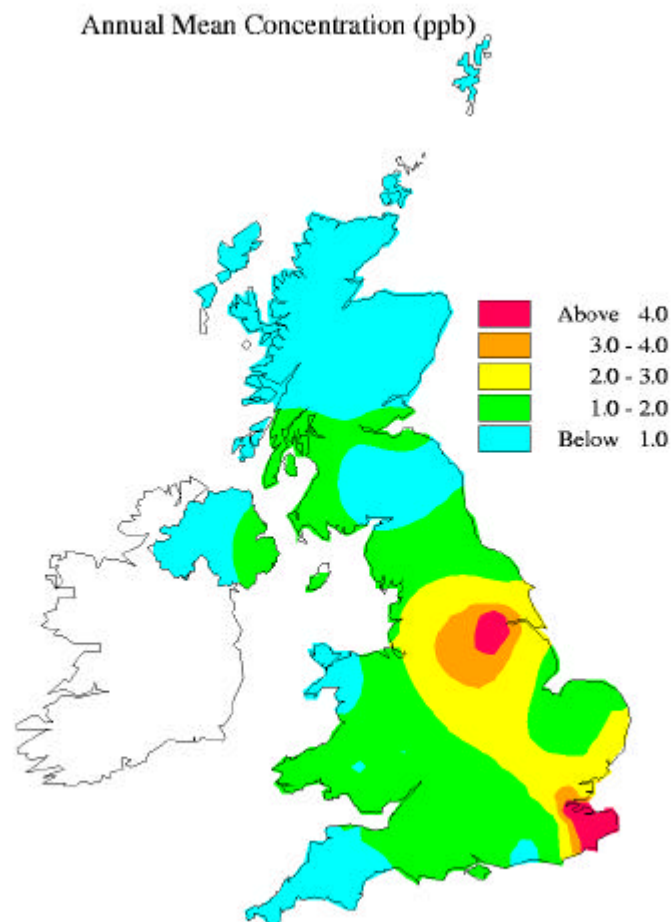


# Rural Sulphur Dioxide Monitoring in the UK: 1997

Sandra Hasler, Garry Hayman, Steve Baker, Malcolm Smith, John Stedman, Lesley Sansom and Heather Page



March 2001

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Sandra Hasler  
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Sandra Hasler  
 AEA Technology plc  
 National Environmental Technology Centre  
 E5 Culham  
 Abingdon  
 OX14 3ED  
 Telephone 01235 463842  
 Facsimile 01235 463817

AEA Technology is the trading name of AEA Technology plc  
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	<b>Name</b>	<b>Signature</b>	<b>Date</b>
<b>Author</b>	Sandra Hasler		
<b>Reviewed by</b>	Garry Hayman		
	Prof D Fowler		
<b>Approved by</b>	Garry Hayman		

# Executive Summary

Sulphur deposition is known to have acidifying effects on freshwater, soils and vegetation. For these effects to be assessed the total sulphur deposition must be estimated from both its wet and dry deposition pathways. The Department of the Environment, Transport and the Regions has placed a contract with the Centre for Ecology and Hydrology at Edinburgh (CEH) on *Acid Deposition Processes* (EPG 1/3/94) to quantify *inter alia* the wet and dry deposition budgets of sulphur for the United Kingdom.

As part of this contract, AEA Technology was subcontracted to operate and manage the UK Rural Sulphur Dioxide Monitoring Network. This network provides monthly and annually-averaged concentrations of SO<sub>2</sub>, which are subsequently used to produce concentration maps for the UK. The dry sulphur deposition across the UK is then derived by CEH by combining the sulphur dioxide (SO<sub>2</sub>) concentration field with estimated deposition velocities.

This report provides a complete dataset of the 1997 measurements for all sites in the UK Rural Sulphur Dioxide Monitoring Network. The measurement data have already been provided to CEH for interpretation and further analysis as part of its programme of work under the Acid Deposition Processes contract.

Maps of the annual and monthly mean sulphur dioxide (SO<sub>2</sub>) concentration fields have been derived for the UK. The spatial distribution of SO<sub>2</sub> is similar to that observed in 1996 with the highest concentrations in the Yorkshire/Nottinghamshire and Thames estuary areas, where monitoring sites are located closest to the major UK SO<sub>2</sub> sources. The 1997 measurements show that SO<sub>2</sub> concentrations have continued to decline in rural areas, a trend which has been observed since the establishment of the network in the early 1990s. The trend for sites closest to emission sources is consistent with the reduction in UK SO<sub>2</sub> emissions calculated over this period.

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# 1 Introduction

Sulphur deposition is known to have acidifying effects on freshwater, soils and vegetation. For these effects to be assessed the total sulphur deposition must be estimated from both its wet and dry deposition pathways. The Department of the Environment, Transport and the Regions has placed a contract with the Centre for Ecology and Hydrology at Edinburgh (CEH) on *Acid Deposition Processes* (EPG 1/3/94) to quantify *inter alia* the wet and dry deposition budgets of sulphur for the United Kingdom.

As part of this contract, AEA Technology was subcontracted to operate and manage the UK Rural Sulphur Dioxide Monitoring Network. This network provides monthly and annually-averaged concentrations of SO<sub>2</sub>, which are subsequently used to produce concentration maps for the UK. The dry sulphur deposition across the UK is then derived by CEH by combining the sulphur dioxide (SO<sub>2</sub>) concentration field with estimated deposition velocities.

This report provides a complete dataset of the 1997 measurements for all sites in the UK Rural Sulphur Dioxide Monitoring Network. The measurement data have already been provided to CEH for interpretation and further analysis as part of its programme of work under the *Acid Deposition Processes* contract.

The format of this report follows that used to report the measurements made in previous years [Hasler and Downing, 1998].

## 2 Network and Sampling Details

### 2.1 DESCRIPTION OF THE NETWORK

In 1997, the Rural Sulphur Dioxide Monitoring Network comprised 29 sites at which concentrations of SO<sub>2</sub> were measured on a weekly basis and one site (Bush) at which daily measurements were made. Siting criteria and individual site assessment are given in Downing and Campbell [1995]. In general, all the monitoring sites are located in rural areas which are largely unaffected by local domestic and industrial sources.

The main focus of this report is to provide a summary of the measurements made in the Rural Sulphur Dioxide Monitoring Network in 1997 and to present the concentration field of SO<sub>2</sub> derived for the UK. The concentration field is however significantly improved by including data which have been obtained in other SO<sub>2</sub> monitoring networks. These include:

- (1) The two bubbler sites funded by the National Assembly for Wales which are sampled weekly, and managed by NETCEN.
- (2) The thirteen continuous monitoring sites operated by National Power and PowerGen as part of the Joint Environment Programme (JEP) of the power generating companies.
- (3) The two continuous monitoring sites from the Automatic Rural Network.
- (4) The two continuous monitoring sites operated by CEH.

The sampling sites and their locations are listed in Table 1 and presented in Figure 1.

### 2.2 SITE CHANGES WITHIN THE NETWORK IN 1997

The Garrary site in south west Scotland (GR: 2531 5790), was established in November 1997 to improve the spatial coverage in an ecologically-sensitive area. The site is located within 1 km of Clatteringshaws Loch and the surrounding land is characterised by coniferous forests and a mountainous terrain. Forest Enterprise is the local site operator.

The building in which the bubbler was housed at the Brockhill site (GR: 4002 2702) required extensive refurbishment, consequently the bubbler was not operated at this site from 20<sup>th</sup> August 1997 until 16<sup>th</sup> February 1998. To maintain the monitoring in the South Midlands area during this period, the bubbler was temporarily resited closeby, and named Burcot (GR: 3983 2717). The Burcot site is approximately 2 km north east of the Brockhill site, and is located close to the B4096. The monitoring data from Burcot is presented with the Brockhill data as site code 5301.

### 2.3 THE SAMPLING TECHNIQUE

The hydrogen peroxide bubbler [Downing and Campbell, 1995] is used as the sampling technique within the Rural SO<sub>2</sub> Monitoring network. Air is drawn successively through a filter

**Table 1 - Rural SO<sub>2</sub> Sampling Sites in the United Kingdom.**

Site code	Site name	Easting	Northing	Network and Measurement Technique
5002	Eskdalemuir	3235	6030	UK Acid Deposition Monitoring Networks - <i>hydrogen peroxide bubbler (8-port)</i> - <i>daily measurements</i>
5004	Stoke Ferry	5700	2988	
5006	Lough Navar	192	5212	
5007	Barcombe Mills	5437	1149	
5008	Yarner Wood	2786	789	
5009	High Muffles	4776	4939	
5010	Strathvaich Dam	2347	8750	
5011	Glen Dye	3642	7864	
5301	Brockhill 1	4002	2702	UK Rural SO <sub>2</sub> Monitoring Network - <i>hydrogen peroxide bubbler (8- and single-port)</i> - <i>weekly measurements</i>
5303	Caenby 1	4993	3900	
5304	Camborne 1	1628	407	
5305	Camphill 1	2274	6546	
5306	Cardington 2	5082	2464	
5308	Corpach 1	2054	7782	
5309	Cresselly 1	2064	2062	
5310	Etton 1	4980	4445	
5312	Husborne Crawley	4964	2361	
5313	Little Horkesley 1	5971	2312	
5314	Marshfield 1	3255	1830	
5315	Ratcliffe 13	4408	3278	
5316	Rockbourne 1	4116	1181	
5317	Wakefield 24	4352	4132	
5318	Waunfawr 1	2533	3607	
5319	Fort Augustus 2	2366	8091	
5320	Loch Leven 2	3159	6990	
5321	Redesdale 2	3833	5961	
5322	Hebden Bridge 2	4011	4327	
5323	Preston Montford 2	3432	3143	
5324	Bentra	1587	5459	
5325	Pitlochry	2918	7599	
5326	Bush	3246	6638	
5329	Cam Forest	1070	5785	
5330	Cwmystwyth	2774	2745	
5331	Rosemaund	3564	2476	
5333	Fairseat	5622	1615	
5338	Forsinain	2906	9486	
5339	Appleacre	3665	5208	
5340	Garrary	2531	5790	<i>Opened November 1997</i>
5334	Bylchau	2959	3596	Welsh Rural SO <sub>2</sub> Network - <i>hydrogen peroxide bubbler (8-port)</i>
5335	Crai	2861	2183	
6002	Fleet Hall	5895	1893	JEP (National Power) - Thames Estuary - <i>UVF automatic analyser</i>
6003	Hall Farm	5589	1848	
6004	Lower Shorne	5703	1728	
6005	Wingham	6243	1553	
6006	Wormdale	5858	1634	
6007	Carr Lane	4672	4274	
6008	Hemingbrough	4669	4298	
6009	Cliffe	4659	4336	
6010	North Duffield	4672	4373	
6011	Wheldrake	4690	4448	
6012	Dunnington	4674	4523	
7001	Bottesford	4797	3376	JEP (PowerGen) - <i>UVF automatic analyser</i>
7002	Jenny Hurn	4816	3982	
8001	Ladybower	4164	3892	Automatic Rural Network - <i>UVF automatic analyser</i>
8002	Lullington Heath	5538	1016	
9001	Sutton Bonnington	4505	3267	CEH - <i>UVF automatic analyser</i>
9002	Auchencorth Moss	3221	6562	





**Figure 1 - Location of the Sites Used to Monitor SO<sub>2</sub> Concentrations in the Rural SO<sub>2</sub> Monitoring Network**

to remove any particulate matter (including particulate sulphate) and a hydrogen peroxide solution, where sulphur dioxide is absorbed and oxidised to sulphate. The sulphate concentration in the solution is determined by ion chromatography. The ambient concentration of sulphur dioxide is derived from the concentration of sulphate determined analytically and the volumes of the air drawn through the bubbler during the sampling period and of the H<sub>2</sub>O<sub>2</sub> solution.

There are three versions of the hydrogen peroxide bubbler used in the monitoring network:

- an 8-port bubbler is used at one site (Bush) and analysis of each daily sample is undertaken to give a daily measurement;
- an 8-port bubbler is used at 23 sites. The individual samples are bulked and a single analysis is undertaken to give a weekly measurement;
- a single-port bubbler is used at 6 sites. A single sample is collected and analysed to give a weekly measurement.

The single-port bubbler is used at the following 6 sites: Corpach (5308), Etton (5310), Marshfield (5314), Rockbourne (5316), Fort Augustus (5319) and Loch Leven (5320). The single-port bubbler is also operated in parallel with the 8-port bubblers located at Husborne Crawley (site codes: 5312 and 5336) and Ratcliffe (site codes: 5315 and 5337).

## 2.4 EQUIPMENT MAINTENANCE

Regular equipment maintenance is needed to maximise data capture and sample quality. The sites within the network are visited annually to ensure all equipment is operated within acceptable working limits. The Table shown in Appendix 1 summarises when the annual site maintenance and other visits occurred.

The bubbler units are subject to a small amount of air ingress which tends to increase if they are not regularly maintained. A well maintained bubbler unit has a leak rate between 3 and 5%, and all the bubbler units used within the network are operated within these limits. If a bubbler unit is found to have a leak rate greater than 5%, the unit is modified to reduce the leak rate or replaced immediately.

The bubbler unit is based on a simple design with few moving parts. However, the motors within the sampling pumps occasionally fail. Consequently, the airflows at all sites are routinely monitored so that failing pumps can be identified and replaced before complete failure occurs. The sampling flowrate is maintained between 2 and 4 m<sup>3</sup> per day.

To ensure airflows are recorded accurately the airflow meters are calibrated at least once a year against a certified wet gas meter (standard meter). The accepted tolerance for bubbler meters is where their measured air volume is within 3% of that measured by the standard meter. If meters are found to fall outside this criteria they are withdrawn from use and replaced.

## 2.5 SENSITIVITY OF THE BUBBLER TECHNIQUE

The ion chromatograph used to determine the concentration of sulphate has an analytical limit of detection of 0.01 mg [SO<sub>4</sub><sup>2-</sup> as S] per litre of solution. This implies that the bubbler method has an intrinsic sensitivity of about 0.2 µg SO<sub>2</sub> as S m<sup>-3</sup> or 0.15 ppb SO<sub>2</sub> for typical volumes of solution analysed and air flow rates. In practice, the sensitivity is 0.4 µg SO<sub>2</sub> as S m<sup>-3</sup> (0.3 ppb SO<sub>2</sub>) taking into account leak rates and other measurement errors.

## 2.6 DATA CAPTURE

Annual and monthly mean concentrations are only calculated if the data capture exceeds 75%. There are a number of reasons why the concentrations cannot be determined for individual samples. These include:

Frequent	<ul style="list-style-type: none"> <li>• The electricity supply is interrupted and the sample collected is not representative of that week's concentration.</li> <li>• A failure of the pump/meter/bubbler occurs.</li> </ul>
Occasional	<ul style="list-style-type: none"> <li>• The bubbler is switched off by the site operator when the site operator is unavailable.</li> <li>• A long sampling period occurs when the site operator is unavailable (2 weeks plus usually) which because of the lack of fluid reservoir is not representative of that sampling period (H<sub>2</sub>O<sub>2</sub> falls below dreschel stems in bottles).</li> <li>• An error or mix-up is made by the site operator.</li> <li>• The sample solution partially or completely leaks during transit because the sample container lids were not secured effectively. The total sample volume is unknown and the concentration in air can not then be calculated.</li> <li>• The parcel is lost during transit.</li> </ul>
Rare	<ul style="list-style-type: none"> <li>• The sample is lost during analysis or sample registration.</li> <li>• Vandalism at the monitoring site may cause the sample to be lost.</li> </ul>

Between October 1996 and April 1997, the RSPB buildings at the Loch Leven site (5320) underwent extensive refurbishment. The sampling programme had to be suspended during this period. The bubbler was installed in the new building and sampling recommenced on 21/4/97.

