



**STROUD
DISTRICT
COUNCIL**

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2023 Air Quality Annual Status Report (ASR)

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

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Executive Summary: Air Quality in Our Area

Air Quality in Stroud district

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

The mortality burden of air pollution within the UK is equivalent to 29,000 to 43,000 deaths at typical ages³, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁴.

The most significant influence on air quality within the Stroud district is road traffic emissions and the main pollutant of concern from road traffic is Nitrogen Dioxide (NO₂). Stroud District Council locates diffusion tubes across its District to measure NO₂ concentrations. The tubes are replaced monthly and then sent away for analysis. In 2022, there was no overall change in the air quality status across Stroud District, despite some monitoring locations reporting marginal increases in NO₂ concentrations. This is because similar numbers of monitoring locations reported similar levels of decreases in NO₂ concentrations. Despite this, the general downward trend in NO₂ concentrations across the district over the past few years continues to be the case and air quality across the district remains very good. This reflects a national trend outlined in national statistics, "Roadside NO₂ pollution has reduced in the long-term and in recent years, having been stable for most of the 2000s" ([https://www.gov.uk/government/statistics/air-quality-statistics/nitrogen-dioxide#:~:text=The%20average%20annual%20mean%20concentration%20of%20NO2%20at%20rural%20background,%25\)%20each%20year%20since%201997](https://www.gov.uk/government/statistics/air-quality-statistics/nitrogen-dioxide#:~:text=The%20average%20annual%20mean%20concentration%20of%20NO2%20at%20rural%20background,%25)%20each%20year%20since%201997)).

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

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

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

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

Due to the requirement to monitor PM_{2.5}, as a result of the Environment Act 2021, Stroud District Council has been investigating options available to it in order to fulfil its duties. Stroud District Council has been working with neighbouring authorities as part of a Gloucestershire-wide network co-ordinated by Gloucestershire County Council to develop a strategy for monitoring and reporting particulate data, as well as ensuring the availability of data to the public.

Actions to Improve Air Quality

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

The Environmental Improvement Plan⁵ sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term PM_{2.5} targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce PM_{2.5} in their areas. The Road to Zero⁶ details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Stroud District Council undertakes diffusion tube monitoring for Schools Streets trials. This forms part of county-wide monitoring of closed streets where schools are located, for ThinkTravel. Information from this is to be used to support the promotion of anti-idling initiatives across Gloucestershire.

Conclusions and Priorities

In 2022, none of the 40 NO₂ monitoring locations exceeded the annual Air Quality Objective of 40 µg/m³ and none were within 10% of the objective (36.0µg/m³). Sixteen monitoring locations reported marginal increases in concentrations of NO₂ compared to 2021.

⁵ Defra. Environmental Improvement Plan 2023, January 2023

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

Seventeen locations reported marginal decreases in concentrations of NO₂ compared to 2021. Two locations reported no change from 2021. The difference between the average increase and the average decrease is negligible (0.1 µg/m³ decrease) and indicates no significant change overall from 2021.

In the context of the last five years, the 2022 data has no negative impact on the downward trend in NO₂ concentrations. Looking forward, Stroud District Council is working closely with neighbouring local authorities and Gloucestershire County Council on providing a digital solution to make air quality and related health data available to the public. In addition, Stroud District Council has been working with Gloucestershire County Council and other neighbouring authorities to explore options for monitoring particulates; particularly PM_{2.5}, with a view to meeting long-term and short-term air quality targets to reduce PM_{2.5} in ambient air.

Local Engagement and How to get Involved

Stroud District Council engages with decision makers and the public through several forums. Gloucestershire Pollution Group is made up of environmental protection professionals from each of the local authorities within Gloucestershire, as well as air quality representatives from Gloucestershire County Council (GCC) and the Environment Agency. This forum allows officers to share good practice and ideas for improving air quality.

Stroud District Council is engaged with the Air Quality and Behaviour Change group. This group is made up of professionals and electoral representatives from across Gloucestershire. The group is finalising the Gloucestershire Air Quality and Health Strategy as well as developing a co-ordinated approach to the monitoring and reporting of particulate matter across Gloucestershire.

Stroud District Council provides support to a Community Liaison Group set up to research air quality issues associated with an energy from waste facility operating in the Stroud district. The group is made up of local electoral representatives, Environment Agency representatives, representatives from the operator as well as members of the public.

There is significant interest in air quality issues across the Stroud district and this is reflected in the political composition of the Council. Councillors actively engage in a whole range of environmental issues, including air quality. Officers regularly brief the Council's Environment Committee on air quality in the district.

The public can help to improve air quality across the district by reducing unnecessary vehicular travel. Additionally, burning household and garden waste is a particular issue in the district so, disposal of these wastes by alternative means would be beneficial.

Copies of the latest air quality report for Stroud District can be found on the Council's website at <https://www.stroud.gov.uk/environment/environmental-health/pollution-and-nuisance/air-quality>.

Queries relating to air quality should be directed to the Environmental Protection team at Stroud District Council.

Local Responsibilities and Commitment

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

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

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1 Local Air Quality Management

This report provides an overview of air quality in Stroud district during 2022. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether 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 Stroud 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.

Stroud District Council currently does not have any declared AQMAs.

2.2 Progress and Impact of Measures to address Air Quality in Stroud district

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

- Stroud District Council have provided a detailed discussion of pollutant trends, with a robust comparison to air quality objectives.
- The report provides a good discussion of measures to address PM_{2.5} and includes an explicit reference to the Public Health Outcomes Framework and the local indicator for the fraction of mortality that is attributable to particulate air pollution indicator. This is welcomed.
- QA/QC procedures have been appropriately applied to diffusion tube monitoring data. However, it is noted PM₁₀ and PM_{2.5} monitoring stations have not been calibrated and thus can be considered as indicative only. The Council should ensure QA/QC of PM₁₀ and PM_{2.5} data is appropriately carried out in future years.
- The Council have provided one graph which takes an average of all diffusion tube monitoring locations to illustrate temporal trends. However, it would also be beneficial to provide multiple graphs to show trends at sites individually to display differing trends within Stroud. An average NO₂ concentration across the district can be impacted by a changing sample size between different years as the Council updates and reviews their monitoring strategy.
- Maps of monitoring locations have been provided and this is welcomed. However, the placement of labels and arrows makes the maps difficult to read. It may be preferable to label with the ID numbers only placed closer to the monitoring location point.

Stroud district has taken forward a number of direct measures during the current reporting year of 2023 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. Ten measures are included within Table 2.1, with the type of measure and the progress Stroud District Council has made during the reporting year of 2023 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1.

