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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Report Reference Number	WFDC/ASR/2024
Date	2024

Executive Summary: Air Quality in Our Area

Air Quality in Wyre Forest District

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas[1,2].

The mortality burden of air pollution within the UK is equivalent to 29,000 to 43,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

Worcestershire Regulatory Services (WRS) have been responsible for managing (monitoring and reporting of) local air quality in the six Worcestershire District Councils since April 2011.

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.

Monitoring across the Wyre Forest District area for nitrogen dioxide (NO_2) is undertaken via a network of passive diffusion tubes located in the main urban centres of Kidderminster, Stourport-on-Severn and Bewdley, and a continuous analyser situated at Wyre Forest House. Additionally, a Zephyr Air Quality Monitor was installed in 2022 which provides indicative monitoring of particulate matter in Kidderminster.

Two Air Quality Management Areas (AQMA's) have been declared by Wyre Forest District Council for exceedances of the annual mean objective for nitrogen dioxide (NO_2):

- Welch Gate, Bewdley AQMA (Declared January 2003)
- Horsefair/Coventry Street, Kidderminster AQMA (Declared January 2003, amended in July 2009 to include part of the Kidderminster Ring Road and Coventry Street)

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

The majority (74%) of diffusion tubes in the Wyre Forest District saw a decrease in their mean annual concentration from 2022-2023. The annual average NO_2 recorded across all of the Wyre Forest District monitoring tubes in 2023 was 25.8µg/m^3 which is a 2.3% decrease from the 2022 value of 26.4µg/m^3.

The annual average results for NO_2 in 2022 and 2023 are higher than observed in 2020 and 2021 due to the COVID-19 pandemic associated lockdowns and restrictions affecting travel patterns and behaviours. Interim traffic data from County Council indicates traffic had returned to 98% of pre-pandemic levels by the beginning of 2023 and as such the annual concentrations of NO_2 have also risen.

There are two tubes that are notable outliers that recorded significant decreases in their annual concentration of NO_2 in 2023 compared to pre-pandemic 2018 data. These are HF(K) and HF(K) (F), both located in the Horsefair/Coventry Street AQMA. In 2023, HF(K) had a decrease of 32.8 µg/m^3 (53.9%) and HF(K)(F) had a decrease of 38.7 µg/m^3 (56.5%) from 2018. Furthermore, the measured concentrations in 2022 are lower than 2020 data when the country experienced significant lockdown measures and greatest level of reduction of vehicle movements. These results indicate that measures to mitigate air pollution through major road infrastructure completed in 2021 in the Horsefair area have had a significant reducing benefit, although WFDC will continue to monitor if this is the case.

In 2023, the highest annual concentration of NO_2 recorded across the Wyre Forest District area was 40.8 µg/m³ at WG(B) (located in the Welch Gate, Bewdley AQMA). As this is above the yearly limit of 40µg/m³, this AQMA will remain in place and be addressed in the 2024 Air Quality Action Plan.

The highest annual concentration measured in the Horsefair/Coventry Street AQMA in 2023 was 38.6 µg/m³ at tube (F)69COV. As this is still within 10% of the annual objective, WFDC are not proposing to revoke this AQMA.

Only two other areas have recorded NO_2 annual means above -10% of the AQS objective. These are TCH in Kidderminster which recorded a value of 36.7µg/m³ when considering distance to the nearest receptor and (F)FBS(S) in Stourport which recorded a value of 36.7µg/m³. As these are still below the annual objective there are no actions necessary for these locations at this time.

There are no Defra approved reference method analysers monitoring particulate matter in Wyre Forest District. There is one Zephyr Air Quality Monitor which is MCERTS approved for indicative particulate matter only, located within the Horsefair AQMA, Kidderminster.

The monitor recorded annual mean PM_{10} of 13.0 µg/m³ and an annual mean $PM_{2.5}$ of 14.0 µg/m³. No exceedances of mean average 50 µg/m³ were recorded within a 24-hour period.

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[1] 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[2] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

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

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

The Road to Zero[3] 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.

In 2013, WRS produced a countywide Air Quality Action Plan (AQAP) for Worcestershire which was adopted by Wyre Forest District Council (WFDC) on 24th October 2013. WRS have produced two updates to the AQAP, the latest in September 2016. For details of all measures completed, in progress or planned, please refer to the 'Air Quality Action Plan Progress Report for Worcestershire April 2015-2016'. A copy of this, the previous update, and the AQAP, is available to view or download at:

https://www.worcsregservices.gov.uk/all-services/pollution/air-quality/local-air-quality-reporting/wyre-forest-district-council-reporting/

A new draft AQAP for Wyre Forest District Council is currently being developed for submission and consultation in November 2024.

Key developments in 2023 are:

- 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, which will include three new monitors in the Wyre Forest in addition to the Zephyr in Horsefair, Kidderminster (making 4 in total)

Air Quality Action Plan and Air Quality Strategy

A new Air Quality Action Plan is required for Wyre Forest in accordance with the Environment Act 2021 and revised guidance published in Aug 2022 (LAQM.TG22 and PG22). In September 2022, WRS began discussions with Worcestershire County Council colleagues with a view to forming a new Steering Group and producing a new plan of actions to improve air quality across the County, to comply with recent legislative changes.

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 2023 ASR.

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

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 Wyre Forest District Council were granted extensions to the timeline for delivery of the draft AQAPs.

The draft Wyre Forest District Council AQAP 2025 – 2030 is currently due for submission and consultation in November 2024. At the time of writing this ASR, WRS has completed the source apportionment stage and the initial identification, filtering and shortlisting of potential AQAP measures is currently in progress.

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.

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 Wyre Forest 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.

In addition to the existing Horsefair, Kidderminster Zephyr monitor, which was installed in 2022, three of the monitors have been deployed within the Wyre Forest District area in January (Lea Street, Kidderminster and Load Street, Bewdley) and May (Mart Lane, Stourport) 2024, following completion of required structural assessments.

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

Worcestershire County Council actions

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

- A public engagement exercise has been undertaken on proposals for enhancements to the North West Worcestershire Corridor to assist in mitigating the impact of existing and future congestion along three primary A roads (A491, A450 and A456). A strategic outline business case for further funding was submitted to Midlands Connect in 2023. Further information is available via North West Worcestershire Corridor (NWWC) | Worcestershire County Council
  North West Worcestershire Corridor (NWWC) | Worcestershire County Council
- Wyre Forest Towns Local Cycling and Walking Infrastructure Plan (LCWIP) funded through Active Travel England due to complete in 2025
  Local cycling and walking infrastructure plans (LCWIPs) | Worcestershire County Council
- Health Supplementary Planning Document (SPD) in development with Wyre Forest Council, has been adopted in 2023.

- Surfacing and upgrading of the canal town path walking and cycling route completed May 2022.

Conclusions and Priorities

There are currently two AQMAs declared in the Wyre Forest District, Horsefair/Coventry Street, Kidderminster and Welch Gate, Bewdley. Monitoring results for 2023 show that air quality in the Horsefair/Coventry Street AQMA was below the annual mean objective while the Welch Gate AQMA was in exceedance with an annual figure of 40.8 $\mu g/m^3$ for NO_2. The highest monitored annual mean NO_2 concentration within Horsefair/Coventry Street AQMA was 38.6 $\mu g/m^3$ (at diffusion tube (F) 69COV) and within the Welch Gate AQMA was 40.8 $\mu g/m^3$ (at diffusion tube WG(B)).

The monitoring results show that 74% of the diffusion tube locations saw a decrease in NO_2 concentrations in 2023 compared to 2022 results. There was however, one exceedance of the annual mean objective with location WG(B) (located in the Welch Gate, Bewdley AQMA) having an annual concentration of 40.8$\mu g/m^3$. As such, this AQMA will remain in place and be addressed in the 2024 Air Quality Action Plan.

In comparing 2023 measured concentrations with pre-pandemic levels it is considered appropriate to compare with 2018 recorded data. In 2023 the Wyre Forest District averaged concentrations of 7.3$\mu g/m^3$ and 19.3% lower than 2018 data.

The highest annual concentration measured in the Horsefair/Coventry Street AQMA in 2023 was 38.6 $\mu g/m^3$ at tube (F)69COV. As this is still within 10% of the annual objective, WFDC are not proposing to revoke this AQMA. Although it has been below the objective for 5 years, the results during the COVID-19 pandemic 2020-2021 are not indicative of a normal monitoring year. We also aim to have a reduction of 10% from the annual objective and as such we intend for all tubes to have an annual concentration below 36 $\mu g/m^3$ before we consider revocation.

Although it is still too soon post-pandemic to determine a trend, it appears that following road improvements in 2020 in the Horsefair, Kidderminster, data at locations in Blackwell Street (HF(K) and HF(K) (F)) have recorded significant reductions in 2023; up to 56.5% compared with pre-pandemic levels 2018 data and in fact measured data lower than 2020 levels when the country experienced significant lockdown measures and greatest level of reduction of vehicle movements.

Wyre Forest District's priorities for the coming year are:

- Development of draft Wyre Forest AQAP 2025 – 2030 for statutory and public consultation

- Installation of 3 (Zephyr) low-cost sensors in the district monitoring NO_2 and particulate matter to inform future decisions and actions

- 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.

As outlined in the previous section an enhanced real time air quality monitoring network will be installed at the beginning of 2024. This will provide important data in respect of PM_{10} and $PM_{2.5}$, for which monitoring across the county has been very limited previously, as well as NO_2. Realtime information will enable a better understanding of air quality in the district and help quantify the impacts from road traffic and other sources, such as solid fuel burning, agriculture and industry. The system will also provide an alert in the event of poor air quality so that vulnerable groups can be informed and limit exposure.

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)[4,5]. 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 Worcestershire Regulatory Services for Wyre Forest District Council with the support and agreement of the following officers and departments:

Worcestershire Regulatory Services

Worcestershire County Council Highways Department

Wyre Forest District Council

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

[5] 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:

Technical Pollution Team

Worcestershire Regulatory Services

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Finepoint Way

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Figures

Tables

1 Local Air Quality Management

This report provides an overview of air quality in the Wyre Forest 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 Wyre Forest District Council 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 the Wyre Forest District Council can be found in Table 2.1. The table presents a description of the two AQMAs that are currently designated within the Wyre Forest District. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designations 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
The Kidderminster Ring Road (Horsefair/ Coventry Street)	Declared 06/01/2003 Amended 30/07/2009	NO$_2$ Annual Mean	An area of residential & commercial properties in The Horsefair & Blackwell Street, extended to include part of the Kidderminster Ring Road and residential properties in Coventry Street.	No	54	38.6	4 years	Draft Action Plan in progress due publication in Nov 2024	Not yet published
Welch Gate, Bewdley	Declared 06/01/2003	NO$_2$ Annual Mean	A short section of Welch Gate from junction with Dog Lane encompassing a number of residential properties	No	47	40.8	Not compliant	Draft Action Plan in progress due publication in Nov 2024	Not yet published

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

☐ **Wyre Forest District Council confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in the Wyre Forest District

Defra's appraisal of last year's ASR concluded that the report was well structured, detailed, and provided the information specified in the Guidance.

Defra provided the following comments on last year's report:

1. The Council outline a number of measures which they have in place to address $PM_{2.5}$ emissions, including the instalment of a Zephyr monitor to provide indicative PM concentrations. The Council is commended on this, as it shows their continued pro-active and committed approach to combating air pollutants, such as particulate emissions.

2. Feedback from last year's appraisal was included and addressed. This is welcomed and is encouraged to continue in future years.

3. The AQAP is required to be updated as soon as possible. It is noted that the Council stated the COVID19 pandemic led to the suspension of previous district AQAP working groups and public health action group's programmes in 2020. In September 2022, WRS began discussions with Worcestershire County Council colleagues with a view to forming a new Steering Group and producing a new plan of actions to improve air quality across the County, to comply with recent legislative changes. The group membership has expanded considerably at the beginning of 2023 and is currently progressing a programme of works which will be reported on in the next ASR (2024). It is expected that details about the updated AQAP are included in the next ASR.

