Stratford-on-Avon District Council

2024 Annual Status Report

July 2024

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2024 Air Quality Annual Status Report (ASR)

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

Date: July 2024

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Date	July 2024

Executive Summary: Air Quality in Our Area

Air Quality in Stratford-on-Avon District Council

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

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

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

Table ES 1 - Description of Key Pollutants

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

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

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

There are currently two AQMAs in Stratford-on-Avon District Council. Both have been designated due to exceedances of the annual mean Air Quality Strategy[3] (AQS) Objective for nitrogen dioxide (NO_2), with the elevated concentrations caused primarily by road traffic emissions. These are:

- Studley AQMA
- Stratford-on-Avon AQMA

Compliance with the 40µg/m^3 AQS objective was reached in 2019, and since then concentrations have remained below 10% of the objective (36µg/m^3). The highest recorded annual mean NO_2 concentrations in 2023 were 26.5µg/m^3 in Stratford-on-Avon AQMA and 25.5µg/m^3 in Studley AQMA. Average 2023 concentrations in both AQMAs were the lowest they have been in five years – including 2020 and 2021 COVID-19 years, which were expected to lead to improved air quality due to travel restrictions and the imposed national lockdowns. Due to the demonstrated continued compliance and air quality improvement, Stratford-on-Avon district Council intend to revoke both the Studley and Stratford-on-Avon AQMAs later this year.

Whilst no automatic monitoring of NO_2 is conducted within Stratford-on-Avon District, no diffusion tube monitoring location has reported a concentration greater than 60µg/m^3. As per LAQM.TG(22), an annual average concentration of 60µg/m^3 can be used as a proxy to identify areas where an exceedance of the 1-hour mean objective is likely to occur. As such, this indicates that there is unlikely to be any exceedances of the 1-hour mean objective within Stratford-on-Avon District at the monitored locations.

Actions to Improve Air Quality

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

The Environmental Improvement Plan[4] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter ($PM_{2.5}$), the pollutant of most harmful to human health. The Air

[3] Defra. UK Air. National Air Quality Objectives.

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

Quality Strategy[5] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero[6] details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel and the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

The Council continues to be a member of the Coventry and Warwickshire Air Quality Alliance (AQA), which was established in December 2015. The Alliance's intention is to take collaborative and collective action against poor air quality, whereby officers from Environmental Health, Transport, Planning and Public Health departments meet with representatives from Public Health England to work towards the development of a shared document repository and forum for exchange of information and ideas. The Alliance's work programme includes joint support for Active Travel/Healthy Travel Choice campaigns linked with national initiatives; joint work on transport projects (e.g. cycle network bids) and the sharing of planning guidance related to Air Quality. The aim to create a common approach to planning across Coventry and Warwickshire.

In 2022, Stratford-on-Avon District Council purchased two AQMesh air quality sensors to enable monitoring of different areas of concern within the Studley and Stratford-on-Avon AQMAs. The monitors are solar powered units that measure nitrogen dioxide, humidity, temperature and particulate matter. The locations were chosen to target areas where air pollution is expected to be high, such as an area that experiences heavy traffic. In 2023, the Council installed a third addition mobile AQMesh sensor and established a live stream of monitoring data that is available to view on their website, with the aim of promoting public involvement and awareness of air quality issues.

Following on from the adoption of the Air Quality and Planning Guidance in 2019, the Council has now fully adopted the Developer Requirements Supplementary Planning Document, including an air quality chapter (Part R) and associated guidance.

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

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

Conclusions and Priorities

Annual mean NO_2 concentrations remained well below the AQS objective in 2023 and overall, there has been a consistent downward trend since 2019. A priority for the Council is therefore to proceed with the revocation of Studley and Stratford-on-Avon AQMAs. Following revocation, Stratford-on-Avon will begin work on the production of a district-wide Air Quality Strategy (AQS).

Over the course of the next reporting year, Stratford-on-Avon District Council also intends to work towards building an evidence base to inform considerations for the potential delivery of EV infrastructure across the district, and to continue to promote clean air initiatives via press releases and Facebook.

Local Engagement and How to get Involved

As the main source of air pollution within Stratford-on-Avon is from transport emissions, the public can get involved in improving their local air quality by looking into alternative ways to travel.

The following are suggested alternatives to private travel that would contribute to improving air quality within Stratford-on-Avon:

- Public transport – The use of the bus and train facilities, which in turn reduces pollutant concentration by reducing the number of vehicles on the road, this also helps to reduce congestion;
- Walk or cycle if your journey allows – From choosing to walk or cycle the number of vehicles is reduced and also there is the added benefit of keeping fit and healthy;
- Car/lift sharing – Where a number of individuals are making similar journeys, such as travelling to work or to school, car sharing reduces the number of vehicles on the roads and therefore reduces road traffic emissions. This can be promoted via travel plans through the workplace and also within schools and;
- Alternative fuel / more efficient vehicles – Choosing a vehicle that meets the specific needs of the owner; fully electric, hybrid fuel and more fuel-efficient cars are available and all have different levels benefits by reducing the amount of emissions being released.

The Stratford-on-Avon District Council website contains information on local air quality for those wishing to find out more and get involved. The installation of AQMesh sensors within

the Studley and Stratford-on-Avon AQMAs means that live monitoring data is now publicly available online. The website has also been updated this year to include additional information for the public on wood burners and clean burning.

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Stratford-on-Avon District Council with the support and agreement of the following officers and departments:

Jacqueline Dicker – Environmental Health and Licensing

This ASR has been approved by:

Ben Ellis – Acting Head of Environmental Health and Licensing

This ASR has not been signed off by a Director of Public Health.

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

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Tables

1 Local Air Quality Management

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

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

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

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

- NO_2 annual mean.

We propose to revoke Stratford-on-Avon AQMA and Studley AQMA (see Section 0).

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
Studley AQMA	08/03/2006	Nitrogen dioxide NO_2	An area encompassing part of Alcester Road, Studley.	NO	62µg/m³	26.0µg/m³	7 years	AQAP for Studley AQMA, published 2008	Visit the AQAP for the Studley AQMA
Stratford upon Avon District Council no 1 2010	22/01/2010	Nitrogen dioxide NO_2	The whole town of Stratford upon Avon and some surrounding areas.	NO	45µg/m³	26.5µg/m³	6 Years	None currently published	-

☒ **Stratford-on-Avon confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **Stratford-on-Avon confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in Stratford-on-Avon District Council

Defra's appraisal of last year's ASR concluded that *"the report provides all of the information specified in the Guidance".* The following comments were made to inform the completion of future reports:

1. *Diffusion tube mapping is robust and clearly demonstrates the extent of the Council's monitoring network.*
2. *Given the Council's ongoing compliance observed for both Studley and Stratford AQMAs in 2022, Stratford-on-Avon District Council intends to progress with revocation in 2023. This decision is supported and is in line with the LAQM Technical Guidance (August 2022).*

Having reviewed the 2023 data, Stratford-on-Avon District Council intends to proceed with revocation of both Studley and Stratford AQMAs this year. A revocation report has been produced which is included in Appendix F: Revocation Report

3. *Further to the above, there is limited evidence of progress made against AQAP measures in 2022. However, it is acknowledged that resourcing constraints post-covid have contributed significantly to the Council's ability to progress actions, and it is anticipated that the Council will be more able to progress measures in the next reporting year.*
4. *It is encouraging to see the Council have been actively and regularly facilitating discussions on emissions and concentrations of $PM_{2.5}$ and ways to reduce these. The discussion on background concentrations and indicative $PM_{2.5}$ concentrations from low-cost sensors is reassuring.*
5. *The Council's NO_2 monitoring network is extensive, however the Council are encouraged to commence automatic monitoring to better validate the non-automatic NO_2 monitoring results. Automatic monitoring of particulate matter is also encouraged if practicable in order to better inform decisions on tackling $PM_{2.5}$ pollution in particular.*
6. *There is currently only one diffusion tube site outside of the AQMAs in a background location. Increasing the non-automatic monitoring outside of the*

designated AQMAs is advised to ensure any other exceedances in the Council are identified.

