

HORTON ROAD, DEVIZES

AIR QUALITY IMPACT ASSESSMENT

November 2025

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1.0 INTRODUCTION

Isopleth Ltd has been commissioned by McDonalds Restaurants to carry out a detailed air quality assessment associated with the development of a drive-thru and eat-in restaurant on land off Horton Road, Devizes. The site is located within the administrative boundary of Wiltshire Council (WC).

This report presents the air quality assessment undertaken in relation to air pollution emissions from the development proposals and the impact on existing sensitive locations in the vicinity of the site.

1.1 Development Description

The proposals comprise the construction of a drive-thru and eat-in restaurant alongside car parking and infrastructure. The site is on a 0.87 hectare (ha) parcel of land. The scheme is bound to the north by the A361 London Road, to the east by vacant land, to the south by Horton Road with residential dwellings beyond and to the west by the London Road/Horton Road roundabout.

Should the scheme be granted planning permission, it is envisaged that the development would be opened by 2027 and this has been taken as the opening year for purposes of this air quality assessment.

The area of development is shown in the drawings included within Appendix 1 of this report.

1.2 Report Context

This air quality impact assessment provides information regarding the potential for air quality impacts from vehicle pollution exposure on existing receptors close to the scheme.

1.3 Scope

The scope of this assessment is limited to the prediction of air quality impacts associated with the operation of the development on land off Horton Road, Devizes, and draws on existing information to determine whether this is likely to be significant.

1.4 Objectives

The objectives of the assessment are therefore as follows:

- To identify and assess the operational impacts of the proposed development (e.g. vehicle trips); and,
- To assess the significance of these impacts.

1.5 Experience of the Assessor

According to guidance issued by the Institute of Air Quality Management (IAQM), air quality assessments must only be completed by a qualified assessor if they are to be considered robust.

This assessment has been completed by Matt Stoaling of Isopleth Ltd and Fellow of the IAQM. Matt has been involved in the field of air quality assessment for over 28 years. During this time, Matt has provided air quality advice and services to a range of industry sectors and clients, including the residential and retail development sectors, industry, solid waste, wastewater and agriculture. Matt has worked on behalf of local authority and government agencies advising on air quality issues, including documents published by the Environment Agency, Sniffer and the IAQM.



2.0 ASSESSMENT METHODOLOGY

2.1 Introduction

The air quality assessment has been completed in accordance with standard UK best practice, as described by the IAQM and Environmental Protection UK. This includes detailed modelling of development impacts.

A staged approach has been adopted; this ensures that the approach taken for the assessment of risk is proportional to the risk of an unacceptable impact being caused. As such, where a simple review of the situation shows that risk of a health or nuisance impact is negligible, this will be sufficient. In cases where the risk cannot be regarded as insignificant, a more detailed assessment may be required, such as a quantitative screening assessment or an advanced dispersion modelling exercise (as appropriate).

The following sections outline the methodology utilised throughout the assessment.

2.2 Consultation

Pre-application consultation was undertaken in relation to the development proposals (Application No: ENQ/2025/00565) and Wiltshire Council confirmed on 21st July 2025 that an air quality assessment would be required in support of the scheme, and that the development must demonstrate how it will mitigate emissions in accordance with Core Policy 55.

2.3 Approach

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. Potential impacts have been defined by predicting nitrogen dioxide (NO₂), particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀) and particulate matter with an aerodynamic diameter of less than 2.5µm (PM_{2.5}) concentrations at sensitive locations using dispersion modelling for the following scenarios:

- **Scenario 0:** 2024 Baseline - Model verification;
- **Scenario 1:** 2027 'do minimum' (DM) (predicted traffic flows in 2027, inclusive of anticipated growth and committed developments, should the proposals not proceed); and,
- **Scenario 2:** 2027 'do something' (DS) (predicted traffic flows in 2027, inclusive of anticipated growth and committed developments, as well as trips associated with the completion of the proposals).

Dispersion modelling was undertaken using the ADMS-Roads dispersion model (version 5.1.0.2).

In the case of impact descriptors for the assessment of traffic emissions, the example criteria described within guidance issued by the IAQM¹ has been used as presented in Table 2-1. This terminology should be used where a quantitative assessment is undertaken (i.e. the vehicle trips exceed the screening threshold).

Table 2-1
Impact Descriptors for Annual Mean Pollutant Concentrations

Concentration at Receptor in Assessment Year	Predicted Concentration Change as Proportion of Air Quality Objective (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

These descriptors, used for describing the severity of impacts provide the basis for determining the significance of the effects arising from air quality impacts. Impacts on air quality, whether adverse or beneficial, will have an effect on human health that can be judged as 'significant' or 'not significant'. Moderate or substantial impacts would typically be regarded as significant, whilst slight (or negligible) impacts would be regarded as not significant.

New Supplementary Planning Guidance - *Air Quality Supplementary Planning Document (SPD)* - to deliver air quality improvements through the planning system was approved at Wiltshire Council's Full Council meeting on 21st October 2025. This assessment also considers the requirements of this newly-issued SPD.

¹ Institute of Air Quality Management, Land-Use Planning & Development Control: Planning for Air Quality. 2017.

3.0 REGULATORY STANDARDS AND GUIDANCE

3.1 Legislation

3.1.1 Air Quality Standards

The Air Quality Standards Regulations 2010, Statutory Instrument 2010 No. 1001 came into force on 11th June 2010 and include Air Quality Limit Values (AQLVs) for seven pollutants, including those most relevant to traffic movements (NO₂ and PM) which have been assessed in this study.

3.1.2 Air Quality Strategy

The Air Quality Strategy (AQS) was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published on 28th April 2023². 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.

The Environmental Improvement Plan 2023³ 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). The air quality Standards and Objectives and Interim Target considered within this air quality assessment are presented within Table 3-1.

Table 3-1
Air Quality Standards

Pollutant	Standard	Measured as	Equivalent percentile
NO ₂	40µg/m ³	Annual mean	-
	200µg/m ³	1 hour mean	99.79 th percentile of 1-hour-means (equivalent to 18 1-hour exceedences)
PM ₁₀ (gravimetric)	40µg/m ³	Annual mean	-
	50µg/m ³	24 hour mean	90.41 st percentile of 24-hour-means (equivalent to 35 24-hour exceedences)
PM _{2.5} (gravimetric)	20µg/m ³	Annual mean	-
	12µg/m ³	Annual mean	Interim Target to be achieved by the end of January 2028.
	10µg/m ³	Annual mean	Concentration Target to be achieved by 2040.

² AQS: Framework for Local Authority Delivery, DEFRA, 2023.

³ Environmental Improvement Plan 2023, DEFRA, 2023.

In accordance with DEFRA technical guidance Local Air Quality Management (TG22), the air quality objectives should be assessed at locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective.

A summary of relevant exposure for the objectives presented in Table 3-1 are shown below in Table 3-2.

Table 3-2
Relevant Public Exposure

Objective Averaging Period	Relevant Locations	Objectives should apply at:	Objectives should not apply at:
Annual mean	Where individuals are exposed for a cumulative period of 6 months in a year;	Building facades of residential properties, schools, hospitals etc	Facades of offices Hotels Gardens of residences Kerbside sites
24-hour mean	Where individuals may be exposed for eight hours or more in a day	As above together with hotels and gardens of residential properties	Kerbside sites where public exposure if expected to be short term
1-hour mean	Where individuals might reasonably expected to spend one hour or longer	As above together with kerbside sites of regular access, car parks, bus stations etc	Kerbside sites where public would not be expected to have regular access

DEFRA advice is for dispersion modelling to be carried out for the annual average NO₂ concentration and this annual average result used as an indication as to whether there will be a likely exceedance of the 1-hour NO₂ objective.

'A study carried out on behalf of Defra and the Devolved Administrations identified that exceedances of the NO₂ 1-hour mean are unlikely to occur where the annual mean is below 60µg/m³. Analysis of data in more recent years has shown local authorities should continue to use this assumption where NO₂ 1-hour mean monitoring data are not available (typically if monitoring NO₂ using passive diffusion tubes).'

In accordance with this guidance and given the limitations for direct modelling of 1-hour NO₂, the annual mean concentrations of NO₂, have been predicted through dispersion modelling and the results used for the basis of the short terms exposure predictions. This is relevant in the case of users of the drive-thru, for example.

3.1.3 Local Authority Air Quality Review and Assessment

Local Authorities (LAs), including WC, have formal powers to control air quality through a combination of Local Air Quality Management (LAQM) and by use of their wider planning policies.

Under Section 82 of the Environment Act 1995 (Part IV), LAs are required to periodically review and assess air quality within their area of jurisdiction under the system of LAQM. This

review and assessment of air quality involves assessing present and likely future air quality against the Objectives. If it is predicted that levels at the façade of buildings, in the instance of annual mean concentrations, where members of the public are regularly present (normally residential properties) 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 Objectives.

The results of WC's Review and Assessment of air quality are summarised in Section 4.2.1

3.2 National Planning Policy

The revised National Planning Policy Framework (NPPF) was published in December 2024 and amended in February 2025. The document sets out the Government's planning policies for England and how these are expected to be applied.

The purpose of the planning system is to contribute to the achievement of sustainable development. In order to ensure this, this 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.'

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 [...].'

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.'

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

3.3 Local Planning Policy

The Wiltshire Core Strategy⁴ was adopted by WC in January 2015. A review of the document identified the following policies of relevance to this report:

'Core Policy 55:

Air quality

Development proposals, which by virtue of their scale, nature or location are likely to exacerbate existing areas of poor air quality, will need to demonstrate that measures can be taken to effectively mitigate emission levels in order to protect public health, environmental quality and amenity. Mitigation measures should demonstrate how they will make a positive contribution to the aims of the Air Quality Strategy for Wiltshire and where relevant, the Wiltshire Air Quality Action Plan. Mitigation may include:

- i. landscaping, bunding or separation to increase distance from highways and junctions*
- ii. possible traffic management or highway improvements to be agreed with the local authority*
- iii. abatement technology and incorporating site layout/separation and other conditions in site planning*
- iv. traffic routing, site management, site layout and phasing*
- v. where appropriate, contributions will be sought toward the mitigation of the impact a development may have on levels of air pollutants.'*

'Core Policy 57

Ensuring high quality design and place shaping

A high standard of design is required in all new developments, including extensions, alterations, and changes of use of existing buildings. Development is expected to create a strong sense of place through drawing on the local context and being complementary to the locality. Applications for new development must be accompanied by appropriate information to demonstrate how the proposal will make a positive contribution to the character of Wiltshire through:

[...]

⁴ Wiltshire Core Strategy, WC, 2015.

v.ii having regard to the compatibility of adjoining buildings and uses, the impact on the amenities of existing occupants, and ensuring that appropriate levels of amenity are achievable within the development itself, including the consideration of privacy, overshadowing, vibration, and pollution (e.g. light intrusion, noise, smoke, fumes, effluent, waste or litter)

[...].'

As described above, WC has produced an Air Quality Supplementary Planning Document (SPD) as part of an overarching Low Emissions Strategy to reduce road transport emissions in the county. It is aimed at helping WC deliver AQO compliance through cost effective service planning brought about by the joint working and relevant Local Plan policies. This document has been considered as necessary throughout the assessment.

