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.

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

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1.0 INTRODUCTION

1.1 Background

1.1.1 Redmore Environmental Ltd was commissioned by Heatons to undertake an Air Quality Assessment in support of a planning application for a waste transfer station on land off Tavistock Road, Yiewsley.

1.1.2 The proposals have the potential to cause air quality impacts as a result of fugitive dust and road vehicle exhaust emissions during operation. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions 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 at the Old Coal Depot, Tavistock Road, Yiewsley, at approximate National Grid Reference (NGR): 505520, 180250. Reference should be made to Figure 1 for a map of the site and surrounding area.

1.2.2 The proposals comprise the construction and operation of a waste transfer station with a maximum throughput of 75,000 tonnes per annum (tpa). The development includes:

- A 30m x 30m building;
- Site office; and
- Vehicle/ skip parking.

1.2.3 The proposed operational hours are 07.00 to 18.00 Monday to Friday and 08.00 to 13.00 on Saturdays.

1.2.4 Operations at the facility, as well as mitigation measures to limit dust generation, can be summarised as follows:

- Skip lorries will enter the site and a banksman will then direct the vehicles into the building;
- Waste will be tipped onto the floor and visually checked for compliance with the Environment Permit conditions;

- Waste will be sorted within the building using two 14-tonne excavators with selector grabs. These will separate larger items of waste into separate fractions. Material may then be further sorted using a trommel screen;
- Ground staff will also manually sort smaller fractions of waste along a picking line where it would be placed into different containers;
- Inert waste, for example hardcore, soils and stone, will be transferred to storage bays within the building using an excavator. Non inert waste, such as plastic, wood, card, metal and mixed waste, will be transferred to a number of roll on/off steel containers, also stored within the building;
- Waste will be regularly removed from the site in accordance with the requirements of the Environmental Permit. Inert waste would be loaded into tipper lorries using an excavator. Non-inert material will be exported off site by hookloader lorries;
- The site will operate in accordance with an Environmental Permit regulated by the Environment Agency (EA). The permit will include a requirement for use of dust minimisation throughout the operational life of the facility; and,
- The site and access road have a concrete hard surface and two road sweepers will be used to routinely sweep the site and access road in order to maintain high standards of housekeeping.

1.2.5 The development has the potential to cause air quality impacts. These may include:

- Fugitive dust emissions from the proposed operations during the operational phase; and,
- Road traffic exhaust emissions associated with vehicles travelling to and from the site during the operational phase.

1.2.6 An Air Quality Assessment has been undertaken in order to determine baseline conditions at the site and consider potential effects associated with the scheme. This is detailed in the following report.

2.0 LEGISLATION AND POLICY

2.1 UK 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 were also 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 AQOs. These are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences 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: Framework for Local Authority Delivery, DEFRA, 2023.

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

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

Table 1 Air Quality Objectives/Interim Target

Pollutant	Air Quality Objective/Interim Target	
	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
$PM_{2.5}$	12[(a)]	Annual mean

Note: (a) Interim Target to be achieved by end January 2028.

2.1.6 Table 2 summarises the advice provided in 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
24-hour mean	All locations where the annual mean objective would apply, together with hotels 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
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 (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.3 Industrial Pollution Control Legislation

2.3.1 Atmospheric emissions from industry are controlled in England through the Environmental Permitting (England and Wales) Regulations (2016) and subsequent amendments. The operation of a waste transfer station is included within the Regulations and therefore the facility is required to operate in accordance with an Environmental Permit issued by the EA. This will include conditions for operation of the plant. Compliance with these must be demonstrated through periodic monitoring requirements which will be set in order to limit potential impacts in the surrounding area.

2.4 National Planning Policy

2.4.1 The revised National Planning Policy Framework[4] (NPPF) was published in September 2023 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 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:

[4] NPPF, Ministry of Housing, Communities and Local Government, 2023.

> "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?
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.

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

3.0 METHODOLOGY

3.1 Introduction

3.1.1 The development has the potential to cause air quality impacts. These have been assessed in accordance with the following methodology.

3.2 Fugitive Dust Emissions

Introduction

3.2.1 Fugitive dust emissions associated with the proposed operations have the potential to cause impacts at sensitive locations in the vicinity of the site. The potential risk of adverse effects has therefore been assessed using the Institute of Air Quality Management (IAQM) 'Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1'[6] document and professional judgement. It is noted that the IAQM document provides guidance for the assessment of impacts associated with mineral extraction sites, rather than waste transfer stations. However, it contains useful research on dust emissions, similar to those that may occur from waste management, and was therefore considered a suitable source of information for this assessment in lieu of specific industry guidance.

3.2.2 The Source-Pathway-Receptor connection presents the hypothetical relationship between the source of the pollutant, the pathway by which exposure might occur, and the receptor that could be adversely affected. The dust impact at relevant receptors was assessed using this concept, as outlined in the following Sections.

Risk Assessment Procedure

3.2.3 The first step in the assessment was to estimate the dust generating potential of site activities. This is termed the Source Emission Potential, which takes into account the scale (magnitude) of the release from the source, as well as the effectiveness of any control or mitigation measures. This involves judging the relative size of the release rate after mitigation and taking account of any pattern of release (e.g. intermittency).

[6] Guidance on the Assessment of Mineral Dust Impacts for Planning V1.1, IAQM, 2016.

3.2.4 Using the example risk ranking in Table 3, the Source Emission Potential was categorised as **small**, **medium** or **large**.

Table 3 Fugitive Dust Emissions - Source Emissions Potential

Magnitude	Activity	Criteria
Large	Materials Handling	• More than 10 loading vehicles within 50m of a site boundary • Transferring material of a high dust potential and/or low moisture content on dry, poorly surfaced ground
	Material Processing	• Processing more than 1,000,000tpa of material
	Stockpiles/ Exposed Surfaces	• Total exposed area more than 10ha in an area exposed to high wind speeds • Located less than 50m from the site boundary • Material production more than 1,000,000tpa
	Off-Site Transportation	• More than 200 Heavy Goods Vehicle (HGV) movements in any one day on unsurfaced site access road less than 20m in length
Medium	Materials Handling	• 5 to 10 loading vehicles between 50m and 100m from the site boundary
	Material Processing	• Processing between 200,000tpa and 1,000,000tpa of material
	Stockpiles/ Exposed Surfaces	• Stockpiles with a total exposed area between 2.5ha and 10ha • Located 50m to 100m from the site boundary
	Off-Site Transportation	• Total HGV movements between 25 and 200 movements in any one day
Small	Materials Handling	• Less than 5 loading vehicles, more than 100m from a site boundary, transferring material of low dust potential and/or high moisture content
	Material Processing	• Fixed plant with effective design in dust control • Processing less than 200,000tpa of material
	Stockpiles/ Exposed Surfaces	• Stockpiles with a total exposed area of less than 2.5ha • Located more than 100m from the site boundary • Production less than 200,000tpa
	Off-Site Transportation	• Less than 25 HGV movements per day • Paved surfaced site access road more than 50m in length • Effective HGV cleaning facilities and procedures

3.2.5 The second step was to estimate the effectiveness of the pollutant pathway as the transport mechanism for the emission through the air to the receptor, versus the dilution/dispersion in the atmosphere. The primary factor influencing the pathway is the distance between the sensitive receptor and the dust sources. However, other factors can cause a higher or lower category to be assigned. These factors include:

- Orientation of receptors relative to the prevailing wind direction; and;
- Topography, terrain and physical features.

3.2.6 Table 4 provides the criteria for determining the frequency of potentially dusty winds, based on twelve 30° wind direction sectors.

Table 4 Fugitive Dust Emissions - Categorisation of Frequency of Potentially Dusty Winds

Frequency Category	Criteria
Infrequent	Frequency of winds (>5m/s) from the direction of the dust source on dry days are less than 5%
Moderately frequent	Frequency of winds (>5m/s) from the direction of the dust source on dry days are between 5% and 12%
Frequent	Frequency of winds (>5m/s) from the direction of the dust source on dry days are between 12% and 20%
Very frequent	Frequency of winds (>5m/s) from the direction of the dust source on dry days are greater than 20%

3.2.7 It should be noted that the assessment was undertaken based on all meteorological data, rather than just dry days as a worst-case.

3.2.8 The criteria used to categorise the distance from each receptor to the source is provided in Table 5.

Table 5 Fugitive Dust Emissions - Categorisation of Receptor Distance from Source

Category	Criteria
Distant	Receptor is between 125m and 250m from the dust source
Intermediate	Receptor is between 75m and 125m from the dust source
Close	Receptor is less than 75m from the dust source

3.2.9 The Pathway Effectiveness was classified using the frequency of potentially dusty winds from Table 4 and the receptor distance from source from Table 5, as shown in Table 6.

Table 6 Fugitive Dust Emissions - Pathway Effectiveness

Category	Frequency of Potentially Dusty Winds			
	Infrequent	Moderately Frequent	Frequent	Very Frequent
Close	Ineffective	Moderately Effective	Highly Effective	Highly Effective
Intermediate	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
Distant	Ineffective	Ineffective	Moderately Effective	Moderately Effective

3.2.10 The Source Emission Potential and Pathway Effectiveness were combined to predict the impact risk at individual receptors, as shown in Table 7.

