



2023 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, 2023

Information	Worcestershire Regulatory Services Details
Local Authority Officer	Christopher Poole
Department	Technical Pollution Team
Address	Wyre Forest House Finepoint Way Kidderminster DY11 7WF
Telephone	01905 822799
E-mail	enquiries@worcsregservices.gov.uk
Report Reference Number	WFDC/ASR/2023
Date	June 2023

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 ages³, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁴.

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.

Monitoring across the Wyre Forest District area for nitrogen dioxide (NO₂) 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 (NO₂):

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

¹ Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

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

³ Defra. Air quality appraisal: damage cost guidance, January 2023

⁴ Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

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 \(worcsregservices.gov.uk\)](https://www.worcsregservices.gov.uk/Air-Quality-Management-Area-Declarations)

All diffusion tube monitoring stations in the Wyre Forest District area saw an increase in annual mean NO₂ concentrations between 2021 and 2022. Monitoring data from 2021 does not represent a standard year with the continuation of the COVID-19 pandemic, associated lockdowns and restrictions affecting travel patterns and behaviours. As such, monitoring data shows an overall increase of 3.2 µg/m³ (13.98%) in average recorded annual mean NO₂ concentrations across the Wyre Forest District area between 2021 and 2022 (23.0 µg/m³ in 2021 and 26.2 µg/m³ in 2022).

There are two notable outliers in the data at locations HF(K) and HF(K) (F) which have both measured significant reductions in 2022 compared with pre-pandemic levels: HF(K) demonstrates reduction in 2022 of 32.9 µg/m³ (54%), and HF(K) (F) 40.7 µg/m³ (59%) below 2018 records. 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. The 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. However, it is considered the reduced measurements in 2022 also include continuing impact of COVID-19 e.g., reduced journeys and potentially mild climate fluctuations at the beginning of that year. Therefore, further monitoring data is required to determine if this trend continues in future years.

In 2022, the highest concentration of NO₂ recorded across the Wyre Forest District area was 39.3 µg/m³ at (F) 69COV (located in the Horsefair/Coventry Street AQMA). This location was also the highest measured concentration in the area in 2021 (35.1 µg/m³). Given the concentration recorded is just below the AQ objective and the need for further monitoring to determine trends following the pandemic throughout the AQMA, no amendments to the Horsefair/Coventry Street AQMA are proposed at this time.

In Bewdley, the maximum concentration of NO₂ is 37.9 µg/m³ in 2022 and was recorded within the Welch Gate AQMA. This is very similar to pre-pandemic levels in 2019, though - 7.3 µg/m³ and -20% below 2018 data. Although the AQMA has not demonstrated an exceedance for 4 years the AQMA should remain at this time and continue to be monitored to determine post pandemic trends.

No other areas have recorded NO₂ above -10% of the AQS objective when considering distance to nearest receptor, with the exception of location (F)FBS(S) in Stourport at 36.6 µg/m³.

No exceedances of the annual mean objective were recorded within Wyre Forest District Council during 2022. No annual means greater than 60 ug/m³ have been recorded indicating that it is very unlikely that there have been any exceedances of the 1-hour mean objective for NO₂ at any diffusion tube monitoring sites.

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 PM₁₀ of 14.0 µg/m³ and annual mean PM_{2.5} of 14.0 µg/m³ following commissioning of the site on 23rd February 2022. No exceedances of mean average PM₁₀ 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 Plan⁵ sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term PM_{2.5} targets. The National Air Quality Strategy, published in April 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce PM_{2.5} in their areas. The Road to Zero⁶ details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMA) 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

⁵ Defra. Environmental Improvement Plan 2023, January 2023

⁶ DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

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/>

Details of all existing AQAP measures completed, in progress or planned are set out in Table 2.2.

Partnership Working

Worcestershire County Council has responsibility for strategic transport issues in the county and published the fourth Local Transport Plan in 2017. Pre-pandemic WRS has enjoyed a good working relationship with the County Council's Strategic Transport Team and developed closer working ties with Public Health, Planning and Sustainability colleagues within the County and District Councils. Unfortunately, the COVID-19 pandemic, led to the suspension of existing action groups in 2020 and delayed air quality improvement projects. Additionally, there have been significant personnel turnover within the WRS, County and District Council teams in the interim period.

As we have emerged from the pandemic during 2022-23, WRS are seeking to re-engage with those teams and new colleagues from the different disciplines that have a role in improving air quality.

Key developments in 2022 are:

1. Strategic infrastructure works completed in Horsefair, Kidderminster, as part of the Churchfields development plan, have resulted in significantly reduced NO₂ concentrations (up to 59% reduction from 2018 measured concentrations) within that part of the Horsefair/Coventry Street AQMA. More detail is provided in section 3.2.1 below.
2. Formation of new Air Quality Action Plan Steering Group to develop and produce a new countywide air quality action plan and strategy, this is discussed in more detail below.
3. In February 2022, Wyre Forest District Council installed an EarthSense Systems Ltd Zephyr monitor in the Horsefair AQMA. This new type of sensor is MCERTS

accredited for indicative particulate matter (PM₁₀ and PM_{2.5}). Further information is provided in section 2.3.

4. In September 2022 WRS submitted, and have been successful in, a bid for funding from Defra's Air Quality Grant to expand the real time monitoring network across Worcestershire. Further information is provided below.

Air Quality Actions Plan and Air Quality Strategy

A new Air Quality Action Plan is required for Worcestershire in accordance with the Environment Act 2021 and revised guidance published in Aug 2022 (LAQM.TG22 and PG22). The COVID19 pandemic, unfortunately, 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, outlined below, which will be reported on in the next ASR (2024).

The group currently comprises officers from the County and District authorities from public health, air quality, strategic planning, sustainability, highways and transport disciplines, and also representatives from the NHS.

The Action Plan will incorporate an improving Air Quality Strategy applicable across the County including districts councils that currently have no AQMAs in accordance with legislation and guidance.

The first step in action planning is to determine the contribution of sources of air pollution (source apportionment) to inform future actions. Up to date source apportionment has been completed for some parts of the County, but further work is required.

The initial Steering Group work is focussed on actions informed by the available source apportionment work in addition to countywide actions applicable to all districts.

Traffic surveys have been completed in 2023 to enable source apportionment work to be undertaken for Wyre Forest District Council in Spring 2024 when the concurrent calendar years' monitoring data will be available in line with technical guidance.

The timeline for the various stages and delivery of the Air Quality Strategy and Action Plan is set out below.

Timeline	Phase
Feb – Dec 2023	Identification of potential overarching Worcestershire County Council actions and Worcester City Council Specific actions, feasibility filter of measures, cost benefit analysis, determination of impact, timelines and funding sources, drafting of countywide action plan
Jan – Mar 2024	Submission of Draft for review by Senior Management Team and approval by Political Committees at Worcester City Council and Worcestershire County Council and revisions
March 2024	Submission of Draft countywide AQAP inc. local AQ strategy and Worcester City Council specific actions to DEFRA
April- June 2024	3-month Public Consultation on Draft countywide AQAP following revisions
July - Sept 2024	Revisions and finalisation of countywide AQAP including local AQ strategy and Worcester City Council specific actions Consideration for revocation of AQMAs and source apportionment work for other AQMAs in 1) Bromsgrove DC 2) Wyre Forest DC 3) Wychavon DC
Sept – Oct 2024	Submission of Finalised AQAP for review by Senior Management Team and approval by Political Committees at Worcester City Council and Worcestershire County Council and revisions
Sept 2024 - Mar 2025	AQAPSG work on Bromsgrove DC and Wyre Forest DC specific actions (if required), refresh SG membership with relevant stakeholders. Identification of district specific actions, feasibility filter of measures, cost benefit analysis, determination of impact, timelines and funding sources, and draft update to AQAP. Consultation on additional chapters/amendments
Nov 2024	Publication of Finalised countywide AQAP inc. local AQ strategy & Worcester City chapter and submission to DEFRA
Mar - May 2025	Annual review for any amendments requiring further work.

Real-time Air Quality Monitoring Project

In September 2022 officers from WRS submitted an application to Defra's Air Quality Grant Scheme 2022/23. The scope of the bid was to establish an enhanced real-time air quality monitoring network across the main areas of air quality concern in Worcestershire for purposes of informing the public and vulnerable groups of the status of air pollution. The scheme would see the installation of approximately 24 'low-cost Air Quality Monitors' across the county which measure NO₂, PM₁₀, and PM_{2.5}.

This will provide important data in respect of particulate matter for which monitoring across the county has been limited previously. The results of monitoring would then be used to inform decision making and requirements for further action as necessary. 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.

In February 2023 Defra announced that the WRS bid had been successful and the requested £248,400 was awarded. 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.

At the time of writing the project is at the procurement stage, with the tender specification close to completion. Once a successful supplier has been appointed, exact monitoring locations will be agreed, and equipment installed. This is anticipated to be in the latter stages of 2023.

Three of the monitors are to be deployed within the Wyre Forest District Council area. Locations are currently to be confirmed but are expected to represent worst case conditions in relation to road traffic and impacts from agriculture and solid fuel burning.

Welch Gate AQMA - alternative traffic rerouting

Proposals to develop a scheme to improve traffic flow in Welch Gate are included in the Infrastructure Delivery Plan for the Wyre Forest Local Plan⁷, adopted in April 2022.

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 (491,450 and 456). A strategic outline business case for further funding is being prepared for submission to Midlands Connect in 2023. Further information is available via [North West Worcestershire Corridor \(NWWC\) | Worcestershire County Council](#)
- Wyre Forest Local Cycling and Walking Infrastructure Plan (LCWIP) funded through Active Travel England due to complete 2024.

⁷ [Wyre Forest Local Plan, 2019](#)

- Funding secured by Wyre Forest DC for upgrades to the canal town path as an active travel route.
- Health Supplementary Planning Document (SPD) in development with Wyre Forest Council, due for adoption in 2023

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 2022 show that air quality in the Horsefair/Coventry Street AQMA and the Welch Gate AQMA was below the annual mean objective. The highest monitored annual mean NO₂ concentration within Horsefair/Coventry Street AQMA was 39.3 µg/m³ (at diffusion tube (F) 69COV) and within the Welch Gate AQMA was 37.9 µg/m³ (at diffusion tube WG(B)).

Monitoring results demonstrate an increase in NO₂ concentrations at all diffusion tube monitoring locations in 2022 compared to 2021; this is consistent with trends across Worcestershire. This is likely to have been caused by the increase in traffic following the cessation of COVID-19 regulations in 2022. There were no exceedances of the annual mean objective for NO₂ at any location within the Wyre Forest District area in 2022.

Measured concentrations at diffusion tube locations in 2022 are on average 6.8 µg/m³ and 17% lower than pre-pandemic recorded data in 2018 across Wyre Forest District.

At this time, it is unclear if some enforced behaviours during the pandemic decreasing 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 NO₂ in future years after 2022.

However, 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 2022; up to 59% 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:

- Installation of additional 3 low-cost Air Quality Analysers in the district monitoring NO₂ and particulate matter as part of the County enhanced monitoring network to inform future decisions and actions.

- Supporting the development of countywide Air Quality Action Plan and Air Quality Strategy. Publication of the draft document is anticipated in Spring 2024 with a finalised version later next year following the necessary consultation process. This is to remain a 'live' document that can be added to and revised on a regular basis as planned actions evolve
- Developing closer working ties with Public Health colleagues on variety of work streams: AQAP progression, campaigns such as Clean Air Day 2023 and establishing an alert system for vulnerable groups linked to the real time monitoring network.
- 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.

As outlined in the previous section an enhanced real time air quality monitoring network will be installed in the latter part of 2023. This will provide important data in respect of PM₁₀ and PM_{2.5}, for which monitoring across the county has been very limited previously, as well as NO₂. 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.

A number of new developments have been identified within the local authority 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. Applications for significant new developments are listed in [Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC](#).

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)^{8,9}. 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/daq>
- 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 \(worcsregservices.gov.uk\)](#) .

⁸ <http://www.breathelondon.org/>

⁹ <https://www.londonair.org.uk/LondonAir/guide/MyActionsForMe.aspx>

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

This ASR has been signed off by the Director of Public Health with the following comments:

We welcome the submission of these reports, continued focus on improving air quality, and installation of new real time air quality monitors which will provide 'information for action' across the system. We recommend inclusion in future reports to recognise ageing population and increasing long term conditions sensitive to poor air quality.

