

# STROUD DISTRICT COUNCIL



## AIR QUALITY REVIEW AND ASSESSMENT PROGRESS REPORT

2008

### Part IV of the Environment Act 1995 Local Air Quality Management

Produced with assistance from the Air Quality Management Resource Centre,  
University of the West of England, Bristol.



**Document Control Sheet**

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## **1: Introduction to Air Quality Progress Reports**

This Air Quality Progress Report forms part of the Local Air Quality Management (LAQM) system introduced by the Environment Act 1995 ('The Act') and subsequent Regulations. It is a requirement as part of the Act, and follows on from Stroud District Council's Updating and Screening Assessment in 2006 and Progress Report in 2007. Stroud District Council's Updating and Screening Assessment in 2006 and Progress Report in 2007 did not identify any potential exceedences of any of the air quality objectives. Consequently, this Progress Report fulfils the Review and Assessment requirements for Stroud District Council in 2008.

The overall aim of this document is to report upon the ongoing implementation of Local Air Quality Management in Stroud District Council, and progress made in maintaining concentrations below the air quality objectives. Progress Reports have been introduced into the LAQM system following a detailed evaluation of the first round (Round 1) of local authority Review and Assessment. Progress Reports are to be prepared in years when Stroud District Council is not undertaking an Updating and Screening Assessment or a Detailed Assessment. It is intended that this Progress Report should assist Stroud District Council in the following ways:

- Maintaining a profile for LAQM within Stroud District Council;
- Providing a means for communicating air quality information to Council Members and the public;
- Maximising the usefulness and interpretation of the monitoring effort being carried out by Stroud District Council;
- Maximising the value of the investment in monitoring equipment;
- Making the next round of Review and Assessment easier, as there will be a readily available up-to-date source of information;
- Assisting Stroud District Council to respond to requests for up-to-date information on air quality;
- Providing information to assist with other policy areas, such as transport and land-use planning;
- Providing a ready source of information on air quality for developers carrying out Environmental Assessments for new schemes;
- Demonstrating progress with implementation of any future Air Quality Action Plans required or Gloucestershire's County-wide Air Quality Strategy, and
- Providing a timely indication of the need for further measures to improve air quality, rather than delaying until the next full round of Review and Assessment.

Copies of this Progress Report have been made available to the Secretary of State, Environment Agency, the Highways Agency and other local authority departments for information as well as to the public and local stakeholders.

### 1.1: Overall aims of the Progress Report

This Progress Report has two main aims:

- To report on progress being made with the implementation of Local Air Quality Management (LAQM) in Stroud District Council, and
- To report on progress in maintaining concentrations below the air quality objectives.

New monitoring data within Stroud District Council and new developments that might affect local air quality are the focus of this report, and are the minimum requirements for Review and Assessment progress reporting purposes. Each is considered in turn, using the Progress Report Checklist made available by Defra on their air quality Review and Assessment Website ([www.uwe.ac.uk/aqm/review](http://www.uwe.ac.uk/aqm/review)). Table 1 below provides an indication of what is expected of local authorities in their progress reporting.

**Table 1: Minimum Reporting Requirements**

<b>Monitoring data</b>	The minimum requirement is to report monitoring data and trends over recent years. To maximise the value of air quality monitoring, careful attention should be paid to the type of equipment used and the locations where the monitors are placed, as well as the QA/QC and data verification procedures.
<b>New developments</b>	A consideration of new developments with the potential to affect local air quality (mainly through the generation of traffic or the introduction of relevant exposure), such as residential developments, industrial processes, retail premises, roads and quarries.

In addition to the minimum requirements, the government recommends that local authorities report upon a number of additional elements in their Progress Reports. These additional elements are listed in Table 2.

**Table 2: Recommended additional reporting requirements**

<b>Additional monitoring data</b>	<p>Projecting the measured concentrations forward to the objective years is helpful in providing early indication of likely exceedences that may not have been previously identified.</p> <p>Local authorities may also find it helpful to report on their monitoring for pollutants not covered by the regulations, e.g. ozone, polycyclic aromatic hydrocarbons (PAH), as well as other air quality data, i.e. odour complaints, dust deposition, radiation monitoring.</p>
<b>Action Plans</b>	<p>Any progress on the implementation of air quality action plans where appropriate.</p>
<b>Local or Regional Air Quality Strategies</b>	<p>Government guidance strongly recommends that all authorities, particularly those without AQMAs but who have areas close to the exceedence levels, should consider drawing up a Local Air Quality Strategy. Progress Reports provide the opportunity for local authorities to report on the development of local or regional strategies. Local authorities should report upon the extent to which the local authority has developed or implemented an Air Quality Strategy, how to access the strategy and when the strategy is to next be reviewed (as appropriate).</p>
<b>Planning policy</b>	<p>Any relevant updates on planning policies that relate specifically to air quality. Policies within Local Development Frameworks (formally Local Plans) determine the local authority approach to the relationship between planning and air quality, with new developments judged against these policies. Any supplementary planning guidance to address air quality matters should be referenced.</p>
<b>Planning applications</b>	<p>A list of planning applications that have the potential to affect local air quality should be provided. The land-use planning system is recognised as playing an integral part in improving air quality. This requires close co-operation between Land-use Planners and Environmental Health Officers. Some local authorities have developed procedures to help ensure that planning applications that might have impacts on air quality are forwarded to the Environmental Health Department for comment.</p>

