2024 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management, as amended by the Environment Act 2021

Date: June, 2024

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Executive Summary: Air Quality in Our Area

Air Quality in Wychavon District

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year[1].

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less affluent areas are most exposed to dangerous levels of air pollution[2].

Table ES 1 provides a brief explanation of the key pollutants relevant to Local Air Quality Management and the kind of activities they might arise from.

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

[1] UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.

[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

Worcestershire Regulatory Services (WRS) is a shared service formed from the Environmental Health and Licensing departments of the six Worcestershire District Councils. Responsibility for managing (monitoring and reporting of) local air quality transferred from the partnership councils to WRS in April 2011.

Monitoring across the Wychavon District focuses on nitrogen dioxide via a network of diffusion tubes. Tubes are located in the main urban centres of Evesham, Pershore and Droitwich with additional tubes located within close proximity to strategic roads in Wychbold and Whittington. As well as a newly installed continuous monitor for NO_2 and PM_{10} in the Worcester Road, Wychbold AQMA.

There is currently one Air Quality Management Area (AQMA) in the Wychavon District. This AQMA was declared for the Worcester Road, Wychbold area on 1st May 2018 due to monitored and modelled exceedances of the annual mean objective for nitrogen dioxide (NO_2).

Details of the AQMA declaration and plans of the AQMA can be found on the following pages of the WRS website: Air Quality Management Area Declarations | Worcestershire Regulatory Services (worcsregservices.gov.uk)

A full list of declared and revoked AQMAs can be viewed at: Local Authority Details - Defra, UK

The Wychavon District area generally enjoys good air quality. Over the five-year period 2019 to 2023 there have been no monitored exceedances of the nitrogen dioxide annual mean air quality objective in the District.

No exceedance of the Nitrogen Dioxide Annual Mean Air Quality Objective occurred within the Worcester Road, Wychbold AQMA in 2023. There have been no exceedances since 2018 (when calculating back to relevant receptors).

There have been several changes to the monitoring network across Wychavon District during 2023: A continuous monitor is now located on the Worcester Road AQMA, and 5 additional diffusion tubes were added. These include sites; LC, RD, WBA1, WBA2 and WBA3. WBA1,2 and 3 are colocated with the new continuous monitoring station.

Monitoring data from 2022 showed a large increase on 2021, as COVID19 restrictions were lifted. Data shows that NO_2 levels have now decreased by almost the same amount in 2023. Monitoring data shows an overall decrease of 3.20 $\mu g/m^3$ in average recorded annual mean NO_2 concentrations across the Wychavon District area between 2022 and 2023 (25.62 $\mu g/m^3$ in 2022 and 29.24 $\mu g/m^3$ in 2023). Diffusion tubes located in the

Worcester Road AQMA show similar readings for 2022 and 2023, while diffusion tubes elsewhere in the district have mostly had lower readings than the previous year.

In 2023, the highest concentration of NO_2 recorded across Wychavon District was 34.7 µg/m^3 at WBA2, a new tube colocated with the new continuous monitor in Worcester Road, Wychbold AQMA, and EPS14a – also 34.7 µg/m^3.

No other diffusion tube monitoring locations have recorded concentrations within -10% of the AQS objective for annual average NO_2, in 2023. All concentrations are shown in Table B.1.

The highest concentration measured at a relevant receptor recorded in Wychavon District in 2023 is 29.6 µg/m^3 at EPS56 within the Worcester Road, Wychbold AQMA.

Following discussions with Defra LAQM Team in September 2023 it was agreed that consideration for AQAP would be delayed until a full years' worth of continuous monitoring data had been obtained.

No annual means greater than 60 µg/m^3 have been recorded indicating that it is very unlikely that there have been any exceedances of the 1-hour mean objective for NO_2 at any diffusion tube monitoring sites.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan[3] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter ($PM_{2.5}$), the pollutant of most harmful to human health. The Air Quality Strategy[4] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

[3] Defra. Environmental Improvement Plan 2023, January 2023

[4] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

The Road to Zero[5] details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel, and the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

The Wychavon District area generally enjoys good air quality. Over the five-year period 2019 to 2023 there has been a single monitored exceedance of the nitrogen dioxide annual mean air quality objective in the District (40µg/m^3 was monitored at EPS56 in 2018).

Reductions in nitrogen dioxide concentrations have been monitored in the Worcester Road, Wychbold AQMA over the six-year period 2018 to 2023 such that it is now uncertain as to whether the AQMA is still required.

Factors influencing the improvement in this period include:

- The completion of proximal and significant Major Scheme enhancement works to the M5 in 2017, resulting in reduction in impacts on local network after that time.
- Low national bias adjustment factors applied to 2017 and 2019 monitoring data.
- Significant reduction in traffic during COVID-19 pandemic impacting on 2020-2022 monitoring data.
- National vehicle fleet improvements: there has been a 4.2% drop in proportion of diesel cars and a 5.5% increase in low emission vehicles during this period.
- Upgrade of buses on local route to Euro Code 6 standards.
- Milder winters resulting in lower concentrations of nitrogen dioxide over the winter months

The Worcester Road, Wychbold AQMA is essentially a strategic road junction in a small village. The air quality issues identified by monitoring in the past are linked to transient traffic travelling through the area to and from other destinations. A source apportionment study of the A38, undertaken in 2018, indicates that the main source of emissions affecting NO_2 concentrations relate to diesel cars (43.9%), diesel LGVs (26.0%) and HGVs (15.7%) travelling through the area to and from other destinations. In order to have any meaningful

[5] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

impact on emissions significant large-scale schemes would be required. Available options are limited, costly and resource intensive.

In light of this and the observed improvements in measured concentrations between 2017 and 2023, Wychavon District Council is not currently pursuing specific actions to improve air quality within the AQMA at this time. Wychavon District Council have installed a new continuous monitor within the AQMA. After discussion with DEFRA, revocation will be evaluated after a full year's dataset for the site has been collected.

If it is concluded that the AQ Objective for annual average NO_2 is still being exceeded, a more reliable and robust dataset will allow Wychavon District Council to make well informed decisions relating to the degree of any required improvement and determine appropriate mitigating actions to achieve any required level of improvement.

Due to delays caused by Covid-19 the process of procuring a suitable monitoring station was delayed. This process recommenced in early 2022 with installation completed and real time monitoring commencing in May 2023.

Long-term trends and observed reductions in nitrogen dioxide concentrations are discussed further in Section 3.2 of this report.

Further details regarding the automatic monitoring programme for the AQMA are discussed further in Section 2.2 of this report.

Air Quality Actions Plan and Air Quality Strategy

The timeline for the various stages and delivery of a revised countywide AQAP, and establishment of a new countywide Air Quality Strategy, were set out in the ASR 2023. However, following the introduction of new enforcement policy by Defra in June 2023, it has been necessary to amend the previously published framework to prioritise production of a standalone AQAP for each district with an existing AQMA.

Following discussions with Defra LAQM Team in September 2023, 4 Worcestershire Councils including Wychavon District Council were granted extensions to the timeline for delivery of the draft AQAPs.

At the time of writing this ASR, following review and further discussion with Defra in May 2024 it has been agreed to not proceed to AQAP for Wychavon district at this time. Consideration for revocation of the AQMA or proceeding to AQAP will be undertaken following a further period of review and reported in next ASR 2025.

It is anticipated the countywide Air Quality Strategy will be developed further in 2025 following completion of these priority works. The timeline for the various stages and delivery of the Air Quality Strategy and Action Plan is set out in the main report below.

Key Developments in 2023 are:

Installation and operation of automatic monitors in Worcester Road, Wychbold AQMA in May 2023.

Real-time Air Quality Monitoring Project

In February 2023, WRS were successful in a bid to the Defra Air Quality Grant Scheme 2022/23 to establish an enhanced real-time air quality monitoring network across Worcestershire. The scope of the bid was to establish a real-time air quality monitoring network across the main areas of air quality concern in Worcestershire for purposes of providing enhanced monitoring data on a range of pollutants. Additionally, the proposal included informing the public and vulnerable groups of the status of air pollution in real time to encourage behaviour change.

£248,400 was awarded to WRS from the AQ Grant Scheme. An additional 10% of funds will also be provided by each district council in Worcestershire, as per the match-funding requirement of the scheme, which equates to £27,600. Giving a grand total of £276,000 for the project.

The scheme has involved the installation and operation of 26 ‘low-cost Air Quality Monitors’ which measure NO_2, PM_{10}, and $PM_{2.5}$ across the county for a period of 3 years (with EA MCERTS standard accreditation as indicative ambient particulate matter devices). The results of monitoring will be used to inform decision making and requirements for further action as necessary.

In 2023 the experienced sensor provider Earthsense were appointed as successful suppliers following a rigorous procurement process. The sensors, known as ‘Zephyrs’ are provided, operated and serviced by Earthsense who also provide data access.

Appropriate monitoring locations were determined by WRS in collaboration with Public Health, Worcestershire County Council Street Lighting team and Earthsense taking into consideration requirements of Wychavon District Council.

The locations have been chosen to maximise data capture within locations proximal to vulnerable communities and/or from a range of sources of air pollution including: transport, solid fuel burning, industry and agriculture.

5 of the monitors have been deployed within the Wychavon District Council area in January 2024.

Earthsense and WRS have designed a publicly accessible portal to the real time monitoring data which launched in May 2024.

Wychavon District Council expects the following measures to be completed over the course of the next reporting year:

- Installation of 5 low-cost sensors in the district and activation of a public access portal to real time data on a range of air pollutants
- Fulfilment of a Behavioural Change Officer (BCO) post at WRS for up to 3 years. The post was advertised at beginning of 2024 and is funded from s106 contributions from new planning developments to provide air quality improvements.
- Construction of new shared use path in St Richard's, Evesham.

Worcestershire County Council actions

Worcestershire County Council have implemented or taken forward a number of actions and plans that will benefit air quality within Wychavon District area:

- Planning approval has been given for a new walking and cycling bridge linking **Hampton** and Evesham, this project will include the delivery of shared use paths linking to the bridge.
  Hampton pedestrian and cycling bridge | Worcestershire County Council
- A **Local Cycling and Walking Infrastructure Plan (LCWIP**) for Evesham is currently in development and due for public consultation and adoption in 2024.
  Local cycling and walking infrastructure plans (LCWIPs) | Worcestershire County Council
- **Pershore and Droitwich (LCWIPs)** funded by Active Travel England, to be completed in 2025
  Local cycling and walking infrastructure plans (LCWIPs) | Worcestershire County Council

- **Moving Evesham Forward**

  The Moving Evesham Forward scheme consisted of a package of incremental packages of schemes that considers all modes of transport. This approach intended to assess what schemes there were that could have been delivered in the short term. To develop medium term schemes and to build the business case for longer term investments into the scheme. Many of the schemes have been completed, with three more of the incremental schemes to be completed. As part of Moving Evesham Forward, further ideas are also being assessed. https://www.worcestershire.gov.uk/council-services/travel-and-highways/major-infrastructure-improvements/road-improvements/moving-evesham-forward

- Worcestershire County Council are collaborating with the districts in review of the South Worcestershire Development Plan, which includes detailed policy to address the impact of air pollution from new development including prioritisation of active travel and corridor improvements. The plan was submitted to the Secretary of State for DLUHC in September 2023.

Conclusions and Priorities

The Wychavon District area generally enjoys good air quality. Over the five-year period 2019 to 2023 there have been no exceedances of the annual mean objective for nitrogen dioxide in the district.

There is currently one Air Quality Management Area (AQMA) in Wychavon District. The Worcester Road, Wychbold AQMA was declared in 2018 due to monitored and modelled exceedances of the annual mean objective for nitrogen dioxide (NO_2).