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

Technical Pollution Team
Worcestershire Regulatory Services
Wyre Forest House
Finepoint Way
Kidderminster
Worcestershire
DY11 7WF

Telephone - 01905 822799

Email - enquiries@worcsregservices.gov.uk

Table of Contents

Executive Summary: Air Quality in Our Area	i
Air Quality in Wyre Forest District	i
Actions to Improve Air Quality	iii
Conclusions and Priorities	viii
Local Engagement and How to get Involved.....	ix
Local Responsibilities and Commitment	xii
1 Local Air Quality Management	1
2 Actions to Improve Air Quality	2
2.1 Air Quality Management Areas	2
2.2 Progress and Impact of Measures to address Air Quality in Wyre Forest District	5
2.3 PM _{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations	13
3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance	15
3.1 Summary of Monitoring Undertaken.....	15
3.1.1 Automatic Monitoring Sites	15
3.1.2 Non-Automatic Monitoring Sites	15
3.2 Individual Pollutants.....	16
3.2.1 Nitrogen Dioxide (NO ₂)	16
3.2.2 Particulate Matter (PM ₁₀)	18
3.2.3 Particulate Matter (PM _{2.5}).....	18
Appendix A: Monitoring Results	20
Appendix B: Full Monthly Diffusion Tube Results for 2022	39
Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	42
New or Changed Sources Identified Within Wyre Forest District During 2022	42
Additional Air Quality Works Undertaken by Wyre Forest District Council During 2022	43
QA/QC of Diffusion Tube Monitoring	43
Diffusion Tube Annualisation	43
Diffusion Tube Bias Adjustment Factors	43
NO ₂ Fall-off with Distance from the Road.....	45
QA/QC of Automatic Monitoring	45
PM ₁₀ and PM _{2.5} Monitoring Adjustment	46
Automatic Monitoring Annualisation	46
NO ₂ Fall-off with Distance from the Road.....	46
Appendix D: Map(s) of Monitoring Locations and AQMAs	47
Appendix E: Summary of Air Quality Objectives in England	56
Glossary of Terms	57

References59

Figures

Figure A.1 – Trends in Annual Mean NO ₂ Concentrations in Wyre Forest District.....	30
Figure A.2 – Trends in Annual Mean NO ₂ Concentrations in Horsefair/Coventry Street AQMA	31
Figure A.3 – Trends in Annual Mean NO ₂ Concentrations in Kidderminster excluding locations within AQMA	32
Figure A.4 – Trends in Annual Mean NO ₂ Concentrations in Stourport on Severn	33
Figure A.5 – Trends in Annual Mean NO ₂ Concentrations in Bewdley	34
Figure D.1 – Map of Horsefair/Coventry Street AQMA and Monitoring Locations	48
Figure D.2 – Map of Welch Gate AQMA and Monitoring Locations	49
Figure D.3 – Map of Chester Road North (A449). East of Kidderminster Town Centre Monitoring Locations.....	50
Figure D.4 – Map of Comberton Road, Comberton Hill and Chester Road North and South (A449). East of Kidderminster Town Centre Monitoring Locations	51
Figure D.5 – Map of Chester Road North South (A449)	52
Figure D.6 – Map of West of Kidderminster Town Centre Monitoring Locations.....	52
Figure D.7 – Map of South of Kidderminster Town Centre Monitoring Locations	53
Figure D.8 – Map of Stourport-on-Severn Monitoring Locations.....	54
Figure D.8 – Map of East of Bewdley Town Centre Monitoring Location	55

Tables

Table 2.1 – Declared Air Quality Management Areas.....	3
Table 2.2 – Progress on Measures to Improve Air Quality.....	11
Table A.1 – Details of Automatic Monitoring Sites	20
Table A.2 – Details of Non-Automatic Monitoring Sites	21
Table A.3 – Annual Mean NO ₂ Monitoring Results: Automatic Monitoring (µg/m ³)	26
Table A.4 – Annual Mean NO ₂ Monitoring Results: Non-Automatic Monitoring (µg/m ³)	27
Table A.5 – 1-Hour Mean NO ₂ Monitoring Results, Number of 1-Hour Means > 200µg/m ³	35
Table A.6 – Annual Mean PM ₁₀ Monitoring Results (µg/m ³)	36

Table A.7 – 24-Hour Mean PM ₁₀ Monitoring Results, Number of PM ₁₀ 24-Hour Means > 50µg/m ³	37
Table A.8 – Annual Mean PM _{2.5} Monitoring Results (µg/m ³)	38
Table B.1 – NO ₂ 2022 Diffusion Tube Results (µg/m ³)	39
Table C.2 – Bias Adjustment Factor	44
Table C.3 – Local Bias Adjustment Calculation	44
Table C.4 – NO ₂ Fall off With Distance Calculations (concentrations presented in µg/m ³)	45
Table E.1 – Air Quality Objectives in England	56

1 Local Air Quality Management

This report provides an overview of air quality in Wyre Forest District during 2022. 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 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 Wyre Forest District can be found in Table 2.1. The table presents a description of the two AQMA(s) that are currently designated within Wyre Forest District. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMA(s) and also the air quality monitoring locations in relation to the AQMA(s). The air quality objectives pertinent to the current AQMA designation(s) are as follows:

- NO₂ 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 µg/m ³	39.3 µg/m ³	3 Years	Air Quality Action Plan for Worcestershire September 2013 Updated September 2016	Visit Air Quality Action Plan for Worcestershire at Worcsregservices.gov.uk
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 µg/m ³	37.9 µg/m ³	4 Years	Air Quality Action Plan for Worcestershire September 2013 Updated September 2016	Visit Air Quality Action Plan for Worcestershire at Worcsregservices.gov.uk

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 Wyre Forest District

Defra's appraisal of last year's ASR concluded:

1. The Council presents and discusses the trends in NO₂, attributing the increased concentrations in 2021 compared to 2020 to the increased traffic volumes following the easing of lockdowns caused by the COVID-19 pandemic. A robust comparison with air quality objectives is also provided.
2. Although QA/QC procedures were robust, there was no explicit justification for the use of the national bias adjustment factor, over a local factor. This is encouraged in future reports.
3. The Council outline a number of measures which they have in place to address PM_{2.5} emissions, including the use of the DEFRA National Background Maps to determine projected PM_{2.5} concentrations in the Wyre Forest District Area for 2021. The Council also refer to the Public Health Outcomes Frameworks and the fraction of mortality attributable to air pollution (indicator D01). There are also four declared smoke control areas operating within the Wyre Forest District Council area. The Council is commended on this, as it shows their continued pro-active and committed approach to combating air pollutants, such as particulate emissions.
4. In last year's ASR appraisal commentary, it was highlighted an updated AQAP would soon be needed. In this year's ASR, the Council state that this hasn't been done, as there have been no exceedances since 2019. However, the Council is reminded due to the impact of COVID-19 restrictions monitoring data from 2020 and 2021 may not be representative. It is recommended that the Council continue to closely monitor concentrations within their AQMA and are encouraged to update the AQAP every 5 years until revocation can be achieved.
5. Feedback from last year's appraisal was included and addressed. This is welcomed and is encouraged to continue in future years.
6. The Council provide a detailed appendix, entitled "Junction of Comberton Road, Chester Road North and Chester Road South, Kidderminster Dispersion Modelling Assessment 2021", as previous ASRs highlighted the need for detailed review of

NO₂ concentrations at the junction of Comberton Road (A448), Chester Road North (A449) and Chester Road South (A44), Kidderminster. This review has been used to determine whether the declaration of an AQMA is required and to determine the geographical extent of any predicted exceedances at relevant receptors. This is extremely detailed and acts as a very useful addition to the report.

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 national bias adjustment factor was preferred as Defra's appraisal report (ref: ASR22-1336) notes: 'The automatic monitoring site had a data capture of <90%, meaning that the bias adjustment factor determined from the automatic monitoring data at Kidderminster Stourport Road site was not used.' An update on countywide AQAP development is provided below.

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: [Wyre Forest District Council Reporting | Worcestershire Regulatory Services \(wocregservices.gov.uk\)](http://Wyre Forest District Council Reporting | Worcestershire Regulatory Services (wocregservices.gov.uk))

Details of all existing AQAP measures completed, in progress or planned are set out in Table 2.2. Fourteen measures are included within Table 2.2, with the type of measure, and the progress Wyre Forest District and air quality partners have made to date are presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

Key developments in 2022 are:

1. Strategic infrastructure works completed in Horsefair, Kidderminster, as part of the Churchfields development plan, have resulted in significantly reduced NO₂ concentrations (up to 59% reduction from 2018 measured concentrations) within that part of the Horsefair/Coventry Street AQMA. More detail is provided in section 3.2.1 below.
2. Formation of new Air Quality Action Plan Steering Group to develop and produce a new countywide air quality action plan and strategy, this is discussed in more detail below.

3. In February 2022, Wyre Forest District Council installed an EarthSense Systems Ltd Zephyr monitor in the Horsefair AQMA to provide an enhanced monitoring network. This new type of sensor is MCERTS accredited for indicative particulate matter (PM₁₀ and PM_{2.5}). Further information is provided in section 2.3.
4. In September 2022 WRS submitted, and have been successful in, a bid for funding from Defra's Air Quality Grant to expand the real time monitoring network across Worcestershire. Further information is provided below.

Air Quality Actions Plan and Air Quality Strategy

A new Air Quality Action Plan is required for Worcestershire in accordance with the Environment Act 2021 and revised guidance published in Aug 2022 (LAQM.TG22 and PG22). The COVID19 pandemic, unfortunately, 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, outlined below, which will be reported on in the next ASR (2024).

The group currently comprises officers from the County and District authorities from public health, air quality, strategic planning, sustainability, highways and transport disciplines, and also representatives from the NHS.

The Action Plan will incorporate an improving Air Quality Strategy applicable across the County including districts councils that currently have no AQMAs in accordance with legislation and guidance.

The first step in action planning is to determine the contribution of sources of air pollution (source apportionment) to inform future actions. Up to date source apportionment has been completed for some parts of the County, but further work is required.

The initial Steering Group work is focussed on actions informed by the available source apportionment work in addition to countywide actions applicable to all districts.

Traffic surveys have been completed in 2023 to enable source apportionment work to be undertaken for Wyre Forest District Council in Spring 2024 when the concurrent calendar years' monitoring data will be available in line with technical guidance.

The timeline for the various stages and delivery of the Air Quality Strategy and Action Plan is set out below.

Timeline	Phase
Feb – Dec 2023	Identification of potential overarching Worcestershire County Council actions and Worcester City Council Specific actions, feasibility filter of measures, cost benefit analysis, determination of impact, timelines and funding sources, drafting of countywide action plan
Jan – Mar 2024	Submission of Draft for review by Senior Management Team and approval by Political Committees at Worcester City Council and Worcestershire County Council and revisions
March 2024	Submission of Draft countywide AQAP inc. local AQ strategy and Worcester City Council specific actions to DEFRA
April- June 2024	3-month Public Consultation on Draft countywide AQAP following revisions
July - Sept 2024	Revisions and finalisation of countywide AQAP including local AQ strategy and Worcester City Council specific actions Consideration for revocation of AQMAs and source apportionment work for other AQMAs in 1) Bromsgrove DC 2) Wyre Forest DC 3) Wychavon DC
Sept – Oct 2024	Submission of Finalised AQAP for review by Senior Management Team and approval by Political Committees at Worcester City Council and Worcestershire County Council and revisions
Sept 2024 - Mar 2025	AQAPSG work on Bromsgrove DC and Wyre Forest DC specific actions (if required), refresh SG membership with relevant stakeholders. Identification of district specific actions, feasibility filter of measures, cost benefit analysis, determination of impact, timelines and funding sources, and draft update to AQAP. Consultation on additional chapters/amendments
Nov 2024	Publication of Finalised countywide AQAP inc. local AQ strategy & Worcester City chapter and submission to DEFRA
Mar - May 2025	Annual review for any amendments requiring further work.

Real-time Air Quality Monitoring Project

In September 2022 officers from WRS submitted an application to Defra's Air Quality Grant Scheme 2022/23. The scope of the bid was to establish an enhanced real-time air quality monitoring network across the main areas of air quality concern in Worcestershire for purposes of informing the public and vulnerable groups of the status of air pollution. The scheme would see the installation of approximately 24 'low-cost Air Quality Monitors' across the county which measure NO₂, PM₁₀, and PM_{2.5}. The results of monitoring would then be used to inform decision making and requirements for further action as necessary.

In February 2023 Defra announced that the WRS bid had been successful and the requested £248,400 was awarded. 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.

At the time of writing the project is at the procurement stage, with the tender specification close to completion. Once a successful supplier has been appointed, exact monitoring locations will be agreed, and equipment installed. This is anticipated to be in the latter stages of 2023.

Three of the monitors are to be deployed within the Wyre Forest District Council area. Locations are currently to be confirmed but are expected to represent worst case conditions in relation to road traffic and impacts from agriculture and solid fuel burning.

Welch Gate AQMA - alternative traffic rerouting

Proposals to develop a scheme to improve traffic flow in Welch Gate are included in the Infrastructure Delivery Plan for the Wyre Forest Local Plan¹⁰, adopted in April 2022.

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 (491, 450 and 456). A strategic outline business case for further funding is being prepared for submission to Midlands Connect in 2023. Further information is available via [North West Worcestershire Corridor \(NWWC\) | Worcestershire County Council](#)
- Wyre Forest Local Cycling and Walking Infrastructure Plan (LCWIP) funded through Active Travel England due to complete 2024.
- Funding secured by Wyre Forest DC for upgrades to the canal town path as an active travel route.