7. *Comments from last year's ASR have been included and addressed. This is welcomed and is encouraged in future ASRs.*
8. *Once again, the report is detailed, concise and satisfies the criteria of relevant standards. The Council should continue their good work.*

Stratford-on-Avon District Council has taken forward a number of direct measures during the current reporting year of 2024 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. Six measures are included within Table 2.2, with the type of measure and the progress Stratford-on-Avon District Council have made during the reporting year of 2024 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 completed measures are:

- Enhancement of the Council webpage on air quality to include additional information on wood burners and clean burning.
- Continued live-streaming of data from two stationary AQMesh sensors. In May 2023, a third mobile AQMesh sensor currently located on Evesham Road, Stratford Upon Avon, was installed and data live streaming was established. The AQMesh sensors monitor concentrations of NO_2, PM_{10} and $PM_{2.5}$ and the live data is available to view on the Air Quality Monitors Council webpage.

Over the course of the next reporting year, Stratford-on-Avon District Council intends to work towards building an evidence base to inform considerations for the potential delivery of EV infrastructure across the district, and to continue to promote clean air initiatives via press releases and Facebook.

Stratford-on-Avon District Council's priorities for the coming year are the adoption of Developer Requirements Supplementary Planning Document (SPD), including the air quality chapter (Part R) and associated guidance. The Council also intends to proceed with the revocation of Studley and Stratford-on-Avon AQMAs. Following revocation, Stratford-on-Avon will begin work on the production of a district-wide Air Quality Strategy (AQS).

Stratford-on-Avon District Council worked to implement these measures in partnership with the following stakeholders during 2023:

- Local Authority Environmental Health;
- Local Authority Transport Department; and,
- Warwick District Council.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Adoption of Developer Requirements SPD including AQ chapter (Part R) an associated guidance	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2026	Stratford-on-Avon District Council	N/A	NO	Not Funded	-	Implementation	N/A	N/A	Implementation on going	-
2	Enhancement of council webpage on AQ to include additional information for public on wood burners and clean burning etc	Public Information	Via the Internet	2022	2024	Stratford-on-Avon District Council	N/A	NO	Not Funded	-	Implementation	N/A	N/A	Implementation on-going	-
3	Building an evidence base to inform considerations for the potential delivery of EV infrastructure across the District	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2023	2025	Stratford-on-Avon District Council and Warwick District Council	TBC	NO	Partially Funded	£1 million - £10 million	Planning	Reduced emissions from private transportation	No of charging points installed	Assessing viability	-
4	Purchase of AQMesh sensors to enable monitoring of different areas of concern within the district.	Public Information	Other	2022	2023	Stratford-on-Avon District Council	N/A	NO	Not Funded		Completed	N/A	N/A	Completed	-
5	Enabling of live stream of data on internet to promote AQ issues	Public Information	Via the Internet	2022	2023	Stratford-on-Avon District Council	N/A	NO	Not Funded		Implementation	N/A	N/A	Implementation on-going	-
6	Promote clear air initiatives via press releases and facebook	Public Information	Via other mechanisms	2022	2025	Stratford-on-Avon District Council	N/A	NO	Not Funded		Planning	N/A	N/A	Implementation on-going	-

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[7], local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter ($PM_{2.5}$)). There is clear evidence that $PM_{2.5}$ (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Stratford-on-Avon District Council has been following discussions relating to the updated WHO guidance levels for $PM_{2.5}$ and recent consultation documents from Defra in regard to the Environmental Targets. Stratford-on-Avon District Council remains part of the Coventry and Warwickshire Air Quality Alliance, where discussions on $PM_{2.5}$ have been part of the regular meetings. Three AQ Mesh monitoring pods have been installed which provide indicative $PM_{2.5}$ hourly and daily concentrations. This data is live streamed and available for members of the public to view on the Council website.

The Public Health Outcomes Framework data tool[8] compiled by Public Heath England quantifies the mortality burden of $PM_{2.5}$ within England on a county and local authority scale. The 2022 fraction of mortality attributable to particle air pollution (indicator D01) in Stratford-on-Avon is 5.3%, which is below the average for the West Midlands region (5.7%) and for England (5.8%). The 2022 estimates of the fraction of mortality attributable to $PM_{2.5}$ pollution range from 2.5% in West Devon to 8.3% in the City of London.

LAQM.TG(22) Table A.1 Action toolbox presents a list of measures that can be implemented to help reduce concentrations of $PM_{2.5}$. Measures which focus on improving vehicle flow, reducing car usage, and promoting the uptake of alternative fuels will likely lead to a reduction of both NO_x and $PM_{2.5}$ emissions.

Where required, Stratford on Avon District Council will review any proposed actions to be implemented with the County Council Public Health team to consider the potential impact of the actions and whether any further action is required.

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

[8] Public Health Outcomes Framework, Public Health England. data tool available online at https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/1/ati/101/are/E07000108

Although Stratford-on-Avon District Council does not have any smoke control areas, some guidance in relation to bonfires is provided on their website. The Council will also respond to nuisance complaints where an individual may be affected by smoke.

Indicative Measurements of $PM_{2.5}$ Concentrations Using Defra Background Maps

The Defra 2023 background maps for Stratford-on-Avon (2018 reference year)[9] show that all background concentrations of $PM_{2.5}$ are far below the annual mean Air Quality Objectives of 20µg/m^3 for $PM_{2.5}$. The average $PM_{2.5}$ background concentration was 7.8µg/m^3, while the highest background concentration is estimated to be 10.8µg/m^3 within the 1 x 1km grid square with the centroid grid reference of 435500, 255500. This is an area to the east of the district, near to the B4100 and located east of the Lighthorne Heath industrial area. The industrial nature of this area will likely lead to higher $PM_{2.5}$ concentrations compared to the rest of the district. This is indicated in the background maps, whereby industrial sources are predicted to account for 2.4 µg/m^3 of the background concentration within this grid square, compared to the average of 0.01 µg/m^3 for the district. The main source contribution within this grid square is secondary PM (5.4 µg/m^3), which forms following reactions of other gaseous pollutants in the atmosphere, such as Nitrogen Oxides (NO_x) and Ammonia (NH_3). Ammonia in particular is likely to occur from agriculture, which is to be expected based on the rural nature of the surrounding areas.

Indicative Measurements of $PM_{2.5}$ from Monitoring Using AQMesh Sensors

Two stationary AQMesh sensors were established in 2022 and in May 2023, a third mobile AQMesh sensor currently located on Evesham Road, Stratford Upon Avon, was installed and data live streaming was established. The AQMesh sensors monitor concentrations of NO_2, PM_{10} and $PM_{2.5}$ and the live data is available to view on the Air Quality Monitors Council webpage.

While the low-cost AQMesh sensors can only provide indicative measurements of pollutants, they are useful for identifying overall pollutant trends and high pollution events. The establishment of the live streaming data service has meant that data was not available for inclusion in this year's ASR. The Council has made arrangements to ensure

[9] Defra Background Mapping data for local authorities (2018-based), available online at https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018

that the data can be captured in suitable format so that the indicative data can be included in future ASRs.

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

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Stratford-on-Avon did not undertake any automatic (continuous) monitoring during 2023.

3.1.2 Non-Automatic Monitoring Sites

Stratford-on-Avon undertook non-automatic (i.e. passive) monitoring of NO_2 at 18 sites during 2023. Table A.2 in Appendix A presents the details of the non-automatic sites.

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

Maps showing the location of the monitoring sites are provided in Appendix D: Map(s) of Monitoring Locations and AQMAs.

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

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

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

All 2023 annual mean NO_2 concentrations reported in Stratford-on-Avon District were well below 10% of the annual mean NO_2 AQS objective (36µg/m^3), with the highest reported annual mean concentration being 26.5µg/m^3 at DT ID 7 (located along Alcester Road in Stratford-on-Avon). The majority of sites (17 of 18) reported decreases in annual mean concentrations when compared with 2022 data, with an average decrease across all sites of 1.5µg/m^3.