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	<p>Updating and Screening Assessments and Detailed Assessments should take account of planning applications that have been approved only. Progress Reports, however, provide the opportunity to log planning applications for new developments to give a picture of areas where changes may take place and where combined impacts from several developments may become important.</p> <p>The information provided should therefore include a list of any major developments under consideration that might affect air quality. Such a list could be based on those applications for which an Air Quality Assessment has been provided or for which an Air Quality Assessment has been requested.</p>
<b>Local Transport Plans and Strategies</b>	<p>Progress on implementing those elements of the Local Transport Plan (LTP) that might affect air quality should be provided. Measures to improve air quality on a local scale are closely related to the LTP. Local authorities should reference those measures within the LTP that relate specifically to bringing about air quality improvements.</p> <p>Local authorities should also report on any other measures aimed at addressing transport-related air quality issues that have not been (or will not be) reported in the LTP Progress Report.</p>

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## **2: Minimum Requirements**

This chapter provides the necessary information to fulfil the minimum requirements of Stroud District Council's Progress Report.

### **2.1: New monitoring results for Stroud District Council**

This report provides a summary of all available monitoring data from 2007 in a format suitable for comparison with the relevant air quality objective(s). In 2007 Stroud District Council only undertook monitoring for nitrogen dioxide using diffusion tubes. The nitrogen dioxide diffusion tubes used are 20% TEA in water supplied and analysed by Bristol Scientific Services. The following information has been included:

- Map and details of the diffusion tube monitoring locations (Appendix 1);
- A summary table of concentrations that allow a comparison with the air quality objectives (see Table 3 below);
- Table 7 in Appendix 2 presents the NO<sub>2</sub> diffusion tube data for Stroud District Council. The 2007 annual mean has been bias adjusted (see Figure 2) and projected forward to 2010 in accordance with TG(03) Box 6.6; and
- A plot showing trends in NO<sub>2</sub> diffusion tube concentrations for selected long term monitoring locations from 2001 to 2007 (Figure 3).

**Table 3: New monitoring results for Stroud District Council (2006)**

<b>Carbon Monoxide</b>	Stroud District Council does not carry out any Carbon Monoxide monitoring. The Council's 2006 Updating and Screening Assessment identified no issues for this pollutant. Carbon Monoxide will next be assessed in the Council's 2009 Updating and Screening Assessment.
<b>Benzene</b>	Stroud District Council does not carry out any Benzene monitoring. The Council's 2006 Updating and Screening Assessment identified no issues for this pollutant. Benzene will next be assessed in the Council's 2009 Updating and Screening Assessment.
<b>1,3-butadiene</b>	Stroud District Council does not carry out any 1,3-butadiene monitoring. The Council's 2006 Updating and Screening Assessment identified no issues for this pollutant. 1,3-butadiene will next be assessed in the Council's 2009 Updating and Screening Assessment.
<b>Lead</b>	Stroud District Council does not carry out any Lead monitoring. The Council's 2006 Updating and Screening Assessment identified no issues for this pollutant. Lead will next be assessed in the Council's 2009 Updating and Screening Assessment.
<b>Nitrogen Dioxide</b>	<p>Stroud District Council undertook monitoring of NO<sub>2</sub> using diffusion tubes at 21 locations in 2007.</p> <p><b>NO<sub>2</sub> Diffusion Tubes:</b> The diffusion tubes (20% TEA in water) are supplied and analysed by Bristol Scientific Services. The tubes at all 21 locations through out the Stroud District Council area have a monthly exposure period. Further details of the tube locations, bias adjustment and results can be found in Appendix 1 and 2.</p> <ul style="list-style-type: none"> <li>• Study of the diffusion tube results identified no locations that will exceed the annual mean objective of 40µg/m<sup>3</sup>.</li> </ul>
<b>Particulates (PM<sub>10</sub>)</b>	Stroud District Council does not carry out any PM <sub>10</sub> monitoring. The Council's 2006 Updating and Screening Assessment identified no issues for this pollutant. Particulates (PM <sub>10</sub> ) will next be assessed in the Council's 2009 Updating and Screening Assessment.
<b>Sulphur Dioxide</b>	Stroud District Council does not carry out any SO <sub>2</sub> monitoring. The Council's 2006 Updating and Screening Assessment identified no issues for this pollutant. Sulphur dioxide (SO <sub>2</sub> ) will next be assessed in the Council's 2009 Updating and Screening Assessment.