¹⁰ [Wyre Forest Local Plan, 2019](#)

- Health Supplementary Planning Document (SPD) in development with Wyre Forest Council, due for adoption in 2023

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

- Implementation of an enhanced monitoring network across the County to provide real time data on a range of air pollutants to go live at beginning of 2024, as detailed above

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

- Installation of additional 3 low-cost Air Quality Analysers in the district monitoring NO₂ and particulate matter as part of the County enhanced monitoring network to inform future decisions and actions.
- Supporting the development of countywide Air Quality Action Plan and Air Quality Strategy.
- Developing closer working ties with Public Health colleagues on variety of work streams: AQAP progression, campaigns such as Clean Air Day 2023 and establishing an alert system for vulnerable groups linked to the real time monitoring network.
- Adoption of Health Supplementary Planning Document (SPD)
- 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.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Wyre Forest District Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of Horsefair/Coventry Street AQMA and Bewdley AQMA.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	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	Loading and unloading restrictions during peak traffic times	Traffic Management	UTC, Congestion management, traffic reduction	2016	2016	WFDC	N/A	NO	Not funded	N/A	Completed	2 - 5%	Decrease in illegally parked vehicles	WFDC parking enforcement targeting AQMA areas.	Currently in operation
2	HGV or weight restriction on affected roads	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	2016	2016	WFDC	N/A	NO	Not funded	N/A	Completed	2%	Fewer HGV's travelling through Welch Gate AQMA	A 7.5 tonne weight limit and access only restriction is currently in operation on the B4190 Cleobury Road leading into Welch Gate.	HGVs use the B4190 for access to the B4194 (Dowles Road)
3	Promote flexible working arrangements	Promoting Travel Alternatives	Encourage / Facilitate homeworking	2017	N/A	WCC & WFDC	N/A	NO	Not funded	N/A	Implementation	1%	Increase in uptake of business travel planning services. Change in behaviour towards more sustainable modes of transport	Currently in operation	Businesses can register at www.modeshiftstars.org for business travel plans
4	Freight Quality Partnership - work with satellite navigation companies to route HGVs around AQMAs	Traffic Management	UTC, Congestion management, traffic reduction	2016	N/A	WCC	N/A	NO	Not funded	N/A	Implementation	5 - 10%	Fewer HGVs travelling through AQMAs	Implementation ongoing	It can take some time for the information to filter down to users.
5	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 59% reduction in measured NO ₂ between 2018 and 2022
6	Introduction of traffic signals at roundabouts	Traffic Management	UTC, Congestion management, traffic reduction	2018	N/A	WCC & WFDC	N/A	NO	Not funded	N/A	Pending	N/A	N/A	N/A	Proposals are included in the Infrastructure Delivery Plan
7	Installing electric vehicle charging points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2014	N/A	WRS & WFDC	N/A	NO	Not funded	N/A	Implementation	1%	Increase in availability of EV charging points and corresponding increase in use of electric vehicles	Recommendations for installation of EV Charging Points recommended by WRS and WCC on relevant planning consents.	WRS technical guidance note for planning (v.5.4 Nov22), produced on behalf of Worcestershire local authorities

Measure No.	Measure	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
8	Travel Planning	Promoting Travel Alternatives	Personalised Travel Planning	2017	2018	WCC	N/A	NO	Not funded	N/A	Completed	<1 %	Increased uptake of alternative modes of transport	WCC have developed a "one-stop-shop" online travel portal	Update 2022: WCC no longer offer personalised travel planning service, except for businesses (Measure no. 3)
9	Measures linked to walking and cycling initiatives	Promoting Travel Alternatives	Promotion of cycling	2015	2016	WFDC	N/A	NO	Not funded	N/A	Completed		Increased uptake of walking and cycling in Wyre Forest	WFDC has a web page dedicated to the promotion of walking and cycling.	N/A
10	Car Sharing	Alternatives to private vehicle use	Car & lift sharing schemes	2015	2016	WCC	N/A	NO	Not funded	N/A	Completed	<1%	Increase in number of people car sharing	LiftShare booking is available on the WCC Website	Update 2022: WCC no longer offer this service
11	Produce Air Quality Supplementary Planning	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2017	2021	WRS & District Councils	N/A	NO	Not funded	N/A	Completed	<1%	Formally adopted and utilised SPD at all six LPAs across County	Formally adopted by North Worcestershire Strategic Planning.	N/A
12	Encourage developers to provide sustainable transport facilities and links serving new developments	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2017	2021	WRS & District Councils	N/A	NO	Not funded	N/A	Completed	<1%	Formally adopted and utilised SPD	Formally adopted by North Worcestershire Strategic Planning.	N/A
13	Air quality networks	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2014	N/A	WFDC & WRS	N/A	NO	Not funded	N/A	Implementation	1%	Improved cross boundary working between Local Authorities in Worcestershire	WRS are members of the Midlands Joint Advisory Council (MJAC). Provision of AQ services to Tewkesbury Borough Council & Gloucester City Council	Update 2022: Most groups ceased during COVID-19 pandemic and have been replaced by online forums such as national AQ hub.
14	Forge closer links with local health agencies	Other	Other	2019	2019	WRS, District Councils & WCC	N/A	NO	Not funded	N/A	Completed	1%	Participation of relevant health agencies in the Worcestershire Air Quality Steering Group	Director of Public Health at Worcestershire County Council set up an air quality group in 2019 to discuss air quality issues in the County	Update 2022: Group ceased at outbreak of COVID-19 pandemic. WRS are re-engaging with PH colleagues in 2022/23 as part of various workstreams

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} 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 and it is hoped these will be in place within the next 6 to 12 months.

In February 2022 Wyre Forest District Council installed an EarthSense Systems Ltd Zephyr monitor in the Horsefair AQMA which monitors NO₂, NO_x, PM₁₀ and PM_{2.5}. This new type of sensor is MCERTS accredited for indicative particulate matter (PM₁₀ and PM_{2.5}). Details of the QA/QC are provided in Appendix C. In 2022, the sensor measured annual average concentration of 14 µg/m³ which is below the current PM_{2.5} Air Quality Standards Regulations (2010) of 20 µg/m³. 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. It is anticipated the sensors will be in place within the next 12 months.

WRS has reviewed the DEFRA national background maps to determine projected PM_{2.5} concentrations across the Wyre Forest District area for the 2022 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 7.26 µg/m³, with a minimum concentration of 6.52 µg/m³ and a maximum concentration of 8.76 µg/m³.

This indicates that PM_{2.5} concentrations within the Wyre Forest District are generally 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

Framework¹¹. The fraction of mortality attributable to particulate emissions in Wyre Forest District in 2021 (the most recent year available) was 5.1% WFDC. This falls below the national figure for England (5.5% in 2021) and below the figure for the West Midlands region (5.5% in 2021). 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 four declared smoke control areas operating within the Wyre Forest District Council area:

- Habberley
- Offmore
- Hoobrook
- Spennells.

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 no record of complaints of nuisance from smoke, dust or fumes in the Wyre Forest District in 2022

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 NO₂ levels across the District and County as part of the revised 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) published at time of producing this report.

¹¹ [Public Health Outcomes Framework - OHID \(phe.org.uk\)](#)

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

This section sets out the monitoring undertaken within 2022 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 2018 and 2022 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 two sites during 2022. This included one recognised reference method analyser monitoring nitrogen dioxide and one Zephyr Air Quality Monitor measuring NO₂, PM₁₀, 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 \(ukairquality.net\)](https://www.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 NO₂ at 53 sites during 2022. 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 (NO₂)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. 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 2022 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 NO₂ hourly mean concentrations for the past five years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year. The data shows there has been no exceedances recorded at the monitoring location, Wyre Forest House, Kidderminster, in the last 2 years.

The continuous monitor recorded an average concentration of 13.02 µg/m³, a decrease from the previous year (13.9µg/m³).

The Zephyr Air Quality Monitor located in Horsefair, Kidderminster recorded an average concentration of 25 µg/m³.

One new diffusion tube location, Z1, was established in 2022 at the same location as the Zephyr Air Quality Monitor.

All monitoring sites recorded >75% data capture and no annualisation of measured results is required. Fall off of distance to sensitive receptor from one monitoring site, TCH, has been undertaken.

Monitoring data from 2021 does not represent a standard year with the continuation of the COVID-19 pandemic, associated lockdowns and restrictions affecting travel patterns and behaviours. As such, monitoring data shows an overall increase of 3.2 $\mu\text{g}/\text{m}^3$ (13.98%) in average recorded annual mean NO_2 concentrations across the Wyre Forest District area between 2021 and 2022 (23.0 $\mu\text{g}/\text{m}^3$ in 2021 and 26.2 $\mu\text{g}/\text{m}^3$ in 2022). All diffusion tube monitoring stations in the Wyre Forest District area saw an increase in annual mean NO_2 concentrations between 2021 and 2022. This is likely to have been caused by the increase in traffic between the two periods following the cessation of all COVID-19 regulations and restrictions in March 2022. Interim traffic data from County Council indicates traffic increased by approximately 9 - 14% between 2021 – 2022 and has returned to 98% of pre-pandemic levels across the County by the beginning of 2023.

At this time, it is unclear if some enforced behaviours during the pandemic decreasing 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.

Measured concentrations at diffusion tube locations in 2022 are generally in line with 2019 data, on average -0.5 $\mu\text{g}/\text{m}^3$ and -0.40% 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 2022 measured concentrations with pre-pandemic levels it is considered appropriate to compare with 2018 recorded data which averages concentrations of 6.8 $\mu\text{g}/\text{m}^3$ and 17% higher than 2022 data across Wyre Forest District.

There are two notable outliers in the data at locations HF(K) and HF(K) (F) which have both measured significant reductions in 2022 compared with pre-pandemic levels: HF(K) demonstrates reduction in 2022 of 32.9 $\mu\text{g}/\text{m}^3$ (54%), and HF(K) (F) 40.7 $\mu\text{g}/\text{m}^3$ (59%) below 2018 records. 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. However, it is considered the reduced measurements in 2022 also include continuing impact of COVID-19 e.g., reduced journeys and potentially mild climate fluctuations at the beginning of that year. Therefore, further monitoring data is required to determine if this trend continues in future years.

In 2022, the highest concentration of NO₂ recorded across the Wyre Forest District area was 39.3 µg/m³ at (F) 69COV (located in the Horsefair/Coventry Street AQMA). This location was also the highest measured concentration in the area in 2021 (35.1 µg/m³). Given the concentration recorded is just below the AQ objective and the need for further monitoring to determine trends following the pandemic throughout the AQMA, no amendments to the Horsefair/Coventry Street AQMA are proposed at this time.

In Bewdley, the maximum concentration of NO₂ is 37.9 µg/m³ in 2022 and was recorded within the Welch Gate AQMA. This is very similar to pre-pandemic levels in 2019, though - 7.3 µg/m³ and -20% below 2018 data. Although the AQMA has not demonstrated an exceedance for 4 years the AQMA should remain at this time and continued to be monitored to determine post pandemic trends.

No other areas have recorded NO₂ above -10% of the AQS objective when considering distance to nearest receptor with exception of location (F)FBS(S) in Stourport at 36.6 µg/m³.

No exceedances of the annual mean objective were recorded within Wyre Forest District Council during 2022. No annual means greater than 60 µg/m³ have been recorded indicating that it is very unlikely that there have been any exceedances of the 1-hour mean objective for NO₂ at any diffusion tube monitoring sites.

3.2.2 Particulate Matter (PM₁₀)

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. The location and 2022 monitoring results for PM₁₀ are shown in Table A.6 and Table A.7 in Appendix A.

The monitor recorded annual mean PM₁₀ of 14.0 µg/m³ following commissioning of the site on 23rd February 2022. 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 14.0 µg/m³ following

commissioning of the site on 23rd February 2022. 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	No	Chemiluminescent Detection	2.98	11.01	1.50m
Zephyr1	Horsefair, Kidderminster	Roadside	383319	277122	NO ₂ , PM ₁₀ , PM _{2.5}	Horsefair/ Coventry St	NO ₂ – Chemiluminescent; PM - light scattering	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)
WFH1/2/3	Co-Location Study Wyre Forest House	Roadside	381768	273551	NO2	No	N/A	11.0	Yes	1.5
HLR1	139 Stourport Road, Kidderminster	Roadside	382148	274587	NO2	No	0.0	18.6	No	1.7
SR113	113 Stourport Rd, Kidderminster	Roadside	382342	275054	NO2	No	2.6	2.4	No	2.3
(F) 69COV	69 Coventry Street Kidderminster	Roadside	383552	276870	NO2	Horsefair/Coventry Street AQMA	0.0	5.5	No	1.8
(F)SGC	6/7 St George's Court Kidderminster	Roadside	383475	276760	NO2	Horsefair/Coventry Street AQMA	0.0	10.0	No	1.8
K1	50 Radford Avenue, Kidderminster	Roadside	383391	277086	NO2	Horsefair/Coventry Street AQMA	0.0	2.1	No	2.5
21HF	21 Horsefair Kidderminster	Roadside	383338	277215	NO2	Horsefair/Coventry Street AQMA	0.0	4.7	No	3.0
Z1	6 Dudley Street, Horsefair Kidderminster	Roadside	383319	277122	NO2	Horsefair/Coventry Street AQMA	0.5	1.6	No	2.4
HF(K)	Peacock PH, Blackwell Street Horsefair	Roadside	383311	277087	NO2	Horsefair/Coventry Street AQMA	0.0	2.5	No	2.5
HF(K) (F)	Hudson Florists Blackwell Street	Roadside	383304	277071	NO2	Horsefair/Coventry Street AQMA	0.0	2.5	No	2.5
K4	1 Silver Street Kidderminster	Urban Background	383337	276998	NO2	Horsefair/Coventry Street AQMA	0.0	18.2	No	2.4
SBR121	121 Stourbridge Road Kidderminster	Roadside	383905	277857	NO2	No	0.0	2.4	No	2.7

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)
334CRN	334 Chester Road North Kidderminster	Roadside	383965	277823	NO2	No	0.0	3.1	No	2.2
294CRN	Cambrian House, 294 Chester Road North Kidderminster	Roadside	384054	277444	NO2	No	0.0	11.0	No	1.6
383CRN	383 Chester Road North Kidderminster	Roadside	384175	277275	NO2	No	0.0	11.0	No	2.4
239CRN	239 Chester Road North Kidderminster	Roadside	384221	276911	NO2	No	0.0	6.1	No	1.6
CSLOC	Land Oak Court, Coventry St	Roadside	384205	277121	NO2	No	0.0	7.9	No	1.9
K3	53 Coventry Street, DY10 1RN	Roadside	383726	276909	NO2	Horsefair/Coventry Street AQMA	0.0	2.7	No	1.3
K2	34 Leswell Lane, Coventry Street	Roadside	383657	276890	NO2	Horsefair/Coventry Street AQMA	0.0	3.1	No	1.8
CAS1	Caspers Polish Shop 99 Comberton Hill Kidderminster	Roadside	383636	276377	NO2	No	1.5	2.7	No	2.5
CR1	Cuts4Scruffs, 29 Comberton Hill	Roadside	383696	276388	NO2	No	0.0	4.6	No	3.0
CR2	Severn Valley Lock & Safe, 9/10 Comberton Road	Roadside	383890	276333	NO2	No	0.0	3.4	No	2.0
(F)COMR(K)	Holmwood, Comberton Road Kidderminster	Roadside	384214	276242	NO2	No	13.5	3.5	No	2.2