More detail on these measures can be found in their respective Action Plans. Key completed measures are: initial implementation of the Local Transport Plan, initial implementation of the connecting places strategy, completed sections on the extension to

the Cotswold Canal, installation of water heat pumps at Stroud District Council offices as part of the Carbon Neutral commitment and ongoing regulation of industry through environmental permitting.

Stroud District Council expects the following measures to be completed over the course of the next reporting year: anti-idling initiatives around schools as part of the Gloucestershire Air Quality and Health Strategy, further work towards the extension of the Cotswold Canals project, further work towards Stroud District Council's Carbon Neutral commitment and ongoing regulation of installations holding environmental permits. Stroud District Council's priorities for the coming year are to continue working with neighbouring local authorities in Gloucestershire, as well as the County Council, to integrate air quality data with other sources and identify opportunities to join up data to improve the understanding of the relationship between air quality and health. Stroud District Council is continuing to work with all neighbouring local authorities and the County Council in setting up a digital solution to make air quality and related health data available to the public, and in addition, it continues to work on expanding the extent of particulate monitoring across the County.

Stroud District Council worked to implement these measures in partnership with the following stakeholders during 2022:

- Neighbouring local authorities
- Gloucestershire County Council

The principal challenges and barriers to implementation are agreeing a countywide strategy with all Gloucestershire local authorities on how to implement the strategy and then obtaining the funding for the necessary measurement apparatus.

Progress on improving public accessibility to air quality data has been slower than expected due to competing workflows as a result of the Covid pandemic.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year measure introduced	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	Gloucestershire Local Transport Plan 2020 - 2041	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2020	2041	SDC and County Council	County Council/Government	No	Partially Funded		Implementation	Reduced vehicle emissions	NOx	Implementation ongoing	Lengthy timescale
2	Connecting Places Strategy - Stroud	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	2020	2041	SDC and County Council	County Council	No	Partially Funded		Implementation	Reduced vehicle emissions	NOx	Implementation ongoing	Lengthy timescale
3	Gloucestershire Air Quality and Health Strategy	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality			SDC and County Council	SDC and County Council	No			Planning	Reduced emissions	PM	Still in planning	Cost
4	Gloucestershire Air Quality and Health Strategy	Promoting Low Emission Transport	Other			SDC and County Council	SDC and County Council	No			Planning	Reduced vehicle emissions	NOx	Still in planning	
5	Gloucestershire Air Quality and Health Strategy	Traffic management	Anti-idling enforcement			SDC and County Council	SDC and County Council	No			Planning	Reduced vehicle emissions	NOx	Still in planning	Public and schools' engagement
6	Gloucestershire Air Quality and Health Strategy	Public information	Via the internet			SDC and County Council	SDC and County Council	No			Planning	Reduced vehicle emissions	NOx	Still in planning	
7	Extension of Cotswold Canals	Promoting Travel Alternatives	Promote use of rail and inland waterways			SDC and charity	SDC and heritage lottery fund	No	Funded	£1 million - £10 million	Implementation	Reduced vehicle emissions	NOx	Implementation ongoing	Lengthy timescale
8	SDC carbon neutral commitment by 2030	Other	Other	2019	2030	SDC	SDC	No	Partially Funded		Implementation	Carbon Neutral	CO ₂	Implementation ongoing	Lengthy timescale
9	Improve air quality	Environmental Permits	Measures to reduce pollution through IPPC Permits going beyond BAT			SDC		No			Implementation	Reduced emissions		Implementation ongoing	
10	Reducing transport carbon emissions	Promoting low emission transport	Taxi emission incentives			Gloucestershire local authorities		No			Planning	Reduced emissions		Still in planning	Cost

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Stroud District Council is taking the following measures to address PM_{2.5}:

Across the local authorities in Gloucestershire, monitoring of particulate matter is patchy. As a result, and because of the negative impact of particulate matter on health, Stroud District Council has been working with Gloucestershire County Council and the other neighbouring authorities to explore options for monitoring particulates; particularly PM_{2.5}. To achieve this, Gloucestershire County Council's Sustainability team has led on creating a bidding process to access funds for air quality monitoring of particulate matter and projects in line with Gloucestershire's Air Quality and Health Strategy.

Gloucestershire's Air Quality and Health Strategy identified the need to engage the public in monitoring as this will contribute to a better understanding of air quality. Currently, the public has limited access to data on air quality throughout Gloucestershire, so a digital solution (through a countywide website) to make air quality and related health data available to the public is to be developed (<https://www.gloucestershire.gov.uk/planning-and-environment/climate-change/greener-gloucestershire-climate-dashboard/transport/gloucestershires-air-quality/reports/#main>). The website will be interactive and provide a visual interpretation of data, in addition to breaking down air quality into simple chunks of information.

To improve the understanding of the relationship between air quality and health, the aim is to integrate air quality data with other data sources, such as health outcomes, healthcare activity, road traffic information, road safety information and, policy and planning decisions. It is hoped that in making data available for members of the public to use, they can then make informed decisions to protect themselves and also to reduce negative impacts on air quality as a result of their own actions.

The Public Health team at Gloucestershire County Council has led the development of the Gloucestershire Health Protection Strategy

<https://www.gloucestershire.gov.uk/media/2094335/gloucestershire-air-quality-and-health-strategy-final.pdf>); of which air quality is a key outcome. The links between air quality and health outcomes is accessed through the Public Health Outcomes Framework.

Specifically, the fraction of mortality that is attributable to particulate air pollution indicator (new method), 2021. This indicator identifies that Stroud district's fraction of mortality attributable to particulate air pollution is 5.2%. This is 0.1% worse than the Southwest average, at 5.1%, and 0.3% better than the national average at 5.5%.

Monitoring of particulates is no longer undertaken in the Stroud district. In previous years, Stroud District Council has been able to report particulate monitoring undertaken in the district using equipment supplied by a Community Liaison Group. Unfortunately, in 2022 that equipment fell into disrepair and so particulate monitoring is no longer possible. Based on previous years' measurements, particulate concentrations appeared to show a downward trend.

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

This section sets out the monitoring undertaken within 2022 by Stroud District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Stroud District Council does not undertake any automatic (continuous) monitoring during 2022.

3.1.2 Non-Automatic Monitoring Sites

Stroud District Council undertook non-automatic (i.e., passive) monitoring of NO₂ at 40 sites during 2022. Table A.1 in Appendix A presents the details of the non-automatic sites.