No exceedance of the Air Quality Objective occurred within the AQMA in 2023. There have been no exceedances since 2018 (when calculating back to relevant receptors).

Monitoring data from 2022 showed a large increase on 2021, as COVID19 restrictions were lifted. Data shows that NO_2 levels have now decreased by almost the same amount in 2023. Monitoring data shows an overall decrease of 3.20 µg/m^3 in average recorded annual mean NO_2 concentrations across the Wychavon District area between 2022 and 2023 (25.62 µg/m^3 in 2022 and 29.24 µg/m^3 in 2023). Monitoring locations in the Worcester Road, Wychbold AQMA demonstrate similar measurements for 2022 and 2023, while locations elsewhere in the district have generally recorded lower concentrations than the previous year.

In 2023, the highest concentration of NO_2 recorded across Wychavon District was 34.7 µg/m^3 at WBA2, a new tube colocated with the new continuous monitor in Worcester Road, Wychbold AQMA, and EPS14a.

Wychavon District Council have not identified any new sources impacting air quality in 2023. A number of applications for new developments have been received; the proposals have been assessed as part of the planning process and are not expected to have a significant impact on local air quality when they are operational.

Wychavon District Council's priorities for the coming year are:

- Development and activation of a public access portal to real time data on a range of air pollutants to enhance public knowledge and encourage behavioural change
- Developing closer working ties with Public Health colleagues on a variety of work streams: AQAP measures progression, campaigns such as Clean Air Day 2023 and supporting the development of an Air Quality Strategy for Worcestershire
- Continue monitoring of air pollutants at key locations across the district.
- Ensure proportionate mitigation measures are included within new developments where air quality is a relevant concern.
- Supporting the WRS Behavioural Change Officer (BCO) focussing on working with schools and other community settings across the county, providing information and advice about local air quality, and encouraging sustainable behaviours, such as switching from short car journeys to active travel modes of transport.

Local Engagement and How to get Involved

There are a number of ways members of the public can help to improve local air quality:

- **Walk or cycle, leave your car at home:** Leaving your car at home and walking or cycling instead will benefit in three ways - increased exercise, reduced pollution exposure and will reduce individual's pollution emissions;
- **Turn off your engine when stationary or parked,** don't 'idle', particularly outside sensitive receptors such as schools, hospitals, care homes and residential properties;

- General travel planning advice is available on Worcestershire County Council's website (including walking, cycling, bus maps and timetables, community transport and travel to school).
- **Hold meetings by Conference Call** by phone or video conference via Teams, Zoom, Skype or Facetime rather than driving to meetings. This reduces fuel and other travel costs, vehicle maintenance and hire cost, increases productivity through reduction in hours lost through unnecessary travel;
- Facilitate **Flexible Working Arrangements** for non-front-line staff to **work remotely from home** or nearer home facilities for one or more days a week thus removing or reducing any journey to work. This reduces congestion which has beneficial impacts for delivery times, reduced business costs and thus economic benefits. Additionally, provides social benefits through improved work life balance for employees, reduces local air quality and reduced emergency vehicle response times.
- **Switch Fleet to Low Emission Vehicles**: The government is currently providing grants for up to 75% of Electric Vehicle (EV) charging points, up to 40 charge points:

  Workplace Charging Scheme: guidance for applicants - GOV.UK (www.gov.uk)
- If you have to drive follow fuel efficient driving advice, often known as '**Smarter Driving Tips'**, to save on fuel and reduce your emissions. A number of websites promote such advice including:

  http://www.theaa.com/driving-advice/fuels-environment/drive-smart

  Maximise fuel economy through efficient driving - Energy Saving Trust

  How to save fuel - the ultimate guide | RAC Drive
- **Reduce air pollution from open fires and wood-burning stoves**: Advice is available from Defra on choosing the right stove, using the right fuels and maintenance enabling householders to reduce their impact on their health and air quality from open fires and wood burning stoves. Further information is available on the Smokeless Zones and Public Advice pages on WRS website.

Air pollution can affect all of us over our lifetime however certain groups will be more sensitive to the effects of air pollution. Vulnerable groups include adults and children with

lung or heart conditions such as asthma, chronic bronchitis, emphysema and chronic obstructive lung disease (COPD)[6,7]. Senior citizens are more likely to be affected by respiratory diseases and children are more likely to be affected by air pollution due to relatively higher breathing and metabolic rates as well as a developing lung and immune system.

Vulnerable individuals and groups can keep informed of:

- Current levels and forecasts of air pollution from Defra at: https://uk-air.defra.gov.uk/.
- If you are sensitive to the effects of air pollution, it may be appropriate to limit the length of time spent in areas of local poor air quality – see advice from Defra at https://uk-air.defra.gov.uk/air-pollution/daqi
- If you are on social media, sign up to the WRS Twitter feed. WRS tweet when pollution is forecast by Defra to be moderate to very high.

Further information for the general public on reducing your family's exposure to poor air quality in Worcestershire and how individuals, business and schools can assist with reducing their impact on local air quality is available at Protecting Me and Others from Air Pollution | Worcestershire Regulatory Services (worcsregservices.gov.uk) .

Local Responsibilities and Commitment

This ASR was prepared by the Worcestershire Regulatory Services for Wychavon District Council with the support and agreement of the following officers and departments:

Worcestershire Regulatory Services

Worcestershire County Council

Wychavon District Council

[6] http://www.breathelondon.org/

[7] https://www.londonair.org.uk/LondonAir/guide/MyActionsForMe.aspx

This ASR has been submitted to the Director of Public Health for comment. No comments have been received for inclusion in this report prior to the deadline for submission.

If you have any comments on this ASR, please send them to:

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1 Local Air Quality Management

This report provides an overview of air quality in Wychavon District during 2023. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Wychavon District to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

A summary of AQMAs declared by Wychavon District Council can be found in Table 2.1. The table presents a description of the one AQMA that is currently designated within Wychavon District. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMA and also the air quality monitoring locations in relation to the AQMA. The air quality objectives pertinent to the current AQMA designation are as follows:

- NO_2 annual mean

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Worcester Road, Wychbold	1st May 2018	NO2 Annual Mean	An area encompassing a number of properties surrounding strategic road network around J5 M5 and A38	YES	44.6 µg/m3	No Exceedance	5 years	N/A – refer to main text	

☒ **Wychavon District Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

☐ **Wychavon District Council confirm that all current AQAPs have been submitted to Defra**

2.2 Progress and Impact of Measures to address Air Quality in Wychavon District Council

Defra's appraisal of last year's ASR concluded

The report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports:

1. WDC has one AQMA which has been compliant with the relevant objective for 4 consecutive years. Since 2018 none of the monitoring locations recorded concentrations within 10% of the objective after distance correction. The Council are strongly advised to consider revocation of their AQMA and continue progress with producing an Air Quality Strategy.
2. WDC do not have a formal AQAP for their AQMA, and thus have not been able to provide the required detail and update on progress made in 2022. However, given their AQMA has been compliant, the Council are advised to focus efforts on revocation and the production of an Air Quality Strategy.
3. WDC are working to re-engage partnership work with local authorities within Worcestershire and Strategic Transport, Public Health, Planning and Sustainability teams from the wider County Council. These partnerships were suspended or delayed as a result of the pandemic. It is encouraging to see effort to rectify and rebuild these working relationships.
4. Additionally, the ASR has been signed off by a Director of Public Health. This is welcomed; collaboration and consultation with those who have responsibility for Public Health is expected to increase support for measures to improve air quality, with co-benefits for all.
5. WDC have expanded their monitoring network, with a new automatic monitor installed in May 2023. This is welcomed, and the Council should report on this monitor in their 2024 ASR.
6. The Public Health Outcomes Framework has been referenced, with indicator D.01 compared to national and regional values.
7. Trends have been presented with a robust comparison to air quality objective. Figures illustrating trends have been provided which are useful.

8. QAQC procedures applied to monitoring data is generally robust. However, a local bias adjustment factor has been derived from a co-location study outside of WDC and has been applied to monitoring data. This is considered acceptable; however it would be beneficial to include additional detail including:
    a. An explanation of why a co-location study outside of WDC was used and a justification of suitability; and
    b. Confirmation the same laboratory and analysis methodology is used for the co-location study compared to WDC own monitoring network.
9. The report includes a brief outline of planning applications received in 2022. It would be useful to include information in relation to air quality, such as if an Air Quality Assessment was caried out and what were the conclusions, and the outcomes of the planning applications.

WRS acknowledge the above and considered comments in the production of this ASR.

The development of an AQAP has not been progressed in 2023, or previously, due to uncertainty as to whether an AQMA is still required in the area against a backdrop of improved nitrogen dioxide concentrations over the 7-year period 2017 to 2023. Therefore no table of measures are provided below. These long-term trends and possible reasons for them are discussed further in Section 3.2 of this report and in the 2020 - 2023 ASRs. A summary of influencing factors and outcomes of review of requirement for an AQAP is provided below in section 2.2.1.

2.2.1 Worcester Road, Wychbold AQMA update for 2023

The Worcester Road, Wychbold AQMA is essentially a strategic road junction in a small village. The air quality issues identified by monitoring in the past are linked to transient traffic travelling through the area to and from other destinations. A source apportionment study of the A38, undertaken in 2018, indicates that the main source of emissions affecting NO_2 concentrations relate to diesel cars (43.9%), diesel LGVs (26.0%) and HGVs (15.7%) travelling through the area to and from other destinations. In order to have any meaningful impact on emissions significant large-scale schemes would be required. Available options are limited, costly and resource intensive.

In light of the above Wychavon District Council need to be certain that such actions are necessary before they proceed further.

Improvements in nitrogen dioxide concentrations have been monitored over the six-year period 2017 to 2022 such that it is uncertain as to whether an AQMA is still required. There has been a single exceedance of the Nitrogen Dioxide Annual Mean AQO over the six-year period 2017 to 2022 of 40µg/m^3 at EPS56 in 2018 (it should be noted that this location is commercial with residential accommodation at first floor level above; the monitored exceedance is at ground floor level and as such may not translate to a true exceedance at relevant exposure above). In addition, there has been no other monitored concentration above 36µg/m^3 at relevant exposure in the AQMA since 2018. Possible reasons and influencing factors for the observed improvements are discussed further in Section 3.2 of this report, and in detail in the 2020 - 2022 ASRs for Wychavon District Council which are available to view and download via the WRS website at Wychavon District Council | Worcestershire Regulatory Services (worcsregservices.gov.uk).

A summary of influencing factors is as follows:

- Strategic road network improvements: the completion of significant Major Scheme enhancement works to the strategic road network in the area in 2017. The Scheme included the upgrade of the M5 between junctions 6 and 4a to a SMART motorway along with improved 'off-slip' capacity and the introduction of traffic signal control on the A38 at junction 5 in the AQMA. The contribution of the M5 to local NO_2 concentrations is anticipated to be considerable based on previous modelling outputs and this factor will become key to progressing any action planning should automatic monitoring on the A38 show that an AQMA is still required in the area. Furthermore, Worcestershire County Council have advised WRS that whilst the Major Scheme works were taking place there was significant constraint on traffic flow on the M5 causing a proportion of strategic traffic to re-route onto local and regional roads including Worcester Road, Wychbold.
- Variance in diffusion tube data: the impact of low published national bias-adjustment factors for the Council's tube supplier applied to monitoring data at the time indicates the significant decrease in concentrations observed in 2017 and 2019 cannot be relied upon as indicative of local trends.
- COVID-19 pandemic: Monitoring data from 2020 to 2021 do not represent standard years with significantly reduced traffic due to associated lockdowns and restrictions affecting travel patterns and behaviours. At this time, it is unclear if some enforced behaviours during the pandemic that led to a decrease in the number of journeys made, such as virtual meetings replacing face to face and an increase in working

from home, will continue to have the beneficial impact on reducing concentrations of NO_2 in future years after 2022.