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)
CRS1	King Charles 1 School J A449 & A448 Kidderminster	Roadside	384129	276263	NO2	No	32.6	3.3	No	2.3
TCH	Top Comberton Hill Kidderminster	Roadside	384086	276228	NO2	No	1.0	2.0	No	2.0
PL2	2 Pelham Lodge Kidderminster	Roadside	384065	276196	NO2	No	5.5	10.4	No	1.8
CR3	20 Comberton Road Kidderminster	Roadside	384069	276304	NO2	No	0.0	13.1	No	1.9
470CRN	470 Chester Road North Kidd	Roadside	384154	276340	NO2	No	0.0	4.9	No	1.9
SP(K)	Jay Park Crescent Spennells	Urban Background	384486	274596	NO2	No	11.0	1.7	No	2.3
50CRS	50 Chester Road South Kidderminster	Roadside	383699	275251	NO2	No	0.0	14.6	No	1.6
100CRS	100 Chester Road South Kidd	Roadside	383766	275723	NO2	No	0.0	12.5	No	1.6
(F)447S	447 Stourport Road Kidderminster	Roadside	382447	275506	NO2	No	0.0	10.6	No	1.7
SR(K)	431 Stourport Road, Kidderminster	Roadside	382429	275315	NO2	No	9.0	3.0	No	2.3
SPR2	Flat 2, Park House, Sutton Park Road	Roadside	382496	275417	NO2	No	0.0	7.0	No	1.7
SRLEC	Lucy Edwards Court, Sutton Road, Kidderminster	Roadside	382183	276388	NO2	No	0.0	9.5	No	2.0

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)
BH166	166 Bewdley Hill DY11 6BA	Roadside	382135	276409	NO2	No	2.0	5.0	No	2.2
(F)BR(K)	52 Bewdley Road DY11 6RL	Roadside	382437	276542	NO2	No	0.0	6.5	No	1.7
HAB203	203 Habberley Lane DY11 5JR	Roadside	381713	278069	NO2	No	0.0	3.1	No	1.5
(F)GIL	10 The Gilgal Stourport	Roadside	381482	271534	NO2	No	0.0	2.0	No	2.3
(F)LSNS(S)	Lumsdons Solicitors, New Street, Stourport	Roadside	380957	271284	NO2	No	0.0	1.5	No	2.3
(F)FBS(S)	Flamingo's, 21 Bridge Street, Stourport	Roadside	380933	271247	NO2	No	0.0	1.9	No	2.4
HS(S)	High Street / York Street corner Stourport	Roadside	380974	271268	NO2	No	0.0	4.0	No	2.8
(F)25YS(S)	Stourport Nails Centre, 22 York Street, Stourport	Roadside	380990	271268	NO2	No	0.0	1.5	No	2.5
(F)19YS(S)	19 York Street, Stourport	Roadside	381086	271268	NO2	No	0.0	1.7	No	2.3
KSW(S)	Kodak Spectacles Warehouse, High Street Stourport	Roadside	381072	271347	NO2	No	0.0	4.0	No	2.3
HS15(S)	15 High Street Stourport	Roadside	381114	271380	NO2	No	0.0	2.2	No	2.3
HS4(S)	4 High Street Stourport	Roadside	381169	271420	NO2	No	0.0	4.4	No	2.4
A1	35 High Street Stourport	Roadside	380989	271298	NO2	No	0.0	3.2	No	2.4
KID22(B)	22 Kidderminster Road	Roadside	373996	275464	NO2	No	0.0	3.0	No	2.4

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)WG42	42 Welch Gate, Bewdley	Roadside	378383	275328	NO2	No	0.0	1.7	No	2.5
WG(B)	88 Welch Gate, Bewdley	Roadside	378465	275292	NO2	Welch Gate, Bewdley	0.0	0.9	No	2.5
LS(B)	Melting Pot Load Street, Bewdley	Roadside	378590	275302	NO2	No	0.0	3.0	No	2.5
B1	Adam & Eves, Load Street, Bewdley	Roadside	378513	275317	NO2	No	0.0	1.1	No	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 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
WFH	381768	273551	Roadside	95.6	95.6	-	-	-	13.9	13.02

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

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 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
WFH1/2/3	381768	273551	Roadside	100	100.0				10.6	13.3
HLR1	382148	274587	Roadside	100	100.0	20.9	17.7	14.3	16.9	18.2
SR113	382342	275054	Roadside	100	100.0	33.6	27.7	24.5	27.9	30.0
(F) 69COV	383552	276870	Roadside	100	100.0	50.6	42.2	34.5	35.1	39.3
(F)SGC	383475	276760	Roadside	80.8	80.8	31.6	26.9	22.1	24.8	28.4
K1	383391	277086	Roadside	100	100.0	23.0	19.9	16.9	16.9	19.8
21HF	383338	277215	Roadside	100	100.0		22.5	21.2	23.5	27.2
Z1	383319	277122	Roadside	75	75.0					22.1
HF(K)	383311	277087	Roadside	100	100.0	60.9	50.5	28.4	24.4	28.0
HF(K) (F)	383304	277071	Roadside	92.3	92.3	68.5	54.0	29.6	25.9	27.9
K4	383337	276998	Urban Background	92.3	92.3	26.6	22.6	19.6	18.2	22.7
SBR121	383905	277857	Roadside	100	100.0	32.2	27.0	22.6	25.8	29.2
334CRN	383965	277823	Roadside	100	100.0		29.0	26.4	29.3	33.3
294CRN	384054	277444	Roadside	100	100.0		20.0	16.3	18.0	20.3
383CRN	384175	277275	Roadside	100	100.0		18.3	15.7	16.4	18.7
239CRN	384221	276911	Roadside	82.7	82.7		19.2	16.2	17.0	20.2
CSLOC	384205	277121	Roadside	84.6	84.6	32.5	27.6	23.4	24.2	27.3
K3	383726	276909	Roadside	90.4	90.4	38.0	30.1	25.3	27.3	29.5
K2	383657	276890	Roadside	92.3	92.3	23.2	20.0	16.2	17.0	21.4
CAS1	383636	276377	Roadside	100	100.0	40.5	34.4	26.4	29.7	35.7
CR1	383696	276388	Roadside	92.3	92.3	31.1	28.8	22.9	26.2	28.1
CR2	383890	276333	Roadside	92.3	92.3	35.8	29.5	22.8	26.4	29.7
(F)COMR(K)	384214	276242	Roadside	100	100.0	32.2	29.0	22.9	27.3	31.1
CRS1	384129	276263	Roadside	92.3	92.3			18.3	21.8	24.7
TCH	384086	276228	Roadside	100	100.0	48.8	38.7	28.8	31.9	37.8
PL2	384065	276196	Roadside	100	100.0			12.6	13.7	16.2
CR3	384069	276304	Roadside	100	100.0	23.7	20.7	16.0	19.4	22.1
470CRN	384154	276340	Roadside	100	100.0	34.0	29.1	22.3	24.5	28.3
SP(K)	384486	274596	Urban Background	90.4	90.4	12.5	11.1	9.4	9.7	11.5
50CRS	383699	275251	Roadside	100	100.0		16.6	13.0	13.5	15.5
100CRS	383766	275723	Roadside	100	100.0		14.8	11.2	12.6	15.0

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 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
(F)447S	382447	275506	Roadside	100	100.0	24.8	21.0	18.0	19.6	21.5
SR(K)	382429	275315	Roadside	100	100.0	41.7	35.0	28.3	32.9	33.7
SPR2	382496	275417	Roadside	90.4	90.4	34.0	29.5	23.1	24.5	28.7
SRLEC	382183	276388	Roadside	100	100.0	35.7	27.9	22.9	25.0	29.6
BH166	382135	276409	Roadside	100	100.0	30.5	25.6	19.6	21.6	23.2
(F)BR(K)	382437	276542	Roadside	100	100.0	31.5	25.3	19.8	22.3	25.6
HAB203	381713	278069	Roadside	100	100.0	32.9	25.4	18.9	21.9	25.4
(F)GIL	381482	271534	Roadside	100	100.0	28.6	24.1	20.6	22.4	25.4
(F)LSNS(S)	380957	271284	Roadside	100	100.0	30.1	22.5	18.5	21.0	24.2
(F)FBS(S)	380933	271247	Roadside	100	100.0	42.8	34.0	28.3	31.9	36.6
HS(S)	380974	271268	Roadside	100	100.0	38.7	31.7	24.7	27.6	31.8
(F)25YS(S)	380990	271268	Roadside	100	100.0	36.7	28.4	23.1	24.8	29.1
(F)19YS(S)	381086	271268	Roadside	100	100.0	28.8	23.5	19.0	21.4	24.3
KSW(S)	381072	271347	Roadside	100	100.0	31.8	27.2	21.5	23.7	28.6
HS15(S)	381114	271380	Roadside	100	100.0	31.4	26.5	21.7	23.8	28.2
HS4(S)	381169	271420	Roadside	100	100.0	33.4	27.8	21.6	23.6	27.8
A1	380989	271298	Roadside	76.9	76.9	42.2	34.8	27.0	29.1	33.6
KID22(B)	373996	275464	Roadside	90.4	90.4	36.3	28.3	22.6	25.4	29.0
(F)WG42	378383	275328	Roadside	100	100.0	30.0	25.0	19.4	21.7	24.8
WG(B)	378465	275292	Roadside	100	100.0	45.6	37.4	29.4	31.9	37.9
LS(B)	378590	275302	Roadside	100	100.0	34.0	27.6	20.9	24.0	27.5
B1	378513	275317	Roadside	100	100.0	36.4	29.9	23.0	27.0	30.7

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 $\mu\text{g}/\text{m}^3$.

Exceedances of the NO₂ annual mean objective of $40\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 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 in Wyre Forest District

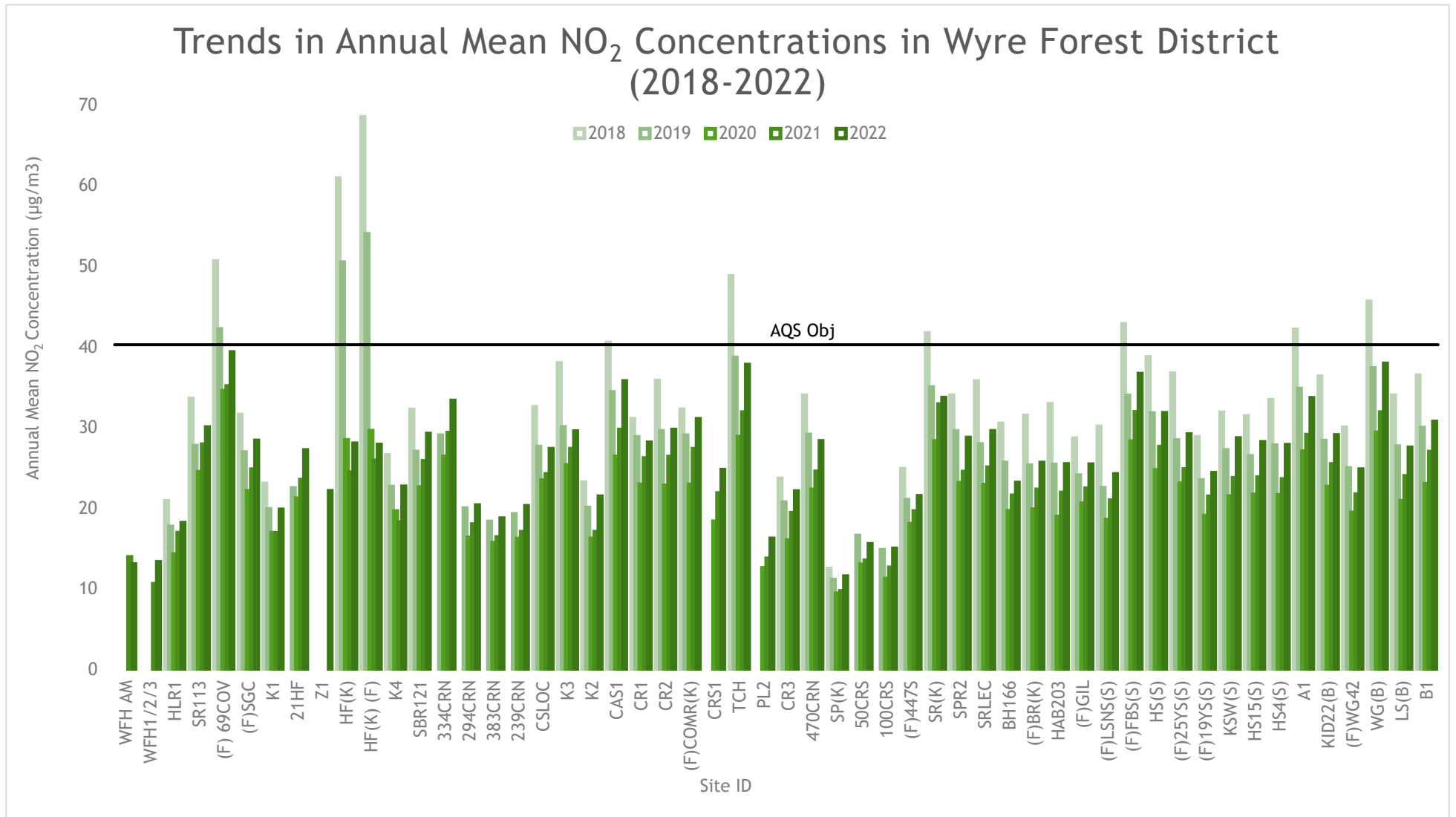


Figure A.2 – Trends in Annual Mean NO₂ Concentrations in Horsefair/Coventry Street AQMA