Table 7 Fugitive Dust Emissions - Estimation of Dust Impact Risk

Pathway Effectiveness	Source Emission Potential		
	Small	Medium	Large
Highly Effective Pathway	Low	Medium	High
Moderately Effective Pathway	Negligible	Low	Medium
Ineffective Pathway	Negligible	Negligible	Low

3.2.11 The magnitude of effect was predicted based on the interaction between dust impact risk and the sensitivity of the receptor. Table 8 outlines the criteria for determining sensitivity to dust soiling effects.

Table 8 Sensitivities of People to Dust Soiling Effects

Sensitivity	Description
High	• Users can reasonably expect enjoyment of a high level of amenity; or, • The appearance, aesthetics or value of their property would be diminished by soiling; or, • The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Indicative examples include dwellings, medium and long term car parks and showrooms
Medium	• Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or, • The appearance, aesthetics or value of their property could be diminished by soiling; or • The people or property wouldn't reasonably be expected to be present continuously or regularly for extended periods, as part of the normal pattern of use of the land Indicative examples include parks and places of work
Low	• The enjoyment of amenity would not reasonably be expected; or, • There is property that would not reasonably be expected to be diminished in the appearance, aesthetics or value by soiling; or, • There is transient exposure, where the people would reasonably be expected to present only for limited periods of time as part of the normal pattern of use of the land Indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads

3.2.12 The predicted effect was determined from the dust impact risk in Table 7 and the receptor sensitivity shown in Table 8, as shown in Table 9.

Table 9 Fugitive Dust Emissions - Descriptors for Magnitude of Dust Effects

Risk of Exposure	Receptor Sensitivity		
	Low	Medium	High
High	Slight	Moderate	Substantial
Medium	Negligible	Slight	Moderate
Low	Negligible	Negligible	Slight
Negligible	Negligible	Negligible	Negligible

Overall Significance

3.2.13 The IAQM guidance[7] 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 effect 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**. This has been considered to determine the overall significance of potential effects associated with the proposed development.

3.2.14 The IAQM guidance[8] recognises that assessment of dust requires some degree of professional judgement. Qualitative methodologies such as those utilised within this report provide guidance for assessing potential impacts. However, professional judgement should be exercised in order to take account of the specific details which are unique to each development. This has been considered as necessary throughout the assessment.

3.3 Road Vehicle Exhaust Emissions

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 during the operational phase. Potential impacts have therefore 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.

7 Guidance on the Assessment of Mineral Dust Impacts for Planning v1.1, IAQM, 2016.

8 Guidance on the Assessment of Mineral Dust Impacts for Planning v1.1, IAQM, 2016.

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)[9] on the likely limits of pollutant dispersion from road sources. The criteria provided within GLA guidance[10] on where the AQOs apply, as summarised in Table 2, was utilised to determine worst-case receptor positions in the 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 IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'[11]. 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 10.

Table 10 Significance of Road Vehicle Exhaust Emission Impacts

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

3.3.5 The matrix shown in Table 10 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**.

9 LA 105: Air Quality, Highways England, 2019.

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

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

3.3.6 Following the prediction of impacts at discrete receptor locations, the IAQM document[12] 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,
- 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[13] suggests the provision of details of the assessor's qualifications and experience. These are provided in Appendix 2.

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

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

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

4.2.1 As required by the Environment Act (1995), the London Borough of Hillingdon (LBoH) has undertaken Review and Assessment of air quality within their area of jurisdiction. This process has indicated that annual mean concentrations of NO_2 are above the relevant AQO within the borough. As such, one AQMA has 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 site is located within the AQMA. As such, there is the potential for vehicles travelling to and from the development to increase pollution levels in this sensitive area. This has been considered throughout the assessment.

4.2.3 LBoH has 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.

4.3 Air Quality Monitoring

4.3.1 Monitoring of pollutant levels is undertaken by LBoH throughout their area of jurisdiction. Recent NO_2 concentrations recorded in the vicinity of the development are shown in Table 11.

Table 11 Monitoring Results

Monitoring Site		Annual Mean NO_2 Concentration ($\mu g/m^3$)		
		2019	2020	2021
HILL13	31 Tavistock Road (on lamp-post outside house)	29.5	27.9	19.9
HILL19	Side of 104 Yiewsley High Street (front of 1A Fairfield Road) Lamp Post (2)	35.0	34.6	27.1
HILL20	1 Porters Way (corner with Kingston Lane) Lamp Post (1)	36.6	36.6	31.6

4.3.2 As shown in Table 11, annual mean NO_2 concentrations were below the relevant AQO of 40µg/m3 at all monitors in recent years. Reference should be made to Figure 2 for a map of the survey sites.

4.3.3 Pollution concentrations recorded during 2020 and 2021 were lower than 2019 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 do 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: 505500, 180500. Data for this location was downloaded from the DEFRA website[14] for the purpose of the assessment and is summarised in Table 12.

Table 12 Background Pollutant Concentration Predictions

Pollutant	Predicted Background Pollutant Concentration ($\mu g/m^3$)		
	2019	2023	2024
NO_2	23.24	20.02	19.37

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

Pollutant	Predicted Background Pollutant Concentration (µg/m³)		
	2019	2023	2024
PM_{10}	16.69	15.76	15.57
$PM_{2.5}$	11.14	10.43	10.28

4.4.2 As shown in Table 12, predicted background NO_2, PM_{10} and $PM_{2.5}$ concentrations are below the relevant AQOs and Interim Target 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 are detailed in the following Sections.

Fugitive Dust Emissions Sensitive Receptors

4.5.2 A desk-top study was undertaken in order to identify any sensitive receptor locations in the vicinity of the site that required specific consideration as part of the assessment of fugitive dust emissions. A summary of the receptors and their associated sensitivity, based on the criteria detailed in Table 5, is provided in Table 13. It should be noted that the distances specified in Table 13 were measured from the closest point of the development boundary in order to provide worst-case assessment of the separation between potential sources and sensitive receptor locations.

Table 13 Fugitive Dust Emissions Sensitive Receptor Locations

Receptor		NGR (m)		Distance from Boundary (m)	Direction from Boundary	Sensitivity
		X	Y			
D1	Residential - Tavistock Road	505672.9	180279.1	135	East	High
D2	Residential - Tavistock Road	505655.0	180358.8	140	North-east	High
D3	Residential - Tavistock Road	505637.1	180410.1	165	North-east	High
D4	Residential - Trout Road	505588.6	180393.1	120	North-east	High

Receptor		NGR (m)		Distance from Boundary (m)	Direction from Boundary	Sensitivity
		X	Y			
D5	Residential - Fairway Avenue	505319.2	180079.9	235	South-west	High
D6	Residential - Fairway Avenue	505372.0	180079.9	190	South-west	High
D7	Residential - Fairway Avenue	505503.0	180083.9	140	South	High
D8	Residential - Fairway Avenue	505581.1	180087.0	140	South-east	High
D9	Residential - Weirside Gardens	505666.9	180070.3	200	South-east	High

4.5.3 Reference should be made to Figure 3 for a map of the dust sensitive receptor locations.

Road Vehicle Exhaust Emissions Sensitive Receptors

4.5.4 Locations sensitive to potential operational phase road vehicle exhaust emission impacts were identified from a desk-top study and are summarised in Table 14.

Table 14 Road Vehicle Exhaust Emissions Sensitive Receptor Locations

Receptor		NGR (m)		Height (m)
		X	Y	
R1	Residential - Tavistock Road	505941.4	180142.2	1.5
R2	Residential - Tavistock Road	505985.9	180142.6	4.5
R3	Residential - High Street	506011.0	180178.7	4.5
R4	Residential - High Street	506046.2	180196.2	1.5
R5	Residential - High Street	506060.6	180272.8	1.5
R6	Yiewsley Health Centre	506086.4	180265.9	1.5
R7	Residential - High Street	506049.2	180539.4	4.5
R8	Residential - High Street	506027.3	180532.6	4.5
R9	Residential - Horton Road	506126.0	180238.5	1.5

Receptor		NGR (m)		Height (m)
		X	Y	
R10	Residential - Horton Road	506119.9	180266.4	1.5
R11	Residential - Station Road	505988.0	180014.2	4.5
R12	Residential - Station Road	506011.4	180017.9	4.5
R13	Residential - Station Road	506159.4	179809.1	1.5
R14	Residential - Station Road	506296.3	179588.5	1.5
R15	Residential - Station Road	506323.9	179606.2	1.5
R16	Residential - Sipson Road	506543.5	179293.0	1.5
R17	Residential - Sipson Road	506600.7	179126.5	1.5
R18	Residential - Sipson Road	506667.6	179106.8	1.5
R19	Residential - Dell Road	506507.1	179199.4	1.5

4.5.5 Reference should be made to Figure 4 for a map of the road vehicle exhaust emission sensitive receptor locations.

4.6 Meteorological Conditions

4.6.1 The potential for atmospheric emissions to impact at sensitive locations depends significantly on the meteorology, particularly wind direction, during release. Meteorological data for use in the assessment was obtained from Heathrow Airport meteorological station over the period 1st January 2016 to 31st December 2020 (inclusive). Heathrow Airport is located at NGR: 506947, 176515, approximately 4.0km south-east of the site. It is considered that conditions are likely to be reasonably similar over a distance of this magnitude and the information is a suitable source of data for an assessment of this nature. The utilised records are summarised in Table 15. Reference should be made to Figure 5 for a wind rose of the meteorological data.