- National vehicle fleet improvements: There has been a reduction in the number of diesel vehicles in UK car fleet following a move towards petrol and LEVs/ULEVs. The most recent available statistics published by the DfT show that between Q4 2016 and Q3 2022 there was a 4.2% drop in the proportion of diesel cars in the national fleet. A similar change in the vehicle fleet on the A38 Wychbold will contribute to the observed improvement in levels of NO_2 as the source apportionment study demonstrates diesel cars contribute approximately 44% of emissions on the A38 Wychbold. DfT statistics also show a 1.3% drop in petrol cars in the national fleet between 2017 and 2022, along with a 5.5% increase in low emission vehicles (which make up 6.8% of the national car fleet as at Q3 2022).
- Bus improvements: WRS understand the main bus provider, First, with services using the A38 through Wychbold retrofitted the buses on its 144 route (Birmingham – Worcester – Birmingham) to Euro 6 standards in order to comply with the upcoming introduction of a Clean Air Zone in Birmingham during 2018 to 2020.
- Meteorological conditions: milder winters generally result in lower concentrations of nitrogen dioxide over the winter months.

Whilst measured diffusion tube data indicates that the AQMA may no longer be necessary, the uncertainties in trend data due to the reasons outlined above and inherent variance in diffusion tube data make it difficult to make a robust decision to amend or revoke the AQMA.

The new automatic monitoring station within the AQMA will allow Wychavon District Council to gather an accurate dataset. This dataset can then be used to draw better informed, robust conclusions as to whether the nitrogen dioxide annual mean objective is still likely to be exceeded at relevant exposure in the area, i.e. whether the AQMA is still required or whether it requires revocation.

If it is concluded that the Objective is still being exceeded a more reliable and robust dataset will allow Wychavon District Council to make well informed decisions relating to the degree of any required improvement and determine appropriate mitigating actions to achieve any required level of improvement.

Following discussions with Defra LAQM Team in September 2023 it was agreed that consideration for AQAP would be delayed until a full years' worth of continuous monitoring

data had been obtained. Results (refer section 3.2.2) indicate concentrations are within 75% of the AQ objective and following review and further discussion with Defra in May 2024 it has been agreed to not proceed to AQAP at this time. Consideration to revocation of the AQMA or proceeding to AQAP will be undertaken following a further period of review and reported in next ASR 2025.

Air Quality Actions Plan and Air Quality Strategy

The timeline for the various stages and delivery of a revised countywide AQAP, and establishment of a new countywide Air Quality Strategy, were set out in the ASR 2023. However, following the introduction of new enforcement policy by Defra in June 2023, it has been necessary to amend the previously published framework to prioritise production of a standalone AQAP for each district with an existing AQMA.

Following discussions with Defra LAQM Team in September 2023, 4 Worcestershire Councils including Wychavon District Council were granted extensions to the timeline for delivery of the draft AQAPs.

It is anticipated the countywide Air Quality Strategy will be developed further in 2025 following completion of these priority works.

Table 2.2 below provides a summary revised timetable.

Table 2.2 - Air Quality Action Plan and Strategy Works Timeline

Time	Phase
1st July 2024	Submission of Draft Worcester City AQAP to DEFRA
1st Nov 2024	Submission of Draft Bromsgrove and Wyre Forest District AQAPs to DEFRA
12th Dec 2024	Publication of Final Worcester City AQAP and submission to DEFRA
Jan – Feb 2025	Progress revocation of Lickey End and Redditch Road, Bromsgrove AQMAs
1st April 2025	Publication of Final Bromsgrove and Wyre Forest District AQAPs and submission to DEFRA
April – May 2025	Review of Wychbold, Wychavon AQMA - consideration of revocation or progress to AQAP if appropriate.
30th June 2025	Publication of Annual Status Report 2025 and submission to DEFRA
2025	Develop and publish draft of Worcestershire Air Quality Strategy

Key Developments in 2023 are:

Installation and operation of automatic monitors in Worcester Road, Wychbold AQMA in May 2023.

Real-time Air Quality Monitoring Project

In February 2023, WRS were successful in a bid to the Defra Air Quality Grant Scheme 2022/23 to establish an enhanced real-time air quality monitoring network across Worcestershire. The scope of the bid was to establish a real-time air quality monitoring network across the main areas of air quality concern in Worcestershire for purposes of providing enhanced monitoring data on a range of pollutants. Additionally, the proposal included informing the public and vulnerable groups of the status of air pollution in real time to encourage behaviour change.

£248,400 was awarded to WRS from the AQ Grant Scheme. An additional 10% of funds will also be provided by each district council in Worcestershire, as per the match-funding requirement of the scheme, which equates to £27,600. Giving a grand total of £276,000 for the project.

The scheme has involved the installation and operation of 26 'low-cost Air Quality Monitors' which measure NO_2, PM_{10}, and $PM_{2.5}$ across the county for a period of 3 years (with EA MCERTS standard accreditation as indicative ambient particulate matter devices). The results of monitoring will be used to inform decision making and requirements for further action as necessary.

In 2023 the experienced sensor provider Earthsense were appointed as successful suppliers following a rigorous procurement process. The sensors, known as 'Zephyrs' are provided, operated and serviced by Earthsense who also provide data access.

Appropriate monitoring locations were determined by WRS in collaboration with Public Health, Worcestershire County Council Street Lighting team and Earthsense taking into consideration requirements of Wychavon District Council.

The locations have been chosen to maximise data capture within locations proximal to vulnerable communities and/or from a range of sources of air pollution including: transport, solid fuel burning, industry and agriculture.

5 of the monitors have been deployed within the Wychavon District Council area in January 2024.

Earthsense and WRS have designed a publicly accessible portal to the real time monitoring data which launched in May 2024.

Wychavon District Council expects the following measures to be completed over the course of the next reporting year:

- Installation of 5 low-cost sensors in the district and activation of a public access portal to real time data on a range of air pollutants
- Fulfilment of a Behavioural Change Officer (BCO) post at WRS for up to 3 years. The post was advertised at beginning of 2024 and is funded from s106 contributions from new planning developments to provide air quality improvements.
- Construction of new shared use path in St Richard's, Evesham.

Wychavon District Council's priorities for the coming year are:

- Development and activation of a public access portal to real time data on a range of air pollutants to enhance public knowledge and encourage behavioural change
- Developing closer working ties with Public Health colleagues on a variety of work streams: AQAP measures progression, campaigns such as Clean Air Day 2023 and supporting the development of an Air Quality Strategy for Worcestershire
- Continue monitoring of air pollutants at key locations across the district.
- Ensure proportionate mitigation measures are included within new developments where air quality is a relevant concern.
- Supporting the WRS Behavioural Change Officer (BCO) focussing on working with schools and other community settings across the county, providing information and advice about local air quality, and encouraging sustainable behaviours, such as switching from short car journeys to active travel modes of transport.

Worcestershire County Council actions

Worcestershire County Council have implemented or taken forward a number of actions and plans that will benefit air quality within Wychavon District area:

- Planning approval has been given for a new walking and cycling bridge linking **Hampton** and Evesham, this project will include the delivery of shared use paths linking to the bridge.
  Hampton pedestrian and cycling bridge | Worcestershire County Council
- A **Local Cycling and Walking Infrastructure Plan (LCWIP**) for Evesham is currently in development and due for public consultation and adoption in 2024.
  Local cycling and walking infrastructure plans (LCWIPs) | Worcestershire County Council
- **Pershore and Droitwich (LCWIPs)** funded by Active Travel England, to be completed in 2025
  Local cycling and walking infrastructure plans (LCWIPs) | Worcestershire County Council
- **Moving Evesham Forward**
  The Moving Evesham Forward scheme consisted of a package of incremental packages of schemes that considers all modes of transport. This approach intended to assess what schemes there were that could have been delivered in the short

term. To develop medium term schemes and to build the business case for longer term investments into the scheme. Many of the schemes have been completed, with three more of the incremental schemes to be completed. As part of Moving Evesham Forward, further ideas are also being assessed. https://www.worcestershire.gov.uk/council-services/travel-and-highways/major-infrastructure-improvements/road-improvements/moving-evesham-forward

- Worcestershire County Council are collaborating with the districts in review of the South Worcestershire Development Plan, which includes detailed policy to address the impact of air pollution from new development including prioritisation of active travel and corridor improvements. The plan was submitted to the Secretary of State for DLUHC in September 2023.

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[8], local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter ($PM_{2.5}$)). There is clear evidence that $PM_{2.5}$ (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Following success of bid for funding for low-cost sensors from Defra Air Quality Grant 2022/23, WRS installed 5 low-cost Air Quality Monitors in Wychavon District. The sensors will measure NO_2, PM_{10}, and $PM_{2.5}$.

A continuous analyser (Model: BAM-1020) has been installed to monitor PM_{10} and NO_2 within the Worcester Road, Wychbold AQMA in May 2023.

WRS have used PM_{10} annualised figures from the newly installed PM_{10} monitoring station to calculate an estimation of a $PM_{2.5}$ annual for the site-specific location. The calculated figure is 8.9 µg/m^3.

WRS has also reviewed the DEFRA national background maps to determine projected $PM_{2.5}$ concentrations across Wychavon District area for the 2023 calendar year. The annual average total $PM_{2.5}$ at 657 locations (centre points of 1km x 1km grids) across Wychavon District is 7.57 µg/m^3, with a minimum concentration of 7.01 µg/m^3 and a maximum concentration of 9.18 µg/m^3.

This indicates that $PM_{2.5}$ concentrations within the Wychavon District are generally below the annual average limit value for $PM_{2.5}$ target of 10µg/m^3 to be met across England by 2040.

WRS has reviewed the fraction of mortality attributable to particulate air pollution (indicator D01) as published by Public Health England as part of the Public Health Outcomes Framework[9]. The fraction of mortality attributable to particulate emissions in Wychavon District in 2022 (the most recent year available) was 5.1%. This falls below the national figure for England (5.8% in 2022) and below the figure for the West Midlands region (5.7% in 2022).

[8] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

[9] Public Health Outcomes Framework - OHID (phe.org.uk)

More information on the Public Health Outcomes Frameworks that examines indicators that help us understand trends in public health can be found at: Public Health Outcomes Framework - PHE

There are no smoke control areas within Wychavon District.

No additional actions are currently planned by Wychavon District in relation to the reduction of $PM_{2.5}$ levels. However, it is anticipated that any actions taken to improve NO_2 levels across the District will likely result in a linked improvement in $PM_{2.5}$ levels. Additionally, the emerging local air quality strategy for Worcestershire districts will have regard for local authority responsibilities for $PM_{2.5}$ outlined within the revised national Air Quality Strategy published 28 April 2023.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

This section sets out the monitoring undertaken within 2023 by Wychavon District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2019 and 2023 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Wychavon District Council undertook automatic (continuous) monitoring at a single site in Wychbold during 2023. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The Interactive Air Quality Maps & Current Status | Worcestershire Regulatory Services (worcsregservices.gov.uk) page presents automatic monitoring results for Wychavon District Council, with automatic monitoring results also available through the UK-Air website .

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Wychavon District Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 28 sites during 2023. Table A.2 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2023 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

There have been several changes to the monitoring network across Wychavon District during 2023: A continuous monitor is now located on the Worcester Road AQMA, and 5 additional diffusion tubes were added. These include sites; LC, RD, WBA1, WBA2 and WBA3. WBA1,2 and 3 are colocated with the new continuous monitoring station.