Fall off with distance corrections have not been carried out at any site due to all monitoring locations reporting a concentration below 36µg/m^3. Additionally, whilst no automatic monitoring of NO_2 is conducted within Stratford-on-Avon District, no diffusion tube monitoring location has reported a concentration greater than 60µg/m^3. As per the LAQM.TG(22), an annual average concentration of 60µg/m^3 can be used as a proxy to identify areas where an exceedance of the 1-hour mean objective is likely to occur. As such, this indicates that there is unlikely to be any exceedances of the 1-hour mean objective within Stratford-on-Avon District Council at the monitored locations.

Studley AQMA

Within Studley AQMA, all sites reported decreases in annual mean NO_2 compared to 2022 data, with an average decrease of 1.7µg/m^3. The highest concentration reported was 26.0µg/m^3 at DT ID 5. This site is located next to a junction and traffic lights, so congestion is likely the reason for increased NO_2 concentrations at this location, although the annual mean concentration remains well below the AQS objective. When compared to 2020 and 2021 COVID-19 years, 2023 concentrations decreased on average by 1.2µg/m^3 and 3.4µg/m^3 respectively, indicating that air quality has continued to improve despite the return to normal travel and work patterns. As compliance with the annual NO_2 AQS objective (40µg/m^3) was achieved in 2019, and full compliance (within 10% of the AQS

objective) has been achieved and maintained from 2020-2023, Stratford-on-Avon District Council will proceed with revocation of the Studley AQMA this year.

Stratford-on-Avon AQMA

Only one site – DT ID 10 - in Stratford-on-Avon AQMA reported an increase in annual mean NO_2 concentrations when compared to 2022 data (23.5µg/m^3, an increase of 1.2µg/m^3). The highest concentration was 26.5µg/m^3 and was reported at DT ID 7. DT ID 10 and DT ID 7 are located either side of a busy junction near traffic lights, so it is likely that congestion is responsible for the higher concentrations observed at these locations, although they remain well below the AQS objective.

When compared to 2020 and 2021 COVID-19 years, 2023 concentrations were decreased on average by 0.2µg/m^3 and 2.1µg/m^3 respectively, indicating that air quality has continued to improve despite the return to normal travel and work patterns. As compliance with the annual mean NO_2 AQS objective (40µg/m^3) was achieved in 2019, and full compliance (within 10% of the AQS objective) has been achieved and maintained from 2020-2023, Stratford-on-Avon District Council will also proceed with revocation of the Stratford-on-Avon AQMA this year.

Appendix A: Monitoring Results

Table A.1 – 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)
1	Studley Background	Roadside	407270	263025	NO_2	No	5.0	2.3	No	2.2
2	Studley 1	Roadside	407300	263989	NO_2	Y - Studley AQMA	0.0	2.5	No	2.5
3	Studley 2	Roadside	407301	263914	NO_2	Y - Studley AQMA	0.0	1.4	No	2.5
4	Studley 4	Roadside	407297	263850	NO_2	Y - Studley AQMA	0.0	1.5	No	2.5
5	Studley 11	Roadside	407297	263864	NO_2	Y - Studley AQMA	2.8	0.0	No	2.3
6	Studley 12	Roadside	407297	263838	NO_2	Y - Studley AQMA	1.5	2.0	No	1.8
7	Alcester Road 2	Roadside	419705	255022	NO_2	Y - Stratford Upon Avon AQMA (No 1)	4.6	3.0	No	2.5
8	Tiddington Rd	Roadside	420727	254826	NO_2	Y - Stratford Upon Avon AQMA (No 1)	0.0	1.7	No	2.2
9	Montague House	Roadside	420202	255101	NO_2	Y - Stratford Upon Avon AQMA (No 1)	3.8	2.5	No	2.0
10	Greenhill St 2	Roadside	419794	255014	NO_2	Y - Stratford Upon Avon AQMA (No 1)	2.0	3.0	No	2.2
11	Grove Road 2	Roadside	419757	254918	NO_2	Y - Stratford Upon Avon AQMA (No 1)	0.0	1.4	No	2.5
12	Evesham Place	Roadside	419685	254604	NO_2	Y - Stratford Upon Avon AQMA (No 1)	0.0	3.0	No	1.8

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)
13	Arden Street 2	Roadside	419797	255178	NO_2	Y - Stratford Upon Avon AQMA (No 1)	2.0	2.2	No	2.0
14	Windsor Street	Roadside	419923	255076	NO_2	Y - Stratford Upon Avon AQMA (No 1)	0.0	5.0	No	1.8
15	Stratford Background	Roadside	418820	255117	NO_2	Y - Stratford Upon Avon AQMA (No 1)	3.0	2.0	No	2.2
16	Birmingham Road 3	Roadside	419816	255601	NO_2	Y - Stratford Upon Avon AQMA (No 1)	3.0	1.5	No	2.2
17	Birmingham Road 7	Roadside	419828	255576	NO_2	Y - Stratford Upon Avon AQMA (No 1)	0.0	7.0	No	1.7
18	Birmingham Road 8	Roadside	419813	255611	NO_2	Y - Stratford Upon Avon AQMA (No 1)	0.0	7.0	No	1.7

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 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
1	407270	263025	Roadside	90.4	90.4	12.6	9.3	9.4	9.4	8.5
2	407300	263989	Roadside	100.0	100.0	31.1	22.9	24.2	22.5	20.3
3	407301	263914	Roadside	100.0	100.0	30.2	22.4	24.9	23.2	21.1
4	407297	263850	Roadside	100.0	100.0	37.6	26.7	27.6	26.6	25.2
5	407297	263864	Roadside	92.3	92.3	-	25.1	29.2	26.7	26.0
6	407297	263838	Roadside	100.0	100.0	-	27.0	29.0	27.7	25.5
7	419705	255022	Roadside	90.4	90.4	35.0	26.1	29.5	28.1	26.5
8	420727	254826	Roadside	100.0	100.0	33.3	22.5	23.8	22.1	21.6
9	420202	255101	Roadside	50.0	50.0	-	16.9	19.1	19.3	16.7
10	419794	255014	Roadside	100.0	100.0	-	21.4	23.4	22.3	23.5
11	419757	254918	Roadside	100.0	100.0	34.3	23.6	24.2	22.9	22.1
12	419685	254604	Roadside	100.0	100.0	-	17.7	18.9	18.2	16.6
13	419797	255178	Roadside	75.0	75.0	-	20.3	22.0	20.1	18.8
14	419923	255076	Roadside	82.7	82.7	-	13.1	14.6	14.9	14.1
15	418820	255117	Roadside	100.0	100.0	11.5	8.7	9.3	11.0	8.0
16	419816	255601	Roadside	75.0	75.0	37.1	26.0	28.4	28.0	24.5
17	419828	255576	Roadside	82.7	82.7	-	19.7	22.1	21.3	21.0
18	419813	255611	Roadside	100.0	100.0	-	19.9	22.5	20.3	19.8

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

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

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

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the NO_2 annual mean objective of 40µg/m³ are shown in **bold**.

