Stroud District Council


# 2020 Air Quality Annual Status Report (ASR)

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

July 2020

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| Local Authority Officer | Paul Bowden |
| Department | Environmental Health |
| Address | Ebley Mill, Ebley Wharf, Stroud, GL5 4UB |
| Telephone | 01451 754484 |
| E-mail | paul.bowden@stroud.gov.uk |
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# Executive Summary: Air Quality in Our Area

Road traffic emissions are the single most significant influence on air quality within the Stroud district. The principal pollutant of concern from road traffic is Nitrogen Dioxide ($NO_2$). Stroud District Council uses diffusion tubes located across the District in order to measure $NO_2$. These tubes are collected and sent away for analysis on a monthly basis. Overall, air quality continues to be very good across the district and monitoring confirms a decreasing trend in $NO_2$ concentrations.

The 2019 Annual Status Report (ASR) highlighted a significant increase in levels across all monitoring locations which, it was agreed with the DEFRA Helpdesk, was likely to have occurred due to an elevated bias adjustment factor. As a result, it was agreed that real-time monitoring equipment would be installed in 2020 in order to establish whether the bias adjustment was the key factor in the increase. However, the Coronavirus pandemic has led to a suspension of this installation.

Despite this, data from monitoring across 2019 indicates a significant decrease in $NO_2$ against the 2018 data such that no sites are within 10% of the annual air quality objective. This fits well with the overall trend of decreasing $NO_2$ concentrations across the District.

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

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

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

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

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

The Stroud District as a whole continues to experience good air quality. However, bonfires from domestic and industrial/trade premises, as well as emissions from industrial activities have an influence on local air quality. Despite this, the main pollutant of concern in the district is $NO_2$ which arises primarily from road traffic.

The Stroud District has seen a long term trend towards decreasing levels of $NO_2$. The monitoring results for $NO_2$ during 2019 indicate a fairly significant decrease against levels from 2018, across all but one location where an increase was noted. None of the monitoring locations demonstrated $NO_2$ levels within 10% of the annual air quality objective.

Within the Stroud District a new major source of emission commenced operations in late July/early August of 2019. The source is a 65.3 MW Energy from Waste plant at Javelin Park, near Haresfield. To account for any potential impact on air quality from this development, Stroud District Council has been monitoring $NO_2$ at seven nearby locations. Additionally, Stroud District Council supports a local community liaison group which has two particulate monitors located in areas of potential exposure in order to obtain data relating to particulates.

Stroud District Council works in partnership with Gloucestershire County Council on developing strategies relating to traffic management across the County. Further details on the Local Transport Plan can be found at https://www.gloucestershire.gov.uk/transport/gloucestershires-local-transport-plan-2015-2031/introduction/.

The plan is currently under review but it aims to support sustainable economic growth, enable community connectivity, conserve the environment and improve community health and wellbeing. Within the document, transport options such as bus travel, the cycle network, the freight network, highways and rail travel are considered. There is also a document promoting travel choice called Think Travel. Both documents feed into district-based strategies called Connecting Places Strategies. The Stroud District strategy can be found at https://www.gloucestershire.gov.uk/media/2211/6_-_ltp_-_stroud_cps-66794.pdf.

In addition to air quality monitoring and developing strategies for traffic management, Stroud District Council regulates and enforces (where necessary) industrial emissions through the environmental permitting regime.

## Actions to Improve Air Quality

In the 2019 ASR, the 2018 data highlighted Dudbridge as a location with exceedances slightly above the annual air quality objective. However, it was felt that the bias correction factor for 2019 may have caused this due to the elevated levels of $NO_2$ found at all of the monitoring locations across the District. As a result of this, and the imprecise nature of diffusion tubes, it was agreed with the DEFRA Helpdesk that real-time monitoring would be undertaken to establish whether the location was actually exceeding the annual air quality objective. Real-time monitoring equipment was proposed to be installed in April 2020. In early 2020, at the beginning of the Coronavirus outbreak, it was agreed with the DEFRA Helpdesk that this plan should be suspended due to the impact that lockdown would have on vehicle use and subsequent $NO_2$ levels. Therefore, Stroud District Council will continue to utilise diffusion tubes to monitor $NO_2$ levels across the District until such time as previous hotspot locations indicate elevated levels of $NO_2$.

Stroud District Council continues to work with Gloucestershire County Council on developing traffic management strategies in the County as well as the Gloucestershire Air Quality and Health Strategy.

## Conclusions and Priorities

The Stroud District continues to experience good air quality, as it has done for a number of years. Whilst the data published in the 2019 ASR was an anomaly in that it outlined a relatively significant increase in $NO_2$ across the Stroud District, the 2019 data appears to continue the pattern of previous years where the overall trend is for a decline in $NO_2$ concentrations; as demonstrated in figure A.1.

The impact of these decreases is that there are no locations that fall within 10% of the annual air quality objective; this includes those locations identified in the 2019 ASR as being in exceedance of the air quality objective. Due to the Coronavirus pandemic, it has not been possible to continue with the agreed course of action (to undertake real-time monitoring); therefore, Stroud District Council will continue to use diffusion tubes to monitor $NO_2$ levels across the district until such time as previous hotspot locations indicate elevated levels of $NO_2$.

Over the course of the next year, it is understood that there are no major developments within the Stroud District that are likely to give rise to a significant adverse impact on air quality. As a result, the priority for Stroud District Council over the coming year is to continue to obtain as much data as possible (within the restrictions imposed by the Coronavirus pandemic) to inform monitoring needs for 2021.

## Local Engagement and How to get Involved

Stroud District Council engages with decision makers and the public through a number of forums. The Gloucestershire Pollution Group is made up of environmental protection professionals from all of the Gloucestershire local authorities as well as air quality representatives from Gloucestershire County Council (GCC). It is at this forum that good practice and ideas for improving air quality are shared.

Stroud District Council is represented at the Air Quality and Behaviour Change sub group which is made up of professionals and electoral representatives from across Gloucestershire. The group continues to work towards producing the Gloucestershire Air Quality and Health Strategy.

Stroud District Council also has involvement with a community liaison group set up with reference to air quality issues relating to an Energy from Waste facility. This group is made up of local electoral representatives, Environment Agency representatives, representatives from the operator as well as members of the public.

Interest in air quality issues is relatively high across the Stroud district. This is reflected in the political composition of the Council. All Councillors actively engage in a whole range of environmental issues, including air quality. In general terms, beyond those with a professional interest in air quality, there is a lack of knowledge and understanding of how air quality is measured and monitored. Despite this, there is definitely an increase in those wanting to improve their understanding of air quality or wishing to become involved in air quality projects locally.