**2.1.1: Monitoring data summary**

- Stroud District Council managed 21 NO<sub>2</sub> diffusion tubes sites in 2007. Study of the 2007 diffusion tube results identified no locations exceeding the annual mean objective of 40µg/m<sup>3</sup>.
- Nitrogen dioxide concentrations for 2007 are on average approximately 1% higher than concentrations in 2006. However, the data indicates that nitrogen dioxide concentrations are generally decreasing in Stroud District Council's administrative area. (Appendix 2, Figure 3).

## 2.2: New local developments

This section considers any new developments and changes that have taken place, or are proposed, that may influence local air quality. Such developments are logged so that they can be considered more thoroughly during the next full round of Review and Assessment. Table 4 provides details of relevant new developments in Stroud District Council.

**Table 4: New local developments with potential to influence local air quality in Stroud District Council**

<b>New Part A1/A2</b>	Stroud District Council has identified no new Part A1/A2 developments.
<b>New Part B</b>	Stroud District Council has identified no new Part B developments.
<b>New retail development</b>	Stroud District Council has identified no new retail developments that will significantly change traffic flows in the area.
<b>New road scheme</b>	Stroud District Council has identified no new road schemes that will significantly alter traffic flows in the area.
<b>New mineral development</b>	Stroud District Council has identified no new mineral developments that will significantly change traffic flows or impact on local air quality.
<b>New landfill development</b>	Stroud District Council has identified no new landfill sites, quarries etc., that have been granted planning permission, and which have nearby relevant exposure.
<b>New residential development</b>	Stroud District Council has identified no new significant residential developments that will significantly change traffic flows or impact on local air quality.
<b>New mixed-use development</b>	Stroud District Council has identified no new mixed use developments that will significantly change traffic flows.

### 2.2.1: New development summary

There are no new developments of significance that will influence air quality in the Stroud District Council area.

### 3: Recommended additional elements

Progress made in respect of a County-wide Air Quality Strategy, Gloucestershire's Local Transport Plan and other elements are reported in Table 5 below.

**Table 5: Recommended additional elements with respect to air quality progress reporting in Stroud District Council**

<b>Additional monitoring data</b>	Stroud District Council does not undertake any monitoring outside of that reported in Section 2.
<b>Air Quality Action Plan</b>	Stroud District Council was not required to develop or implement an Air Quality Action Plan following Round 1, Round 2 and Round 3 Local Air Quality Management to date.
<b>Local or Regional Air Quality Strategies</b>	<p>Stroud District Council does not have a Local Air Quality Strategy, but is, however, part of a partnership that has developed a County-wide Strategy for Gloucestershire. All six local authorities in Gloucestershire (operating as the Gloucestershire Pollution Group) together with the Gloucestershire County and the University of the West of England's Air Quality Management Research Centre (AQMRC, U.W.E.) have published a County-wide Air Quality Strategy. Stroud District Council's cabinet formally adopted the Local Air Quality Strategy for Gloucestershire in 2005. This strategy is being publicised to appropriate stakeholders within the authority (development control, transport etc.) and relevant external bodies (GOSW, Highways Agency etc.). The intention is for these bodies to use the strategy to establish air quality improvements as an integral reference within their work.</p> <p>The main objectives of the county strategy included:</p> <ul style="list-style-type: none"> <li>• Working toward maintaining the national air quality objectives.</li> <li>• Continue working towards reducing ozone concentrations.</li> <li>• Comply with the LAQM timetable regarding the submission of reports.</li> <li>• Provide a framework for designating, revoking and amending AQMA's within Gloucester and for developing AQAP's.</li> <li>• Review and seek to improve the key structures and</li> </ul>