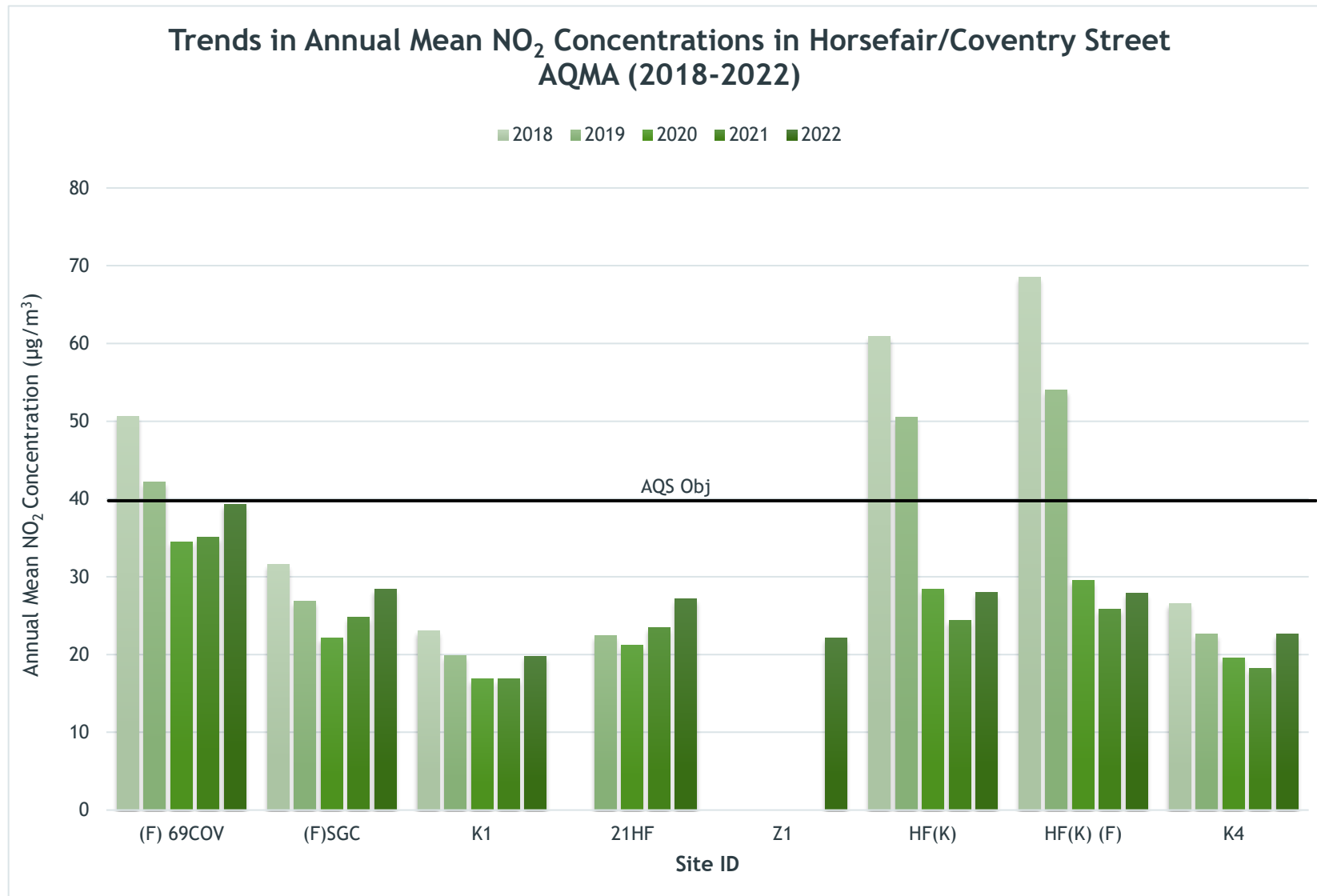


Figure A.3 – Trends in Annual Mean NO₂ Concentrations in Kidderminster excluding locations within AQMA

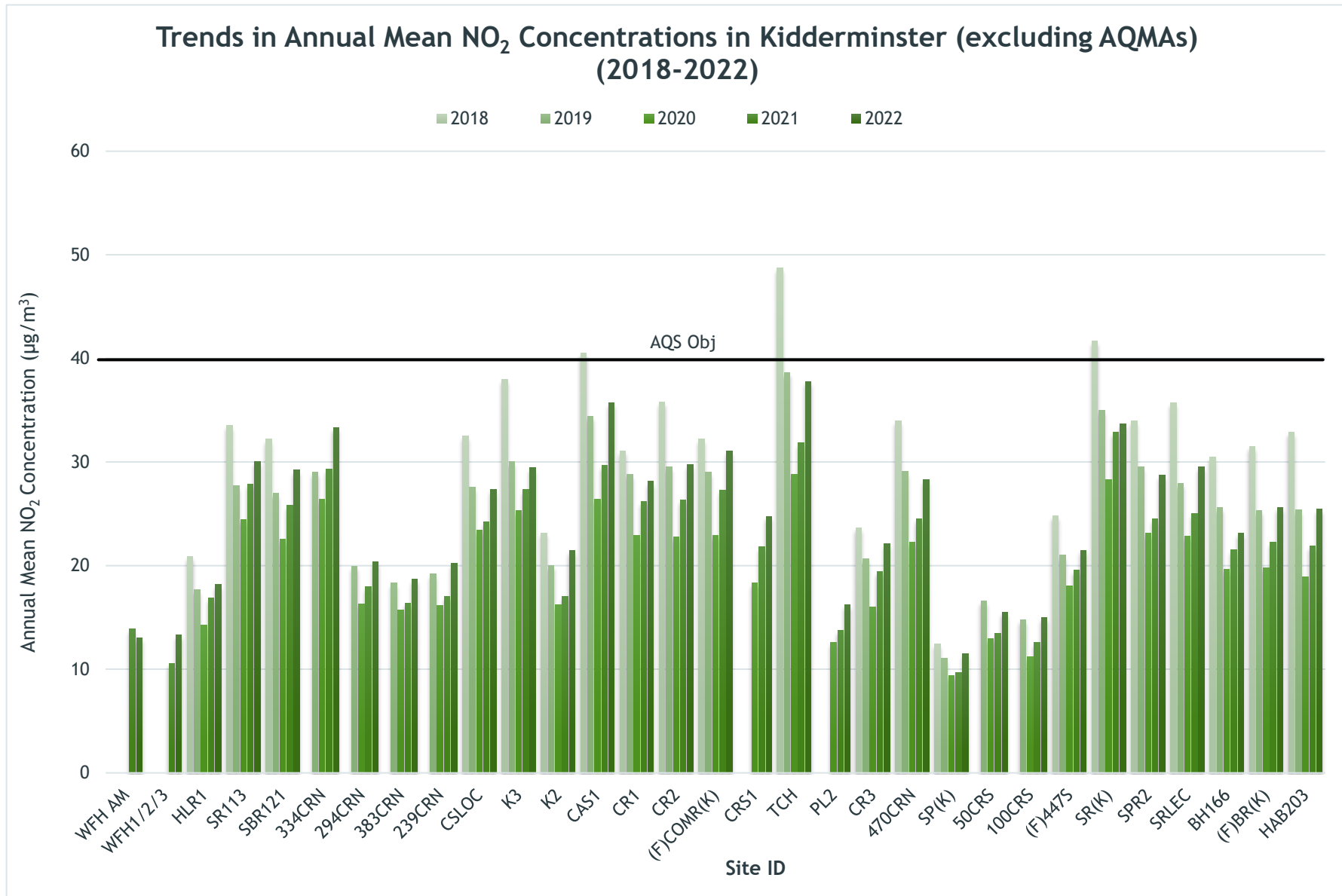


Figure A.4 – Trends in Annual Mean NO₂ Concentrations in Stourport on Severn

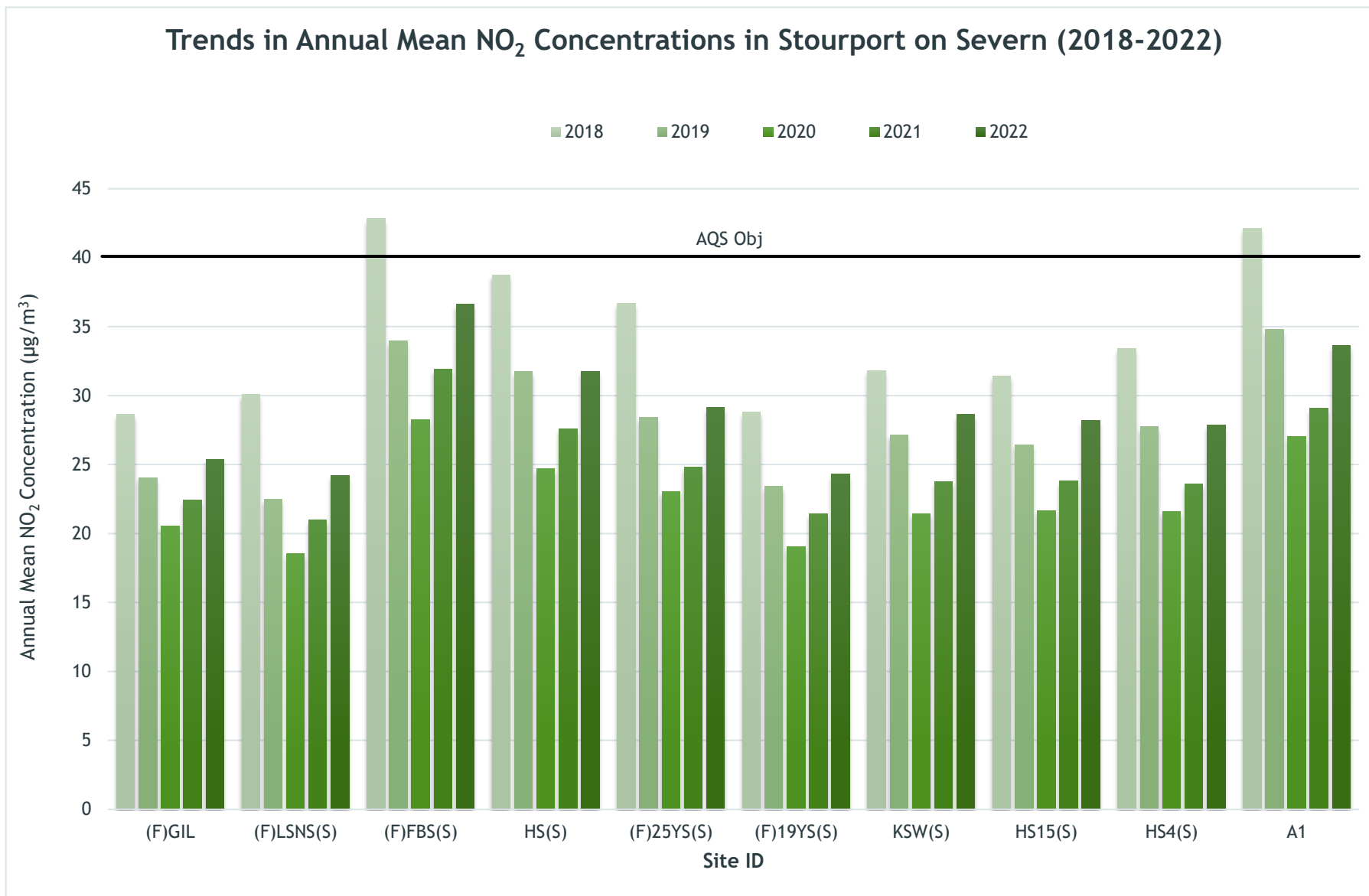


Figure A.5 – Trends in Annual Mean NO₂ Concentrations in Bewdley

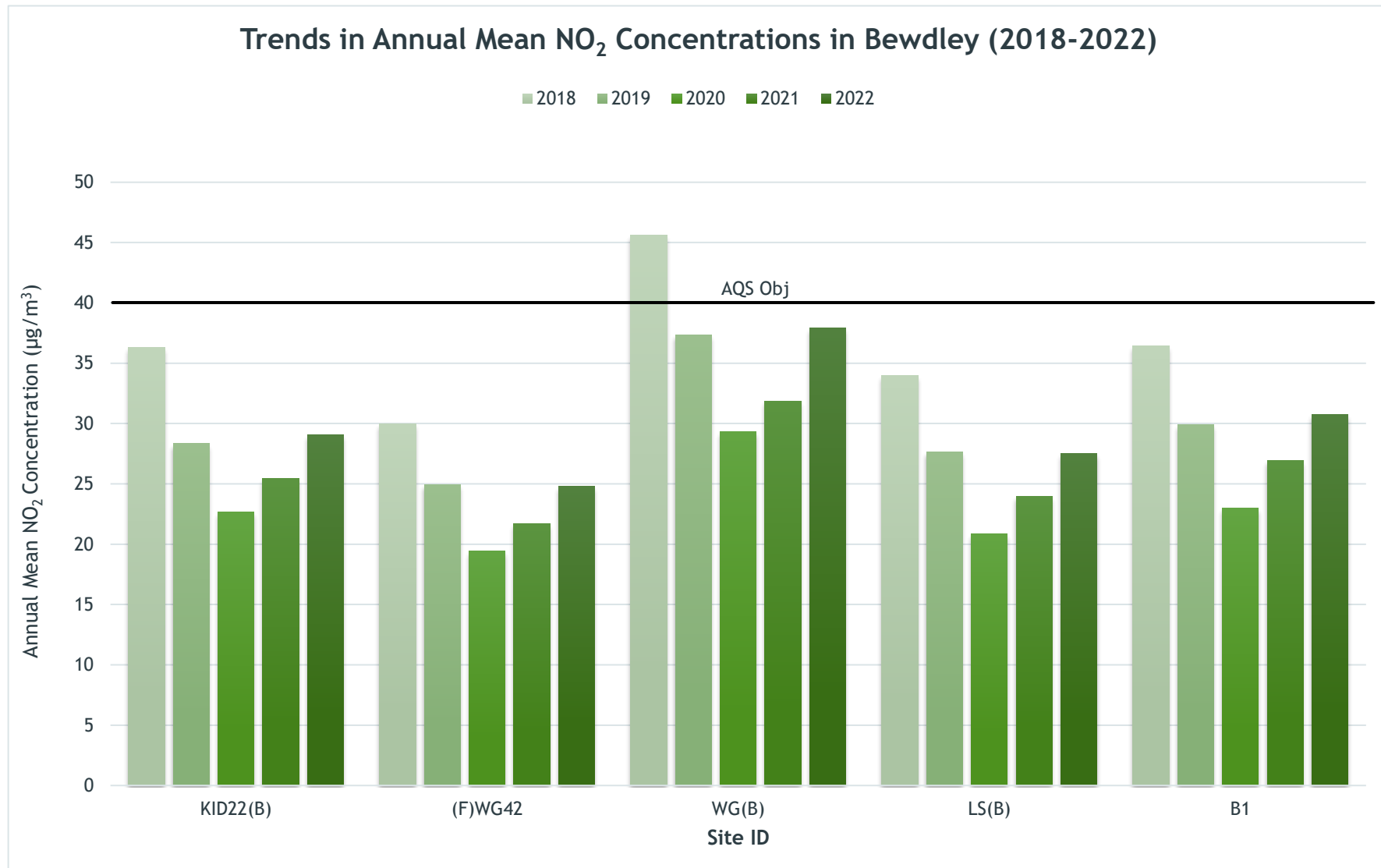


Table A.5 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
WFH	381768	273551	Roadside	95.6	95.6	-	-	-	0	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m³ have been recorded.