Monitoring data from 2022 showed a large increase on 2021, as COVID19 restrictions were lifted. Data shows that NO_2 levels have now decreased by almost the same amount in 2023. Monitoring data shows an overall decrease of 3.20 µg/m^3 in average recorded annual mean NO_2 concentrations across the Wychavon District area between 2022 and 2023 (25.62 µg/m^3 in 2022 and 29.24 µg/m^3 in 2023). Monitoring locations in the Worcester Road, Wychbold AQMA demonstrate similar measurements for 2022 and 2023, while locations elsewhere in the district have generally recorded lower concentrations than the previous year.

In 2023, the highest concentration of NO_2 recorded across Wychavon District was 34.7 µg/m^3 at WBA2, a new tube colocated with the new continuous monitor in Worcester Road, Wychbold AQMA, and EPS14a.

No other diffusion tube monitoring locations have recorded concentrations within -10% of the AQS objective for annual average NO_2, in 2022. All concentrations are shown in Table B.1.

The highest concentration measured at a relevant receptor recorded in Wychavon District in 2023 is 29.6 µg/m^3 at EPS56 within the Worcester Road, Wychbold AQMA.

Following discussions with Defra LAQM Team in September 2023 it was agreed that consideration for AQAP would be delayed until a full years' worth of continuous monitoring data had been obtained. Results (refer section 3.2.2) indicate concentrations are within 75% of the AQ objective and following review and further discussion with Defra in May 2024 it has been agreed to not proceed to AQAP at this time. Consideration for revocation of the AQMA or proceeding to AQAP will be undertaken following a further period of review and reported in next ASR 2025.

No annual means greater than 60 ug/m^3 have been recorded indicating that it is very unlikely that there have been any exceedances of the 1-hour mean objective for NO_2 at any diffusion tube monitoring sites.

3.2.2 Particulate Matter (PM_{10})

In May 2023 Wychavon District Council began monitoring PM_{10} with a newly installed automatic monitor. The monitor is located in the Worcester Road, Wychavon AQMA (391982, 265667).

In the 6-month and a half period (May-December) there were no exceedance of hourly air quality objectives for PM_{10}.

Due to a limited amount of data, it is not possible to identify any significant trends at this time or how the data will inform future decisions on the Worcester Road AQMA.

All monitoring data has been correctly ratified and annualised (Please see Appendix C for specific calculations).

Table A.6 in Appendix A: Monitoring Results shows the first year of ratified and adjusted monitored PM_{10} annual mean concentrations compared with the air quality objective of 40µg/m^3.

Table A.7 in Appendix A shows the ratified continuous monitored PM_{10} daily mean concentrations for the first year of data with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

3.2.3 Particulate Matter ($PM_{2.5}$)

No dedicated $PM_{2.5}$ automatic monitoring took place in Wychavon in 2023. However, the newly installed continuous monitor in Wychbold (391982, 265667) has been monitoring PM_{10} since May 2023. Annualised PM_{10} data was used to estimate annual mean $PM_{2.5}$ levels at the monitoring location, giving an estimated annual mean of 8.7 µg/m^3. This was calculated using the National Factor for PM_{Coarse} (Roadside).

PM_{Coarse} Split Summary Table

Site Type	2021	2022	2023
Background	4.9	5.5	4.7
Roadside	5.7	6.4	5.9

Error! Reference source not found. in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentration for the last year.

3.2.4 Sulphur Dioxide (SO_2)

Wychavon District Council did not undertake SO_2 monitoring in 2023.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
WBA	Wychbold	Roadside	391982	265667	NO_2, PM_{10}	YES Worcester Road, Wychbold	Chemiluminescent; Beta Ray Attenuation	8.2	2.0	1.5

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable

Table A.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
EPS8	40 High Street, Pershore	Roadside	395048	245527	NO_2	No	2.0	0.5	No	2.3
EPS9	St Andrews Road, Pershore	Roadside	394571	245377	NO_2	No	6.0	3.0	No	2.3
EPS33	High Street, Evesham	Roadside	403753	244068	NO_2	No	2.5	3.5	No	2.3
EPS44	33 Port Street, Evesham	Roadside	404183	243611	NO_2	No	2.6	1.2	No	2.4
EPS43	Long Stay Sign, Evesham	Roadside	404222	243598	NO_2	No	0.0	1.9	No	2.5
EPS14	Port Street Road Sign	Kerbside	404128	243630	NO_2	No	1.7	0.7	No	2.4
EPS14 a	Port Street Road Sign	Kerbside	404128	243630	NO_2	No	1.7	0.7	No	2.4
EPS14 b	Port Street Road Sign	Kerbside	404128	243630	NO_2	No	1.7	0.7	No	2.4
EPS60	Corner of Rynal Street	Roadside	403914	244046	NO_2	No	5.5	1.1	No	2.1
EPS61	The Old Dairy, Swan Lane	Roadside	403796	244006	NO_2	No	0.0	1.9	No	2.0
EPS62	Bengal Dreams, Evesham	Roadside	403729	243971	NO_2	No	1.3	5.4	No	2.2
EPS63	60 Mayflower Road, Droitwich	Roadside	390708	262863	NO_2	No	0.0	2.5	No	1.9

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
WychSC	Worcester Road, Wychbold	Roadside	392022	265702	NO_2	Worcester Road, Wychbold	19.6	1.2	No	1.3
EPS56	Post Office, Worcester Road, Wychbold	Roadside	391983	265688	NO_2	Worcester Road, Wychbold	0.0	8.1	No	2.1
RD	Rose Dene, Wychbold	Roadside	392019	265736	NO_2	Worcester Road, Wychbold	9.9	1.9	No	2.0
EPS58	Rose Villas, Wychbold	Roadside	392027	265770	NO_2	Worcester Road, Wychbold	0.0	3.0	No	2.3
WMD1	Walk Mill Drive, Wychbold	Roadside	392050	265790	NO_2	Worcester Road, Wychbold	4.9	2.3	No	2.1
EPS27	Worcester Road, Wychbold	Roadside	392031	265624	NO_2	Worcester Road, Wychbold	15.5	2.3	No	2.1
WMD2	Walk Mill Drive, Wychbold	Roadside	391871	265859	NO_2	Worcester Road, Wychbold	13.5	21.5	No	1.8
WychCH	Amesford, Wychbold	Roadside	392160	265937	NO_2	Worcester Road, Wychbold	7.5	2.1	No	2.3
CROW1	Crown Lane, Wychbold	Roadside	392257	266043	NO_2	Worcester Road, Wychbold	4.3	1.3	No	2.3
WychAD	Mill Lane, Wychbold	Roadside	392384	266195	NO_2	Worcester Road, Wychbold	0.0	1.5	No	2.1

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
EPS53	Hillview Cottage, Whittington	Suburban	387595	252533	NO_2	No	0.0	22.0	No	1.7
BG	Norton Roundabout	Urban Background	386297	252150	NO_2	No	0.0	36.0	No	1.9
WBA1	Wychbold Analyser	Kerbside	391982	265667	NO_2	Worcester Road, Wychbold	8.2	2.0	Yes	1.5
WBA2	Wychbold Analyser	Kerbside	391982	265667	NO_2	Worcester Road, Wychbold	8.2	2.0	Yes	1.5
WBA3	Wychbold Analyser	Kerbside	391982	265667	NO_2	Worcester Road, Wychbold	8.2	2.0	Yes	1.5
LC	Lawn Cottage, Wychbold	Roadside	392005	265736	NO_2	Worcester Road, Wychbold	0.0	10.1	No	2.0

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
WBA	391982	265667	Roadside	98%	50%	-	-	-	-	27.6

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22**

☒ **Reported concentrations are those at the location of the monitoring site (annualised, as required), i.e. prior to any fall-off with distance correction**

☒ **Where exceedances of the NO_2 annual mean objective occur at locations not representative of relevant exposure, the fall-off with distance concentration has been calculated and reported concentration provided in brackets for 2023**

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
EPS8	395048	245527	Roadside	100	100.0	21.9	16.8	18.6	20.7	19.2
EPS9	394571	245377	Roadside	100	100.0	10.0	8.6	8.4	9.4	9.8
EPS33	403753	244068	Roadside	100	100.0	23.9	18.6	21.0	24.7	23.9
EPS44	404183	243611	Roadside	100	100.0	27.5	21.2	22.3	29.2	28.5
EPS43	404222	243598	Roadside	92.30769231	92.3	27.3	21.1	22.6	30.2	29.0
EPS14	404128	243630	Kerbside	100	100.0	34.1	26.2	24.5	33.8	34.2
EPS14 a	404128	243630	Kerbside	100	100.0	34.1	26.2	24.5	33.8	34.7
EPS14 b	404128	243630	Kerbside	100	100.0	34.1	26.2	24.5	33.8	34.2
EPS60	403914	244046	Roadside	90.38461538	90.4	13.9	11.5	12.4	12.3	11.7
EPS61	403796	244006	Roadside	100	100.0	25.0	19.1	20.0	27.2	25.3
EPS62	403729	243971	Roadside	90.38461538	90.4	27.7	20.0	23.6	27.3	28.6
EPS63	390708	262863	Roadside	100	100.0	18.5	14.8	14.6	19.4	17.8
WychSC	392022	265702	Roadside	75	75.0	30.9	23.4	27.3	27.1	28.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
EPS56	391983	265688	Roadside	92.30769231	92.3	32.2	27.0	27.7	31.2	29.6
RD	392019	265736	Roadside	100	75.0					24.9
EPS58	392027	265770	Roadside	100	100.0	26.9	21.9	24.5	27.4	25.1
WMD1	392050	265790	Roadside	100	100.0	33.2		30.4	32.4	29.5
EPS27	392031	265624	Roadside	100	100.0	34.4	24.7	28.4	32.7	30.4
WMD2	391871	265859	Roadside	100	67.3	25.2	21.1	21.9	25.0	21.6
WychCH	392160	265937	Roadside	100	100.0	29.3	21.8	25.1	30.7	28.6
CROW1	392257	266043	Roadside	84.61538462	84.6	22.7	18.1	19.9	21.9	22.2
WychAD	392384	266195	Roadside	100	100.0	29.7	24.5	26.6	29.2	26.3
EPS53	387595	252533	Suburban	100	100.0	23.4	18.9	20.0	21.3	20.6
BG	386297	252150	Urban Background	100	100.0	20.0	17.4	20.3	20.0	18.6
WBA1	391982	265667	Kerbside	100	59.6					34.4
WBA2	391982	265667	Kerbside	100	59.6					34.0
WBA3	391982	265667	Kerbside	100	59.6					34.7

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
LC	392005	265736	Roadside	100	75.0					21.5

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **Diffusion tube data has been bias adjusted.**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.1 – Trends in Annual Mean NO_2 Concentrations