NO_2 annual means exceeding 60µg/m³, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

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

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

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

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

Figure A.1 – Trends in Annual Mean NO_2 Concentrations: Stratford-on-Avon

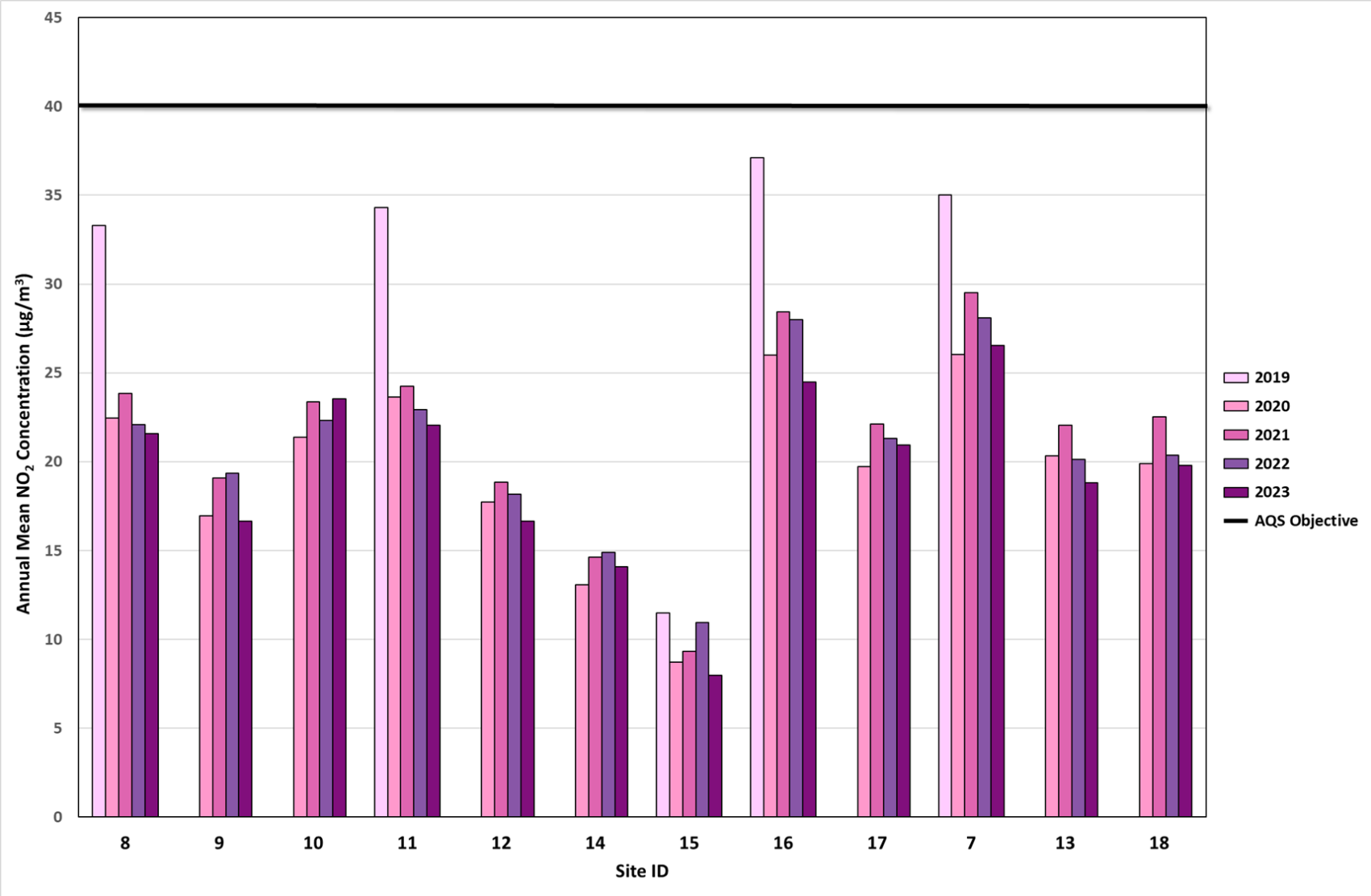
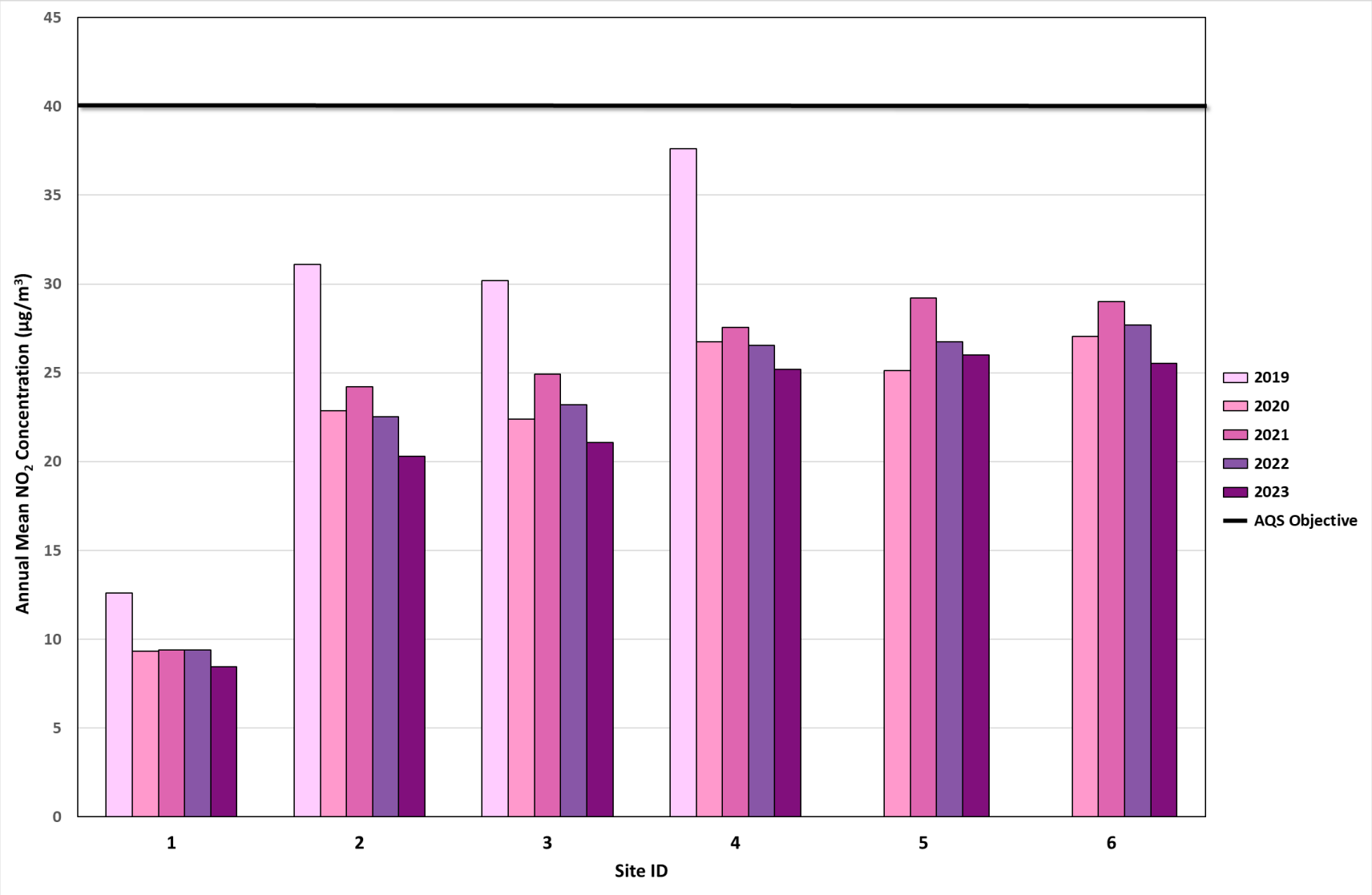


