

Worcestershire
Regulatory Services

Supporting and protecting you

2018 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the
Environment Act 1995
Local Air Quality Management

December 2018

Wyre Forest District Council

Local Authority Officer	Neil Kirby
Department	Land and Air Quality Team
Address	Wyre Forest House Finepoint Way Kidderminster Worcestershire DY11 7WF
Telephone	01905 822799
E-mail	wrsenquiries@worcsregservices.gov.uk
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Executive Summary: Air Quality in Our Area

Air Quality in Wyre Forest District Council

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 and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas^{1,2}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

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

Two Air Quality Management Areas (AQMA's) were declared by Wyre Forest District Council for exceedences 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.

Details can be found at:

https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=325

In 2017, there continue to be exceedences of the annual mean objective for NO₂ of 40µg/m³ within the Horsefair/Coventry Street AQMA. Monitoring results for the Welch Gate AQMA showed a significant decrease to below the annual mean objective for NO₂.

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

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

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Monitoring results demonstrate a significant decrease in concentrations at all monitoring locations between 2016 and 2017 (apart from (F)COMR(K) Holmwood, Comberton Road, Kidderminster which showed an increase); this is consistent with trends across Worcestershire. This is attributed to the low bias adjustment factor of 0.77 applied to the raw NO_x tube data as required. There is no discernible upward or downward trend in concentrations over the 5 year period 2013- 2017.

In Kidderminster, TCH (Top of Comberton Hill), outside of the AQMA, continued to show an exceedence of the annual mean objective for nitrogen dioxide (NO₂) of 44µg/m³.

Monitoring at the following location was discontinued in 2017 due to there being no relevant receptor in the vicinity:

- JAK (Spar Shop, Franche Road, Kidderminster)

Actions to Improve Air Quality

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:

<http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-action-plan.aspx>

WRS set up the Worcestershire Air Quality Steering Group to facilitate progressing the implementation of actions identified in the AQAP. At the inaugural Steering Group meeting, on 18th June 2014, it was agreed to establish a number of subgroups. The Welch Gate Sub Group covers the Welch Gate AQMA and the Horsefair Sub Group covers the Horsefair/Coventry Street AQMA. The sub-groups currently comprise representatives of WRS, the Worcestershire County Council Air Quality Liaison Officer, and local County and district Councillors.

The Horsefair/Coventry Street AQMA is intrinsically linked to the Kidderminster Ringway with the vast majority of traffic travelling through the AQMA doing so either from or towards the Kidderminster Ringway. As part of the WFDC Churchfields Masterplan, there is a proposal to build a spur road from the Ringway roundabout at the bottom of Blackwell Street into Churchfields and creating a one way system which should result in a significant improvement in air quality. A planning application for improvements to the highways infrastructure in the Churchfields area was approved in October 2018, work is due to commence in 2019. The Wyre Forest District Council chapter of the Air Quality Action Plan will be updated on completion of the proposed works.

A planning application was submitted for a large residential development off Cleobury Road (B4190) which leads into Welch Gate, Bewdley. As part of the application a consultation was carried out to investigate if changing the traffic priorities at the junction of Welch Gate, Dog Lane and High Street would improve traffic flows and reduce waiting times. The investigation showed that whilst there would be improvements to air quality in Welch Gate there would be adverse effects elsewhere in Bewdley town centre. The planning application was refused for reasons other than concerns over air quality.

Conclusions and Priorities

There are currently two AQMAs declared in the Wyre Forest District, Welch Gate, Bewdley and Horsefair/ Coventry Street, Kidderminster. Monitoring shows that the Horsefair/ Coventry Street continued to exceed the annual mean objective, monitoring results within the Welch Gate, Bewdley AQMA showed that it was now below the annual mean objective, however, both AQMAs will remain in place.

TCH (Top of Comberton Hill) continued to exceed the annual mean objective in 2017; the monitoring network will be expanded in 2018 to locations along Comberton Road and Chester Road North (A449) to identify the extent of additional sites of relevant exposure.

Monitoring results demonstrate a significant decrease in concentrations at all monitoring locations in 2017; this is consistent with trends across Worcestershire.

This is attributed to the low bias adjustment factor of 0.77 applied to the raw NOx tube data as required.

Following discussion with other Local Authorities and the National Physics Laboratory (NPL), WRS are aware that Defra produced national bias adjustment factors for 2017 are significantly lower than in previous years. Consequently this significantly reduces adjusted measurements of local nitrogen dioxide tubes to well below local trends. No satisfactory explanation has been provided to WRS as to why this is the case and it does not provide confidence in the adjusted 2017 results. Therefore, in WRS opinion, the 2017 data should not be relied upon as indicative of local trends.

The priorities for Wyre Forest District Council are to continue to monitor nitrogen dioxide at key points across the area. To this end tube rationalisation conducted at the end of 2016 led to the decommissioning of a diffusion tube where there was no relevant receptor.

WRS on behalf of Wyre Forest District Council will continue to monitor locations in 2018 to assess any improvements or degradation in NO₂ concentrations. The data gathered will assist in further assessment of areas of poor air quality within the District. Further update on monitoring and action progress will be provided in the 2019 Annual Status Report.

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 around the District instead of driving;
- Worcestershire County Council have launched a car sharing website, LiftShare, to help people find others journeying to the same destinations to share journeys and costs, and reduce traffic and emissions. Visit this link for more information: <https://worcestershire.liftshare.com/>
- General travel planning advice is available on Worcestershire County Council's website (including walking, cycling and bus maps and timetables).

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- 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.energysavingtrust.org.uk/travel/driving-advice>
 - <http://www.theaa.com/driving-advice/fuels-environment/drive-smart>
 - <http://www.dft.gov.uk/vca/fcb/smarter-driving-tips.asp>

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1 Local Air Quality Management

This report provides an overview of air quality in Wyre Forest District Council during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Wyre Forest District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

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 must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Wyre Forest District Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at

https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=325.

Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMA(s).

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
The Kidderminster Ring Road (Horsefair/Coventry Street)	Declared 06/01/2003 Amended 30/07/2009	NO2 Annual Mean	Kidderminster	An area of residential & commercial properties in The Horsefair & Blackwell Street. The AQMA was extended to include part of the Kidderminster Ring Road and residential properties in the vicinity of Coventry Street.	NO	54	µg/m3	60	µg/m3	Action Plan for Horsefair/Coventry Street AQMA	Sep-13	http://www.worcsergservices.gov.uk/pollution/air-quality/air-quality-action-plan.aspx
Welch Gate	Declared 06/01/2003	NO2 Annual Mean	Bewdley	A short section of Welch Gate encompassing a number of residential properties from the junction of Dog Lane running south west to north east to a point level with 84 Welch Gate	NO	47	µg/m3	38	µg/m3	Action Plan for Welch Gate AQMA	Sep-13	http://www.worcsergservices.gov.uk/pollution/air-quality/air-quality-action-plan.aspx

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

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

Defra's appraisal of last year's ASR concluded the report is well structured, detailed, and provides the information specified in the Guidance. A few minor comments are made that the local authority may wish to consider in future reports.

1. It is noted that the District Council has reviewed its monitoring strategy and has relocated some diffusion tubes and discontinued others where results were considerably below the AQO. Routine monitoring with diffusion tubes for nitrogen dioxide is now undertaken at 41 sites across the Borough, with many results remaining consistently above objective levels.
2. Pollution levels monitored over the last 5 years within the current AQMA's show little evidence of improvement and have deteriorated between 2015 and 2016. There is still a single exceedance location outside of a current AQMA, but this is being carefully monitored by the local authority and further monitoring may be implemented to identify the extent of additional sites of relevant exposure if it is felt necessary. This is supported.
3. In light of the fact that air quality has declined across the Borough, the Council may wish to review the action plan for each AQMA and consider developing measures in line with the latest Technical Guidance from Defra LAQM TG(16), based upon source apportionment and more targeted measures to reduce emissions at hotspot locations.
4. We acknowledge that the Worcestershire approach providing a centralised AQAP, co-ordinated for each district is a cost effective approach to local air quality management.
5. Table 2.2 has been completed for Wyre Forest District Council for the first time in this report. This is supported and should be kept up to date and included in all future ASRs as it provides a useful tool for tracking progress with measures to improve air quality.
6. The link given in Table 2.1 to the AQMAs needs to be updated as it does not work anymore.

7. Screen shots of the distance calculations have been included in the ASR. This is supported and should be continued in future reports, as it provides confirmation that the correct distances have been used in the calculation.
8. In future reports, one box should be ticked to confirm which Bias Adjustment Factor (BAF) has been used. In this report, both boxes are ticked, however the text confirms that the local BAF was applied.

Wyre Forest District Council has taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

More detail on these measures can be found in the 'Air Quality Action Plan Progress Report for Worcestershire April 2015 – April 2016'. Key completed measures are:

- Freight Quality Partnership:
On-going work with satellite navigation companies to route HGVs around AQMAs.
- Installing electric vehicle charging points:
Recommendations for the installation of EV Charging Points are routinely included by WRS on relevant planning consents
- Greening Council and Business Fleets:
Worcestershire County Council Local Transport Plan (LTP4) was formally adopted in November 2017 and incorporates policy on alternative fuels and associated infrastructure:
http://www.worcestershire.gov.uk/downloads/file/9024/worcestershire_s_local_transport_plan_ltp_2018_-_2030
- Travel Planning:
Personalised travel planning program planned as part of wider health improvement drives from the County Council who have developed a “one-stop-shop” online travel portal:
http://www.worcestershire.gov.uk/info/20007/travel_and_roads

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

- Produce Air Quality Supplementary Planning Document (SPD):
WRS officers will draft the SPD and send it out for consultation. WRS estimate formal adoption by the Worcestershire District Councils in 2018.