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

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO₂)

Error! Reference source not found. and Table A.2 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. Note that the concentration data presented represents the

concentration at the location of the monitoring site following the application of bias adjustment and annualisation, as required (i.e., the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2022 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

In 2022, none of the 40 monitoring locations exceeded the annual air quality objective of $40\mu\text{g}/\text{m}^3$ and none were within 10% of the objective ($36.0\mu\text{g}/\text{m}^3$). There were only two locations within 20% of the annual air quality objective ($32.0\mu\text{g}/\text{m}^3$): the highest was diffusion tube 29 (1, Signal House) with an annual mean concentration of $32.4\mu\text{g}/\text{m}^3$ followed by diffusion tube 56 (Beeches Green - Lamp Post 76), with an annual mean concentration of $32.1\mu\text{g}/\text{m}^3$. Comparatively, in 2021 the highest annual level of NO_2 was also diffusion tube 29, at 1, Signal House. The level in 2021 was $34.7\mu\text{g}/\text{m}^3$, which was $2.3\mu\text{g}/\text{m}^3$ higher than in 2022.

Over the past five years, with the exception of 2018 (when it was considered that the bias adjustment factor may have increased NO_2 concentrations reported against previous years) and 2021 (when it was considered that increased concentrations of NO_2 may have occurred as a result of the gradual release of commuters and motorists from restrictions imposed during the Covid pandemic), there has been a general downward trend in NO_2 concentrations. In 2022, there is no continuation in this trend due to there being no discernible pattern to the annual mean concentrations. In 2022, seventeen monitoring locations reported a decrease in mean concentrations from 2021 whereas sixteen locations reported an increase in mean concentrations. Two locations (diffusion tube 37; The Lodge, Haresfield at $17.4\mu\text{g}/\text{m}^3$ and diffusion tube 54; Cainscross Rd - Junction with Gannicox Road at $21.4\mu\text{g}/\text{m}^3$) reported no change in mean concentrations.

The seventeen locations reporting very slight decreases in mean concentrations from 2021 were:

Diffusion Tube ID	Site name	2021 mean concentration ($\mu\text{g}/\text{m}^3$)	2022 mean concentration ($\mu\text{g}/\text{m}^3$)	Mean concentration decrease ($\mu\text{g}/\text{m}^3$)
25	Painswick - High St Lights	26.6	25.8	0.8

Diffusion Tube ID	Site name	2021 mean concentration ($\mu\text{g}/\text{m}^3$)	2022 mean concentration ($\mu\text{g}/\text{m}^3$)	Mean concentration decrease ($\mu\text{g}/\text{m}^3$)
27	Stroud - Bowbridge	33.4	29.9	3.5
28	Signal House, Dudbridge	28.9	28.6	0.3
29	Stroud - 1, Signal House	34.7	32.4	2.3
30	Stroud - 2, Signal House	31.7	29.3	2.4
31	Stroud - 3, Signal House	30.7	28.0	2.7
32	Stroud - 4, Signal House	22.0	21.0	1.0
33	Stroud - 5, Signal House	22.5	20.5	2.0
34	Upton St Leonards - 50, Woodland Green	16.6	16.2	0.4
35	Trevoise, Hardwicke	25.2	23.6	1.6
38	Rodborough - Bath Road	27.6	26.6	1.0
40	London Road, Stroud	26.1	24.8	1.3
45	Moreton Hill	7.9	7.6	0.3
46	Standish Lane	10.3	10.2	0.1
47	Little Haresfield	10.4	10.2	0.2
48	Haresfield Village Hall	9.8	9.4	0.4
57	A46 / Grove Cottages	21.3	19.8	1.5

It should be noted that due to highways works on both Dudbridge Road (12th July – 17th September) and Dudbridge Hill (16th August – 17th September), there would have been reduced traffic flows in the area. Despite the fact that the raw data (see Table B1) does not necessarily reflect this, these works may have impacted on the mean concentration of NO₂ for the year. Additionally, there were highways works adjacent to the tube location at Bowbridge. Those works included the removal (in October) and eventual replacement (December) of the street furniture used to host the diffusion tubes at that location. This is why there is no data for October, November and December of 2022 as there was nowhere

to locate a diffusion tube. Given that road traffic was unable to pass this location during the works, it may be that this has impacted on the mean annual concentration of NO₂.

The sixteen locations reporting very slight increases in mean concentrations from 2021 were:

Diffusion Tube ID	Site name	2021 mean concentration (µg/m ³)	2022 mean concentration (µg/m ³)	Mean concentration increase (µg/m ³)
26	Painswick - Traffic Camera	24.0	26.1	2.1
36	30, Hunts Grove Drive, Hardwicke	11.8	12.0	0.2
42	Russell Street, Stroud	18.8	19.4	0.6
49	Haresfield Beacon	8.2	8.4	0.2
50	Hiltmead Lane	15.1	15.3	0.2
51	Hardwicke Village Hall	12.4	12.9	0.5
52	Merrywalks Bus Station - Lamp Post 64	25.6	28.3	2.7
53	Merrywalks South - Lamp Post 60	30.3	30.7	0.4
55	Locking Hill Surgery	19.0	20.9	1.9
56	Beeches Green - Lamp Post 76	31.6	32.1	0.5
58	A46 Bath Road	17.3	18.6	1.3
59	Station Forecourt	14.1	15.5	1.4
60	STC Offices - 58, London Road	22.2	24.9	2.7
61	Parliament Street/Cornhill/Nelson Street Mini Roundabout	14.6	17.8	3.2
63	Silver Street, Dursley	25.5	26.3	0.8
65	Knotgrass Way, Hardwicke	16.7	17.4	0.7

It should be noted that highways works on the A46 Bath Road (from 2021 through to 28th February and then again from 17th October to 16th December) led to traffic being queued

and idling in the area. The raw data (see Table B1) does not demonstrate any notable or significant differences compared to neighbouring months' data. However, due to the increase reported here, it may be that these works did impact on the mean concentration of NO₂ for the year at that location.

Across the seventeen locations reporting a decrease in mean concentration from 2021 to 2022, the average decrease was 1.3µg/m³. Across the sixteen locations reporting an increase in mean concentration from 2021 to 2022, the average increase was 1.2µg/m³. The difference between the average increase and the average decrease is marginal (0.1µg/m³). In addition, there was a very small change in bias adjustment between the two years; 0.86 in 2021 and 0.85 in 2022. Therefore, it could be argued that there has been very little overall change in mean concentrations of NO₂ across the District as a whole from 2021.