A fire at the Yarner Wood site affected the hut housing the sampling equipment and the electrical supply to the hut. The sampling programme was suspended between 1/4/97 and 7/5/97. A new bubbler was installed on 8/5/97.

As indicated in Section 2.2, the bubbler at the Brockhill site (5301) was temporarily relocated to Burcot between 20<sup>th</sup> August 1997 until 16<sup>th</sup> February 1998. The monitoring data from Burcot is presented with the Brockhill data as site code 5301. No data were lost.

## 3 Results and Discussion

The complete data set of measurements for 1997 for (i) the 30 sites in the Rural Sulphur Dioxide Monitoring Network, (ii) the 8 sites in the UK Acid Deposition Monitoring Networks and (iii) the two sites operated for the National Assembly of Wales are given in Appendix 2. The data for individual sites are also presented graphically in Appendix 3. Monthly mean concentrations have only been calculated when the data capture is greater than 75% and these are also presented in the Tables and Figures of Appendices 2 and 3.

### 3.1 ANNUAL MEAN CONCENTRATIONS

The annual mean concentrations are presented in Table 2. The monitoring data from Brockhill and its temporary relocation to Burcot have been combined to provide an annual mean concentration. An annual mean has not been provided for Garrary as this site was established at the end of 1997. The single-port measurements made at the Husborne Crawley (5336) and Ratcliffe (5337) sites have also been omitted in preference for the 8-port bubbler measurements made at the same sites (5312 and 5315 respectively).

The highest annual mean concentrations were measured at the JEP sites in the Thames estuary, and Yorkshire<sup>1</sup>. These sites are located close to major SO<sub>2</sub> sources. The lowest annual means were measured at Lough Navar (0.3 ppb) in Northern Ireland, Forsinain (0.2 ppb), Strathvaich Dam (0.4 ppb) and Fort Augustus (0.3 ppb) in Scotland. All these sites are located in more remote and less populated areas of the UK, away from the influence of SO<sub>2</sub> emission sources.

Table 3 presents the maximum concentrations for a selection of sites. Many of the maximum daily and weekly SO<sub>2</sub> concentrations were observed at the end of January, where maximum daily concentrations reached as high as 25.8 ppb at High Muffles (Yorkshire), and maximum weekly concentrations reached 10.7 ppb at Hebden Bridge (Lancashire) and 9.8 ppb at Wakefield (Yorkshire). The remainder of the year showed generally low concentrations with no pronounced winter peak.

Lough Navar (Northern Ireland) and Forsinain (Scotland) are remote sites and hence their maximum concentrations were much lower. The annual means at Lough Navar (0.3 ppb) and Forsinain (0.2 ppb) are comparable, but higher maximum concentrations are observed at Lough Navar (up to 3.9 ppb) as compared to Forsinain (0.7 ppb). This reflects the temporal resolution of sampling. Daily sampling is carried out at Lough Navar and therefore shorter term episodes of SO<sub>2</sub> are captured in the data set.

Overall, SO<sub>2</sub> concentrations in rural areas are observed to decrease between 1996 and 1997, which is in keeping with the decline in UK SO<sub>2</sub> emission estimates during this period [Goodwin *et al.*, 1999]. Figure 2, adapted from Hayman *et al.* [2000], presents both the monthly and running annual mean SO<sub>2</sub> concentrations measured at Eskdalemuir. This is used

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<sup>1</sup> The data for these sites have been provided on condition that neither the measurements made at the sites nor the statistics derived are explicitly reported. The company involved considers that the measurements have commercial value and that a third party could benefit through their inclusion in this report.

**Table 2 - Rural SO<sub>2</sub> Annual Mean Concentrations in 1997**

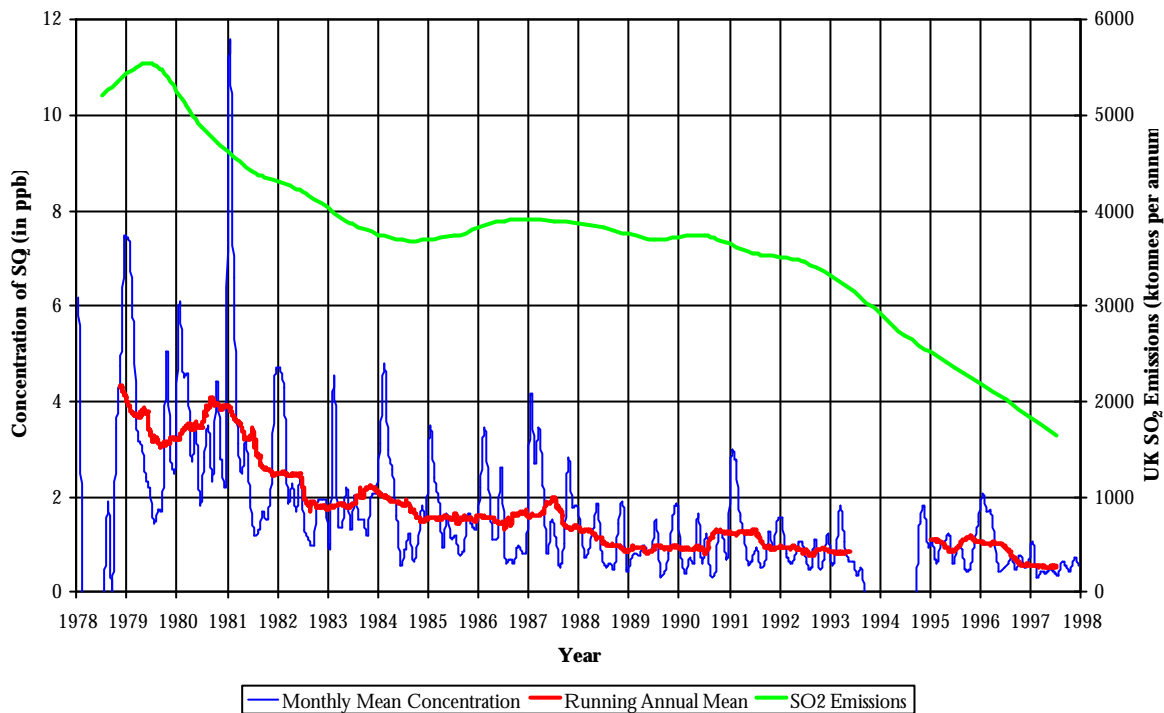
Site code	Site name	Concentration/ppb
5002	Eskdalemuir	0.5
5004	Stoke Ferry	1.4
5006	Lough Navar	0.3
5007	Barcombe Mills	1.0
5008	Yarner Wood	0.7
5009	High Muffles	1.7
5010	Strathvaich Dam	0.4
5011	Glen Dye	0.6
5301	Brockhill 1	1.8
5303	Caenby 1	2.5
5304	Camborne 1	0.9
5305	Camphill 1	1.2
5306	Cardington 2 (Note 1)	3.3
5308	Corpach 1	0.9
5309	Cresselly 1	1.2
5310	Etton 1	2.7
5312	Husborne Crawley 1	2.1
5313	Little Horkeley 1	2.1
5314	Marshfield 1	1.4
5315	Ratcliffe 13	2.8
5316	Rockbourne 1	1.2
5317	Wakefield 24	3.1
5318	Waunfawr 1	0.8
5319	Fort Augustus 2	0.3
5320	Loch Leven 2	-
5321	Redesdale 2	0.9
5322	Hebden Bridge 2	2.9
5323	Preston Montford 2	1.4
5324	Bentra	1.6
5325	Pitlochry	0.5
5326	Bush	1.4
5329	Cam Forest	0.6
5330	Cwmystwyth	1.1
5331	Rosemaund	1.0
5333	Fairseat	1.6
5338	Forsinain	0.2
5339	Appleacre	1.3
5340	Garrary (Note 2)	-
5334	Bylchau	1.0
5335	Crai	1.0
6002	Fleet Hall	(Note 3)
6003	Hall Farm	(Note 3)
6004	Lower Shorne	(Note 3)
6005	Wingham	(Note 3)
6006	Wormdale	(Note 3)
6007	Carr Lane	(Note 3)
6008	Hemingbrough	(Note 3)
6009	Cliffe	(Note 3)
6010	North Duffield	(Note 3)
6011	Wheldrake	(Note 3)
6012	Dunnington	(Note 3)
7001	Bottesford	2.7
7002	Jenny Hurn	4.8
8001	Ladybower	3.7
8002	Lullington Heath	1.7
9001	Sutton Bonnington	2.9
9002	Auchencorth Moss	0.7

Notes (1) Site not used for mapping purposes (see text); (2) New site (less than 50% data capture); (3) The data for these sites have been provided solely for use in generating the SO<sub>2</sub> concentration map and on condition that neither the measurements made at the sites nor the statistics derived are explicitly reported.

**Table 3 - Maximum Daily or Weekly SO<sub>2</sub> Concentrations at Selected Sites**

Site	Day or week beginning	SO <sub>2</sub> -S concentration in air	
		(mgS m <sup>-3</sup> )	(ppb)
Lough Navar 5006 Daily measurements	07/01/97	5.2	3.9
	31/01/97	4.1	3.1
	08/01/97	4.0	3.0
	30/01/97	4.0	3.0
	17/12/97	2.0	1.5
	04/03/97	1.9	1.4
	15/12/97	1.7	1.3
	17/04/97	1.6	1.2
	27/10/97	1.4	1.0
	09/01/97	1.2	0.9
Barcombe Mills 5007 Daily measurements	03/01/97	17.0	12.7
	07/01/97	12.1	9.1
	10/01/97	12.1	9.0
	02/01/97	9.9	7.4
	05/01/97	8.6	6.5
	26/01/97	8.6	6.5
	09/01/97	8.5	6.4
	06/01/97	8.3	6.2
	27/01/97	8.0	6.0
	20/01/97	6.2	4.7
High Muffles 5009 Daily measurements	16/01/97	34.4	25.8
	11/01/97	21.3	15.9
	11/03/97	17.1	12.8
	29/10/97	14.7	11.0
	15/01/97	13.3	10.0
	26/01/97	12.9	9.6
	08/04/97	11.9	8.9
	17/01/97	11.3	8.5
	07/03/97	10.6	7.9
	14/01/97	10.0	7.5
Wakefield 5317 Weekly measurements	15/01/97	13.1	9.8
	05/03/97	10.6	8.0
	17/12/97	9.7	7.3
	22/01/97	9.4	7.1
	29/01/97	9.2	6.9
Hebden Bridge 5322 Weekly measurements	29/01/97	14.3	10.7
	17/12/97	9.4	7.1
	02/01/97	9.1	6.8
	05/03/97	8.6	6.5
	29/10/97	7.3	5.5
Forsinain 5338 Weekly measurements	16/11/97	0.9	0.6
	15/04/97	0.8	0.6
	07/10/97	0.5	0.4
	19/08/97	0.5	0.4
	25/11/97	0.4	0.3

as an example to illustrate the substantial decline in SO<sub>2</sub> concentrations since the early 1980s. The average concentration at Eskdalemuir has decreased by a factor of nine since 1980 from 4.5 ppb to 0.5 ppb. The figure shows that the downward trend in the SO<sub>2</sub> concentrations follows the reduction in UK SO<sub>2</sub> emissions.



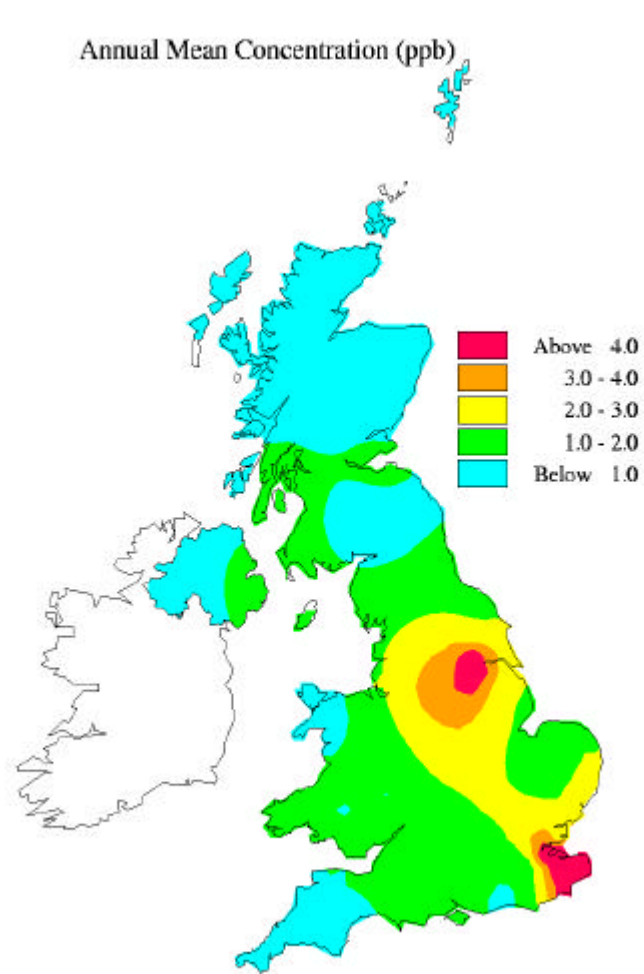
**Figure 2 - Trends in the Concentration of SO<sub>2</sub> Observed at Eskdalemuir and in the Annual UK Emissions of SO<sub>2</sub> [Adapted from Hayman *et al.*, 2000].**

Figure 2 also illustrates the large seasonal variation, where higher concentrations are observed during cold winter months when emissions are relatively high and the vertical dispersion of pollutants poor [Hayman *et al.*, 2000].