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ 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 PM₁₀ Monitoring Results (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 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
Zephyr1	383319	277122	Roadside	99.4%	92.7%					14.0

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/m³.

Exceedances of the PM₁₀ 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.

(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 PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg/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 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
Zephyr1	383319	277122	Roadside	99.4%	92.7%					0

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m³ have been recorded.

Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ 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/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 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
Zephyr1	383319	277122	Roadside	99.4%	92.7%					14.0

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/m³.

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 2022

Table B.1 – NO₂ 2022 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	21.1	9.5	20.5	14.4	8.1	7.0	10.0	12.1	12.7	13.3	15.4	21.8	13.8	13.4		
WFH2	381768	273551	19.6	9.2	20.9	15.3	8.0	7.1	9.6	11.9	12.9	12.6	16.3	21.3	13.7	13.3		
WFH3	381768	273551	19.0	9.5	19.1	15.3	8.0	7.0	9.6	12.8	12.8	13.2	15.4	20.2	13.5	13.1		
HLR1	382148	274587	23.5	14.6	23.9	18.7	13.5	11.1	14.3	17.9	18.9	19.3	22.5	26.5	18.7	18.2		
SR113	382342	275054	38.0	32.4	31.0	28.2	27.1	26.0	29.5	26.6	26.4	30.4	37.4	38.6	31.0	30.0		
(F) 69COV	383552	276870	45.8	38.3	44.4	34.3	29.7	36.4	42.1	42.4	40.8	41.6	46.5	44.6	40.6	39.3		
(F)SGC	383475	276760	36.9	25.7	31.5			23.3	25.6	27.5	29.4	28.2	31.4	33.0	29.2	28.4		
K1	383391	277086	29.8	21.7	23.9	16.2	14.7	13.6	15.2	16.1	17.5	21.2	26.6	28.5	20.4	19.8		
21HF	383338	277215	42.8	29.0	28.5	22.5	22.0	20.8	24.8	25.4	26.0	26.4	31.6	36.8	28.0	27.2		
Z1	383319	277122			26.6		15.9	15.6	20.1	18.8	21.0	25.2	30.4	31.5	22.8	22.1		
HF(K)	383311	277087	36.1	28.9	32.0	24.2	22.5	22.0	26.1	25.4	26.3	30.4	33.5	39.3	28.9	28.0		
HF(K) (F)	383304	277071	35.8		30.9	28.3	24.4	24.1	30.0	18.2	27.9	32.6	28.5	35.2	28.7	27.9		
K4	383337	276998	29.7	25.0		18.4	17.3	17.0	18.6	27.0	19.7	23.7	30.0	30.6	23.4	22.7		
SBR121	383905	277857	37.8	28.5	32.5	28.0	24.4	22.7	29.6	28.5	30.2	31.6	30.8	37.0	30.1	29.2		
334CRN	383965	277823	39.2	27.4	39.7	32.5	27.9	28.3	31.9	36.6	36.3	34.1	39.6	38.7	34.3	33.3		
294CRN	384054	277444	27.7	21.9	21.1	18.4	16.3	15.1	16.5	17.3	18.1	23.8	26.0	29.6	21.0	20.3		
383CRN	384175	277275	26.6	15.0	25.3	16.3	12.9	11.5	13.7	17.5	18.6	21.1	24.1	28.8	19.3	18.7		
239CRN	384221	276911	28.1	18.8	23.6	18.3			15.5	16.0	17.7	19.8	23.4	27.4	20.9	20.2		
CSLOC	384205	277121	32.8	28.2	28.2	25.2	24.0			24.9	25.4	28.0	31.9	33.2	28.2	27.3		
K3	383726	276909	35.3	22.2	37.7	29.9		22.4	27.9	31.6	32.6	28.6	30.2	36.1	30.4	29.5		
K2	383657	276890	26.5	20.5	27.9	19.2	15.3		17.5	19.3	20.4	21.9	25.8	28.7	22.1	21.4		
CAS1	383636	276377	47.0	39.4	37.3	31.2	30.8	28.2	34.6	30.3	36.4	39.0	44.2	43.9	36.8	35.7		
CR1	383696	276388	37.1	25.5	35.6	30.3	22.3	20.4	27.4	30.8	30.7	25.1		33.8	29.0	28.1		
CR2	383890	276333		25.8	35.4	34.3	25.6	22.5	31.2	33.3	36.6	27.5	29.6	35.5	30.6	29.7		
(F)COMR(K)	384214	276242	45.8	31.5	39.0	26.0	25.3	25.1	27.8	26.8	30.8	30.8	40.7	34.6	32.0	31.1		
CRS1	384129	276263	35.4	23.4	32.1	27.2	19.7	17.0	23.0	25.2	26.3	21.6		29.6	25.5	24.7		
TCH	384086	276228	47.0	35.7	43.3	37.2	32.3	34.0	35.8	39.9	39.1	38.2	38.8	45.9	38.9	37.8	35.1	

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
PL2	384065	276196	23.4	14.3	22.8	17.1	11.1	9.7	12.8	14.9	16.5	16.4	17.6	24.0	16.7	16.2		
CR3	384069	276304	30.6	19.6	36.7	20.6	16.8	14.3	18.5	20.7	21.4	21.6	24.2	28.3	22.8	22.1		
470CRN	384154	276340	35.3	27.4	26.8	27.6	23.9	22.7	25.4	28.0	26.2	32.7	37.2	36.8	29.2	28.3		
SP(K)	384486	274596	18.4	9.1	14.6	11.1		6.4	8.3	10.0	10.4	10.3	12.7	19.1	11.9	11.5		
50CRS	383699	275251	22.1	12.7	21.5	14.3	10.9	9.2	13.4	14.4	14.7	16.2	19.2	23.4	16.0	15.5		
100CRS	383766	275723	23.5	15.0	17.8	13.8	10.6	10.0	12.2	13.3	14.1	15.4	17.3	22.2	15.4	15.0		
(F)447S	382447	275506	28.9	19.4	24.0	20.9	18.4	18.0	20.5	22.3	21.9	18.7	24.3	28.7	22.2	21.5		
SR(K)	382429	275315	44.7	29.5	36.6	32.9	27.0	26.4	30.9	34.6	35.9	34.9	39.1	44.3	34.7	33.7		
SPR2	382496	275417	34.7	28.3	33.5	26.0	25.6	28.3	24.6	23.6	28.7	34.6	37.8		29.6	28.7		
SRLEC	382183	276388	40.0	33.1	33.7	28.9	26.4	22.1	28.7	28.7	28.2	28.8	31.7	35.5	30.5	29.6		
BH166	382135	276409	32.4	19.7	30.5	24.6	18.9	11.7	19.1	23.1	21.3	26.1	28.5	30.5	23.9	23.2		
(F)BR(K)	382437	276542	32.8	22.0	31.9	24.2	20.3	17.0	22.6	24.6	26.0	28.1	32.8	34.5	26.4	25.6		
HAB203	381713	278069	33.1	21.2	30.5	23.3	21.9	21.5	24.0	26.9	28.4	24.1	28.2	31.8	26.2	25.4		
(F)GIL	381482	271534	37.8	19.2	30.6	23.4	18.9	18.6	21.4	24.0	25.0	24.7	34.2	36.4	26.2	25.4		
(F)LSNS(S)	380957	271284	27.7	18.2	31.5	27.3	20.8	18.2	23.1	27.3	23.0	22.3	29.2	30.7	24.9	24.2		
(F)FBS(S)	380933	271247	43.2	37.2	36.8	36.5	34.4	30.9	39.8	42.8	40.9	32.5	38.2	40.0	37.8	36.6		
HS(S)	380974	271268	34.2	24.2	38.6	32.0	27.0	26.2	30.7	36.2	33.5	33.2	40.2	37.2	32.8	31.8		
(F)25YS(S)	380990	271268	37.7	25.1	35.4	26.9	26.8	25.6	28.4	30.7	29.8	28.9	31.0	34.2	30.0	29.1		
(F)19YS(S)	381086	271268	31.6	25.8	27.1	25.5	22.8	21.6	23.4	24.9	22.9	21.1	27.0	27.3	25.1	24.3		
KSW(S)	381072	271347	31.5	21.9	39.7	30.1	24.6	21.4	25.3	31.7	28.7	30.3	35.1	34.2	29.5	28.6		
HS15(S)	381114	271380	37.7	23.6	34.9	28.0	25.5	21.5	26.3	28.3	27.4	28.6	33.3	33.8	29.1	28.2		
HS4(S)	381169	271420	22.5	26.6	36.6	27.2	24.5	22.3	26.8	26.6	28.4	34.1	34.7	34.4	28.7	27.8		
A1	380989	271298	42.7	29.5		32.7	34.3	32.3	37.6			30.1	35.8	37.1	34.7	33.6		
KID22(B)	373996	275464	35.4	28.9	33.7	29.9	27.3	24.3	27.0	31.1	28.2	29.9	33.6		29.9	29.0		
(F)WG42	378383	275328	33.5	23.9	30.0	25.6	19.9	17.7	22.1	25.5	25.2	25.1	26.6	31.9	25.6	24.8		
WG(B)	378465	275292	46.4	34.0	42.7	38.9	35.9	30.9	33.5	38.9	42.8	39.8	43.2	42.4	39.1	37.9		
LS(B)	378590	275302	33.1	22.2	33.3	28.1	22.6	22.6	26.8	29.3	28.7	28.5	31.5	33.6	28.3	27.5		
B1	378513	275317	38.8	26.5	36.0	31.5	26.6	23.2	29.3	33.3	34.5	29.4	36.7	34.3	31.7	30.7		

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 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 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 2022

Wyre Forest 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 Wyre Forest 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 Wyre Forest District Council in 2022 are as follows:

Application Number	Location	Description of development
22/0226/EIA	Land at Comberton Road, Kidderminster, Worcestershire	1450 dwellings to comprise: Outline application for up to 1,055 dwellings, a community hub, a primary school, community and health facilities, retail provision up to 800 sqm, new vehicular access to Husum Way and Comberton Road with link road, new pedestrian access to Tennyson Way, open space; Full planning application for 395 dwellings, new vehicular access onto Comberton Road; open space.
22/0404/OUT	Land at Lea Castle Drive, Lea Castle, Kidderminster, Worcestershire,	Up to 800 dwellings, around 7ha for employment uses, primary school/education use, retail floor space, community uses and care home provision, as part of a mixed use village centre, public open space, outdoor sport/recreation, orchard, additional green infrastructure

Additional Air Quality Works Undertaken by Wyre Forest District Council During 2022

Wyre Forest District Council has not completed any additional works within the reporting year of 2022.

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 NO₂ 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

Annualisation has not been required for any monitoring sites in 2022.

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/NO₂ 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 2022 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 (0.83, Defra published National Diffusion Tube Bias Adjustment Spreadsheet Version 03/23), 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
2022	Local	-	0.97
2021	National	03/21	0.84
2020	National	03/21	0.81
2019	National	03/20	0.78
2018	National	03/19	0.89

Table C.2 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	11				
Bias Factor A	0.97 (0.92 - 1.04)				
Bias Factor B	3% (-4% - 9%)				
Diffusion Tube Mean ($\mu\text{g}/\text{m}^3$)	13.0				
Mean CV (Precision)	2.7%				
Automatic Mean ($\mu\text{g}/\text{m}^3$)	12.7				
Data Capture	100%				
Adjusted Tube Mean ($\mu\text{g}/\text{m}^3$)	13 (12 - 14)				

Notes:

A single local bias adjustment factor has been used to bias adjust the 2022 diffusion tube results.

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1 and the calculation is shown below in Table C.4.

Table C.3 – NO₂ 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	37.8	9.6	35.1	

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 97.3%. The 2022 data has been fully ratified and is available on [Air Quality in the United Kingdom \(ukairquality.net\)](https://ukairquality.net).

Similar Local Site Operator (LSO) duties are not required for the Zephyr monitor. Maintenance and servicing of the analyser is undertaken by Enviro Technology Services on behalf of Wyre Forest District Council.

The Zephyr unit has been calibrated and checked for performance against a reference grade continuous monitoring air quality station, which is serviced and maintained by Enviro Technology Services, before being installed on site.

The period data capture was 99.4%. The 2022 data has been fully ratified and is available on [Air Quality in the United Kingdom \(ukairquality.net\)](https://ukairquality.net).

PM₁₀ and PM_{2.5} Monitoring Adjustment

The type of PM₁₀/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.