Table 15 Wind Frequency Data

Wind Direction (°)	Total Frequency of Wind (%)
345 - 15	5.0
15 - 45	8.1

Wind Direction (°)	Total Frequency of Wind (%)
45 - 75	6.4
75 - 105	5.1
105 - 135	3.6
135 - 165	5.1
165 - 195	8.4
195 - 225	14.7
225 - 255	13.3
255 - 285	14.3
285 - 315	7.9
315 - 345	5.3
Sub-Total	97.2
Calms	2.0
Missing/Incomplete	0.8

4.6.2 As shown in Table 15, the prevailing wind direction at the site is from the west through south-west. Winds from the north and east are relatively infrequent, which is indicative of conditions throughout the majority of the UK.

4.6.3 All meteorological data used in the assessment was provided by Atmospheric Dispersion Modelling Ltd, which is an established distributor of meteorological data within the UK.

5.0 ASSESSMENT

5.1 Introduction

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

5.2 Fugitive Dust Emissions

5.2.1 There is the potential for emissions from the proposed development to cause adverse impacts at the sensitive locations in the vicinity of the site. The risk was therefore assessed in accordance with the IAQM methodology[15].

5.2.2 The first step was to classify the Source Emission Potential. This is summarised in Table 16. It should be noted that the development will operate in accordance with an Environmental Permit issued by the EA. This will include requirements for dust minimisation and provides regulatory control of potential impacts throughout the operational life of the facility. A comprehensive Dust Management Plan (DMP) to minimise and control potential releases from the site will also be implemented. This can be secured through planning condition if required by the Local Planning Authority.

Table 16 Fugitive Dust Emissions - Source Emission Potential

Activity	Residual Source Emission	Justification
Materials handling	Medium	Less than 5 loading vehicles Operating within 50m of site boundary
Material processing	Small	Processing less than 200,000tpa of material
Stockpiles and exposed surfaces	Small	Stockpiles with a total exposed area of less than 2.5ha Processing less than 200,000tpa of material

15 Guidance on the Assessment of Mineral Dust Impacts for Planning v1.1, IAQM, 2016.

Activity	Residual Source Emission	Justification
Off-site transportation	Medium	Total HGV movements between 25 and 200 movements in any one day Paved surfaced site access road more than 50m in length Effective HGV cleaning facilities and procedures

5.2.3 As shown in Table 16, the magnitude of residual source emissions from dust generating activities was classified as **small** to **medium**. As such, a classification of **medium** was utilised throughout the assessment as a worst-case.

5.2.4 The Pathway Effectiveness was subsequently defined based on the distance between the facility and the identified receptors, as well as the prevailing meteorological conditions. This is summarised in Table 17.

Table 17 Fugitive Dust Emissions - Pathway Effectiveness

Receptor		Frequency of Potentially Dusty Winds		Distance from Site Boundary		Pathway Effectiveness
		Frequency of Winds (%)	Category	Distance (m)	Category	
D1	Residential - Tavistock Road	27.6	Very frequent	135	Distant	Moderately Effective
D2	Residential - Tavistock Road	28.0	Very frequent	140	Distant	Moderately Effective
D3	Residential - Tavistock Road	14.7	Frequent	165	Distant	Moderately Effective
D4	Residential - Trout Road	14.7	Frequent	120	Intermediate	Moderately Effective
D5	Residential - Fairway Avenue	6.4	Moderately frequent	235	Distant	Ineffective
D6	Residential - Fairway Avenue	14.5	Frequent	190	Distant	Moderately Effective
D7	Residential - Fairway Avenue	5.0	Moderately frequent	140	Distant	Ineffective
D8	Residential - Fairway Avenue	5.3	Moderately frequent	140	Distant	Ineffective

Receptor		Frequency of Potentially Dusty Winds		Distance from Site Boundary		Pathway Effectiveness
		Frequency of Winds (%)	Category	Distance (m)	Category	
D9	Residential - Weirside Gardens	5.3	Moderately frequent	205	Distant	Ineffective

5.2.5 As shown in Table 17, the Pathway Effectiveness was determined to be **moderately effective** at five positions and **ineffective** at four receptors.

5.2.6 The residual source emission, Pathway Effectiveness and receptor sensitivity were combined to assess potential effects resulting from the proposed development. This is summarised in Table 18.

Table 18 Fugitive Dust Emissions - Risk Assessment

Receptor		Source Emission Potential	Pathway Effectiveness	Exposure Risk	Sensitivity	Effect Significance
D1	Residential - Tavistock Road	Medium	Moderately Effective	Low	High	Slight
D2	Residential - Tavistock Road	Medium	Moderately Effective	Low	High	Slight
D3	Residential - Tavistock Road	Medium	Moderately Effective	Low	High	Slight
D4	Residential - Trout Road	Medium	Moderately Effective	Low	High	Slight
D5	Residential - Fairway Avenue	Medium	Ineffective	Negligible	High	Negligible
D6	Residential - Fairway Avenue	Medium	Moderately Effective	Low	High	Slight
D7	Residential - Fairway Avenue	Medium	Ineffective	Negligible	High	Negligible
D8	Residential - Fairway Avenue	Medium	Ineffective	Negligible	High	Negligible
D9	Residential - Weirside Gardens	Medium	Ineffective	Negligible	High	Negligible

5.2.7 As shown in Table 18, the effect significance was predicted to be **slight** at five positions and **negligible** at four receptors.

5.2.8 The IAQM guidance[16] states that only if the impact is **moderate** or **substantial**, the effect is considered **significant**. As such, potential impacts as a result of fugitive dust emissions from the development are considered **not significant**, in accordance with the stated methodology.

5.3 Road Vehicle Exhaust Emissions

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.

5.3.2 The assessment considered the following scenarios:

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

Predicted Concentrations

5.3.5 Annual mean NO_2 concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 19.

[16] Guidance on the Assessment of Mineral Dust Impacts for Planning v1.1, IAQM, 2016

Table 19 Predicted Annual Mean NO_2 Concentrations

Receptor		Predicted Annual Mean NO_2 Concentration ($\mu g/m^3$)		
		DM	DS	Change
R1	Residential - Tavistock Road	25.50	25.57	0.07
R2	Residential - Tavistock Road	27.90	27.98	0.08
R3	Residential - High Street	28.34	28.38	0.04
R4	Residential - High Street	33.23	33.29	0.06
R5	Residential - High Street	30.51	30.54	0.03
R6	Yiewsley Health Centre	32.04	32.08	0.04
R7	Residential - High Street	28.76	28.78	0.02
R8	Residential - High Street	27.55	27.57	0.02
R9	Residential - Horton Road	26.73	26.75	0.02
R10	Residential - Horton Road	26.98	27.00	0.02
R11	Residential - Station Road	27.11	27.15	0.04
R12	Residential - Station Road	28.63	28.68	0.05
R13	Residential - Station Road	29.75	29.81	0.06
R14	Residential - Station Road	28.25	28.30	0.05
R15	Residential - Station Road	29.46	29.52	0.06
R16	Residential - Sipson Road	29.93	29.97	0.04
R17	Residential - Sipson Road	26.61	26.62	0.01
R18	Residential - Sipson Road	26.10	26.11	0.01
R19	Residential - Dell Road	25.79	25.82	0.03

5.3.6 As indicated in Table 19, predicted annual mean NO_2 concentrations were below the AQO of 40µg/m³ at all receptors in both scenarios.

5.3.7 Annual mean PM_{10} concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 20.

Table 20 Predicted Annual Mean PM_{10} Concentrations

Receptor		Predicted Annual Mean PM_{10} Concentration ($\mu g/m^3$)		
		DM	DS	Change
R1	Residential - Tavistock Road	17.72	17.75	0.02
R2	Residential - Tavistock Road	19.02	19.05	0.03
R3	Residential - High Street	19.24	19.25	0.02
R4	Residential - High Street	21.92	21.95	0.03
R5	Residential - High Street	20.39	20.40	0.01
R6	Yiewsley Health Centre	21.22	21.23	0.02
R7	Residential - High Street	19.44	19.44	0.01
R8	Residential - High Street	18.80	18.80	0.00
R9	Residential - Horton Road	18.55	18.57	0.01
R10	Residential - Horton Road	18.61	18.62	0.01
R11	Residential - Station Road	18.70	18.72	0.02
R12	Residential - Station Road	19.57	19.60	0.02
R13	Residential - Station Road	20.23	20.26	0.03
R14	Residential - Station Road	19.36	19.38	0.02
R15	Residential - Station Road	20.06	20.09	0.03
R16	Residential - Sipson Road	19.66	19.68	0.02
R17	Residential - Sipson Road	18.44	18.45	0.01
R18	Residential - Sipson Road	18.16	18.16	0.00
R19	Residential - Dell Road	17.98	18.00	0.02

5.3.8 As indicated in Table 20, predicted annual mean PM_{10} concentrations were below the AQO of $40\mu g/m^3$ at all sensitive receptors in both scenarios.