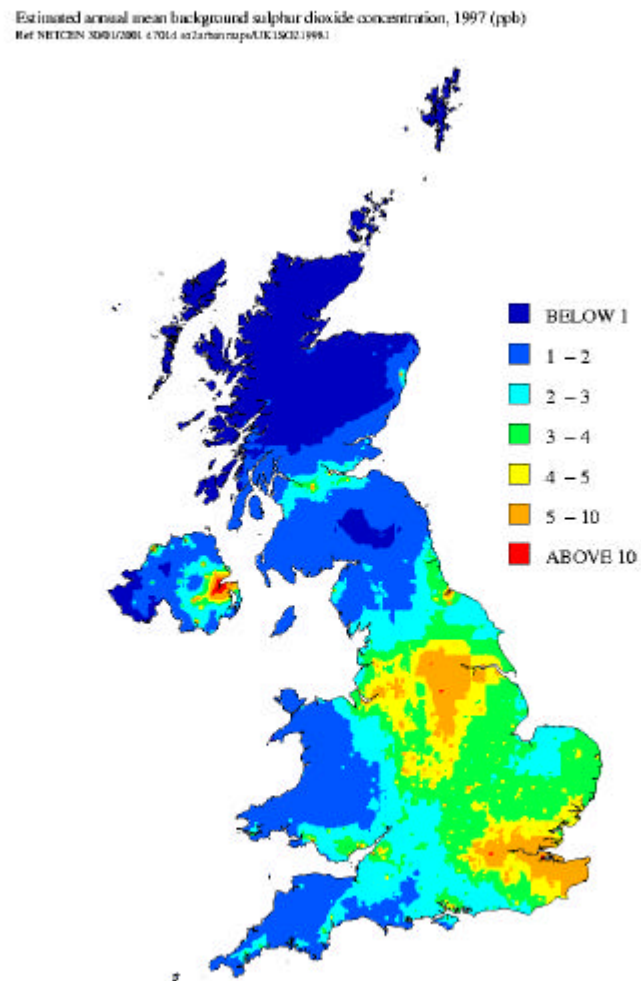
### 3.2 SPATIAL VARIATIONS

The geographical distribution of annual mean SO<sub>2</sub> concentrations is shown in Figure 3. A geostatistical kriging method developed by Webster *et al.* [1991] is used to calculate the annual concentration map. Appendix 4 provides a summary of the kriging method and the parameters used. Monthly mean SO<sub>2</sub> concentration maps are presented in Appendix 5, and have been calculated using bi-linear interpolation, a description of which is given by UNIRAS [1988].

The annual mean concentration of SO<sub>2</sub> at Cardington was 3.3 ppb compared to an annual mean of 2.1 ppb at the nearby site of Husborne Crawley. As in earlier years, the Cardington data have not been used for mapping purposes because this site was originally established to determine the effect of specific factors which influenced local concentrations of SO<sub>2</sub> and not to determine regional patterns. The Cardington site is influenced by a local source. Downing and Campbell [1995] showed that the exclusion of the Cardington data does not greatly influence the reliability of the maps since there are good representative sites nearby (Woburn originally and then Husborne Crawley on relocation).



**Figure 3 - Rural SO<sub>2</sub> concentrations (ppb) in 1997**



**Figure 4 - Urban-corrected SO<sub>2</sub> concentrations (ppb) in 1997**



The spatial distribution of SO<sub>2</sub> is similar to that observed in 1995 and 1996 by Hasler and Downing [1998], where the highest concentrations were observed in the Yorkshire and Nottinghamshire areas and the Thames Estuary. This is most probably because the sites in these areas are located closest to major UK SO<sub>2</sub> emission sources which have a strong influence on the concentrations in the region.

Most of the sites in the Yorkshire/Nottinghamshire area and the Thames Estuary are JEP sites that employ UVF (ultraviolet fluorescence) continuous monitors, whereas the majority of the other sites across the UK use the hydrogen peroxide bubbler measurement technique. Downing and Campbell [1995] have shown that some of the hydrogen peroxide bubblers measure SO<sub>2</sub> concentrations between 10% and 15% lower than UVF analysers. This could possibly explain some of the differences in the measurements although it is more likely that the high concentrations are a result of the proximity to emission sources.

It should be noted that the bubbler technique has a limit of detection in the region of 0.3 ppb and many of the concentrations measured at remote sites are close to this threshold. Consequently, measurements that fall close to the limit of detection will have greater inaccuracy.

The monthly mean maps (see Appendix 5) show that SO<sub>2</sub> concentrations were more elevated across the UK in winter months (January and February), although very few individual sites display a pronounced winter peak. The higher concentrations observed in January may have been due to the anticyclonic conditions during this period, where high pressure and low wind speeds typically lead to poor pollutant dispersion. The lowest concentrations across the UK were observed in the spring months (April and May).

Concentrations to the south east of the Thames Estuary were consistently high for most of the year (January and February and June to December).

### 3.3 URBAN-ENHANCED MAP

The sites used to map the rural SO<sub>2</sub> concentration field are sited away from local sources of pollution so that they are representative of the region. The map of the rural SO<sub>2</sub> concentration field presented in Figure 3 shows that the concentrations observed are highest in those regions with major sources (*i.e.*, Yorkshire, Thames Estuary, *etc.*). However, the maps produced using the rural concentration alone are not adequate to characterise fully the dry deposition to vegetation in the urban environment, or in rural locations that are on the fringes of urban areas. Hence, the deposition maps prepared using the rural concentration field alone would be inaccurate.

A simple methodology has been developed to estimate the correction needed [Stedman *et al.*, 2001a, 2001b]. The approach has been to take the difference in the urban SO<sub>2</sub> concentration (taken from automatic monitoring instruments in urban background locations) and the corresponding rural background and to correlate this with a simple dispersion of the emissions from line and area sources (*i.e.*, excluding point sources) within a 35 km x 35 km area, weighted by distance and direction from the receptor. For the 1997 map, data from 38 automatic monitoring sites were used. The dispersion coefficients derived are then applied to the line and area sources in the National Atmospheric Emission Inventory to give the urban enhancement for each 1 km x 1km grid square covering the UK, as shown in Figure 4.

As the approach excludes the emissions from the major point sources, it is appropriate to include the JEP sites in the derivation of the base rural concentration field. However, such as Cardington which are unduly influenced by local sources should be excluded.

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## 5 Acknowledgements

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With special thanks to all the site operators whose commitment to the network has helped provide such a comprehensive and high quality data set.

# Appendix 1

## ANNUAL SITE MAINTENANCE AND OTHER SITE VISITS

Site Code	Site Name	Date of Annual Site Visit	Other Site Visits/ Comments
5002	Eskdalemuir (1)	24/4/97	Site maintenance visit.
		8/11/97	Valve was replaced during routine visit on 8/11/97.
5004	Stoke Ferry (1)	4/6/97	Site maintenance visit.
5006	Lough Navar (1)	26/2/97	Site maintenance visit.
		9/10/97	Valve and inlet tubing was replaced during routine visit on 9/10/97.
5007	Barcombe Mills (1)	12/9/97	Site maintenance visit.
5008	Yarner Wood (1)	8/5/97	Fire at site affecting sampler housing and electrical supply. Sampling suspended between 1/4/97 and 7/5/97. New bubbler installed.
		24/12/97	Site maintenance visit.
5009	High Muffles (1)	2//6/97	Identified need for new bubbler during routine visit.
		18/7/97	Emergency visit to replace bubbler.
		18/11/97	Meter replaced during routine visit.
5010	Strathvaich Dam (1)	22/4/97	Site maintenance visit.
		24/9/97	Site maintenance visit.
5011	Glen Dye (1)	26/9/97	Site maintenance visit.
		17/12/97	Pump and meter replaced during routine visit.
5301	Brockhill 1	19/5/97	Annual site maintenance visit.
		20/8/97	Bubbler installed in Burcot while major site renovations undertaken at Brockhill.
5303	Caenby 1	20/5/97	Meter replaced during annual site maintenance visit.
5304	Camborne 1	27/8/97	Annual site maintenance visit.
5305	Camphill 1	6/11/97	Meter replaced during annual site maintenance visit.
5306	Cardington 2	22/7/97	Meter replaced during annual site maintenance visit.
5308	Corpach 1	20/3/97	Annual site maintenance visit.
		14/8/97	Replacement meter sent.
5309	Cresselly 1	18/6/97	Meter replaced during annual site maintenance visit.
5310	Etton 1	18/3/97	Replacement meter installed and the tubing replaced.
5312	Husborne Crawley 1	21/7/97	Inlet tubing and funnel replaced during annual site maintenance visit.
5313	Little Horkesley 1	20/6/97	Replacement pump sent to site operator.
		8/9/97	Replaced inlet tubing during annual site maintenance visit.
5314	Marshfield 1	16/6/97	Annual site maintenance visit.
5315	Ratcliffe 13	21/5/97	Replaced failed meter annual site maintenance visit.
5316	Rockbourne 1	10/6/97	Failing pump replaced annual site maintenance visit.
		15/10/97	Replacement meter installed on 15/10/97.
5317	Wakefield 24	17/3/97	Annual site maintenance visit.
		11/7/97	Replaced valve and worn electrical components during site visit.
5318	Waunfawr 1	20/8/97	Annual site maintenance visit.
5319	Fort Augustus 2	25/9/97	Replaced inlet tubing and funnel during annual site maintenance visit.
5320	Loch Leven 2	October 96-April 97	Sampling programme suspended as site underwent extensive refurbishment.
		21/4/97	Bubbler installed during annual site maintenance visit.
		17/12/97	Emergency visit to replace meter and pump.
5321	Redesdale 2	2/5/97	Replaced inlet tubing and funnel during annual site maintenance visit.
5322	Hebden Bridge 2	11/7/97	Replaced inlet tubing during annual site maintenance visit.
5323	Preston Montford 2	18/8/97	Annual site maintenance visit.
5324	Bentra	8/10/97	Annual site maintenance visit.
5325	Pitlochry	8/7/97	Replaced inlet tubing and funnel during annual site maintenance visit.
5326	Bush	19/3/97	Annual site maintenance visit.
5329	Cam Forest	7/10/97	Replaced the pump during annual site maintenance visit.
5330	Cwmystwyth	19/6/97	Replaced inlet during annual site maintenance visit.
5331	Rosemaund	22/8/97	Annual site maintenance visit.
5333	Fairseat	10/9/97	Replaced inlet tubing and funnel during annual site maintenance visit.
		1/10/97	Emergency visit to replace bubbler.
5338	Forsinain	23/9/97	Replaced inlet tubing and bubbler during annual site maintenance visit.
		8/10/97	Replacement valve sent to site operator.
5339	Appleacre	30/4/97	Annual site maintenance visit.
5340	Garrary	7/11/97	Installation of site.
5334	Bylchau	28/4/97	Annual site maintenance visit.
		21/8/97	Emergency visit to replace valve.
5335	Crai	17/6/97	Replaced bubbler and inlet during annual site maintenance visit.

Note (1) These sites are operated as part of the UK Acid Deposition Monitoring Networks and are visited more frequently given the more extensive monitoring programmes undertaken at most of the sites.

# Appendix 2

## DAILY, WEEKLY AND MONTHLY SO<sub>2</sub> CONCENTRATIONS

# National Environmental Technology Centre

## Daily Sites Analysed:

5002 Eskdalemuir  
5004 Stoke Ferry  
5006 Lough Navar  
5007 Barcombe Mills  
5008 Yarner Wood  
5009 High Muffles  
5010 Strathvaich Dam  
5011 Glen Dye  
5326 Bush

<u>Variables Analysed</u>	<u>Units</u>	<u>Specified Variable Limit</u>
sulphur dioxide as S	$\mu\text{g m}^{-3}$	1.000

## Time Period Covered:

January 1997 - December 1997



National Environmental Technology Centre  
 Site: 5002 Eskdalemuir - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Daily measurements - Summary for January 1997 to December 1997

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DATE												
1 - 2	0.81	1.37	0.14	0.25	0.63	0.68	0.60	0.25	0.70	0.28	N	0.97
2 - 3	0.74	0.37	0.31	0.21	0.39	0.18	1.13	0.23	0.45	0.31	0.48	1.65
3 - 4	0.47	0.22	0.42	0.93	0.81	0.20	0.46	1.56	0.42	0.28	0.68	1.17
4 - 5	0.29	1.88	4.25	0.57	0.84	0.74	0.19	0.63	0.37	0.24	0.89	1.08
5 - 6	2.10	0.43	0.25	0.25	0.33	2.34	0.16	0.26	0.31	0.38	1.03	0.33
6 - 7	1.36	0.22	2.10	0.25	0.20	0.80	0.21	0.28	0.34	0.26	0.38	0.26
7 - 8	1.28	0.44	0.23	0.42	0.28	0.35	0.30	0.44	0.40	0.26	0.46	0.51
8 - 9	0.97	0.51	0.28	1.78	1.49	0.24	0.63	1.93	0.20	0.40	0.82	0.17
9 - 10	0.28	0.28	2.00	0.39	0.47	0.34	0.58	0.21	0.32	0.37	0.63	0.23
10 - 11	9.46	0.20	0.67	0.23	1.08	1.20	1.95	1.06	0.32	0.25	0.48	0.18
11 - 12	1.28	0.44	0.68	0.50	0.21	0.41	1.09	1.32	0.65	0.31	0.24	1.18
12 - 13	0.31	0.22	0.60	0.74	0.32	0.18	1.54	1.24	0.61	0.60	0.19	0.66
13 - 14	0.30	0.14	0.24	0.31	0.35	0.50	0.16	1.68	0.32	0.95	0.18	0.38
14 - 15	1.26	0.25	0.19	0.36	0.38	0.29	0.28	0.17	0.25	1.06	0.38	0.29
15 - 16	1.99	1.18	0.13	0.25	1.44	0.41	0.18	0.32	0.26	0.38	0.37	0.90
16 - 17	1.43	0.50	0.18	1.38	0.59	0.65	0.20	1.26	0.21	0.59	0.30	0.73
17 - 18	0.67	0.17	0.25	0.19	0.29	0.44	0.36	0.31	0.44	0.59	1.06	1.59
18 - 19	0.41	0.37	0.32	0.34	0.29	0.24	0.32	0.82	0.28	0.29	0.47	1.01
19 - 20	0.54	0.26	0.33	0.26	0.53	0.29	0.20	2.83	0.22	0.39	1.33	1.38
20 - 21	0.62	0.21	1.52	0.49	0.43	0.62	0.72	1.14	1.27	0.55	0.67	1.26
21 - 22	3.30	0.29	0.55	0.33	0.26	0.38	0.94	0.29	1.34	0.37	1.57	0.46
22 - 23	3.36	0.16	0.53	0.43	0.33	0.73	0.34	0.24	1.66	0.49	1.37	3.10
23 - 24	1.77	0.39	0.68	0.46	0.26	1.59	0.53	0.28	1.45	1.67	5.25	0.67
24 - 25	0.39	0.23	0.21	0.24	0.54	0.49	0.54	0.76	2.59	1.26	2.34	0.61
25 - 26	1.05	0.16	0.13	1.46	0.84	1.25	0.17	0.24	3.17	0.36	1.06	0.32
26 - 27	3.26	0.34	0.29	1.46	0.27	0.37	0.31	1.75	0.30	0.38	2.35	0.24
27 - 28	0.76	0.26	0.39	0.63	0.22	0.26	0.19	1.06	1.27	0.81	1.01	0.29
28 - 29	0.37	0.26	0.25	0.19	0.38	0.21	0.25	3.16	0.91	0.97	1.48	0.40
29 - 30	0.68		0.24	0.18	0.95	0.36	0.26	0.29	0.27	3.24	0.91	0.53
30 - 31	0.84		0.25	0.55	3.78	0.51	0.20	0.22	0.42	0.62	0.52	0.37
31 - 1	2.13		0.46		0.92		0.39	0.92		0.30		0.26
Arithmetic Mean (3)	1.43	0.42	0.61	0.53	0.65	0.57	0.50	0.88	0.72	0.62	1.00	0.75
Standard Deviation (3)	1.74	0.40	0.84	0.43	0.68	0.47	0.43	0.78	0.72	0.59	1.00	0.62
Sample Size	31	28	31	30	31	30	31	31	30	31	29	31