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)
25	Painswick - High St Lights	Kerbside	386686	209781	NO ₂	No	3.2	0.5	No	2.0
26	Painswick - Traffic Camera	Kerbside	386740	209821	NO ₂	No	1.0	0.5	No	2.4
27	Stroud - Bowbridge	Roadside	385784	204367	NO ₂	No	1.9	1.3	No	2.4
28	Signal House, Dudbridge	Roadside	383652	204557	NO ₂	No	5.7	2.7	No	2.4
29	Stroud - 1, Signal House	Kerbside	383657	204549	NO ₂	No	0.9	0.7	No	1.5
30	Stroud - 2, Signal House	Roadside	383665	204553	NO ₂	No	0.0	3.9	No	2.4
31	Stroud - 3, Signal House	Roadside	383666	204552	NO ₂	No	0.0	2.9	No	2.4
32	Stroud - 4, Signal House	Roadside	383676	204544	NO ₂	No	0.0	8.0	No	2.4
33	Stroud - 5, Signal House	Roadside	383672	204538	NO ₂	No	0.0	2.5	No	5.0
34	Upton St Leonards - 50, Woodland Green	Kerbside	386301	215294	NO ₂	No	8.0	0.5	No	2.4
35	Trevoze, Hardwicke	Roadside	380188	211951	NO ₂	No	21.7	4.7	No	2.4
36	30, Hunts Grove Drive, Hardwicke	Kerbside	381140	212269	NO ₂	No	23.7	0.1	No	2.4
37	The Lodge, Haresfield	Other	380232	210421	NO ₂	No	N/A	N/A	No	2.4
38	Rodborough - Bath Road	Roadside	384448	204934	NO ₂	No	4.2	1.9	No	2.4
40	London Road, Stroud	Roadside	383471	204988	NO ₂	No	5.1	3.7	No	2.4
42	Russell Street, Stroud	Kerbside	382845	204720	NO ₂	No	2.9	1.3	No	2.4
45	Moreton Hill	Rural	381872	206279	NO ₂	No	N/A	N/A	No	2.4
46	Standish Lane	Rural	379342	208604	NO ₂	No	N/A	1.2	No	2.4
47	Little Haresfield	Rural	380374	209112	NO ₂	No	N/A	0.4	No	2.4
48	Haresfield Village Hall	Rural	381349	210005	NO ₂	No	7.0	0.2	No	2.4
49	Haresfield Beacon	Rural	382295	209217	NO ₂	No	N/A	0.2	No	2.4
50	Hiltmead Lane	Rural	380110	211214	NO ₂	No	N/A	N/A	No	2.4
51	Hardwicke Village Hall	Suburban	380217	212821	NO ₂	No	N/A	0.6	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
52	Merrywalks Bus Station - Lamp Post 64	Roadside	384991	205352	NO ₂	No	N/A	2.5	No	2.7
53	Merrywalks South - Lamp Post 60	Roadside	384868	205260	NO ₂	No	N/A	1.5	No	2.8
54	Cainscross Rd - Junction with Gannicox Road	Kerbside	384389	205185	NO ₂	No	9.5	1.8	No	3.0
55	Locking Hill Surgery	Roadside	385145	205414	NO ₂	No	N/A	1.6	No	2.7
56	Beeches Green - Lamp Post 76	Roadside	384934	205516	NO ₂	No	N/A	1.9	No	2.9
57	A46 / Grove Cottages	Roadside	384669	206344	NO ₂	No	23.9	1.3	No	2.7
58	A46 Bath Road	Roadside	384717	205057	NO ₂	No	N/A	2.9	No	3.1
59	Station Forecourt	Kerbside	384973	205152	NO ₂	No	N/A	0.3	No	2.7
60	STC Offices - 58, London Road	Kerbside	385112	205085	NO ₂	No	N/A	0.3	No	2.7
61	Parliament Street/Cornhill/Nelson Street Mini Roundabout	Roadside	385282	205159	NO ₂	No	N/A	1.1	No	2.7
63	Silver Street, Dursley	Roadside	375642	198095	NO ₂	No	1.5	1.2	No	2.4
65	Knotgrass Way, Hardwicke	Kerbside	381378	211760	NO ₂	No	9.5	0.4	No	2.4
66	Fullers Close, Eastington	Roadside	376912	205701	NO ₂	No	26.0	1.5	No	2.7
67	The Cross, Eastington	Roadside	377469	205323	NO ₂	No	5.2	2.1	No	2.4
68	Haw Street, Wotton-Under-Edge	Roadside	375457	193174	NO ₂	No	9.0	2.1	No	2.4
69	Elstub Lane, Cam	Roadside	373974	200016	NO ₂	No	5.8	3.6	No	2.4
70	Slad Road/Springfield Road, Stroud	Roadside	385560	205550	NO ₂	No	3.2	1.0	No	2.7

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 NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
25	386686	209781	Kerbside	83	84.6	37.3	31.8	25.9	26.6	25.8
26	386740	209821	Kerbside	92	92.6	32.2	25.5	23.6	24.0	26.1
27	385784	204367	Roadside	75	73.1	42.2	34.6	30.9	33.4	29.9
28	383652	204557	Roadside	83	83.0	42.5	31.4	25.8	28.9	28.6
29	383657	204549	Kerbside	92	92.3	43.1	35.4	29.8	34.7	32.4
30	383665	204553	Roadside	100	100.0	38.8	31.8	29.0	31.7	29.3
31	383666	204552	Roadside	100	100.0	40.3	33.1	28.6	30.7	28.0
32	383676	204544	Roadside	100	100.0	27.7	22.2	19.1	22.0	21.0
33	383672	204538	Roadside	83	82.7	29.0	23.5	20.0	22.5	20.5
34	386301	215294	Kerbside	100	100.0	22.5	18.7	16.7	16.6	16.2
35	380188	211951	Roadside	100	100.0	32.8	28.0	25.9	25.2	23.6
36	381140	212269	Kerbside	92	92.3			11.3	11.8	12.0
37	380232	210421	Other	100	100.0	21.4	19.2	15.3	17.4	17.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
38	384448	204934	Roadside	100	100.0			25.5	27.6	26.6
40	383471	204988	Roadside	92	90.4			25.4	26.1	24.8
42	382845	204720	Kerbside	100	100.0			17.4	18.8	19.4
45	381872	206279	Rural	92	92.3		7.9	7.1	7.9	7.6
46	379342	208604	Rural	100	100.0		10.9	9.1	10.3	10.2
47	380374	209112	Rural	100	100.0		10.9	9.3	10.4	10.2
48	381349	210005	Rural	100	100.0		10.3	8.5	9.8	9.4
49	382295	209217	Rural	100	100.0		9.0	7.8	8.2	8.4
50	380110	211214	Rural	92	90.4		18.5	13.8	15.1	15.3
51	380217	212821	Suburban	75	76.9		13.1	11.5	12.4	12.9
52	384991	205352	Roadside	100	100.0			24.0	25.6	28.3
53	384868	205260	Roadside	100	100.0			29.7	30.3	30.7
54	384389	205185	Kerbside	92	92.3			20.1	21.4	21.4
55	385145	205414	Roadside	100	100.0			20.9	19.0	20.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
56	384934	205516	Roadside	100	100.0			29.0	31.6	32.1
57	384669	206344	Roadside	100	100.0			17.2	21.3	19.8
58	384717	205057	Roadside	100	100.0			15.4	17.3	18.6
59	384973	205152	Kerbside	100	100.0			13.8	14.1	15.5
60	385112	205085	Kerbside	100	100.0			19.3	22.2	24.9
61	385282	205159	Roadside	100	100.0			14.3	14.6	17.8
63	375642	198095	Roadside	92	90.4				25.5	26.3
65	381378	211760	Kerbside	100	100.0				16.7	17.4
66	376912	205701	Roadside	100	100.0					16.6
67	377469	205323	Roadside	83	82.7					13.9
68	375457	193174	Roadside	100	100.0					15.6
69	373974	200016	Roadside	100	100.0					9.0
70	385560	205550	Roadside	83	82.7					17.9