	<p>mechanisms in place regionally to deliver air quality improvements.</p> <ul style="list-style-type: none"> <li>• Ensure that air quality is a key objective in all future LTP's.</li> <li>• Review and reduce the main constraints to improving air quality.</li> <li>• Reduce air pollution inline with the underlying principles of the European Ambient Air Quality Framework Directive (96/62/EC).</li> <li>• Maintain good air quality and prevent the deterioration of air quality.</li> <li>• Reduce emissions of CO<sub>2</sub> emitted by road transport.</li> <li>• Consider subsequent reviews of the Strategy in conjunction with annual reviews of the LTP.</li> </ul> <p>It is expected that the Gloucestershire County-wide Air Quality Strategy will be reviewed shortly to incorporate new national and local policies and strategies such as Local Transport Plan and the revised National Air Quality Strategy 2007 etc.</p>
<b>Planning policy</b>	<p>There is no Supplementary Planning Guidance (SPG) to address air quality matters currently available to the District, although the authority has made use of the SPG on Planning and Air Quality produced by the Bristol, Gloucestershire and Somerset (BG&amp;S) Environment Protection Committee in 2001.</p>
<b>Planning applications</b>	<p>There are no significant planning applications currently submitted in Stroud District Council. The council operates procedures to help ensure that planning applications that might have impacts on air quality are forwarded to the Environmental Health department for comment. There are currently no major developments under consideration that might affect air quality.</p>
<b>Local Transport Plan</b>	<p>One of the four key priorities in Gloucestershire County Council's Local Transport Plan is to improve air quality in areas where it is significantly influenced by pollution from traffic. The Traffic Management Act and Gloucestershire County Council proposals to adopt an ITS (mainly in the form of UTMC) and to create a traffic control centre will help reduce congestion by smoothing traffic flows and providing better travel information helping people to avoid congestion and encourage use of alternative modes.</p>

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County wide plans are being developed to:

- Promote 30 minute inter urban services to Gloucester and Cheltenham from main market towns in the county to help reduce demand on key radials, some of which run through air quality hot spots.
- Promote school and business travel plans and development of Gloucestershire car share scheme.
- Road safety - further 20mph schemes etc - all aimed at encouraging vulnerable modes.

Plans specific to Stroud in the LTP(2) include:

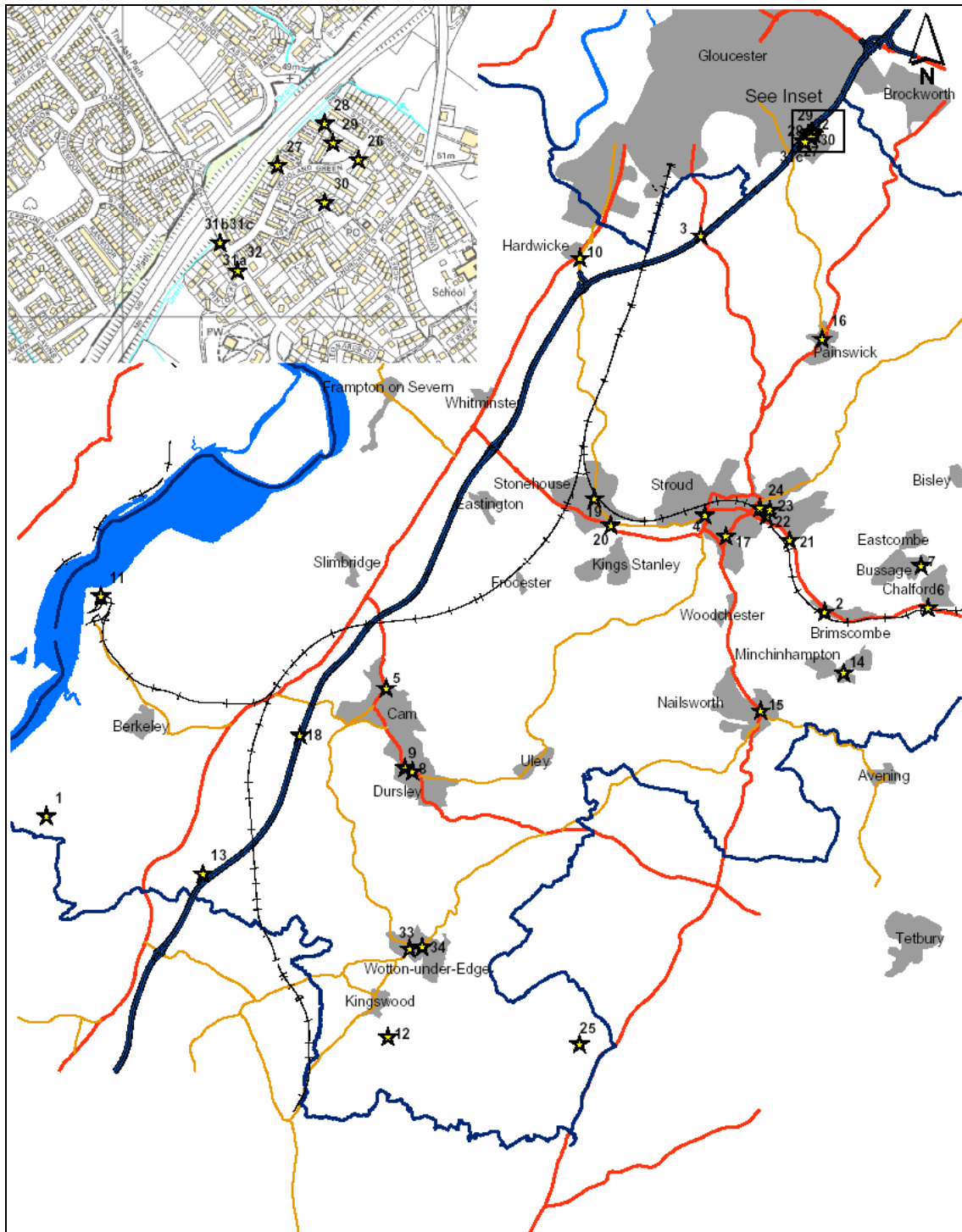
- The improvements to major road junctions at Wallbridge to ease traffic flows – this should remove rat run from entirely unsuitable residential roads and reduce queues.
  - The creation of Stroud interchange (rail/bus) - promotion of bus network.
- 