WRS on behalf of Wyre Forest District Council will continue to monitor locations in 2018 to assess any improvements or degradation in NO₂ concentrations. The data gathered will assist in further assessment of areas of poor air quality outside the current AQMAs. Further update on monitoring and action progress will be provided in the 2019 Annual Status Report.

The principal challenges and barriers to implementation that Wyre Forest District Council anticipates facing are that Blackwell Street in the Horsefair/Coventry Street AQMA, Kidderminster and Welch Gate, Bewdley are described as 'street canyons', in that they are narrow streets with continuous buildings on either side and both streets are major routes for traffic in and out of Kidderminster and Bewdley respectively. As a consequence solving the problem of poor air quality at these locations is proving to be difficult. Two solutions have been considered:

- Horsefair/Coventry Street AQMA: As part of the WFDC Churchfields Masterplan, there is a proposal to build a spur road from the Ringway roundabout at the bottom of Blackwell Street into Churchfields to create a one way system which should result in a significant improvement in air quality. A planning application for improvements to the highways infrastructure in the Churchfields area was approved in October 2018, work is due to commence in 2019. The Wyre Forest District Council chapter of the Air Quality Action Plan will be updated on completion of the proposed works.
- Welch Gate AQMA: A planning application was submitted for a large residential development off Cleobury Road (B4190) which leads into Welch Gate, Bewdley. As part of the application a consultation was carried out to see if changing the traffic priorities at the junction of Welch Gate, Dog Lane and High Street would improve traffic flows and reduce waiting times. The consultation showed that whilst there would be improvements to air quality in

Welch Gate there would be adverse effects elsewhere in Bewdley town centre. The planning application was refused for reasons other than concerns over air quality.

Progress on the following measure has been slower than expected:

- HGV or weight restriction on affected roads:

The B4190 Cleobury Road/Welch Gate is the main access route for traffic from the B456 Bewdley By-pass to the B4194 Dowles Road which leads to towns in Shropshire. Enforcement of the 7.5 tonne weight limit and access only restriction is proving problematic as alternative routes in the area for HGVs are not considered viable.

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 the Horsefair/Coventry Street and Welch Gate AQMAs.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Loading and unloading restrictions during peak traffic times	Traffic Management	UTC, Congestion management, traffic reduction	Wyre Forest District Council (WFDC)	2015	2016	Decrease in illegally parked vehicles	2-5%	WFDC parking enforcement to target 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	WCC	2015 - 2016	2016	Less HGV's travelling through Welch Gate AQMA	2%	A 7.5 tonne weight limit and access only restriction is currently in operation on the B4190 Cleobury Road leading into Welch Gate.	Currently in operation	HGVs use the B4190 for access to the B4194 (Dowles Road)
3	Promote flexible working arrangements	Promoting Travel Alternatives	Encourage / Facilitate home-working	WCC & WFDC	2015 - 2016	2017	Increase in uptake of personal travel planning services. Change in behaviour towards more sustainable modes of transport	<1%	Implementation on-going	On-going	
4	Freight Quality Partnership, work with sat nav companies to route HGVs around AQMAs	Traffic Management	UTC, Congestion management, traffic reduction	WCC		On-going	Fewer HGVs travelling through AQMAs	5 - 10%	Implementation on-going	On-going	It can take some time for the information to filter down to users.

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5	Alteration to phasing of traffic light systems	Traffic Management	UTC, Congestion management, traffic reduction	WCC	2015 - 2017	2018 onwards	Improved flow through Horsefair/Coventry Street AQMA, reduction in congestion	10-40%	Action linked to the implementation of the WFDC Churchfields Masterplan	Currently on-going	Improvements to Highways Infrastructure in the Churchfields area. Planning application approved 10/2018
6	Introduction of traffic signals at roundabouts	Traffic Management	UTC, Congestion management, traffic reduction	WCC	2015 - 2017	2018 onwards	Improved flow around ring road, significant reduction in stationary idling traffic at peak times.	10-40%	Action linked to the implementation of the WFDC Churchfields Masterplan;	Currently on-going	Improvements to Highways Infrastructure in the Churchfields area. Planning application approved 10/2018
7	Installing electric vehicle charging points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	WFDC & WCC	2013	2014 onwards	Increase in availability of EV charging points and corresponding increase in use of electric vehicles	1%	Recommendations for installation of EV Charging Points routinely recommended by WRS on relevant planning consents. To be formalised in SPD drafted by WRS officers.	Estimate formal adoption by District Councils in 2018.	Draft SPD currently out for consultation
8	Greening Council and Business Fleets	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	WCC	2015 - 2017	2018 onwards	Increase in number of Council and business fleet vehicles of higher Euro Standard and/or utilising alternative fuels	1%	WCC Local Transport Plan (LTP4) adopted November 2017.	2017	
9	Travel Planning	Promoting Travel Alternatives	Personalised Travel Planning	WCC		2017 onwards	Increased uptake of alternative modes of transport	<1%	Personalised travel planning program planned as part of wider health improvement drives from County Council who have developed a "one-stop-shop" online travel portal	2017	

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10	Measures linked to walking and cycling initiatives	Promoting Travel Alternatives	Promotion of cycling	WFDC & WCC	2014 - 2015	Easter 2015 onwards	Increased uptake of walking and cycling in Wyre Forest	<1%	WFDC has a web page dedicated to the promotion of walking and cycling.	Currently operating	
11	Car Sharing	Alternatives to private vehicle use	Car & lift sharing schemes	WCC	2014 – 2015	Liftshare Scheme launched Autumn 2015	Increase in number of people car sharing	<1%	Liftshare Scheme launched in Autumn 2015	Currently operating	
12	Produce Air Quality Supplementary Planning Document	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	WRS & District Councils	On-going	Draft completed in August 2017. Start of formal adoption processes by November 2017	Formally adopted and utilised SPD at all six LPAs across County	<1%	SPD drafted by WRS officers	Estimate formal adoption by District Councils in 2018.	Draft SPD currently out for consultation
13	Encourage developers to provide sustainable transport facilities and links serving new developments	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	WRS & District Councils	On-going	Draft completed in August 2017. Start of formal adoption processes by November 2017	Formally adopted and utilised a by all six LPAs across County	<1%	SPD drafted by WRS officers	Estimate formal adoption by District Councils in 2018.	Draft SPD currently out for consultation
14	Air Quality Policy in Local Development Plans	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	WFDC	On-going	Due to come into effect on 13th August 2015	Formal adoption of revised LDO	<1%	WRS consulted on revised South Kidderminster Enterprise Park Revised Development Order. WRS recommended air quality condition updated to reflect current local and national policies	13th August 2015	

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15	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	WFDC & WRS	2014	2014 onwards	Improved cross boundary working between local authorities in Worcestershire	1%	WRS hold position of Air Quality technical coordinator for the Midlands Joint Advisory Council (MJAC). Provision of AQ services to Tewkesbury DC & Herefordshire Council 2017-18	On-going	
16	Forge closer links with local health agencies	Other	Other	WRS & WCC	N/A	On-going	Participation of relevant health agencies in the Worcestershire Air Quality Steering Group	<1%	WRS officers have met with the Director of Public Health at Worcestershire County Council to highlight the air quality agenda in relation to NO2 and PM2.5. Discussions are on-going as role of DoPH is considered	On-going	
17	Normal length buses block road in narrow bends	Transport Planning and Infrastructure	Bus route improvements	WFDC (WCC no longer manages any bus fleet other than school buses, all operators are private companies)	2015 - 2016	N/A	More shorter length buses seen in Welch Gate AQMA area	2%	WCC has no control over commercial bus companies and any commitment to using shorter length buses would be purely on a voluntary basis on the part of the bus companies.	WCC advised they have no influence over bus networks	Action to be re-prioritised

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), 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. The nearest AURN PM_{2.5} monitoring station is the Walsall Woodlands site approximately 23 kilometres to the north east of the Wyre Forest District.

WRS has reviewed the DEFRA national background maps to determine projected PM_{2.5} concentrations with the Wyre Forest District for the 2017 calendar year. The average total PM_{2.5} at 197 locations (centre points of 1km x 1km grids) across the Wyre Forest District is 8.46µg/m³, with a minimum concentration of 7.35µg/m³ and a maximum concentration of 11.43µg/m³.

This indicates that PM_{2.5} concentrations within the Wyre Forest District are well below the annual average EU limit value for PM_{2.5} of 25µg/m³.

As outlined in Policy Guidance LAQM.PG16 WRS have discussed the role of the DoPH and the details of PM_{2.5} levels across the County, with the Director of Public Health for Worcestershire County Council. The DoPH has not confirmed to WRS that they are advocating or supporting any specific actions to reduce PM_{2.5} concentrations across the County at this time.

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 will likely result in a linked improvement in PM_{2.5} levels.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

No automatic (continuous) monitoring was undertaken within the Wyre Forest District during 2017.