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

Diffusion tube data has been bias adjusted.

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

Notes:

The annual mean concentrations are presented as $\mu\text{g}/\text{m}^3$.

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

NO₂ annual means exceeding 60 $\mu\text{g}/\text{m}^3$, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

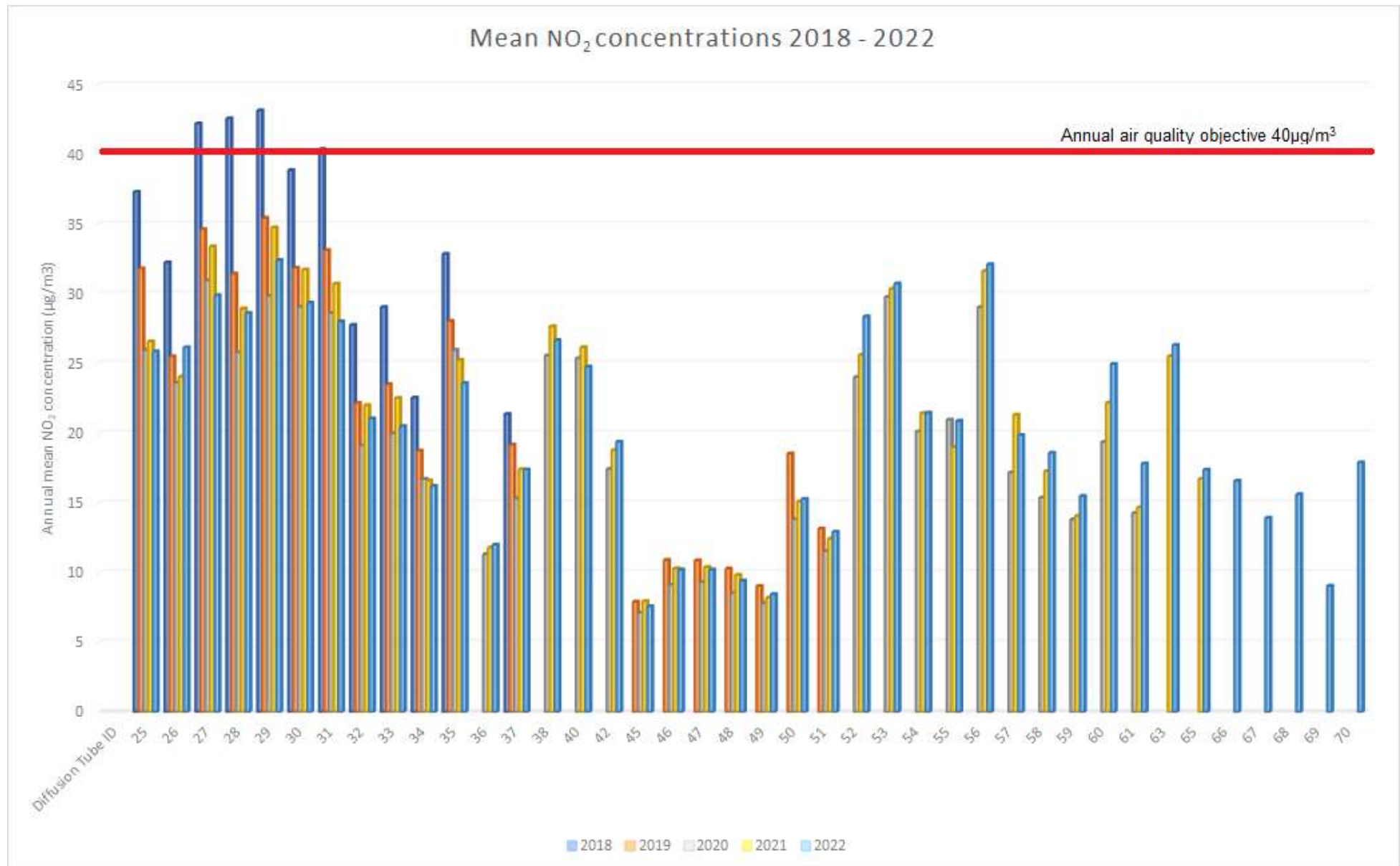
Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