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5004 Stoke Ferry - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Daily measurements - Summary for January 1997 to December 1997

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DATE												
1 - 2	2.15	2.32	0.77	2.16	2.47	0.67	0.83	0.70	0.74	1.55	5.24	4.06
2 - 3	9.69	3.84	0.91	3.40	0.34	5.38	1.54	0.88	2.50	2.43	2.43	1.44
3 - 4	7.52	3.94	2.92	1.67	1.69	1.32	0.53	0.45	0.91	5.24	1.13	1.45
4 - 5	N	2.80	1.14	3.02	0.38	0.82	6.69	0.43	0.94	1.69	1.45	3.62
5 - 6	1.59	4.97	1.53	0.80	0.55	1.57	1.50	0.57	0.87	0.49	0.97	4.77
6 - 7	0.90	1.38	1.52	0.84	2.91	1.19	1.91	1.01	1.59	1.46	1.10	1.75
7 - 8	2.48	2.51	1.93	1.72	1.50	1.33	4.15	1.19	1.82	0.85	1.77	2.12
8 - 9	4.85	1.95	0.80	2.62	0.53	0.64	2.53	2.07	3.39	0.72	0.98	1.37
9 - 10	3.23	0.82	1.47	6.56	3.42	1.53	0.55	2.22	1.99	1.57	0.75	1.56
10 - 11	7.74	0.88	0.96	6.13	0.70	1.71	1.34	2.83	4.13	3.93	0.94	0.77
11 - 12	10.78	1.39	1.35	2.06	0.40	0.63	0.68	1.99	2.46	0.68	1.70	2.60
12 - 13	1.83	1.01	3.96	1.39	0.66	1.08	1.51	2.52	1.42	2.06	3.22	6.32
13 - 14	3.22	1.15	1.17	2.96	0.65	1.20	0.78	1.83	1.44	1.60	1.50	1.56
14 - 15	9.74	6.53	1.84	1.72	1.09	1.09	2.01	2.23	1.05	3.40	1.18	0.57
15 - 16	1.57	2.30	1.18	2.35	2.69	0.46	1.13	4.28	2.28	1.34	0.54	0.69
16 - 17	4.11	2.53	1.96	4.34	1.72	0.75	1.47	4.03	1.37	2.10	1.64	2.73
17 - 18	3.75	0.78	2.91	0.86	0.92	0.55	1.45	2.15	3.31	1.27	2.66	2.01
18 - 19	1.56	1.10	1.49	1.95	0.87	1.58	1.41	1.53	2.11	1.03	1.58	1.16
19 - 20	1.22	0.98	1.07	1.00	1.13	0.45	0.73	1.32	0.81	1.23	1.62	6.98
20 - 21	1.84	1.05	5.90	0.58	0.89	0.68	0.44	2.72	0.74	0.48	0.74	1.84
21 - 22	N	1.68	1.81	4.79	0.68	0.53	2.17	1.82	0.75	0.72	0.87	2.26
22 - 23	1.89	1.06	3.67	1.41	4.46	0.89	1.07	3.37	0.82	1.25	0.59	1.57
23 - 24	1.31	0.75	1.03	1.95	3.79	1.59	3.12	1.08	0.93	1.45	0.89	1.33
24 - 25	1.82	0.97	3.33	0.99	0.89	1.16	2.28	0.66	0.70	0.96	1.68	0.54
25 - 26	4.33	1.07	2.72	0.46	0.41	0.83	0.98	0.73	1.67	10.38	1.41	0.64
26 - 27	1.59	2.74	1.36	0.75	2.47	2.49	1.04	1.20	2.45	2.19	3.07	1.38
27 - 28	2.56	1.79	1.08	0.72	2.42	2.11	0.56	2.14	1.41	0.82	1.22	0.98
28 - 29	2.78	1.59	1.33	1.44	0.48	0.58	0.97	1.76	2.28	1.79	0.84	0.98
29 - 30	0.92		2.04	1.71	0.92	0.52	1.96	1.03	3.63	1.78	1.72	1.43
30 - 31	1.57		1.16	5.05	1.35	5.97	1.09	0.93	2.96	<0.28	0.90	1.11
31 - 1	4.46		1.12		1.16		1.12	1.41		3.14		0.75
Arithmetic Mean (3)	3.55	2.00	1.85	2.25	1.44	1.38	1.60	1.71	1.78	1.93	1.54	2.01
Standard Deviation (3)	2.84	1.39	1.14	1.64	1.11	1.28	1.25	1.00	0.98	1.91	0.97	1.59
Sample Size	29	28	31	30	31	30	31	31	30	31	30	31

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5006 Lough Navar - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Daily measurements - Summary for January 1997 to December 1997

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DATE												
1 - 2	0.52	0.74	0.17	0.27	0.27	0.73	0.15	0.27	0.27	0.23	0.18	0.18
2 - 3	0.30	0.62	0.17	0.24	0.29	0.52	0.19	0.18	0.24	0.30	0.19	0.28
3 - 4	0.79	0.36	0.24	0.24	0.28	0.48	0.32	0.27	0.33	0.28	0.38	0.29
4 - 5	0.61	0.18	1.91	0.21	0.17	0.41	0.20	0.81	0.26	0.26	0.68	0.27
5 - 6	0.84	0.42	0.23	0.41	0.11	0.29	0.27	0.37	0.29	0.23	0.32	0.22
6 - 7	0.45	0.31	0.47	0.19	0.19	0.26	0.18	0.98	0.27	0.22	0.30	0.31
7 - 8	5.17	0.41	<0.16	0.32	0.18	0.22	0.17	0.53	0.30	0.32	0.19	<0.17
8 - 9	4.03	0.35	0.30	0.38	0.19	N	0.18	N	0.40	0.26	0.25	0.24
9 - 10	1.24	0.26	<0.17	0.19	0.21	N	0.24	N	0.36	0.23	0.22	0.29
10 - 11	0.66	0.28	0.29	0.21	0.20	0.25	0.28	N	0.22	0.33	0.20	0.18
11 - 12	0.32	0.27	0.21	0.11	0.26	0.22	0.13	0.33	0.40	0.25	0.26	0.24
12 - 13	0.35	0.16	0.21	0.17	0.20	0.18	0.15	0.24	0.20	0.22	0.24	0.24
13 - 14	0.27	0.21	0.21	0.23	0.23	0.24	0.20	0.25	0.46	0.18	0.20	0.67
14 - 15	0.49	0.28	0.43	0.29	0.19	0.15	0.20	0.25	0.28	0.27	0.33	0.58
15 - 16	0.22	0.24	0.16	0.20	0.31	0.17	0.15	0.24	0.24	0.27	<0.18	1.72
16 - 17	0.36	0.25	0.17	0.26	0.71	0.34	0.13	0.22	0.26	0.17	0.28	0.91
17 - 18	0.25	0.22	0.21	1.59	0.27	0.27	0.16	0.24	0.22	0.32	<0.16	2.03
18 - 19	0.14	0.27	0.20	0.97	0.23	0.16	0.14	0.25	0.50	0.22	0.25	0.78
19 - 20	0.18	0.25	0.23	0.38	0.18	0.18	0.20	0.47	1.17	0.43	0.20	0.64
20 - 21	0.22	0.22	0.28	0.32	0.22	0.16	0.22	0.23	0.96	0.48	0.32	0.40
21 - 22	0.80	0.29	0.26	0.19	0.17	0.16	0.30	0.23	0.58	1.08	0.24	0.24
22 - 23	0.37	0.27	0.22	0.16	0.29	0.15	0.28	0.60	0.41	0.94	0.18	0.46
23 - 24	0.33	0.14	0.24	0.21	0.30	0.24	0.15	0.28	0.96	0.36	0.61	0.26
24 - 25	0.26	0.22	0.30	0.33	0.62	0.19	0.24	0.26	0.50	0.51	<0.45	0.30
25 - 26	0.18	0.24	0.29	0.84	0.71	0.32	0.21	0.26	0.31	0.21	N	0.70
26 - 27	0.22	0.24	0.24	0.25	0.28	0.16	0.18	0.30	0.70	0.26	N	0.32
27 - 28	0.33	<0.18	0.22	0.19	0.63	0.17	0.16	0.23	0.38	1.38	N	0.28
28 - 29	0.30	0.29	0.32	0.19	0.50	0.20	0.16	0.20	0.35	0.94	0.24	0.48
29 - 30	0.35		0.18	0.17	0.95	0.20	0.23	0.23	0.24	0.43	0.36	0.23
30 - 31	4.02		0.16	0.20	0.62	0.16	0.18	0.21	0.20	0.18	0.23	0.41
31 - 1	4.09		0.35		1.06		0.22	0.28		0.19		0.22
Arithmetic Mean (3)	0.92	0.29	0.29	0.33	0.36	0.26	0.20	0.33	0.41	0.39	0.27	0.47
Standard Deviation (3)	1.36	0.13	0.31	0.30	0.24	0.13	0.05	0.19	0.24	0.29	0.13	0.43
Sample Size	31	28	31	30	31	28	31	28	30	31	27	31

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5007 Barcombe Mills - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Daily measurements - Summary for January 1997 to December 1997

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DATE												
1 - 2	4.69	3.72	0.37	0.42	0.74	0.61	1.47	0.81	0.40	0.80	1.24	1.77
2 - 3	9.90	2.47	0.45	1.11	0.57	1.32	0.35	0.77	0.99	1.19	0.90	2.75
3 - 4	16.99	2.80	1.06	0.55	0.88	0.92	0.27	0.77	0.52	2.04	3.57	4.81
4 - 5	5.07	1.46	0.40	1.14	0.30	1.01	0.74	0.72	0.45	1.10	1.18	3.44
5 - 6	8.64	3.80	0.80	0.34	0.46	1.24	1.33	0.82	0.65	0.49	0.54	1.00
6 - 7	8.31	1.24	1.01	0.39	0.71	0.68	1.13	0.78	0.81	0.91	0.54	0.90
7 - 8	12.12	0.61	1.19	0.75	0.57	0.88	1.44	0.83	0.69	0.42	0.73	0.67
8 - 9	N	1.95	0.81	1.11	0.61	0.37	1.20	0.94	0.55	0.46	0.30	0.37
9 - 10	8.48	1.33	1.26	1.48	0.44	0.60	0.67	0.62	1.36	0.30	0.29	0.47
10 - 11	12.05	0.71	0.31	1.38	0.54	1.76	0.28	1.12	1.26	0.94	0.28	0.47
11 - 12	5.74	0.88	0.88	0.54	0.38	0.48	0.55	0.68	1.41	0.64	0.32	1.25
12 - 13	1.46	0.92	0.72	0.56	0.39	0.40	0.26	0.62	0.41	1.08	0.54	3.99
13 - 14	3.33	1.30	0.38	1.11	0.31	0.39	0.61	0.66	0.47	4.93	0.31	0.77
14 - 15	1.70	2.83	0.47	1.44	0.46	0.46	0.83	0.78	0.46	2.58	0.42	2.13
15 - 16	1.08	1.68	0.31	2.68	1.46	0.64	0.27	0.79	0.35	1.26	0.39	0.91
16 - 17	3.85	1.56	0.49	1.90	0.70	1.17	0.94	1.36	1.02	0.70	0.91	4.33
17 - 18	1.72	0.58	0.81	0.47	0.90	0.57	1.83	1.17	0.58	0.92	1.58	1.69
18 - 19	1.35	0.96	0.43	1.76	0.56	1.84	0.56	3.34	2.46	0.70	0.65	0.63
19 - 20	3.88	1.32	1.08	1.31	0.60	0.39	0.55	2.86	1.81	0.59	0.88	1.36
20 - 21	6.23	0.98	1.65	1.24	0.35	0.25	1.20	2.43	1.49	0.80	0.72	4.39
21 - 22	2.84	0.64	1.08	1.35	0.84	0.27	2.45	1.36	1.77	1.23	0.25	2.38
22 - 23	1.69	1.03	1.04	1.26	1.11	0.49	1.54	1.18	1.77	1.95	0.65	1.07
23 - 24	1.95	1.03	0.57	1.24	0.31	0.77	1.20	0.64	0.78	0.89	1.15	0.67
24 - 25	1.50	0.56	1.15	0.65	0.26	0.57	1.28	0.53	1.38	2.69	1.18	0.43
25 - 26	1.59	0.56	0.74	0.68	0.46	0.30	0.40	0.73	1.68	0.59	1.79	0.26
26 - 27	8.61	0.99	0.39	0.45	0.80	0.64	0.35	1.11	1.92	1.39	1.96	0.66
27 - 28	7.96	1.21	0.54	0.32	0.86	1.07	0.34	0.75	1.45	1.63	1.45	0.76
28 - 29	2.65	0.54	0.45	0.37	0.30	0.55	0.59	0.56	0.68	1.20	0.64	1.42
29 - 30	2.52		0.55	0.72	1.14	1.63	0.83	0.42	1.28	0.94	1.17	1.69
30 - 31	3.43		0.47	2.81	2.28	2.27	0.39	0.81	1.09	1.30	2.46	0.79
31 - 1	5.31		0.69		1.23		0.59	0.79		2.84		0.49
Arithmetic Mean (3)	5.22	1.42	0.73	1.05	0.69	0.82	0.85	1.02	1.06	1.27	0.96	1.57
Standard Deviation (3)	3.98	0.91	0.34	0.64	0.42	0.52	0.54	0.67	0.56	0.95	0.74	1.33
Sample Size	30	28	31	30	31	30	31	31	30	31	30	31

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5008 Yarner Wood - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Daily measurements - Summary for January 1997 to December 1997