4. The Kidderminster Ring Road AQMA and Welch Gate AQMA have been compliant for three and four years, respectively. Therefore, the revocation of both AQMAs should be considered. Where there have been no exceedances for the past five years, local authorities must proceed with plans to revoke the AQMA which might be the case for Welch Gate AQMA in the next reporting year. Consideration of this should be included in the next ASR.

5. While the chapter "QA/QC of diffusion tube monitoring" includes the information that the laboratory used for the diffusion tube analysis participates in the AIR-PT

Scheme, no results of the Scheme were provided. This information should be included in future reports.

6. The declaration date of the Kidderminster Ring Road AQMA in Table 2.1 and the Portal are not consistent. On the portal this AQMA was declared 30/07/2009 and not amended. In the table it says this AQMA was declared 06/01/2003 and amended on 30/07/2009. Please ensure that the information provided in the ASR and on the Portal match. This should be amended for the next ASR.

7. Overall, the report is detailed, concise and satisfies the criteria of relevant standards. The Council should continue their good work.

WRS note the above and provide the following comments: The declaration date and amendment of the Kidderminster Ring Road AQMA is correct as per stated in the 2023 ASR; unfortunately, this has been deleted from the DEFRA portal for unknown reasons. We have contacted LAQM help desk to rectify this error and are currently awaiting a response. An update on countywide AQAP development is provided below.

Wyre Forest District Council are not at this time considering revocation of either Wyre Forest AQMA's as the pandemic years (2020-2021) are not considered representative of normal trends. Additionally, an exceedance has been measured within the Welch Gate, Bewdley AQMA in 2023. WFDC will continue to monitor both AQMA's to observe the trend post-pandemic.

Wyre Forest District Council has taken forward a number of direct measures during the current reporting year of 2023 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out below and in Table 2.3. Three measures are included within Table 2.3, with the type of measure and the progress Wyre Forest District Council have made during the reporting year of 2023 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.3. Measures reported in previous years relating to earlier action plans have been removed from Table 2.3 in this ASR as are superseded by the developing Draft Wyre Forest District Council AQAP 2025 – 2030, see below for further information.

Key developments in 2023 are:

- 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, which will include three new low-cost sensors in the Wyre Forest district.

Air Quality Actions Plan and Air Quality Strategy

A new Air Quality Action Plan is required for Wyre Forest District in accordance with the Environment Act 2021 and revised guidance published in Aug 2022 (LAQM.TG22 and PG22). In September 2022, WRS began discussions with Worcestershire County Council colleagues with a view to forming a new Steering Group and producing a new plan of actions to improve air quality across the County, to comply with recent legislative changes. In 2023, working groups, including colleagues from public health and transport, were established and in regular communication to make progress on the formation of a countywide AQAP.

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 2023 ASR. 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 Wyre Forest 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 – Timeline of AQAP production

Timeline	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

At the time of writing this ASR, WRS has completed the source apportionment stage for the Wyre Forest District and the initial identification, filtering and shortlisting of potential AQAP measures is currently in progress.

Real-time Air Quality Monitoring Project

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Worcestershire County Council actions

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

- A public engagement exercise has been undertaken on proposals for enhancements to the Northwest Worcestershire Corridor to assist in mitigating the impact of existing and future congestion along three primary A roads (491,450 and 456). A strategic outline business case for further funding was submitted to Midlands Connect in 2023. Further information is available via Northwest Worcestershire Corridor (NWWC) | Worcestershire County Council
  North West Worcestershire Corridor (NWWC) | Worcestershire County Council
- Wyre Forest Towns Local Cycling and Walking Infrastructure Plan (LCWIP) funded through Active Travel England due to complete in 2025
  Local cycling and walking infrastructure plans (LCWIPs) | Worcestershire County Council

- Health Supplementary Planning Document (SPD) in development with Wyre Forest Council, has adopted in 2023
- Surfacing and upgrading of the canal town path walking and cycling route completed May 2022.

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

- Publication of draft AQAP 2025 – 2030 for statutory and public consultation in November 2024.
- Installation of 3 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.

Wyre Forest District Council's priorities for the coming year are:

- Development of draft Bromsgrove AQAP 2025 – 2030 for statutory and public consultation
- Installation of 3 (Zephyr) low-cost sensors in the district monitoring NO_2 and particulate matter to inform future decisions and actions
- 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.

The principal challenges and barriers to implementation that Wyre Forest District Council anticipates facing are:

- Availability of funding for potential AQAP measures to improve air quality.

Whilst the measures stated above and in Table 2.3 will help to contribute towards compliance Wyre Forest District Council anticipates that measures outlined within the forthcoming draft Wyre Forest AQAP 2025 - 2030 will be required in subsequent years to achieve compliance and enable the revocation of the existing AQMAs.

Table 2.3 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Churchfields Urban Highway Improvement Scheme	Traffic Management	UTC, Congestion management, traffic reduction	2018	2020	WCC	Worcestershire LEP, Homes England, Greater Birmingham & Solihull LEP	No	Funded	£1 million - £10 million	Completed	10 - 40%	Horsefair / Coventry Street AQMA reduction in congestion	Highways Infrastructure in the Churchfields area via a one-way system. Opened in Sep-20	Up to 57% reduction in measured NO$_2$ between 2018 and 2023
2	Zephyr Air Quality Network & Public Portal	Public Information	Via the Internet	2023	2024	WRS	Defra Grant	Yes	Funded		Implementation			Zephyr locations have been decided and the supplier has been selected	
3	Development of a new AQAP	Other	Other	2024	2025	WRS, WFDC, WCC	N/A	No	N/A	N/A	Planning				

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[6], 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.

There are currently no automatic PM$_{2.5}$ monitoring stations in Worcestershire that are recognised by Defra for measuring against ambient air quality directives. The nearest AURN PM$_{2.5}$ monitoring station is the Birmingham Ladywood site approximately 19 kilometres to the north-east of the Wyre Forest District. However, WRS have assisted the Defra AURN expansion project team with potential locations for two PM$_{2.5}$ monitors in Worcestershire that are anticipated to be installed in 2024.

In February 2022 Wyre Forest District Council installed an EarthSense Systems Ltd Zephyr monitor in the Horsefair AQMA which monitors NO$_2$, NO$_x$, PM$_{10}$ and PM$_{2.5}$. This new type of sensor is MCERTS accredited for indicative particulate matter (PM$_{10}$ and PM$_{2.5}$). Details of the QA/QC are provided in Appendix C. In 2023, the sensor measured annual average concentration of 11.8 µg/m^3 which is 2.2 µg/m^3 lower than the annual average for 2022 and also below the current PM$_{2.5}$ Air Quality Standards Regulations (2010) of 20 µg/m^3. Following success of bid for funding for further low-cost sensors from Defra Air Quality Grant 2022/23, WRS are progressing implementation of a further 3 low-cost sensors in Wyre Forest District. The sensors installed at the beginning of 2024 and monitoring results will be reported on in the next ASR in 2025.

WRS has reviewed the DEFRA national background maps to determine projected PM$_{2.5}$ concentrations across the Wyre Forest District area for the 2023 calendar year. The annual average total PM$_{2.5}$ at 197 locations (centre points of 1km x 1km grids) across the Wyre Forest District is 7.16 µg/m^3, with a minimum concentration of 6.42 µg/m^3 and a maximum concentration of 8.65 µg/m^3.

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

This indicates that $PM_{2.5}$ concentrations within the Wyre Forest District are generally already below the annual average limit value for $PM_{2.5}$ target of 10μg/m³ 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[7]. The fraction of mortality attributable to particulate emissions in Wyre Forest District in 2022 (the most recent year available) was 5.2%. 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). Recent trend data is not available for the district due to a lack of data points with valid values.

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 currently five declared smoke control areas operating within the Wyre Forest District Council area:

- Habberley, Kidderminster
- Offmore, Kidderminster
- Hoobrook, Kidderminster
- Spennells, Kidderminster
- Franche, Kidderminster

More information, maps and guides on the type of fuels that can be used can be found at:

[Smoke Control Areas | Worcestershire Regulatory Services (worcsregservices.gov.uk)](#)

WRS hold 54 records of complaints of nuisance from smoke in the Wyre Forest District in 2023, most of which relate to bonfires or burning of other waste or other enquiries. 8 records of complaints are attributable to wood burning stoves in residential developments which were either unsubstantiated, not pursued or resolved without requirement for enforcement action.

In light of the above no additional actions are currently planned by Wyre Forest District Council 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 and County as part of the revised

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

future countywide AQAP will likely result in a linked improvement in $PM_{2.5}$ levels. Additionally, the new countywide AQAP will include the local air quality strategy for all Worcestershire districts and have due regards for responsibilities on local authority for $PM_{2.5}$ outlined within the revised national Air Quality Strategy (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 Wyre Forest 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

Wyre Forest District Council undertook automatic (continuous) monitoring at 2 sites during 2023. This included one recognised reference method analyser monitoring nitrogen dioxide and one Zephyr Air Quality Monitor measuring NO_2, PM_{10}, and $PM_{2.5}$. Table A.1 in Appendix A shows the details of the automatic monitoring sites.

The [Air Quality in the United Kingdom (ukairquality.net)](ukairquality.net) page presents automatic monitoring results for Wyre Forest District Council.

For clarification, Zephyrs are a type of new low-cost sensor that are not currently approved by Defra for reference against Air Quality Standards and objectives. Zephyrs are MCERTs approved for indicative particulate matter only and the datasets are provided within the report and tables for information only.

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

Wyre Forest District Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 53 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. It shows that there have been no exceedances in the hourly mean recorded at the Wyre Forest House, Kidderminster, monitoring station in the 3 years it has been in place.

The yearly average NO$_2$ at automatic monitoring station WFH (Wyre Forest House in Kidderminster) for 2023 was 11.9µg/m^3 which is a decrease from the previous year (13.0µg/m^3). This is the second year in a row that the yearly average has decreased for this monitoring station.

The yearly average NO$_2$ recorded at the Horsefair Zephyr in Kidderminster in 2023 was 25.3µg/m^3 which is a slight increase from the previous year (25.0µg/m^3). The co-located diffusion tube, Z1, recorded an annual average of 22.5µg/m^3.

Both automatic monitoring stations and all diffusion tubes in the Wyre Forest District had a data capture >75% for the year so did not require annualisation.

The annual average NO$_2$ recorded across all of the Wyre Forest District monitoring tubes in 2023 was 25.8µg/m^3 which is a 2.3% decrease from the 2022 value of 26.4µg/m^3.

Additionally, 74% of the diffusion tubes saw a decrease in their mean annual concentration from 2022-2023.

The annual average results for NO_2 in 2022 and 2023 are higher than observed in 2020 and 2021 due to the COVID-19 pandemic associated lockdowns and restrictions affecting travel patterns and behaviours. Interim traffic data from County Council indicates traffic had returned to 98% of pre-pandemic levels by the beginning of 2023 and as such the annual concentrations of NO_2 have also risen.

The measured concentrations at diffusion tube locations in 2023 are not dissimilar to the 2019 data (on average -1.1 µg/m^3 and -2.3% below 2019 records). However, 2019 measurements were subject to application of particularly low bias adjustment factor and not considered indicative of local trends. In comparing 2023 measured concentrations with pre-pandemic levels it is considered appropriate to compare with 2018 recorded data. In 2023 the Wyre Forest District averaged concentrations of 7.3µg/m^3 and 19.3% lower than 2018 data.

There are two tubes that are notable outliers that recorded significant decreases in their annual concentration of NO_2 in 2023 compared to pre-pandemic 2018 data. These are HF(K) and HF(K) (F), both located in the Horsefair/Coventry Street AQMA. In 2023, HF(K) had a decrease of 32.8 µg/m^3 (53.9%) and HF(K)(F) had a decrease of 38.7 µg/m^3 (56.5%) from 2018. Furthermore, the measured concentrations in 2023 are lower than 2020 data when the country experienced significant lockdown measures and greatest level of reduction of vehicle movements. These results indicate that measures to mitigate air pollution through major road infrastructure completed in 2021 in the Horsefair area have had a significant reducing benefit, although Wyre Forest will continue to monitor if this is the case.