Figure A.1 – Trends in Annual Mean NO₂ Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO₂ 2022 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted 0.85	Annual Mean: Distance Corrected to Nearest Exposure	Comment
25	386686	209781	50.3		28.2	36.1	23.9	25.8	24.7	26.9		24.9	31.0	32.2	30.4	25.8		
26	386740	209821	42.8	32.2	27.5	32.1	21.5	24.1	28.5		30.4	26.6	35.7	36.8	30.7	26.1		
27	385784	204367	42.7	29.5	33.0	32.8	29.9	33.2	38.3	39.0	37.9				35.1	29.9		
28	383652	204557	41.2		43.4	30.7		21.0	31.6	40.0	37.6	26.5	28.1	36.0	33.6	28.6		
29	383657	204549		31.9	43.0	50.8	31.6	32.0	35.3	41.4	39.8	36.0	38.9	38.6	38.1	32.4		
30	383665	204553	40.7	34.2	37.5	34.4	29.0	32.9	32.7	35.0	36.0	30.1	35.8	35.7	34.5	29.3		
31	383666	204552	36.5	32.2	37.4	35.3	28.4	30.1	30.2	33.0	34.4	29.8	33.6	34.5	32.9	28.0		
32	383676	204544	33.3	21.8	27.3	27.7	19.9	20.6	22.7	24.5	25.6	20.6	27.0	26.0	24.7	21.0		
33	383672	204538	31.2		29.6	0.1	22.3	22.1	28.2	27.4	28.1	24.1	27.8		24.1	20.5		
34	386301	215294	28.0	19.7	16.4	21.2	16.5	13.8	17.9	19.7	18.5	13.8	15.3	27.6	19.0	16.2		
35	380188	211951	37.9	27.9	26.6	29.3	20.9	26.5	27.1	27.0	26.4	24.9	26.2	32.0	27.7	23.6		
36	381140	212269	24.3	10.9	17.6	13.6	10.8	9.2	10.0	12.2	11.6	12.8		21.8	14.1	12.0		
37	380232	210421	28.3	17.8	27.1	20.0	16.5	14.2	17.4	20.3	19.0	17.8	21.7	25.1	20.4	17.4		
38	384448	204934	54.3	30.6	32.3	27.8	21.8	23.5	24.2	34.3	30.7	26.1	34.3	36.4	31.3	26.6		
40	383471	204988	42.1	30.7	30.9	23.1	23.1	21.8	30.0	25.8	27.4		35.0	30.5	29.1	24.8		
42	382845	204720	31.5	21.7	20.7	21.5	17.7	19.5	21.9	21.1	21.4	21.4	27.5	27.6	22.8	19.4		
45	381872	206279	15.3		9.4	8.1	7.4	6.1	7.4	8.8	6.5	7.4	10.0	11.7	8.9	7.6		
46	379342	208604	19.2	9.5	16.1	11.5	7.6	8.5	10.8	12.1	10.2	9.7	10.6	18.2	12.0	10.2		
47	380374	209112	18.6	7.0	14.4	11.0	9.3	9.1	10.7	11.4	10.6	10.2	13.8	17.9	12.0	10.2		
48	381349	210005	17.0	9.7	13.4	10.3	8.0	8.1	9.4	10.4	8.6	9.2	12.3	16.3	11.1	9.4		
49	382295	209217	13.5	7.5	11.5	9.5	8.1	8.2	8.5	11.0	8.5	8.1	10.5	14.3	9.9	8.4		
50	380110	211214	25.9	13.0	25.2	18.7	12.1	15.2	12.9	18.1	15.6	18.6	22.4		18.0	15.3		
51	380217	212821	23.5	11.4	20.2	13.1	10.4	10.3			11.5	12.5		24.0	15.2	12.9		
52	384991	205352	40.6	31.2	39.8	28.7	28.4	25.6	35.2	30.3	31.5	36.3	35.3	37.3	33.3	28.3		
53	384868	205260	46.9	42.6	43.7	28.4	22.0	31.7	40.9	39.0	27.5	35.2	36.2	39.5	36.1	30.7		
54	384389	205185	35.3	25.0	34.5	23.1	19.9	16.8	15.1	28.3		22.5	29.1	27.9	25.2	21.4		
55	385145	205414	33.2	27.2	31.2	18.1	22.2	18.7	23.5	20.0	19.4	25.1	27.6	28.2	24.5	20.9		

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 0.85	Annual Mean: Distance Corrected to Nearest Exposure	Comment
56	384934	205516	44.2	39.6	42.9	33.4	36.5	33.9	38.9	39.2	34.3	37.8	37.6	34.7	37.7	32.1		
57	384669	206344	33.3	22.9	23.9	19.5	19.9	23.3	24.8	20.4	19.4	20.1	26.5	26.0	23.3	19.8		
58	384717	205057	27.4	17.4	27.0	21.7	16.0	20.1	25.8	18.6	18.4	18.6	25.8	25.4	21.8	18.6		
59	384973	205152	27.1	17.9	21.6	16.7	16.0	14.9	17.6	13.9	16.5	15.7	18.3	22.1	18.2	15.5		
60	385112	205085	38.4	29.6	32.8	25.5	22.3	24.9	28.0	26.0	28.2	29.1	32.9	34.3	29.3	24.9		
61	385282	205159	28.3	18.9	27.0	16.5	16.1	15.5	19.5	18.2	17.7	22.3	26.9	24.4	20.9	17.8		
63	375642	198095	40.3	30.1	37.0	30.2	26.3	24.8	26.6	25.7	26.8		38.8	33.7	30.9	26.3		
65	381378	211760	30.5	17.8	25.6	18.3	15.4	15.6	17.4	17.7	16.7	20.4	23.6	26.2	20.4	17.4		
66	376912	205701	27.9	14.0	25.5	18.5	14.1	15.7	16.5	17.8	16.1	19.2	22.0	26.7	19.5	16.6		
67	377469	205323	23.2	13.5			13.7	12.7	14.9	15.4	16.5	15.4	17.3	21.2	16.4	13.9		
68	375457	193174	27.4	18.9	19.4	17.2	14.6	12.8	14.9	16.8	14.8	15.5	23.3	24.6	18.4	15.6		
69	373974	200016	16.7	9.3	13.1	9.3	7.6	8.0	8.2	7.6	7.1	7.8	16.5	16.5	10.6	9.0		
70	385560	205550	29.4	23.5	20.0		18.9	17.2	21.5		15.5	17.6	24.2	22.7	21.0	17.9		

- All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.
- Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.
- Local bias adjustment factor used.
- National bias adjustment factor used.
- Where applicable, data has been distance corrected for relevant exposure in the final column.
- Stroud District Council confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

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

NO₂ annual means exceeding 60 µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Stroud district During 2022

Stroud District Council has not identified any such new sources relating to air quality within the reporting year of 2022.

Additional Air Quality Works Undertaken by Stroud District Council During 2022

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

QA/QC of Diffusion Tube Monitoring

In undertaking air quality monitoring in its District, Stroud District Council uses diffusion tubes provided by Somerset Scientific Services (SSS) that have been prepared in 20% TEA in water. To obtain laboratory accreditation to undertake the analysis of diffusion tubes, SSS participates in an external laboratory scheme called the Air & Stack Emissions Scheme. This is a proficiency testing scheme operated through the Laboratory of the Government Chemist (LGC). SSS is required to undertake four rounds of testing per year, which must be confirmed as accurate, before SSS can be ratified to undertake analysis. SSS is included in the annual field inter-comparison exercise from which the bias adjustment factor is obtained.

SSS analyses diffusion tubes using the colorimetry method. This method requires a solution to be added to the diffusion tubes so that the nitrite collected on the grids within the tubes is dissolved. The solution reacts with nitrite collected in the tube to produce a coloured compound. The intensity of the colour produced is then measured using spectrophotometry and is calibrated against a set of standard nitrite solutions to identify the concentration of nitrite present in the sample. The concentration is then used to

calculate the mass of nitrite collected by the tube from which an average ambient concentration of NO₂ is calculated for the exposure period.

Diffusion tube monitoring has been undertaken in accordance with the 2022 Diffusion Tube Monitoring Calendar.