5.3.9 Annual mean $PM_{2.5}$ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios. These are summarised in Table 21.

Table 21 Predicted Annual Mean $PM_{2.5}$ Concentrations

Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration ($\mu g/m^3$)		
		DM	DS	Change
R1	Residential - Tavistock Road	11.83	11.84	0.01
R2	Residential - Tavistock Road	12.50	12.52	0.02
R3	Residential - High Street	12.61	12.62	0.01
R4	Residential - High Street	14.00	14.02	0.02
R5	Residential - High Street	13.21	13.21	0.01
R6	Yiewsley Health Centre	13.64	13.65	0.01
R7	Residential - High Street	12.72	12.72	0.00
R8	Residential - High Street	12.38	12.39	0.00
R9	Residential - Horton Road	12.26	12.26	0.01
R10	Residential - Horton Road	12.29	12.29	0.01
R11	Residential - Station Road	12.33	12.34	0.01
R12	Residential - Station Road	12.78	12.80	0.01
R13	Residential - Station Road	13.12	13.14	0.02
R14	Residential - Station Road	12.67	12.69	0.01
R15	Residential - Station Road	13.04	13.05	0.02
R16	Residential - Sipson Road	12.84	12.84	0.01
R17	Residential - Sipson Road	12.20	12.21	0.00
R18	Residential - Sipson Road	12.06	12.06	0.00
R19	Residential - Dell Road	11.96	11.97	0.01

5.3.10 As indicated in Table 21, predicted annual mean $PM_{2.5}$ concentrations were above the Interim Target of $12\mu g/m^3$ at 17 receptors and below at two locations in both scenarios.

Predicted Impacts

5.3.11 Predicted impacts on annual mean NO_2 concentrations at the sensitive receptor locations are summarised in Table 22.

Table 22 Predicted Impacts - NO_2

Receptor		Predicted Annual Mean NO_2 Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - Tavistock Road	Below 75% of AQO	0	Negligible
R2	Residential - Tavistock Road	Below 75% of AQO	0	Negligible
R3	Residential - High Street	Below 75% of AQO	0	Negligible
R4	Residential - High Street	76 - 94% of AQO	0	Negligible
R5	Residential - High Street	76 - 94% of AQO	0	Negligible
R6	Yiewsley Health Centre	76 - 94% of AQO	0	Negligible
R7	Residential - High Street	Below 75% of AQO	0	Negligible
R8	Residential - High Street	Below 75% of AQO	0	Negligible
R9	Residential - Horton Road	Below 75% of AQO	0	Negligible
R10	Residential - Horton Road	Below 75% of AQO	0	Negligible
R11	Residential - Station Road	Below 75% of AQO	0	Negligible
R12	Residential - Station Road	Below 75% of AQO	0	Negligible
R13	Residential - Station Road	Below 75% of AQO	0	Negligible
R14	Residential - Station Road	Below 75% of AQO	0	Negligible
R15	Residential - Station Road	Below 75% of AQO	0	Negligible
R16	Residential - Sipson Road	Below 75% of AQO	0	Negligible
R17	Residential - Sipson Road	Below 75% of AQO	0	Negligible
R18	Residential - Sipson Road	Below 75% of AQO	0	Negligible
R19	Residential - Dell Road	Below 75% of AQO	0	Negligible
R1	Residential - Tavistock Road	Below 75% of AQO	0	Negligible
R2	Residential - Tavistock Road	Below 75% of AQO	0	Negligible

5.3.12 As indicated in Table 22, impacts on annual mean NO_2 concentrations as a result of the proposed development were predicted to be **negligible** at all receptors.

5.3.13 Predicted impacts on annual mean PM_{10} concentrations at the sensitive receptor locations are summarised in Table 23.

Table 23 Predicted Impacts - PM_{10}

Receptor		Predicted Annual Mean PM_{10} Concentration	Predicted Concentration Change as Proportion of AQO (%)	Impact Significance
R1	Residential - Tavistock Road	Below 75% of AQO	0	Negligible
R2	Residential - Tavistock Road	Below 75% of AQO	0	Negligible
R3	Residential - High Street	Below 75% of AQO	0	Negligible
R4	Residential - High Street	Below 75% of AQO	0	Negligible
R5	Residential - High Street	Below 75% of AQO	0	Negligible
R6	Yiewsley Health Centre	Below 75% of AQO	0	Negligible
R7	Residential - High Street	Below 75% of AQO	0	Negligible
R8	Residential - High Street	Below 75% of AQO	0	Negligible
R9	Residential - Horton Road	Below 75% of AQO	0	Negligible
R10	Residential - Horton Road	Below 75% of AQO	0	Negligible
R11	Residential - Station Road	Below 75% of AQO	0	Negligible
R12	Residential - Station Road	Below 75% of AQO	0	Negligible
R13	Residential - Station Road	Below 75% of AQO	0	Negligible
R14	Residential - Station Road	Below 75% of AQO	0	Negligible
R15	Residential - Station Road	Below 75% of AQO	0	Negligible
R16	Residential - Sipson Road	Below 75% of AQO	0	Negligible
R17	Residential - Sipson Road	Below 75% of AQO	0	Negligible
R18	Residential - Sipson Road	Below 75% of AQO	0	Negligible
R19	Residential - Dell Road	Below 75% of AQO	0	Negligible

5.3.14 As indicated in Table 23, impacts on annual mean PM_{10} concentrations as a result of the proposed development were predicted to be **negligible** at all receptors.

5.3.15 Predicted impacts on annual mean $PM_{2.5}$ concentrations at the sensitive receptor locations are summarised in Table 24.

Table 24 Predicted Impacts - $PM_{2.5}$

Receptor		Predicted Annual Mean $PM_{2.5}$ Concentration	Predicted Concentration Change as Proportion of Interim Target (%)	Impact Significance
R1	Residential - Tavistock Road	95 - 102% of Interim Target	0	Negligible
R2	Residential - Tavistock Road	103 - 109% of Interim Target	0	Negligible
R3	Residential - High Street	103 - 109% of Interim Target	0	Negligible
R4	Residential - High Street	110% or more of Interim Target	0	Negligible
R5	Residential - High Street	110% or more of Interim Target	0	Negligible
R6	Yiewsley Health Centre	110% or more of Interim Target	0	Negligible
R7	Residential - High Street	103 - 109% of Interim Target	0	Negligible
R8	Residential - High Street	103 - 109% of Interim Target	0	Negligible
R9	Residential - Horton Road	103 - 109% of Interim Target	0	Negligible
R10	Residential - Horton Road	103 - 109% of Interim Target	0	Negligible
R11	Residential - Station Road	103 - 109% of Interim Target	0	Negligible
R12	Residential - Station Road	103 - 109% of Interim Target	0	Negligible
R13	Residential - Station Road	103 - 109% of Interim Target	0	Negligible
R14	Residential - Station Road	103 - 109% of Interim Target	0	Negligible
R15	Residential - Station Road	103 - 109% of Interim Target	0	Negligible
R16	Residential - Sipson Road	103 - 109% of Interim Target	0	Negligible
R17	Residential - Sipson Road	95 - 102% of Interim Target	0	Negligible
R18	Residential - Sipson Road	95 - 102% of Interim Target	0	Negligible
R19	Residential - Dell Road	95 - 102% of Interim Target	0	Negligible

5.3.16 As indicated in Table 24, impacts on annual mean $PM_{2.5}$ concentrations as a result of the proposed development were predicted to be **negligible** at all receptors.

Overall Impact Significance

5.3.17 The overall significance of operational phase road traffic emission impacts was determined as **negligible**. This was based on the predicted impacts at the discrete receptor locations and the considerations outlined previously. Further justification is provided in Table 25.

Table 25 Overall Impact Significance of Road Vehicle Exhaust Emissions

Guidance	Comment
The existing and future air quality in the absence of the development	Predicted annual mean NO_2 and PM_{10} concentrations were below the AQO at all receptors in the DM scenario. Predicted $PM_{2.5}$ concentrations were above the relevant Interim Target at 17 locations and below at two positions in the DM scenario The predictions are unlikely to change in the absence of the proposals given the relatively 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 and Interim Target
The influence and validity of any assumptions adopted when undertaking the prediction of impacts	The assessment assumed that background pollutant 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

5.3.18 The IAQM guidance[17] states that only if the impact is **moderate** or **substantial** the effect is considered **significant**. As the impacts were predicted to be **negligible**, overall effects are considered **not significant**, in accordance with the stated methodology.

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

6.0 CONCLUSION

6.1.1 Redmore Environmental Ltd was commissioned by Heatons to undertake an Air Quality Assessment in support of a planning application for a waste transfer station on land off Tavistock Road, Yiewsley.

6.1.2 The proposals have the potential to cause air quality impacts as a result of fugitive dust and road vehicle exhaust emissions during operation. As such, an Air Quality Assessment was undertaken in order to determine baseline conditions and assess potential effects as a result of the scheme.

6.1.3 The risk of potential effects as a result of fugitive dust emissions from the facility during the operational phase was assessed using the IAQM methodology. This included consideration of the Source Emission potential, Pathway Effectiveness and sensitivity of relevant receptors in the vicinity of the site. The results of the assessment indicated the overall effects as a result of the development were predicted to be **not significant**.

6.1.4 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. Dispersion modelling was therefore undertaken in order to predict pollutant concentrations at sensitive locations as a result of emissions from the highway network both with and without the development in place. Results were subsequently verified using local monitoring data.