3.1.2 Non-Automatic Monitoring Sites

Wyre Forest District Council undertook non- automatic (passive) monitoring of NO₂ at 40 sites during 2017. Table 1 in Appendix A shows the details of the 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” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

During 2017, Wyre Forest District Council monitored annual mean nitrogen dioxide concentrations using passive diffusion tubes at forty locations across the District compared to forty one locations in 2016. No monitoring was carried out in December 2017 due to a staff shortage.

Monitoring at one location was discontinued in 2017 due to there being no relevant receptor in the vicinity:

- JAK (Spar Shop, Franche Road, Kidderminster)

Table 3.1 below provides a summary of measured exceedences in 2017 or borderline locations (within 5% of annual mean objective), whether representative of relevant exposure and within an existing AQMA or not.

Table 3.1 - Summary of measured exceedences and borderline results in 2017

Site ID	Within AQMA Y/N	Bias Adjusted Measurement ($\mu\text{g}/\text{m}^3$)	Adjusted for distance to relevant exposure ($\mu\text{g}/\text{m}^3$)
Kidderminster			
HF(K) ¹	Y – Horsefair/Coventry Street	55.23	55.23
HF(K)(F) ¹	Y – Horsefair/Coventry Street	59.61	59.61
(F)69COV	Y – Horsefair/Coventry Street	43.36	43.36
TCH	N	43.96	41.0
Bewdley			
WG(B)	Y – Welch Gate	37.78	37.78

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

Table 3.1 above indicates there have been exceedences of the annual mean Air Quality Objective (AQO) for NO₂ concentrations or recorded within 5% of the AQO at 5 of the 40 monitoring locations in 2017. Of these, three locations are within the Horsefair/Coventry Street AQMA, the location within the Welch Gate AQMA fell below the objective in 2017. This is attributed to the low bias adjustment factor of 0.77 applied to the raw NO_x tube data as required. One location (TCH - Top of Comberton Hill) is outside of an existing AQMA.

Error! Reference source not found. 2 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40 $\mu\text{g}/\text{m}^3$.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

NO₂ Five Year Trends for Kidderminster, Stourport-on-Severn and Bewdley

Kidderminster

Figure 3.1 below demonstrates the five year trend for NO₂ concentrations for Kidderminster excluding the Horsefair/Coventry Street AQMA where available.

Figure 3.1 - Long Term Trend Graph of NO₂ Concentrations in Kidderminster. Excluding the Horsefair/Coventry Street AQMA

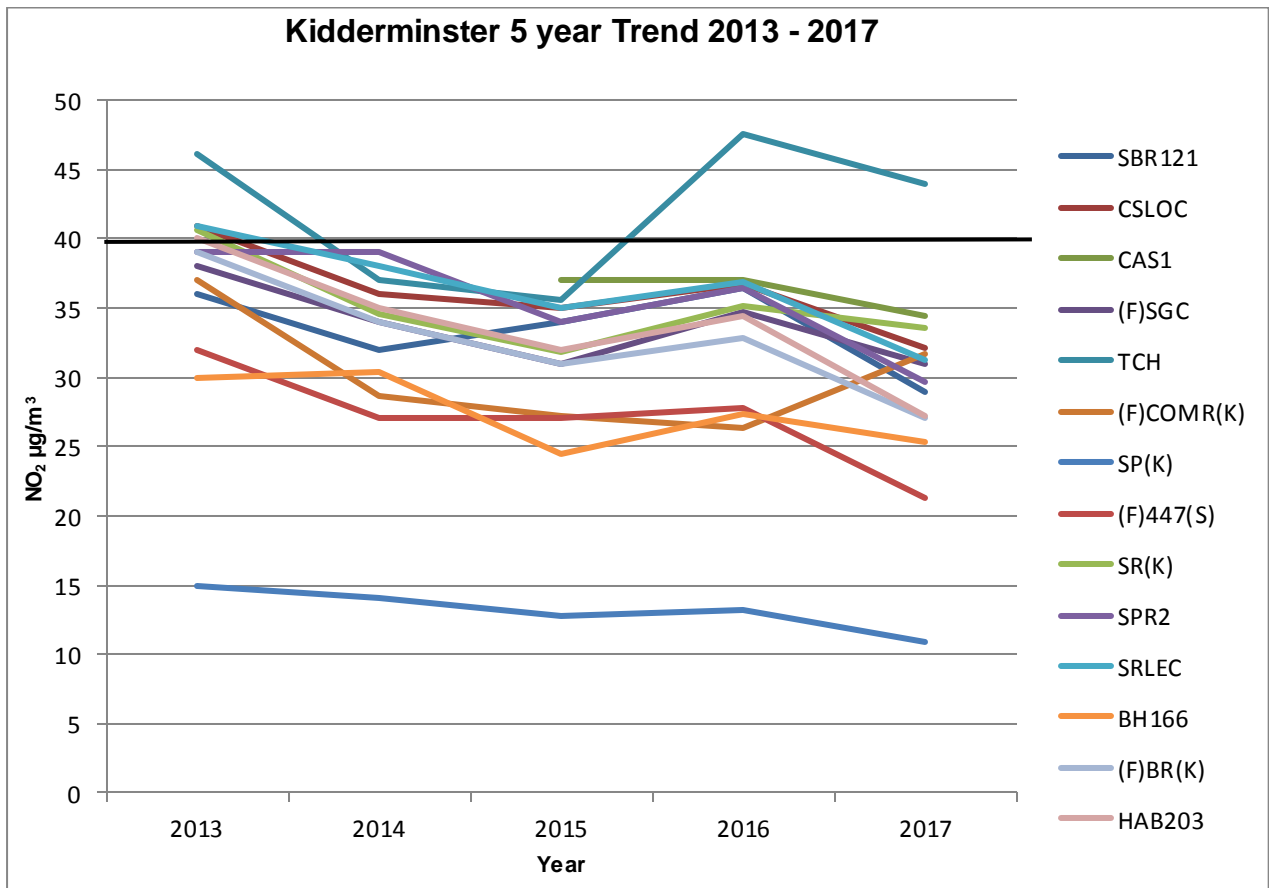


Figure 3.1 shows that there was one exceedence in Kidderminster outside of the Horsefair/Coventry Street AQMA in 2017. Location TCH (Top of Comberton Hill) shows an exceedence of the annual mean objective for NO₂ of 43.96µg/m³. WRS will continue to monitor the area in 2018 and expand the monitoring network to locations along Comberton Road and Chester Road North (A449) to identify the extent of additional sites of relevant exposure.

There has been a decrease in NO₂ concentrations at all locations in 2017 when compared to 2016 apart from location (F)COMR((K) (Holmwood, Comberton Road) which shows an increase.

No annual means greater than 60µg/m³ have been recorded indicating it is unlikely there have been any exceedences of the 1-hour mean objective at these sites.

Horsefair/Coventry Street AQMA

Figure 3.2 below demonstrates the five year trend for NO₂ concentrations for the Horsefair/Coventry Street AQMA where available.

Figure 3.2 - Long Term Trend Graph of NO₂ Concentrations in the Horsefair/Coventry Street AQMA

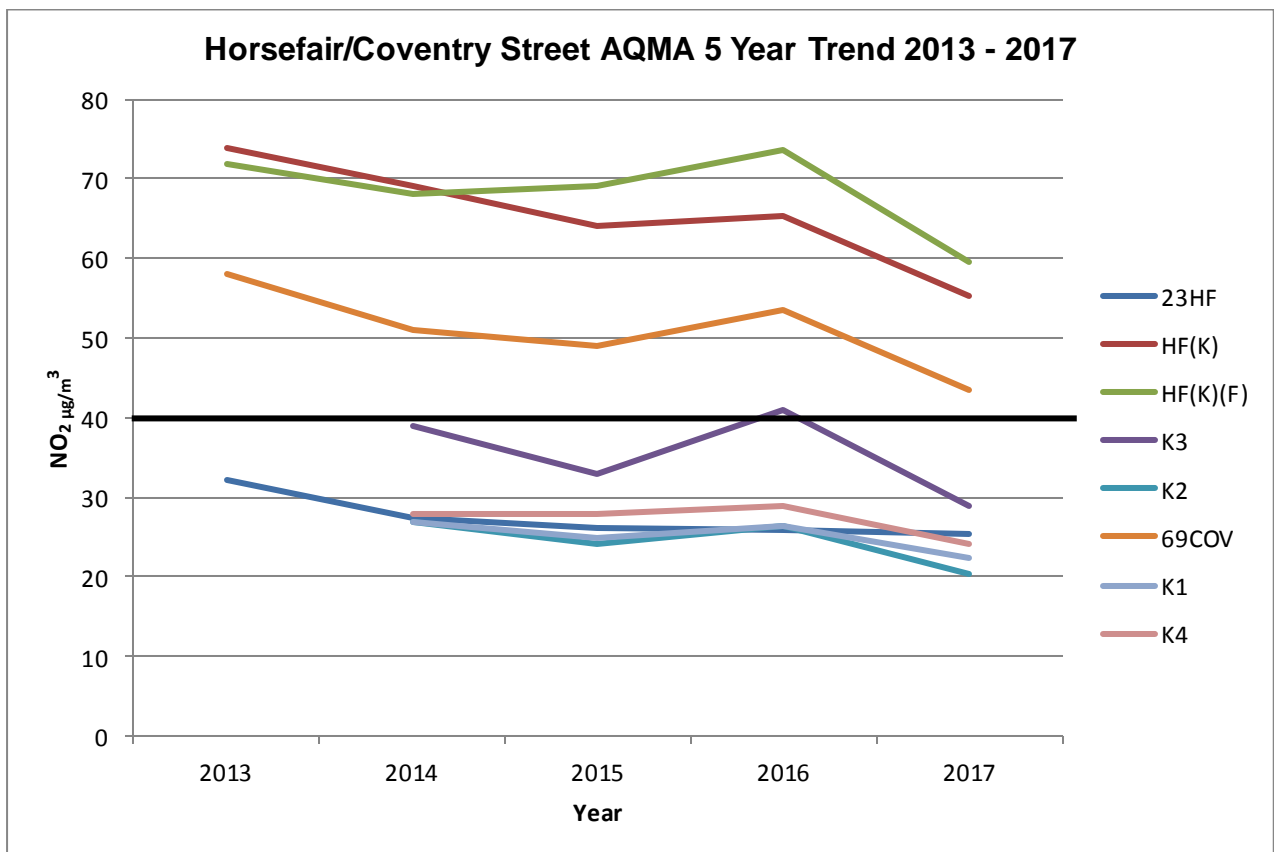


Figure 3.2 shows that there were exceedences at three locations within the Horsefair/Coventry Street AQMA. There has been a decrease in NO₂ concentrations at all locations within the AQMA in 2017 when compared to 2016.