In 2023, the highest annual concentration of NO_2 recorded across the Wyre Forest District area was 40.8 µg/m^3 at WG(B) (located in the Welch Gate, Bewdley AQMA). As this is above the AQS for annual average nitrogen dioxide of 40µg/m^3, this AQMA will remain in place at this time and be addressed within a new Air Quality Action Plan 2025-2030.

The highest annual concentration measured in the Horsefair/Coventry Street AQMA in 2023 was 38.6 µg/m^3 at tube (F)69COV. Although it has been below the objective for 5 years, the results during the COVID-19 pandemic 2020-2021 are not considered representative of normal trends. Furthermore, LAQM Technical Guidance (LAQM.TG22) advises local authorities should only consider revocation of AQMAs following three consecutive years of annual mean NO_2 concentrations being lower than 36µg/m^3 (i.e.

within 10% of the annual mean NO_2 objective) due to the inherent uncertainty associated with diffusion tube monitoring. Therefore, Wyre Forest District Council are not proposing any changes to this AQMA at this time.

Only two other areas have recorded NO_2 annual means above -10% of the AQS objective. These are TCH in Kidderminster which recorded a value of 36.7µg/m³ when considering distance to the nearest receptor and (F)FBS(S) in Stourport which recorded a value of 36.7µg/m³. As these are still below the annual objective there are no actions are proposed at this time for these locations.

3.2.2 Particulate Matter (PM_{10})

There are no Defra approved reference method analysers monitoring particulate matter in Wyre Forest District. There is one Zephyr Air Quality Monitor MCERTS approved for indicative particulate matter only, located within the Horsefair AQMA, Kidderminster. The datasets are provided within the report and tables for information only.

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past two years the monitor has been in place for, with the air quality objective of 40µg/m³.

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past two years the monitor has been in place, with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year.

The monitor recorded annual mean PM_{10} of 13.0 µg/m³ and no exceedances of mean average 50 µg/m³ were recorded within a 24-hour period.

3.2.3 Particulate Matter ($PM_{2.5}$)

As outlined above in section 3.2.2, there are no Defra approved reference method analysers monitoring particulate matter in Wyre Forest District. The Zephyr air quality monitor located in Horsefair AQMA recorded annual mean $PM_{2.5}$ of 11.8 µg/m³ which is less than the 14 µg/m³ measured in the previous year, 2022. These results show that the Wyre Forest is close to the target of 10 µg/m³ across England by 2040 already. The results are shown in Table A.8 in Appendix A.

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)
WFH	Kidderminster Stourport Road	Roadside	381768	273551	NO_2	YES/NO AQMA 1	Chemiluminescent Detection	2.98	11.01	1.50m
Horsefair Zephyr	Horsefair, Kidderminster	Roadside	383319	277122	NO_2, PM_{10}, $PM_{2.5}$	YES/NO AQMA 1	NO_2, NO and O_3- Electrochemical Sensors PM – Optical particle counter	0.45	1.6	N/A

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)
WFH1, WFH2, WFH3	Co-Location Study Wyre Forest House	Roadside	381768	273551	NO_2	No	N/A	11.0	No	1.5
HLR1	139 Stourport Road, Kidderminster	Roadside	382148	274587	NO_2	No	0.0	18.6	No	1.7
SR113	113 Stourport Rd, Kidderminster	Roadside	382342	275054	NO_2	No	2.6	2.4	No	2.3
(F)69COV	69 Coventry Street, Kidderminster	Roadside	383552	276870	NO_2	Horsefair/Coventry Street AQMA	0.0	5.5	No	1.8
(F)SGC	6/7 St George's Court, Kidderminster	Roadside	383475	276760	NO_2	Horsefair/Coventry Street AQMA	0.0	10.0	No	1.8
K1	50 Radford Avenue, Kidderminster	Roadside	383391	277086	NO_2	Horsefair/Coventry Street AQMA	0.0	2.1	No	2.5
21HF	21 Horsefair, Kidderminster	Roadside	383338	277215	NO_2	Horsefair/Coventry Street AQMA	0.0	4.7	No	3.0
Z1	6 Dudley Street, Horsefair, Kidderminster	Roadside	383319	277122	NO_2	Horsefair/Coventry Street AQMA	0.5	1.6	No	2.4
HF(K)	Peacock PH, Blackwell Street, Horsefair, Kidderminster	Roadside	383311	277087	NO_2	Horsefair/Coventry Street AQMA	0.0	2.5	No	2.5
HF(K)(F)	Hudson Florists, Blackwell Street, Horsefair, Kidderminster	Roadside	383304	277071	NO_2	Horsefair/Coventry Street AQMA	0.0	2.5	No	2.5

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)
K4	1 Silver Street, Kidderminster	Urban Background	383337	276998	NO_2	Horsefair/Coventry Street AQMA	0.0	18.2	No	2.4
SBR121	121 Stourbridge Road, Kidderminster	Roadside	383905	277857	NO_2	No	0.0	2.4	No	2.7
334CRN	334 Chester Road North, Kidderminster	Roadside	383965	277823	NO_2	No	0.0	3.1	No	2.2
294CRN	Cambrian House, 294 Chester Road North, Kidderminster	Roadside	384054	277444	NO_2	No	0.0	11.0	No	1.6
383CRN	383 Chester Road North, Kidderminster	Roadside	384175	277275	NO_2	No	0.0	11.0	No	2.4
239CRN	239 Chester Road North, Kidderminster	Roadside	384221	276911	NO_2	No	0.0	6.1	No	1.6
CSLOC	Land Oak Court, Coventry St, Kidderminster	Roadside	384205	277121	NO_2	No	0.0	7.9	No	1.9
K3	53 Coventry Street, Kidderminster	Roadside	383726	276909	NO_2	Horsefair/Coventry Street AQMA	0.0	2.7	No	1.3
K2	34 Leswell Lane, Coventry Street, Kidderminster	Roadside	383657	276890	NO_2	Horsefair/Coventry Street AQMA	0.0	3.1	No	1.8
CAS1	99 Comberton Hill, Kidderminster	Roadside	383636	276377	NO_2	No	1.5	2.7	No	2.5
CR1	29 Comberton Hill, Kidderminster	Roadside	383696	276388	NO_2	No	0.0	4.6	No	3.0

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)
CR2	9/10 Comberton Road, Kidderminster	Roadside	383890	276333	NO$_2$	No	0.0	3.4	No	2.0
(F)COMR(K)	Holmwood, Comberton Road Kidderminster	Roadside	384214	276242	NO$_2$	No	13.5	3.5	No	2.2
CRS1	King Charles 1 School, J A449 & A448, Kidderminster	Roadside	384129	276263	NO$_2$	No	32.6	3.3	No	2.3
TCH	Top Comberton Hill, Kidderminster	Roadside	384086	276228	NO$_2$	No	1.0	2.0	No	2.0
PL2	2 Pelham Lodge, Kidderminster	Roadside	384065	276196	NO$_2$	No	0.0	10.4	No	1.8
CR3	20 Comberton Road, Kidderminster	Roadside	384069	276304	NO$_2$	No	0.0	13.1	No	1.9
470CRN	470 Chester Road North, Kidderminster	Roadside	384154	276340	NO$_2$	No	0.0	4.9	No	1.9
SP(K)	Jay Park Crescent, Spennells, Kidderminster	Urban Background	384486	274596	NO$_2$	No	11.0	1.7	No	2.3
50CRS	50 Chester Road South, DY10 1XJ	Roadside	383699	275251	NO$_2$	No	0.0	14.6	No	1.6
100CRS	100 Chester Road South, DY10 1XF	Roadside	383766	275723	NO$_2$	No	0.0	12.5	No	1.6

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)
(F) 447 (s)	447 Stourport Road, DY11 7BD	Roadside	382447	275506	NO$_2$	No	0.0	10.6	No	1.7
SR(K)	431 Stourport Road, DY11 7BQ	Roadside	382429	275315	NO$_2$	No	9.0	3.0	No	2.3
SPR2	Sutton Park Road, DY11 6LA	Roadside	382496	275417	NO$_2$	No	0.0	7.0	No	1.7
SRLEC	Lucy Edwards Court, Sutton Road, DY11 6QJ	Roadside	382183	276388	NO$_2$	No	0.0	9.5	No	2.0
BH166	166 Bewdley Hill, DY11 6BA	Roadside	382135	276409	NO$_2$	No	2.0	5.0	No	2.2
(F)BR(K)	52 Bewdley Road, DY11 6RL	Roadside	382437	276542	NO$_2$	No	0.0	6.5	No	1.7
HAB203	203 Habberley Lane, DY11 5JR	Roadside	381713	278069	NO$_2$	No	0.0	3.1	No	1.5
(F)GIL	10 The Gilgal, DY13 9AL	Roadside	381482	271534	NO$_2$	No	0.0	2.0	No	2.3
(F)LSNS(S)	29 Bridge Street, Stourport, DY13 0AA	Roadside	380957	271284	NO$_2$	No	0.0	1.5	No	2.3
(F)FBS(S)	21 Bridge Street Stourport, DY13 8UT	Roadside	380933	271247	NO$_2$	No	0.0	1.9	No	2.4
HS(S)	High Street corner of York Street, DY13 8BA	Roadside	380974	271268	NO$_2$	No	0.0	4.0	No	2.8
(F)25YS(S)	22 York Street, Stourport, DY13 9BT	Roadside	380990	271268	NO$_2$	No	0.0	1.5	No	2.5

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)
(F)19YS(S)	19 York Street, Stourport, DY13 9BT	Roadside	381086	271268	NO_2	No	0.0	1.7	No	2.3
KSW(S)	20B High St, DY13 8BJ	Roadside	381072	271347	NO_2	No	0.0	4.0	No	2.3
HS15(S)	15 High Street DY13 8BL	Roadside	381114	271380	NO_2	No	0.0	2.2	No	2.3
HS4(S)	4 High Street, DY13 8DH	Roadside	381169	271420	NO_2	No	0.0	4.4	No	2.4
A1	35 High Street, DY13 8BA	Roadside	380989	271298	NO_2	No	0.0	3.2	No	2.4
KID22(B)	22 Kidderminster Road, DY12 1AG	Roadside	373996	275464	NO_2	No	0.0	3.0	No	2.4
(F)WG42	42 Welch Gate, Bewdley, DY12 2AU	Roadside	378383	275328	NO_2	No	0.0	1.7	No	2.5
WG(B)	88 Welch Gate, Bewdley, DY12 2AX	Roadside	378465	275292	NO_2	Welch Gate, Bewdley	0.0	0.9	No	2.5
LS(B)	The Melting Pot, Load Street, Bewdley, DY12 2AE	Roadside	378590	275302	NO_2	No	0.0	3.0	No	2.5
B1	Adam & Eve, Load Street, DY12 2AP	Roadside	378513	275317	NO_2	No	0.0	1.1	Yes	2.3

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 NO₂ Monitoring Results: Automatic Monitoring (µg/m³)

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
WFH	381768	273551	Roadside	99.6	99.6			13.9	13.0	11.9
Horsefair Zephyr	383319	277122	Roadside	100	100				25.0	25.3

☐ **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 NO₂ 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/m³.