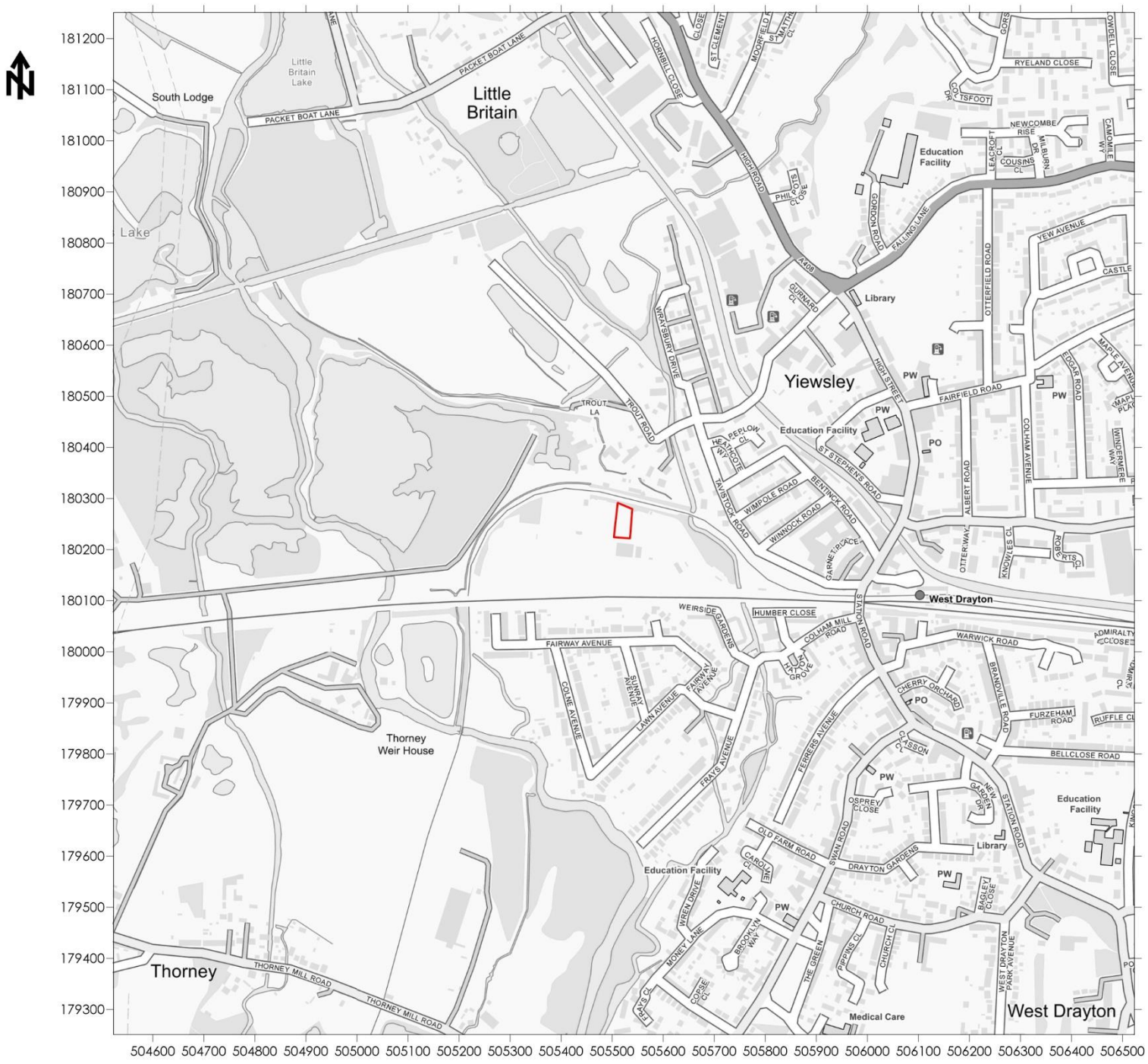
6.1.5 Review of the dispersion modelling results indicated that impacts on annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations were predicted to be **negligible** at all sensitive receptor locations. Following consideration of the relevant issues, air quality impacts as a result of road vehicle exhaust emissions associated with the operation of the development were considered to be **not significant**, in accordance with the IAQM guidance.

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

7.0 ABBREVIATIONS

AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQAP	Air Quality Action Plan
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
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
DS	Do-Something
EA	Environment Agency
EFT	Emissions Factor Toolkit
GLA	Greater London Authority
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
LBoH	London Borough of Hillingdon
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
tpa	Tonnes per annum
z_0	Roughness Length

Figures



Legend

Site Boundary

Title
Figure 1 - Site Location

Project
Air Quality Assessment
Tavistock Road, Yiewsley

Project Reference
6975

Client
Heatons

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

Redmore environmental
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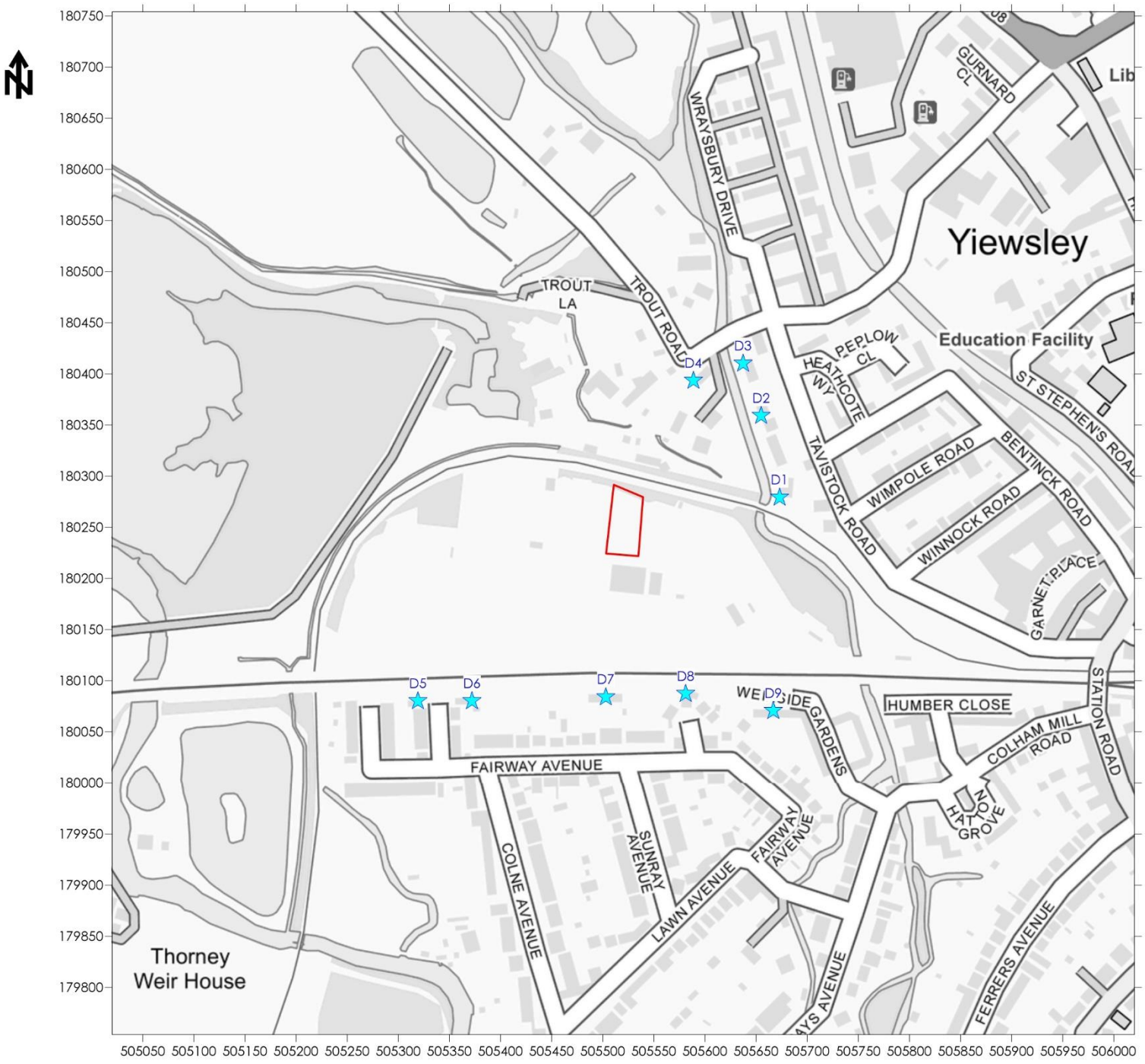