3.4 Future Trends

In January 2019 the Government launched the Clean Air Strategy. This highlighted the commitment of the UK Government to reducing levels of air pollution over time, from sources including road transport, industry and agriculture. This document included a commitment to end the sale of conventional new diesel and petrol cars and vans at some point in the future, initially stated to be 2040 but in 2020 this was brought forward to 2030. The commitment to end the sale of conventional new diesel and petrol (internal combustion engine, or ICE) cars and vans has been offset by a similar commitment to significantly increase the numbers of electric vehicles (EVs), which will be emissions free.

In the meantime, the ICE vehicles that are being released will be required to meet stringent emissions criteria aimed at reducing combustion pollutants such as nitrogen oxides (NO_x) and particulates. As such, the current evidence points to the following in terms of overall future trends:

- NO_x emissions are reducing as a result of fewer ICE cars and exhaust mitigation; and,
- As EVs are more widely used, the emissions of all pollutants (e.g. NO_x and PM₁₀) will reduce. This is will particularly be the case in the longer term (i.e. 5 years and longer, towards a ban on new ICEs in 2035).

The requirement in the Building Regulations for new residential and commercial buildings to be EV charger enabled after 2025 will assist with adoption of EVs. This is emphasised in the July 2025 Air Quality SPD:

EV charging requirements for developments: Employment sites Use Classes B2, B8, C1, C2, C2(a), E, F1, F2 and Sui Generis as appropriate. 20% of parking spaces with active provision and an additional 20% of parking spaces with passive provision. For employment developments with high turnover of parking, provision should be made for rapid charging, due to a short dwell time (e.g. one hour maximum stay). Rating 7.4kW minimum. At least one rapid charger of at least 50kW as a minimum, unless it can be demonstrated why this is not necessary.

4.0 RECEPTORS AND BASELINE AIR QUALITY

The following sections provide detail of the baseline air quality at the site and the surrounding receptors.

4.1 Site Location

The site is approximately 0.87ha in size and is located on land off Horton Road, Devizes. The proposed development location currently comprises a petrol filling station with the A361 London Road to the north, vacant land to the east, Horton Road to the south with residential dwellings beyond and London Road/Horton Road roundabout to the west.

4.2 Existing Baseline Conditions

4.2.1 Local Authority Review and Assessment

As required under Section 82 of the Environment Act (1995) (Part IV), as amended by the Environment Act (2021), WC has conducted an ongoing exercise to review and assess air quality within their area of jurisdiction. This process, as reported in the WC 2025 Air Quality Annual Status Report⁵, has indicated that annual mean concentrations of NO₂ are above the relevant AQO at locations of relevant public exposure within WC's administrative area.

There are currently eight AQMAs in Wiltshire, having been declared in respect of NO₂ resulting from road-traffic emissions. The closest of these to the development is the Devizes AQMA. This is described as main roads through the town and is adjacent to the site. 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.

In relation to the AQMAs, the Wiltshire Council website states that:

'Air quality has improved significantly across the county in recent years, and it is likely that we will be able to start revoking the AQMAs from 2025 onwards. Defra require 3 years monitoring results 10% below the objective or 5 years monitoring results below the objective.'

The location of the Devizes AQMA is presented on Figure 4-1.

⁵ 2025 Air Quality Annual Status Report, WC, 2025.

4.2.2 Monitoring

A summary of recent NO₂ monitoring results from the WC survey locations with most relevance to the application site is presented in Table 4-1.

Table 4-1
NO₂ Monitoring Results

Monitoring Location		Grid Reference (OS GR)		Monitored NO ₂ Concentration (µg/m ³)		
ID	Description	X	Y	2022	2023	2024
AM3	Sidmouth Street, Devizes	400765	161458	30	27	32.3
5	Windsor Drive, Devizes	401778	162414	16.9	14.9	12.6
7	105 St James Place, Devizes	400807	161389	28.1	25.3	23.3

Table 4-1 indicates that annual mean NO₂ concentrations were below the AQO of 40µg/m³ at all monitoring sites in 2022, 2023 and 2024.

A summary of recent PM₁₀ monitoring results from the WC survey locations with most relevance to the application site is presented in Table 4-2.

Table 4-2
PM₁₀ Monitoring Results

Monitoring Location		Grid Reference (OS GR)		Monitored PM ₁₀ Concentration (µg/m ³)		
ID	Description	X	Y	2022	2023	2024
AM3	Sidmouth Street, Devizes	400807	161389	20	17	19.2

Table 4-2 indicates that annual mean PM₁₀ concentrations were below the AQO of 40µg/m³ at the AM3 - Sidmouth Street monitoring site in 2022, 2023 and 2024.

A summary of recent PM_{2.5} monitoring results from the WC survey locations with most relevance to the application site is presented in Table 4-3.

Table 4-3
PM_{2.5} Monitoring Results

Monitoring Location		Grid Reference (OS GR)		Monitored PM _{2.5} Concentration (µg/m ³)		
ID	Description	X	Y	2022	2023	2024
AM3	Sidmouth Street, Devizes	400807	161389	14.3	11.4	13.2

Table 4-3 indicates that annual mean PM_{2.5} concentrations were below the AQO of 20µg/m³ at the AM3 - Sidmouth Street monitoring site in 2022, 2023 and 2024.

4.2.3 National Air Quality Archive

Background pollutant concentration data on a 1km x 1km spatial resolution is provided by the National Air Quality Information Archive (NAQIA) based upon the background mapping study undertaken by DEFRA and is routinely used to support LAQM and Air Quality Assessments.

Mapped background concentrations of NO₂, PM₁₀ and PM_{2.5} were downloaded for grid square x402500, y163500, which is the closest to the development site. This data is presented in Table 4-4, below.

Table 4-4
Relevant Estimated Annual Mean Background Concentrations

Pollutant	Predicted Concentrations (µg/m ³)	
	2024	2027
NO ₂	6.6	6.1
PM ₁₀	12.3	12.0
PM _{2.5}	6.7	6.4

4.3 Sensitive Receptors

The term 'sensitive receptors' includes any persons, locations or systems that may be susceptible to changes as a consequence of the proposed development.

Existing receptors: residents of near-by properties and occupiers of residences alongside road links used by site traffic will be the key receptors of concern.

Discrete receptors sensitive to potential operational phase road vehicle exhaust emission impacts were identified from a desk-top study. These are summarised in Table 4-5, below. Receptor height was defined as the lowest level of sensitive land use at the specific location.

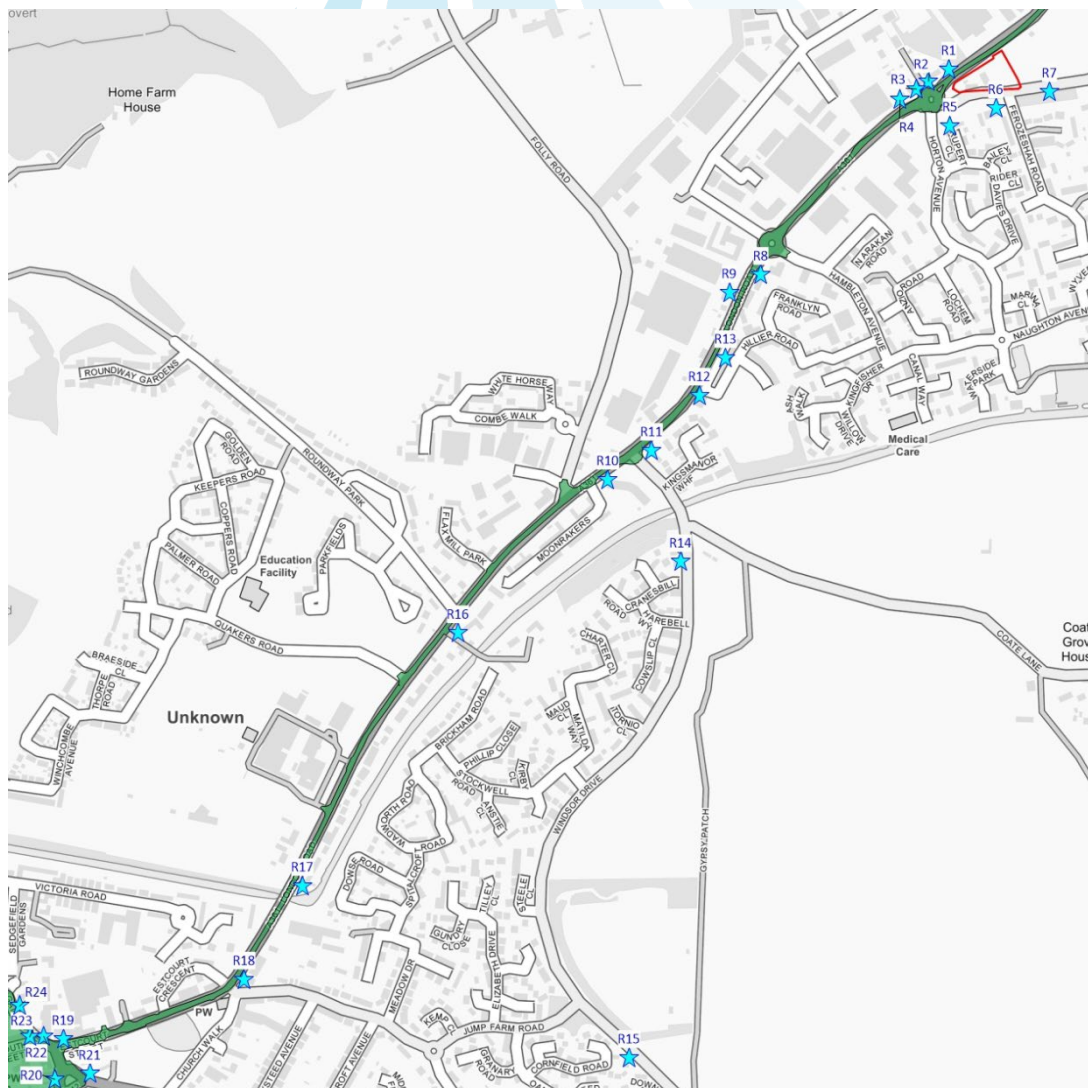
Table 4-5
Road Traffic Emissions Discrete Receptors

Receptor Location		OS GR (m)		Height (m)
		x	y	
R1	Residential - London Road	402275.6	163051.2	1.5
R2	Residential - London Road	402242.1	163031.7	1.5
R3	Residential - London Road	402222.3	163019.2	1.5
R4	Residential - London Road	402195.2	163001.3	1.5
R5	Residential - Rupert Close	402277.5	162958.5	1.5
R6	Residential - Ferozenshah Road	402352.6	162987.0	1.5
R7	Residential - Horton Road	402440.9	163014.1	1.5
R8	Residential - London Road	401966.5	162713.4	1.5
R9	Residential - London Road	401914.6	162684.0	1.5
R10	Briggs Lodge Residential and Nursing Home	401715.1	162376.3	1.5
R11	Residential - London Road	401787.0	162424.1	1.5
R12	Residential - London Road	401865.6	162514.9	1.5
R13	Residential - London Road	401908.6	162576.5	1.5
R14	Residential - Windsor Drive	401834.8	162241.0	1.5

Receptor Location		OS GR (m)		Height (m)
		x	y	
R15	Residential - Windsor Drive	401749.8	161425.3	1.5
R16	Residential - Windsor Drive	401468.8	162123.9	1.5
R17	Residential - Estcourt Street	401213.1	161708.1	1.5
R18	Residential - Estcourt Street	401117.3	161554.2	1.5
R19	Residential - Estcourt Street	400820.0	161456.0	1.5
R20	Residential - A342	400806.5	161390.3	1.5
R21	Residential - Nursteed Road	400863.8	161399.0	1.5
R22	Residential - Gains Lane	400787.8	161460.9	1.5
R23	Residential - Gains Lane	400764.6	161459.7	3.5
R24	Residential - Gains Lane	400748.1	161510.6	1.5

The assessed receptor locations in the vicinity of the site and the Devizes AQMA (in the south western corner of the figure) are shown in Figure 4-1, below.