#### **4: Progress Report Conclusions**

- From the evidence provided in this report, no exceedences of the air quality objectives are likely to occur at any location within Stroud District Council's area. Stroud District Council undertake an Updating and Screening Assessment 2009.
- Stroud District Council currently carries out no monitoring for Carbon Monoxide, Benzene, Lead, 1,3-butadiene, PM<sub>10</sub>, SO<sub>2</sub> and Ozone.
- There are no new developments of significance that will influence air quality in the Stroud District Council area.

**Appendix 1: Air quality monitoring locations**

**Figure 1: Map of air quality monitoring locations in Stroud District Council**



Diffusion Tube Location Details

1:140,000



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18/05/2004

Section

User

**Table 6: Ambient air quality monitoring locations and details**

Site Ref	Site Name	Site Class	Pollutants Monitored	Current Monitoring (Y/N)?
1	Bevington - M5 Survey	R1	NO <sub>2</sub> – diffusion tube, O <sub>3</sub> , SO <sub>2</sub>	Y
2	Brimscombe Corner	U2	NO <sub>2</sub> – diffusion tube	N
3	Brookthorpe – North View	U2	NO <sub>2</sub> – diffusion tube	Y
4	Cainscross - Tricorn	U1	NO <sub>2</sub> – diffusion tube	Y
5	Cam Ptich	U1	NO <sub>2</sub> – diffusion tube	N
6	Chalford - A419/High St	U1	NO <sub>2</sub> – diffusion tube	N
7	Chalford – Manor Farm	U1	NO <sub>2</sub> – diffusion tube	Y
8	Dursley – Town Hall	U1	NO <sub>2</sub> – diffusion tube	Y
9	Dursley – Traffic Lights	U1	NO <sub>2</sub> – diffusion tube	N
10	Hardwicke - X Keys	U1	NO <sub>2</sub> – diffusion tube	Y
11	Hinton – Sharpness Docks	U2	NO <sub>2</sub> – diffusion tube	N
12	Kingswood - M5 Survey	R2	NO <sub>2</sub> – diffusion tube, SO <sub>2</sub>	Y
13	Michaelwood - M5 Survey	Sp	NO <sub>2</sub> – diffusion tube	Y
14	Minchinhampton Centre	U2	NO <sub>2</sub> – diffusion tube	N
15	Nailsworth – Bath Rd	U1	NO <sub>2</sub> – diffusion tube	Y
16	Painswick – High St Lights	U1	NO <sub>2</sub> – diffusion tube	Y
17	Rod - Golden X Junction	U1	NO <sub>2</sub> – diffusion tube	Y
18	Stinchcombe - M5 Road Bridge	Sp	NO <sub>2</sub> – diffusion tube	N
19	Stonehouse -High St	U2	NO <sub>2</sub> – diffusion tube	N
20	Stonehouse Roundabout	U2	NO <sub>2</sub> – diffusion tube	Y
21	Stroud - Bowbridge	U2	NO <sub>2</sub> – diffusion tube	Y
22	Stroud - Music Centre	U2	NO <sub>2</sub> – diffusion tube	Y
23	Stroud – Nelson St	U2	NO <sub>2</sub> – diffusion tube	N
24	Stroud – Taxi Rank	U3	NO <sub>2</sub> – diffusion tube	Y
25	Tresham -M5 Survey	R2	NO <sub>2</sub> – diffusion tube	Y
26	Upton St Leonards- 1 Woodland Green	SU	NO <sub>2</sub> – diffusion tube	N
27	Upton St Leonards- 50 Woodland Green	SU	NO <sub>2</sub> – diffusion tube	Y
28	Upton St Leonards- 26 Woodland Green	SU	NO <sub>2</sub> – diffusion tube	Y
29	Upton St Leonards- 12/14 Woodland Green	SU	NO <sub>2</sub> – diffusion tube	N
30	Upton St Leonards -10 Ash Grove	SU	NO <sub>2</sub> – diffusion tube	Y
31	Upton St Leonards –Ash Path Bridge	SU	NO <sub>2</sub> – diffusion tube	Y
32	Upton St Leonards –Ash Path Bridge	SU	NO <sub>2</sub> – diffusion tube	N
33	Upton St Leonards –Ash Path Bridge	SU	NO <sub>2</sub> – diffusion tube	N
34	Upton St Leonards – Torshaven	SU	NO <sub>2</sub> – diffusion tube	N
35	Wotton - Bear/High St	U1	NO <sub>2</sub> – diffusion tube	N
36	Wotton - Old Town	U1	NO <sub>2</sub> – diffusion tube	Y