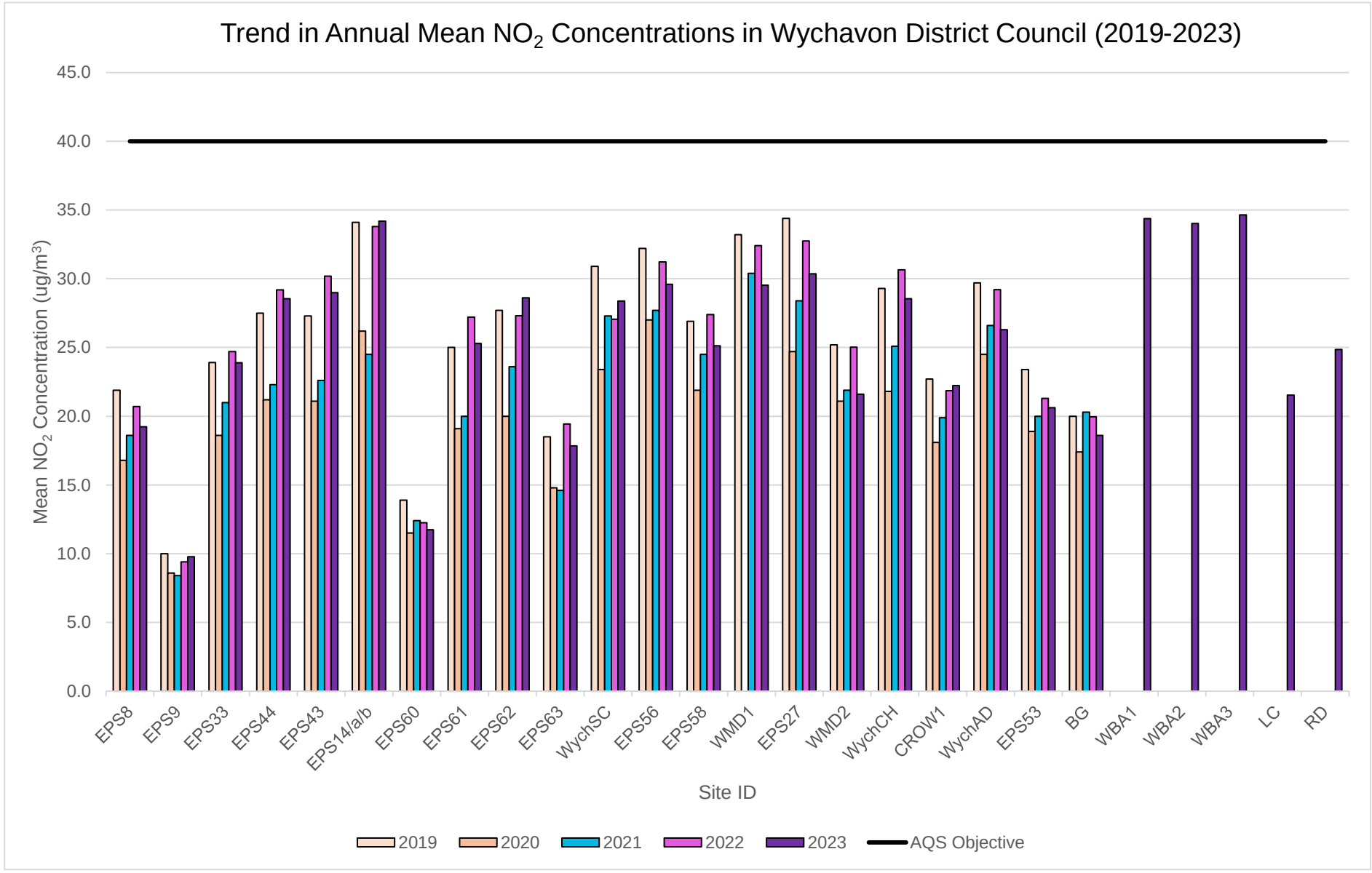

Figure A.2 – Trends in Annual Mean NO_2 Concentrations in Worcester Road, Wychbold AQMA

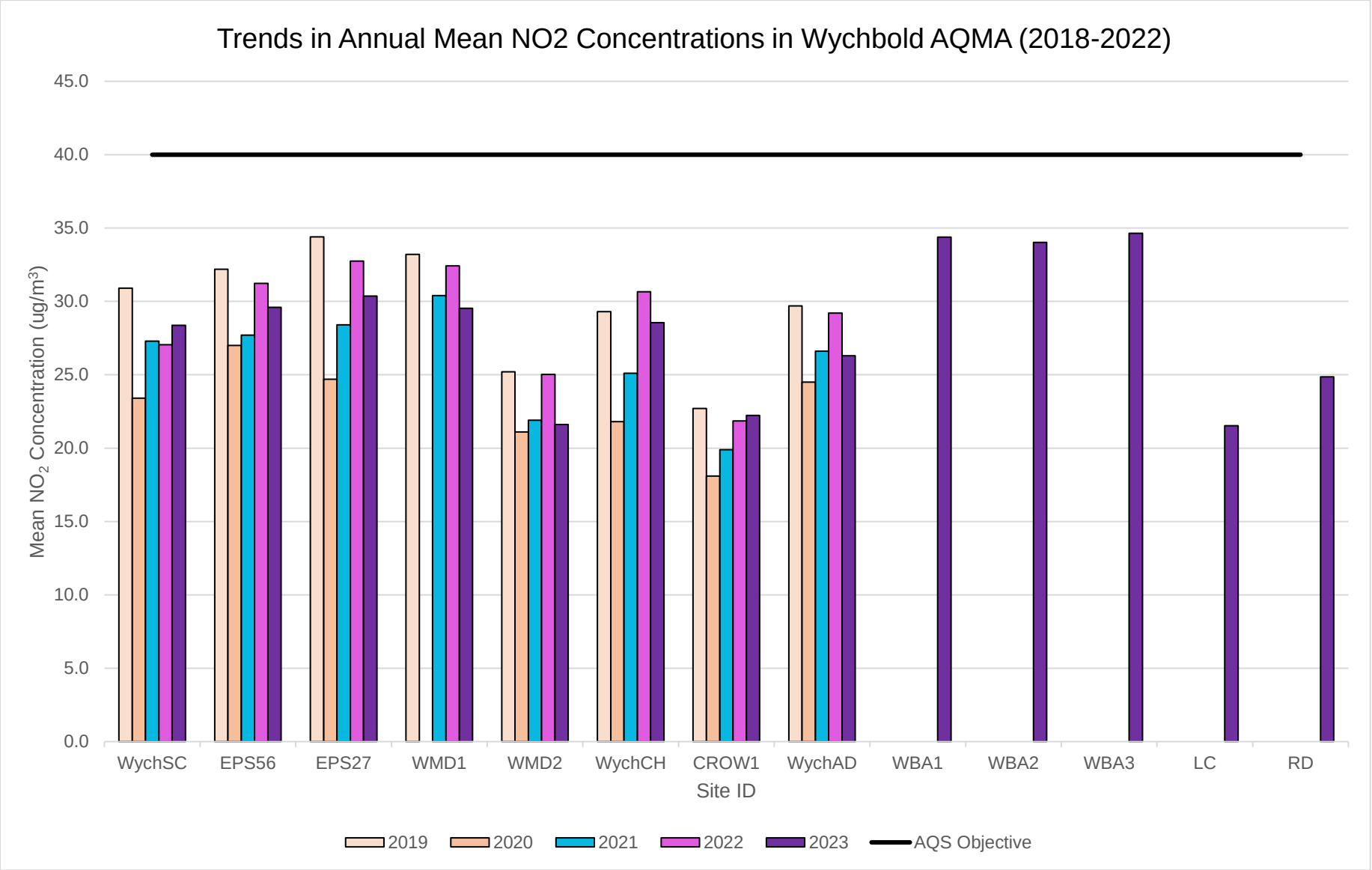

Figure A.3 – Trends in Annual Mean NO2 Concentrations in Evesham

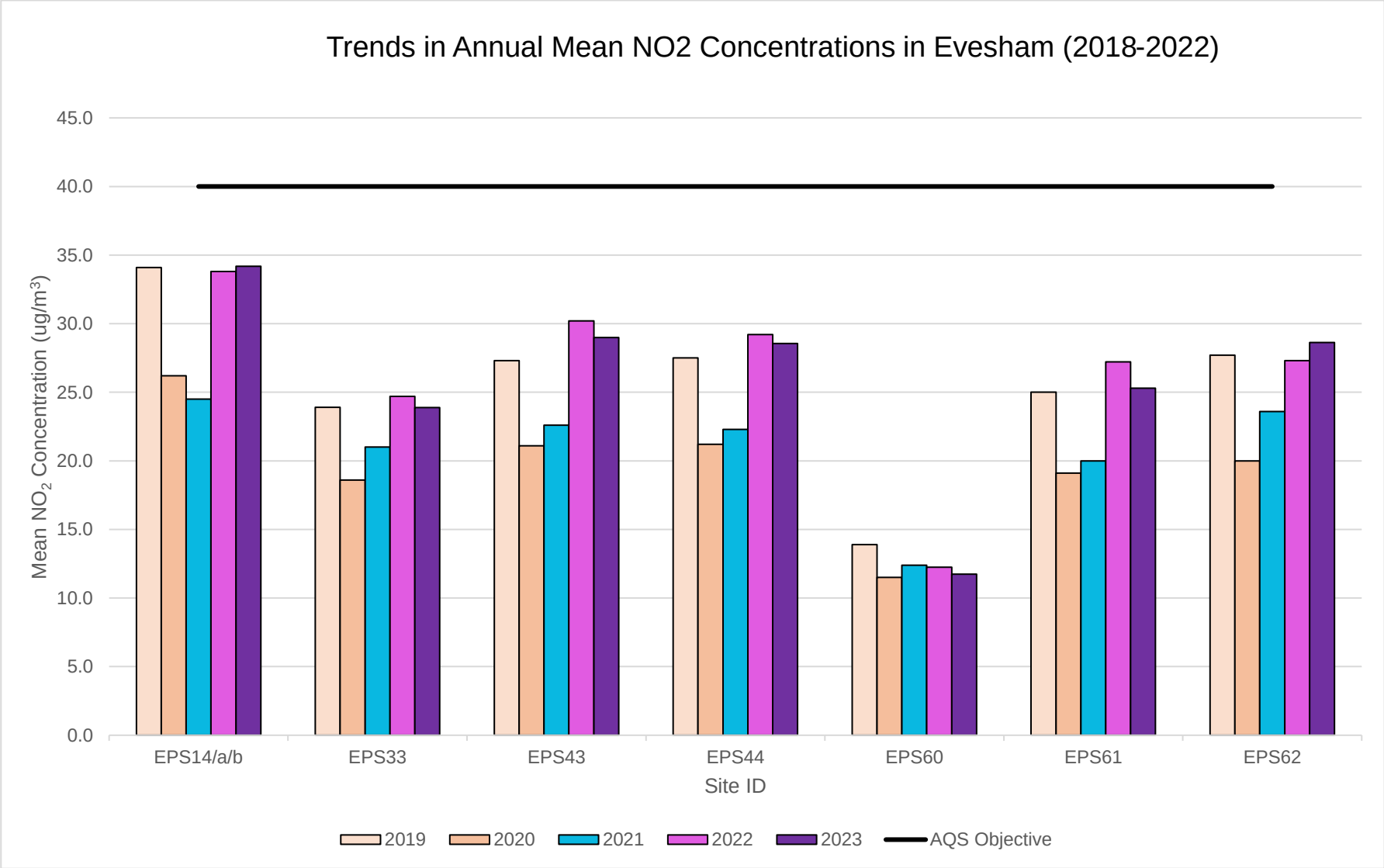

Figure A.4 – Trends in Annual Mean NO_2 Concentrations in Pershore and other areas