Figure 4-1
Road Traffic Emissions Discrete Receptors and AQMA Extents



5.0 DISPERSION MODELLING ASSESSMENT

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. Potential impacts have been defined by predicting pollutant concentrations at sensitive locations using dispersion modelling for the following scenarios, as described in section 2.2:

- **Scenario 0:** Verification (2024);
- **Scenario 1:** Opening year (2027) DM; and,
- **Scenario 2:** Opening year (2027) DS.

The relevant inputs are outlined in the following Sections.

5.1 Dispersion Model

Dispersion modelling was undertaken using the ADMS-Roads dispersion model (version 5.1.0.2). 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.

5.2 Assessment Area

Ambient concentrations were predicted over the area OSGR 400730, 161370 to OSGR 402510, 163150, at a height of 1.5m to represent breathing zone exposure.

One Cartesian grid was included within the model to produce data suitable for contour plotting using the Surfer software package.

5.3 Emission Factors

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (EFT) (version 13.1). This has been produced by DEFRA and incorporates COPERT5 vehicle emission factors and fleet information.

There is current uncertainty over NO₂ concentrations within the UK, with the implementation of new vehicle emission standards historically not resulting in the previously expected reduction in roadside levels. However, this trend has been reversed in recent years and recent research undertaken by Air Quality Consultants Ltd concluded:

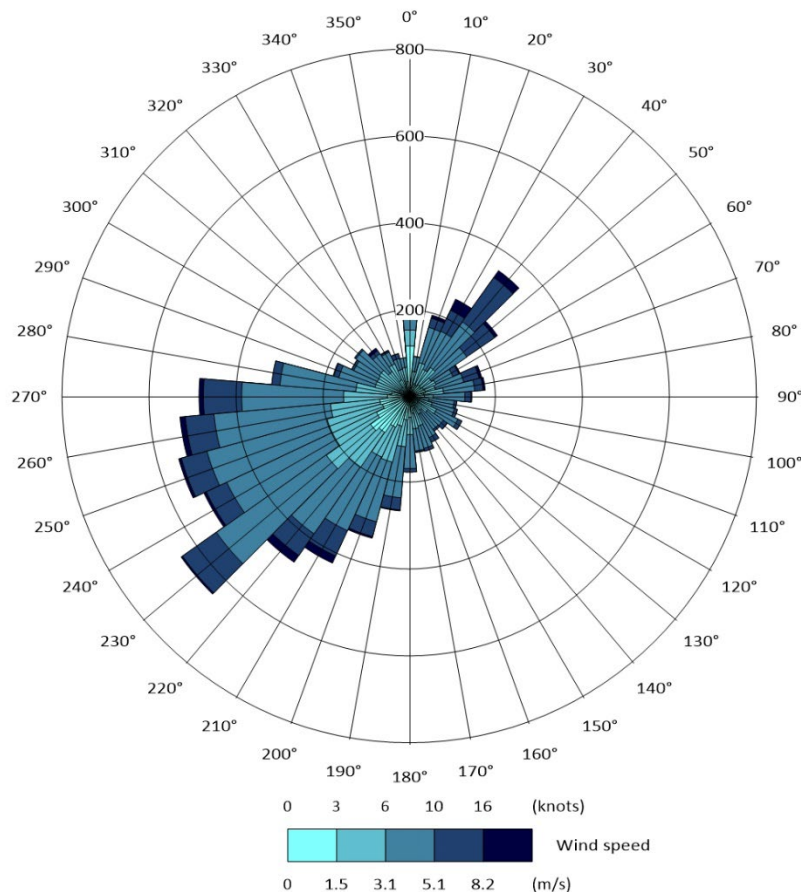
"There remains no justification for the use of sensitivity tests assuming higher NO_x emissions in the future than EFT v10 predicts."

As such, 2027 emission factors were utilised in the model in order to represent the development opening year.

5.4 Meteorological Data

Meteorological data used in the assessment was taken from Larkhill meteorological station over the period 1st January 2024 to 31st December 2024 (inclusive). Larkhill meteorological station is located approximately 21.5km south of the development. A wind rose of the meteorological data is shown in Figure 5-1, below.

Figure 5-1 - Wind Rose of 2024 Larkhill Meteorological Data



5.5 Roughness Length

The roughness length is a modelling parameter applied to allow consideration of surface height roughness elements. Roughness lengths of 0.5m and 0.3m were used to describe the modelling extents and meteorological site, respectively.

5.6 Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. Minimum Monin-Obukhov lengths of 30m and 10m were used to describe the modelling extents and meteorological site, respectively.

5.7 Background Concentrations

Annual mean background pollutant concentrations for use in the assessment were taken from the DEFRA mapping study for the grid square containing the 5 - Windsor Drive monitor, OS GR: 401500, 162500. These are shown in Table 5-1.

Table 5-1
Background Pollutant Concentrations - Modelling Extents

Pollutant	Predicted 2024 Background Pollutant Concentrations ($\mu\text{g}/\text{m}^3$)
NO ₂	6.9
PM ₁₀	11.4
PM _{2.5}	6.7

The NO₂ and PM₁₀ values shown in Table 5-1 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 4-4. The value for PM_{2.5} was chosen to provide continuity throughout the assessment.

5.8 NO_x to NO₂ Conversion

Predicted annual mean NO_x concentrations were converted to NO₂ concentrations using the spreadsheet (version 9.1) provided by DEFRA, which is the method detailed within DEFRA guidance LAQM(TG22).

5.9 Traffic Flow Data

Traffic data for use in the assessment, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition as Heavy Duty Vehicle (HDV) proportion, was provided by the Transport Consultant for the scheme.

A diurnal profile was included within the model to represent variations in traffic flow throughout the day. Separate inputs were provided for weekdays, Saturday and Sunday.

A summary of the traffic data used in the assessment is provided in Table 5-2, below. Road widths were estimated from aerial photography and UK highway design standards.

Table 5-2
Traffic Flow Data

Road Link		AADT Flow		
		2024 Sc0	2027 Sc1	2027 Sc2
L1	A361 London Road	11737	12325	12531
L2	A361 London Road, 40 mph	11737	12325	12531
L3	A361 London Road south of site access Slow Phase (SP)	11737	12325	12531
L4	Horton Road, west of site access, SP	4771	6683	7313
L5	Horton Road, east of site access	4771	6683	6878
L6	Horton Road east of Ernle Drive	4771	6683	6878

Road Link		AADT Flow		
		2024 Sc0	2027 Sc1	2027 Sc2
L7	A361 London Road south of Horton Road SP	15381	17002	17426
L8	A361 London Road south of Horton Road	15381	17002	17426
L9	A361 London Road north of Hopton Road SP	15381	17002	17426
L10	A361 London Road south of Hopton Road SP	20824	22534	22898
L11	A361 London Road south of Hopton Road	20824	22534	22898
L12	A361 London Road north of Windsor Drive SP	20824	22534	22898
L13	A361 London Road south of Windsor Drive SP	20824	22534	22838
L14	A361 London Road south of Windsor Drive	20824	22534	22838
L15	Windsor Drive SP	8753	9355	9415
L16	Windsor Drive	8753	9355	9415
L17	A361 London Road, north of Brickley Lane, SP	20824	22534	22838
L18	A361 Estcourt Street, south of Brickley Lane, SP	20824	22534	22798
L19	A361 Estcourt Street, east of Gains Lane, SP	20824	22534	22798
L20	A342 Southbroom Road, south of Estcourt Street northbound (NB), SP	7035	7318	7390
L21	A342 Southbroom Road, south of Estcourt Street southbound (SB), SP	7035	7318	7390
L22	A342 Roundabout - canyon	13157	13695	13767
L23	A342 Roundabout	13157	13695	13767
L24	A342 Southbroom Road, SP	14069	14637	14717
L25	A342 Southbroom Road	14069	14637	14717
L26	A342 Southbroom Road, north of Hare and Hounds Street	14069	14637	14717
L27	A342 Southbroom Road, at Hare and Hounds Street junction	14069	14637	14717
L28	A342 Southbroom Road, south of Hare and Hounds Street	14069	14637	14717
L29	A342 Nursteed Road, SP	11334	11811	11875
L30	A342 Nursteed Road	11334	11811	11875
L31	A361 Gains Lane, SP	19346	20144	20264
L32	A361 Gains Lane - canyon	19346	20144	20264
L33	A361 Gains Lane	19346	20144	20264
L34	A361 Gains Lane, east of Commercial Road, SP	19346	20144	20264
L35	A361 Gains Lane, west of Commercial Road, SP	19346	20144	20264
R1	Horton Road Roundabout	10630	12003	12106
R2	Hopton Road Roundabout	18102	19768	19980
R3	Ernle Drive Roundabout	4771	6683	6878
R4	London Road Roundabout	20824	22534	22686
R5	Estcourt Street Roundabout	20824	22534	22666
R6	Gains Lane/ Estcourt Street Roundabout	18080	19105	19237
R7	Gains Lane Roundabout	19346	20144	20204

A summary of the link parameter data used in the assessment is provided in Table 5-3, below.