Exceedances of the NO₂ annual mean objective of 40µg/m³ 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 NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

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
WFH1, WFH2, WFH3	381768	273551	Roadside	100	100.0			10.6	13.3	12.0
HLR1	382148	274587	Roadside	100	100.0	17.7	14.3	16.9	18.2	17.6
SR113	382342	275054	Roadside	100	74.5	27.7	24.5	27.9	30.0	28.6
(F)69COV	383552	276870	Roadside	100	100.0	**42.2**	34.5	35.1	39.3	38.6
(F)SGC	383475	276760	Roadside	100	100.0	26.9	22.1	24.8	28.4	27.0
K1	383391	277086	Roadside	100	100.0	19.9	16.9	16.9	19.8	18.9
21HF	383338	277215	Roadside	100	100.0	22.5	21.2	23.5	27.2	25.1
Z1	383319	277122	Roadside	100	100.0				22.1	22.5
HF(K)	383311	277087	Roadside	80.8	80.8	**50.5**	28.4	24.4	28.0	28.1
HF(K)(F)	383304	277071	Roadside	100	100.0	**54.0**	29.6	25.9	27.9	29.8
K4	383337	276998	Urban Background	100	100.0	22.6	19.6	18.2	22.7	21.3
SBR121	383905	277857	Roadside	100	100.0	27.0	22.6	25.8	29.2	28.3
334CRN	383965	277823	Roadside	100	100.0	29.0	26.4	29.3	33.3	33.5

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
294CRN	384054	277444	Roadside	100	100.0	20.0	16.3	18.0	20.3	19.5
383CRN	384175	277275	Roadside	100	100.0	18.3	15.7	16.4	18.7	18.0
239CRN	384221	276911	Roadside	92.0	92.0	19.2	16.2	17.0	20.2	19.2
CSLOC	384205	277121	Roadside	100	100.0	27.6	23.4	24.2	27.3	26.5
K3	383726	276909	Roadside	100	100.0	30.1	25.3	27.3	29.5	27.6
K2	383657	276890	Roadside	100	100.0	20.0	16.2	17.0	21.4	20.5
CAS1	383636	276377	Roadside	100	100.0	34.4	26.4	29.7	35.7	32.9
CR1	383696	276388	Roadside	100	100.0	28.8	22.9	26.2	28.1	27.7
CR2	383890	276333	Roadside	100	100.0	29.5	22.8	26.4	29.7	30.3
(F)COMR(K)	384214	276242	Roadside	100	100.0	29.0	22.9	27.3	31.1	28.6
CRS1	384129	276263	Roadside	90.1	90.1		18.3	21.8	24.7	24.1
TCH	384086	276228	Roadside	92.0	92.0	38.7	28.8	31.9	37.8	36.7
PL2	384065	276196	Roadside	100	100.0		12.6	13.7	16.2	15.6
CR3	384069	276304	Roadside	100	100.0	20.7	16.0	19.4	22.1	21.0

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
470CRN	384154	276340	Roadside	100	100.0	29.1	22.3	24.5	28.3	28.6
SP(K)	384486	274596	Urban Background	100	100.0	11.1	9.4	9.7	11.5	10.4
50CRS	383699	275251	Roadside	100	100.0	16.6	13.0	13.5	15.5	14.7
100CRS	383766	275723	Roadside	100	100.0	14.8	11.2	12.6	15.0	14.3
(F) 447 (s)	382447	275506	Roadside	100	100.0	21.0	18.0	19.6	21.5	21.0
SR(K)	382429	275315	Roadside	100	100.0	35.0	28.3	32.9	33.7	34.0
SPR2	382496	275417	Roadside	100	100.0	29.5	23.1	24.5	28.7	28.4
SRLEC	382183	276388	Roadside	92.3	92.3	27.9	22.9	25.0	29.6	28.0
BH166	382135	276409	Roadside	92.3	92.3	25.6	19.6	21.6	23.2	22.5
(F)BR(K)	382437	276542	Roadside	100	100.0	25.3	19.8	22.3	25.6	24.4
HAB203	381713	278069	Roadside	100	100.0	25.4	18.9	21.9	25.4	23.6
(F)GIL	381482	271534	Roadside	100	100.0	24.1	20.6	22.4	25.4	25.8
(F)LSNS(S)	380957	271284	Roadside	100	100.0	22.5	18.5	21.0	24.2	24.3
(F)FBS(S)	380933	271247	Roadside	90.1	90.1	34.0	28.3	31.9	36.6	36.7

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
HS(S)	380974	271268	Roadside	83.0	83.0	31.7	24.7	27.6	31.8	31.7
(F)25YS(S)	380990	271268	Roadside	75.3	75.3	28.4	23.1	24.8	29.1	29.1
(F)19YS(S)	381086	271268	Roadside	100	100.0	23.5	19.0	21.4	24.3	24.0
KSW(S)	381072	271347	Roadside	100	100.0	27.2	21.5	23.7	28.6	26.9
HS15(S)	381114	271380	Roadside	100	100.0	26.5	21.7	23.8	28.2	27.0
HS4(S)	381169	271420	Roadside	100	100.0	27.8	21.6	23.6	27.8	27.9
A1	380989	271298	Roadside	92.3	92.3	34.8	27.0	29.1	33.6	35.1
KID22(B)	373996	275464	Roadside	100	100.0	28.3	22.6	25.4	29.0	28.5
(F)WG42	378383	275328	Roadside	100	100.0	25.0	19.4	21.7	24.8	26.1
WG(B)	378465	275292	Roadside	100	100.0	37.4	29.4	31.9	37.9	**40.8**
LS(B)	378590	275302	Roadside	100	100.0	27.6	20.9	24.0	27.5	25.8
B1	378513	275317	Roadside	100	100.0	29.9	23.0	27.0	30.7	29.0

☒ **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 NO₂ Concentrations

Trends in Annual Mean NO$_2$ Concentrations in Wyre Forest District (2019-2023)
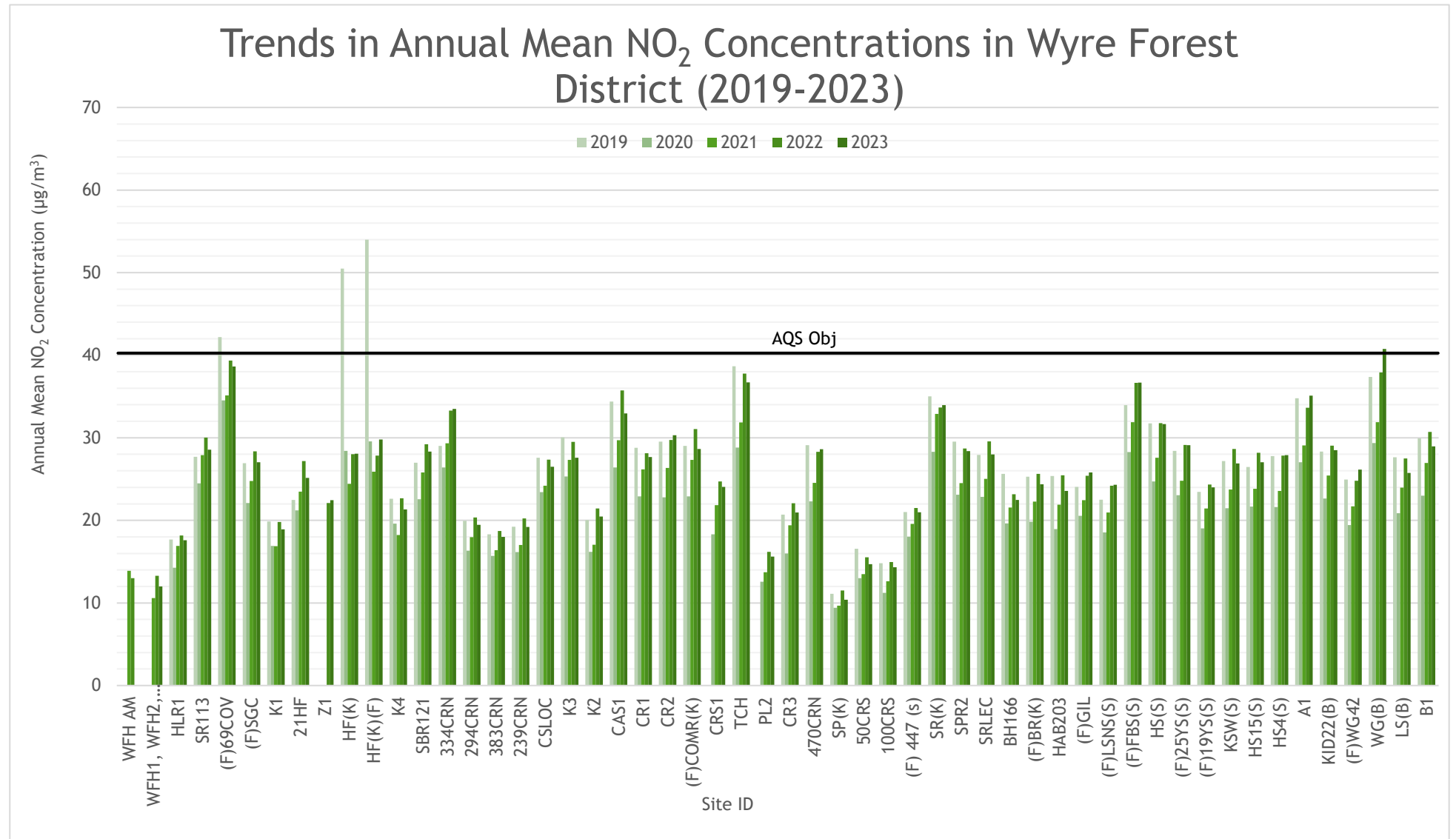
Figure A.2 – Trends in Annual Mean NO₂ Concentrations in Horsefair/Coventry Street
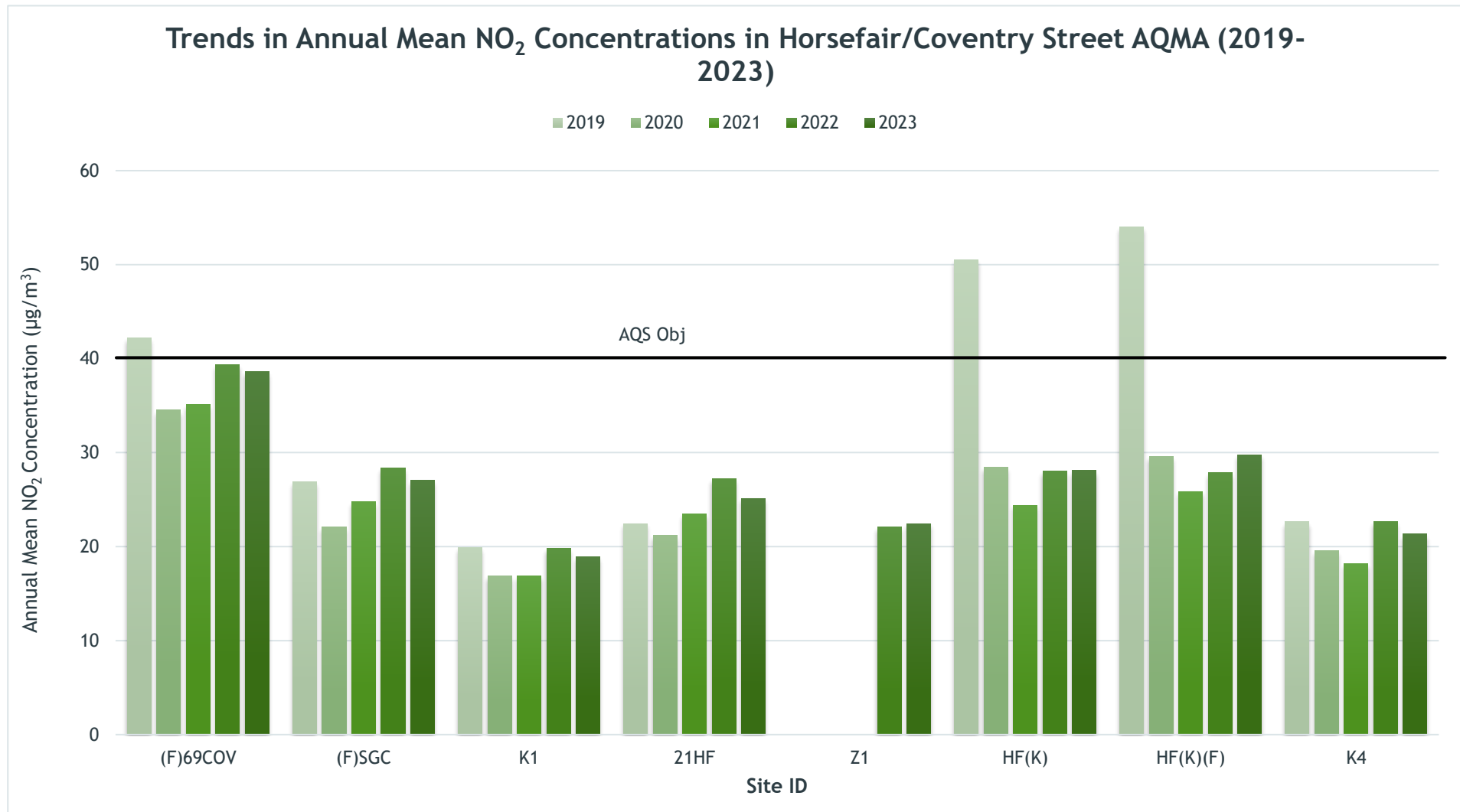
Figure A.3 – Trends in Annual Mean NO2 Concentrations in Kidderminster excluding locations within AQMA