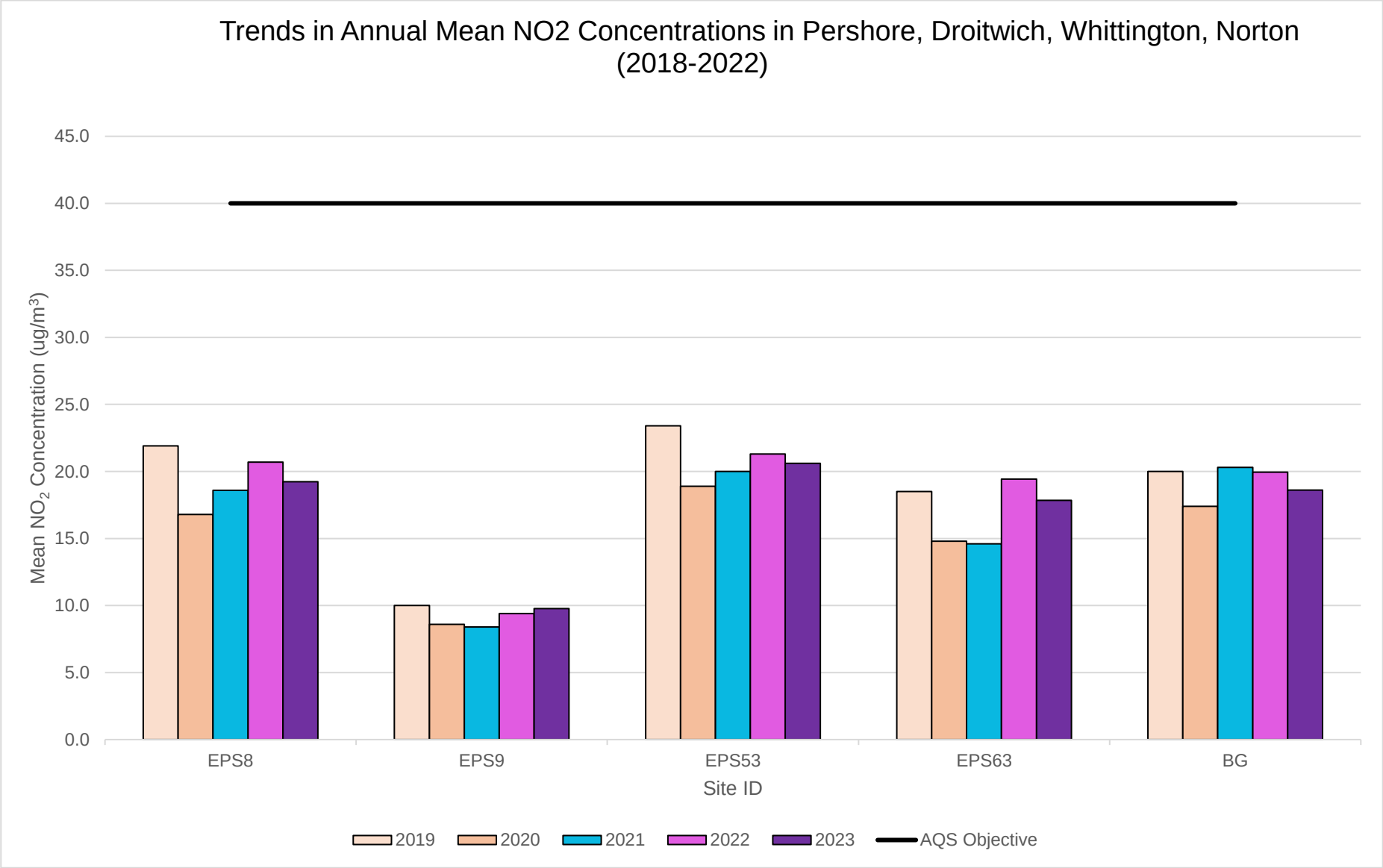

Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
WBA	391982	265667	Roadside	99	50	-	-	-	-	(0)

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m^3 have been recorded.

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table A.6 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
WBA	391982	265667	Roadside	97	50	-	-	-	-	14.8

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22**

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the PM_{10} annual mean objective of 40µg/m^3 are shown in **bold**.

All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
WBA	391982	265667	Roadside	97	50	-	-	-	-	(0)

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m^3 have been recorded.

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO_2 2023 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.96)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
EPS8	395048	245527	26.1	28.7	22.0	20.9	17.5	14.5	18.6	19.1	19.2	20.7	15.5	17.9	20.0	19.2	-	
EPS9	394571	245377	13.8	14.7	10.0	8.4	7.2	6.5	5.7	6.6	9.0	10.5	22.6	7.3	10.2	9.8	-	
EPS33	403753	244068	26.0	31.0	27.1	28.4	25.3	24.9	17.7	18.7	25.3	26.6	30.7	16.9	24.9	23.9	-	
EPS44	404183	243611	34.1	37.9	28.5	33.2	25.0	25.6	26.9	27.5	31.0	31.2	34.1	22.0	29.7	28.5	-	
EPS43	404222	243598	33.5	39.4	28.9	35.2	26.9	27.3	24.8	27.3		33.6	34.0	21.5	30.2	29.0	-	
EPS14	404128	243630	39.8	42.3	36.9	36.0	29.6	31.4	35.4	32.3	37.4	36.3	37.8	32.1	35.6	34.2	-	Triplicate Site with EPS14, EPS14a and EPS14b - Annual data provided for EPS14b only
EPS14 a	404128	243630	36.0	47.7	36.5	37.0	29.1		36.4	31.4	37.4	37.0	38.5	30.2	36.1	34.7	-	Triplicate Site with EPS14, EPS14a and EPS14b - Annual data provided for EPS14b only
EPS14 b	404128	243630	41.1	43.2	37.4	37.4	29.4	30.7	36.2	30.4	38.2	35.5	37.1	30.4	35.6	34.2	-	Triplicate Site with EPS14, EPS14a and EPS14b - Annual data provided for EPS14b only
EPS60	403914	244046	18.3	19.0	13.4	11.3	9.0	7.6	9.0	9.0	12.5	14.5		11.0	12.2	11.7	-	
EPS61	403796	244006	32.4	35.0	26.1	28.8	19.6	21.8	27.0	22.4	29.5	29.6	18.6	25.4	26.4	25.3	-	
EPS62	403729	243971	36.1	36.6	28.6	26.1	21.4	22.2	26.2		39.6	32.1	33.3	25.8	29.8	28.6	-	
EPS63	390708	262863	17.8	20.3	20.4	23.0	18.5	19.5	11.5	16.6	19.6	23.2	20.3	12.5	18.6	17.8	-	
WychSC	392022	265702	35.0	35.1	30.7		24.1			22.4	23.5	29.1	37.6	28.7	29.6	28.4	-	
EPS56	391983	265688	34.6	36.5	31.0	28.5	27.9	25.2		27.9	33.8	29.9	35.4	28.6	30.8	29.6	-	
RD	392019	265736				25.8	22.9	23.5	24.8	22.9	27.9	28.4	30.4	26.4	25.9	24.9	-	New Location
EPS58	392027	265770	30.6	30.9	27.3	25.0	21.9	22.1	22.6	25.6	26.4	29.9	30.5	21.3	26.2	25.1	-	
WMD1	392050	265790	34.8	36.5	33.2	29.5	26.2	24.3	25.2	25.9	32.6	34.9	36.4	29.6	30.8	29.5	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.96)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
EPS27	392031	265624	39.5	39.4	35.9	30.5	27.4	25.5	27.5	27.3	33.4	28.3	36.3	28.7	31.6	30.4	-	
WMD2	391871	265859				18.9	16.2	17.4	23.0	20.0		19.7	24.4	22.5	20.3	21.6	-	
WychCH	392160	265937	34.9	36.7	31.2	28.0	24.0	25.4	22.9	24.7	28.3	30.7	39.1	31.1	29.7	28.6	-	
CROW1	392257	266043	26.1	25.4	23.0	27.7		18.6	15.9	17.3	21.0	30.2	26.5		23.2	22.2	-	
WychAD	392384	266195	31.5	33.8	29.2	26.3	25.0	28.6	21.3	23.6	24.4	24.9	33.0	27.0	27.4	26.3	-	
EPS53	387595	252533	26.7	27.6	21.2	20.4	14.2	15.8	18.5	20.3	23.4	22.8	27.1	19.7	21.5	20.6	-	
BG	386297	252150	25.4	25.7	19.3	18.5	15.5	14.7	12.4	20.6	16.2	16.8	26.4	21.2	19.4	18.6	-	
WBA1	391982	265667						27.8	31.3	32.7	37.1	33.7	37.3	30.7	33.0	34.4	-	Co-located with monitor
WBA2	391982	265667						31.4	30.3	30.4	35.8	33.6	36.5	30.3	32.6	34.0	-	Co-located with monitor
WBA3	391982	265667						31.4	32.5	33.5	35.9	33.3	35.6	30.2	33.2	34.7	-	Co-located with monitor
LC	392005	265736				22.7	21.1	19.4	20.9	21.1	26.0	27.0	22.6	21.1	22.4	21.5	-	New Location

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1.**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **Local bias adjustment factor used.**

☐ **National bias adjustment factor used.**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column.**

☒ **Wychavon District Council confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**.

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

As $PM_{2.5}$ is not monitored at Worcester Road, Wychbold estimation of annual mean $PM_{2.5}$ was calculated using PM_{coarse} National Factor using the formula below -

14.8(Annual Mean PM_{10} for GGG)– 5.9(Roadside National Factor)=8.9 $PM_{2.5}$ Annual Mean

New or Changed Sources Identified Within Wychavon District Council During 2023

Wychavon District Council has not identified any new sources impacting air quality within the reporting year of 2022.

Applications for a number of new developments have been identified within the Wychavon District area. The proposals have been assessed as part of the planning process and are not expected to have a significant impact on local air quality when they are operational.

Details of applications for significant developments received by Wychavon District Council in 2023 are as follows:

Application Number	Location	Description of development
W/23/00903/PA	Woodhall Pershore Road High Park Whittington Worcestershire WR5 2RR	Mixed- use sustainable development: circa 1,250 homes, primary school, neighbourhood hub and 27ha of employment land.

Additional Air Quality Works Undertaken by Wychavon District Council During 2023

Wychavon District Council has not completed any additional works within the reporting year of 2023.

QA/QC of Diffusion Tube Monitoring

The following UKAS accredited company provided Wychavon District Council with nitrogen dioxide diffusion tubes and analysis in 2022:

Gradko International Limited
St. Martins House
77 Wales Street
Winchester
SO23 0RH
diffusion@gradko.com

The 20% Triethanolamine (TEA) / De-ionised Water preparation method is used.

Gradko International Limited participate in the AIR NO_2 Proficiency Testing Scheme (AIR-PT).

All monitoring undertaken has been completed in accordance with the 2022 Diffusion Tube Monitoring Calendar, i.e. on or within ± 2 days of the specified date.

Diffusion Tube Annualisation

Several of the new diffusion tube monitoring locations (WBA1, WBA2, and WBA3) recorded a data capture of less than 75% in Wychavon District in 2023. Therefore, the monitoring data has been annualised using monitoring data from four automatic monitors. In addition, any sites with a data capture below 25% do not require annualisation.

Table C.1 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Birmingham Ladywood	Annualisation Factor Leamington Spa	Annualisation Factor Leominster	Annualisation Factor West Bromwich Kenrick Park	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
WBA1	1.0643	1.1108	1.1573	1.0507	1.0869	33.0	35.8
WBA2	1.0643	1.1108	1.1573	1.0507	1.0869	32.6	35.4
WBA3	1.0643	1.1108	1.1573	1.0507	1.0869	33.2	36.1

Table C.2 – Annualisation Summary of Continuous Monitoring

Background Site	Annual Mean NO_2 (A_{m1})	Annual Mean PM_{10} (A_{m2})	Period Mean NO_2 (P_{m1})	Period Mean PM_{10} (P_{m2})	Ratio PM_{10} (A_{m2} – P_{m2})	Ratio NO_2 (A_{m1} – P_{m1})
Birmingham Ladywood	15.17604	11.0658	14.38053	10.71302	1.032930023	1.055318545
Coventry Allesley	13.36239	11.54636	10.79313	12.28245	0.940069774	1.238045868
Leamington Spa	10.86888	13.69329	12.35872	10.10596	1.35497172	0.879450299
				Average	1.109323839	1.057604904
			Period Mean NO_2 (P_{m3})	Period Mean PM_{10} (P_{m4})	Annualised PM_{10} (P_{m3} x PM_{10} Ratio)	Annualised NO_2 (P_{m4} x NO_2 Ratio)
Wychbold			26.10536	13.31207	14.7673966	27.60915676

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2024 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Wychavon District Council have applied a local bias adjustment factor of 0.97 to the 2023 monitoring data. The local bias adjustment factor has been used as more conservative compared with the national bias adjustment factor (0.83, Defra published National Diffusion Tube Bias Adjustment Spreadsheet Version 03/23), following consultation with Defra LAQM helpdesk and technical guidance.