No annual means greater than $60\mu\text{g}/\text{m}^3$ have been recorded indicating it is unlikely there have been any exceedences of the 1-hour mean objective at these sites.

Stourport-on-Severn

Figure 3.3 below demonstrates the five year trend for NO_2 concentrations for Stourport-on-Severn where available

Figure 3.3 - Long Term Trend Graph of NO_2 Concentrations at Stourport-on-Severn

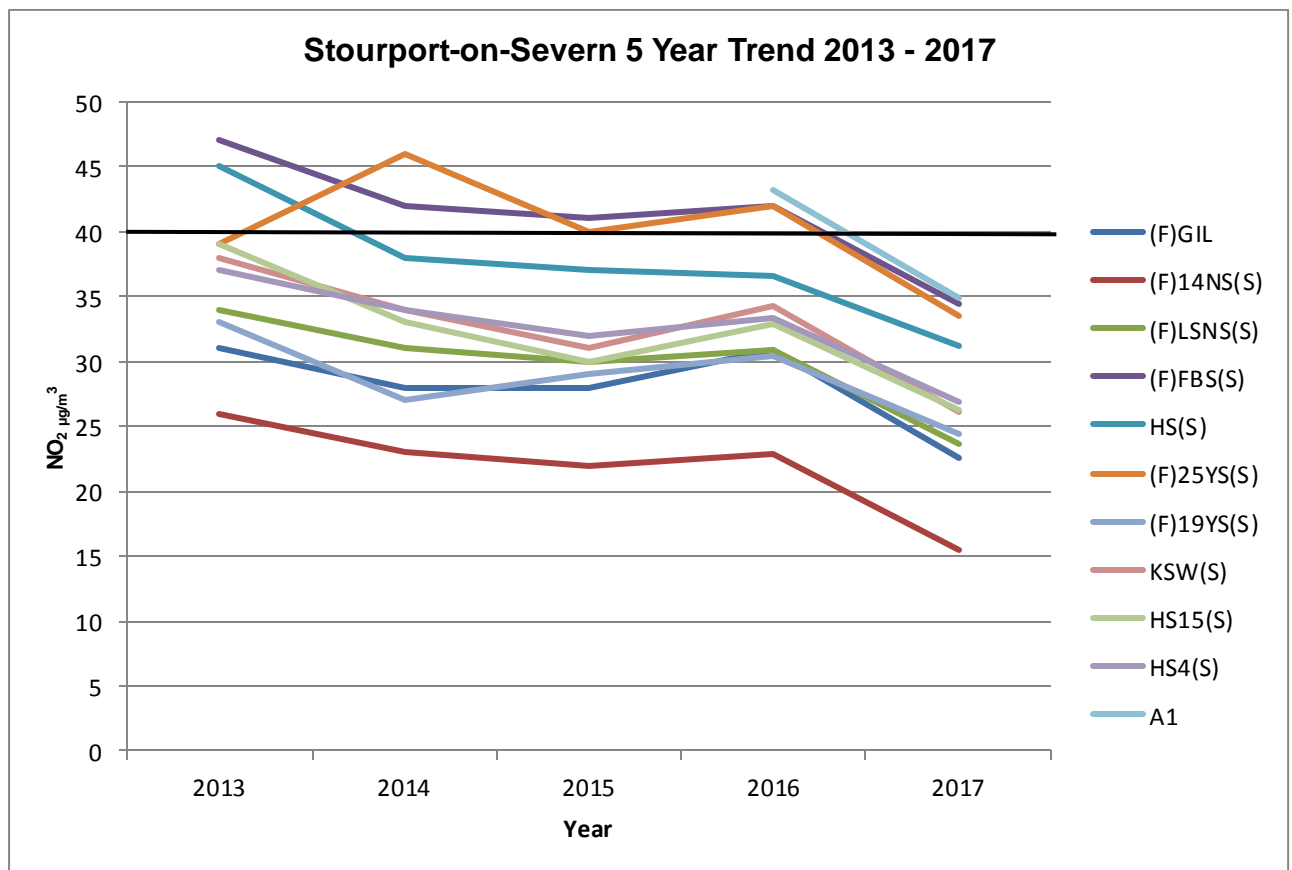


Figure 3.3 shows that there has been a decrease in NO_2 concentrations at all locations in Stourport-on-Severn in 2017 when compared to 2016.

No annual means greater than $60\mu\text{g}/\text{m}^3$ have been recorded indicating it is unlikely there have been any exceedences of the 1-hour mean objective at these sites.

Bewdley

Figure 3.4 below demonstrates the five year trend for NO₂ concentrations for Bewdley where available

Figure 3.4 - Long Term Trend Graph of NO₂ Concentrations at Bewdley

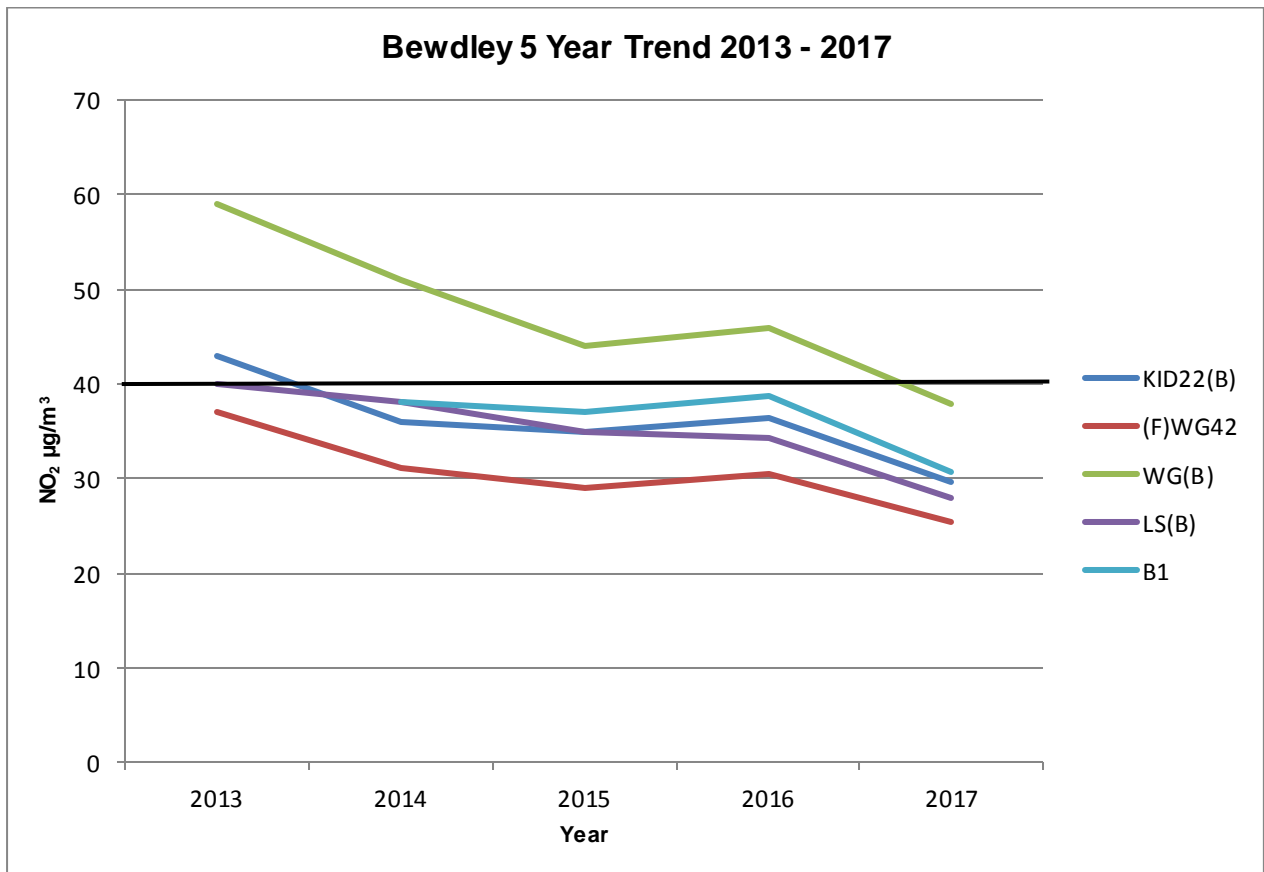


Figure 3.4 shows that there has been a decrease in NO₂ concentrations at all locations in Bewdley in 2017 when compared to 2016. Location WG(B) within the Welch Gate AQMA fell below the annual mean objective in 2017. This is attributed to the low bias adjustment factor of 0.77 applied to the raw NO_x tube data as required.