The general public can assist in improving air quality across the Stroud District by reducing unnecessary vehicular travel. In addition, disposal of household and garden waste by means other than burning would be very 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/pollutionand-nuisance/air-quality.

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

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# 1 Local Air Quality Management

This report provides an overview of air quality in Stroud District during 2019. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

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

# 2 Actions to Improve Air Quality

Stroud District Council works with Gloucestershire County Council on developing strategies relating to traffic management across the County through the Local Transport Plan (LTP). The LTP is currently under review; however, further details on it can be found at https://www.gloucestershire.gov.uk/transport/gloucestershires-local-transport-plan-2015-2031/introduction/.

The LTP aims to support sustainable economic growth, enable community connectivity, conserve the environment and improve community health and wellbeing. It considers transport options through specific policy documents relating to bus travel, the cycle network, the freight network, highways, rail travel. There is also a document called Think Travel which promotes travel choice. This document identifies opportunities and pressures within the county and addresses these through Connecting Places Strategies. These strategies are district based; the strategy specific to the Stroud district can be found at https://www.gloucestershire.gov.uk/media/2211/6_-_ltp_-_stroud_cps-66794.pdf.

Stroud District Council works with the Gloucestershire Air Quality and Behaviour Change sub group. The aim of this group is to produce an Air Quality and Health Strategy for Gloucestershire. The strategy is currently being drafted by Gloucestershire County Council.

## 2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

Stroud District Council currently does not have any AQMAs.

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

DEFRA's appraisal of last year's ASR agreed that the conclusions reached were acceptable for all sources and pollutants. The 2019 ASR reasoned that the two exceedances of the annual air quality objective and the general increase in $NO_2$ concentrations observed were likely to be the consequence of a higher bias adjustment factor than in previous years. The ASR concluded that additional real-time monitoring would be installed at the sites of exceedance for the 2020 reporting year.

However, earlier this year the Coronavirus pandemic reached the UK and it became clear that a lockdown would be necessary to restrict the spread of the disease. At this point, Stroud District Council considered that, with the likely reduction in vehicle movements resulting from lockdown, concentrations of $NO_2$ would be significantly diminished. Due to the significant cost of undertaking real-time monitoring, it was concluded that installing such equipment at this time would represent poor value economically and would not provide representative $NO_2$ data.

The DEFRA helpdesk was consulted at this point and it was agreed that a suspension of the proposed installation was a reasonable response to the Coronavirus outbreak. Stroud District Council intends to reconsider the installation of real-time monitoring equipment if $NO_2$ concentrations (as determined by diffusion tubes) return to levels in exceedance of the annual air quality objective.

Stroud District Council has taken forward a number of direct measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1.

Stroud District Council's priorities for the coming year are to obtain as much data as possible from existing monitoring locations (given the impact of the Coronavirus lockdown on diffusion tube installation, collection and analysis) to allow for a meaningful analysis of $NO_2$ concentrations in order to inform diffusion tube locations for 2021.

## Table 2.1 – Progress on Measures to Improve Air Quality

| Measure No. | Measure | EU Category | EU Classification | Date Measure Introduced | Organisations involved | Funding Source | Key Performance Indicator | Reduction in Pollutant / Emission from Measure | Progress to Date | Estimated / Actual Completion Date | Comments / Barriers to implementation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Gloucestershire Local Transport Plan 2015 - 2031 | Promoting Travel Alternatives | Intensive active travel campaign & infrastructure | 2015 | LA and County Council | County Council | NOx | Reduced vehicle emissions | LTP currently under review 2019/20 | 2031 | Lengthy timescale |
| 2 | Connecting Places Strategy - Stroud | Transport Planning and Infrastructure | Public transport improvements-interchanges stations and services | LA and County Council | LA and County Council | LA and County Council | NOx | Reduced vehicle emissions | Implementation on-going | 2031 | Lengthy timescale |
| 3 | Gloucestershire Air Quality and Health Strategy | Promoting Low Emission Transport | Other | LA and County Council | LA and County Council | LA and County Council | NOx | Reduced vehicle emissions | Implementation on-going | | |
| 4 | Extension of Cotswold Canals | Promoting Travel Alternatives | Promote use of rail and inland waterways | LA and charity | LA and charity | LA and Heritage Lottery fund | NOx | Reduced vehicle emissions | Implementation on-going | | Lengthy timescale |
| 5 | Improve air quality | Environmental Permits | Measures to reduce pollution through IPPC Permits going beyond BAT | LA and regulated industry | | | | Reduced emissions | Implementation on-going | | |
| 6 | SDC Carbon neutral commitment by 2030 | Other | Other | LA | Currently being planned | LA | $CO_2$ | Carbon neutral | | 2030 | |
| 7 | Improve public accessibility to air quality data | Public Information | Other | LA and County Council | Currently being planned | LA and County Council | | Reduced emissions | | | |

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5 µm 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 $PM_{2.5}$:

- Working with Gloucestershire County Council to develop and implement strategies relating to traffic management, as set out in the current LTP and Connecting Places Strategy. By implementing transport schemes and promoting travel alternatives, traffic based pollutants (including $PM_{2.5}$) can be reduced.

- Working with Gloucestershire Air Quality and Behaviour Change sub group to develop an Air Quality and Health Strategy for Gloucestershire. The Air Quality and Health Strategy aims to improve the publication and availability of air quality information to the public, promoting active travel in schools and workplaces, promoting the uptake of low emission vehicles, cleaner public sector vehicle fleet and cleaner public transport services.

## 2.4 Summary of Monitoring Undertaken

### 2.4.1 Automatic Monitoring Sites

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

In conjunction with a local community liaison group, Stroud District Council undertook automatic (continuous) particulate matter monitoring at two sites during 2019. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at https://uk-air.defra.gov.uk/networks/.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

### 2.4.2 Non-Automatic Monitoring Sites

Stroud District Council undertook non- automatic (passive) monitoring of $NO_2$ at twenty-seven sites during 2019. The diffusion tubes (20% TEA in water) were supplied and analysed by Somerset Scientific Services. Table A.2 in Appendix A shows the details of the sites.

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

## 2.5 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias[4], “annualisation” (where the data capture falls below 75%), and distance correction[5]. Further details on adjustments are provided in Appendix C.

### 2.5.1 Nitrogen Dioxide ($NO_2$)

Table A.3 in Appendix A compares the ratified and adjusted monitored $NO_2$ annual mean concentrations for the past 5 years with the air quality objective of 40 µg/m$^3$. Note that the concentration data presented in Table A.3 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 of fall-off with distance adjustment).

For diffusion tubes, the full 2019 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.