## Appendix 2: NO<sub>2</sub> Diffusion Tube Data

### A2.1: Calculation of the 2007 bias adjustment factor

Nitrogen dioxide diffusion tubes used by Stroud District Council use the 20% triethanolamine (TEA) in water preparation method and are supplied and analysed by Bristol Scientific Services. No collocation bias adjustment study was undertaken by Stroud District Council, therefore the annual bias adjustment factors were obtained from the bias adjustment

spreadsheet on the Review and Assessment Helpdesk website. Figure 2 shows the output from the bias adjustment spreadsheet for 2007.

A factor of 0.77 was calculated from the Bias Adjustment Factors Spreadsheet (v04/08). Although in many cases, using an overall correction factor derived from as many co-location studies as possible will provide the ‘best estimate’ of the ‘true’ annual mean concentration, it is important to recognise that there will still be uncertainty associated with this bias adjusted annual mean. One analysis has shown that the uncertainty for tubes bias adjusted in this way is ± 20% (at 95% confidence level). This compares with a typical value of ± 10% for chemiluminescent monitors subject to appropriate QA/QC procedures.

Yearly adjustment factors have been applied to the data according to the site type (roadside or background). These adjustment factors allow projections of likely 2010 concentrations to be calculated from the measurements year while taking into account likely changes in emissions from traffic and stationary sources. Yearly adjustment factors have been applied according to the Technical Guidance (TG(03)).

**Figure 2: Bias adjustment factor for 2007 nitrogen dioxide diffusion tube data**

Spreadsheet Version Number: 04/08										
Follow the steps below <b>in the correct order</b> to show the results of <b>relevant</b> collocation studies							This spreadsheet will be updated in late September 2008 on the <a href="#">R&amp;A website</a>			
<b>Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods</b> <b>Whenever presenting adjusted data, you should state the adjustment factor used</b>										
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.										
Published by Air Quality Consultants Ltd on behalf of Defra, the Welsh Assembly Government and the Department of the Environment Northern Ireland										
Step 1:	Step 2:	Step 3:	Step 4:							
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor <sup>3</sup> shown in blue at the foot of the final column.							
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data.	If you have your own collocation study then see footnote <sup>4</sup> . If uncertain what to do then contact the Review and Assessment Helpdesk 0117 328 3668 aqm-review@uwe.ac.uk.							
Analysed By <sup>1</sup>	Method <sup>2</sup>	Year <sup>5</sup>	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m <sup>3</sup> )	Automatic Monitor Mean Conc. (Cm) (µg/m <sup>3</sup> )	Bias (B)	Tube Precision <sup>4</sup>	Bias Adjustment Factor (A) (Cm/Dm)
Bristol Scientific Services	20% TEA in Water	2007	Rural	Pembrokeshire CC	11	7	5	36.9%	G	<b>0.73</b>
Bristol Scientific Services	20% TEA in Water	2007	R	Brighton and Hove CC	12	46	33	38.2%	G	<b>0.72</b>
Bristol Scientific Services	20% TEA in Water	2007	K	South Gloucestershire	9	29	24	21.0%	G	<b>0.83</b>
Bristol Scientific Services	20% TEA in Water	2007	R	West Wiltshire DC	9	38	26	48.6%	G	<b>0.67</b>
Bristol Scientific Services	20% TEA in Water	2007	K	AEA Tech Intercomparison	12	115	103	12.0%	G	<b>0.89</b>
Bristol Scientific Services	20% TEA in Water	2007	<b>Overall Factor<sup>3</sup> (5 studies)</b>						<b>Use</b>	<b>0.77</b>

**A2.2: NO<sub>2</sub> diffusion tube data (2007)**

Table 7 presents the NO<sub>2</sub> diffusion tube data for Stroud District Council. The 2007 annual mean has been bias adjusted and projected forward to 2010 in accordance with TG(03) Box 6.6 Pg 6-9.