Figure A.2 – Trends in Annual Mean NO_2 Concentrations: Studley



Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO_2 2023 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	407270	263025	12.1	15.5	10.6	9.2	8.4	6.8	4.9	7.17	9.3	11.3	17.8	9.0	10.4	8.5	-	
2	407300	263989	26.3	29.8	23.5	26.7	29.3	23.2	18.8	23.5	26.5	26.8	28.0	18.5	25.1	20.3	-	
3	407301	263914	27.6	32.6	25.9	29.0	25.7	22.9	18.9	23.7	28.0	28.8	28.0	21.1	26.0	21.1	-	
4	407297	263850	30.1	40.0	33.1	33.2	35.0	31.0	20.9	26.5	31.5	34.7	33.3	24.1	31.1	25.2	-	
5	407297	263864	30.3	37.9	32.0	34.9	32.6			27.2	31.5	35.5	34.1	24.3	32.0	26.0	-	
6	407297	263838	28.8	40.7	32.5	33.5	35.3	32.3	19.9	28.6	32.9	36.3	35.3	22.3	31.5	25.5	-	
7	419705	255022	33.1	34.7	29.5	35.9	34.3		29.9	33.1	32.8	35.0	34.0	28.3	32.8	26.5	-	
8	420727	254826	22.5	32.7	25.6	28.9	27.4	26.7	21.7	24.8	29.3	29.2	28.1	23.0	26.6	21.6	-	
9	420202	255101							13.6	17.9	20.5	24.6	25.8	19.1	20.3	16.7	-	
10	419794	255014	34.8	34.5	28.3	27.2	23.9	25.4	27.5	25.2	30.7	31.0	31.9	28.1	29.0	23.5	-	
11	419757	254918	34.7	32.9	26.8	23.1	22.7	22.9	22.6	22.1	27.6	31.2	32.8	27.4	27.2	22.1	-	
12	419685	254604	25.3	24.4	20.9	20.4	19.1	16.5	15.9	17.9	20.5	22.5	25.7	17.6	20.5	16.6	-	
13	419797	255178	28.3	30.4	24.1			20.8	14.8	18.6	24.0	26.9		21.2	23.2	18.8	-	
14	419923	255076	21.6	21.7	17.9	16.7	14.1	13.5	14.3	15.1		20.8		18.3	17.4	14.1	-	
15	418820	255117	14.7	15.0	10.2	9.3	7.9	6.2	4.2	6.6	8.2	11.8	15.1	8.9	9.8	8.0	-	
16	419816	255601	35.6	21.9	31.6	38.0	24.6	34.1	24.6	29.1	32.6				30.2	24.5	-	
17	419828	255576	27.2	29.6		24.8	34.7	21.6		20.9	24.8	25.7	28.4	21.0	25.9	21.0	-	
18	419813	255611	25.0	28.3	31.6	26.0	23.7	22.8	16.0	21.4	24.6	27.1	27.2	19.7	24.5	19.8	-	

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

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

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

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

☒ **Stratford-on-Avon confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m³ are shown in **bold**.

NO_2 annual means exceeding 60µg/m³, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Stratford-on-Avon District Council During 2024

The following developments identified in the 2023 ASR as having the potential to impact air quality are still ongoing:

- 18/01061/REM - Land to the North and West of Bishopton Lane, Stratford upon Avon - erection of 500 dwellings.
- 19/02827/REM – Shottery 391 dwellings- additional phases of the development have been submitted for approval.
- 18/01892/OUT - Long Marston Airfield, 3100 new homes, 2 x schools, mixed use employment land.
- Gaydon/Lighthorne Heath - 3000 houses.
- Stratford upon Avon Canal Quarter - 500 houses.

In addition, the following works have been identified this year as having the potential to impact air quality:

- 21/000204/FUL - Cross boundary application for the erection of 236 homes with open space, landscaping, drainage, infrastructure and other associated works. 210 homes falling within Redditch District and 26 homes within Stratford on Avon District.
- Ongoing road re-configuration works on the Evesham Road and Luddington Road connected with the ongoing South Western Relief Road.

Additional Air Quality Works Undertaken by Stratford-on-Avon District Council During 2024

Stratford-on-Avon District Council undertook a review of monitoring data within the AQMAs and have produced a report outlining their intentions to proceed with revocation of the Studley and Stratford-on-Avon AQMAs. The report is included in Appendix F: Revocation Report

QA/QC of Diffusion Tube Monitoring

Stratford-on-Avon District Council's diffusion tubes were supplied and analysed by Gradko International Ltd during 2023, using the 20% Triethanolamine (TEA) in water preparation method. Gradko's laboratory is UKAS accredited, participating in the AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO_2 tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high caliber. The lab follows the procedures set out in the Harmonisation Practical Guidance.

In the 2023 AIR NO_2 PT rounds, AIR-PT AR055 - AR059 (January - October 2023) Gradko scored 100%. The results for November - December 2023 have not yet been published. The percentage score reflects the results deemed to be satisfactory based upon the z-score of < ±2. Additionally, the precision of the NO_2 diffusion tubes (20% TEA in Water) supplied by Gradko has been classified as 'good' for all 21 observations in 2023. This precision reflects the laboratory's performance and consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field. Tubes are considered to have a "good" precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more monitoring periods during a year is less than 20%. Further information on the precision summary results can be found on the LAQM website.

Diffusion tube monitoring during 2023 was undertaken in line with the Diffusion Tube Monitoring Calendar and recommended exposure period (5 weeks (+/- 4 days)).

Diffusion Tube Annualisation

One site (DT ID 9) required annualisation due to having less than 75% annual data capture. Annualisation was carried out by calculating an annualisation factor using background concentrations from the four nearest background monitoring sites: West Bromwich Kenrick Park, Leamington Spa, Coventry Allesley and Birmingham Ladywood. Details of the calculations are provided in Table C.1.

Table C.1 – Annualisation Summary (concentrations presented in µg/m³)

Site ID	Annualisation Factors				Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
	West Bromwich Kenrick Park	Leamington Spa	Coventry Allesley	Birmingham Ladywood			
9	0.9909	1.0353	1.0365	0.9977	1.0151	20.3	20.6

Diffusion Tube Bias Adjustment Factors

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

Stratford-on-Avon District Council have applied a national bias adjustment factor of 0.81 to the 2023 monitoring data. This has been derived from the National Diffusion Tube Bias Adjustment Factor Spreadsheet, as shown in Figure C.1. A summary of bias adjustment factors used by Stratford-on-Avon District Council over the past five years is presented in Table C.2.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	National	03/24	0.81
2022	National	03/23	0.83
2021	National	03/22	0.84
2020	National	03/21	0.81
2019	National	03/20	0.93

Figure C.1 - National Diffusion Tube Bias Adjustment Factor

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/24

Follow the steps below in the correct order to show the results of relevant co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2024

LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List. If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List. If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List. If a year is not shown, we have no data[2]

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[2] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in Water	2023	R	Monmouthshire County Council	11	33	26	26.5%	G	**0.79**
Gradko	20% TEA in water	2023	R	Blackburn With Darwen Bc	12	23	16	43.8%	G	**0.70**
Gradko	20% TEA in water	2023	R	Lancaster City Council	10	35	27	28.6%	G	**0.78**
Gradko	20% TEA in water	2023	R	Eastleigh Borough Council	12	33	26	26.4%	G	**0.79**
Gradko	20% TEA in water	2023	R	Eastleigh Borough Council	12	22	19	12.5%	G	**0.89**
Gradko	20% TEA in water	2023	R	Plymouth City Council	12	35	26	38.3%	S	**0.72**
Gradko	20% TEA in water	2023	R	Plymouth City Council	10	39	31	24.2%	S	**0.80**
Gradko	20% TEA in water	2023	UC	Belfast City Council	10	26	19	38.3%	G	**0.72**
Gradko	20% TEA in water	2023	R	Cheshire West And Chester	12	35	32	10.0%	G	**0.91**
Gradko	20% TEA in water	2023	R	Cheshire West And Chester	10	32	28	14.6%	G	**0.87**
Gradko	20% TEA in water	2023	R	Dudley Mbc	12	27	23	17.1%	G	**0.85**
Gradko	20% TEA in water	2023	UB	Dudley Mbc	12	19	13	45.4%	G	**0.69**
Gradko	20% TEA in water	2023	R	Dudley Mbc	12	40	37	7.7%	G	**0.93**
Gradko	20% TEA in water	2023	R	Gateshead Council	12	23	20	17.7%	G	**0.85**
Gradko	20% TEA in water	2023	R	Gateshead Council	11	23	18	26.9%	G	**0.79**
Gradko	20% TEA in water	2023	R	Gateshead Council	12	27	22	20.7%	G	**0.83**
Gradko	20% TEA in water	2023	R	Gateshead Council	12	29	23	25.9%	G	**0.79**
Gradko	20% TEA in water	2023	R	Gateshead Council	12	30	33	-7.8%	G	**1.08**
Gradko	20% TEA in water	2023	KS	Marylebone Road intercomparison	11	45	38	20.3%	G	**0.83**
Gradko	20% TEA in water	2023	B	South Holland District Council	10	8	7	12.4%	G	**0.89**
Gradko	20% TEA in water	2023	R	Worcestershire	12	12	11	17.4%	G	**0.85**
Gradko	20% TEA in Water	2023	R	Ards And North Down Borough Council	12	33	21	60.2%	G	**0.62**
Gradko	20% TEA in Water	2023	R	Lisburn & Castlereagh City Council	11	24	20	22.1%	G	**0.82**
Gradko	20% TEA in water	2023		**Overall Factor[3] (23 studies)**				**Use**		**0.81**