No annual means greater than 60µg/m³ have been recorded indicating it is unlikely there have been any exceedences of the 1-hour mean objective at these sites.

3.2.2 Particulate Matter (PM₁₀)

PM₁₀ is not monitored within the Wyre Forest District.

3.2.3 Particulate Matter (PM_{2.5})

PM_{2.5} is not monitored within the Wyre Forest District.

3.2.4 Sulphur Dioxide (SO₂)

Sulphur Dioxide is not monitored within the Wyre Forest District.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
KIDDERMINSTER										
HLR1	139 Stourport Road, Kidderminster	Roadside	382136	274589	NO ₂	NO	Diffusion Tube	0m	18.6	1.7m
SR113	Sign Post O/S 113 Stourport Road	Roadside	382342	275054	NO ₂	NO	Diffusion Tube	2.6m	2.4m	2.3m
23HF	23 Horsefair	Roadside	383350	277193	NO ₂	YES	Diffusion Tube	12m	2.5m	2.34m
HF(K)	Horsefair (lamppost @ peacock PH, Blackwell Street)	Roadside	383311	277087	NO ₂	YES	Diffusion Tube	0m	2.5m	2.51m
HF(K)(F)	Hudson Florists on Horsefair	Roadside	383304	277071	NO ₂	YES	Diffusion Tube	0m	2.5m	2.49m
SBR121	121 Stourbridge Road	Roadside	383905	277857	NO ₂	NO	Diffusion Tube	0m	2.44m	2.69m
CSLOC	Flats at top of Coventry Street - Land Oak Court	Roadside	384205	277121	NO ₂	NO	Diffusion Tube	0m	7.92m	1.93m
K3	53 Coventry Street, 6m to kerb	Roadside	383726	276909	NO ₂	YES	Diffusion Tube	0m	2.72m	1.27m
K2	34 Leswell Lane, 3m to kerb, 10m to Coventry Street	Roadside	383657	276890	NO ₂	YES	Diffusion Tube	0m	3.07m	1.80m
(F)69COV	69 Coventry Street	Roadside	383552	276870	NO ₂	YES	Diffusion Tube	0m	5.5m	1.83m
K1	50 Radford Avenue	Roadside	383391	277086	NO ₂	YES	Diffusion Tube	0m	2.12m	2.49m

Wyre Forest District Council

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
K4	1 Silver Street – façade 20 m to kerb of ring road, 14 m to kerb of Silver Street.	Roadside	383337	276998	NO ₂	YES	Diffusion Tube	0m	18.2m	2.39m
CAS1	Casper Polish Shop, 99 Comberton Hill (On lamppost)	Roadside	383636	276377	NO ₂	NO	Diffusion Tube	4.2m	2.7m	2.5m
(F)SGC	6/7 St George's Court	Roadside	383475	276760	NO ₂	YES	Diffusion Tube	0m	10m	1.79m
TCH	Top Comberton Hill (lamppost) on corner with the Firs (white building)	Roadside	384086	276228	NO ₂	NO	Diffusion Tube	1m	2m	2m
(F)COMR(K)	Holmwood, Comberton Road	Roadside	384214	276242	NO ₂	NO	Diffusion Tube	13.5m	3.5m	2.18m
SP(K)	Spennells (located at Jay Park Crescent)	Urban Background	384486	274596	NO ₂	NO	Diffusion Tube	11m	1.70m	2.34m
(F) 447 (S)	447 Stourport Road	Roadside	382447	275506	NO ₂	NO	Diffusion Tube	0m	10.62m	1.65m
SR(K)	431 Stourport Road	Roadside	382429	275315	NO ₂	NO	Diffusion Tube	9m	3m	2.34m
SPR2	Flat 2, Park House, Sutton Park Road	Roadside	382496	275417	NO ₂	NO	Diffusion Tube	0m	7m	1.73m
SRLEC	Flats at crossroads - Lucy Edwards Court Sutton Road	Roadside	382183	276388	NO ₂	NO	Diffusion Tube	0m	9.5m	1.98m
BH166	166 Bewdley Hill (lamppost against garden wall)	Roadside	382135	276409	NO ₂	NO	Diffusion Tube	5m	2m	2.21m
(F)BR(K)	52 Bewdley Road	Roadside	382437	276542	NO ₂	NO	Diffusion Tube	0m	6.53m	1.70m
HAB203	203 Habberley Lane (Façade)	Roadside	381713	278069	NO ₂	NO	Diffusion Tube	0m	3.10m	1.52m

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m)	Inlet Height (m)
STOURPORT-ON-SEVERN										
(F)GIL	10 The Gilgal	Roadside	381482	271534	NO ₂	NO	Diffusion Tube	0m	2m	2.29m
(F)14NS(S)	14 New Street	Roadside	380931	271307	NO ₂	NO	Diffusion Tube	0m	2m	2.4m
(F)LSNS(S)	Lumsdons, New Street,	Roadside	380957	271284	NO ₂	NO	Diffusion Tube	0m	1.47m	2.32m
(F)FBS(S)	21 Bridge Street	Roadside	380933	271247	NO ₂	NO	Diffusion Tube	0m	1.86m	2.4m
HS(S)	High Street corner of York Street	Roadside	380974	271268	NO ₂	NO	Diffusion Tube	0m	2.3m	2.82m
(F)25YS(S)	22 York Street	Roadside	380990	271268	NO ₂	NO	Diffusion Tube	0m	1.46m	2.45m
(F)19YS(S)	19 York Street	Roadside	381086	271268	NO ₂	NO	Diffusion Tube	0m	1.66m	2.34m
KSW(S)	Kodak Spectacles High Street	Roadside	381072	271347	NO ₂	NO	Diffusion Tube	0m	2.2m	2.25m
HS15(S)	15 High Street	Roadside	381114	271380	NO ₂	NO	Diffusion Tube	0m	2.2m	2.34m
HS4(S)	4 High Street	Roadside	381169	271420	NO ₂	NO	Diffusion Tube	0m	3.5m	2.36m
A1	35 High Street	Roadside	380989	271298	NO ₂	NO	Diffusion Tube	0m	3.2m	2.4m
BEWDLEY										
KID22(B)	22 Kidderminster Road	Roadside	373996	275464	NO ₂	NO	Diffusion Tube	0m	2m	2.4m
(F)WG42	42 Welch Gate	Roadside	378383	275328	NO ₂	NO	Diffusion Tube	0m	1.69m	2.5m
WG(B)	88 Welch Gate	Roadside	378465	275292	NO ₂	YES	Diffusion Tube	0m	0.93m	2.53m
LS(B)	Load Street, (by estate agents)	Roadside	378590	275302	NO ₂	NO	Diffusion Tube	0m	3m	2.5m
B1	Adam & Eve, Load Street, (Lampost)	Roadside	378513	275317	NO ₂	NO	Diffusion Tube	0m	1.1m	2.31m

Notes:

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

Table A.2 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
KIDDERMINSTER									
HLR1	Roadside	Diffusion Tube		92				22.3	16.4
SR113	Roadside	Diffusion Tube		83				32.0	30.7
23HF	Roadside	Diffusion Tube		92	32.2	27.5	26.1	26.0	25.5
HF(K)	Roadside	Diffusion Tube		83	74	69	64	65.3	55.2
HF(K)(F)	Roadside	Diffusion Tube		92	71.8	68	69	73.6	59.6
SBR121	Roadside	Diffusion Tube		92	36	32	34	36.4	29.0
CSLOC	Roadside	Diffusion Tube		83	41	36	35	36.7	32.1
K3	Roadside	Diffusion Tube		83		39	33	40.9	29.0
K2	Roadside	Diffusion Tube		83		27	24	26.5	20.4
(F)69COV	Roadside	Diffusion Tube		83	58	51	49	53.5	43.4
K1	Roadside	Diffusion Tube		92		27	25	26.6	22.4
K4	Roadside	Diffusion Tube		83		28	28	28.9	24.1
CAS1	Roadside	Diffusion Tube		67			37.1	37.1	32.0
(F)SGC	Roadside	Diffusion Tube		92	38	34	31	34.7	31.0
TCH	Roadside	Diffusion Tube		83	46.1	37.1	35.6	47.6	44.0
(F)COMR(K)	Roadside	Diffusion Tube		67	37.1	28.6	27.2	26.4	29.7
SP(K)	Urban Background	Diffusion Tube		83	15	14	12.7	13.2	10.9
(F) 447 (S)	Roadside	Diffusion Tube		83	32	27	27	27.8	21.3
SR(K)	Roadside	Diffusion Tube		92	40.6	34.6	31.8	35.1	33.5