**Table 7: NO<sub>2</sub> diffusion tube data for all locations in Stroud District Council (2007)**

Site No	Name	Jan*	Feb*	Mar*	Apr*	May*	Jun*	Jul*	Aug*	Sept*	Oct*	Nov*	Dec*	2007#	2010#
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	Mean
1	Bevington - M5 Survey	12.9	20.9	12.7	14.0	9.0	10.5	7.9	9.4	11.0	20.3	20.3	22.1	11.0	9.8
2	Brookthorpe - North View	37.3	46.0	34.3	43.8	31.4	37.8	27.2	29.5	30.5	43.6	43.1	47.8	29.0	26.0
3	Cainscross - Tricorn	36.7	51.8	43.1	46.6	35.4	42.0	29.3	41.2	46.1	44.9	56.0	54.3	33.8	30.3
4	Chalford - Manor Farm	17.7	30.1	21.0	17.6	14.2	16.6	12.8	17.1	18.3	25.1	28.1	32.7	16.1	14.4
5	Dursley - Town Hall	23.9	36.3	28.7	31.9	24.5	28.8	-	25.3	28.4	36.5	38.0	37.6	23.8	21.3
6	Hardwicke - Westland Road	19.5	31.5	23.4	23.9	15.8	21.4	14.5	20.2	19.5	34.6	38.1	34.2	19.0	17.0
7	Kingswood - M5 Survey	22.8	21.9	17.3	13.7	-	12.9	9.5	12.7	15.5	20.0	25.9	-	13.3	11.9
8	Michaelwood - M5 Survey	23.9	32.7	22.9	27.3	16.8	18.7	14.7	15.8	19.1	30.0	30.2	33.7	18.3	16.4
9	Nailsworth - Bath Road	34.0	42.1	33.1	34.3	24.9	29.8	29.5	31.8	34.0	36.5	44.0	43.3	26.8	24.0
10	Painswick - High St Lights	49.6	44.1	46.7	42.1	43.4	40.9	41.2	39.0	36.0	39.3	46.8	40.2	32.7	29.2
11	Rod - Golden X Junction	28.2	40.7	33.8	41.5	22.7	29.6	20.3	29.4	31.5	45.1	46.0	42.2	26.4	23.6
12	Stonehouse Roundabout	38.8	44.7	39.5	41.5	29.2	38.5	23.2	35.8	42.5	46.1	59.0	53.2	31.6	28.2
13	Stroud - Bowbridge	41.2	42.5	40.2	45.3	38.7	43.3	37.0	38.7	38.5	48.6	48.7	45.3	32.6	29.2
14	Stroud - London Road	-	-	32.7	-	-	-	-	-	34.6	43.1	-	43.3	29.6	26.5
15	Stroud - Taxi Rank	39.3	41.9	36.4	37.9	29.7	33.9	27.5	31.9	30.1	37.5	43.1	43.0	27.7	24.8
16	Tresham - M5 Survey	17.0	23.4	16.2	13.2	11.9	10.8	8.9	14.0	16.1	23.2	26.2	30.6	13.6	12.1
17	Upton St Leonards - Ash Path Bridge	42.8	31.4	42.1	27.5	36.8	-	29.7	41.0	42.7	39.8	-	41.8	28.9	25.9
18	Upton St Leonards - 26 Woodland Green	41.8	30.1	38.6	34.6	36.8	29.4	25.1	37.2	33.0	36.3	-	38.8	26.7	23.9
19	Upton St Leonards - 50 Woodland Green	44.2	37.9	42.7	38.1	39.4	-	30.9	23.2	40.0	35.8	49.8	39.8	29.5	26.4
20	Upton St Leonards - 10 Ash Grove	32.8	25.0	29.6	27.3	25.1	24.8	19.8	31.3	29.4	33.2	44.1	32.9	22.8	20.4
21	Wotton - Old Town	25.8	30.0	26.5	24.7	19.3	19.0	14.3	21.9	23.4	23.0	31.9	30.2	18.6	16.6