Trends in Annual Mean NO$_2$ Concentrations in Kidderminster (excluding AQMAs) (2019-2023)
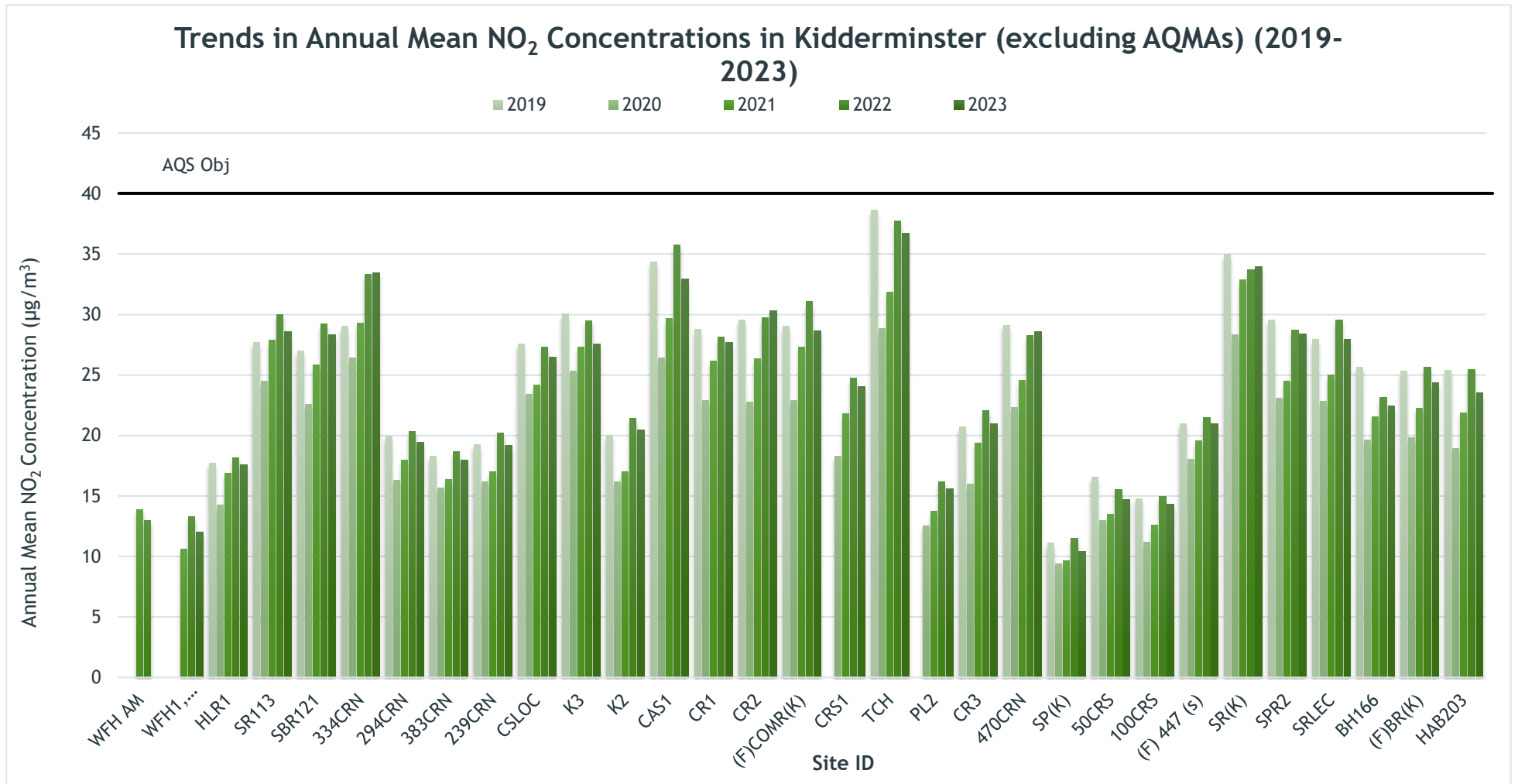
Figure A.4 – Trends in Annual Mean NO2 Concentrations in Stourport on Severn

Trends in Annual Mean NO$_2$ Concentrations in Stourport on Severn (2019-2023)
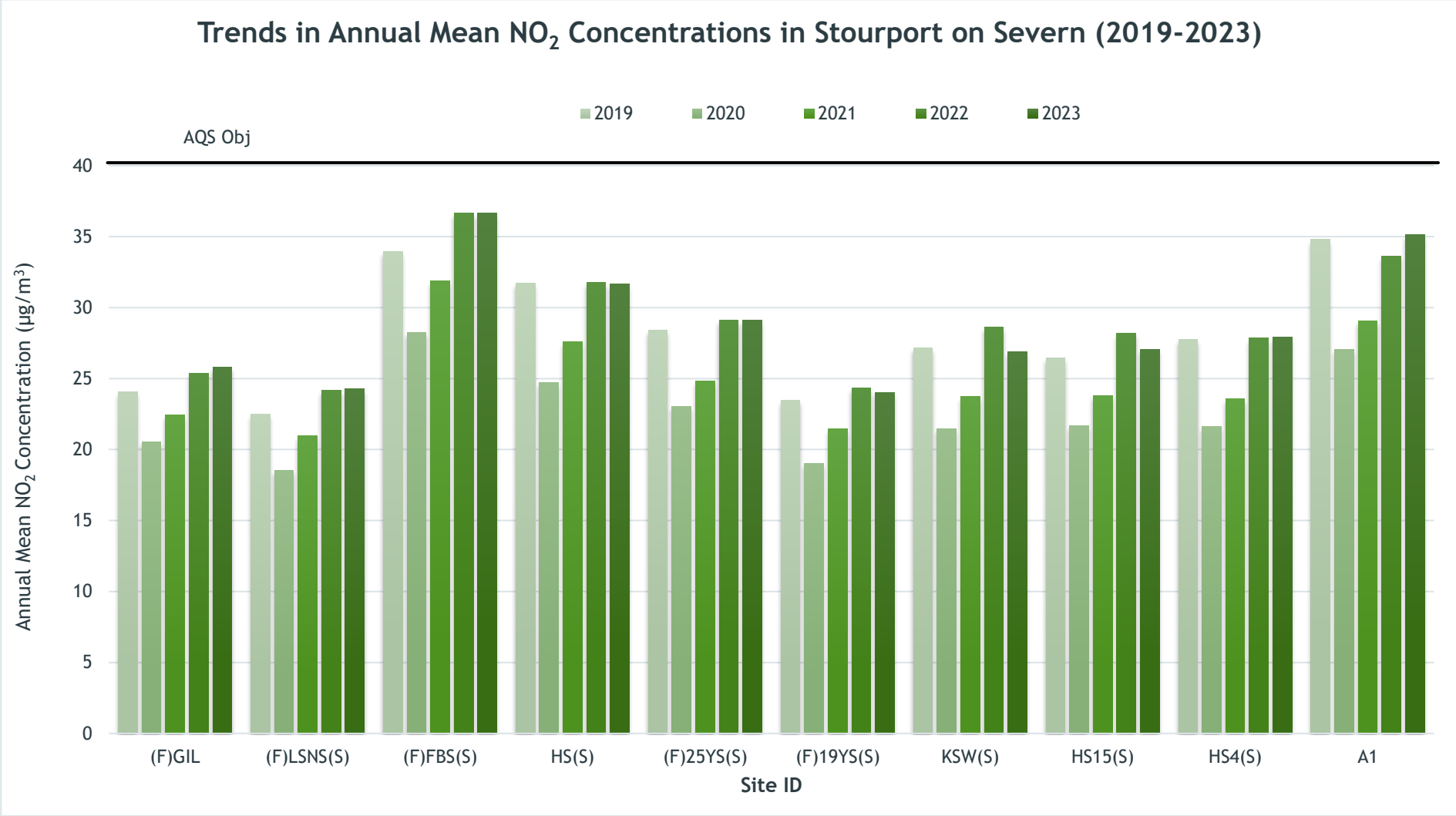
Figure A.5 – Trends in Annual Mean NO₂ Concentrations in Bewdley

Trends in Annual Mean NO₂ Concentrations in Bewdley (2019-2023)
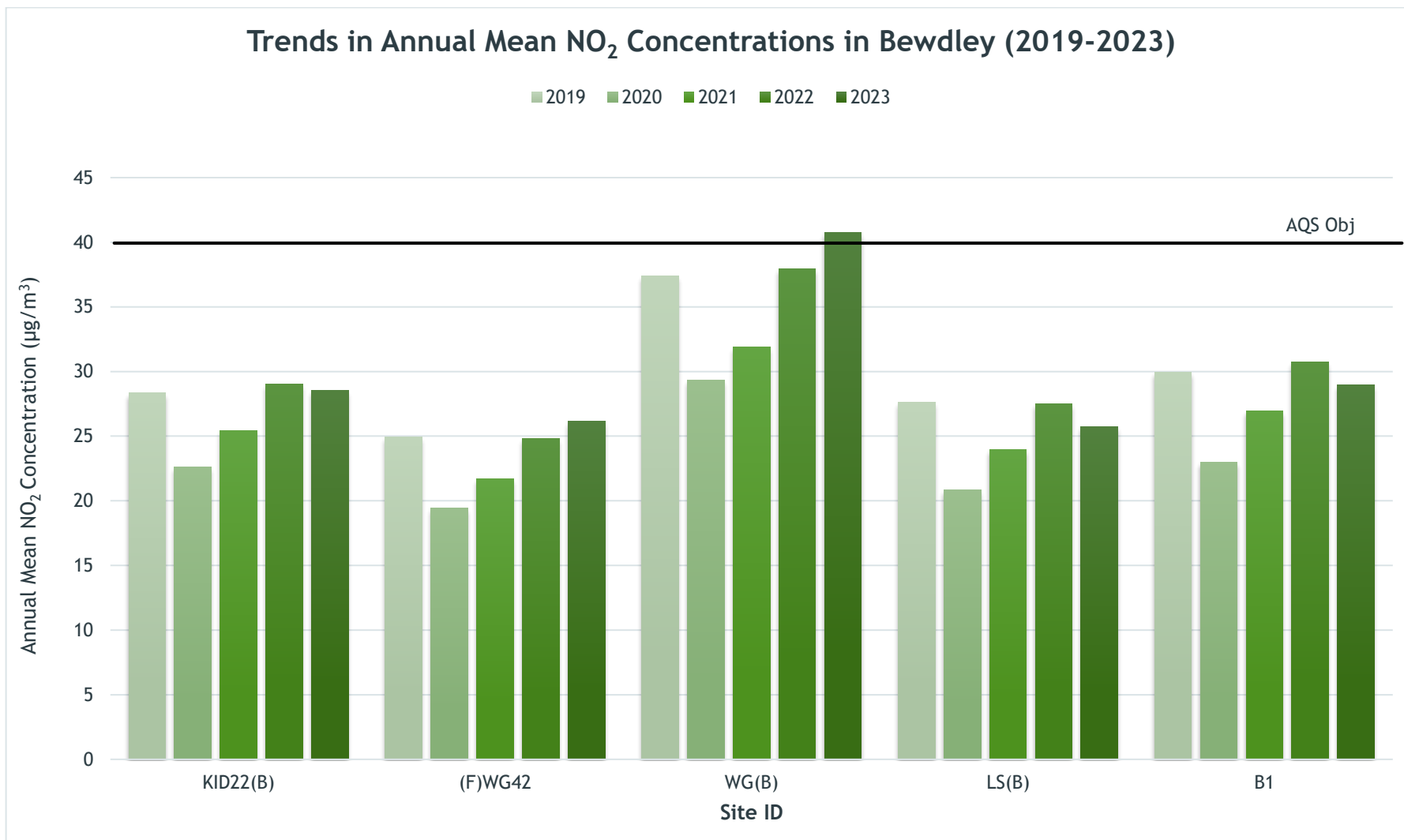
Table A.5 – 1-Hour Mean NO$_2$ Monitoring Results, Number of 1-Hour Means > 200µg/m^3

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
WFH	381768	273551	Roadside	97.3	97.3	N/A	N/A	0	0	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
Horsefair Zephyr	383319	277122	Roadside	100	100				14	13

☐ **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
Horsefair Zephyr	383319	277122	Roadside	100	100				0	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%).