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Site Boundary

Dust Sensitive Receptor

Title
Figure 3 - Dust Sensitive Receptors

Project
Air Quality Assessment
Tavistock Road, Yiewsley

Project Reference
6975

Client
Heatons

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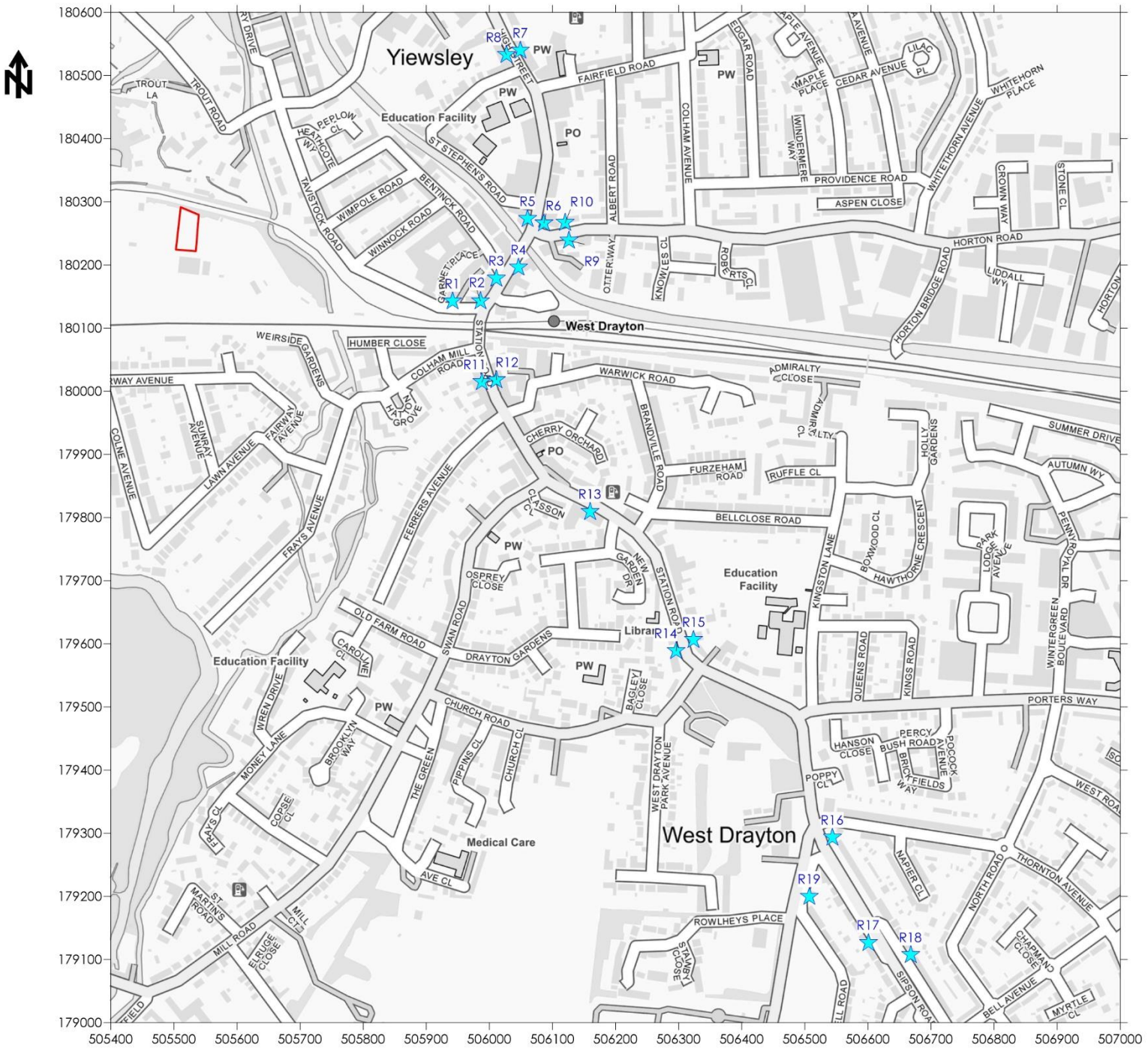

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Site Boundary

Receptor

Title
Figure 4 - Road Vehicle Exhaust Emission Receptors

Project
Air Quality Assessment
Tavistock Road, Yiewsley

Project Reference
6975

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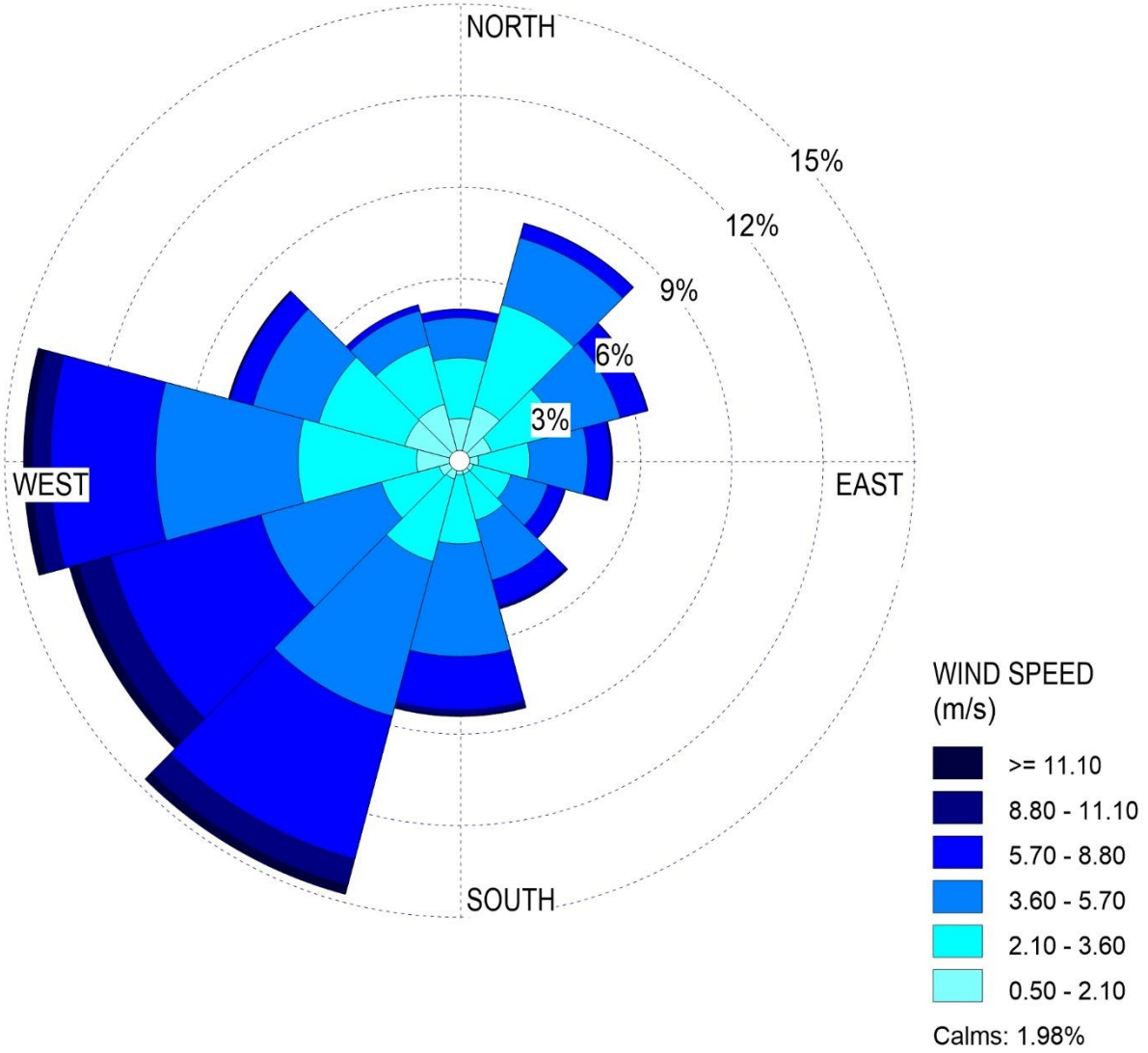