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DATE												
1 - 2	1.34	0.69	0.62	N	N	1.06	<0.30	0.47	0.38	0.51	7.19	1.26
2 - 3	7.52	1.24	0.43	N	N	1.47	0.40	<0.37	0.49	N	4.17	2.53
3 - 4	4.12	0.47	0.44	N	N	1.33	<0.35	0.43	0.58	N	2.84	6.16
4 - 5	1.54	<0.40	<0.28	N	N	1.22	0.81	0.78	0.56	0.40	0.87	3.05
5 - 6	2.83	0.44	0.28	N	N	1.03	0.58	0.57	0.37	0.45	0.50	1.02
6 - 7	6.86	0.34	0.45	N	N	0.58	0.44	0.55	0.45	0.53	0.64	0.79
7 - 8	7.60	0.35	<0.28	N	N	0.53	<0.37	0.57	1.06	0.39	0.37	0.54
8 - 9	N	0.58	0.47	N	0.50	0.37	0.62	0.63	0.56	0.46	0.74	<0.35
9 - 10	7.40	<0.34	0.36	N	1.46	0.43	0.93	<0.37	0.38	0.40	0.37	0.81
10 - 11	1.91	0.79	0.44	N	0.59	1.09	0.61	N	0.40	0.42	0.41	0.42
11 - 12	0.72	<0.39	0.75	N	0.73	N	0.40	N	0.72	0.67	0.49	0.42
12 - 13	0.43	0.51	0.36	N	0.47	N	0.41	N	0.41	0.63	<0.32	0.63
13 - 14	0.47	0.47	0.52	N	0.39	N	<0.40	1.75	0.50	1.22	0.38	0.78
14 - 15	5.20	0.79	0.48	N	0.49	N	0.51	0.93	0.49	0.67	<0.33	1.22
15 - 16	1.10	0.55	0.43	N	1.43	N	<0.38	1.14	0.50	0.44	0.78	1.13
16 - 17	1.92	0.45	0.41	N	0.96	N	<0.32	2.13	0.66	0.48	0.45	2.39
17 - 18	0.45	0.51	0.43	N	0.61	N	0.42	0.71	0.45	0.37	0.85	1.25
18 - 19	0.51	0.98	0.70	N	0.53	0.45	0.66	0.90	0.48	1.07	<0.30	0.53
19 - 20	0.49	<0.36	1.00	N	0.52	<0.46	0.45	1.26	0.72	0.86	0.38	0.74
20 - 21	1.53	N	0.96	N	0.43	0.90	0.63	1.91	1.46	1.18	<0.35	1.58
21 - 22	2.34	<0.34	1.36	N	<0.34	0.58	N	1.04	1.19	1.40	<0.31	1.31
22 - 23	0.66	0.37	0.83	N	0.68	0.50	0.96	1.91	1.15	1.67	<0.34	0.59
23 - 24	0.93	<0.32	0.74	N	<0.34	0.47	0.97	0.75	2.17	1.75	<0.39	0.42
24 - 25	2.40	<0.33	0.53	N	0.45	0.55	<0.37	0.52	0.91	0.64	0.58	0.62
25 - 26	2.23	0.58	0.53	N	0.59	0.44	0.47	0.60	1.39	0.71	0.62	0.40
26 - 27	1.53	1.44	0.56	N	0.34	0.80	0.46	0.66	1.23	1.62	1.10	0.50
27 - 28	2.40	0.39	0.51	N	1.03	1.05	0.43	N	1.00	1.28	0.53	0.64
28 - 29	2.08	0.59	0.82	N	0.91	0.68	0.46	2.94	0.96	1.04	0.36	0.66
29 - 30	1.38		0.75	N	1.11	1.06	0.44	0.90	N	1.55	0.39	0.53
30 - 31	1.69		0.87	N	1.81	0.72	0.39	0.61	N	1.06	0.49	0.65
31 - 1	1.56		1.70		1.58		0.63	0.88		1.30		0.41
Arithmetic Mean (3)	2.44	0.51	0.61	-	0.75	0.76	0.48	0.96	0.77	0.87	0.89	1.10
Standard Deviation (3)	2.23	0.32	0.33	-	0.45	0.34	0.23	0.64	0.43	0.45	1.45	1.15
Sample Size	30	27	31	0	24	23	30	27	28	29	30	31

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5009 High Muffles - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Daily measurements - Summary for January 1997 to December 1997

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DATE												
1 - 2	5.98	5.80	2.75	0.40	2.13	0.41	0.43	0.55	0.51	0.49	0.63	5.14
2 - 3	4.21	0.87	0.32	0.54	5.48	0.51	4.05	1.26	3.14	0.93	0.45	1.88
3 - 4	0.57	4.33	0.50	2.96	1.12	0.53	7.90	0.74	1.38	0.41	0.35	1.80
4 - 5	0.31	2.10	4.40	2.00	0.63	1.11	4.47	0.50	0.73	0.39	0.71	1.86
5 - 6	0.36	1.16	2.07	0.40	0.58	1.25	1.69	0.51	0.49	0.60	6.48	2.13
6 - 7	0.31	1.74	6.81	2.56	1.63	1.97	0.45	0.48	0.80	6.59	1.89	1.28
7 - 8	0.37	0.73	10.55	2.52	0.33	3.67	4.08	0.52	0.40	0.64	1.84	7.27
8 - 9	0.38	4.46	0.78	11.88	0.63	1.41	N	0.88	0.34	8.25	0.99	2.39
9 - 10	0.33	2.08	1.16	5.60	1.37	4.59	2.91	0.39	0.78	0.95	1.55	1.96
10 - 11	9.18	1.62	5.02	1.52	1.95	2.22	N	0.73	1.24	0.34	2.89	1.14
11 - 12	21.26	4.62	17.13	2.00	1.64	0.54	1.09	1.24	8.92	0.99	1.09	1.74
12 - 13	3.18	1.02	2.46	3.93	1.78	0.79	1.77	4.74	0.46	1.30	0.41	2.52
13 - 14	4.48	0.35	0.44	2.88	2.38	2.07	1.68	0.56	0.34	1.64	1.15	0.77
14 - 15	10.00	0.73	0.53	1.10	0.92	0.47	0.55	0.61	0.60	2.02	4.01	1.15
15 - 16	13.34	4.01	0.42	5.05	2.26	2.09	2.04	1.66	1.23	1.65	3.03	0.70
16 - 17	34.35	4.64	0.38	2.63	0.49	0.85	0.73	1.84	0.75	5.19	2.13	<0.57
17 - 18	11.28	5.42	1.37	1.00	0.39	3.84	1.42	0.88	0.72	6.50	2.76	1.66
18 - 19	6.64	0.77	0.60	0.90	4.46	4.64	1.01	1.05	1.06	1.20	3.23	0.92
19 - 20	1.11	3.94	1.52	0.31	1.18	4.08	0.71	1.49	0.53	1.18	0.89	0.98
20 - 21	0.46	1.29	1.57	0.66	1.10	2.69	0.73	1.83	0.45	0.44	1.62	1.90
21 - 22	1.08	1.68	2.34	0.99	0.35	1.72	0.72	0.77	0.72	0.45	4.91	1.93
22 - 23	2.98	3.13	5.30	3.30	0.31	0.38	0.44	0.49	N	0.90	6.01	2.24
23 - 24	4.87	2.18	2.11	1.10	0.35	1.64	0.49	0.86	N	0.92	1.44	6.00
24 - 25	6.46	2.28	0.69	0.48	0.45	1.12	0.47	0.75	0.49	1.60	0.80	2.37
25 - 26	8.24	0.50	1.66	0.34	2.75	0.83	0.54	1.29	0.49	1.86	1.65	0.44
26 - 27	12.86	0.70	1.37	0.45	0.79	0.34	0.75	2.53	0.51	1.62	1.54	0.37
27 - 28	7.04	6.83	0.44	3.77	0.41	0.42	0.47	0.88	0.89	0.60	4.29	0.52
28 - 29	5.55	0.94	0.43	0.31	1.09	0.34	0.53	1.86	2.95	1.60	2.28	3.74
29 - 30	2.75		0.46	0.70	5.23	0.32	1.55	0.76	1.51	14.71	1.44	4.31
30 - 31	7.90		0.44	0.48	3.18	0.63	0.46	0.51	1.78	3.48	3.19	1.27
31 - 1	3.88		0.49		3.20		0.42	1.41		0.45		1.67
Arithmetic Mean (3)	6.18	2.50	2.47	2.09	1.63	1.58	1.54	1.11	1.22	2.25	2.19	2.07
Standard Deviation (3)	7.17	1.86	3.55	2.36	1.43	1.35	1.69	0.86	1.66	3.08	1.62	1.64
Sample Size	31	28	31	30	31	30	29	31	28	31	30	31

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5010 Strathvaich Dam - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Daily measurements - Summary for January 1997 to December 1997

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DATE												
1 - 2	N	0.81	0.37	1.38	0.43	0.62	<0.42	0.37	0.52	N	0.43	<0.44
2 - 3	N	0.49	<0.37	0.44	<0.37	<0.43	0.58	<0.37	0.67	N	<0.41	<0.38
3 - 4	N	0.34	0.40	0.48	0.37	0.45	1.21	0.35	0.47	N	1.16	0.74
4 - 5	N	0.50	2.17	0.45	<0.37	1.00	<0.40	0.43	0.50	N	0.46	<0.39
5 - 6	N	0.37	0.42	0.64	0.51	0.74	<0.40	0.80	0.45	N	0.42	<0.38
6 - 7	N	0.37	0.40	0.43	0.57	0.81	<0.41	0.65	0.46	N	<0.41	<0.39
7 - 8	N	0.46	0.41	0.53	0.51	0.48	<0.41	0.75	0.43	N	<0.41	<0.40
8 - 9	N	0.36	0.67	0.95	0.54	<0.43	<0.36	0.73	0.45	N	0.40	<0.39
9 - 10	0.93	0.39	0.79	<0.36	<0.42	<0.38	0.38	0.47	0.51	N	0.41	<0.36
10 - 11	3.44	<0.35	0.64	0.77	<0.41	0.48	0.82	0.61	0.71	N	<0.41	<0.42
11 - 12	1.88	0.90	1.02	<0.36	<0.25	0.58	0.44	0.82	0.98	N	0.38	0.42
12 - 13	0.70	0.58	0.67	<0.36	<0.45	<0.39	0.74	1.49	0.40	N	0.44	<0.44
13 - 14	0.62	0.68	0.52	<0.37	N	0.51	<0.40	0.68	0.41	N	<0.41	<0.41
14 - 15	0.75	0.46	0.45	<0.36	<0.44	<0.38	<0.37	0.54	0.97	0.65	0.48	<0.43
15 - 16	0.94	0.43	0.40	0.62	0.78	<0.34	<0.37	0.53	0.48	0.53	<0.46	<0.41
16 - 17	0.44	0.76	0.42	0.51	1.45	0.33	0.43	0.57	0.47	0.58	<0.43	0.70
17 - 18	0.50	0.43	<0.38	0.51	0.55	0.63	0.38	0.56	0.37	0.36	1.12	0.63
18 - 19	0.63	0.71	0.75	0.43	<0.48	0.52	0.42	0.54	0.38	0.58	0.71	N
19 - 20	0.40	0.44	0.51	<0.35	0.68	0.38	0.67	1.47	0.45	0.49	1.51	<0.42
20 - 21	0.74	0.35	0.53	0.35	N	0.56	0.50	1.33	0.45	0.41	0.65	0.51
21 - 22	0.81	0.41	0.83	0.42	0.49	0.44	0.69	0.58	0.73	0.38	1.45	0.44
22 - 23	0.81	0.41	0.59	0.48	0.57	<0.42	0.69	0.71	0.55	<0.36	1.58	1.42
23 - 24	1.01	0.50	0.51	<0.37	0.52	0.40	0.38	0.46	0.61	0.36	1.13	0.75
24 - 25	0.46	0.40	0.36	<0.35	0.58	0.44	0.32	0.50	1.15	<0.36	1.16	0.47
25 - 26	0.46	0.46	0.64	0.42	0.43	0.40	0.43	2.07	1.09	<0.39	0.76	<0.40
26 - 27	0.56	0.43	0.53	<0.36	0.60	0.67	0.53	1.50	0.62	<0.40	1.49	0.72
27 - 28	0.42	<0.37	0.55	0.41	0.50	0.47	0.36	1.22	0.87	0.49	1.05	<0.40
28 - 29	1.20	0.37	0.47	<0.37	0.42	0.40	0.39	0.92	0.68	1.12	1.08	0.46
29 - 30	0.44		0.41	0.46	0.41	0.54	0.43	1.10	0.53	0.73	0.94	N
30 - 31	<0.34		0.52	0.44	1.09	0.57	0.50	0.71	N	<0.39	<0.44	0.55
31 - 1	0.71		0.50		0.44		0.38	0.80		<0.39		0.40
Arithmetic Mean (3)	-	0.47	0.57	0.43	0.48	0.46	0.43	0.79	0.60	-	0.70	0.39
Standard Deviation (3)	-	0.17	0.34	0.26	0.28	0.20	0.23	0.42	0.22	-	0.46	0.28
Sample Size	23	28	31	30	29	30	31	31	29	18	30	29

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5011 Glen Dye - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Daily measurements - Summary for January 1997 to December 1997

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DATE												
1 - 2	<0.29	1.47	1.33	0.56	0.45	0.34	0.37	0.31	0.38	0.36	0.25	0.32
2 - 3	<0.29	0.33	0.31	0.32	0.37	0.31	1.86	0.54	0.76	0.42	0.24	0.33
3 - 4	0.80	1.90	0.30	0.36	<0.28	1.33	0.42	0.29	0.79	0.30	0.32	0.33
4 - 5	<0.29	0.34	3.04	0.60	<0.28	0.92	0.46	0.36	1.71	0.44	0.31	0.29
5 - 6	<0.29	1.12	0.95	0.31	<0.28	3.40	0.30	0.26	0.44	0.58	0.44	0.51
6 - 7	0.29	0.83	1.00	0.74	0.32	1.56	0.29	0.43	0.43	1.13	0.39	0.26
7 - 8	0.32	0.29	1.28	0.52	<0.27	0.70	0.28	0.36	0.34	0.72	<0.22	0.97
8 - 9	0.35	0.37	0.47	1.26	0.37	0.82	N	3.44	0.31	1.06	<0.21	0.77
9 - 10	0.33	0.71	1.18	0.34	0.46	N	3.34	0.36	0.34	0.42	<0.22	0.58
10 - 11	2.92	0.45	1.08	0.27	<0.26	0.74	0.46	0.34	0.43	0.39	1.03	0.61
11 - 12	3.16	0.41	2.90	0.39	0.53	0.41	6.51	0.41	0.78	0.40	<0.21	0.46
12 - 13	<0.28	0.90	1.41	0.44	1.66	0.35	0.66	0.91	0.45	0.33	0.26	0.30
13 - 14	0.74	<0.28	0.60	0.34	0.70	0.35	0.73	0.82	0.36	0.36	0.28	0.29
14 - 15	0.55	<0.28	0.35	0.38	0.32	0.32	0.58	0.71	0.77	0.65	1.10	1.41
15 - 16	1.37	0.47	0.29	0.46	1.65	0.34	0.49	0.71	0.68	1.10	0.70	0.36
16 - 17	3.67	1.43	0.29	0.32	1.22	2.34	0.31	1.19	1.00	0.55	1.10	0.49
17 - 18	2.91	0.54	0.89	0.35	0.50	0.55	0.33	0.83	0.70	0.74	2.02	0.74
18 - 19	1.04	<0.28	0.52	0.30	0.35	1.74	0.62	0.48	0.36	0.38	1.58	0.76
19 - 20	0.28	0.68	0.34	0.29	0.36	1.68	0.29	0.76	0.41	0.26	N	0.84
20 - 21	0.34	<0.29	0.28	0.30	0.51	1.80	0.31	4.23	0.61	0.27	0.65	0.32
21 - 22	0.64	<0.28	0.42	0.33	0.32	0.34	0.43	0.66	1.53	0.38	1.05	0.48
22 - 23	0.80	0.47	0.67	0.49	0.36	0.34	0.36	0.43	0.58	0.38	6.75	5.71
23 - 24	2.52	0.65	0.57	<0.28	0.42	0.32	0.33	0.77	0.85	0.36	2.53	0.60
24 - 25	1.27	1.43	0.29	0.37	1.49	0.36	0.31	0.30	3.91	0.32	0.96	0.51
25 - 26	4.90	0.32	0.62	0.27	0.40	0.37	0.30	0.32	1.22	0.27	0.62	0.22
26 - 27	0.55	0.40	0.34	0.28	0.46	0.31	0.31	1.31	0.34	3.75	2.00	0.35
27 - 28	0.30	1.14	0.33	1.90	0.34	0.32	<0.22	0.84	0.65	0.51	1.33	0.22
28 - 29	0.30	0.51	0.29	0.46	0.71	0.26	0.32	1.24	2.10	1.42	2.48	0.21
29 - 30	<0.29		0.25	0.26	1.56	0.28	0.28	1.58	0.31	2.17	0.89	2.12
30 - 31	0.34		0.26	<0.23	1.80	0.28	0.28	0.31	1.05	1.11	1.81	0.45
31 - 1	0.37		<0.25		0.37		0.21	0.82		0.33		1.36
Arithmetic Mean (3)	1.03	0.64	0.74	0.45	0.60	0.80	0.73	0.85	0.82	0.70	1.09	0.75
Standard Deviation (3)	1.24	0.47	0.70	0.34	0.51	0.77	1.25	0.87	0.73	0.70	1.31	1.01
Sample Size	31	28	31	30	31	29	30	31	30	31	29	31

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.