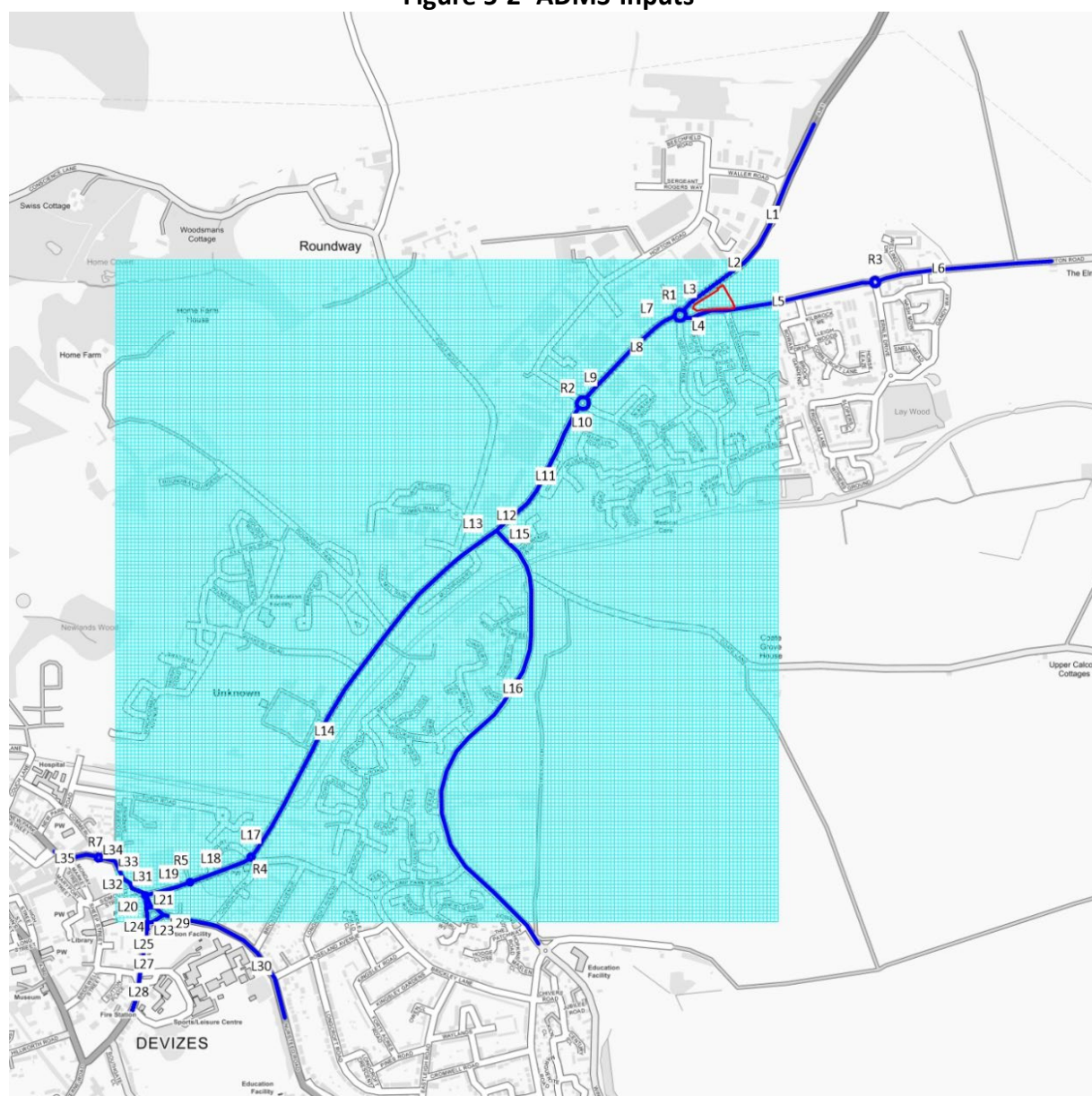
Table 5-3
Link Parameter Data

Road Link		HDV Prop. (%)	Av. Vehicle Speed (km/h)	Road Width (m)
L1	A361 London Road	3.70	80	8.5
L2	A361 London Road, 40 mph	3.70	60	8.1
L3	A361 London Road south of site access SP	3.70	15	16.6
L4	Horton Road, west of site access, SP	2.59	15	14.1
L5	Horton Road, east of site access	2.59	60	7.6
L6	Horton Road east of Ernle Drive	2.59	40	5.8
L7	A361 London Road south of Horton Road SP	3.23	15	16.5
L8	A361 London Road south of Horton Road	3.23	60	8.4
L9	A361 London Road north of Hopton Road SP	3.23	15	16.8
L10	A361 London Road south of Hopton Road SP	3.01	15	16.8
L11	A361 London Road south of Hopton Road	3.01	40	7.8
L12	A361 London Road north of Windsor Drive SP	3.01	15	9.5
L13	A361 London Road south of Windsor Drive SP	3.01	15	10.2
L14	A361 London Road south of Windsor Drive	3.01	40	7.4
L15	Windsor Drive SP	5.34	15	17.9
L16	Windsor Drive	5.34	60	7.5
L17	A361 London Road, north of Brickley Lane, SP	3.01	15	9.8
L18	A361 Estcourt Street, south of Brickley Lane, SP	3.01	15	10.0
L19	A361 Estcourt Street, east of Gains Lane, SP	3.01	15	12.3
L20	A342 Southbroom Road, south of Estcourt Street NB, SP	2.24	15	5.7
L21	A342 Southbroom Road, south of Estcourt Street SB, SP	2.24	15	5.7
L22	A342 Roundabout - canyon	2.81	15	7.8
L23	A342 Roundabout	2.81	15	7.2
L24	A342 Southbroom Road, SP	2.24	15	9.4
L25	A342 Southbroom Road	2.24	40	7.4
L26	A342 Southbroom Road, north of Hare and Hounds Street	2.24	40	7.4
L27	A342 Southbroom Road, at Hare and Hounds Street junction	2.24	40	7.4
L28	A342 Southbroom Road, south of Hare and Hounds Street	2.24	40	6.8
L29	A342 Nursteed Road, SP	2.81	15	8.8
L30	A342 Nursteed Road	2.81	40	5.8
L31	A361 Gains Lane, SP	5.36	15	8.2
L32	A361 Gains Lane - canyon	5.36	20	6.9
L33	A361 Gains Lane	5.36	40	7.2
L34	A361 Gains Lane, east of Commercial Road, SP	5.36	15	6.9
L35	A361 Gains Lane, west of Commercial Road, SP	5.36	15	7.7
R1	Horton Road Roundabout	3.70	15	9.5
R2	Hopton Road Roundabout	3.23	15	8.2
R3	Ernle Drive Roundabout	2.59	15	5.6

Road Link		HDV Prop. (%)	Av. Vehicle Speed (km/h)	Road Width (m)
R4	London Road Roundabout	3.01	15	4.9
R5	Estcourt Street Roundabout	3.01	15	5.0
R6	Gains Lane/ Estcourt Street Roundabout	5.36	15	9.0
R7	Gains Lane Roundabout	5.36	15	9.3

A map of the model inputs is shown in Figure 5-2, below.

Figure 5-2 -ADMS-Inputs



5.10 Street Canyon

Where buildings or walls surround roads, pollutant dispersion patterns are altered which can lead to high pollutant concentrations. These street canyons can significantly influence air quality along a road and therefore it is important to take consideration of their effects when undertaking dispersion modelling.

The release of ADMS-Roads version 4.0.1.0 in December 2015 incorporated a number of new features including an advanced street canyon module, which have been retained in version 5.1.0.2. Advanced street canyon modelling allows a number of parameters to be included in the dispersion model in order to predict pollutant dispersion patterns which better reflect air flow within complex urban geometries.

Canyons have five principal effects on dispersion which can influence pollutant concentrations. These are:

- Pollutants are channelled along street canyons;
- Pollutants are dispersed across street canyons by circulating flow at road height;
- Pollutants are trapped in recirculation regions;
- Pollutants leave the canyon through gaps between buildings - as if there was no canyon; and,
- Pollutants leave the canyon from the canyon top.

The combined modelling of these effects will result in concentration patterns unique to each canyon. The parameters used in the assessment are outlined in Table 5-4. It should be noted that where the wall wasn't present along one side of the road, the parameters were purposefully included as 0m.

Table 5-4
Canyon Parameters

Link	Parameter (m)					
	Canyon Width to Left	Average Height of Buildings to Left	Building Length Left	Canyon Width to Right	Average Height of Buildings to Right	Building Length Right
L22	0.0	0.0	0.0	6.9	7.0	39.1
L24	0.0	0.0	0.0	6.4	10.5	26.9
L25	0.0	0.0	0.0	6.5	9.5	76.3
L26	0.0	0.0	0.0	6.2	9.5	28.6
L28	0.0	0.0	0.0	5.6	9.5	67.2
L31	0.0	0.0	0.0	7.1	10.5	20.2
L32	6.5	10.5	14.9	0.0	0.0	0.0

A choice of two modes is provided for use in the advanced canyon module. Standard mode assumes that each road is part of a continuous network of roads with similar canyon properties. Network mode analyses the road network to determine transport of pollutants

between adjoining street canyons, allows for varying concentrations along the canyon and accounts for transport of pollutants out of the end of a canyon. Network mode is considered best for detailed local analysis and as such was the mode selected for use in the model.

5.11 Verification

The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons. Model verification is the process by which these uncertainties are investigated and where possible minimised.

The model verification calculations are included as Appendix B.



6.0 ASSESSMENT OF AIR QUALITY IMPACTS & CONSTRAINTS

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. Annual mean NO₂ concentrations were predicted at the sensitive receptor locations for scenarios 1 and 2. These are summarised in Table 6-1, below.

Table 6-1
Predicted Annual Mean NO₂ Concentrations

Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		Sc1	Sc2	Increase
R1	Residential - London Road	11.14	11.23	0.09
R2	Residential - London Road	11.57	11.66	0.09
R3	Residential - London Road	11.07	11.16	0.09
R4	Residential - London Road	10.22	10.30	0.08
R5	Residential - Rupert Close	8.53	8.59	0.06
R6	Residential - Ferozenshah Road	8.17	8.22	0.05
R7	Residential - Horton Road	8.54	8.59	0.05
R8	Residential - London Road	14.14	14.25	0.11
R9	Residential - London Road	9.98	10.04	0.06
R10	Briggs Lodge Residential and Nursing Home	12.40	12.48	0.08
R11	Residential - London Road	13.59	13.68	0.09
R12	Residential - London Road	13.51	13.61	0.10
R13	Residential - London Road	11.30	11.38	0.08
R14	Residential - Windsor Drive	8.64	8.66	0.02
R15	Residential - Windsor Drive	7.94	7.95	0.01
R16	Residential - Windsor Drive	10.97	11.03	0.06
R17	Residential - Estcourt Street	12.16	12.23	0.07
R18	Residential - Estcourt Street	17.99	18.10	0.11
R19	Residential - Estcourt Street	20.40	20.50	0.10
R20	Residential - A342	22.72	22.80	0.08
R21	Residential - Nursteed Road	16.87	16.93	0.06
R22	Residential - Gains Lane	22.19	22.28	0.09
R23	Residential - Gains Lane	24.90	25.00	0.10
R24	Residential - Gains Lane	15.26	15.31	0.05

As indicated in Table 6-1, predicted annual mean NO₂ concentrations were below the relevant AQO at all receptors during both scenarios.

Reference should be made to Figure A-1 and Figure A-2 (appendix A) for graphical representations of annual mean NO₂ concentrations across the assessment area, for scenarios 1 and 2.

As all annual average NO₂ concentrations are predicted to be less than 60µg/m³ it can be assumed that there is no realistic probability that the hourly average NO₂ objective will be exceeded.

Annual mean PM₁₀ concentrations were predicted at the sensitive receptor locations for scenarios 1 and 2. These are summarised in Table 6-2, below.