NO₂ Fall-off with Distance from the Road

No automatic NO₂ 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

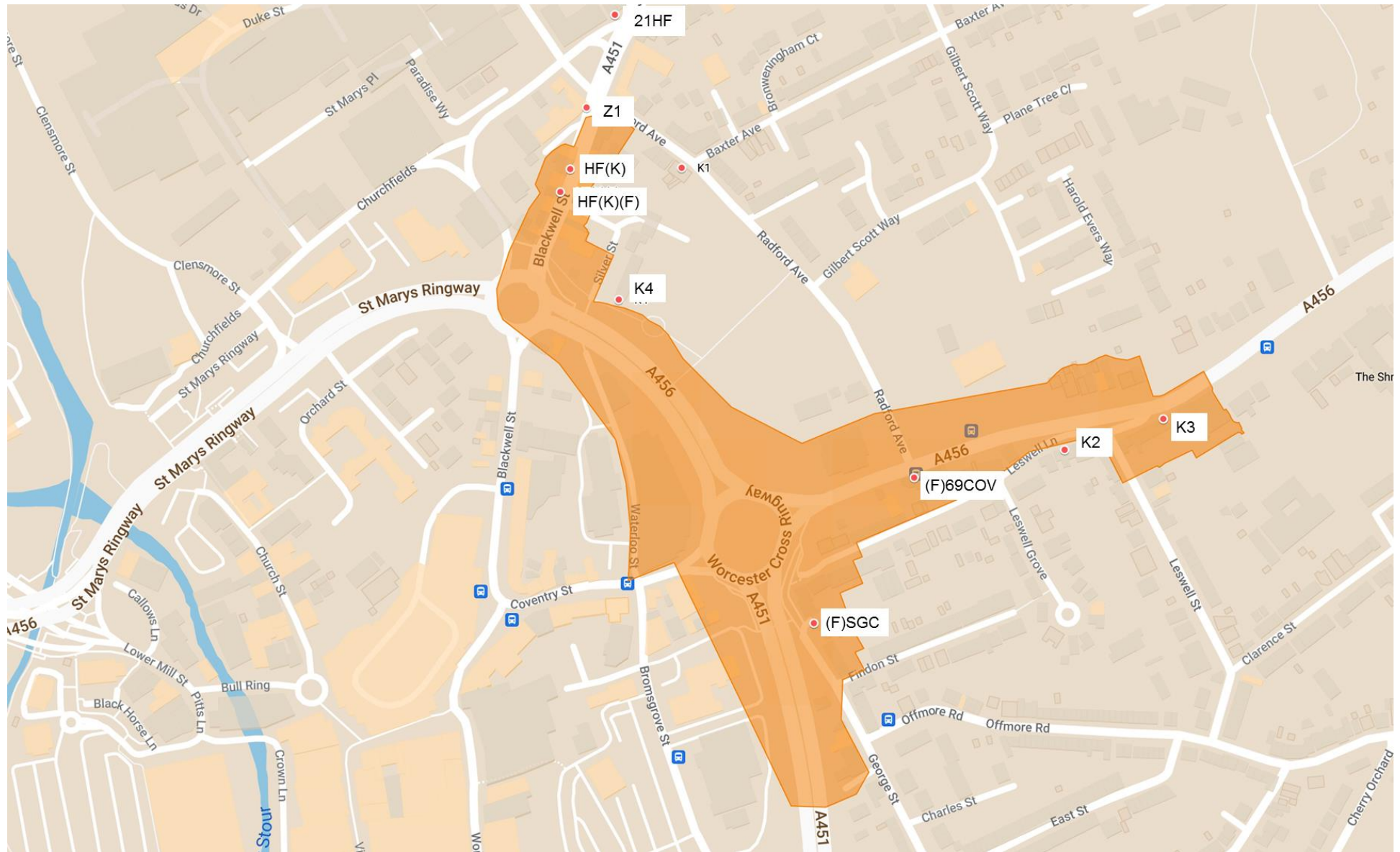


Figure D.2 – Map of Welch Gate AQMA and Monitoring Locations

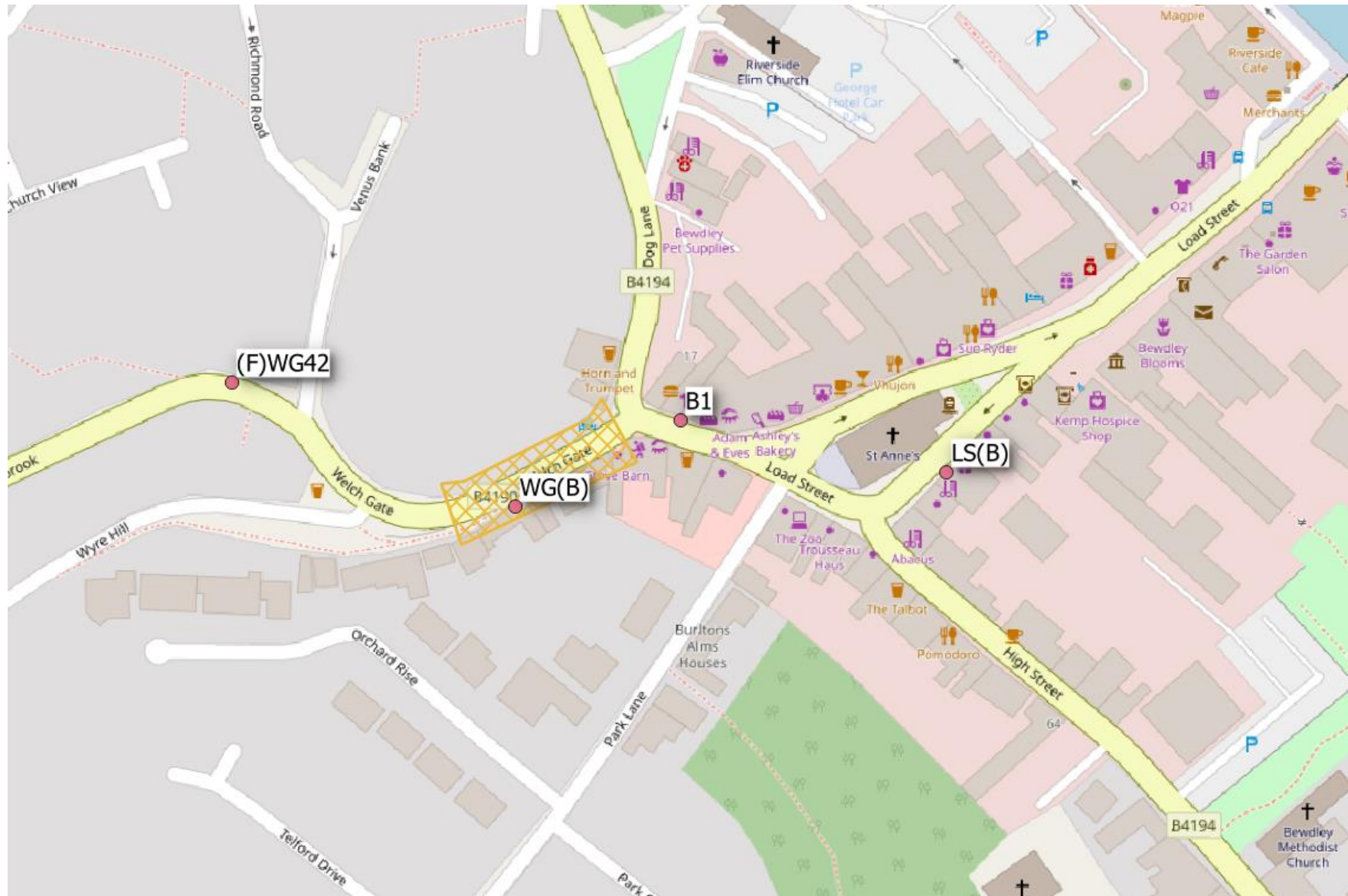


Figure D.3 – Map of Chester Road North (A449). East of Kidderminster Town Centre Monitoring Locations

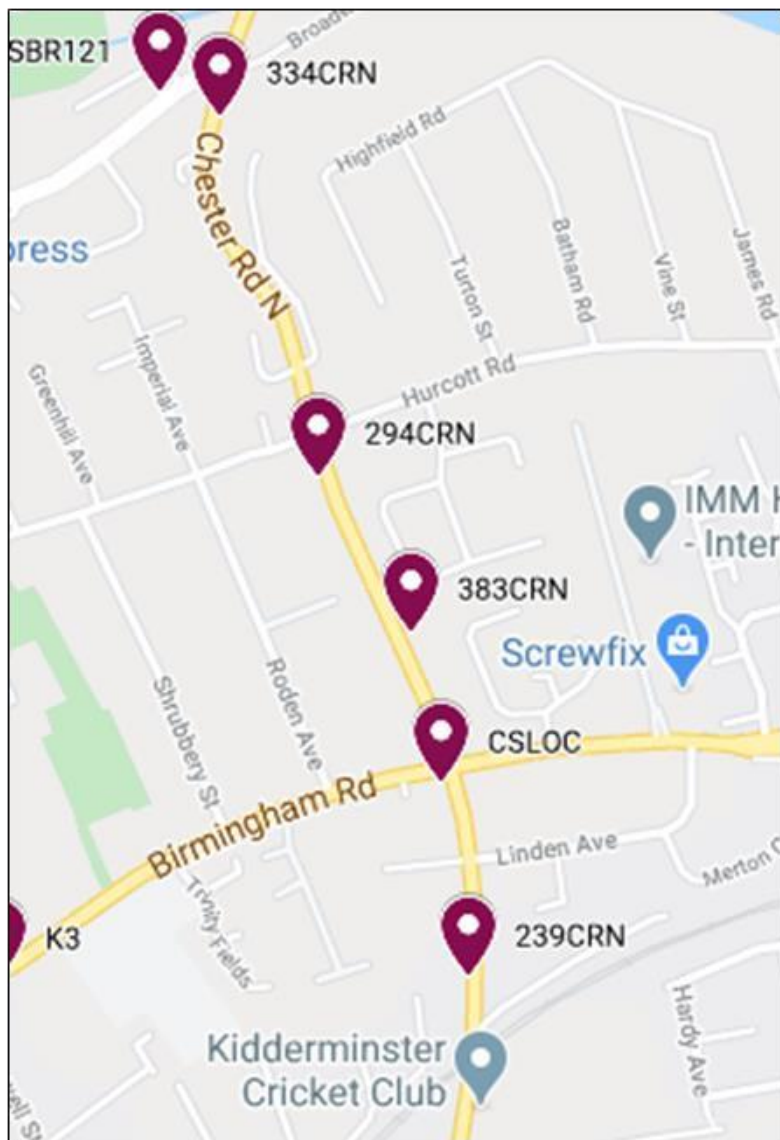


Figure D.4 – Map of Comberton Road, Comberton Hill and Chester Road North and South (A449). East of Kidderminster Town Centre Monitoring Locations

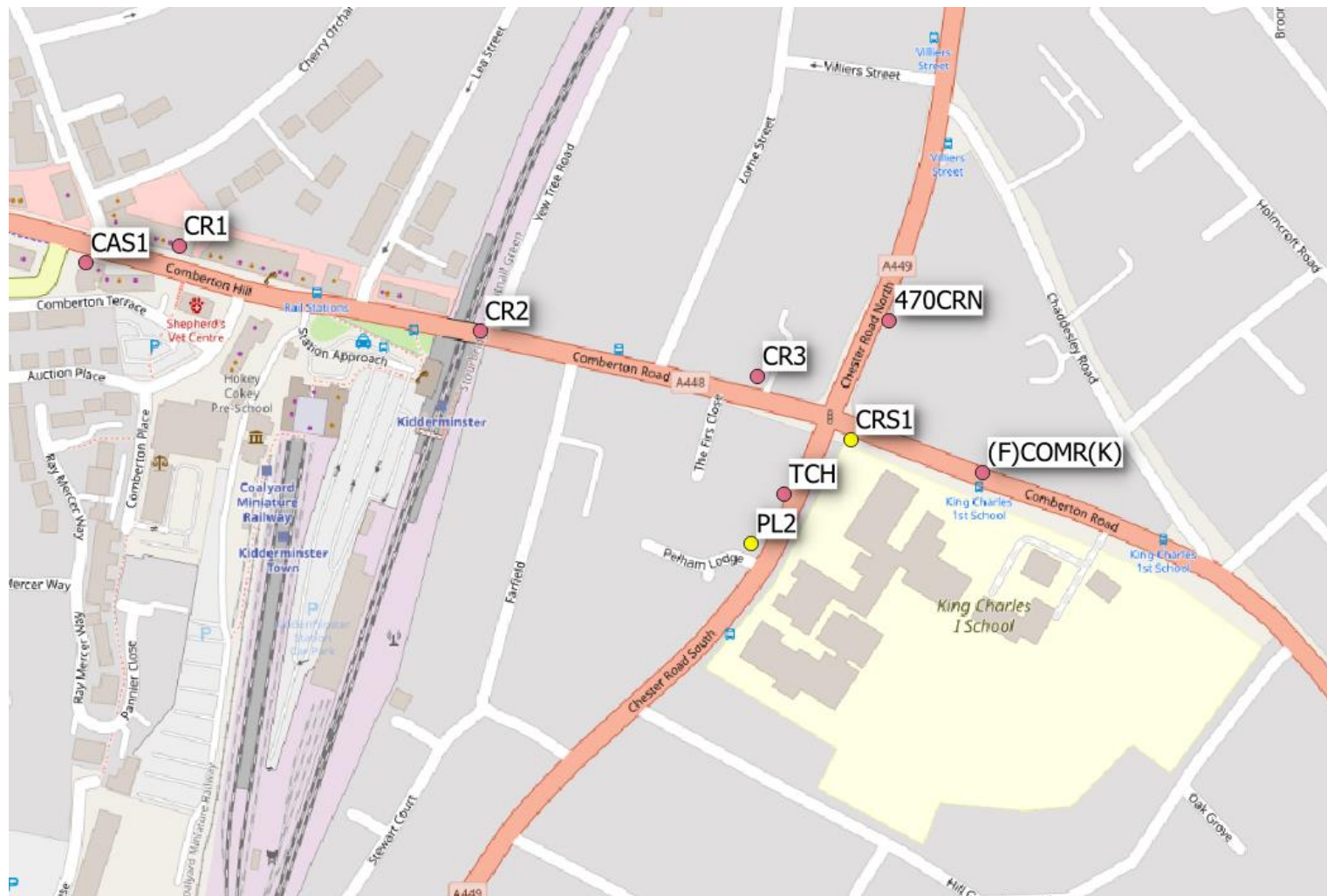


Figure D.5 – Map of Chester Road North South (A449) and Urban Background Monitoring Locations