Table A.8 – Annual Mean PM$_{2.5}$ 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
Horsefair Zephyr	383319	277122	Roadside	99.9	99.9				14.0	11.8

☐ **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.

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%).

Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO₂ 2023 Diffusion Tube Results (µg/m³)

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 (0.97)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
WFH1	381768	273551	14.6	15.9	13.1	13.7	10.8	10.7	5.9	9.5	12.1	15.7	16.8	10.3	-	-	-	Triplicate Site with WFH1, WFH2 and WFH3 - Annual data provided for WFH3 only
WFH2	381768	273551	13.9	15.6	13.0	13.7	10.7	11.2	5.8	9.4	11.8	15.6	16.3	10.4	-	-	-	Triplicate Site with WFH1, WFH2 and WFH3 - Annual data provided for WFH3 only
WFH3	381768	273551	14.0	16.0	12.6	14.4	10.8	11.1	5.8	9.2	11.9	16.1	15.6	10.7	12.4	12.0	-	Triplicate Site with WFH1, WFH2 and WFH3 - Annual data provided for WFH3 only
HLR1	382148	274587	18.5	20.9	18.8	20.0	16.9	17.7	10.9	15.1	18.3	22.7	22.0	15.8	18.1	17.6	-	
SR113	382342	275054	37.6	38.1	30.0	28.8	24.0	26.0	25.4	23.1	32.0				29.4	28.6	-	Lamppost that held the tube was removed in October
(F)69 COV	383552	276870	43.9	43.4	41.7	40.2	39.2	39.8	30.8	36.1	42.4	43.1	44.0	33.4	39.8	38.6	-	
(F)SG C	383475	276760	32.1	32.5	29.5	26.6	26.0	24.3	22.1	24.4	29.9	30.5	32.4	24.4	27.9	27.0	-	
K1	383391	277086	25.5	24.7	18.8	18.0	13.0	13.3	14.3	16.0	19.7	21.6	27.1	22.0	19.5	18.9	-	
21HF	383338	277215	31.3	32.2	26.9	24.3	22.7	20.3	19.5	22.1	26.5	25.8	34.1	25.4	25.9	25.1	-	
Z1	383319	277122	27.6	29.2	24.4	22.2	16.8	17.2	17.7	18.8	23.6	25.3	30.3	24.7	23.2	22.5	-	
HF(K)	383311	277087	34.2	34.0	29.7	26.8	23.4		23.6	25.0	31.7	32.4		28.8	28.9	28.1	-	
HF(K)(F)	383304	277071	36.6	39.1	30.8	29.6	25.8	24.6	24.2	26.3	31.9	32.7	37.6	29.4	30.7	29.8	-	
K4	383337	276998	27.5	27.0	21.5	19.5	13.4	15.4	19.5	18.1	24.2	25.2	28.0	24.4	22.0	21.3	-	
SBR121	383905	277857	34.3	36.3	27.3	28.7	26.4	25.7	24.1	25.5	30.1	32.0	32.4	27.9	29.2	28.3	-	
334C RN	383965	277823	35.5	36.9	38.4	40.4	36.0	35.4	26.2	30.4	36.4	35.8	33.9	28.9	34.5	33.5	-	
294C RN	384054	277444	26.7	25.9	20.5	19.0	14.7	14.2	14.7	15.8	19.8	22.6	26.1	20.8	20.1	19.5	-	
383C RN	384175	277275	20.7	22.1	19.3	19.5	14.1	15.9	11.0	15.4	19.4	22.7	25.8	16.5	18.5	18.0	-	
239C RN	384221	276911	24.4	24.5	19.6		14.4	15.1	13.4	16.3	20.4	23.3	27.2	19.1	19.8	19.2	-	

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 (0.97)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
CSLOC	384205	277121	34.3	34.0	26.3	24.5	21.8	23.2	23.8	23.0	27.7	27.5	35.2	26.5	27.3	26.5	-	
K3	383726	276909	21.3	35.1	28.3	29.7	29.3	28.1	20.5	27.1	28.5	32.9	36.2	24.5	28.4	27.6	-	
K2	383657	276890	30.6	25.6	21.1	21.1	16.6	17.0	13.7	17.1	20.9	23.6	26.3	19.8	21.1	20.5	-	
CAS1	383636	276377	39.8	40.0	34.4	35.7	28.8	28.7	29.2	29.1	36.8	36.5	37.9	30.7	34.0	32.9	-	
CR1	383696	276388	30.9	33.7	27.3	30.5	30.7	27.6	19.5	24.8	29.1	31.1	33.5	23.7	28.5	27.7	-	
CR2	383890	276333	31.7	35.8	32.9	33.4	35.3	33.1	21.0	27.3	31.1	32.4	35.8	25.2	31.2	30.3	-	
(F)COMR(K)	384214	276242	35.5	35.6	30.1	32.0	24.5	28.5	21.9	25.3	30.2	31.0	32.4	27.4	29.5	28.6	-	
CRS1	384129	276263	30.0	31.0	27.0	25.9	23.0	21.3	15.7		23.1	25.6	29.3	20.9	24.8	24.1	-	
TCH	384086	276228	47.6	48.1	41.8		37.1	34.3	28.3	31.5	36.6	37.7	42.4	30.8	37.8	36.7	34.2	
PL2	384065	276196	20.3	21.0	18.0	16.0	14.1	13.7	9.1	12.5	16.0	18.1	19.7	14.8	16.1	15.6	-	
CR3	384069	276304	25.3	26.9	21.2	22.2	19.2	18.2	14.3	18.5	23.1	24.5	26.3	19.5	21.6	21.0	-	
470CRN	384154	276340	33.4	33.2	31.9	30.9	24.6	26.2	22.3	24.4	31.4	33.0	34.1	28.5	29.5	28.6	-	
SP(K)	384486	274596	15.2	14.8	11.3	10.0	7.3	7.9	5.7	7.8	10.2	12.0	16.6	9.8	10.7	10.4	-	
50CRS	383699	275251	19.2	19.4	15.0	14.4	11.7	11.7	9.6	12.2	15.8	17.6	20.9	14.3	15.2	14.7	-	
100CRS	383766	275723	18.9	19.2	14.2	13.1	10.9	10.3	9.7	11.7	15.3	16.3	21.6	15.9	14.8	14.3	-	
(F)447(s)	382447	275506	26.6	27.2	20.6	20.9	21.3	19.7	14.6	18.1	20.5	23.3	27.1	19.7	21.6	21.0	-	
SR(K)	382429	275315	38.9	44.8	35.0	35.8	33.9	33.8	23.2	28.9	35.1	38.7	43.2	28.8	35.0	34.0	-	
SPR2	382496	275417	31.0	32.8	29.8	26.7	24.1	27.2	24.3	25.0	34.0	34.5	33.7	28.1	29.3	28.4	-	
SRLEC	382183	276388	33.3	35.6	30.3	26.7	22.0	24.7	24.6	25.4	29.0		36.7	28.8	28.8	28.0	-	
BH166	382135	276409	26.0	27.1	22.9	25.1	25.6	21.3	16.2	18.8	24.3		25.9	21.7	23.2	22.5	-	
(F)BR(K)	382437	276542	30.3	28.8	27.1	26.8	19.6	22.0	18.8	21.7	26.1	28.5	27.6	24.1	25.1	24.4	-	

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 (0.97)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
HAB203	381713	278069	28.0	28.6	26.0	27.3	24.3	18.1	18.0	23.7	24.3	26.9	24.7	21.6	24.3	23.6	-	
(F)GIL	381482	271534	33.4	33.8	26.3	26.3	22.8	18.5	19.2	22.6	27.6	29.5	33.7	25.5	26.6	25.8	-	
(F)LSNS(S)	380957	271284	26.4	28.6	28.3	28.3	23.1	24.7	17.6	24.4	23.9	27.4	25.8	22.1	25.1	24.3	-	
(F)FBS(S)	380933	271247	45.6	43.8	41.3	41.3	40.7	33.7	28.8		34.9	33.6	38.1	34.3	37.8	36.7	-	
HS(S)	380974	271268	31.6	33.0	37.8	37.8	32.3	32.8	23.8			34.8	32.9	29.7	32.6	31.7	-	
(F)25YS(S)	380990	271268	33.6	34.4	30.5	30.5	24.3	25.2				30.8	32.9	27.8	30.0	29.1	-	
(F)19YS(S)	381086	271268	29.4	29.7	25.4	25.4	21.5	21.3	18.1	22.3	22.9	24.0	34.1	22.9	24.7	24.0	-	
KSW(S)	381072	271347	25.7	29.4	33.3	33.3	26.6	27.5	20.4	24.8	29.7	30.9	27.2	23.7	27.7	26.9	-	
HS15(S)	381114	271380	28.8	30.0	31.2	31.2	24.4	24.9	21.6	25.3	28.9	31.4	30.5	26.1	27.9	27.0	-	
HS4(S)	381169	271420	31.1	32.5	31.5	31.5	22.7	24.7	22.7	25.9	30.0	33.2	32.1	27.2	28.8	27.9	-	
A1	380989	271298	41.7	39.8	39.0	39.0		33.2	27.6	34.1	36.0	36.2	39.2	32.4	36.2	35.1	-	
KID22(B)	373996	275464	31.9	35.7	33.0	33.0	30.7	29.6	25.0	23.5	28.3	27.9	26.8	27.4	29.4	28.5	-	
(F)WG42	378383	275328	31.4	29.2	26.6	26.6	23.3	22.3	16.0	23.1	24.6	31.3	39.7	29.3	27.0	26.1	-	
WG(B)	378465	275292	42.1	40.1	43.9	43.9	38.4	38.5	29.3	35.5	38.7	45.8	61.5	46.7	42.0	**40.8**	-	
LS(B)	378590	275302	29.3	30.7	32.1	32.1	27.4	26.1	20.6	20.0	23.0	26.9	24.6	25.7	26.6	25.8	-	
B1	378513	275317	32.8	33.4	33.8	33.8	31.3	30.6	21.8	24.9	27.4	29.8	30.3	28.2	29.9	29.0	-	

☒ **All erroneous data has been removed from the NO₂ 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.**

☒ **Wyre Forest 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

New or Changed Sources Identified Within Wyre Forest District During 2023

Wyre Forest District Council has identified following developments which have the potential to impact on local air quality:

- In 2023 there were 371 dwellings completed, the vast majority in/on the edge of Kidderminster or in Stourport. These developments potentially have an impact on the air quality in the Horsefair/Coventry Street, Kidderminster AQMA.