WRS has determined the appropriate local bias adjustment factor utilising the Diffusion Tube Data Processing Tool v3.0. The site used was the colocation study at Wyre Forest House, Kidderminster, Finepoint Way, Kidderminster which is the head office for WRS. The installation is collocated with three diffusion tubes and is largely run and managed for the purpose of undertaking a local bias adjustment factor for the county. WRS are responsible for maintaining the monitoring network across the six district councils within Worcestershire and therefore the handling and processing of the diffusion tubes is the same for each area. The station is located only 1.7km west of Wychavon district area.

A summary of bias adjustment factors used by Wychavon District Council over the past five years is presented in Table C.2.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	Local	<->	0.96
2022	Local	03/22	0.97
2021	National	03/21	0.84
2020	National	03/20	0.78
2019	National	03/19	0.89

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1
Periods used to calculate bias	12
Bias Factor A	0.96 (0.92 – 1.01)
Bias Factor B	4% (-1% - 8%)
Diffusion Tube Mean (µg/m^3)	12.4
Mean CV (Precision)	1.8%
Automatic Mean (µg/m^3)	11.9
Data Capture	99%
Adjusted Tube Mean (µg/m^3)	12 (11 - 12)

Notes:

A single local bias adjustment factor has been used to bias adjust the 2023 diffusion tube results.

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

QA/QC of Automatic Monitoring

Data management of the automatic monitor at Worcester Road, Wychbold is undertaken by Air Quality Data Management (AQDM) on behalf of Worcestershire Regulatory Services.

Local Site Operator (LSO) duties Worcester Road, Wychbold are carried out by the Technical Pollution team at Worcestershire Regulatory Services. Calibration is carried out monthly, audit/servicing is carried out bi-annually. The annual data capture was 63%. The 2023 data has been fully ratified and is available on Air Quality in the United Kingdom (ukairquality.net).

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

The type of PM_{10}/$PM_{2.5}$ monitor utilised within Wyre Forest District does not require the application of a correction factor.

Automatic Monitoring Annualisation

Monitor (WBA) was installed in the Worcester Road, Wychbold AQMA in May 2023. Therefore data capture for both PM_{10} and NO_2 were below 75%, and annualisation has been completed for both measurements. Please see Appendix C Figure C.2 for further detail.

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, automatic annual mean NO_2 concentrations corrected for distance are presented in Table A.3.

Appendix D: Map(s) of Monitoring Locations and AQMAs

Figure D.1 – Map of Non-Automatic Monitoring Site within Worcester Road, Wychbold AQMA

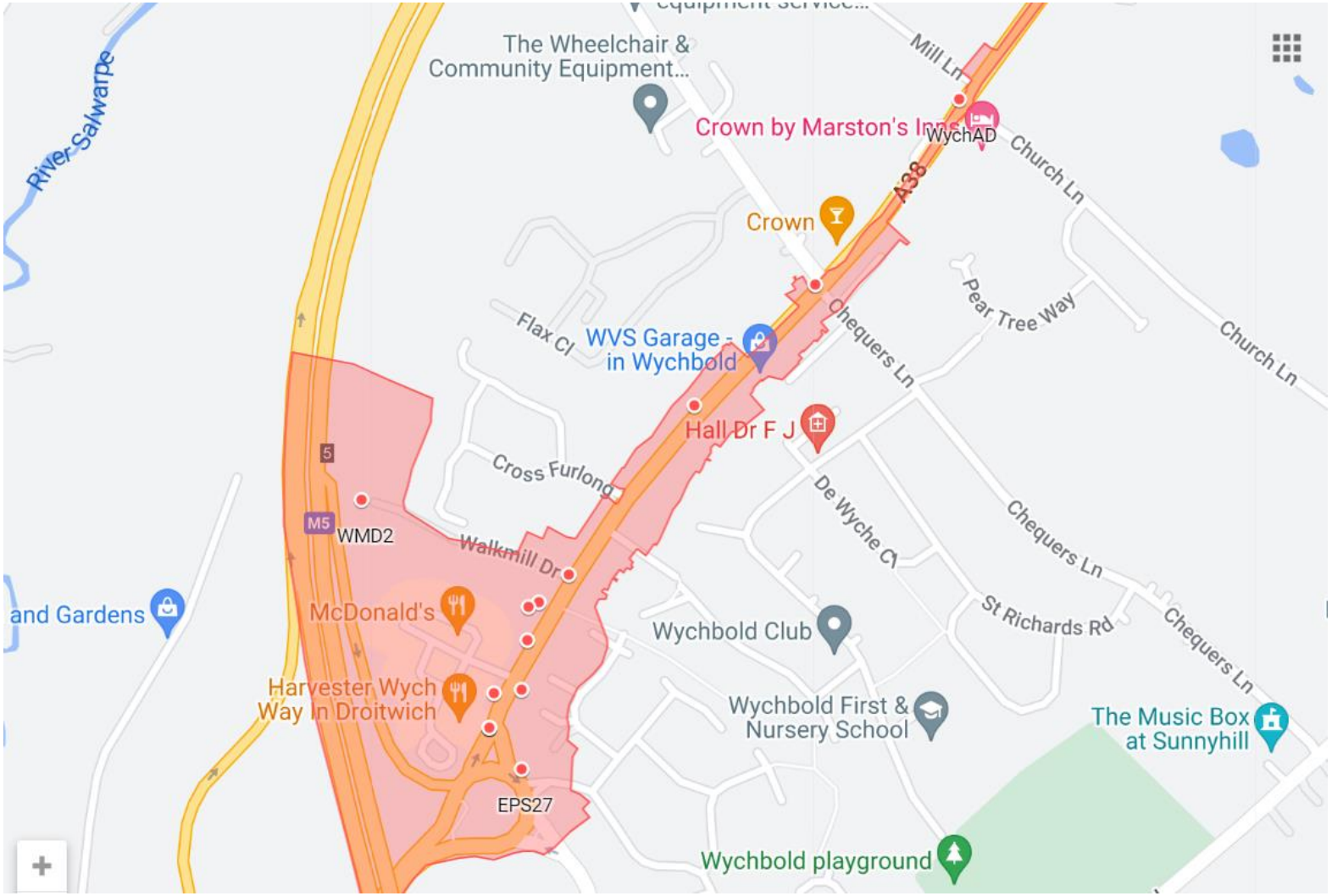

Figure D.2 – Map of Non-Automatic Monitoring Site: Worcester Road, Wychbold AQMA, southern section