Table 6-2
Predicted Annual Mean PM₁₀ Concentrations

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		Sc1	Sc2	Increase
R1	Residential - London Road	12.20	12.22	0.02
R2	Residential - London Road	12.23	12.25	0.02
R3	Residential - London Road	12.14	12.16	0.02
R4	Residential - London Road	12.02	12.04	0.02
R5	Residential - Rupert Close	11.61	11.62	0.01
R6	Residential - Ferozenshah Road	11.55	11.56	0.01
R7	Residential - Horton Road	11.67	11.69	0.01
R8	Residential - London Road	13.19	13.22	0.03
R9	Residential - London Road	12.12	12.13	0.02
R10	Briggs Lodge Residential and Nursing Home	12.81	12.83	0.02
R11	Residential - London Road	12.78	12.80	0.02
R12	Residential - London Road	13.21	13.24	0.03
R13	Residential - London Road	12.54	12.57	0.02
R14	Residential - Windsor Drive	11.73	11.73	0.01
R15	Residential - Windsor Drive	11.54	11.54	0.00
R16	Residential - Windsor Drive	12.47	12.48	0.02
R17	Residential - Estcourt Street	12.79	12.81	0.02
R18	Residential - Estcourt Street	13.77	13.80	0.03
R19	Residential - Estcourt Street	14.09	14.11	0.02
R20	Residential - A342	14.76	14.78	0.02
R21	Residential - Nursteed Road	13.38	13.40	0.01
R22	Residential - Gains Lane	14.47	14.50	0.02
R23	Residential - Gains Lane	15.55	15.58	0.03
R24	Residential - Gains Lane	13.57	13.58	0.01

As indicated in Table 6-2, predicted annual mean PM₁₀ concentrations were below the relevant AQO at all receptors in both scenarios.

Reference should be made to Figure A-3 and Figure A-4 (appendix A) for graphical representations of annual mean PM₁₀ concentrations across the assessment area, for scenarios 1 and 2.

Annual mean PM_{2.5} concentrations were predicted at the sensitive receptor locations for scenarios 1 and 2. These are summarised in Table 6-3, below.

Table 6-3
Predicted Annual Mean PM_{2.5} Concentrations

Receptor		Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		
		Sc1	Sc2	Increase
R1	Residential - London Road	7.00	7.01	0.01
R2	Residential - London Road	7.01	7.02	0.01
R3	Residential - London Road	6.96	6.97	0.01
R4	Residential - London Road	6.90	6.91	0.01
R5	Residential - Rupert Close	6.68	6.69	0.01
R6	Residential - Ferozenshah Road	6.65	6.66	0.01
R7	Residential - Horton Road	6.72	6.73	0.01
R8	Residential - London Road	7.51	7.52	0.02
R9	Residential - London Road	6.94	6.95	0.01
R10	Briggs Lodge Residential and Nursing Home	7.31	7.32	0.01
R11	Residential - London Road	7.30	7.31	0.01
R12	Residential - London Road	7.51	7.53	0.02
R13	Residential - London Road	7.17	7.18	0.01
R14	Residential - Windsor Drive	6.74	6.75	0.00
R15	Residential - Windsor Drive	6.64	6.65	0.00
R16	Residential - Windsor Drive	7.13	7.13	0.01
R17	Residential - Estcourt Street	7.30	7.31	0.01
R18	Residential - Estcourt Street	7.82	7.84	0.01
R19	Residential - Estcourt Street	8.00	8.01	0.01
R20	Residential - A342	8.35	8.36	0.01
R21	Residential - Nursteed Road	7.62	7.62	0.01
R22	Residential - Gains Lane	8.20	8.21	0.01
R23	Residential - Gains Lane	8.77	8.78	0.01
R24	Residential - Gains Lane	7.71	7.72	0.01

As indicated in Table 6-3, predicted annual mean PM_{2.5} concentrations were below the relevant AQO at all receptors in both scenarios.

Reference should be made to Figure A-5 to Figure A-6 (appendix A) for graphical representations of annual mean PM_{2.5} concentrations across the assessment area, for scenarios 1 and 2.

Predicted impacts on annual mean NO₂ concentrations at the sensitive receptor locations are summarised in Table 6-4, below.

Table 6-4
Predicted Impacts on Annual Mean NO₂ Concentrations

Receptor		Predicted Concentration	Predicted Conc. Change as Proportion of AQO (%)	Impact Significance
R1	Residential - London Road	Below 75% of AQO	<1	Negligible
R2	Residential - London Road	Below 75% of AQO	<1	Negligible
R3	Residential - London Road	Below 75% of AQO	<1	Negligible
R4	Residential - London Road	Below 75% of AQO	<1	Negligible
R5	Residential - Rupert Close	Below 75% of AQO	<1	Negligible
R6	Residential - Ferozeshah Road	Below 75% of AQO	<1	Negligible
R7	Residential - Horton Road	Below 75% of AQO	<1	Negligible
R8	Residential - London Road	Below 75% of AQO	<1	Negligible
R9	Residential - London Road	Below 75% of AQO	<1	Negligible
R10	Briggs Lodge Residential and Nursing Home	Below 75% of AQO	<1	Negligible
R11	Residential - London Road	Below 75% of AQO	<1	Negligible
R12	Residential - London Road	Below 75% of AQO	<1	Negligible
R13	Residential - London Road	Below 75% of AQO	<1	Negligible
R14	Residential - Windsor Drive	Below 75% of AQO	<1	Negligible
R15	Residential - Windsor Drive	Below 75% of AQO	<1	Negligible
R16	Residential - Windsor Drive	Below 75% of AQO	<1	Negligible
R17	Residential - Estcourt Street	Below 75% of AQO	<1	Negligible
R18	Residential - Estcourt Street	Below 75% of AQO	<1	Negligible
R19	Residential - Estcourt Street	Below 75% of AQO	<1	Negligible
R20	Residential - A342	Below 75% of AQO	<1	Negligible
R21	Residential - Nursteed Road	Below 75% of AQO	<1	Negligible
R22	Residential - Gains Lane	Below 75% of AQO	<1	Negligible
R23	Residential - Gains Lane	Below 75% of AQO	<1	Negligible
R24	Residential - Gains Lane	Below 75% of AQO	<1	Negligible

As indicated in Table 6-4, impacts on annual mean NO₂ concentrations as a result of the proposed development were predicted to be negligible at all receptors.

Predicted impacts on annual mean PM₁₀ concentrations at the sensitive receptor locations are summarised in Table 6-5, below.

Table 6-5
Predicted Impacts on Annual Mean PM₁₀ Concentrations

Receptor		Predicted Concentration	Predicted Conc. Change as Proportion of AQO (%)	Impact Significance
R1	Residential - London Road	Below 75% of AQO	<1	Negligible
R2	Residential - London Road	Below 75% of AQO	<1	Negligible
R3	Residential - London Road	Below 75% of AQO	<1	Negligible
R4	Residential - London Road	Below 75% of AQO	<1	Negligible
R5	Residential - Rupert Close	Below 75% of AQO	<1	Negligible
R6	Residential - Ferozeshah Road	Below 75% of AQO	<1	Negligible
R7	Residential - Horton Road	Below 75% of AQO	<1	Negligible
R8	Residential - London Road	Below 75% of AQO	<1	Negligible
R9	Residential - London Road	Below 75% of AQO	<1	Negligible
R10	Briggs Lodge Residential and Nursing Home	Below 75% of AQO	<1	Negligible
R11	Residential - London Road	Below 75% of AQO	<1	Negligible
R12	Residential - London Road	Below 75% of AQO	<1	Negligible
R13	Residential - London Road	Below 75% of AQO	<1	Negligible
R14	Residential - Windsor Drive	Below 75% of AQO	<1	Negligible
R15	Residential - Windsor Drive	Below 75% of AQO	<1	Negligible
R16	Residential - Windsor Drive	Below 75% of AQO	<1	Negligible
R17	Residential - Estcourt Street	Below 75% of AQO	<1	Negligible
R18	Residential - Estcourt Street	Below 75% of AQO	<1	Negligible
R19	Residential - Estcourt Street	Below 75% of AQO	<1	Negligible
R20	Residential - A342	Below 75% of AQO	<1	Negligible
R21	Residential - Nursteed Road	Below 75% of AQO	<1	Negligible
R22	Residential - Gains Lane	Below 75% of AQO	<1	Negligible
R23	Residential - Gains Lane	Below 75% of AQO	<1	Negligible
R24	Residential - Gains Lane	Below 75% of AQO	<1	Negligible

As indicated in Table 6-5, impacts on annual mean PM₁₀ concentrations as a result of the proposed development were predicted to be negligible at all receptors.

Predicted impacts on annual mean PM_{2.5} concentrations at the sensitive receptor locations are summarised in Table 6-6, below.

Table 6-6
Predicted Impacts on Annual Mean PM_{2.5} Concentrations

Receptor		Predicted Concentration	Predicted Conc. Change as Proportion of AQO (%)	Impact Significance
R1	Residential - London Road	Below 75% of AQO	<1	Negligible
R2	Residential - London Road	Below 75% of AQO	<1	Negligible
R3	Residential - London Road	Below 75% of AQO	<1	Negligible
R4	Residential - London Road	Below 75% of AQO	<1	Negligible
R5	Residential - Rupert Close	Below 75% of AQO	<1	Negligible
R6	Residential - Ferozenshah Road	Below 75% of AQO	<1	Negligible
R7	Residential - Horton Road	Below 75% of AQO	<1	Negligible
R8	Residential - London Road	Below 75% of AQO	<1	Negligible
R9	Residential - London Road	Below 75% of AQO	<1	Negligible
R10	Briggs Lodge Residential and Nursing Home	Below 75% of AQO	<1	Negligible
R11	Residential - London Road	Below 75% of AQO	<1	Negligible
R12	Residential - London Road	Below 75% of AQO	<1	Negligible
R13	Residential - London Road	Below 75% of AQO	<1	Negligible
R14	Residential - Windsor Drive	Below 75% of AQO	<1	Negligible
R15	Residential - Windsor Drive	Below 75% of AQO	<1	Negligible
R16	Residential - Windsor Drive	Below 75% of AQO	<1	Negligible
R17	Residential - Estcourt Street	Below 75% of AQO	<1	Negligible
R18	Residential - Estcourt Street	Below 75% of AQO	<1	Negligible
R19	Residential - Estcourt Street	Below 75% of AQO	<1	Negligible
R20	Residential - A342	Below 75% of AQO	<1	Negligible
R21	Residential - Nursteed Road	Below 75% of AQO	<1	Negligible
R22	Residential - Gains Lane	Below 75% of AQO	<1	Negligible
R23	Residential - Gains Lane	Below 75% of AQO	<1	Negligible
R24	Residential - Gains Lane	Below 75% of AQO	<1	Negligible

As indicated in Table 6-6, impacts on annual mean PM_{2.5} concentrations as a result of the proposed development were predicted to be negligible at all receptors.

7.0 AIR QUALITY SPD

WC has produced an Air Quality Air Quality Supplementary Planning Document (SPD) ⁶ which includes direction on when an air quality assessment will be required and the associated scope of works:

The Air Quality Supplementary Planning Document (SPD) has been developed to support commitments set out in the council's Air Quality Strategy and the Air Quality Action Plan (AQAP), which was approved by Cabinet on 19 March 2024.