- The major redesign of the roads in the Horsefair area in the last few years have allowed for the redevelopment of the Tomkinson Carpets site at Churchfields (246 dwellings) with the final 10 dwellings due to complete in mid 2024.

- Another major development which could impact on the AQMA is the new 'Lea Castle Village' currently under construction near Cookley. There is currently approval for 600 dwellings with a further 800 dwellings, employment land and community facilities (including a primary school and local shops) expected to come forward in the next few years. All access roads from the site into Kidderminster come through the Horsefair AQMA.

- A new school opened on Hurcott Road, just off the Horsefair.

Additional Air Quality Works Undertaken by Wyre Forest District Council During 2023

Wyre Forest 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 Wyre Forest 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 2023 Diffusion Tube Monitoring Calendar, i.e. on or within ± 2 days of the specified date

Diffusion Tube Annualisation

Annualisation of diffusion tubes is only required when the annual data capture is less than 75% but more than 25%. No diffusion tubes in the Wyre Forest District had a data capture below 75% so annualisation was not required for any tubes in the 2023 monitoring year.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 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.

Wyre Forest District Council have applied a local bias adjustment factor of 0.97 to the 2023 monitoring data. A summary of bias adjustment factors used by Wyre Forest District Council over the past five years is presented in Table C.1.

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. The local bias adjustment factor has been used as more conservative compared with the national bias adjustment factor (0.81, Defra published

National Diffusion Tube Bias Adjustment Spreadsheet Version 03/24), following consultation with Defra LAQM helpdesk and technical guidance.

Table C.1 – Bias Adjustment Factor

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

Table C.2 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input
Periods used to calculate bias	12
Bias Factor A	0.97 (0.93 - 1.01)
Bias Factor B	3% (-1% - 8%)
Diffusion Tube Mean (µg/m³)	12.4
Mean CV (Precision)	1.9%
Automatic Mean (µg/m³)	12.0
Data Capture	99%
Adjusted Tube Mean (µg/m³)	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 and the calculation is shown below in Table C.3.

Table C.3 – Non-Automatic NO_2 Fall off With Distance Calculations (concentrations presented in µg/m³)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
TCH	2.0	3.0	36.7	10.6	34.2	*N/A*

QA/QC of Automatic Monitoring

Data management of the automatic monitors at Kidderminster Stourport Road (WFH) and the Zephyr analyser in Horsefair, Kidderminster are undertaken by Air Quality Data Management (AQDM) on behalf of Worcestershire Regulatory Services.

Local Site Operator (LSO) duties at Kidderminster Stourport Road (WFH) 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 99.6%. 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

All automatic monitoring locations within Wyre Forest District Council District recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Wyre Forest District Council required distance correction during 2022.

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

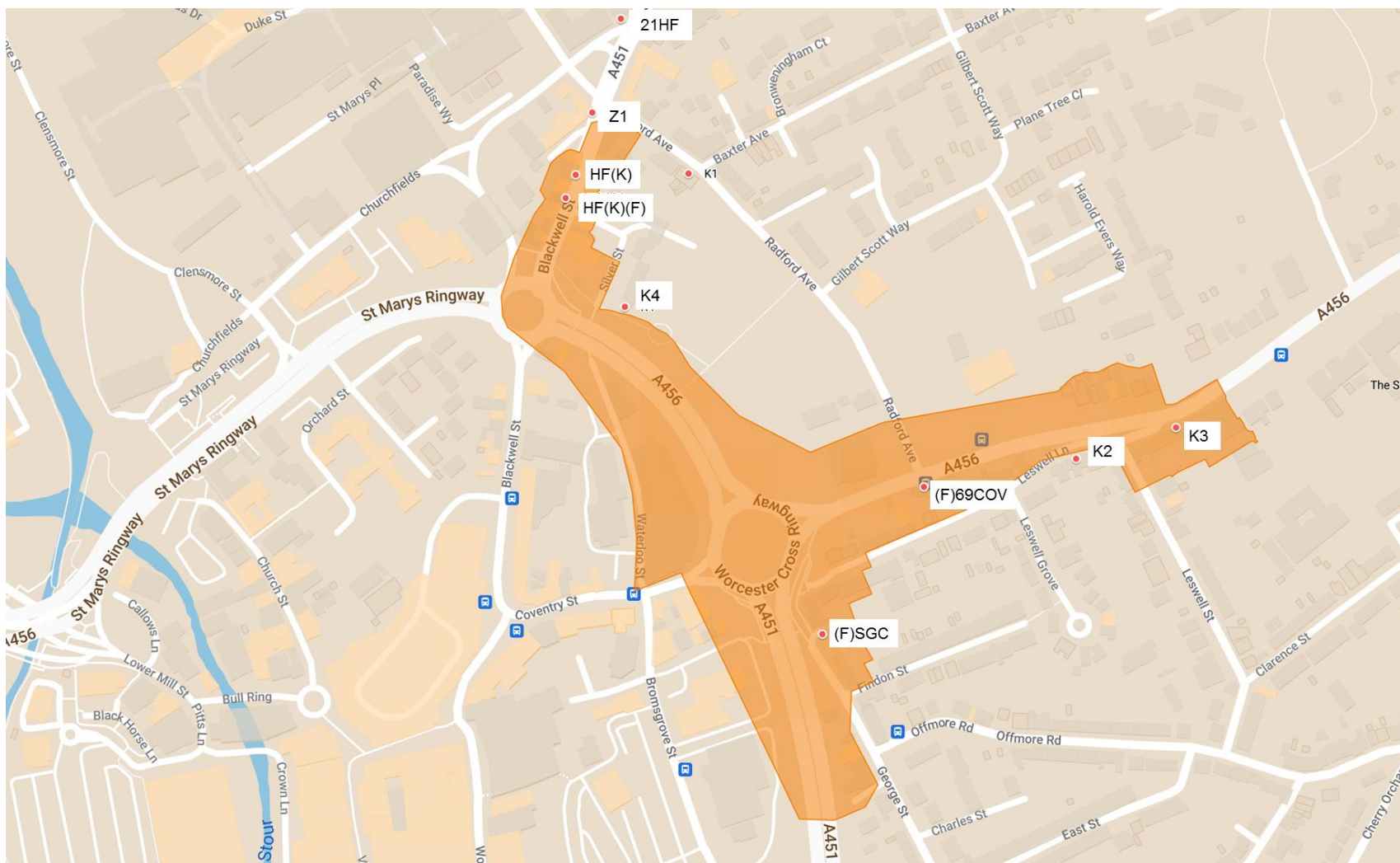**Figure D.1 – Map of Horsefair/Coventry Street AQMA and Monitoring Locations**

Figure D.2 – Map of Welch Gate AQMA and Monitoring Locations
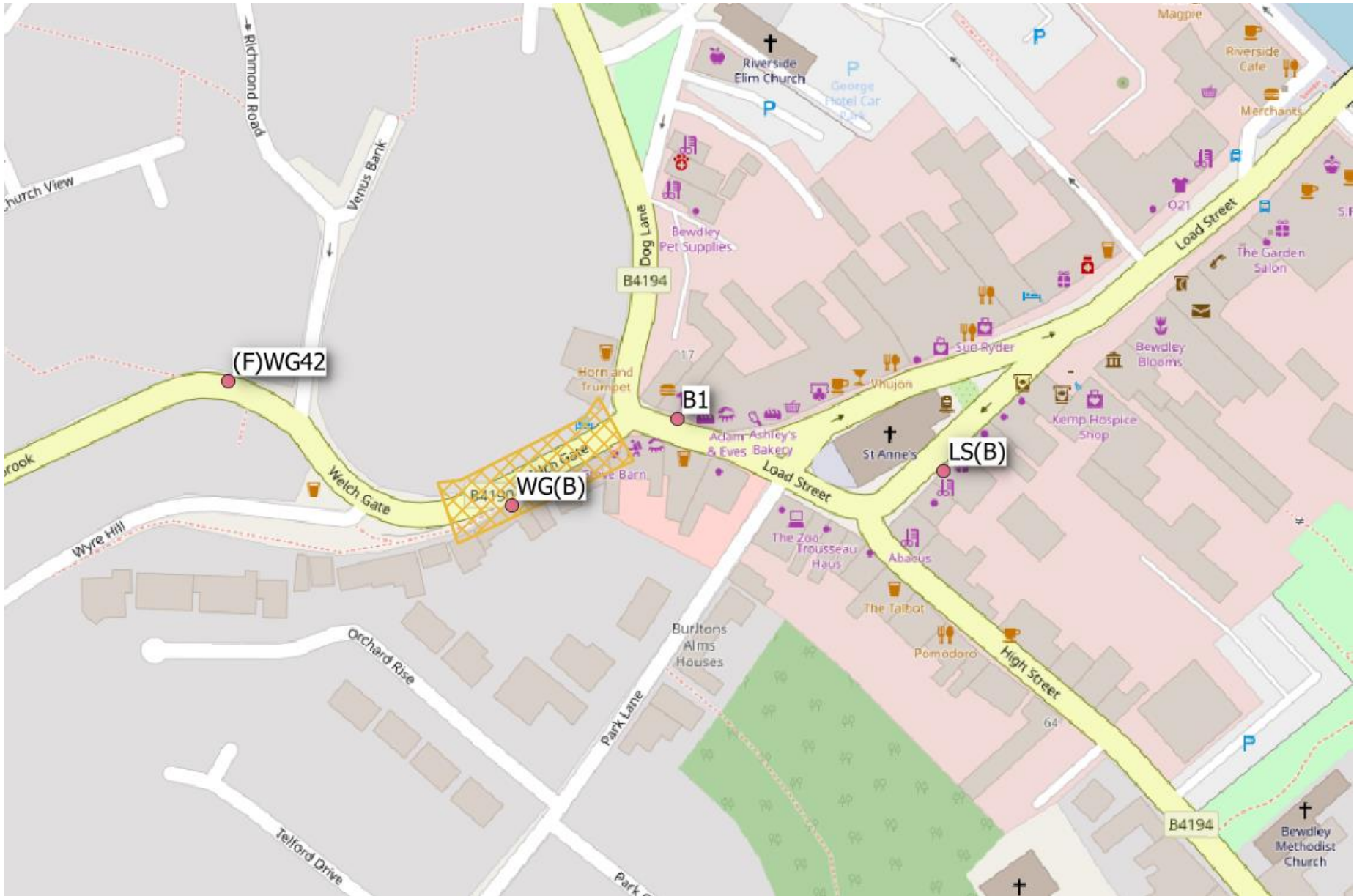
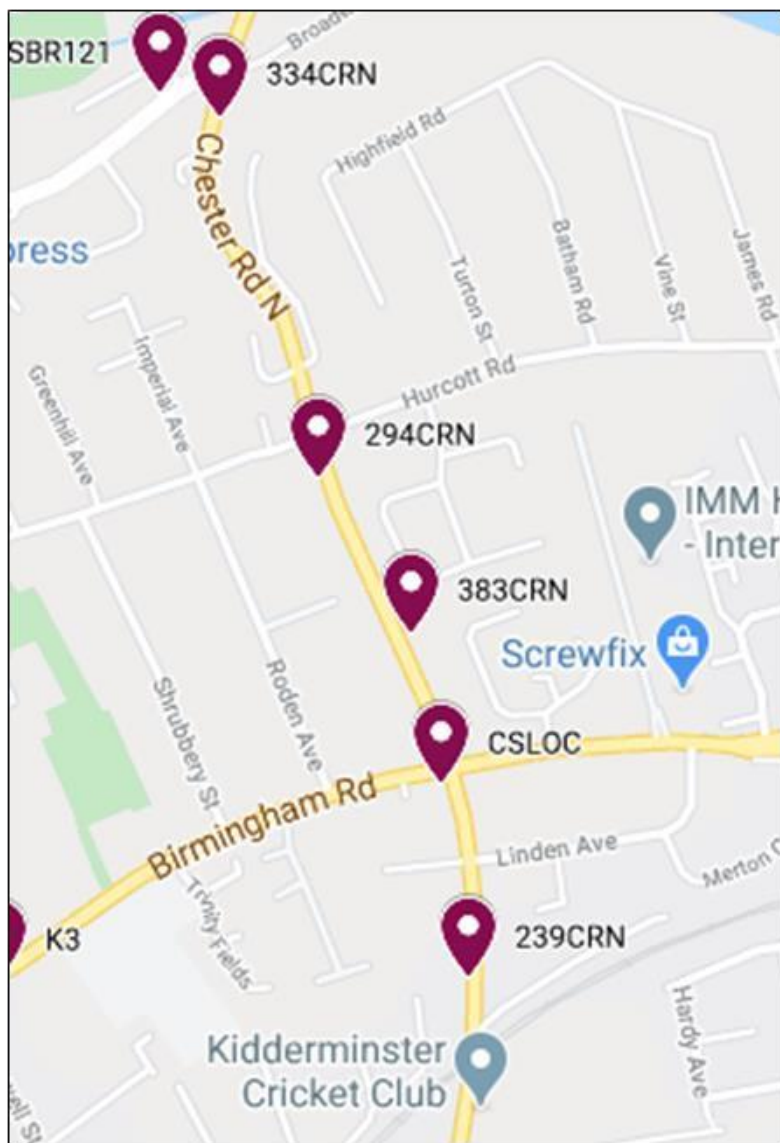**Figure D.3 – Map of Chester Road North (A449). East of Kidderminster Town Centre Monitoring Locations**