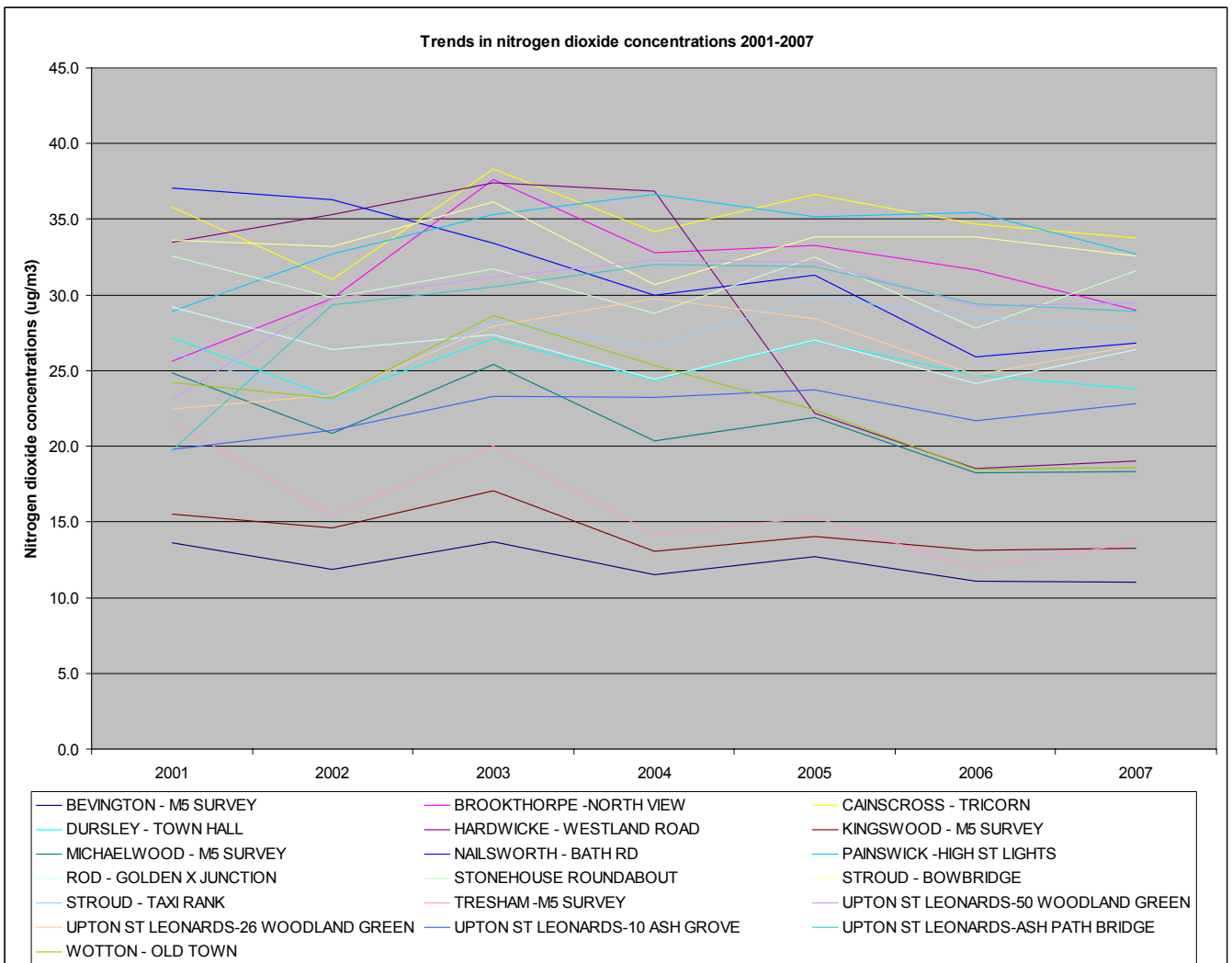
\* Data in these columns are not bias adjusted

# Data in these columns are bias adjusted

\$ Short term adjusted for missing data

### A2.3: Assessment of air quality trends

**Figure 3: Trends of annual mean nitrogen dioxide concentrations for select diffusion tube monitoring locations (2001-2007)**



Nitrogen dioxide concentrations for 2007 are on average approximately 1.1% higher than concentrations in 2006 and but are approximately 11% lower than concentrations during in 2001. The site with the largest increase in concentrations since 2006 was Stonehouse Roundabout (increase of 12%), conversely, the site with the greatest decrease in concentrations since 2006 was Brookthorpe – North View (decrease of 9%). In the longer term, the site with the largest increase in concentrations since 2001 was Upton St Leonards – Ash Path Bridge (increase of 32%), conversely, the site with the greatest decrease in concentrations since 2001 was Hardwicke – Westland Road (decrease of 76%).