The guidance provides a methodology for determining the scale of a development as Type 1, Type 2 or Type 3 and the required air quality mitigation for the relevant banding. Review of the relevant criteria indicated the proposals were classified as Type 2 under the following categories:

- The proposed development is located within WC's administrative extents;
- The development classification is Class E(b) and the Gross Floor Area is less than 1,000m²; and,
- The development is not anticipated to reduce average speeds by more than 10km/h, significantly alter congestion or involve substantial infrastructure changes.

It is noted that the development is located adjacent to the Devizes AQMA which was declared by WC due exceedences of the annual mean AQO for NO₂. This has the potential to trigger the Type 3 criteria. However, as noted in the 2025 Air Quality ASR⁷, the monitored annual NO₂ concentration in 2024 was 26µg/m³. This is below the NO₂ AQO of 40µg/m³. The AQMA has also been compliant with the AQO over the last five years. Therefore, there is the potential for the AQMA to be revoked should there be five consecutive years of data below the objective.

In addition to the above, the results of the assessment in Section 6.0 show that the proposed development is anticipated to have a **negligible** impact on existing receptors within the AQMA.

Based on the above, the development is not anticipated to cause air quality deterioration in an AQMA or in an area where the annual mean NO₂ concentration is already greater than 38µg/m³. As such, the proposals do not meet the criteria for Type 3 and Type 2 was considered appropriate for the development.

It is envisaged that the requirement for a Construction Environmental Management Plan (CEMP) would be Conditioned as part of the planning approval for the scheme.

⁶ Air Quality SPD, WC, 2023, revised 22nd October 2025

⁷ 2025 Air Quality Annual Status Report, WC, 2025.

In summary, the SPD document provides a number of mitigation measures that must be included within Type 2 developments. These are provided in Table 7-1, below.

Table 7-1
Type 2 Mitigation Checklist

Measure	Details	Completed?	Comments
Construction Environmental Management Plan (CEMP)	Dust risk assessment in line with IAQM guidance?	No	Dust impacts from the construction of the development would be subject to condition
	Suitable dust mitigation measures?	No	Dust impacts from the construction of the development would be subject to condition
Electric Vehicle (EV) Charging	EV infrastructure at councils' minimum requirements?	Yes	47 car parking spaces are proposed. Charging provision compliant with minimum Council requirements.
Exposure Mitigation	Exposure at sensitive site?	N/A	The scheme comprises Class E(b) land use, which is not considered sensitive to long-term pollutant exposure
	Exposure mitigation considered as part of the Exposure Assessment?	N/A	
Low Emission Travel Plan	Production of a site-specific low emission travel plan incorporating WC's minimum requirements?	No	It is recommended that a Low Emission Travel Plan is provided for the scheme in response to the assessment

It is recommended that the above measures are incorporated into the scheme in response to the assessment. This will assist with minimising potential emissions from the development and control air quality impacts within the vicinity of the site. A planning condition can be attached to any forthcoming consent requiring measures to be incorporated within the final scheme, if required by WC.

8.0 CONCLUSIONS

Isopleth Ltd has been commissioned by McDonalds Restaurants to carry out a detailed air quality assessment associated with the development of a drive-thru and eat-in restaurant on land off Horton Road, Devizes. The site is located within the administrative boundary of Wiltshire Council.

This report presents the air quality assessment undertaken in relation to air pollution from the development proposals.

The conclusions of the assessment are as follows:

- Based on the results of a dispersion modelling assessment, potential impacts on annual mean NO₂, PM₁₀ and PM_{2.5} concentrations associated with additional vehicle emissions from the development are predicted to be negligible at all receptors. As such, overall impacts are not significant according to IAQM criteria;
- A number of mitigation measures were identified in line with the requirements of the WC Air Quality SPD in order to minimise air quality impacts associated with the proposals. It is considered these are appropriate for a development of this scale and nature and will further control impacts during the operational phase; and,
- As a result of these findings, no further mitigation is needed other than the provision of a CEMP via condition for construction dust mitigation.

As such, the proposed development does not conflict with the NPPF or Core Policy 55 and Core Policy 57 of the Wiltshire Core Strategy.

Notice:

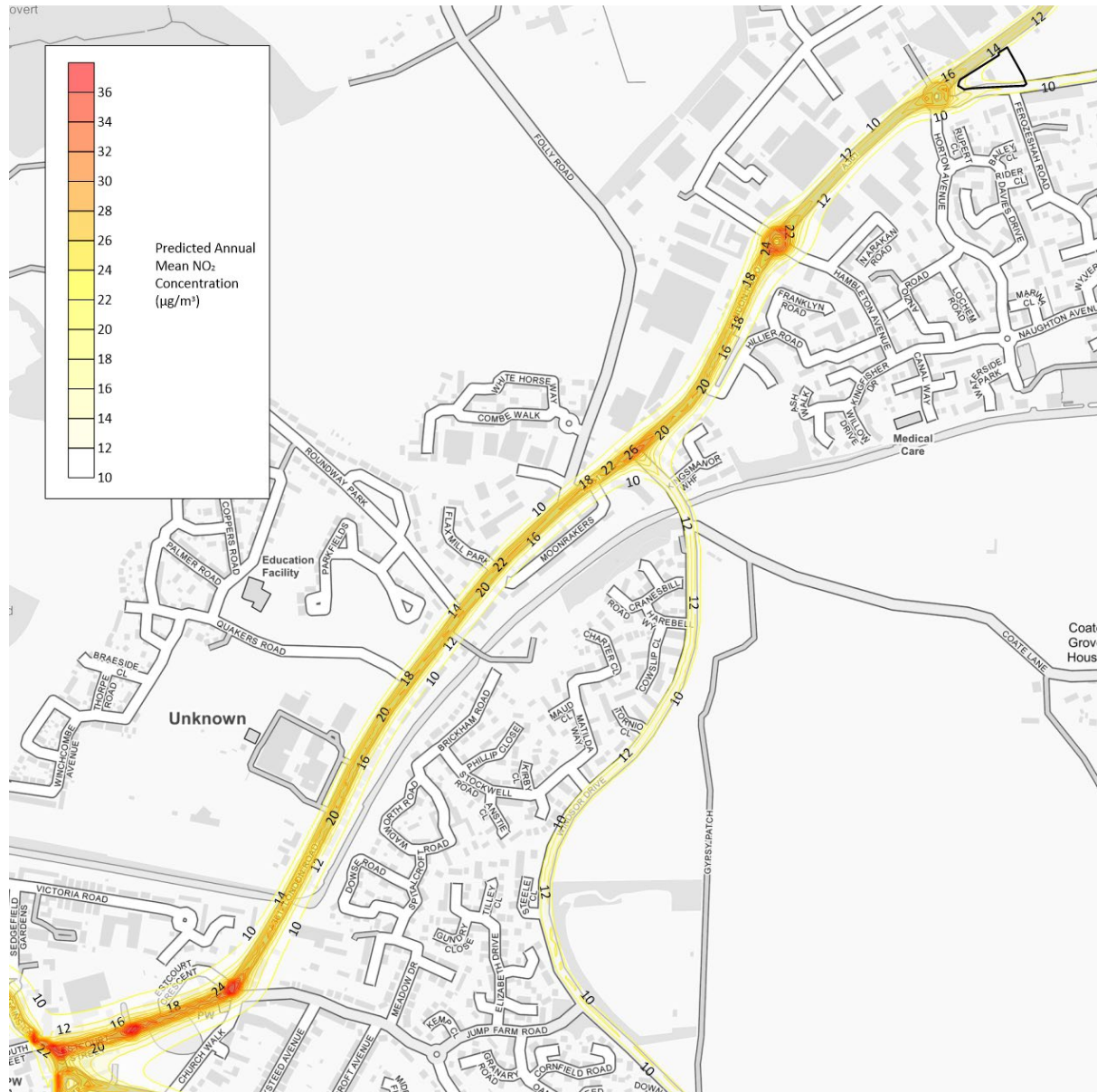
This report was produced by Isopleth Ltd to present the results of an air quality assessment for the proposed development on land off Horton Road, Devizes.

This report may not be used by any person (or organisation) other than McDonalds Restaurants without express permission. In any event, Isopleth Ltd accepts no liability for any costs, liabilities or losses arising as a result of the use of or reliance upon the contents of this report by any person (or organisation) other than McDonalds Restaurants.

APPENDIX A: IMPACT DRAWINGS

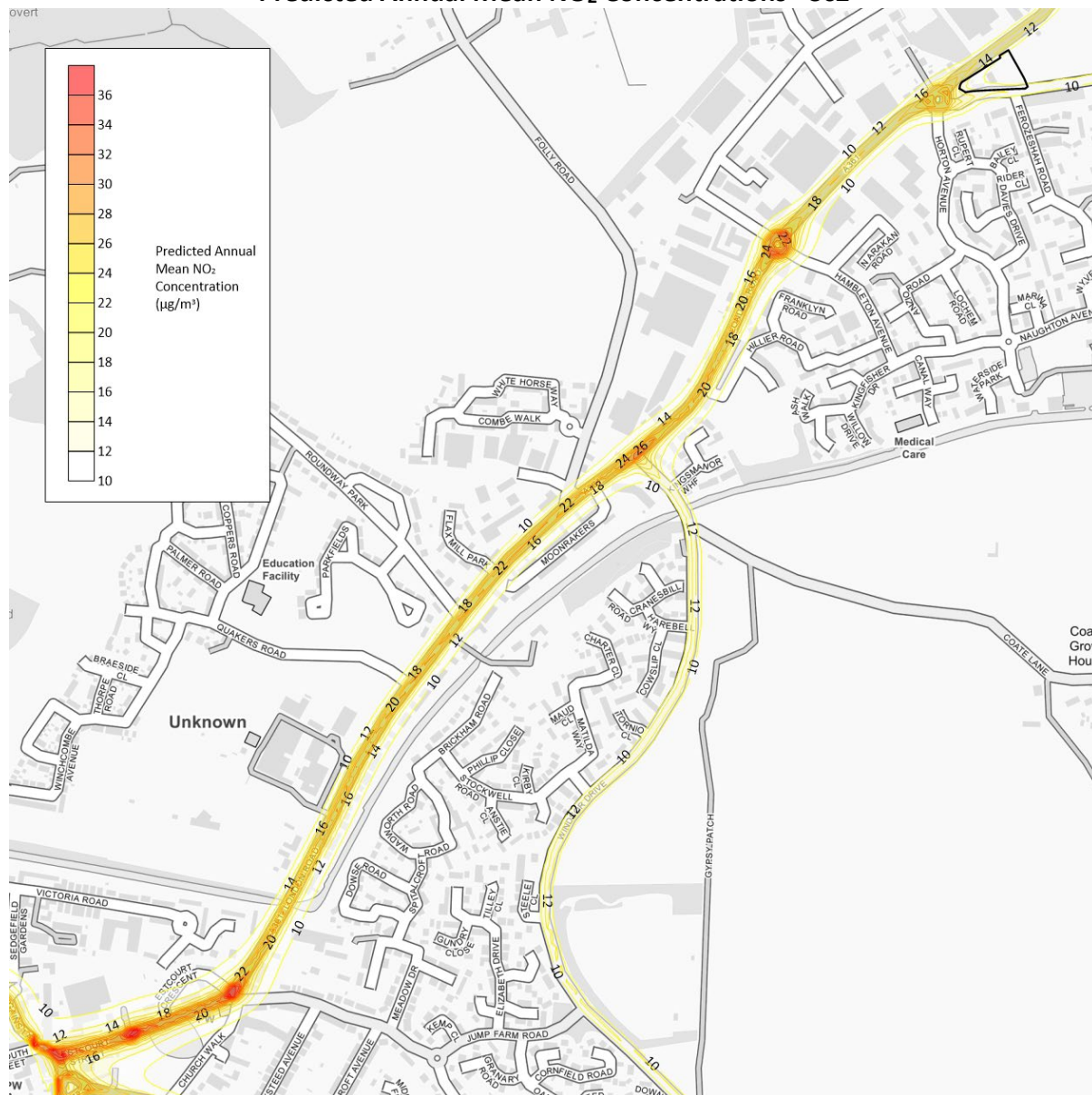
Annual mean NO₂ concentrations were predicted in the vicinity of the proposed development. The results for scenario Sc1 are shown in Figure A-1, below.