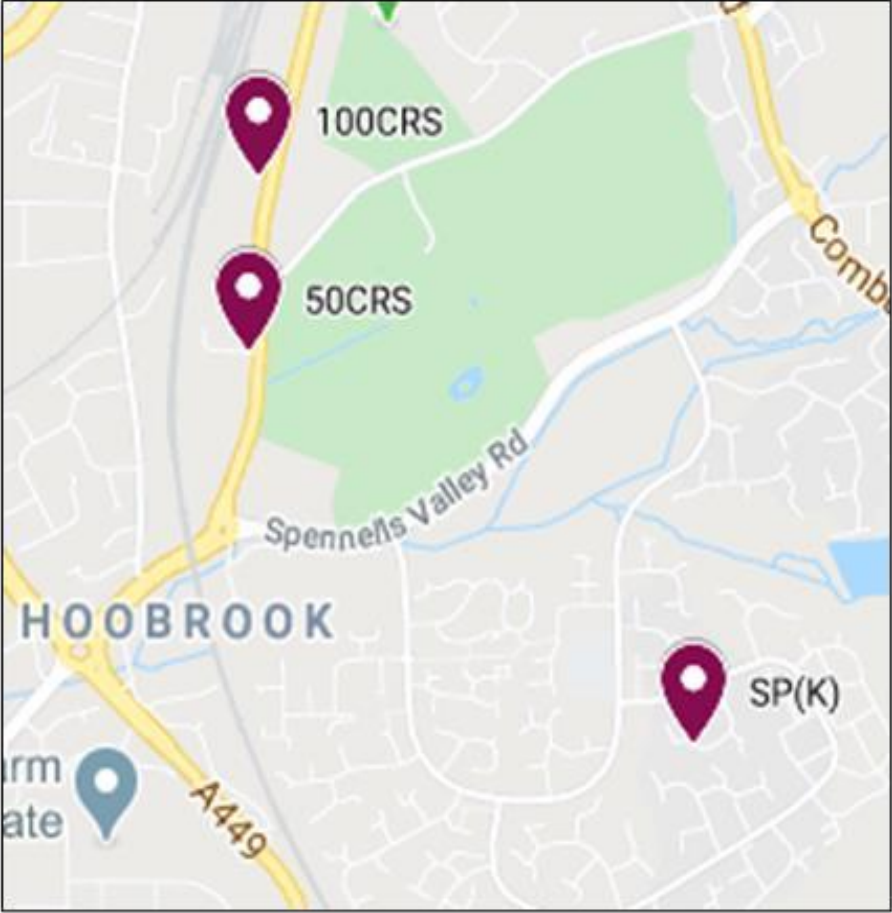
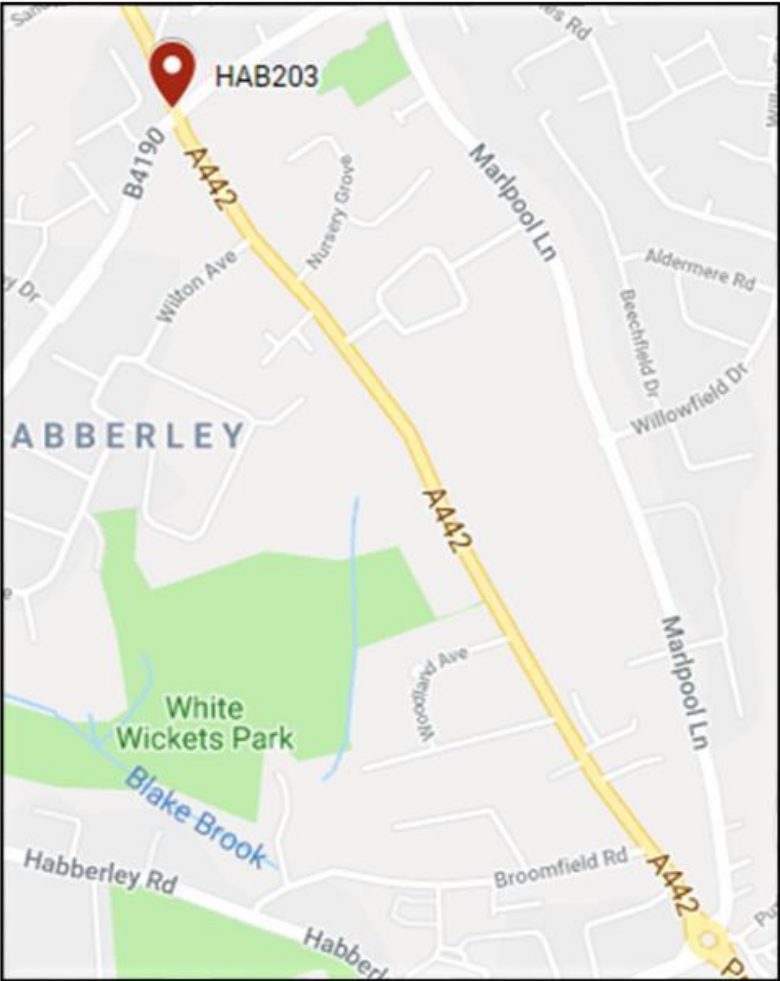


Figure D.6 – Map of West of Kidderminster Town Centre Monitoring Locations

Figure D.7 – Map of South of Kidderminster Town Centre Monitoring Locations

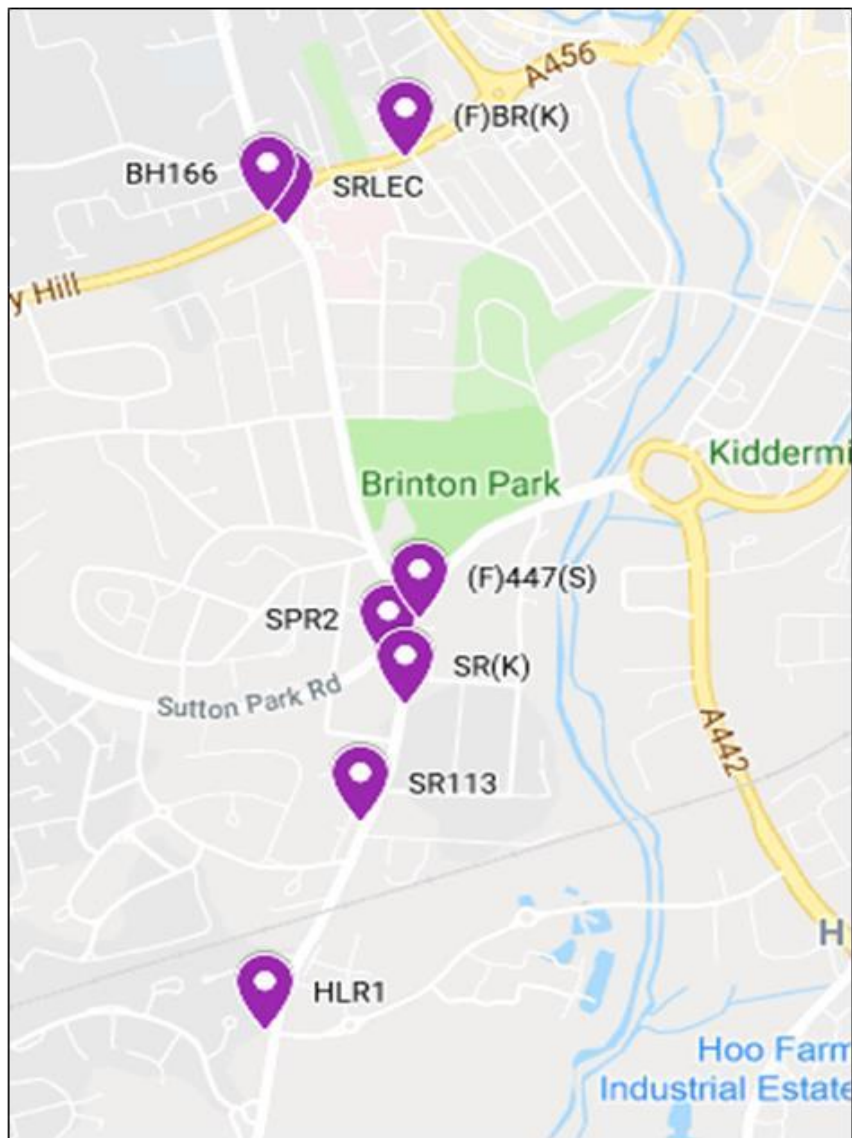


Figure D.8 – Map of Stourport-on-Severn Monitoring Locations

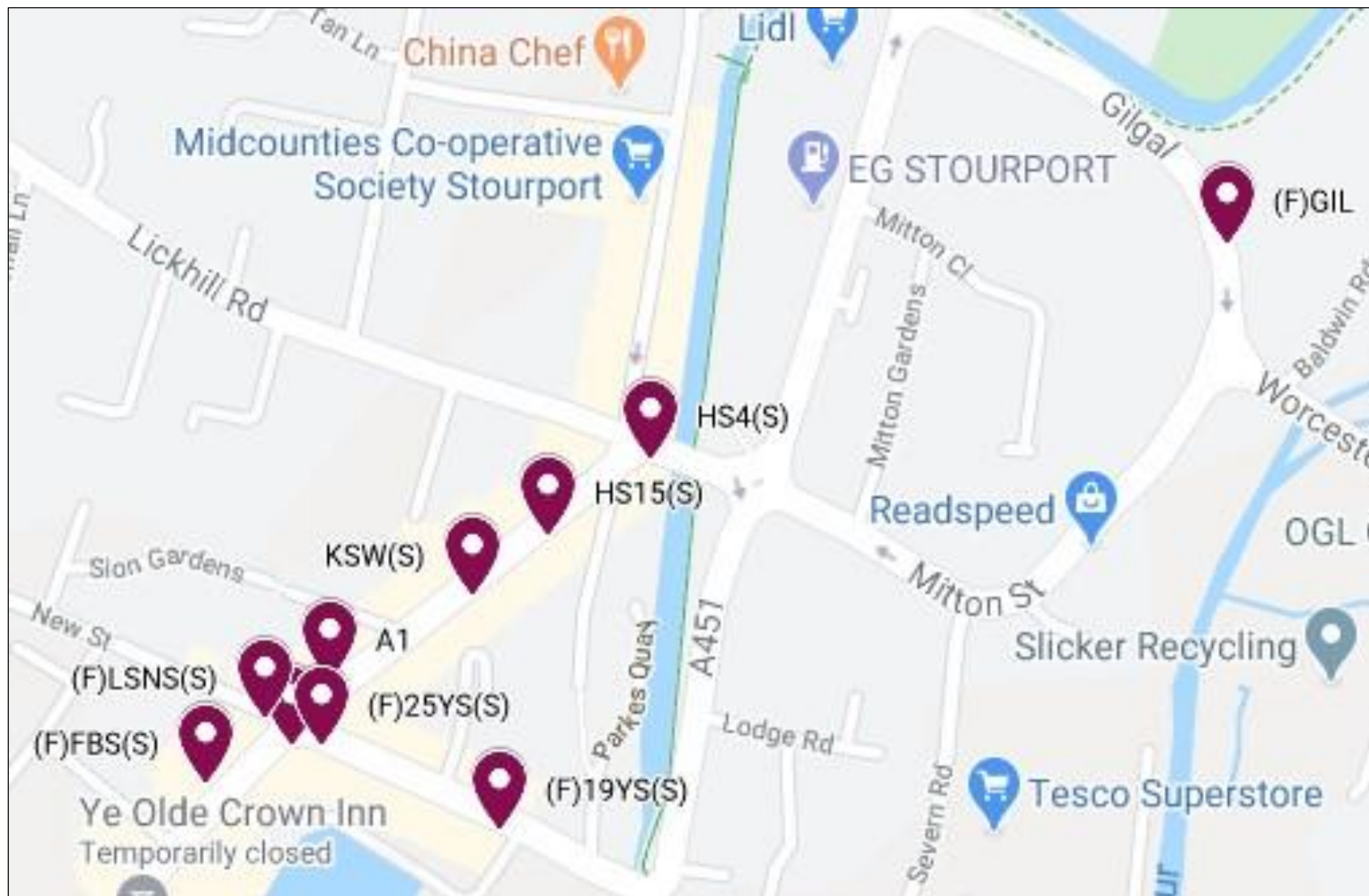


Figure D.9 – Map of East of Bewdley Town Centre Monitoring Location



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England¹²

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

¹² 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'
AQAPSG	Air Quality Action Plan Steering Group
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 Vehicles
LAQM	Local Air Quality Management
LCWIP	Local Cycling and Walking Infrastructure Plan
LEP	Local Economic Partnership
MCERTS	Monitoring Certification Scheme (Environment Agency) - certification of equipment that monitors pollution in the ambient air.
MJAC	Midlands Joint Advisory Council
NHS	National Health Service
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

Abbreviation	Description
WCC	Worcestershire County Council
WFDC	Wyre Forest District Council
WRS	Worcestershire Regulatory Services

References

- DEFRA (2023) National Diffusion Tube Bias Adjustment Factor Spreadsheet v.03/23
- DEFRA (2018) Background Mapping for Local Authorities
- 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.
- 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