[4] https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html

[5] Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

**Error! Reference source not found.** in Appendix A compares the ratified continuous monitored $NO_2$ hourly mean concentrations for the past 5 years with the air quality objective of 200 µg/m$^3$, not to be exceeded more than 18 times per year.

In 2018, there were four monitoring locations that reported exceedances of the annual air quality objective; locations 21a (42.18 µg/m$^3$), 25a (42.54 µg/m$^3$), 25c (43.12 µg/m$^3$) and 25e (40.34 µg/m$^3$). When corrected to account for distance to public exposure, the NO2 annual mean concentration for each location was: 39.6µg/m$^3$ at location 21a, 36.6 µg/m$^3$ at location 25a, 41.6 µg/m$^3$ at location 25c and 40.3 µg/m$^3$ at location 25e. This meant that two locations (25c and 25e) exceeded the annual air quality objective.

Comparatively, in the 2019 monitoring period, those locations had $NO_2$ concentrations of 21a (34.59 µg/m$^3$; a reduction of 7.59 µg/m$^3$), 25a (31.41 µg/m$^3$; a reduction of 11.13 µg/m$^3$), 25c (35.42 µg/m$^3$; a reduction of 7.7 µg/m$^3$), and 25e (33.11 µg/m$^3$; a reduction of 7.23 µg/m$^3$). However, it should be noted that location 25a was not one of the four locations with the highest $NO_2$ concentrations in 2019 as it was replaced by location 25d (31.83 µg/m$^3$). In 2018, location 25d reported $NO_2$ concentrations of 38.83 µg/m$^3$ so has reduced by 7 µg/m$^3$. None of the locations reporting the highest concentrations of $NO_2$ are currently within 10% of the annual air quality objective, so corrections for distance to public exposure have not been undertaken. In addition, it should be noted that in the 2019 monitoring year, data accrual was good (above 75%), so no annualisation of data was necessary.

Across the rest of the locations that had been monitored in previous years, the general downward trend in $NO_2$ concentrations has continued. Compared with concentrations reported in 2018, where it was considered that the bias correction factor adversely increased $NO_2$ concentrations reported, all monitoring locations have seen a relatively significant decrease in $NO_2$, with the exception of location 42. At this location, an increase of 5.63 µg/m$^3$ was noted from 25.23 µg/m$^3$ in 2018 to 30.86 µg/m$^3$ in 2019. It is not clear why this location might have experienced such an increase, although it may have been a “knock on” result of highway works in the area.

### 2.5.2 Particulate Matter ($PM_{10}$)

Table A.4 in Appendix A compares the ratified and adjusted monitored $PM_{10}$ annual mean concentrations for the past 2 years with the air quality objective of 40 µg/m$^3$. Monitoring of $PM_{10}$ commenced part way through 2018, thus there is no historical data to refer to beyond this.

Table A.5 in Appendix A compares the ratified continuous monitored $PM_{10}$ daily mean concentrations for the past 2 years with the air quality objective of 50 µg/m$^3$, not to be exceeded more than 35 times per year.

In 2018, the automated monitoring location at Hardwicke provided an annual mean concentration of 9.85 µg/m$^3$. In 2019, due to the reduced operation of the monitoring equipment, the data required annualisation. This requires the use of data from two to four comparable sites within 50km. Unfortunately, the only relevant and comparable site within 50km is the Haresfield site so, this was used to produce the annualised annual mean for Hardwicke; a concentration was 10.10 µg/m$^3$. This meant an increase of 0.25 µg/m$^3$ but, still well within the annual air quality objective. At Haresfield in 2018, the annual mean concentration was 9.9 µg/m$^3$. In 2019, the mean annual concentration was 8.58 µg/m$^3$, a reduction of 1.41 µg/m$^3$ and well within the annual air quality objective. Both locations recorded no exceedances of the 24-hour mean air quality objective of 50 µg/m$^3$.

### 2.5.3 Particulate Matter ($PM_{2.5}$)

Table A.6 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past 2 years. Monitoring of $PM_{2.5}$ commenced part way through 2018 and thus there is no historical data to refer to beyond this.

In 2018, the annual mean concentration of $PM_{2.5}$ at Hardwicke was 7.14 µg/m$^3$. In 2019, due to the reduced operation of the monitoring equipment, the data required annualisation. As with $PM_{10}$ above, the only relevant and comparable site within 50km is the Haresfield site. Therefore, the annualised annual mean for Hardwicke was 6.40 µg/m$^3$; a reduction of 0.74 µg/m$^3$ and well within the annual air quality objective. At Haresfield, in 2018, the annual mean concentration was 7.16 µg/m$^3$. In 2019, the annual mean concentration was 5.82 µg/m$^3$, a reduction of 1.34 µg/m$^3$.

$PM_{2.5}$ is the pollutant which has the biggest impact on public health and, therefore, it is the pollutant which is used as a wider determinant of health in the Public Health Outcomes Framework (PHOF). In terms of the link between $PM_{2.5}$ and the PHOF, there are three indicators of relevance:

- Air pollution: fine particulate matter
- Fraction of mortality attributable to particulate air pollution
- Access to health assets and hazards index

The 2019 PHOF reports that $PM_{2.5}$ within the Stroud District is 7.9 µg/m$^3$, based on date from 2017. Comparatively, the South West region averages 7.8 µg/m$^3$ whereas the average for England as a whole is 8.9 µg/m$^3$. It is notable that the Stroud value in the PHOF is slightly elevated against the particulate data from the automated monitors, as reported above. However, it should be considered that the automatic monitors are located in relatively rural and suburban settings where air pollution from road traffic would not necessarily be expected to be significant.

The fraction of mortality attributable to particulate air pollution data relates to 2018. For the Stroud District, mortality was reported to be 4.6%. This is above the South West region value of 4.4% and below the 5.2% value for England.