Legend

Title
Figure 5 - Wind Rose of 2016 to 2020 Heathrow Airport Meteorological Data

Project
Air Quality Assessment
Tavistock Road, Yiewsley

Project Reference
6975

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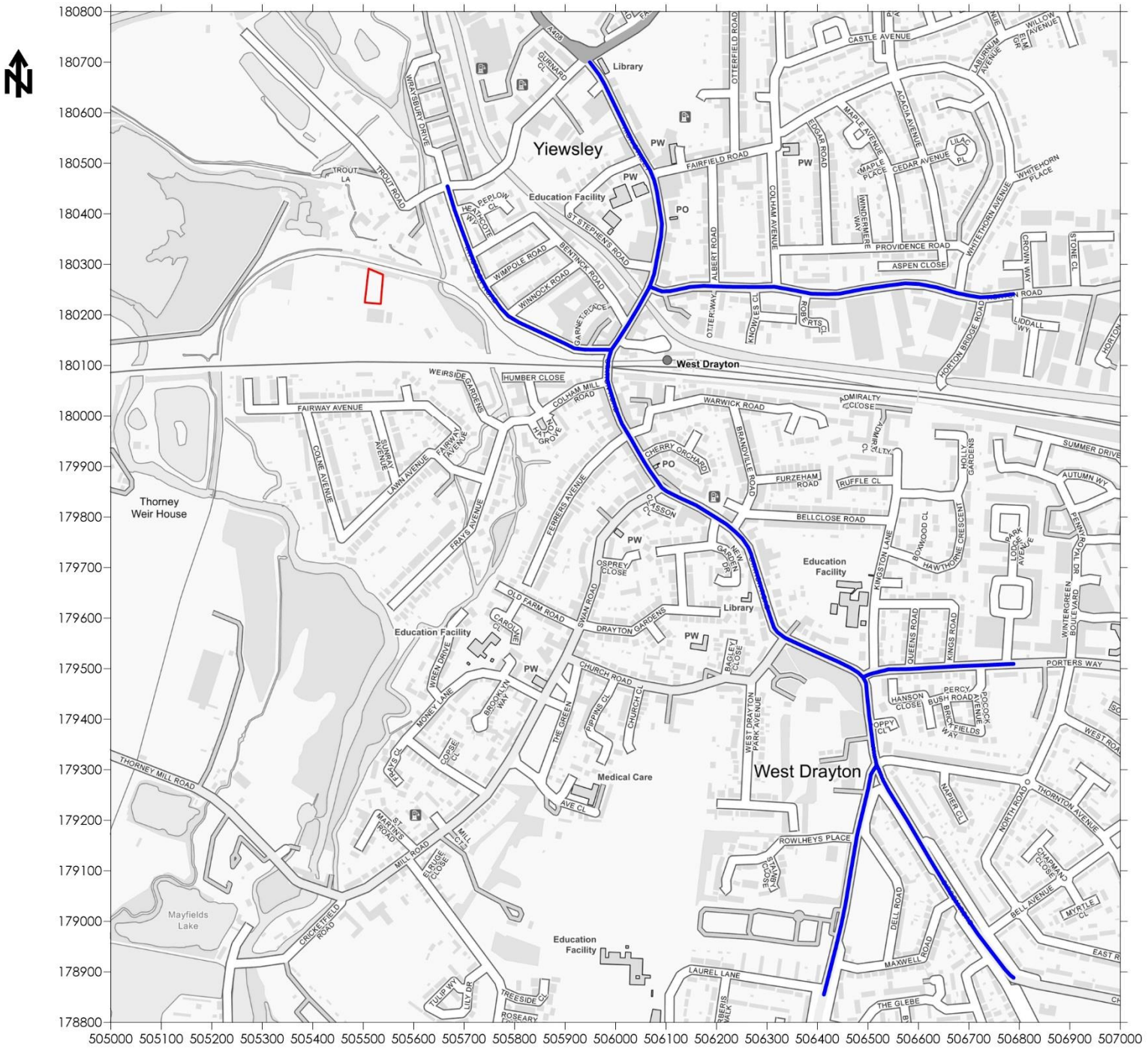

Legend

Site Boundary

Modelled Road Link

Title
Figure 6 - ADMS-Roads Inputs

Project
Air Quality Assessment
Tavistock Road, Yiewsley

Project Reference
6975

Client
Heatons

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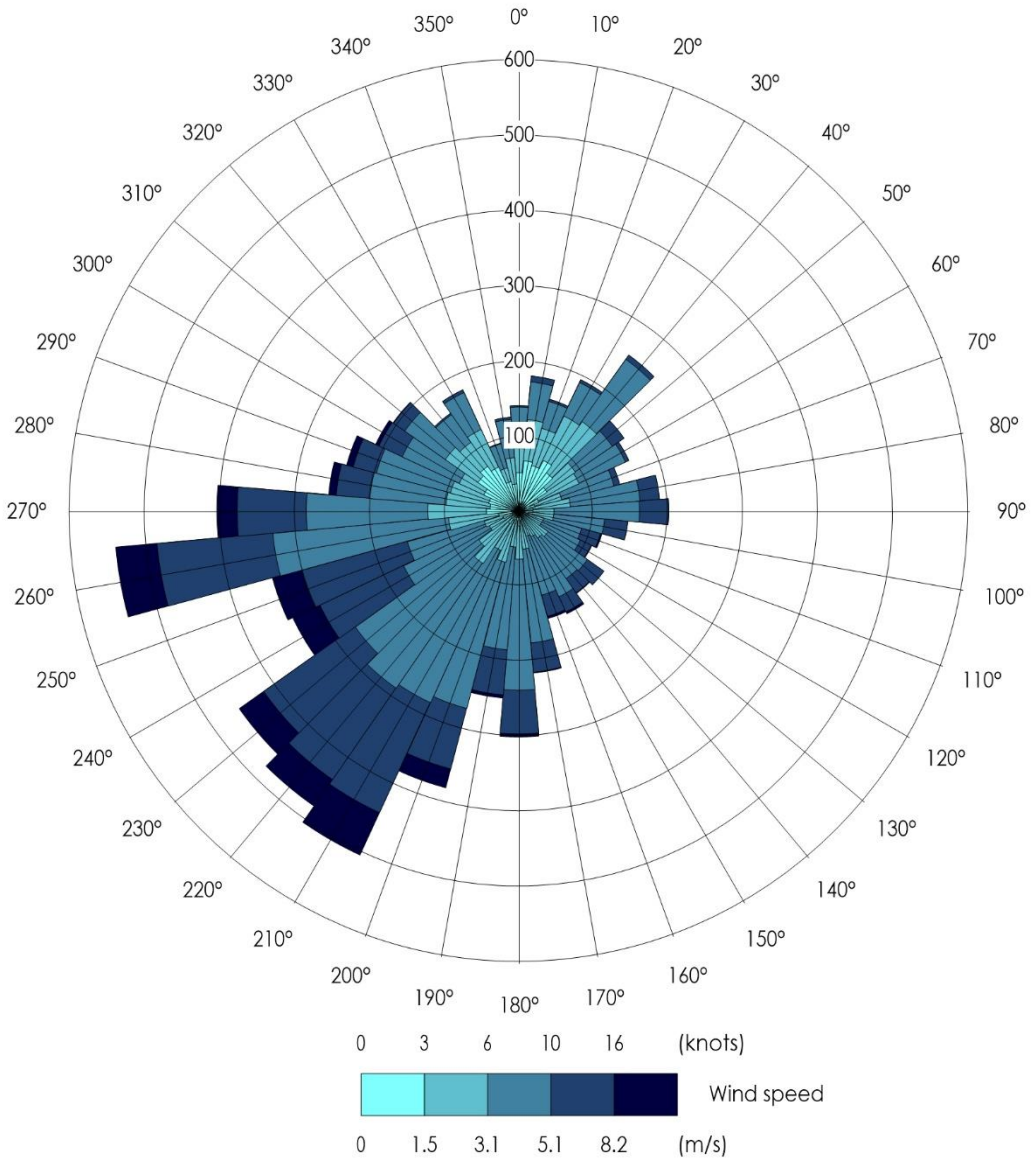

Legend

Title
Figure 7 - Wind Rose of 2019 Heathrow Airport Meteorological Data

Project
Air Quality Assessment
Tavistock Road, Yiewsley

Project Reference
6975

Client
Heatons

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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 site during the operational phase. 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:

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

These are detailed in the following Sections.

Traffic Flow Data

Baseline traffic data for use in the assessment was obtained from the latest version of the LAEI, 2019[18]. 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[19] as being a

[18] LAEI 2019 - London Datastore.

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

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 8.0). This software package has been developed by the Department for Transport (DfT) to calculate future traffic growth throughout the UK.

Development trip generation data was provided by Cora IHT, the Transport Consultants for the project. This was applied to the relevant links in order to develop the DS scenario inputs.

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

Table A1.1 Traffic Flows

Link		24-hour AADT Flow			Avg. Vehicle Speed (km/h)	Road Width (m)
		Verif.	DM	DS		
L1	Tavistock Road, west of site	1,147	1,200	1,200	25	6.2
L2	Tavistock Road, east of site	1,147	1,200	1,299	20	6.2
L3	High Street, north of Tavistock Road	21,640	22,631	22,665	25	9.7
L4	High Street, north of Horton Road	21,640	22,631	22,648	25	9.7
L5	Horton Road, junction	5,299	5,542	5,559	15	11.2
L6	Horton Road	5,299	5,542	5,559	40	6.7
L7	Station Road	21,566	22,554	22,619	30	7.5
L8	Station Road, junction	21,566	22,554	22,619	15	12.3
L9	Sipson Road, junction	15,056	15,746	15,763	15	12.3
L10	Sipson Road	15,056	15,746	15,763	45	7.7
L11	Harmondsworth Road, junction	6,552	6,852	6,900	15	10.1
L12	Harmondsworth Road	6,552	6,852	6,900	45	7.3
L13	Porters Way, junction	5,197	5,435	5,435	15	11.2
L14	Porters Way	5,197	5,435	5,435	25	7.3

Fleet composition data as a proportion of total flows on each link for cars, taxis, Light Goods Vehicles (LGV), Heavy Goods Vehicles (HGV), buses and coaches and motorcycles are summarised in Table A1.2 for the verification and DM scenarios.

Table A1.2 Fleet Composition Data - Verification and DM

Link	Proportion of Fleet (%)						
	Car	Taxi	LGV	Rigid HGV	Artic HGV	Bus and Coach	Motorcycle
L1	66.6	0.0	0.0	33.4	0.0	0.0	0.0
L2	66.6	0.0	0.0	33.4	0.0	0.0	0.0
L3	81.2	0.3	12.4	0.3	0.1	4.5	1.2
L4	81.2	0.3	12.4	0.3	0.1	4.5	1.2
L5	85.8	0.7	8.4	1.0	0.2	2.7	1.2
L6	85.8	0.7	8.4	1.0	0.2	2.7	1.2
L7	81.4	0.3	12.4	0.3	0.1	4.4	1.2
L8	81.4	0.3	12.4	0.3	0.1	4.4	1.2
L9	73.7	1.5	18.3	2.2	0.4	2.7	1.2
L10	73.7	1.5	18.3	2.2	0.4	2.7	1.2
L11	80.9	0.3	15.1	0.2	0.0	2.3	1.2
L12	80.9	0.3	15.1	0.2	0.0	2.3	1.2
L13	66.8	1.9	19.0	3.2	0.6	7.2	1.2
L14	66.8	1.9	19.0	3.2	0.6	7.2	1.2

Fleet composition data for the DS scenario is summarised in Table A1.3.