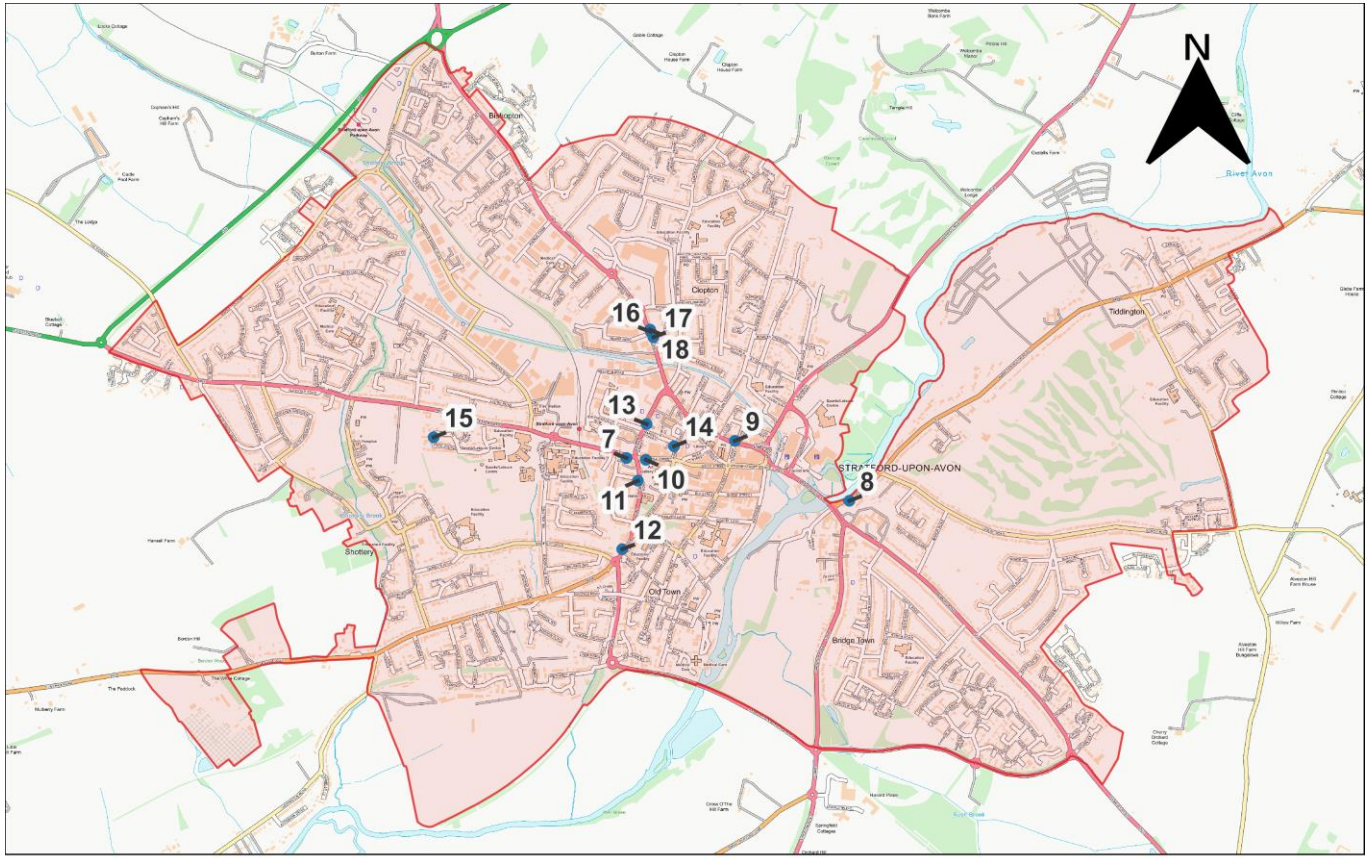
NO_2 Fall-off with Distance from the Road

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

No diffusion tube NO_2 monitoring locations within Stratford-on-Avon required distance correction during 2023, as all annual mean bias adjusted NO_2 concentrations were below 36 µg/m^3 (10% of the AQS Objective).

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

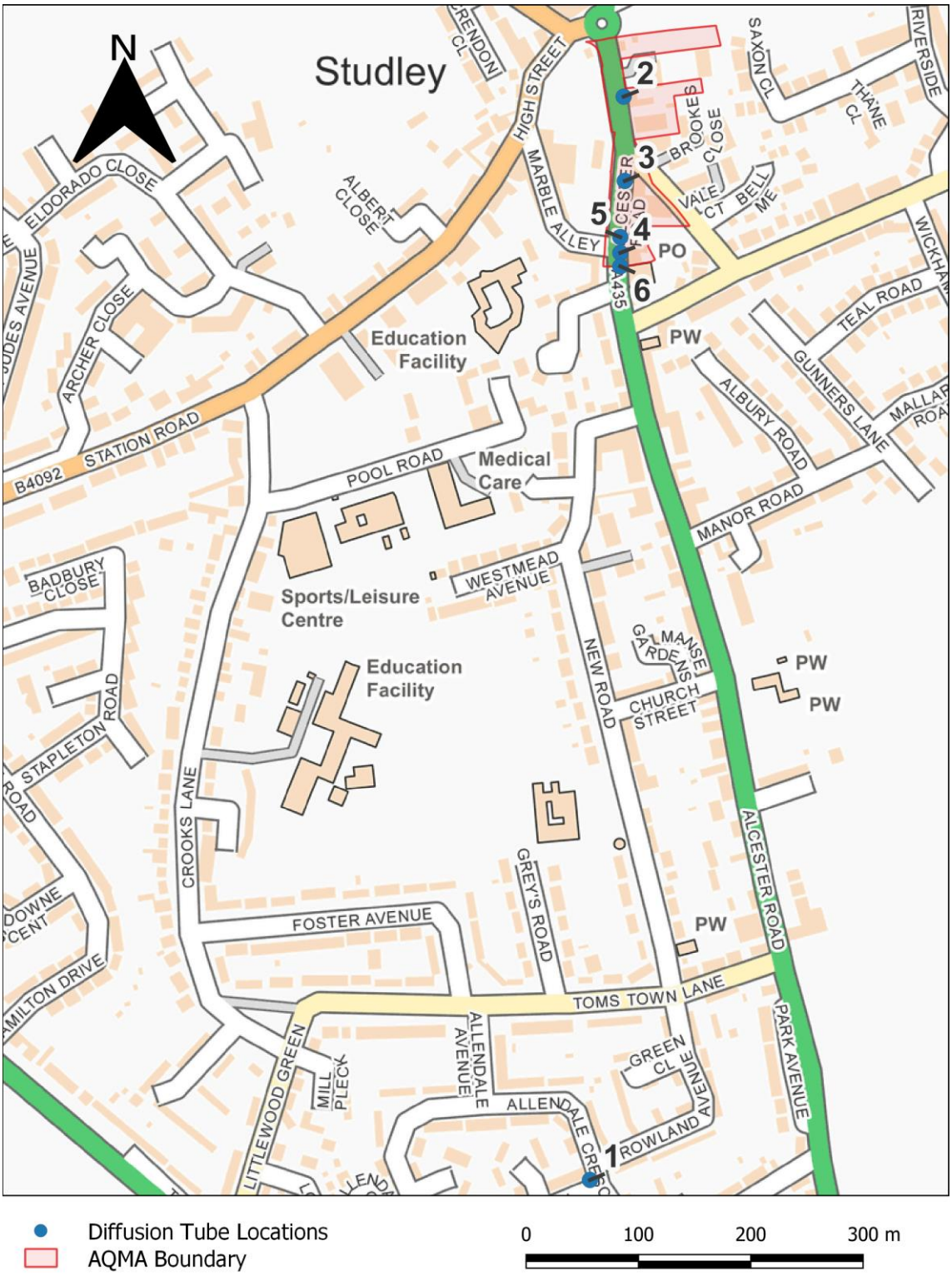
Figure D.1 – Map of Non-Automatic Monitoring Sites: Stratford-on-Avon