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
SPR2	Roadside	Diffusion Tube		92	39	39	34	36.5	29.6
SRLEC	Roadside	Diffusion Tube		92	41	38	35	36.9	31.3
BH166	Roadside	Diffusion Tube		92	29.9	30.4	24.5	27.3	25.3
(F)BR(K)	Roadside	Diffusion Tube		92	39	34	31	32.8	27.1
HAB203	Roadside	Diffusion Tube		92	40	35	32	34.4	27.2
STOURPORT-ON-SEVERN									
(F)GIL	Roadside	Diffusion Tube		83	31	28	28	30.8	22.6
(F)14NS(S)	Roadside	Diffusion Tube		92	26	23	22	22.9	15.4
(F)LSNS(S)	Roadside	Diffusion Tube		75	34	31	30	30.8	23.6
(F)FBS(S)	Roadside	Diffusion Tube		92	47	42	41	41.9	34.5
HS(S)	Roadside	Diffusion Tube		92	45	38	37	36.6	31.1
(F)25YS(S)	Roadside	Diffusion Tube		92	39	46	40	42	33.4
(F)19YS(S)	Roadside	Diffusion Tube		92	33	27	29	30.4	24.4
KSW(S)	Roadside	Diffusion Tube		92	38	34	31	34.2	26.2
HS15(S)	Roadside	Diffusion Tube		92	39	33	30	32.8	26.3
HS4(S)	Roadside	Diffusion Tube		92	37	34	32	33.4	26.9
A1	Roadside	Diffusion Tube		83				43.2	34.9

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
BEWDLEY									
KID22(B)	Roadside	Diffusion Tube		92	43	36	35	36.4	29.7
(F)WG42	Roadside	Diffusion Tube		92	37	31	29	30.4	25.3
WG(B)	Roadside	Diffusion Tube		83	59	51	44	45.8	37.8
LS(B)	Roadside	Diffusion Tube		92	40	38	35	30	27.8
B1	Roadside	Diffusion Tube		92		38	36	37.8	30.6

Diffusion tube data has been bias corrected

Annualisation has been conducted where data capture is <75%

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**.

(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%).

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO₂ Monthly Diffusion Tube Results – 2017

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.77) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
KIDDERMINSTER															
HLR1	34.07	26.95	22.56	17.18	22.19	15.96	15.39	14.92	19.73	19.72	25.23	-	21.26	16.37	-
SR113	55.81	44.42	45.86	38.42	-	34.32	27.09	31.98	34.84	40.03	45.87	-	39.86	30.69	27.4
23HF	48.01	42.37	37.53	26.50	29.41	26.91	24.95	23.92	30.13	34.99	39.42	-	33.10	25.49	19.5
HF(K)	80.82		77.55	74.65	61.54	72.37	60.33	67.41	68.31	79.54	74.73	-	71.73	55.23	-
HF(K)(F)	91.04	82.40	76.99	87.94	63.80	72.68	67.63	72.09	67.91	78.28	90.77	-	77.41	59.61	-
SBR121	49.71	41.64	38.46	39.79	33.78	27.64	30.63	31.67	36.79	39.19	44.94	-	37.66	29.00	-
CSLOC	47.43	44.12	45.42	41.29	30.96	36.23	31.31	36.35	36.06	40.82	-	-	41.70	32.11	-
K3	58.70	47.93	42.27	42.33	43.23	34.88	34.55	37.04	38.98	38.91	-	-	37.65	28.99	-
K2	35.93	31.18	30.56	24.48	24.00	20.22	18.92	21.19	23.99	-	34.97	-	26.54	20.44	-
(F)69COV	67.88	59.54	58.54	47.54	54.01	57.01	49.34	50.67	59.52	-	59.08	-	56.31	43.36	-
K1	37.62	34.38	32.74	26.17	22.83	24.33	20.42	23.09	25.74	36.48	35.65	-	29.04	22.36	-
K4	42.58	37.71	34.48	25.52	24.17	28.87	24.25	26.80	28.10	-	39.86	-	31.23	24.05	-
CAS1	60.92	49.81	51.41	48.06	29.97	-	-	30.27		34.47	52.28	-	44.65	32.00	28.0
(F)SGC	43.98	38.92	41.40	41.61	49.44	31.71	29.81	30.69	34.19	58.01	42.89	-	40.24	30.98	-

Wyre Forest District Council

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.77) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
TCH	65.99	61.60	61.70	61.88	-	49.18	44.49	53.73	50.75	57.87	63.68	-	57.09	43.96	41.0
(F)COMR(K)	53.09	47.21	44.39	32.10	-	30.59	32.57	-	-	45.54	43.04	-	41.07	29.72	23.5
SP(K)	25.65	17.27	13.47	10.791	-	8.68	8.45	10.01	12.56	13.04	21.52	-	14.14	10.89	10.2
(F) 447 (S)	33.48	31.36	28.61	28.78	-	22.86	20.51	22.72	24.69	27.52	36.43	-	27.70	21.33	-
SR(K)	61.27	51.14	47.82	43.50	35.99	36.42	33.07	32.82	40.36	44.42	51.89	-	43.52	33.51	26.0
SPR2	45.21	45.57	40.96	34.31	31.52	38.50	31.09	33.71	35.49	42.74	43.92	-	38.46	29.61	-
SRLEC	48.19	45.45	46.29	42.26	34.16	40.22	34.74	36.77	36.47	38.68	43.18	-	40.58	31.27	-
BH166	40.25	46.18	37.53	28.19	35.47	28.32	24.67	25.31	28.28	32.93	34.62	-	32.89	25.33	21.9
(F)BR(K)	48.31	40.92	36.39	32.29	36.79	30.16	24.99	28.74	34.60	35.50	38.39	-	35.19	27.10	-
HAB203	44.57	37.71	37.37	38.75	35.24	26.23	28.55	30.14	34.36	32.65	43.28	-	35.35	27.22	-
STORPORT-ON-SEVERN															
(F)GIL		42.30	30.39	29.43	25.54	23.13	21.82	21.92	27.66	31.72	39.03	-	29.29	22.55	-
(F)14NS(S)	32.32	28.84	22.70	19.00	25.63	14.80	14.94	14.44	17.95	17.47	23.18	-	20.02	15.42	-
(F)LSNS(S)	44.56	37.53	34.70	-	33.74	22.33	23.73	25.98	25.64	-	27.29	-	30.61	23.57	-
(F)FBS(S)	54.24	46.65	43.47	52.74	42.53	36.92	40.06	39.87	42.05	41.29	52.33	-	44.74	34.45	-
HS(S)	52.37	48.76	42.11	37.83	44.17	37.71	34.29	33.08	34.77	38.02	41.67	-	40.44	31.14	-
(F)25YS(S)	60.24	44.42	57.26	37.12	34.67	32.08	40.76	33.31	32.27	35.17	70.47	-	43.43	33.44	-
(F)19YS(S)	41.47	33.91	34.42	34.33	30.62	26.81	25.17	25.96	30.57	29.85	35.46	-	31.69	24.40	-
KSW(S)	45.14	42.48	38.78	29.62	35.61	28.46	26.20	27.13	30.81	35.59	33.79	-	33.97	26.16	-
HS15(S)	46.78	40.25	37.42	32.89	32.31	27.36	26.66	27.96	30.16	35.73	38.00	-	34.14	26.29	-

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.77) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
HS4(S)	50.68	38.07	38.13	33.15	-	34.25	28.48	29.62	30.73	31.62	34.77	-	34.95	26.91	-
A1	55.05	53.77	47.99	50.98	35.70	38.69	38.29	41.25	42.94	-	48.27	-	45.30	34.88	-
BEWDLEY															
KID22(B)	56.86	44.23	41.34	31.40	39.65	35.14	32.39	30.21	33.32	38.02	41.86	-	38.59	29.71	-
(F)WG42	41.94	35.90	37.20	33.93	29.68	25.46	25.03	25.69	30.24	34.24	42.01	-	32.85	25.29	-
WG(B)	52.66	-	48.83	48.83	49.02	45.68	46.39	41.21	47.07	50.55	60.38	-	49.06	37.78	-
LS(B)	44.91	40.31	37.15	35.11	37.77	30.54	30.24	30.35	34.61	35.69	40.74	-	36.13	27.82	-
B1	50.45	44.11	41.94	43.76	33.96	33.06	33.31	33.26	37.28	38.30	47.44	-	39.72	30.58	-

- Local bias adjustment factor used
 National bias adjustment factor used
 Annualisation has been conducted where data capture is <75%
 Where applicable, data has been distance corrected for relevant exposure

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**.

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

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

Sources of pollution

Wyre Forest District Council has not identified any new or significant changes to sources as described in Chapter 7, section 1 of Technical Guidance LAQM.TG(16)

QA/QC Data

Factor from Local Co-location Studies (if available)

No local co-location studies for nitrogen dioxide have been undertaken in 2017.

Diffusion Tube Bias Adjustment Factors

The following UKAS accredited company provides Wyre Forest District Council with nitrogen dioxide diffusion tubes and analysis:

Somerset Scientific Services,
Unit 2A,
Westpark 26
Chelston
Wellington
Somerset
TA21 9AD

01823 355906

sssmailbox@somerset.gov.uk

The 20% Triethanolamine (TEA) / De-ionised Water preparation method is used. The bias adjustment factor applied to the results in 2017 was 0.77 (Spreadsheet Version No. 09/18) which were derived from the national studies.

QA/QC of Automatic Monitoring

No Automatic Monitoring Data is available for 2017.

QA/QC of Diffusion Tube Monitoring

Under the AIR NO₂ PT (formerly WASP) Scheme Somerset Scientific Services performed 100% satisfactory for the period January to August 2017 and 75% for the period September to October 2017 (no data for the period November to December 2017). Tube precision was 'Good' throughout 2017.