# Appendix A: Monitoring Results

## Table A.1 - Details of Automatic Monitoring Sites

| Site ID | Site Name | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA ? | Monitoring Technique | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Inlet Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| Hardwicke | Hardwicke | Suburban | 380203 | 212842 | PM10, PM2.5 | No | Particulate monitor | N/A | N/A | 1.5 |
| Haresfield | Haresfield | Rural | 381324 | 210015 | PM10, PM2.5 | No | Particulate monitor | N/A | N/A | 1.5 |

**Notes:**

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

(2) N/A if not applicable

## Table A.2 – Details of Non-Automatic Monitoring Sites

| Site ID | Site Name | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Tube collocated with a Continuous Analyser? | Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 15 | Bath Road - Nailsworth | Roadside | 332395 | 433175 | $NO_2$ | No | 11.7 | 4.1 | NO | 1.5 |
| 16 | High Street lights - Painswick | Kerbside | 332395 | 433175 | $NO_2$ | No | 3.2 | 0.5 | NO | 2 |
| 16b | Traffic camera - Painswick | Kerbside | 386700 | 209794 | $NO_2$ | No | 1 | 0.5 | NO | 2.4 |
| 21a | Bowbridge - Stroud | Roadside | 385785 | 204370 | $NO_2$ | No | 1.9 | 1.3 | NO | 2.4 |
| 25a | Signal House, Dudbridge | Roadside | 383652 | 204557 | $NO_2$ | No | 5.7 | 2.7 | NO | 2.4 |
| 25c | 1, Signal House - Dudbridge | Kerbside | 383655 | 204551 | $NO_2$ | No | 0.9 | 0.7 | NO | 1.5 |
| 25d | 2, Signal House - Dudbridge | Roadside | 383659 | 204556 | $NO_2$ | No | 0 | 3.9 | NO | 2.4 |
| 25e | 3, Signal House - Dudbridge | Roadside | 383662 | 204554 | $NO_2$ | No | 0 | 2.9 | NO | 2.4 |
| 25f | 4, Signal House - Dudbridge | Roadside | 383676 | 204545 | $NO_2$ | No | 0 | 8 | NO | 2.4 |
| 25g | 5, Signal House - Dudbridge | Roadside | 383672 | 204538 | $NO_2$ | No | 0 | 2.5 | NO | 5 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 31 | 50 Woodland Green - Upton St. Leonards | Kerbside | 386301 | 215294 | $NO_2$ | No | 8 | 0.5 | NO | 2.4 |
| 33 | Trevose - Hardwicke | Roadside | 380188 | 211951 | $NO_2$ | No | 21.7 | 4.7 | NO | 2.4 |
| 34 | 63, Hunts Grove - Hardwicke | Other | 381139 | 212275 | $NO_2$ | No | N/A | 0.1 | NO | 2.4 |
| 35 | The Lodge - Haresfield | Other | 380232 | 210421 | $NO_2$ | No | N/A | N/A | NO | 2.4 |
| 37 | Grove Lane - Westend | Other | 378290 | 206899 | $NO_2$ | No | N/A | N/A | NO | 2.4 |
| 39 | Westward Road - Cainscross | Roadside | 383471 | 204988 | $NO_2$ | No | 0 | 3.7 | NO | 2.4 |
| 40 | Slimbridge Primary School | Roadside | 374327 | 202878 | $NO_2$ | No | N/A | 3 | NO | 2.4 |
| 41 | Westward Road - Ebley | Kerbside | 382839 | 204717 | $NO_2$ | No | 1.4 | 1.3 | NO | 2.4 |
| 42 | Slad Brook - Stroud | Roadside | 385082 | 205398 | $NO_2$ | No | 7.6 | 1.6 | NO | 2.4 |
| 43 | Walkley Hill - Stroud | Roadside | 384500 | 204446 | $NO_2$ | No | 2.7 | 0.8 | NO | 2.4 |
| 44 | Moreton Hill | Rural | 381872 | 206279 | $NO_2$ | No | N/A | N/A | NO | 2.4 |
| 45 | Standish Lane | Rural | 379342 | 208604 | $NO_2$ | No | N/A | 1.2 | NO | 2.4 |
| 46 | Little Haresfield | Rural | 380374 | 209112 | $NO_2$ | No | N/A | 0.4 | NO | 2.4 |
| 47 | Haresfield village hall | Rural | 381349 | 210005 | $NO_2$ | No | 7 | 0.2 | NO | 2.4 |
| 48 | Haresfield Beacon | Rural | 382295 | 209217 | $NO_2$ | No | N/A | 0.2 | NO | 2.4 |
| 49 | Hiltmead Lane | Rural | 380108 | 211214 | $NO_2$ | No | N/A | 1.6/25.8 | NO | 2.4 |
| 50 | Hardwicke Village Hall | Suburban | 380208 | 212824 | $NO_2$ | No | N/A | 0.6 | NO | 2.4 |

**Notes:**

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

(2) N/A if not applicable.

## Table A.3 – Annual Mean $NO_2$ Monitoring Results

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Monitoring Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2019 (%) (2) | $NO_2$ Annual Mean Concentration ($\mu g/m^3$) (3) (4) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2015 | 2016 | 2017 | 2018 | 2019 |
| 15 | 332395 | 433175 | Roadside | Diffusion Tube | N/A | 100 | 24.9 | 25.54 | 22.06 | 25.46 | 20.45 |
| 16 | 332395 | 433175 | Kerbside | Diffusion Tube | N/A | 100 | 29.5 | 30.1 | 35.51 | 37.28 | 31.79 |
| 16b | 386700 | 209794 | Kerbside | Diffusion Tube | N/A | 100 | 31.3 | 31.5 | 28.57 | 32.22 | 25.49 |
| 21a | 385785 | 204370 | Roadside | Diffusion Tube | N/A | 100 | 37.6 | 38.4 | 38.64 | **42.18** | 34.59 |
| 25a | 383652 | 204557 | Roadside | Diffusion Tube | N/A | 100 | 36.2 | 36.2 | 30.98 | **42.54** | 31.41 |
| 25c | 383655 | 204551 | Kerbside | Diffusion Tube | N/A | 100 | 39.5 | 39.1 | 38.98 | **43.12** | 35.42 |
| 25d | 383659 | 204556 | Roadside | Diffusion Tube | N/A | 100 | 38.2 | 37.1 | 34.02 | 38.83 | 31.83 |
| 25e | 383662 | 204554 | Roadside | Diffusion Tube | N/A | 100 | 37.9 | 37.8 | 35.97 | **40.34** | 33.11 |
| 25f | 383676 | 204545 | Roadside | Diffusion Tube | N/A | 100 | 25 | 28.09 | 25.54 | 27.74 | 22.15 |
| 25g | 383672 | 204538 | Roadside | Diffusion Tube | N/A | 100 | 26.7 | 28.93 | 24.77 | 29.02 | 23.49 |
| 31 | 386301 | 215294 | Kerbside | Diffusion Tube | N/A | 100 | 24.6 | 27.05 | 21.42 | 22.52 | 18.72 |
| 33 | 380188 | 211951 | Roadside | Diffusion Tube | N/A | 92 | N/A | 34.64 | 30.15 | 32.83 | 28.02 |
| 34 | 381139 | 212275 | Other | Diffusion Tube | N/A | 92 | N/A | 19.07 | 14.58 | 15.84 | 13.17 |
| 35 | 380232 | 210421 | Other | Diffusion Tube | N/A | 100 | N/A | 24.08 | 20 | 21.35 | 19.15 |
| 37 | 378290 | 206899 | Other | Diffusion Tube | N/A | 92 | N/A | 16.67 | 12.64 | 20.34 | 12.68 |
| 39 | 383471 | 204988 | Roadside | Diffusion Tube | N/A | 100 | N/A | N/A | 36.32 | 39.71 | 21.65 |
| 40 | 374327 | 202878 | Roadside | Diffusion Tube | N/A | 100 | N/A | N/A | N/A | 28.78 | 10.77 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 41 | 382839 | 204717 | Kerbside | Diffusion Tube | N/A | 100 | N/A | N/A | N/A | 27.12 | 23.29 |
| 42 | 385082 | 205398 | Roadside | Diffusion Tube | N/A | 100 | N/A | N/A | N/A | 25.23 | 30.86 |
| 43 | 384500 | 204446 | Roadside | Diffusion Tube | N/A | 100 | N/A | N/A | N/A | 34.36 | 18.68 |
| 44 | 381872 | 206279 | Rural | Diffusion Tube | N/A | 92 | N/A | N/A | N/A | N/A | 7.89 |
| 45 | 379342 | 208604 | Rural | Diffusion Tube | N/A | 100 | N/A | N/A | N/A | N/A | 10.89 |
| 46 | 380374 | 209112 | Rural | Diffusion Tube | N/A | 100 | N/A | N/A | N/A | N/A | 10.86 |
| 47 | 381349 | 210005 | Rural | Diffusion Tube | N/A | 92 | N/A | N/A | N/A | N/A | 10.27 |
| 48 | 382295 | 209217 | Rural | Diffusion Tube | N/A | 100 | N/A | N/A | N/A | N/A | 9.01 |
| 49 | 380108 | 211214 | Rural | Diffusion Tube | N/A | 83 | N/A | N/A | N/A | N/A | 18.51 |
| 50 | 380208 | 212824 | Suburban | Diffusion Tube | N/A | 100 | N/A | N/A | N/A | N/A | 13.12 |