National Environmental Technology Centre  
 Site: 5326 Bush - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Daily measurements - Summary for January 1997 to December 1997

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DATE												
1 - 2	4.25	1.79	0.43	0.59	0.67	3.09	2.49	0.52	0.80	0.89	0.49	4.00
2 - 3	2.14	0.77	0.49	0.60	1.45	1.82	1.28	0.56	0.93	0.78	1.47	2.54
3 - 4	2.54	0.95	0.74	0.83	0.90	1.23	2.09	4.84	0.73	0.66	1.61	6.34
4 - 5	3.29	2.81	3.81	1.22	0.45	1.56	0.74	0.84	0.74	0.53	1.20	2.97
5 - 6	4.36	1.61	1.41	0.52	0.56	4.34	0.52	0.50	0.51	0.59	1.21	0.91
6 - 7	10.38	0.80	1.53	0.61	2.79	1.45	0.35	0.78	0.40	0.88	0.93	0.42
7 - 8	4.15	0.75	0.89	0.75	0.75	0.53	0.45	0.61	0.36	0.90	1.14	0.74
8 - 9	7.45	0.84	1.44	2.97	9.34	0.56	5.93	3.01	0.53	0.85	1.64	0.52
9 - 10	3.08	0.86	1.53	1.40	3.46	0.68	6.37	0.58	3.71	0.88	1.19	0.46
10 - 11	7.32	0.49	1.50	0.74	1.96	3.28	1.22	0.96	0.74	1.15	0.83	1.75
11 - 12	4.59	1.00	3.15	4.77	0.80	1.69	2.31	1.05	2.99	2.26	0.79	0.98
12 - 13	0.71	0.91	2.01	2.00	0.70	1.42	2.33	4.66	0.54	3.56	0.66	3.67
13 - 14	0.55	0.54	0.87	0.80	0.74	2.77	0.51	8.26	0.54	1.09	0.72	0.52
14 - 15	0.87	0.70	0.41	3.26	0.78	2.31	0.47	0.67	0.66	1.38	0.84	1.92
15 - 16	0.68	0.65	0.51	4.38	2.47	1.25	0.62	1.14	0.50	2.47	0.86	1.14
16 - 17	3.29	1.20	0.57	2.43	2.49	4.52	0.44	1.08	0.45	0.91	0.62	0.97
17 - 18	1.63	0.62	0.82	1.02	0.95	5.49	2.53	0.60	1.96	0.71	1.24	1.43
18 - 19	1.31	0.54	0.45	2.21	0.56	1.24	0.99	1.35	5.45	0.69	1.00	1.32
19 - 20	2.03	0.54	3.25	2.91	2.66	2.97	1.18	4.18	1.75	0.80	2.69	N
20 - 21	5.58	0.60	1.68	1.57	2.02	1.56	9.21	4.55	2.22	1.26	1.78	N
21 - 22	2.44	0.48	1.67	1.27	3.28	0.59	5.36	0.95	6.92	1.12	3.26	N
22 - 23	14.16	0.54	1.11	2.97	1.05	0.49	1.41	0.69	7.76	1.80	2.61	N
23 - 24	3.32	0.42	2.99	0.88	1.21	0.76	1.54	1.05	15.12	1.65	4.83	N
24 - 25	1.41	0.63	0.77	1.05	2.11	2.39	0.91	4.10	6.29	3.05	3.59	N
25 - 26	1.54	0.66	0.63	1.08	1.04	3.66	0.57	1.68	10.20	1.16	1.37	N
26 - 27	4.61	1.33	0.50	0.74	2.09	1.87	0.58	1.17	2.63	1.36	2.31	2.66
27 - 28	2.99	0.75	0.51	1.26	1.88	0.69	0.61	3.40	2.34	2.08	2.31	N
28 - 29	2.50	0.85	0.52	0.40	1.27	1.58	0.65	4.44	1.90	2.60	3.49	N
29 - 30	3.02		0.56	0.45	4.29	2.04	0.57	1.02	0.75	8.06	1.45	N
30 - 31	3.28		0.54	0.65	3.52	3.12	0.55	0.57	1.34	1.42	1.00	N
31 - 1	6.80		0.82		4.32		0.39	1.61		0.91		N
Arithmetic Mean (3)	3.75	0.88	1.23	1.54	2.02	2.03	1.78	1.98	2.72	1.56	1.64	-
Standard Deviation (3)	2.97	0.50	0.93	1.18	1.77	1.30	2.11	1.89	3.45	1.42	1.05	-
Sample Size	31	28	31	30	31	30	31	31	30	31	30	19

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

## National Environmental Technology Centre

### Weekly Sites Analysed:

5301 Brockhill 1  
 5303 Caenby 1  
 5304 Camborne 1  
 5305 Camphill 1  
 5306 Cardington 2  
 5308 Corpach 1  
 5309 Cresselly 1  
 5310 Etton 1  
 5312 Husborne Crawley 1  
 5313 Little Horkesley 1  
 5314 Marshfield 1  
 5315 Ratcliffe 13  
 5316 Rockbourne 1  
 5317 Wakefield 24  
 5318 Waunfawr 1  
 5319 Fort Augustus 2  
 5320 Loch Leven 2  
 5321 Redesdale 2  
 5322 Hebden Bridge 2  
 5323 Preston Montford 2  
 5324 Bentra  
 5325 Pitlochry  
 5329 Cam Forest  
 5330 Cwmystwyth  
 5331 Rosemaund  
 5333 Fairseat  
 5334 Bylchau  
 5335 Crai  
 5336 Husborne Crawley 2  
 5337 Ratcliffe 18  
 5338 Forsinain  
 5339 Appleacre  
 5340 Garrary

<u>Variables Analysed</u>	<u>Units</u>	<u>Specified Variable Limit</u>
sulphur dioxide as S	$\mu\text{g m}^{-3}$	1.000

### Time Period Covered:

January 1997 - December 1997

National Environmental Technology Centre  
 Site: 5301 Brockhill 1 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	03/01	10/01	3.84	31/01	07/02	3.34	28/02	07/03	2.42	04/04	11/04	2.71	02/05	09/05	1.46	30/05	06/06	2.32
	10/01	17/01	2.33	07/02	14/02	1.72	07/03	14/03	2.38	11/04	18/04	6.32	09/05	16/05	1.66	06/06	13/06	1.07
	17/01	24/01	3.87	14/02	21/02	2.40	14/03	21/03	1.53	18/04	25/04	3.19	16/05	23/05	2.64	13/06	20/06	1.36
	24/01	31/01	6.68	21/02	28/02	1.70	21/03	04/04	2.08	25/04	02/05	2.22	23/05	30/05	2.55	20/06	27/06	2.22
																27/06	04/07	2.65

Arithmetic Mean	4.18	2.29	2.10	3.61	2.08	1.92
Standard Deviation	1.82	0.77	0.41	1.85	0.61	0.67
Valid Samples	4	4	4	4	4	5

MONTH	JUL		AUG		SEP		OCT		NOV		DEC							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	04/07	11/07	2.08	01/08	20/08	N	05/09	12/09	1.26	03/10	10/10	1.02	31/10	14/11	N	28/11	05/12	7.20
	11/07	18/07	0.98	20/08	05/09	1.74	12/09	19/09	2.05	10/10	17/10	2.45	14/11	21/11	0.83	05/12	12/12	1.60
	18/07	25/07	2.29				19/09	26/09	1.62	17/10	24/10	3.32	21/11	28/11	2.16	12/12	19/12	2.67
	25/07	01/08	0.79				26/09	03/10	1.85	24/10	31/10	4.47				19/12	02/01	0.99

Arithmetic Mean	1.53	-	1.69	2.82	-	3.12
Standard Deviation	0.76	-	0.34	1.46	-	2.81
Valid Samples	4	1	4	4	2	4

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5303 Caenby 1 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	31/12	- 07/01	2.35	04/02	- 11/02	3.13	04/03	- 11/03	1.87	01/04	- 08/04	4.25	29/04	- 06/05	7.11	03/06	- 10/06	2.18
	07/01	- 14/01	3.05	11/02	- 18/02	2.99	11/03	- 18/03	2.78	08/04	- 15/04	3.09	06/05	- 13/05	4.32	10/06	- 17/06	2.30
	14/01	- 21/01	1.91	18/02	- 25/02	4.98	18/03	- 25/03	1.99	15/04	- 22/04	1.73	13/05	- 20/05	2.41	17/06	- 24/06	1.70
	21/01	- 28/01	2.89	25/02	- 04/03	3.56	25/03	- 01/04	4.62	22/04	- 29/04	6.24	20/05	- 27/05	1.55	24/06	- 01/07	2.13
	28/01	- 04/02	2.57										27/05	- 03/06	1.28			

Arithmetic Mean	2.55	3.66	2.81	3.83	3.33	2.08
Standard Deviation	0.45	0.91	1.27	1.91	2.42	0.26
Valid Samples	5	4	4	4	5	4

MONTH	JUL		AUG		SEP		OCT		NOV		DEC							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	01/07	- 08/07	3.51	29/07	- 05/08	2.37	02/09	- 09/09	4.20	30/09	- 07/10	3.46	04/11	- 11/11	2.59	02/12	- 09/12	6.15
	08/07	- 15/07	2.20	05/08	- 12/08	1.80	09/09	- 16/09	6.77	07/10	- 14/10	2.29	11/11	- 18/11	2.43	09/12	- 16/12	4.10
	15/07	- 22/07	2.49	12/08	- 19/08	2.81	16/09	- 23/09	3.28	14/10	- 21/10	1.09	18/11	- 25/11	1.71	16/12	- 23/12	5.91
	22/07	- 29/07	2.57	19/08	- 28/08	2.87	23/09	- 30/09	1.72	21/10	- 28/10	2.63	25/11	- 02/12	2.88	23/12	- 30/12	3.01
				28/08	- 02/09	7.84				28/10	- 04/11	9.04						

Arithmetic Mean	2.69	3.54	3.99	3.70	2.40	4.79
Standard Deviation	0.57	2.44	2.12	3.11	0.50	1.50
Valid Samples	4	5	4	5	4	4

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5304 Camborne 1 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	30/12	- 06/01	3.56	03/02	- 10/02	0.82	03/03	- 10/03	1.01	31/03	- 07/04	0.75	28/04	- 05/05	0.88	02/06	- 09/06	0.99
	06/01	- 13/01	3.53	10/02	- 17/02	0.68	10/03	- 17/03	0.81	07/04	- 14/04	2.54	05/05	- 12/05	0.58	09/06	- 16/06	0.84
	13/01	- 20/01	1.06	17/02	- 24/02	0.67	17/03	- 24/03	1.01	14/04	- 21/04	1.94	12/05	- 19/05	1.20	16/06	- 23/06	0.65
	20/01	- 27/01	1.78	24/02	- 03/03	0.69	24/03	- 31/03	0.77	21/04	- 28/04	1.11	19/05	- 26/05	0.99	23/06	- 30/06	0.66
	27/01	- 03/02	1.70										26/05	- 02/06	1.69			
Arithmetic Mean	2.33		0.71		0.90		1.58		1.07		0.78							
Standard Deviation	1.15		0.07		0.13		0.81		0.42		0.16							
Valid Samples	5		4		4		4		5		4							

MONTH	JUL		AUG		SEP		OCT		NOV		DEC							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	30/06	- 07/07	0.58	04/08	- 11/08	0.72	01/09	- 08/09	0.74	29/09	- 06/10	0.84	03/11	- 10/11	1.18	01/12	- 08/12	2.11
	07/07	- 14/07	0.79	11/08	- 18/08	0.71	08/09	- 15/09	0.71	06/10	- 13/10	0.64	10/11	- 17/11	0.72	08/12	- 15/12	0.77
	14/07	- 21/07	0.64	18/08	- 25/08	0.85	15/09	- 22/09	1.14	13/10	- 20/10	0.90	17/11	- 24/11	0.72	15/12	- 22/12	1.28
	21/07	- 28/07	0.84	25/08	- 01/09	0.65	22/09	- 29/09	1.79	20/10	- 27/10	1.91	24/11	- 01/12	0.83	22/12	- 29/12	0.63
	28/07	- 04/08	0.55							27/10	- 03/11	3.79						
Arithmetic Mean	0.68		0.73		1.10		1.62		0.86		1.20							
Standard Deviation	0.13		0.08		0.50		1.31		0.22		0.67							
Valid Samples	5		4		4		5		4		4							

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5305 Camphill 1 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	02/01 - 09/01	2.75	30/01 - 06/02	1.33	27/02 - 06/03	1.00	03/04 - 10/04	0.95	01/05 - 08/05	0.89	29/05 - 05/06	5.10
	09/01 - 16/01	2.85	06/02 - 13/02	0.39	06/03 - 13/03	1.90	10/04 - 17/04	1.56	08/05 - 15/05	0.89	05/06 - 12/06	2.28
	16/01 - 23/01	2.64	13/02 - 20/02	0.41	13/03 - 20/03	0.36	17/04 - 24/04	1.18	15/05 - 22/05	2.76	12/06 - 19/06	1.40
	23/01 - 30/01	1.45	20/02 - 27/02	0.57	20/03 - 27/03	0.77	24/04 - 01/05	0.79	22/05 - 29/05	1.15	19/06 - 26/06	1.01
					27/03 - 03/04	0.40					26/06 - 03/07	1.08
Arithmetic Mean	2.42		0.68		0.89		1.12		1.42		2.18	
Standard Deviation	0.66		0.45		0.63		0.33		0.90		1.71	
Valid Samples	4		4		5		4		4		5	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	03/07 - 10/07	1.13	31/07 - 07/08	2.14	04/09 - 11/09	0.52	02/10 - 09/10	7.33	30/10 - 06/11	1.68	04/12 - 11/12	0.53
	10/07 - 17/07	2.49	07/08 - 14/08	1.79	11/09 - 18/09	0.62	09/10 - 16/10	1.54	06/11 - 13/11	1.21	11/12 - 18/12	0.90
	17/07 - 24/07	2.00	14/08 - 21/08	1.05	18/09 - 25/09	5.01	16/10 - 23/10	2.17	13/11 - 20/11	0.77	18/12 - 24/12	1.96
	24/07 - 31/07	0.51	21/08 - 28/08	0.73	25/09 - 02/10	1.59	23/10 - 30/10	2.10	20/11 - 27/11	1.95	24/12 - 31/12	0.58
			28/08 - 04/09	0.91					27/11 - 04/12	1.74		
Arithmetic Mean	1.53		1.32		1.93		3.29		1.47		0.99	
Standard Deviation	0.88		0.61		2.11		2.71		0.47		0.67	
Valid Samples	4		5		4		4		5		4	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5306 Cardington 2 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	31/12	- 08/01	4.68	29/01	- 05/02	4.02	26/02	- 05/03	5.55	02/04	- 09/04	5.98	30/04	- 07/05	3.53	04/06	- 11/06	2.33
	08/01	- 15/01	5.24	05/02	- 12/02	4.36	05/03	- 13/03	9.08	09/04	- 16/04	5.04	07/05	- 14/05	4.15	11/06	- 18/06	2.34
	15/01	- 22/01	3.16	12/02	- 19/02	6.51	13/03	- 19/03	7.67	16/04	- 23/04	2.46	14/05	- 21/05	2.07	18/06	- 25/06	3.27
	22/01	- 29/01	6.01	19/02	- 26/02	6.04	19/03	- 26/03	7.89	23/04	- 30/04	3.75	21/05	- 28/05	1.87	25/06	- 02/07	2.15
							26/03	- 02/04	5.89				28/05	- 04/06	1.39			
Arithmetic Mean	4.77		5.23		7.21		4.31		2.60		2.52							
Standard Deviation	1.21		1.22		1.47		1.54		1.18		0.51							
Valid Samples	4		4		5		4		5		4							