Diffusion Tube Annualisation

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

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Stroud District Council has applied a national bias adjustment factor of 0.85 to the 2022 monitoring data. A summary of bias adjustment factors used by Stroud District Council over the past five years is presented in Table C.1.

Stroud District Council does not operate any automatic NO₂ monitoring locations, so it is unable to undertake its own co-location studies to determine a local adjustment factor. Therefore, it was necessary to use a national bias adjustment factor. The factor used by Stroud District Council to correct the raw diffusion tube data was 0.85 from spreadsheet version 06/23, as per Table C.2. This factor was developed by the SSS laboratory utilising 14 studies to produce an overall correction factor for diffusion tubes.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	06/23	0.85
2021	National	09/22	0.86

2020	National	09/21	0.85
2019	National	03/20	0.78
2018	National	03/19	0.89

NO₂ Fall-off with Distance from the Road

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

No diffusion tube NO₂ monitoring locations within Stroud District required distance correction during 2022.

QA/QC of Automatic Monitoring

Monitoring of particulates is no longer undertaken in Stroud district. Previously, Stroud District Council reported on particulate levels using equipment supplied by a Community Liaison Group interested in the impact of particulates following the construction and operation of an energy from waste plant. During 2022, the equipment unfortunately fell into disrepair so particulate monitoring was no longer possible.