☒ **Diffusion tube data has been bias corrected**

☐ **Annualisation has been conducted where data capture is <75%**

☒ **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 adjustment**

**Notes:**

Exceedances of the $NO_2$ annual mean objective of 40µg/$m^3$ are shown in **bold**.

$NO_2$ annual means exceeding 60µg/$m^3$, indicating a potential exceedance of the $NO_2$ 1-hour mean objective are shown in **bold and underlined.**

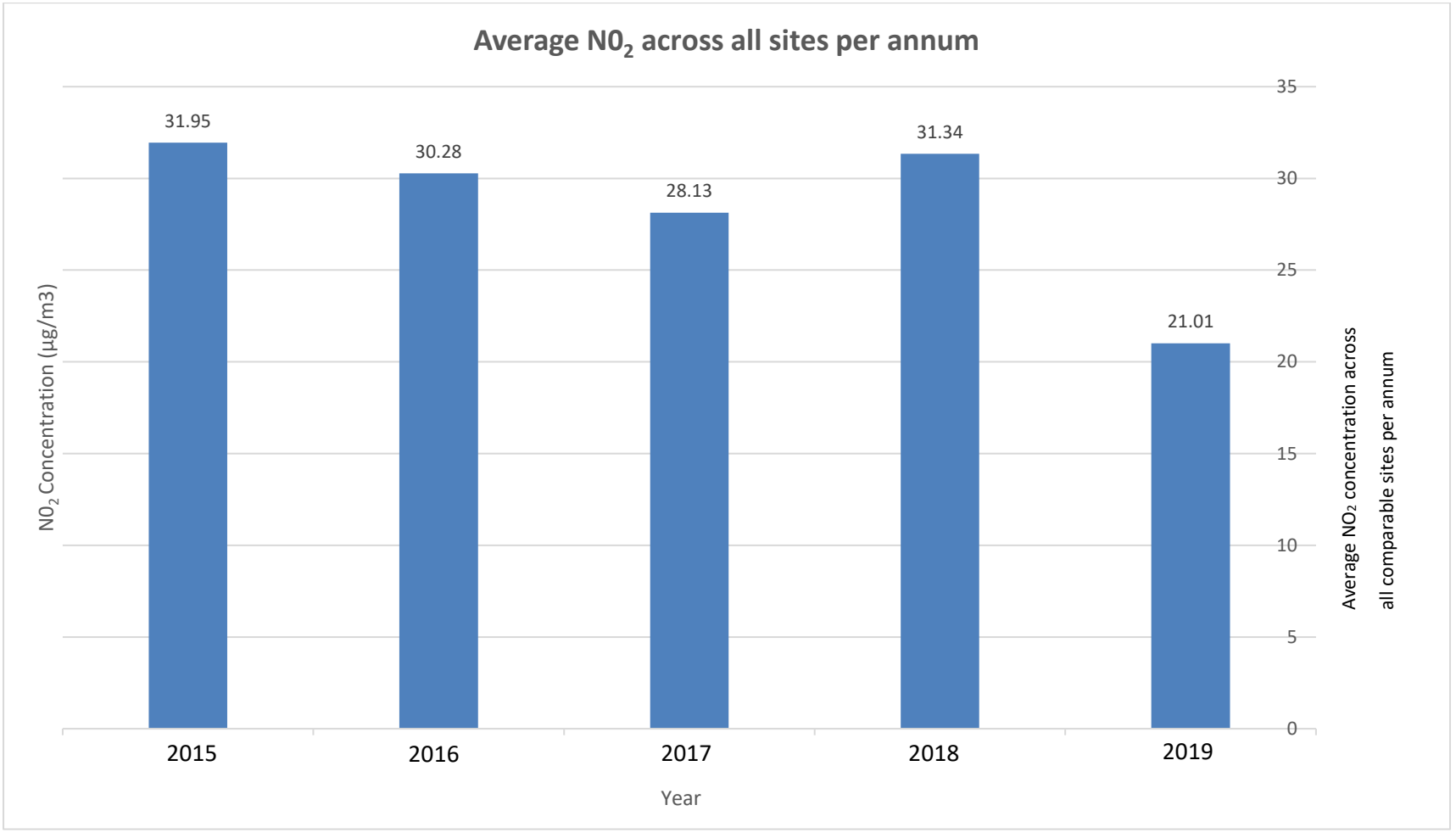
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

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

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

## Figure A.1 – Trends in Annual Mean $NO_2$ Concentrations



## Table A.4 – Annual Mean $PM_{10}$ Monitoring Results

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2019 (%) (2) | $PM_{10}$ Annual Mean Concentration ($\mu g/m^3$) (3) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2015 | 2016 | 2017 | 2018 | 2019 |
| Hardwicke | 380203 | 212842 | Suburban | N/A | 67 | N/A | N/A | N/A | 9.85 | 10.10 |
| Haresfield | 381325 | 210016 | Rural | N/A | 88 | N/A | N/A | N/A | 9.9 | 8.58 |

☒ **Annualisation has been conducted where data capture is <75%**

**Notes:**

Exceedances of the $PM_{10}$ annual mean objective of 40µg/$m^3$ are shown in **bold.**

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

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

(3) All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details. However, there are not a sufficient number of comparable sites within 50km of the Hardwicke station. Therefore, annualisation for the Hardwicke monitor has been calculated using data from the Haresfield station only.