Diffusion Tube Locations
AQMA Boundary
Contains Ordnance Survey data © Crown copyright and database right 2023

0 1 2 km

Figure D.2 – Map of Non-Automatic Monitoring Sites: Studley



Appendix E: Summary of Air Quality Objectives in England

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

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

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

Appendix F: Revocation Report

1.1 Part IV of the Environment Act 1995 places a statutory duty on local authorities to periodically review and assess the air quality within their area. Where it is considered likely that an air quality objective (AQO) is not likely to be met the local authority must declare an Air Quality Management Area (AQMA). Following the declaration of an AQMA an Air Quality Action Plan (AQAP) must be developed and published setting out local measures to be implemented to improve air quality and meet the AQO. Each year local authorities are required to submit an Annual Status Report (ASR) to DEFRA reporting on air quality in their area over the previous year.

1.2 Following review of Nitrogen Dioxide (NO2) levels across the district an AQMA was declared in 2006 covering an area of the Alcester Road in Studley (see map in Appendix 1). In 2010 a second AQMA was declared covering Stratford-upon-Avon town (see map in Appendix 2). An AQAP was adopted for Studley in 2008, consultation for an updated AQAP commenced in 2018 but was halted by the pandemic in 2020. An AQAP has never been published for the Stratford AQMA.

1.3 DEFRA's most recently published technical guidance states that revocation of an AQMA should be considered following annual mean NO2 concentrations being lower than 36 ug/m3 for 3 consecutive years (i.e. when they are at least 10% lower than the NO2 objective). Guidance also states that local results should be considered in conjunction with national emissions trends and any local factors that may affect the AQMA. DEFRA state no AQMAs should exist where compliance with the relevant objective has been achieved for a consecutive five-year period.

1.4 STUDLEY AQMA

Figure 1 shows the trendlines of the 3 monitoring sites which have remained at the same location since 2010; a continuing decrease in NO2 levels can be seen. In 2018 and 2020 additional diffusion tubes were installed to show a more detailed picture of the air quality in and around the AQMA. A summary of the results since 2017 can be seen in Table 1 which confirm the continual decrease and show that the last time a result exceeded the AQO was in 2017. 10% of the AQO was exceeded at Studley 4 in 2018 and 2019, but no further exceedances have been observed since.

Figure 1. Studley AQMA annual average NO_2 (µg/m³) bias adjusted

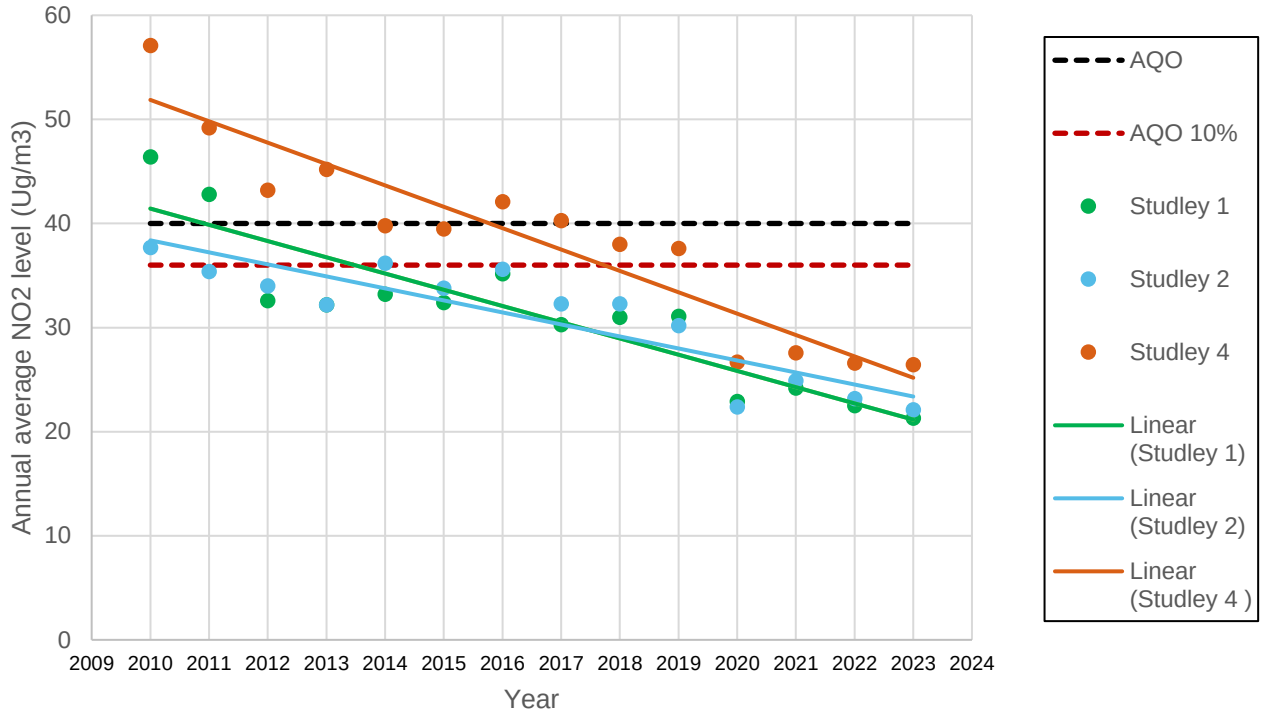


Table 1: Studley AQMA annual average NO_2 data from the last 5 years (ug/m³ bias adjusted) (exceedances of AQO in bold, exceedance of 10% level underlined)

STUDLEY AQM	2017	2018	2019	2020	2021	2022	2023
Studley 1	30.3	31.0	31.1	22.9	24.2	22.5	21.3
Studley 2	32.3	30.2	30.2	22.4	24.9	23.2	22.1
Studley 4	**40.3**	38.0	37.6	26.7	27.6	26.6	26.5
Studley 11				25.1	29.2	26.7	24.9
Studley 12				27.0	29.0	27.7	26.8

1.5 STRATFORD AQMA

Figure 2 shows the trendlines of the 5 monitoring sites which have remained in the same location since 2007; a continuing decrease can be seen. In 2018 and 2020 additional diffusion tubes were installed to show a more detailed picture of the air quality in and around the AQMA; the full results can be seen in Appendix 3. A summary of the results since 2017 can be seen in Table 1 which confirm the continual decrease and show that the AQO has not been exceeded within the last 5 years. 10% of the AQO was exceeded at Birmingham Road 3 in 2019, but no further exceedances have been observed since.