Data Annualisation

Short-term to Long-term Data Adjustment

Only 8 months of data was recorded for CAS1 - Casper Polish Shop, 99 Comberton Hill, Kidderminster. The data has been annualised in accordance with Technical Guidance LAQM TG(16) as shown in Table C.1 below.

Table C.1 - Annualisation calculation for CAS1

Site	Site Type	Annual Mean	Period Mean	Ratio
Birmingham Acocks Green	Urban Background	18	20	0.9
Oldbury, Birmingham Road	Urban Traffic	36	38.4	0.94
Walsall Woodlands	Urban Background	17	17.3	0.98
Leamington Spa, Rugby Road	Urban Traffic	16	18.8	0.9
			Average	0.93
			CAS1 Result	34.38
			CAS1 Annualised	31.97

Only 8 months of data was recorded for (F)COMR(K) - Holmwood, Comberton Road, Kidderminster. The data has been annualised in accordance with Technical Guidance LAQM TG(16) as shown in Table C.2 below.

Table C.2 - Annualisation calculation for (F)COMR(K)

Site	Site Type	Annual Mean	Period Mean	Ratio
Birmingham Acocks Green	Urban Background	18	19.3	0.9
Oldbury, Birmingham Road	Urban Traffic	36	37.5	0.96
Walsall Woodlands	Urban Background	17	16.5	0.96
Leamington Spa, Rugby Road	Urban Traffic	16	18.1	0.94
			Average	0.94
			(F)COMR(K) Result	31.62
			(F)COMR(K) Annualised	29.72

Distance Correction

Estimates of concentrations at the nearest receptor



If an exceedance is measured at a monitoring site (or close to the air quality objective) which is not representative of public exposure, the procedure specified in Technical Guidance LAQM.TG(16) has been used to estimate the concentration at the nearest receptor where applicable. The results are presented in Figures C.1 to C.8 below.

Figure C.1 SR113 – Signpost outside 113 Stourport Road

Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	2.4	metres
Step 2	How far from the KERB is your receptor (in metres)?	5	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	12.52	mg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	30.69	mg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	27.4	mg/m ³



Figure C.2 23HF – 23 Horsefair

Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	2.5	metres
Step 2	How far from the KERB is your receptor (in metres)?	14.5	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	11.78	mg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	25.49	mg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	19.5	mg/m ³



Figure C.3 CAS1 – Lamp-post outside 99 Comberton Hill

Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	2.7	metres
Step 2	How far from the KERB is your receptor (in metres)?	6.9	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	15.1	mg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	32	mg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	28	mg/m ³



Figure C.4 TCH – Lamp-post outside The Firs top of Comberton Hill

Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	3	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	12.53	mg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	43.96	mg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	41	mg/m ³



Figure C.5 (F)COMR(K) – Lamp-post outside Holmwood, Comberton Road

Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	3.5	metres
Step 2	How far from the KERB is your receptor (in metres)?	17	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	12.53	mg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	31.62	mg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	23.5	mg/m ³



Figure C.6 SP(K) – Spennells, lamp-post in Jay Park Crescent

Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	1.7	metres
Step 2	How far from the KERB is your receptor (in metres)?	12.7	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	9.45	mg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	10.89	mg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	10.2	mg/m ³



Figure C.7 SR(K) – Lamp-post outside 431 Stourport Road

Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	3	metres
Step 2	How far from the KERB is your receptor (in metres)?	12	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	12.52	mg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	33.51	mg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	26	mg/m ³

Figure C.8 BH166 – Lamp-post outside 166 Bewdley Hill

Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	7	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	13.61	mg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	25.33	mg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	21.9	mg/m ³