## Table A.5 – 24-Hour Mean $PM_{10}$ Monitoring Results

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2019 (%) (2) | $PM_{10}$ 24-Hour Means > 50µg/m³ (3) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2015 | 2016 | 2017 | 2018 | 2019 |
| Hardwicke | 380203 | 212842 | Suburban | N/A | 67 | N/A | N/A | N/A | 0 | 0 |
| Haresfield | 381325 | 210016 | Rural | N/A | 88 | N/A | N/A | N/A | 0 | 0 |

**Notes:**

Exceedances of the $PM_{10}$ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold.**

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

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

(3) If the period of valid data is less than 85%, the 90.4$^{th}$ percentile of 24-hour means is provided in brackets.

## Table A.6 – $PM_{2.5}$ Monitoring Results

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) [1] | Valid Data Capture 2019 (%) [2] | $PM_{2.5}$ Annual Mean Concentration ($\mu g/m^3$) [3] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2015 | 2016 | 2017 | 2018 | 2019 |
| Hardwicke | 380203 | 212842 | Suburban | N/A | 67 | N/A | N/A | N/A | 7.14 | 6.40 |
| Haresfield | 381325 | 210016 | Rural | N/A | 88 | N/A | N/A | N/A | 7.16 | 5.82 |

☒ **Annualisation has been conducted where data capture is <75%**

**Notes:**

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

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

(3) All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details. However, there are not a sufficient number of comparable sites within 50km of the Hardwicke station. Therefore, annualisation for the Hardwicke monitor has been calculated using data from the Haresfield station only.

# Appendix B: Full Monthly Diffusion Tube Results for 2019

## Table B.1 - $NO_2$ Monthly Diffusion Tube Results - 2019

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | $NO_2$ Mean Concentrations ($\mu g/m^3$) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Mean | | |
| | | | | | | | | | | | | | | | Raw Data | Bias Adjusted (0.78) and Annualised (1) | Distance Corrected to Nearest Exposure (2) |
| 15 | 332395 | 433175 | 33.1 | 24.4 | 26.7 | 32.3 | 23.4 | 24.4 | 22.6 | 19.9 | 22.8 | 25.0 | 31.9 | 28.0 | 26.2 | 20.4 | |
| 16 | 332395 | 433175 | 52.3 | 43.6 | 43.8 | 36.4 | 41.7 | 38.3 | 37.1 | 36.8 | 39.9 | 36.2 | 43.8 | 39.2 | 40.8 | 31.8 | |
| 16b | 386700 | 209794 | 43.0 | 34.7 | 31.6 | 37.2 | 30.1 | 29.9 | 27.3 | 24.2 | 31.4 | 30.7 | 38.8 | 33.2 | 32.7 | 25.5 | |
| 21a | 385785 | 204370 | 51.6 | 45.7 | 45.2 | 49.9 | 35.3 | 40.6 | 40.0 | 37.4 | 43.5 | 46.0 | 51.9 | 45.0 | 44.3 | 34.6 | |
| 25a | 383652 | 204557 | 52.9 | 40.3 | 43.5 | 53.5 | 44.7 | 33.3 | 35.2 | 25.1 | 37.4 | 29.3 | 49.1 | 39.0 | 40.3 | 31.4 | |
| 25c | 383655 | 204551 | 54.7 | 47.9 | 42.9 | 59.5 | 43.6 | 45.1 | 37.6 | 36.2 | 39.2 | 42.4 | 52.3 | 43.4 | 45.4 | 35.4 | |
| 25d | 383659 | 204556 | 45.8 | 42.5 | 43.0 | 43.3 | 42.2 | 40.6 | 36.3 | 33.9 | 40.3 | 36.6 | 44.9 | 40.4 | 40.8 | 31.8 | |
| 25e | 383662 | 204554 | 50.0 | 39.8 | 44.9 | 48.2 | 43.4 | 41.5 | 42.9 | 36.6 | 37.4 | 38.5 | 44.4 | 41.9 | 42.4 | 33.1 | |
| 25f | 383676 | 204545 | 36.9 | 24.5 | 30.0 | 33.2 | 28.6 | 25.9 | 25.8 | 21.7 | 26.2 | 26.5 | 34.7 | 26.8 | 28.4 | 22.2 | |
| 25g | 383672 | 204538 | 40.7 | 23.5 | 31.6 | 35.7 | 33.5 | 26.1 | 27.7 | 24.1 | 25.1 | 29.1 | 37.0 | 27.3 | 30.1 | 23.5 | |
| 31 | 386301 | 215294 | 34.1 | 24.4 | 29.6 | 24.6 | 20.7 | 20.2 | 18.0 | 20.0 | 21.4 | 22.2 | 28.9 | 23.9 | 24.0 | 18.7 | |
| 33 | 380188 | 211951 | 43.6 | | 41.2 | 31.9 | 31.5 | 33.2 | 29.9 | 37.6 | 38.0 | 37.1 | 33.8 | 37.4 | 35.9 | 28.0 | |
| 34 | 381139 | 212275 | 24.4 | | 13.4 | 20.0 | 12.1 | 12.4 | 11.1 | 12.0 | 15.9 | 19.4 | 25.4 | 19.6 | 16.9 | 13.2 | |
| 35 | 380232 | 210421 | 31.5 | 28.0 | 22.6 | 29.3 | 21.2 | 21.1 | 18.5 | 17.7 | 21.5 | 24.8 | 32.6 | 26.1 | 24.6 | 19.2 | |
| 37 | 378290 | 206899 | 24.6 | 18.6 | 13.4 | 19.6 | 9.0 | 12.3 | | 11.1 | 14.3 | 17.2 | 22.1 | 16.8 | 16.3 | 12.7 | |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | 383471 | 204988 | 30.0 | 29.8 | 27.3 | 35.2 | 23.0 | 26.7 | 23.2 | 18.3 | 27.7 | 26.9 | 36.8 | 28.1 | 27.8 | 21.6 | |
| 40 | 374327 | 202878 | 19.6 | 18.6 | 11.0 | 22.5 | 10.6 | 10.8 | 11.0 | 9.1 | 12.6 | 14.9 | 11.0 | 14.0 | 13.8 | 10.8 | |
| 41 | 382839 | 204717 | 30.7 | 35.1 | 32.9 | 32.3 | 26.7 | 21.2 | 26.5 | 28.1 | 25.2 | 29.9 | 36.1 | 33.5 | 29.9 | 23.3 | |
| 42 | 385082 | 205398 | 45.6 | 46.6 | 41.4 | 39.7 | 35.3 | 36.5 | 36.0 | 33.5 | 38.1 | 41.1 | 37.6 | 43.4 | 39.6 | 30.9 | |
| 43 | 384500 | 204446 | 43.1 | 24.2 | 22.3 | 27.2 | 21.9 | 18.5 | 19.8 | 15.7 | 21.3 | 23.1 | 29.3 | 20.9 | 23.9 | 18.7 | |
| 44 | 381872 | 206279 | 14.9 | | 9.0 | 12.3 | 6.3 | 7.1 | 7.2 | 7.9 | 8.3 | 10.4 | 16.2 | 11.7 | 10.1 | 7.9 | |
| 45 | 379342 | 208604 | 20.7 | 16.1 | 11.5 | 15.9 | 10.0 | 10.3 | 9.0 | 9.1 | 12.7 | 14.7 | 22.3 | 15.1 | 14.0 | 10.9 | |
| 46 | 380374 | 209112 | 19.2 | 15.0 | 11.8 | 13.1 | 11.4 | 11.1 | 10.8 | 11.3 | 14.2 | 14.2 | 20.1 | 14.9 | 13.9 | 10.9 | |
| 47 | 381349 | 210005 | 17.9 | 15.2 | 11.6 | 14.0 | 10.1 | 10.3 | 9.1 | | 10.3 | 12.9 | 19.2 | 14.4 | 13.2 | 10.3 | |
| 48 | 382295 | 209217 | 14.5 | 13.9 | 9.4 | 12.7 | 10.1 | 9.0 | 9.9 | 8.5 | 10.6 | 13.3 | 15.5 | 11.3 | 11.6 | 9.0 | |
| 49 | 380108 | 211214 | 29.6 | 27.5 | 19.3 | 34.2 | 18.7 | 18.5 | | 16.0 | 20.5 | | 29.9 | 23.3 | 23.7 | 18.5 | |
| 50 | 380208 | 212824 | 26.1 | 20.9 | 14.0 | 20.7 | 11.7 | 11.9 | 8.0 | 11.2 | 13.8 | 16.8 | 25.9 | 20.9 | 16.8 | 13.1 | |