Figure A-1
Predicted Annual Mean NO₂ Concentrations - Sc1



Annual mean NO₂ concentrations were predicted in the vicinity of the proposed development. The results for scenario Sc2 are shown in Figure A-2, below.

Figure A-2
Predicted Annual Mean NO₂ Concentrations - Sc2



Annual mean PM₁₀ concentrations were predicted in the vicinity of the proposed development. The results for scenario Sc1 are shown in Figure A-3, below.

Figure A-3
Predicted Annual Mean PM₁₀ Concentrations - Sc1

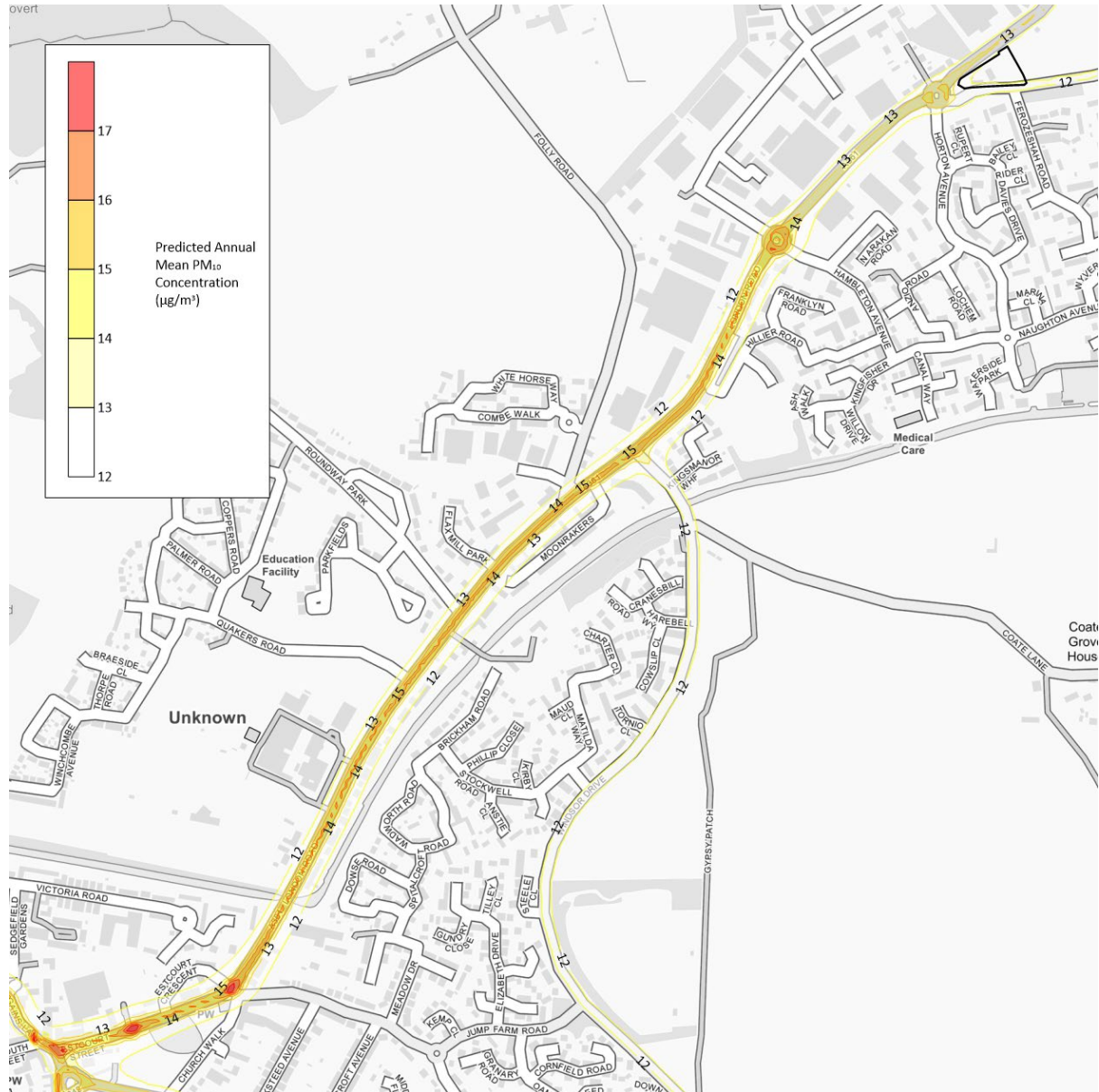


Figure A-4
Predicted Annual Mean PM₁₀ Concentrations - Sc2

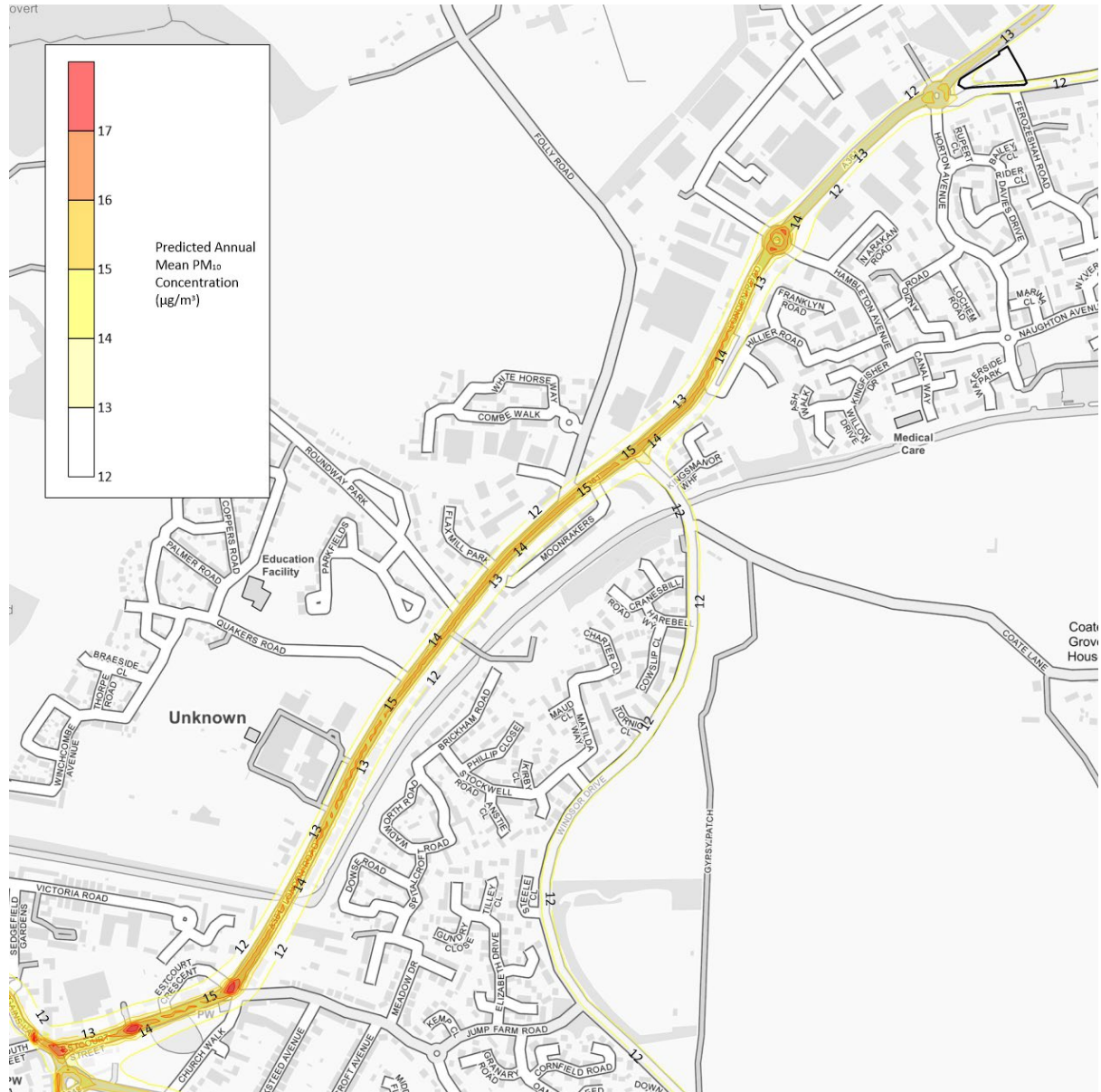


Figure A-5
Predicted Annual Mean PM_{2.5} Concentrations - Sc1

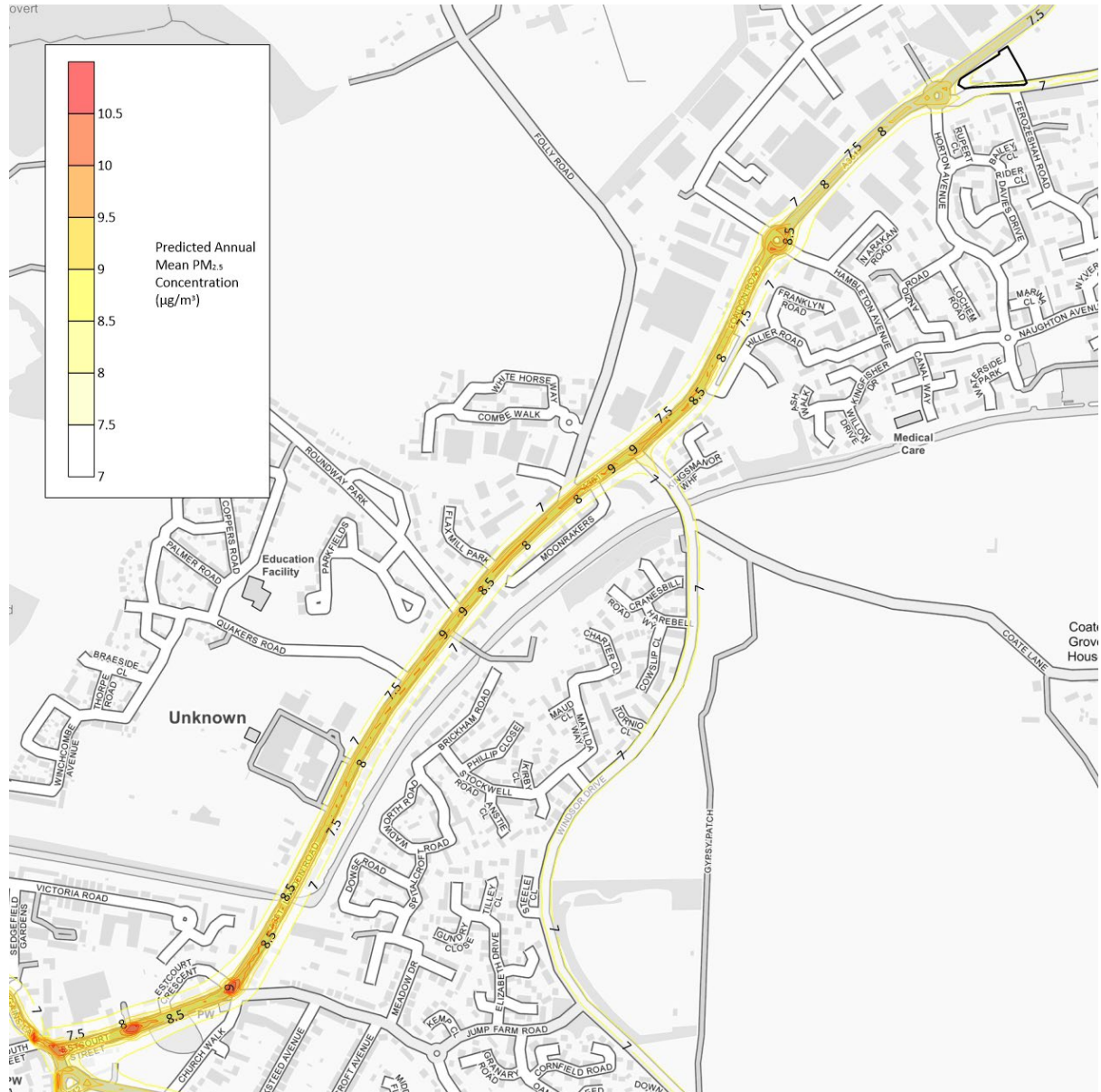
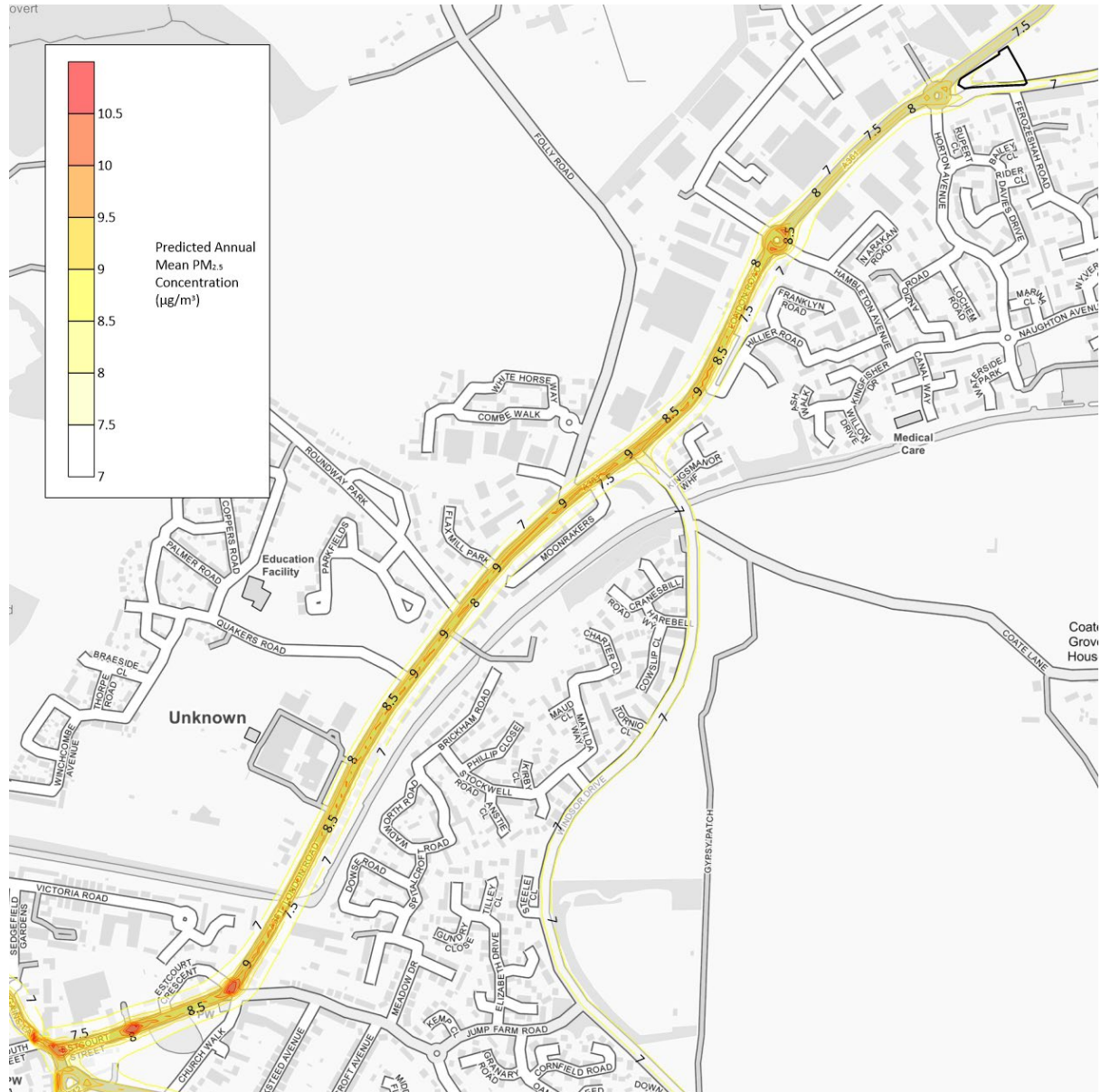


Figure A-6
Predicted Annual Mean PM_{2.5} Concentrations - Sc2



APPENDIX B: VERIFICATION

The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons. Model verification is the process by which these uncertainties are investigated and where possible minimised. For the purpose of the assessment model verification was undertaken for 2024 using traffic data, meteorological data and monitoring results from this year.

WC undertook monitoring of NO₂ concentrations at three locations within the vicinity of roads included within the model during 2024. Maximum results recorded at the locations, where relevant, were obtained and the road contributions to total NO_x concentrations calculated following the methodology contained within DEFRA guidance LAQM(TG22). The monitored annual mean NO₂ concentrations and calculated road NO_x concentrations are summarised in Table B-1.

Table B-1
NO_x Verification - Monitoring Results

Monitoring Location		Monitored NO ₂ Concentration (µg/m ³)	Calculated Road NO _x Concentration (µg/m ³)
5	Windsor Drive	12.6	12.0
7	105 St James Place	23.3	37.4