Figure D.4 – Map of Comberton Road, Comberton Hill and Chester Road North and South (A449). East of Kidderminster Town Centre Monitoring Locations

Figure D.5 – Map of Chester Road North South (A449) and Urban Background Monitoring Locations
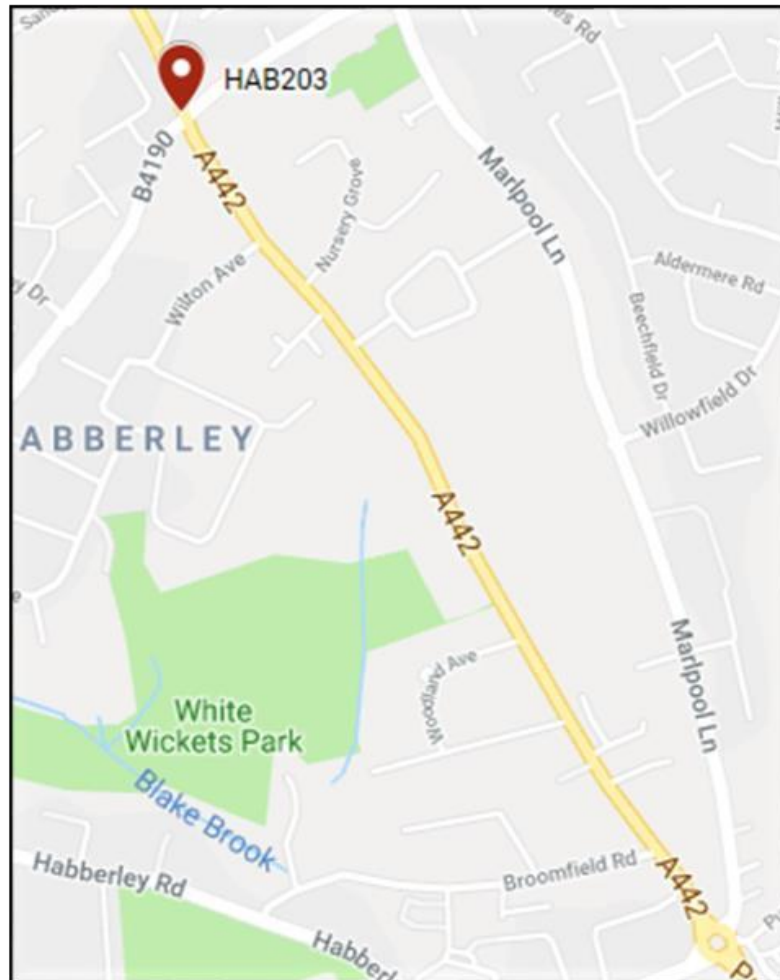

Figure D.6 – Map of West of Kidderminster Town Centre Monitoring Locations
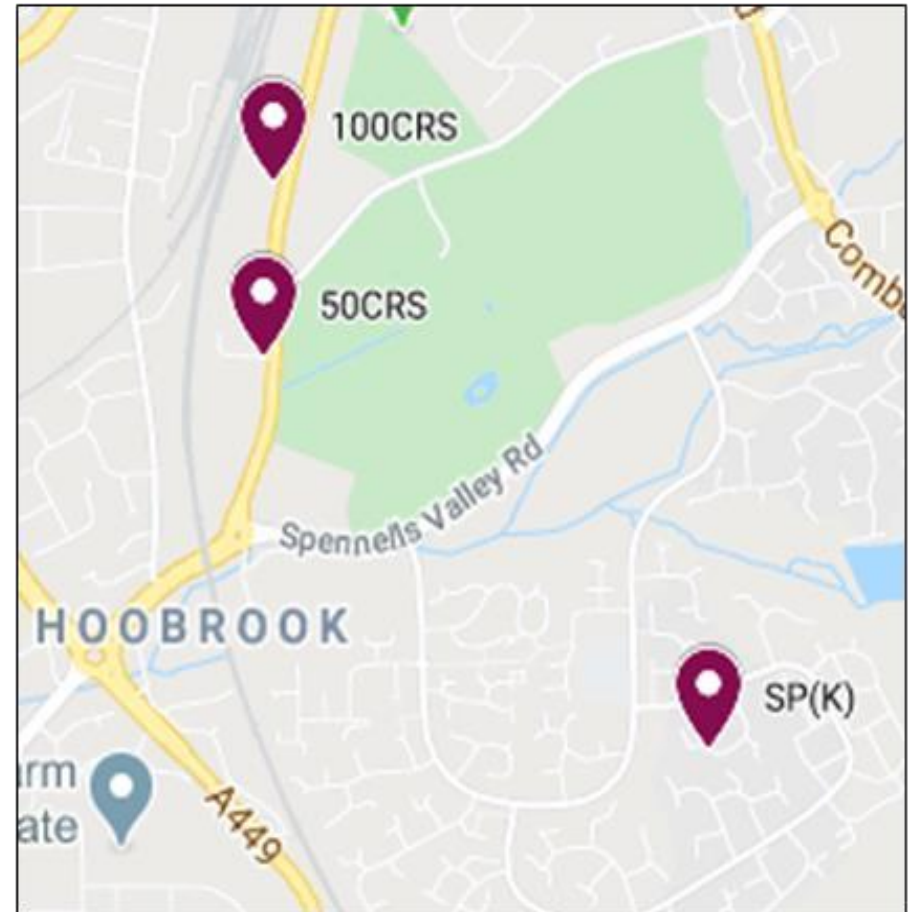
Figure D.7 – Map of South of Kidderminster Town Centre Monitoring Locations
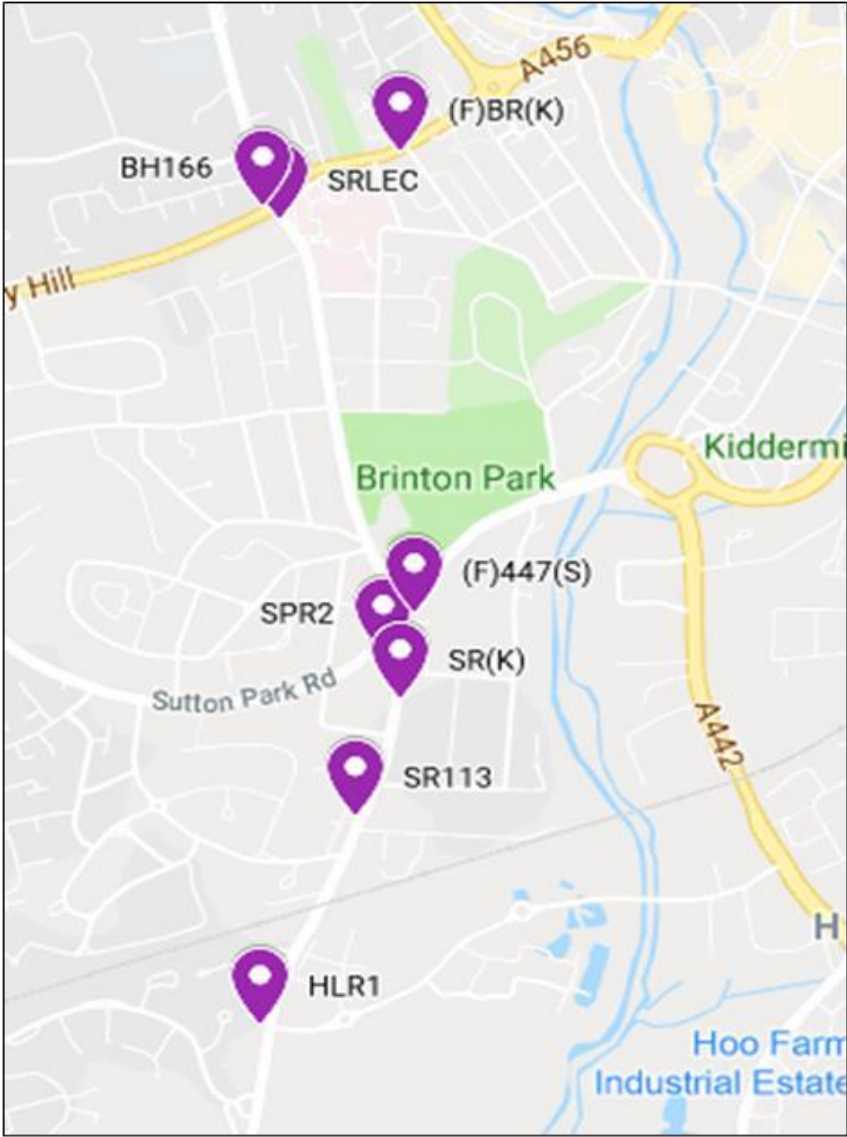
Figure D.8 – Map of Stourport-on-Severn Monitoring Locations

Figure D.9 – Map of East of Bewdley Town Centre Monitoring Location

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[8]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m³ not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m³	Annual mean
Particulate Matter (PM_{10})	50µg/m³, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m³	Annual mean
Sulphur Dioxide (SO_2)	350µg/m³, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m³, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m³, not to be exceeded more than 35 times a year	15-minute mean

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[8] The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

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
AURN	Automatic Urban and Rural Network (Defra) - UK's largest automatic monitoring network and is the main network used for compliance reporting against the Ambient Air Quality Directives (by Gov't)
COPD	Chronic obstructive pulmonary disease - the name for a group of lung conditions that cause breathing difficulties that includes emphysema and chronic bronchitis
Defra	Department for Environment, Food and Rural Affairs
DoPH	Director of Public Health
HGV	Heavy Goods Vehicle
MCERTS	Monitoring Certification Scheme (Environment Agency) - certification of equipment that monitors pollution in the ambient air.
NHS	National Health Service
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
SPD	Supplementary Planning Document
WCC	Worcestershire County Council
WFDC	Wyre Forest District Council
WRS	Worcestershire Regulatory Services

References

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- Air Quality Strategy – Framework for Local Authority Delivery. August 2023. Published by Defra.

- DEFRA (2024) National Diffusion Tube Bias Adjustment Factor Spreadsheet v.03/24

- DEFRA (2018) Background Mapping for Local Authorities

- Worcestershire Regulatory Services (2013) 'Air Quality Action Plan for Worcestershire'

- Worcestershire Regulatory Services (2015) 'Air Quality Action Plan Progress Report for Worcestershire April 2013-April 2015'

- Worcestershire Regulatory Services (2016) 'Air Quality Action Plan Progress Report for Worcestershire April 2015 – April 2016'

- Worcestershire Regulatory Services (2022) Air Quality Annual Status Report for Wyre Forest District Council