MONTH	JUL		AUG		SEP		OCT		NOV		DEC							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	02/07	- 09/07	2.38	30/07	- 06/08	3.39	03/09	- 10/09	4.15	01/10	- 08/10	6.98	29/10	- 05/11	9.05	03/12	- 10/12	7.43
	09/07	- 16/07	3.38	06/08	- 13/08	4.00	10/09	- 17/09	4.85	08/10	- 15/10	7.21	05/11	- 12/11	2.41	10/12	- 17/12	5.67
	16/07	- 23/07	1.69	13/08	- 20/08	4.17	17/09	- 24/09	2.46	15/10	- 22/10	2.22	12/11	- 19/11	3.46	17/12	- 24/12	5.49
	23/07	- 30/07	2.86	20/08	- 27/08	4.84	24/09	- 01/10	2.46	22/10	- 29/10	3.82	19/11	- 26/11	2.65	24/12	- 06/01	N
				27/08	- 03/09	2.51							26/11	- 03/12	8.14			
Arithmetic Mean	2.58		3.78		3.48		5.06		5.14		6.20							
Standard Deviation	0.72		0.88		1.21		2.44		3.19		1.07							
Valid Samples	4		5		4		4		5		3							

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5308 Corpach 1 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	08/01 - 15/01	2.26	29/01 - 05/02	1.58	26/02 - 05/03	0.71	02/04 - 09/04	0.88	30/04 - 07/05	0.85	28/05 - 05/06	2.29
	15/01 - 22/01	1.60	05/02 - 12/02	0.57	05/03 - 12/03	1.25	09/04 - 16/04	1.31	07/05 - 15/05	N	05/06 - 11/06	0.53
	22/01 - 29/01	1.37	12/02 - 19/02	0.61	12/03 - 20/03	0.62	16/04 - 23/04	1.08	15/05 - 21/05	1.09	11/06 - 18/06	1.02
			19/02 - 26/02	0.84	20/03 - 26/03	0.93	23/04 - 30/04	0.77	21/05 - 28/05	N	18/06 - 25/06	1.28
					26/03 - 02/04	0.37					25/06 - 02/07	0.91
Arithmetic Mean	1.74		0.90		0.78		1.01		-		1.20	
Standard Deviation	0.46		0.47		0.33		0.24		-		0.66	
Valid Samples	3		4		5		4		2		5	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	02/07 - 09/07	1.08	30/07 - 06/08	1.19	03/09 - 10/09	0.56	01/10 - 08/10	0.54	29/10 - 05/11	1.04	03/12 - 11/12	0.60
	09/07 - 16/07	0.78	06/08 - 13/08	3.01	10/09 - 18/09	1.13	08/10 - 16/10	0.77	05/11 - 12/11	1.47	11/12 - 17/12	0.81
	16/07 - 23/07	2.31	13/08 - 20/08	2.20	18/09 - 24/09	2.73	16/10 - 23/10	0.72	12/11 - 19/11	0.46	17/12 - 24/12	0.72
	23/07 - 30/07	1.63	20/08 - 27/08	1.70	24/09 - 01/10	1.77	23/10 - 29/10	2.08	19/11 - 26/11	2.59	24/12 - 07/01	0.29
			27/08 - 03/09	1.68					26/11 - 03/12	1.42		
Arithmetic Mean	1.45		1.96		1.55		1.03		1.40		0.60	
Standard Deviation	0.67		0.69		0.93		0.71		0.78		0.22	
Valid Samples	4		5		4		4		5		4	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.



National Environmental Technology Centre  
 Site: 5309 Cresselly 1 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	02/01	- 08/01	3.45	29/01	- 05/02	3.53	26/02	- 05/03	0.86	02/04	- 09/04	2.25	30/04	- 07/05	1.16	04/06	- 11/06	0.97
	08/01	- 15/01	2.84	05/02	- 12/02	0.71	05/03	- 12/03	2.53	09/04	- 16/04	2.78	07/05	- 14/05	0.70	11/06	- 18/06	1.16
	15/01	- 22/01	2.21	12/02	- 19/02	1.06	12/03	- 19/03	1.44	16/04	- 23/04	2.87	14/05	- 21/05	1.13	18/06	- 25/06	0.63
	22/01	- 29/01	4.06	19/02	- 26/02	1.11	19/03	- 26/03	1.06	23/04	- 30/04	1.01	21/05	- 28/05	1.29	25/06	- 02/07	0.73
							26/03	- 02/04	0.86				28/05	- 04/06	2.58			
Arithmetic Mean	3.14		1.60		1.35		2.23		1.37		0.87							
Standard Deviation	0.80		1.30		0.70		0.86		0.71		0.24							
Valid Samples	4		4		5		4		5		4							

MONTH	JUL		AUG		SEP		OCT		NOV		DEC							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	02/07	- 09/07	0.92	30/07	- 06/08	1.65	03/09	- 10/09	0.78	01/10	- 08/10	0.97	29/10	- 05/11	3.40	03/12	- 10/12	1.10
	09/07	- 16/07	1.34	06/08	- 13/08	2.01	10/09	- 17/09	1.24	08/10	- 15/10	1.01	05/11	- 12/11	0.97	10/12	- 17/12	1.04
	16/07	- 23/07	1.78	13/08	- 20/08	1.05	17/09	- 24/09	2.90	15/10	- 22/10	1.88	12/11	- 19/11	0.79	17/12	- 24/12	2.17
	23/07	- 30/07	1.07	20/08	- 27/08	0.69	24/09	- 01/10	1.64	22/10	- 29/10	4.44	19/11	- 26/11	1.24	24/12	- 07/01	0.73
				27/08	- 03/09	0.86							26/11	- 03/12	1.74			
Arithmetic Mean	1.28		1.25		1.64		2.07		1.63		1.26							
Standard Deviation	0.38		0.56		0.91		1.64		1.05		0.63							
Valid Samples	4		5		4		4		5		4							

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5310 Etton 1 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	07/01 - 14/01	0.63	04/02 - 11/02	5.52	04/03 - 11/03	4.18	01/04 - 08/04	7.75	29/04 - 06/05	3.84	03/06 - 11/06	3.10
	14/01 - 24/01	10.71	11/02 - 18/02	4.63	11/03 - 18/03	4.47	08/04 - 15/04	2.45	06/05 - 13/05	3.79	11/06 - 18/06	3.98
	24/01 - 28/01	7.19	18/02 - 25/02	6.27	18/03 - 25/03	2.69	15/04 - 22/04	0.89	13/05 - 20/05	3.02	18/06 - 24/06	3.59
	28/01 - 04/02	4.25	25/02 - 04/03	3.63	25/03 - 01/04	1.93	22/04 - 29/04	3.69	20/05 - 27/05	1.50	24/06 - 01/07	0.97
									27/05 - 03/06	2.71		
Arithmetic Mean	5.69		5.01		3.32		3.69		2.97		2.91	
Standard Deviation	4.29		1.14		1.21		2.94		0.96		1.34	
Valid Samples	4		4		4		4		5		4	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	01/07 - 08/07	3.22	29/07 - 05/08	1.30	02/09 - 09/09	2.18	30/09 - 07/10	2.37	29/10 - 04/11	7.36	02/12 - 09/12	5.25
	08/07 - 15/07	1.91	05/08 - 12/08	1.42	09/09 - 16/09	5.99	07/10 - 14/10	3.43	04/11 - 11/11	5.13	09/12 - 16/12	2.64
	15/07 - 22/07	0.87	12/08 - 20/08	4.04	16/09 - 25/09	0.96	14/10 - 22/10	6.60	11/11 - 18/11	4.64	16/12 - 23/12	5.21
	22/07 - 29/07	1.76	20/08 - 26/08	3.37	25/09 - 30/09	2.61	22/10 - 29/10	1.17	18/11 - 26/11	4.23	23/12 - 06/01	4.11
			26/08 - 02/09	2.79					26/11 - 02/12	3.33		
Arithmetic Mean	1.94		2.59		2.94		3.39		4.94		4.30	
Standard Deviation	0.97		1.20		2.15		2.33		1.51		1.23	
Valid Samples	4		5		4		4		5		4	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5312 Husborne Crawley 1 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	31/12	- 07/01	04/02	- 11/02	04/03	- 11/03	01/04	- 08/04	29/04	- 06/05	03/06	- 10/06
	7.44		2.21		4.11		2.36		1.71		2.76	
	07/01	- 14/01	11/02	- 18/02	11/03	- 18/03	08/04	- 15/04	06/05	- 13/05	10/06	- 17/06
	4.40		1.56		4.56		4.89		1.14		2.89	
	14/01	- 21/01	18/02	- 25/02	18/03	- 25/03	15/04	- 22/04	13/05	- 20/05	17/06	- 24/06
	2.86		1.21		5.22		4.76		2.70		1.95	
	21/01	- 28/01	25/02	- 04/03	25/03	- 01/04	22/04	- 29/04	20/05	- 27/05	24/06	- 01/07
	4.14		1.32		3.50		1.78		3.56		1.55	
	28/01	- 04/02							27/05	- 03/06		
	4.24								2.85			
Arithmetic Mean	4.62		1.57		4.35		3.45		2.39		2.29	
Standard Deviation	1.69		0.45		0.73		1.61		0.96		0.64	
Valid Samples	5		4		4		4		5		4	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	01/07	- 08/07	29/07	- 05/08	02/09	- 09/09	30/09	- 07/10	04/11	- 11/11	02/12	- 09/12
	1.60		1.38		1.22		2.02		1.63		6.98	
	08/07	- 15/07	05/08	- 12/08	09/09	- 16/09	07/10	- 14/10	11/11	- 18/11	09/12	- 16/12
	2.30		3.71		2.53		1.78		1.44		2.89	
	15/07	- 22/07	12/08	- 19/08	16/09	- 23/09	14/10	- 21/10	18/11	- 25/11	16/12	- 23/12
	3.01		2.85		1.81		2.42		1.29		3.35	
	22/07	- 29/07	19/08	- 26/08	23/09	- 30/09	21/10	- 28/10	25/11	- 02/12	23/12	- 30/12
	2.67		3.24		1.82		2.80		3.37		1.07	
			26/08	- 02/09			28/10	- 04/11				
			2.28				5.62					
Arithmetic Mean	2.39		2.69		1.84		2.93		1.93		3.57	
Standard Deviation	0.61		0.90		0.54		1.56		0.97		2.48	
Valid Samples	4		5		4		5		4		4	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5313 Little Horkesley 1 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	25/12	08/01	2.96	29/01	05/02	3.45	26/02	05/03	2.46	02/04	09/04	2.41	30/04	07/05	3.66	04/06	11/06	2.62
	08/01	15/01	8.53	05/02	12/02	2.99	05/03	12/03	2.21	09/04	16/04	4.09	07/05	14/05	2.43	11/06	18/06	2.18
	15/01	22/01	5.22	12/02	19/02	2.45	12/03	19/03	1.98	16/04	23/04	2.93	14/05	21/05	3.29	18/06	25/06	2.29
	22/01	29/01	6.09	19/02	26/02	1.96	19/03	26/03	2.65	23/04	30/04	1.96	21/05	28/05	3.45	25/06	02/07	1.66
							26/03	02/04	1.64				28/05	04/06	3.25			
Arithmetic Mean	5.70		2.71		2.19		2.85		3.22		2.19							
Standard Deviation	2.30		0.65		0.40		0.92		0.47		0.40							
Valid Samples	4		4		5		4		5		4							

MONTH	JUL		AUG		SEP		OCT		NOV		DEC							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	02/07	09/07	2.92	30/07	06/08	0.91	03/09	10/09	2.56	01/10	08/10	2.59	29/10	05/11	4.36	03/12	10/12	2.73
	09/07	16/07	2.20	06/08	13/08	3.05	10/09	17/09	2.04	08/10	15/10	2.14	05/11	12/11	2.65	10/12	17/12	3.53
	16/07	23/07	1.13	13/08	20/08	2.63	17/09	24/09	2.62	15/10	22/10	1.63	12/11	19/11	1.89	17/12	24/12	3.09
	23/07	30/07	1.99	20/08	27/08	2.46	24/09	01/10	2.35	22/10	29/10	3.51	19/11	26/11	2.97	24/12	31/12	1.06
				27/08	03/09	2.24							26/11	03/12	3.27			
Arithmetic Mean	2.06		2.26		2.39		2.47		3.03		2.60							
Standard Deviation	0.74		0.81		0.26		0.80		0.91		1.08							
Valid Samples	4		5		4		4		5		4							

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5314 Marshfield 1 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	31/12	- 07/01	4.58	04/02	- 11/02	1.18	04/03	- 11/03	1.17	02/04	- 08/04	1.24	29/04	- 06/05	1.22	03/06	- 10/06	0.80
	07/01	- 14/01	3.91	11/02	- 18/02	1.36	11/03	- 18/03	0.98	08/04	- 15/04	3.65	06/05	- 13/05	0.52	10/06	- 17/06	0.77
	14/01	- 21/01	2.71	18/02	- 25/02	0.69	18/03	- 25/03	0.94	15/04	- 22/04	2.71	13/05	- 20/05	0.54	17/06	- 24/06	1.10
	21/01	- 28/01	2.97	25/02	- 04/03	0.82	25/03	- 02/04	0.75	22/04	- 29/04	0.62	20/05	- 27/05	1.06	24/06	- 01/07	1.71
	28/01	- 04/02	4.36										27/05	- 03/06	2.06			
Arithmetic Mean	3.71		1.01		0.96		2.05		1.08		1.09							
Standard Deviation	0.83		0.31		0.17		1.38		0.63		0.44							
Valid Samples	5		4		4		4		5		4							