Table A1.3 Fleet Composition Data - DS

Link	Proportion of Fleet (%)						
	Car	Taxi	LGV	Rigid HGV	Artic HGV	Bus and Coach	Motorcycle
L1	66.6	0.0	0.0	33.4	0.0	0.0	0.0
L2	61.3	0.0	0.0	38.7	0.0	0.0	0.0

Link	Proportion of Fleet (%)						
	Car	Taxi	LGV	Rigid HGV	Artic HGV	Bus and Coach	Motorcycle
L3	81.1	0.3	12.4	0.4	0.1	4.5	1.2
L4	81.2	0.3	12.4	0.3	0.1	4.5	1.2
L5	85.5	0.7	8.4	1.3	0.2	2.7	1.2
L6	85.5	0.7	8.4	1.3	0.2	2.7	1.2
L7	81.1	0.3	12.4	0.5	0.1	4.4	1.2
L8	81.1	0.3	12.4	0.5	0.1	4.4	1.2
L9	73.7	1.5	18.3	2.2	0.4	2.7	1.2
L10	73.7	1.5	18.3	2.2	0.4	2.7	1.2
L11	80.2	0.3	15.1	0.9	0.0	2.3	1.2
L12	80.2	0.3	15.1	0.9	0.0	2.3	1.2
L13	66.9	1.9	19.0	3.2	0.6	7.2	1.2
L14	66.9	1.9	19.0	3.2	0.6	7.2	1.2

Reference should be made to Figure 6 for a graphical representation of the road link locations.

Emission Factors

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (EFT) (version 12.0). This has been produced by DEFRA and incorporates COPERT 5.6 vehicle emission factors and fleet information.

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).

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 7 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 1.0m was used to describe the modelling extents. This is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'cities, woodland'.

A z_0 of 0.3m was used to describe the meteorological site. This value is considered appropriate for the morphology of the area 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

Background annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations for use in the assessment were obtained from the DEFRA mapping study for the grid square containing the HILL20 monitor, NGR: 506500, 179500, as shown in Table A1.4.

Table A1.4 Background Concentrations - Modelling Extents

Pollutant	Predicted 2019 Background Concentration (µg/m^3)
NO_2	23.30
PM_{10}	16.61
$PM_{2.5}$	11.25

The values shown in Table A1.4 were chosen to represent concentrations throughout the dispersion modelling extents without the contribution from road vehicles as they were higher than the DEFRA background for the grid square containing the site, as shown in Table 13.

Background concentrations from 2019 were utilised throughout the assessment in preference to the development opening year. This provided a robust assessment and is likely to overestimate pollutant concentrations during the operation of the proposal.

It is noted that the GLA has released background concentration maps with a spatial resolution of 20m for 2013, 2020, 2025 and 2030. However, as the modelling area is considerably greater than 20m, and values were not available for the verification or opening years, this data was not considered appropriate for use in the assessment.

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 DEFRA guidance[20] and GLA guidance[21].

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,
- 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

[20] Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

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

year aligns with the IAQM position statement 'Use of 2020 and 2021 Monitoring Datasets'[22], 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"

Monitoring of NO_2 concentrations was undertaken at two locations within the vicinity of roads included in the model during 2019. The results were obtained and the road contribution to total NO_x concentrations calculated following the methodology contained within DEFRA guidance[23]. The monitored annual mean NO_2 concentrations and calculated road NO_x concentrations are summarised in Table A1.5.

Table A1.5 Verification - Monitoring Results

Monitoring Location		Monitored NO_2 Concentration (µg/m³)	Calculated Road NO_x Concentration (µg/m³)
HILL13	31 Tavistock Road (on lamp-post outside house)	27.9	9.57
HILL20	1 Porters Way (corner with Kingston Lane) Lamp Post (1)	36.6	29.21

The annual mean road NO_x concentrations predicted from the dispersion model and the 2019 road NO_x concentrations calculated from the monitoring results are summarised in Table A1.6.

Table A1.6 Verification - Modelling Results

Monitoring Location		Calculated Road NO_x Concentration (µg/m³)	Modelled Road NO_x Concentration (µg/m³)
HILL13	31 Tavistock Road (on lamp-post outside house)	9.57	2.48
HILL20	1 Porters Way (corner with Kingston Lane) Lamp Post (1)	29.21	7.77

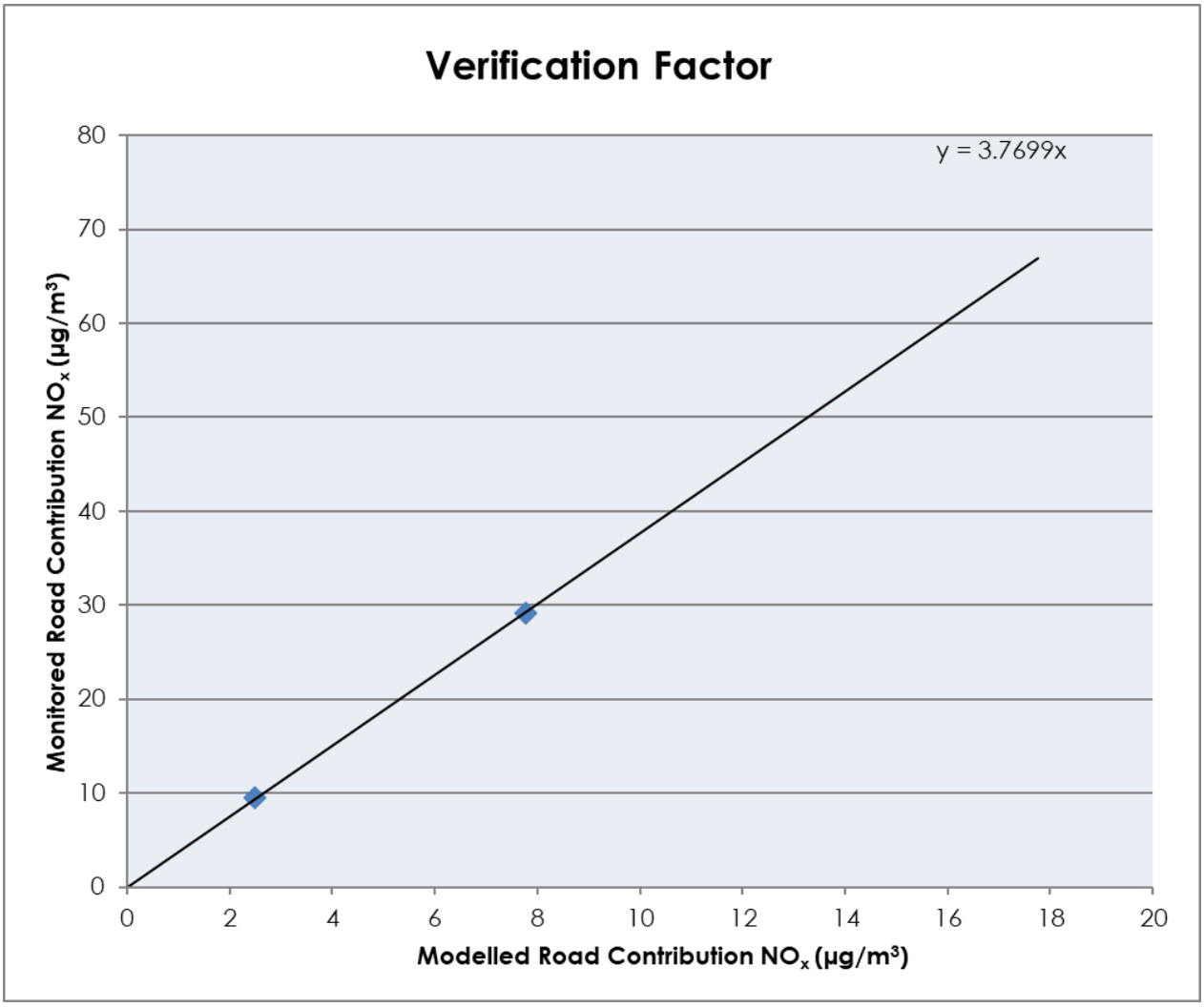
The monitored and modelled road NO_x concentrations were graphed and the equation of the trendline based on linear progression through zero calculated. This indicated that a verification

22 Use of 2020 and 2021 Monitoring Datasets, IAQM, 2021

23 Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

factor of 3.7699 was required to be applied to all road NO_x modelling results, as shown in Graph 1.

Graph 1 NO_x Verification Factor



Monitoring of PM_{10} and $PM_{2.5}$ concentrations are 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 DEFRA guidance[24].

[24] Local Air Quality Management Technical Guidance (TG22), DEFRA, 2022.

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.

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