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

☐ **Annualisation has been conducted where data capture is <75%**

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

**Notes:**

Exceedances of the $NO_2$ annual mean objective of 40µg/$m^3$ are shown in **bold**.

$NO_2$ annual means exceeding 60µg/$m^3$, indicating a potential exceedance of the $NO_2$ 1-hour mean objective are shown in **bold and underlined.**

(1) See Appendix C for details on bias adjustment and annualisation.
(2) Distance corrected to nearest relevant public exposure.

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

To ensure that the data presented is relevant and valid, a number of corrections and calculations must be applied to the raw data. Specific corrections include annualisation, bias adjustment and distance correction.

Annualisation is a means of validating data. It is used where data capture at a location was below 75% for the year. In such instances, annualisation can be used to estimate an annual average based on a part year average. For annualisation to be completed there must be 3 months of monitoring data available. In 2019, annualisation was only necessary for PM10 and PM 2.5 at the Hardwicke continuous monitoring location as data was captured for just over 67% of the year. Due to the fact that only one other particulate monitor within 50 km was situated in a similar type of location, annualisation has been calculated using only one reference unit; the Haresfield monitoring station.

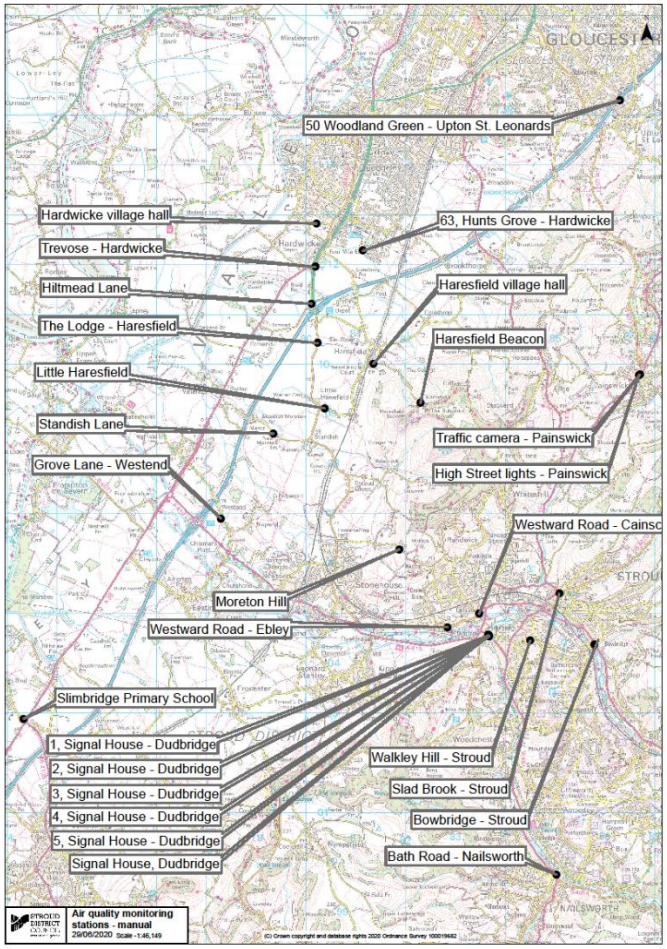
After annualisation is completed (where necessary), diffusion tube data should then be corrected for any bias. Bias is the inclination of any diffusion tube to over or under report actual levels of a pollutant being monitored when compared against a reference chemiluminescence analyser. Where local authorities undertake co-location studies (diffusion tubes and reference unit measurement together) a local bias adjustment factor is obtained. All local co-location study data is forwarded to the LAQM support desk where it is collated to create a national bias adjustment figure for each laboratory. The bias adjustment figure specific to each laboratory can then be used by local authorities to correct the raw data. The Stroud District Council uses Somerset County Council laboratory for analysis of diffusion tubes. The bias adjustment factor published by DEFRA for this laboratory, to be used in the 2020 ASR, is 0.78.