AM3	Sidmouth Street	32.3	63.1

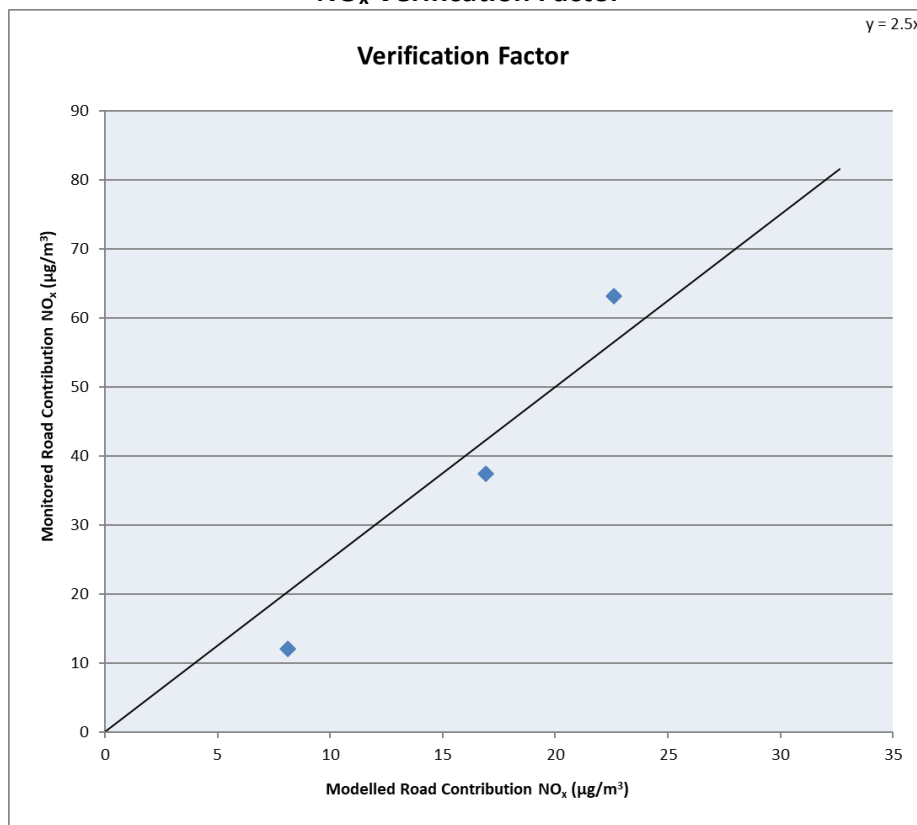
The annual mean road NO_x concentrations predicted from the dispersion model and the 2024 monitoring results are summarised in Table B-2.

Table B-2
NO_x Verification - Modelling Results

Monitoring Location		Calculated Road NO _x Concentration (µg/m ³)	Modelled Road NO _x Concentration (µg/m ³)
5	Windsor Drive	12.0	8.1
7	105 St James Place	37.4	16.9
AM3	Sidmouth Street	63.1	22.6

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 factor of 2.5 was required to be applied to all modelling results, as shown in Graph B-1.

Graph B-1
NO_x Verification Factor



PM₁₀ monitoring data was available for one roadside location within the modelling extents. The monitored annual mean PM₁₀ concentration and modelled PM₁₀ concentration are summarised in Table B-3.

Table B-3
PM₁₀ Verification - Modelling Result

Monitoring Location		Monitored PM ₁₀ Concentration (µg/m³)	Modelled PM ₁₀ Concentration (µg/m³)
AM3	Sidmouth Street	19.2	14.6

The monitored and modelled PM₁₀ concentrations were compared to calculate the associated ratio. This indicated that a verification factor of 1.3 was required to be applied to all modelling results.

PM_{2.5} monitoring data was available for one roadside location within the modelling extents. The monitored annual mean PM_{2.5} concentration and modelled PM_{2.5} concentration are summarised in Table B-4.

Table B-4
PM_{2.5} Verification - Modelling Result

Monitoring Location		Monitored PM _{2.5} Concentration (µg/m³)	Modelled PM _{2.5} Concentration (µg/m³)
AM3	Sidmouth Street	13.2	8.4

The monitored and modelled $PM_{2.5}$ concentrations were compared to calculate the associated ratio. This indicated that a verification factor of 1.6 was required to be applied to all modelling results.





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