Figure 2. Stratford AQMA annual average NO2 (ug/m3) bias adjusted

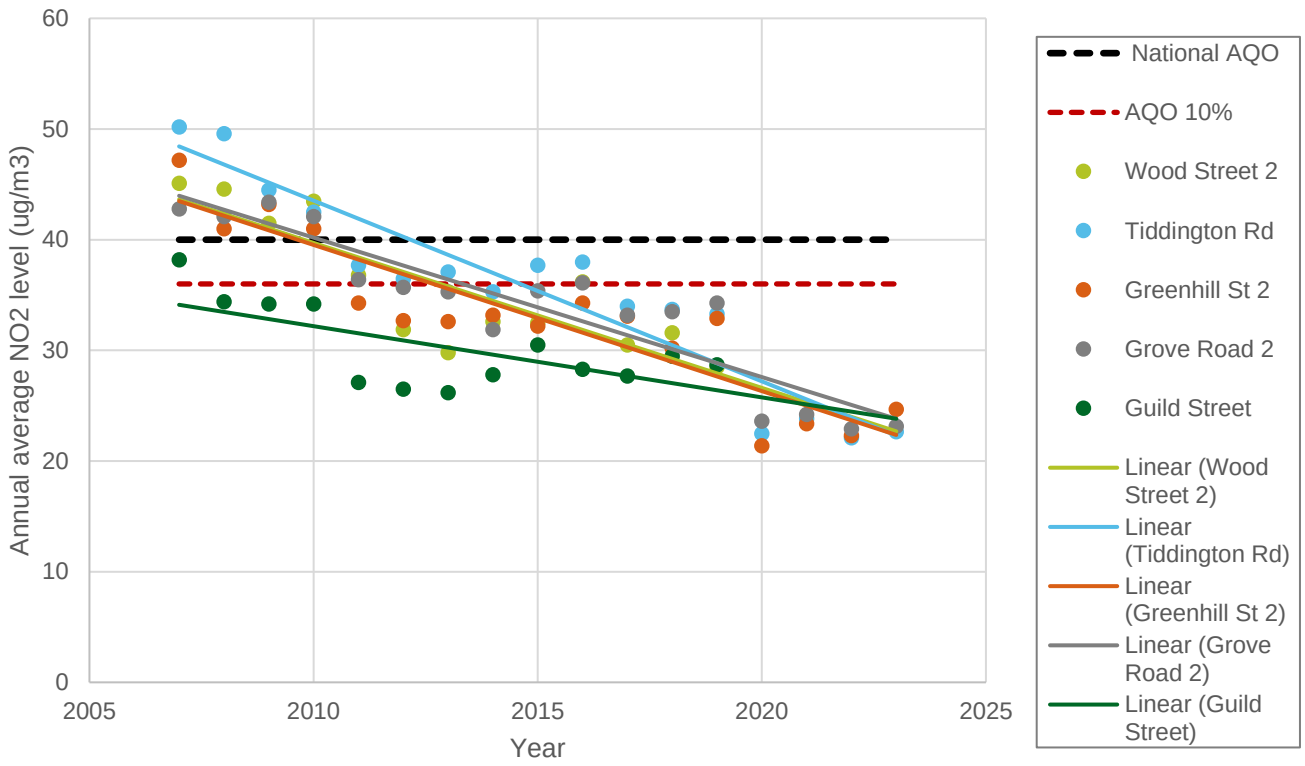


Table 2: Stratford AQMA annual average NO2 data from the last 5 years (ug/m3 bias adjusted)

STRATFORD AQMA	2019	2020	2021	2022	2023
Tiddington Rd	33.3	22.5	23.8	22.1	22.7
Greenhill St 2	32.9	21.4	23.4	22.3	24.7
Grove Road 2	34.3	23.6	24.2	22.9	23.2
Stratford Background	11.5	8.7	9.3	11.0	8.4
Birmingham Rd 3	37.1	26.0	28.4	28.0	25.7
Alcester Road 2	35.0	26.1	29.5	28.1	27.9
Arden Street 2	30.2	20.3	22.0	20.1	19.7
Evesham Place		17.7	18.9	18.2	
Birmingham Road 7		19.7	22.1	21.3	22.0
Birmingham Road 8		19.9	22.5	20.3	20.8
Windsor Street		13.1	14.6	14.9	14.8
Montague House		16.9	19.1	19.3	17.2

1.6 Levels can be seen to be higher either side of 2020 data in both Stratford and Studley, this is to be expected due to the global pandemic. Since 2020 there have been 3 consecutive years of data lower than 10% of the Air Quality Objective.

1.7 **Local Factors**

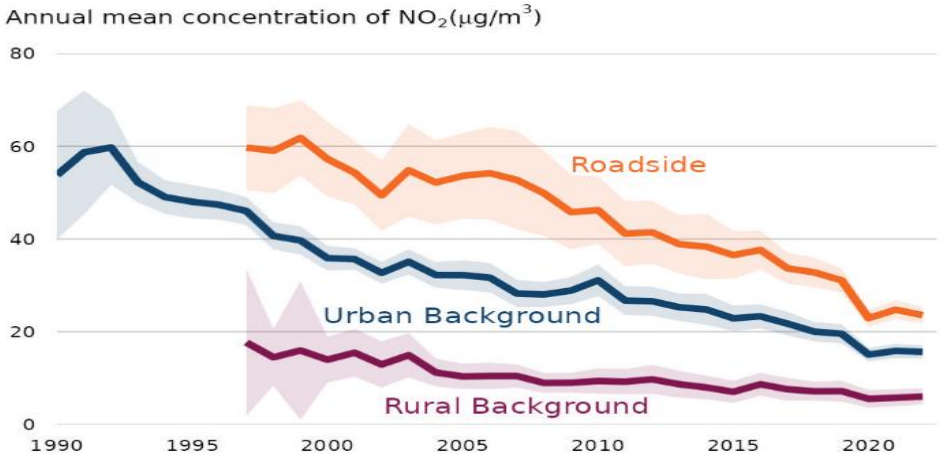
Stratford upon Avon has seen a high level or residential development over the last 10 years with 10,023 new homes being built across the district between April 2011 and March 2022. The population has grown by 11.8% during the same time. Following advice provided during scoping for the Long Marston airfield redevelopment tubes were installed at Stratford

town centre locations, monitoring was also completed on Alcester Road Studley which may have been impacted by increased HGV journeys through the Studley AQMA due to the Redditch Gateway development. However, despite such changing local factors NO2 levels have continued to decrease.

1.8 **National Emissions Trends**

National roadside levels of NO2 have decreased from an annual average of over 60ug/m3 in 2000 to an annual average of 23.6 ug/m3 in 2022. DEFRA state that this is most likely due to the large reduction in road transport emissions of NO2 as newer vehicles subject to stricter emissions standards have entered the transport fleet. It is considered that this trend will continue with the number of electric vehicles on the road increasing.

Figure 3: Annual mean concentrations of NO2 in the UK, 1990 to 2022 (DEFRA, 2023.)



1.9 SDCs Annual Status Report for 2022 was submitted to DEFRA in 2023 with their appraisal comments provided in January 2024. The appraiser acknowledged that there has been consistent achievement of the AQO for several years and would support a decision to revoke both AQMAs, stating that such a decision would be in line with the LAQM Technical Guidance (August 2022).

1.10 **Recommendation:**

(a) Roadside NO2 levels in Stratford-on-Avon have fallen in line with national trends. compliance with both the AQO and the secondary target of 36ug/m3 has been achieved for 3 years (4 if 2020 is included) in both AQMAs. Furthermore, neither AQMA has a current action plan in force. Following DEFRA guidance, the 2 AQMAs should therefore be revoked.

(b) A district wide Air Quality Strategy (AQS) should be adopted. The Technical Guidance states that where a local authority has no AQMAs an AQS should be put in place to ensure air quality remains a high-profile issue and to ensure it is able to respond quickly should there be any deterioration in condition. The AQS will detail suitable measures to be put in place to further improve air quality within the district and will cover both Nitrogen Dioxide and Particulate Matter.

1.11 **Other Options.**

The only alternative would be to defer revocation and keep the AQMAs in place. There is no justification for this as the purpose of an AQMA is to enable actions to be prioritised by the local authority to tackle high levels of Nitrogen Dioxide. Air Quality in both areas already achieve the relevant targets and both local and national NO2 levels continually reduce year on year. DEFRA have stated that if the AQMAs are not revoked new Air Quality Action Plans are required to be put in place in both locations. It would be a more efficient use of resources to focus on a district wide AQS.

Glossary of Terms

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

References

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- 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.
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- Stratford on Avon District Council, 2008 Draft Air Quality Action Plan.
- Stratford on Avon District Council 2023 Annual Status Report.
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- Stratford on Avon District Council 2021 Annual Status Report.
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