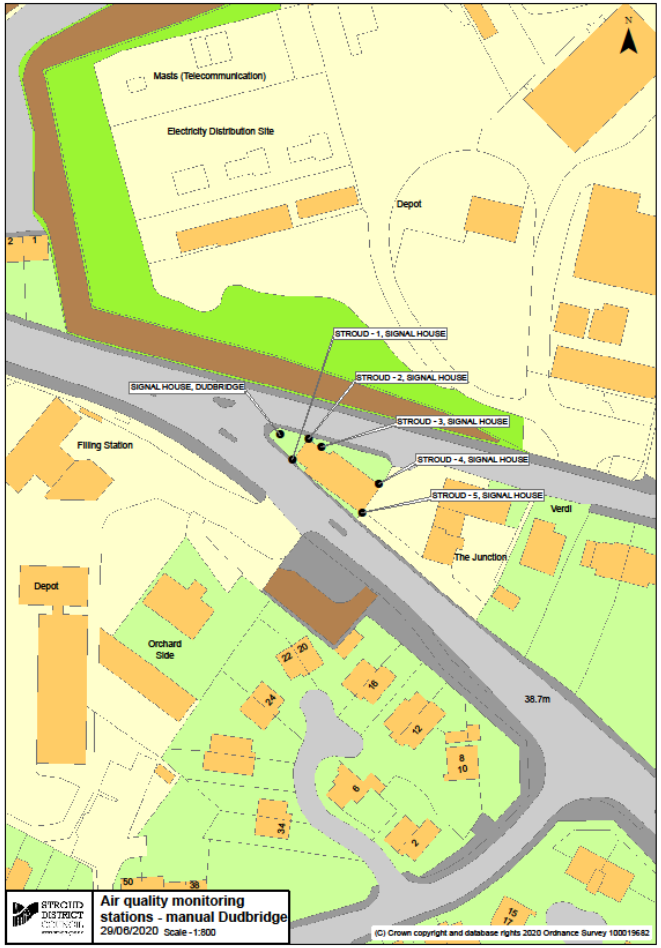
In most circumstances, diffusion tubes should be located so that the data is representative of public exposure. Where this is not possible, it is necessary to calculate the estimated level at the point of exposure. To do this, there is a calculator spreadsheet available at the LAQM support website. It is recommended that all locations exceeding the annual mean concentration should be distance corrected.

Additionally, all locations that report annual mean concentrations within 10% of the annual objective should be corrected for distance. The reason is that this should reduce some of the uncertainty that is standard in diffusion tube monitoring concentration data.

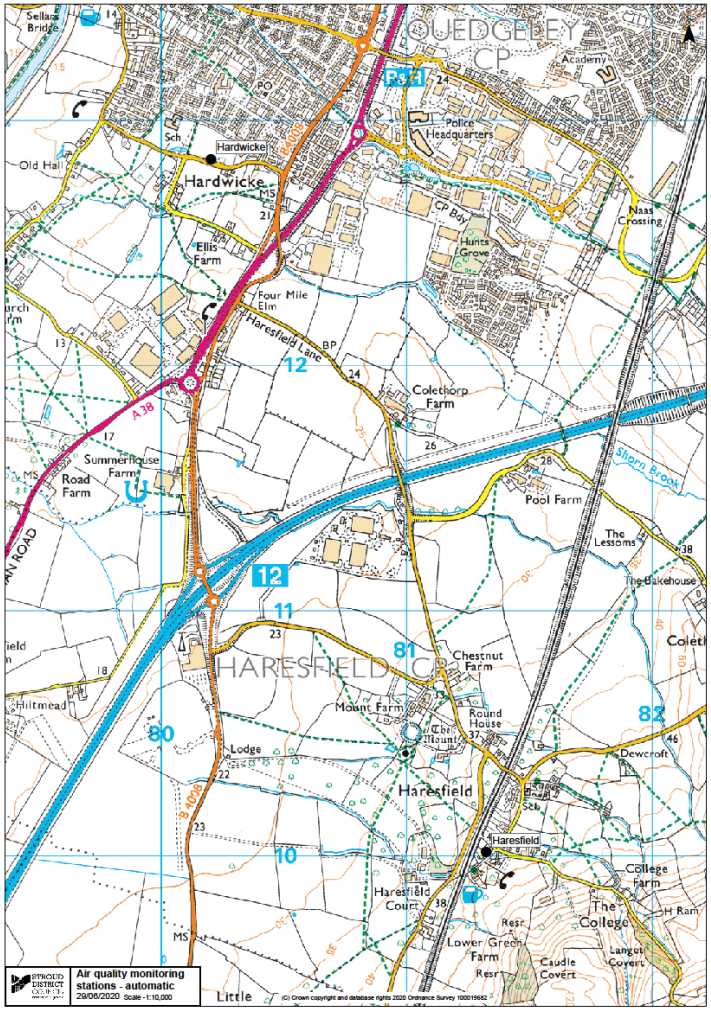
# Appendix D: Maps of Monitoring Locations and AQMAs

## Non-Automatic Monitoring locations



## Automatic Monitoring locations



# Appendix E: Summary of Air Quality Objectives in England

### Table E.1 – Air Quality Objectives in England

| Pollutant | Air Quality Objective[6] | |
|---|---|---|
| | Concentration | Measured as |
| Nitrogen Dioxide ($NO_2$) | 200 µg/m$^3$ not to be exceeded more than 18 times a year | 1-hour mean |
| | 40 µg/m$^3$ | Annual mean |
| Particulate Matter ($PM_{10}$) | 50 µg/m$^3$, not to be exceeded more than 35 times a year | 24-hour mean |
| | 40 µg/m$^3$ | Annual mean |
| Sulphur Dioxide ($SO_2$) | 350 µg/m$^3$, not to be exceeded more than 24 times a year | 1-hour mean |
| | 125 µg/m$^3$, not to be exceeded more than 3 times a year | 24-hour mean |
| | 266 µg/m$^3$, not to be exceeded more than 35 times a year | 15-minute mean |

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

# Glossary of Terms

| Abbreviation | Description |
|---|---|
| AQAP | Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values' |
| AQMA | Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives |
| ASR | Air quality Annual Status Report |
| Defra | Department for Environment, Food and Rural Affairs |
| DMRB | Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England |
| 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 (micrometres or microns) or less |
| $PM_{2.5}$ | Airborne particulate matter with an aerodynamic diameter of 2.5µm or less |
| QA/QC | Quality Assurance and Quality Control |
| $SO_2$ | Sulphur Dioxide |