Appendix D: Maps of Monitoring Locations

Figure D.1 – Map of Non-Automatic Monitoring for Stroud district

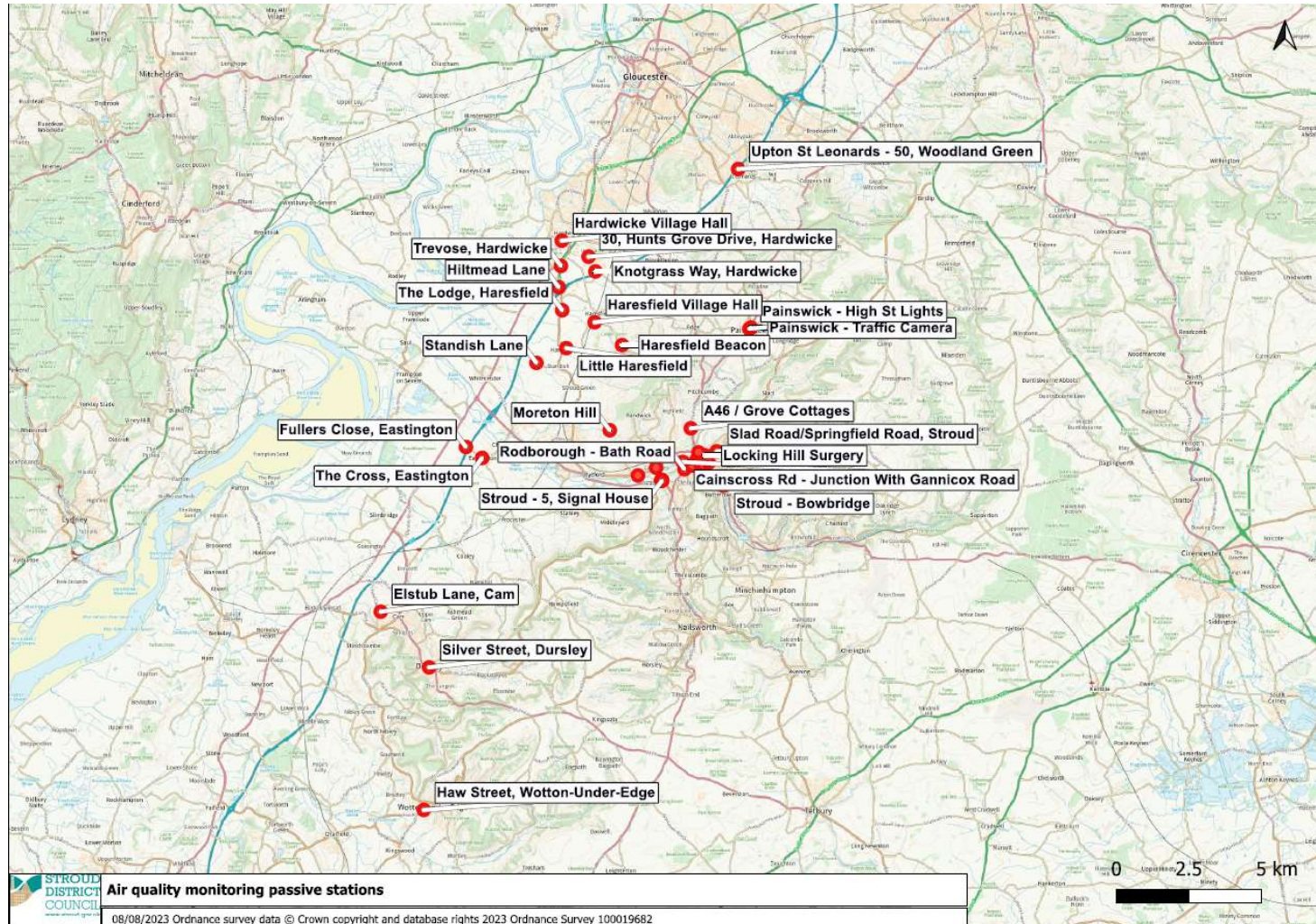


Figure D.2 – Map of Non-Automatic Monitoring for Stroud town

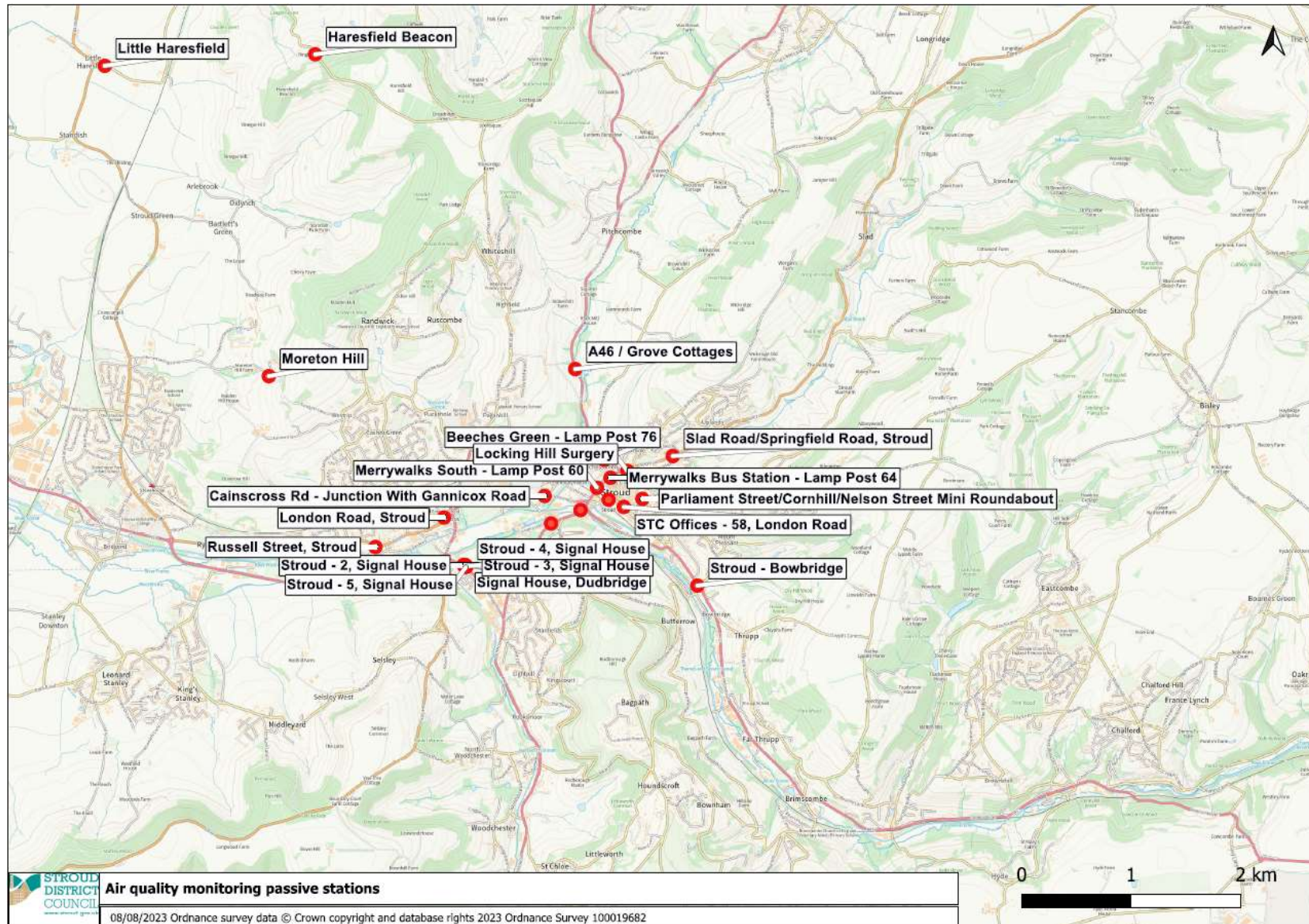
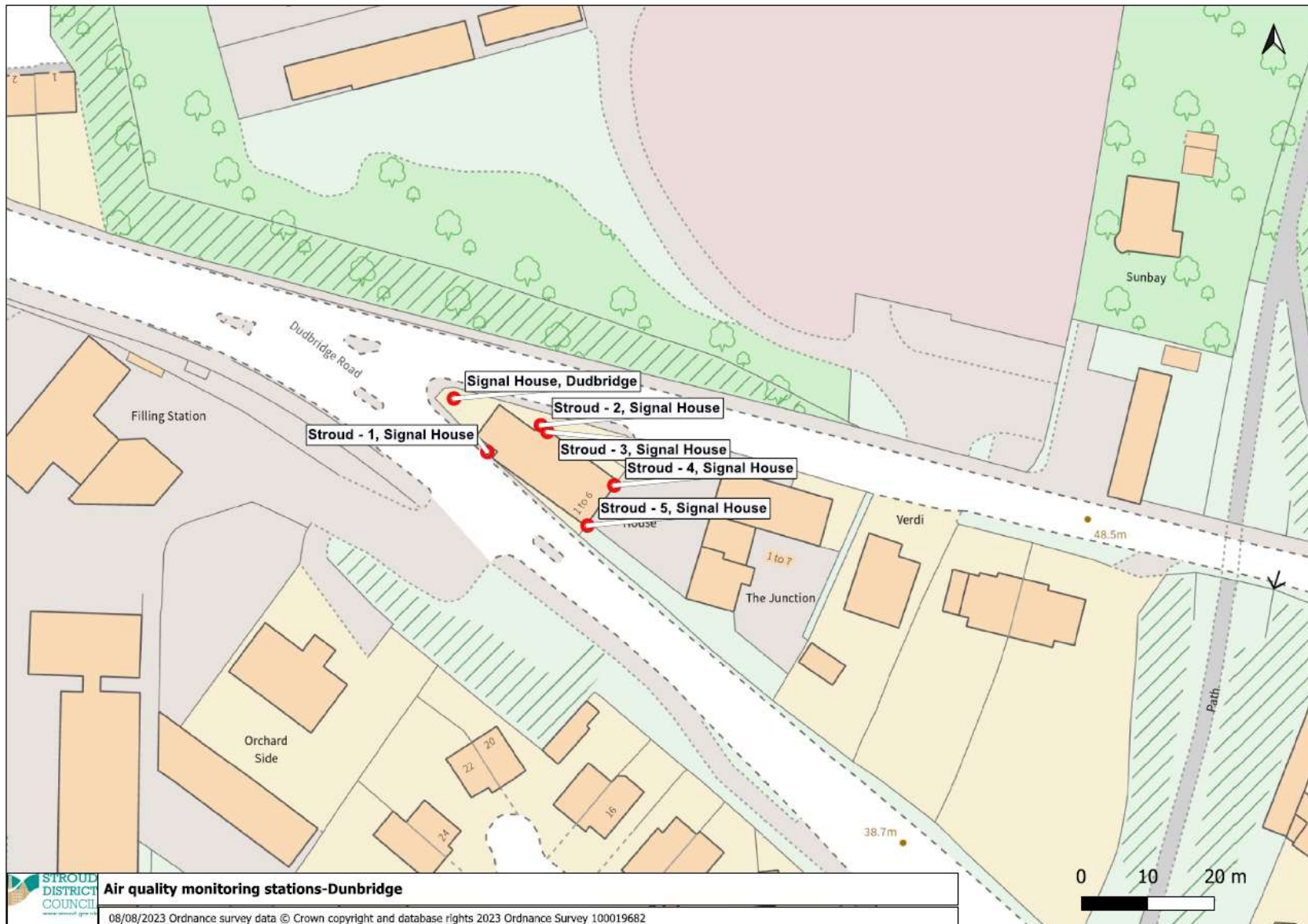


Figure D.3 – Map of Non-Automatic Monitoring for Dudbridge



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁷

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

⁷ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
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	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022.
Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022.
Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.