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

Figure D.1 Horsefair/Coventry Street AQMA and Monitoring Locations

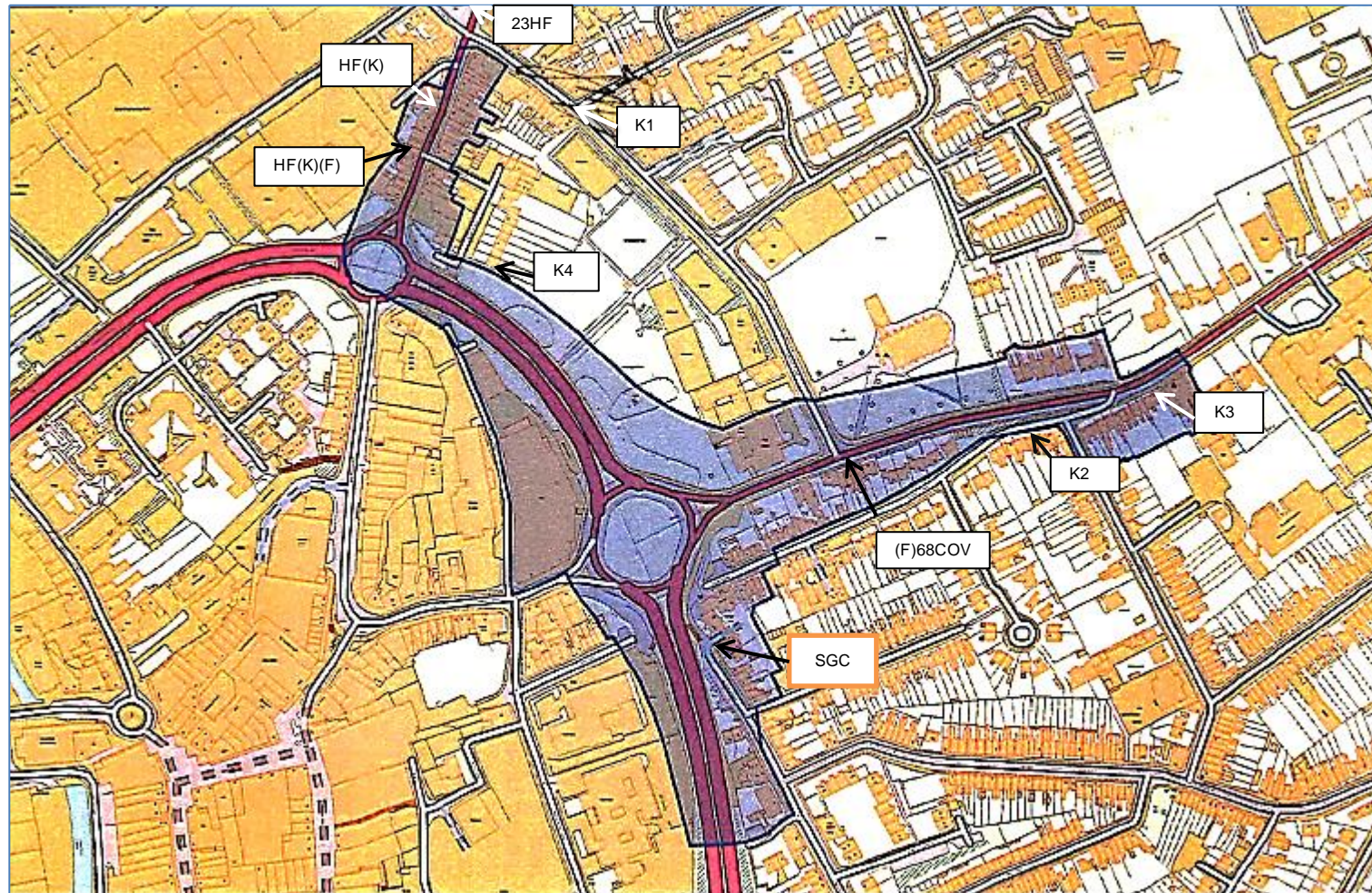


Figure D.2 Welch Gate AQMA and Monitoring Locations

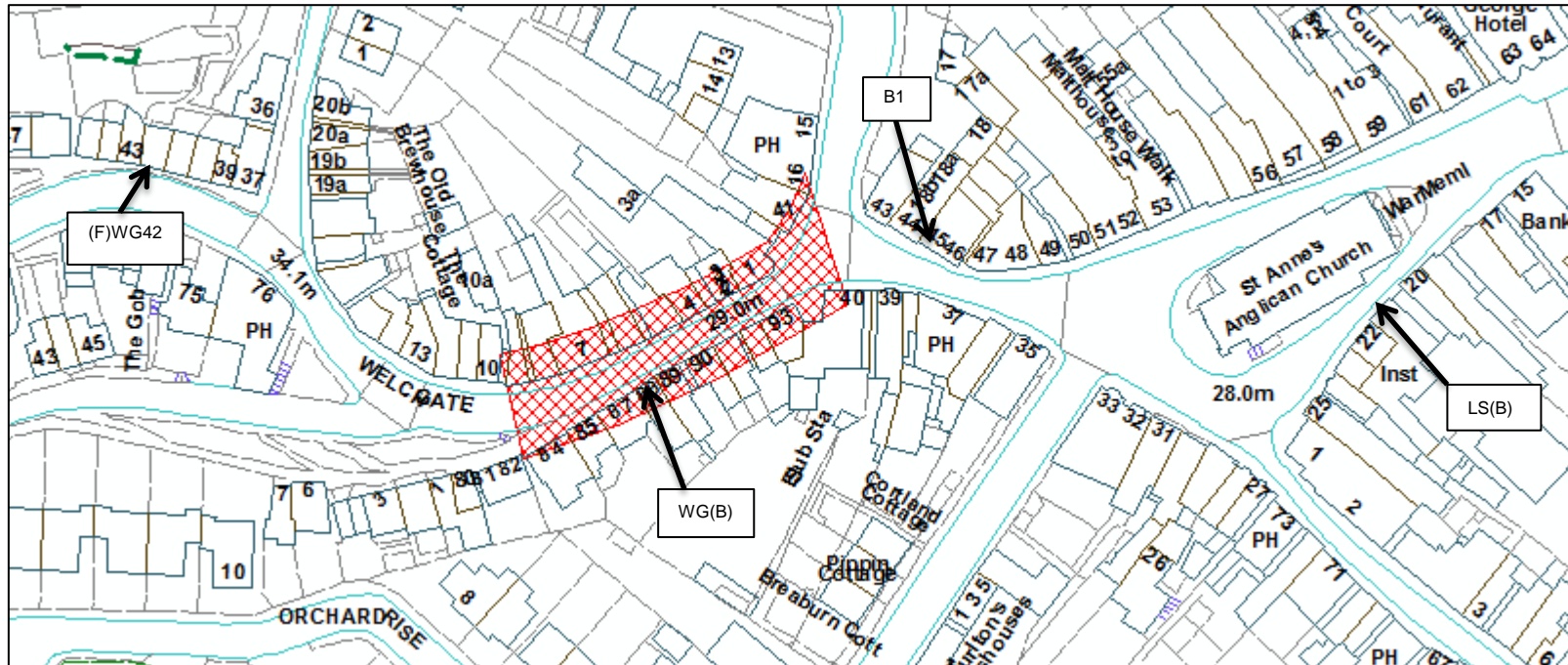


Figure D.3 East of Kidderminster Town Centre

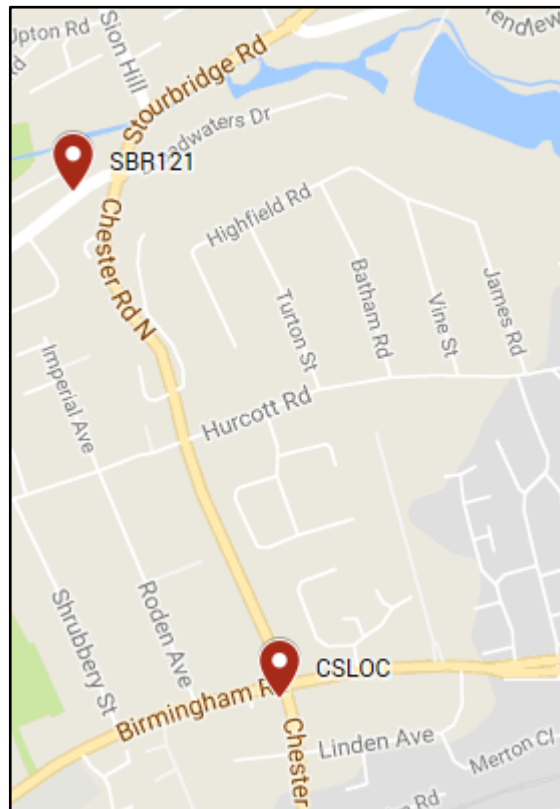


Figure D.4 West of Kidderminster Town Centre



Figure D.5 South of Kidderminster Town Centre

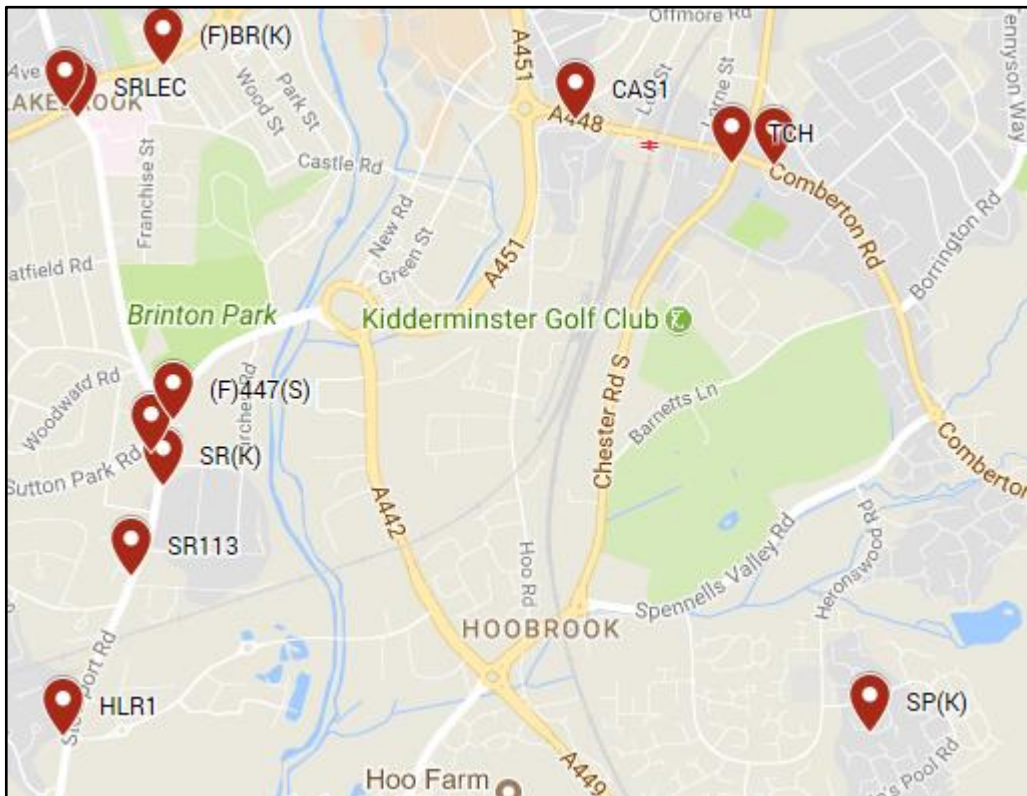


Figure D.6 Stourport-on-Severn

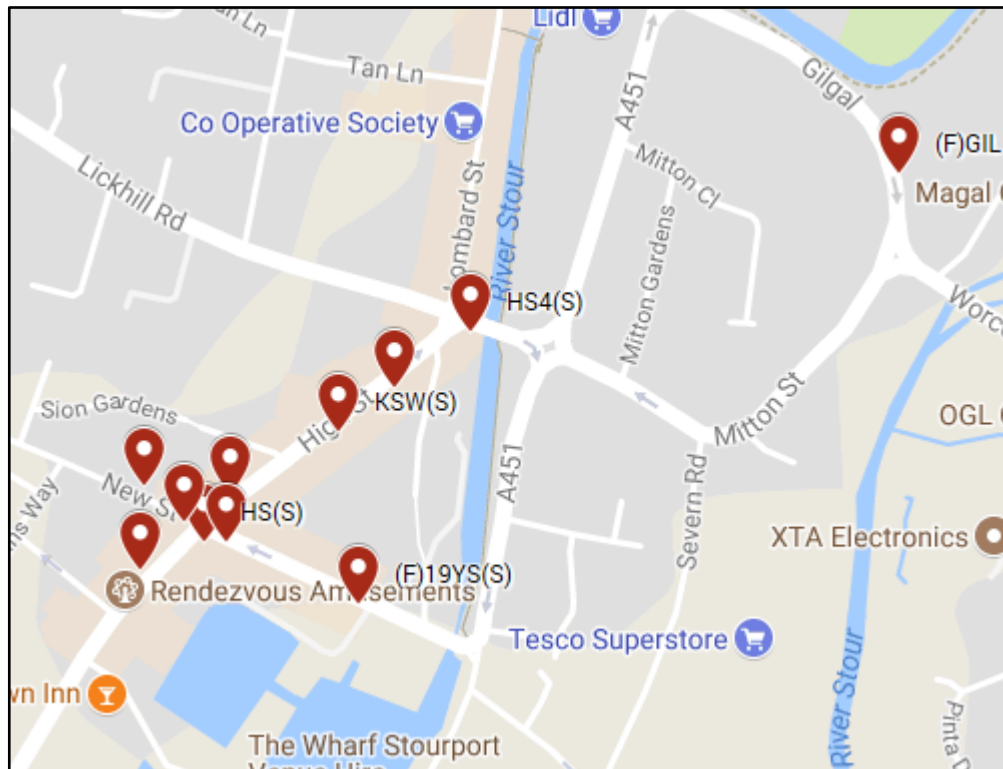


Figure D.7 East of Bewdley Town Centre



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁴	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DoPH	Director of Public Health
EU	European Union
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) 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
WCC	Worcestershire County Council
WFDC	Wyre Forest District Council
WRS	Worcestershire Regulatory Services

References

1. DEFRA (2016) Local Air Quality Management Policy Guidance LAQM PG.(16)
2. DEFRA (2016) 'Local Air Quality Management Technical Guidance LAQM TG.(16)
3. DEFRA (2017) 'National Diffusion Tube Bias Adjustment Factor Spreadsheet v.03/17 V2
4. Worcestershire Regulatory Services (2013) 'Air Quality Action Plan for Worcestershire'
5. Worcestershire Regulatory Services (2015) 'Air Quality Action Plan Progress Report for Worcestershire April 2013-April 2015'
6. Worcestershire Regulatory Services (2016) 'Air Quality Action Plan Progress Report for Worcestershire April 2015 – April 2016'
7. Worcestershire Regulatory Services (2017) Air Quality Annual Status Report for Wyre Forest District Council
8. Wyre Forest District Council (2011) Churchfields Masterplan Supplementary Planning Document