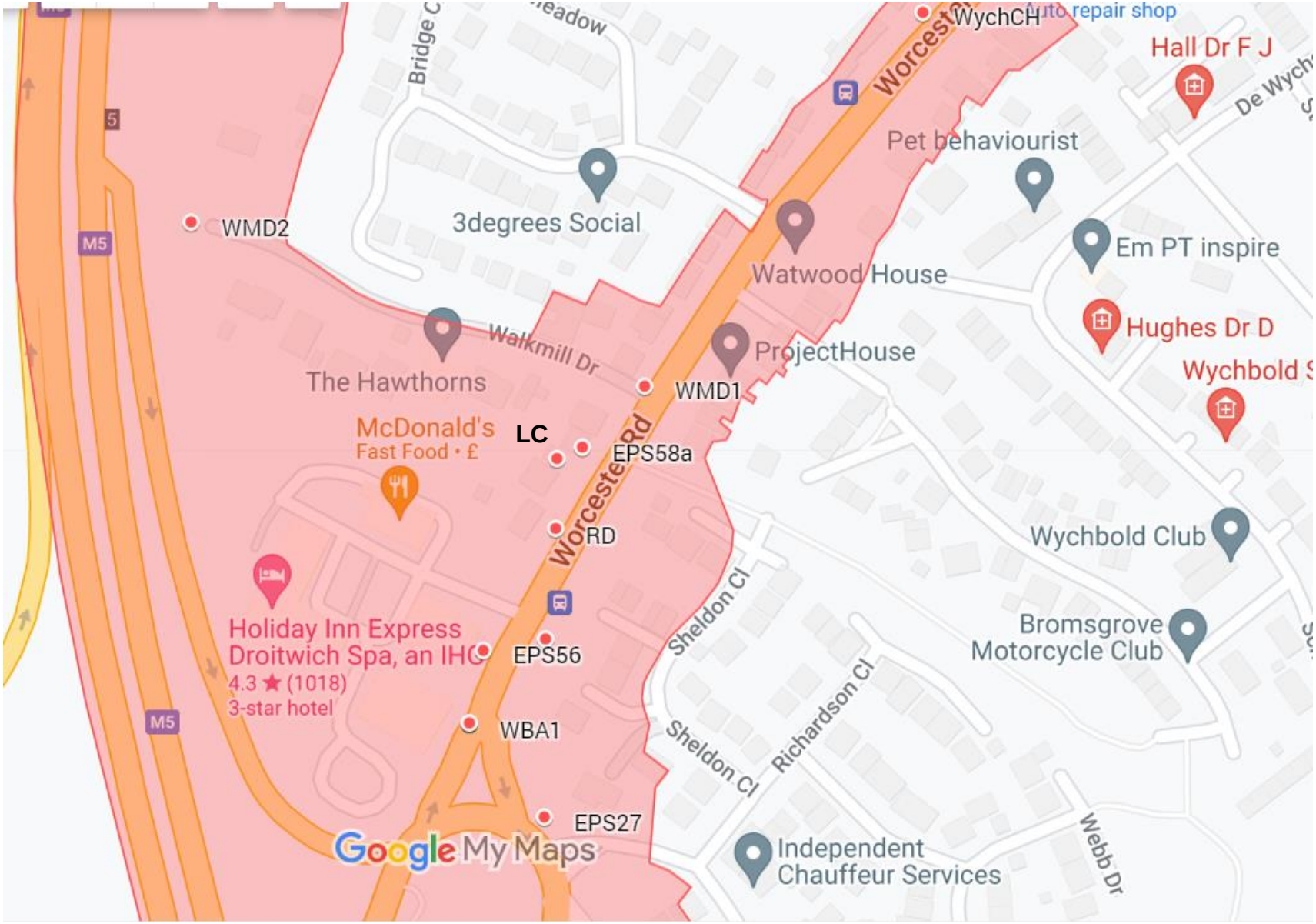

Figure D.3 – Map of Non-Automatic Monitoring Site: Pershore

Figure D.4 – Map of Non-Automatic Monitoring Site: Evesham

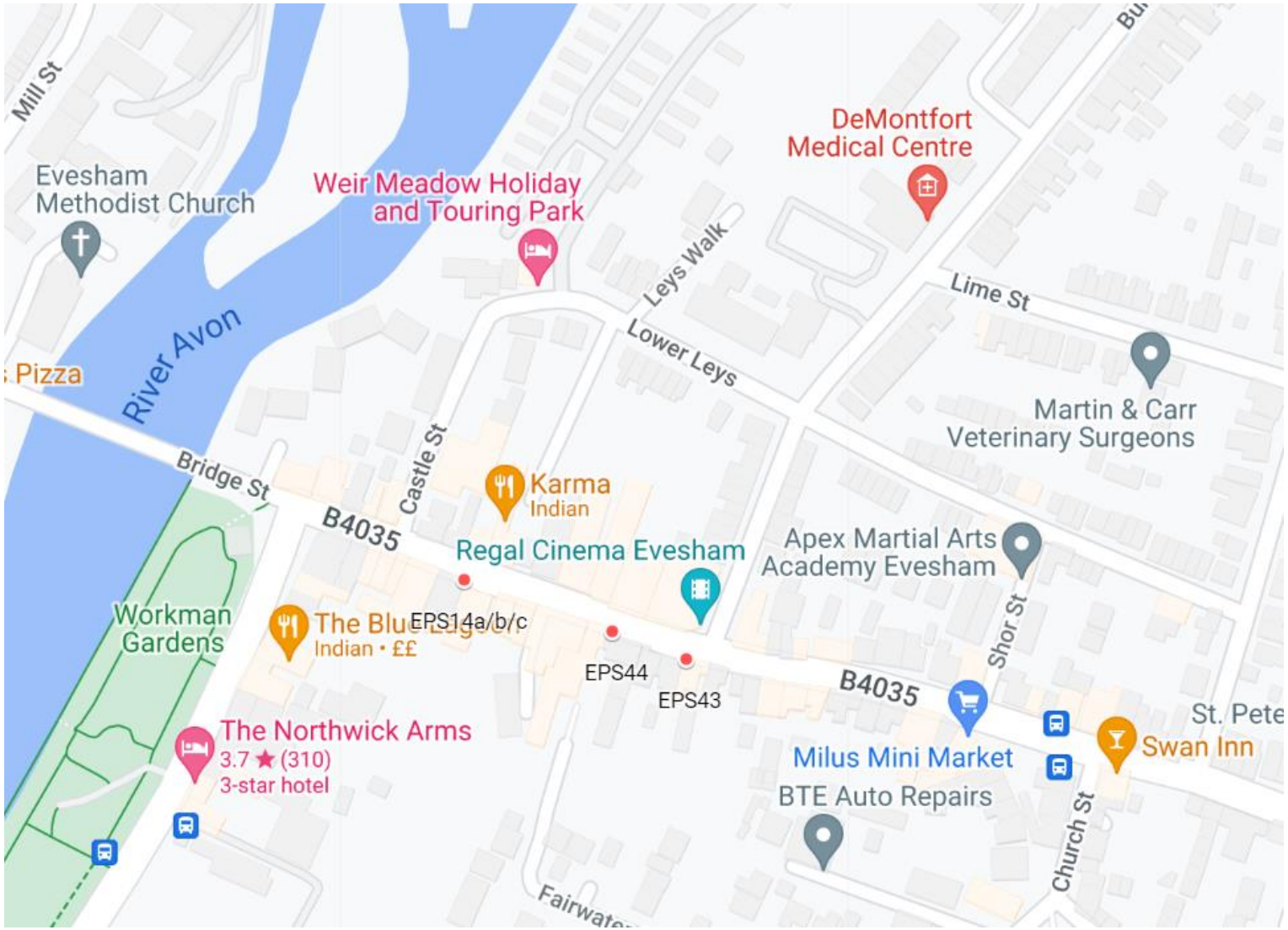

Figure D.5 – Map of Non-Automatic Monitoring Site: Evesham Part 2

Figure D.6 – Map of Non-Automatic Monitoring Site: Droitwich

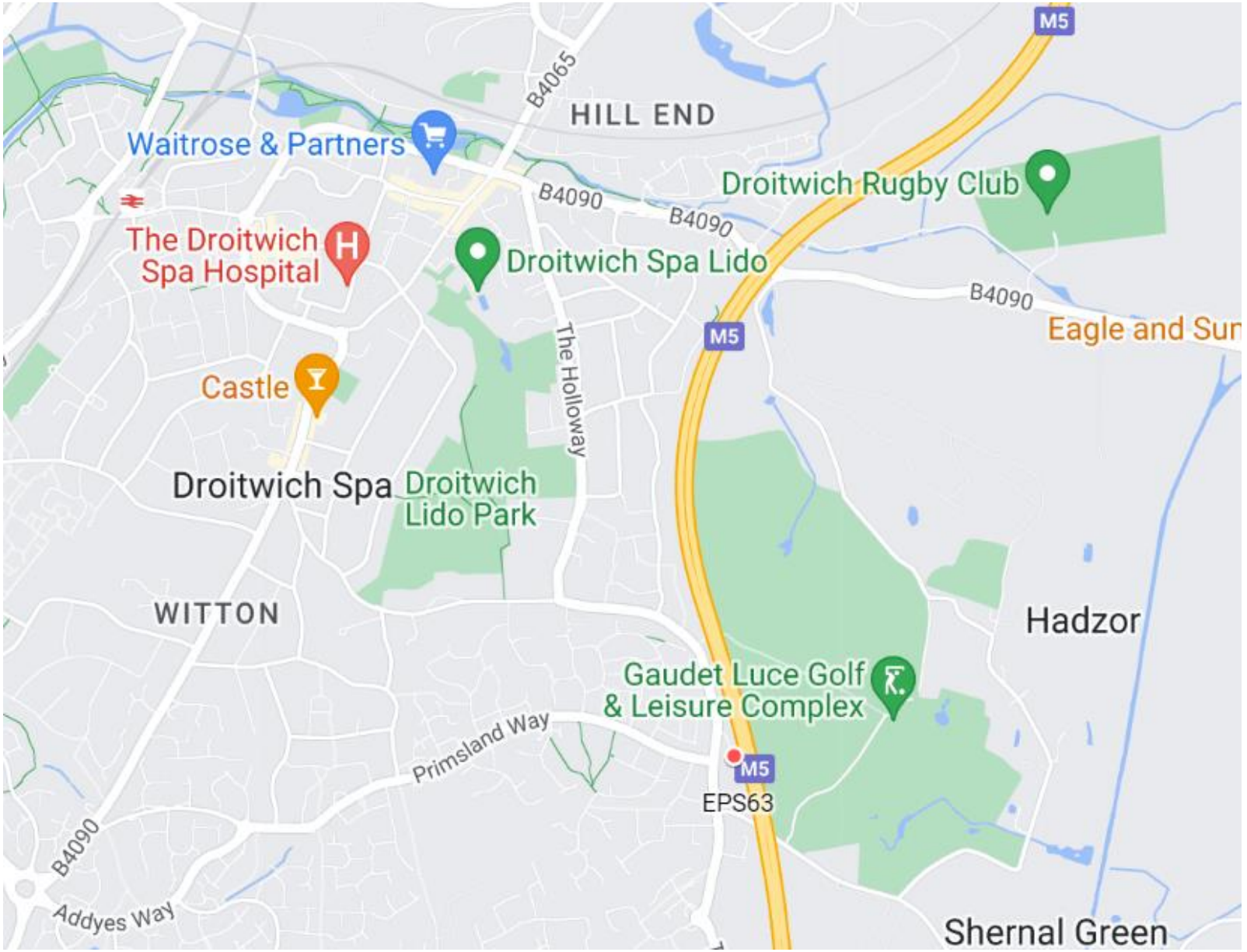

Figure D.7 – Map of Non-Automatic Monitoring Site: Whittington

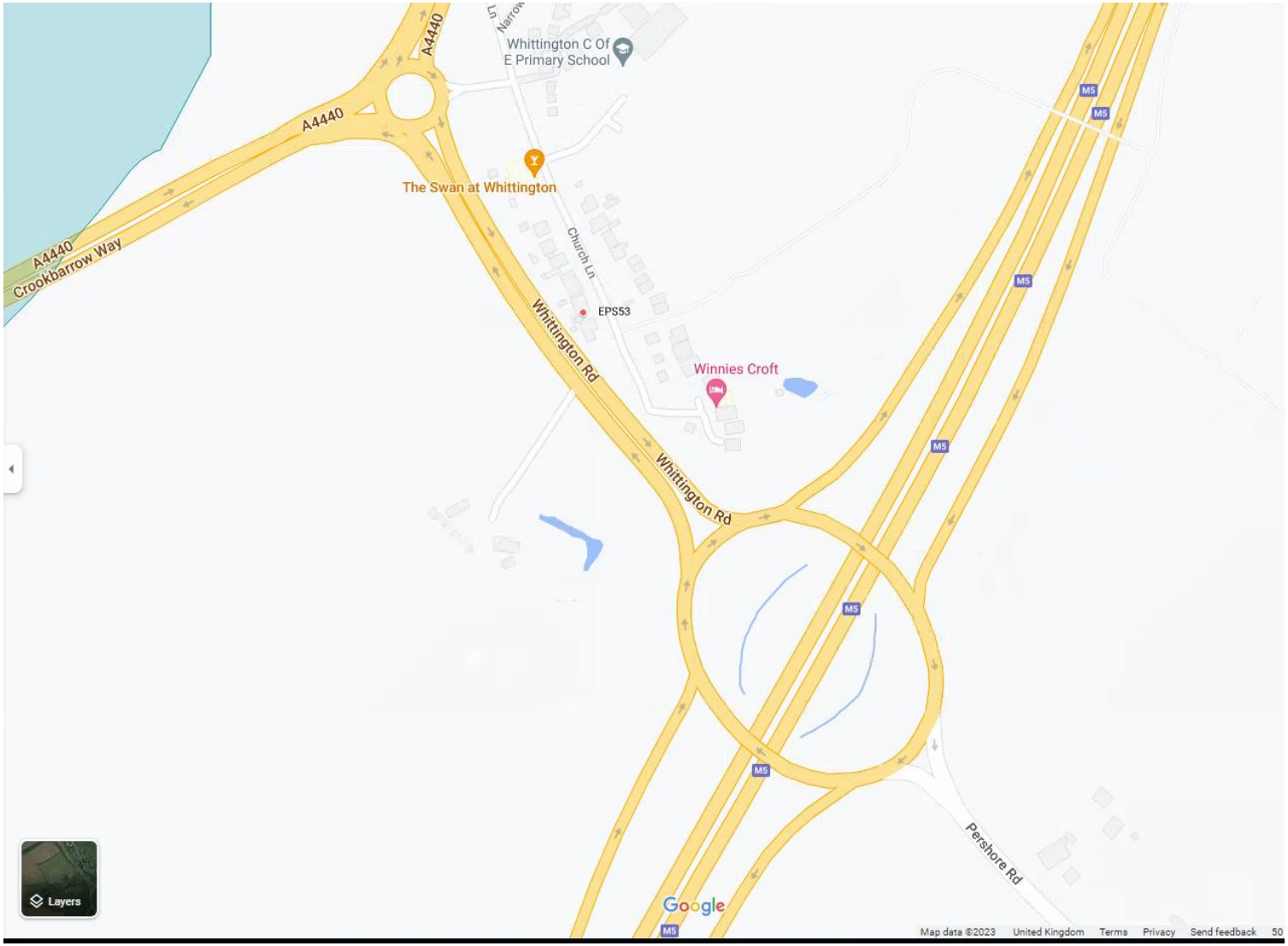

Figure D.8 – Map of Non-Automatic Monitoring Site: Norton Road

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[10]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[10] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
EU	European Union
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency
- Air Quality Strategy – Framework for Local Authority Delivery. August 2023. Published by Defra.
- Worcestershire Regulatory Services (2023) Air Quality Annual Status Report for Wychavon District Council.
- UK-AIR DEFRA background Mapping.