MONTH	JUL		AUG		SEP		OCT		NOV		DEC							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	01/07	- 08/07	2.82	29/07	- 05/08	1.43	02/09	- 09/09	0.65	30/09	- 07/10	1.03	04/11	- 11/11	1.36	02/12	- 09/12	4.83
	08/07	- 15/07	2.30	05/08	- 12/08	1.93	09/09	- 16/09	1.61	07/10	- 14/10	0.91	11/11	- 18/11	0.74	09/12	- 16/12	1.44
	15/07	- 22/07	2.04	12/08	- 19/08	2.54	16/09	- 23/09	2.74	14/10	- 21/10	1.02	18/11	- 25/11	1.26	16/12	- 23/12	2.81
	22/07	- 29/07	1.76	19/08	- 26/08	1.21	23/09	- 30/09	2.12	21/10	- 28/10	4.84	25/11	- 02/12	2.55	23/12	- 30/12	1.01
				26/08	- 02/09	0.41				28/10	- 04/11	4.91						
Arithmetic Mean	2.23		1.50		1.78		2.54		1.48		2.52							
Standard Deviation	0.45		0.79		0.88		2.13		0.77		1.72							
Valid Samples	4		5		4		5		4		4							

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5315 Ratcliffe 13 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN								
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End							
	31/12	- 09/01	N		30/01	- 06/02	3.02	27/02	- 06/03	3.94	03/04	- 10/04	3.98	01/05	- 08/05	1.85	29/05	- 05/06	3.52
	09/01	- 16/01	3.76		06/02	- 13/02	4.38	06/03	- 13/03	3.11	10/04	- 17/04	7.04	08/05	- 15/05	2.72	05/06	- 12/06	2.54
	16/01	- 23/01	3.08		13/02	- 20/02	3.07	13/03	- 20/03	4.25	17/04	- 24/04	6.08	15/05	- 22/05	6.06	12/06	- 19/06	2.91
	23/01	- 30/01	3.93		20/02	- 27/02	4.82	20/03	- 27/03	5.39	24/04	- 01/05	3.28	22/05	- 29/05	4.43	19/06	- 26/06	2.54
								27/03	- 03/04	3.82							26/06	- 03/07	2.60
Arithmetic Mean			3.59				3.82			4.10			5.09			3.76			2.82
Standard Deviation			0.45				0.92			0.83			1.76			1.87			0.42
Valid Samples			3				4			5			4			4			5

MONTH	JUL		AUG		SEP		OCT		NOV		DEC								
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End							
	03/07	- 10/07	4.00	31/07	- 07/08	2.34	04/09	- 11/09	4.38	02/10	- 09/10	2.83	30/10	- 06/11	2.66	04/12	- 11/12	4.41	
	10/07	- 17/07	3.31	07/08	- 14/08	6.61	11/09	- 18/09	3.96	09/10	- 16/10	2.36	06/11	- 13/11	3.16	11/12	- 18/12	2.38	
	17/07	- 24/07	4.75	14/08	- 21/08	5.61	18/09	- 25/09	2.46	16/10	- 23/10	1.90	13/11	- 20/11	1.29	18/12	- 23/12	11.77	
	24/07	- 31/07	1.53	21/08	- 28/08	N	25/09	- 02/10	4.00	23/10	- 30/10	4.04	20/11	- 27/11	2.13	23/12	- 29/12	1.56	
				28/08	- 04/09	N							27/11	- 04/12	4.73				
Arithmetic Mean			3.40			4.85			3.70			2.78			2.79				5.03
Standard Deviation			1.38			2.23			0.85			0.92			1.28				4.65
Valid Samples			4			3			4			4			5				4

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5316 Rockbourne 1 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	31/12	- 08/01	5.54	30/01	- 05/02	1.93	26/02	- 05/03	0.57	02/04	- 09/04	2.46	30/04	- 08/05	1.02	04/06	- 10/06	3.28
	08/01	- 15/01	3.43	05/02	- 12/02	0.75	05/03	- 12/03	1.97	09/04	- 16/04	2.00	08/05	- 14/05	0.43	10/06	- 18/06	1.60
	15/01	- 22/01	1.25	12/02	- 19/02	0.88	12/03	- 19/03	0.66	16/04	- 23/04	1.01	14/05	- 21/05	2.50	18/06	- 25/06	0.72
	22/01	- 30/01	2.13	19/02	- 26/02	0.38	19/03	- 26/03	0.93	23/04	- 30/04	0.65	21/05	- 28/05	2.49	25/06	- 02/07	1.31
							26/03	- 02/04	0.94				28/05	- 04/06	5.36			
Arithmetic Mean	3.09		0.98		1.01		1.53		2.36		1.73							
Standard Deviation	1.87		0.66		0.56		0.84		1.91		1.10							
Valid Samples	4		4		5		4		5		4							

MONTH	JUL		AUG		SEP		OCT		NOV		DEC							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	02/07	- 09/07	0.84	30/07	- 06/08	0.91	03/09	- 10/09	0.38	01/10	- 15/10	N	29/10	- 05/11	3.50	03/12	- 10/12	2.11
	09/07	- 16/07	0.79	06/08	- 13/08	1.54	10/09	- 17/09	1.28	15/10	- 22/10	1.38	05/11	- 12/11	0.53	10/12	- 17/12	1.67
	16/07	- 23/07	1.14	13/08	- 20/08	2.56	17/09	- 24/09	N	22/10	- 29/10	2.49	12/11	- 19/11	0.50	17/12	- 23/12	2.17
	23/07	- 30/07	1.25	20/08	- 27/08	0.80	24/09	- 01/10	N				19/11	- 26/11	0.82	23/12	- 31/12	0.55
				27/08	- 03/09	0.52							26/11	- 03/12	3.38			
Arithmetic Mean	1.00		1.26		-		-		1.74		1.62							
Standard Deviation	0.22		0.81		-		-		1.55		0.75							
Valid Samples	4		5		2		2		5		4							

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5317 Wakefield 24 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	31/12	08/01	29/01	05/02	26/02	05/03	02/04	09/04	30/04	07/05	04/06	11/06
	8.72		9.20		3.16		4.08		2.09		5.41	
	08/01	15/01	05/02	12/02	05/03	12/03	09/04	16/04	07/05	14/05	11/06	18/06
	8.96		3.61		10.62		1.93		1.57		2.55	
	15/01	22/01	12/02	19/02	12/03	19/03	16/04	23/04	14/05	21/05	18/06	25/06
	13.07		3.06		3.30		5.23		3.85		2.91	
	22/01	29/01	19/02	26/02	19/03	26/03	23/04	30/04	21/05	28/05	25/06	02/07
	9.44		2.10		3.17		3.61		4.22		0.87	
					26/03	02/04	1.39		28/05	04/06	3.40	
Arithmetic Mean	10.05		4.49		4.33		3.71		3.03		2.93	
Standard Deviation	2.04		3.20		3.61		1.37		1.14		1.87	
Valid Samples	4		4		5		4		5		4	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	02/07	09/07	30/07	06/08	03/09	10/09	01/10	08/10	29/10	05/11	03/12	10/12
	3.01		1.31		1.12		1.89		5.45		4.27	
	09/07	17/07	06/08	13/08	10/09	17/09	08/10	15/10	05/11	12/11	10/12	17/12
	2.50		4.13		1.58		1.85		4.41		2.96	
	17/07	23/07	13/08	20/08	17/09	24/09	15/10	22/10	12/11	19/11	17/12	24/12
	2.89		2.70		4.10		4.22		6.01		9.72	
	23/07	30/07	20/08	27/08	24/09	01/10	22/10	29/10	19/11	26/11	24/12	31/12
	1.29		2.14		3.39		4.59		7.55		N	
			27/08	03/09	1.96				26/11	03/12	4.92	
Arithmetic Mean	2.42		2.45		2.55		3.14		5.67		5.65	
Standard Deviation	0.78		1.06		1.42		1.47		1.21		3.59	
Valid Samples	4		5		4		4		5		3	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.



National Environmental Technology Centre  
 Site: 5318 Waunfawr 1 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	02/01 - 08/01	7.50	29/01 - 05/02	2.21	26/02 - 05/03	0.57	02/04 - 09/04	0.49	30/04 - 07/05	0.48	04/06 - 11/06	0.65
	08/01 - 15/01	2.64	05/02 - 12/02	0.69	05/03 - 12/03	0.77	09/04 - 16/04	0.61	07/05 - 14/05	0.51	11/06 - 18/06	0.37
	15/01 - 22/01	1.66	12/02 - 19/02	0.35	12/03 - 19/03	0.65	16/04 - 23/04	1.41	14/05 - 21/05	0.39	18/06 - 25/06	0.31
	22/01 - 29/01	1.11	19/02 - 26/02	<0.31	19/03 - 25/03	0.60	23/04 - 30/04	0.94	21/05 - 28/05	1.11	25/06 - 02/07	<0.26
					25/03 - 02/04	0.48			28/05 - 04/06	1.53		
Arithmetic Mean	3.22		0.85		0.62		0.86		0.80		0.37	
Standard Deviation	2.92		0.93		0.11		0.41		0.49		0.22	
Valid Samples	4		4		5		4		5		4	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	02/07 - 09/07	0.38	30/07 - 06/08	0.53	03/09 - 10/09	0.56	01/10 - 08/10	0.46	29/10 - 05/11	1.30	03/12 - 10/12	0.86
	09/07 - 16/07	0.71	06/08 - 13/08	1.01	10/09 - 17/09	0.35	08/10 - 15/10	0.54	05/11 - 12/11	0.59	10/12 - 17/12	3.50
	16/07 - 23/07	0.34	13/08 - 20/08	1.61	17/09 - 24/09	0.53	15/10 - 22/10	0.78	12/11 - 19/11	0.46	17/12 - 23/12	4.02
	23/07 - 30/07	0.41	20/08 - 27/08	0.70	24/09 - 01/10	0.62	22/10 - 29/10	2.19	19/11 - 26/11	0.40	23/12 - 07/01	0.29
			27/08 - 03/09	0.44					26/11 - 03/12	0.88		
Arithmetic Mean	0.46		0.86		0.51		0.99		0.72		2.17	
Standard Deviation	0.16		0.47		0.12		0.81		0.37		1.86	
Valid Samples	4		5		4		4		5		4	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5319 Fort Augustus 2 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	30/12	- 07/01	0.31	03/02	- 10/02	0.29	03/03	- 10/03	0.56	07/04	- 14/04	0.44	28/04	- 12/05	0.21	02/06	- 09/06	0.44
	07/01	- 13/01	0.83	10/02	- 17/02	<0.32	10/03	- 17/03	0.41	14/04	- 21/04	0.43	12/05	- 19/05	0.34	09/06	- 16/06	0.35
	13/01	- 20/01	0.47	17/02	- 24/02	<0.31	17/03	- 24/03	0.35	21/04	- 28/04	0.38	19/05	- 27/05	0.31	16/06	- 23/06	0.27
	20/01	- 27/01	0.51	24/02	- 03/03	<0.17	24/03	- 07/04	0.21				27/05	- 02/06	0.65	23/06	- 30/06	0.24
	27/01	- 03/02	0.40															
Arithmetic Mean	0.51		0.17		0.38		0.42		0.38		0.33							
Standard Deviation	0.20		0.09		0.15		0.04		0.19		0.09							
Valid Samples	5		4		4		3		4		4							

MONTH	JUL		AUG		SEP		OCT		NOV		DEC							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	30/06	- 07/07	0.44	29/07	- 04/08	0.45	25/08	- 08/09	0.41	29/09	- 06/10	0.27	04/11	- 10/11	<0.38	01/12	- 08/12	<0.35
	07/07	- 29/07	0.41	04/08	- 13/08	0.87	08/09	- 15/09	0.38	06/10	- 20/10	0.19	10/11	- 17/11	<0.34	08/12	- 17/12	0.19
				13/08	- 20/08	N	15/09	- 22/09	0.46	20/10	- 27/10	0.49	17/11	- 01/12	0.73	17/12	- 22/12	0.54
				20/08	- 25/08	1.05	22/09	- 29/09	0.68	27/10	- 04/11	0.36				22/12	- 30/12	0.29
Arithmetic Mean	0.43		0.79		0.48		0.33		0.36		0.30							
Standard Deviation	0.02		0.31		0.13		0.13		0.32		0.17							
Valid Samples	2		3		4		4		3		4							

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5320 Loch Leven 2 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
									29/04 - 05/05	0.68	02/06 - 09/06	2.03
									05/05 - 12/05	1.48	09/06 - 16/06	2.79
									12/05 - 19/05	3.00	16/06 - 23/06	2.50
									19/05 - 26/05	1.27	23/06 - 30/06	1.09
									26/05 - 02/06	4.56		
Arithmetic Mean	-	-	-	-	-	-	-	-		2.20		2.10
Standard Deviation	-	-	-	-	-	-	-	-		1.57		0.75
Valid Samples	0	0	0	0	0	0	0	0		5		4

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	30/06 - 07/07	0.94	04/08 - 11/08	1.91	01/09 - 08/09	3.22	29/09 - 06/10	1.42	03/11 - 10/11	1.39	01/12 - 08/12	6.89
	07/07 - 14/07	2.65	11/08 - 18/08	2.53	08/09 - 15/09	2.11	06/10 - 13/10	1.84	10/11 - 17/11	3.86	08/12 - 22/12	3.03
	14/07 - 21/07	1.18	18/08 - 25/08	2.06	15/09 - 22/09	3.38	13/10 - 20/10	1.00	17/11 - 23/11	2.89	22/12 - 29/12	4.13
	21/07 - 28/07	1.77	25/08 - 01/09	4.70	22/09 - 29/09	2.45	20/10 - 27/10	0.94	23/11 - 01/12	1.98		
	28/07 - 04/08	1.60					27/10 - 03/11	4.48				
Arithmetic Mean	1.63		2.80		2.79		1.94		2.53		4.68	
Standard Deviation	0.66		1.29		0.61		1.47		1.08		1.99	
Valid Samples	5		4		4		5		4		3	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5321 Redesdale 2 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	31/12	- 07/01	0.45	04/02	- 11/02	1.81	04/03	- 10/03	2.19	01/04	- 08/04	0.99	28/04	- 06/05	2.15	03/06	- 10/06	1.45
	07/01	- 14/01	2.19	11/02	- 18/02	N	10/03	- 18/03	0.63	08/04	- 16/04	2.05	06/05	- 13/05	1.43	10/06	- 17/06	1.79
	14/01	- 21/01	0.55	18/02	- 25/02	1.82	18/03	- 25/03	1.18	16/04	- 22/04	0.88	13/05	- 22/05	1.05	17/06	- 24/06	1.17
	21/01	- 28/01	1.37	25/02	- 04/03	1.79	25/03	- 01/04	0.93	22/04	- 28/04	1.96	22/05	- 28/05	1.08	24/06	- 01/07	1.11
	28/01	- 04/02	1.23										28/05	- 03/06	1.29			
Arithmetic Mean	1.16		1.81		1.23		1.47		1.40		1.38							
Standard Deviation	0.70		0.02		0.68		0.62		0.44		0.31							
Valid Samples	5		3		4		4		5		4							

MONTH	JUL		AUG		SEP		OCT		NOV		DEC							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	01/07	- 08/07	1.09	29/07	- 05/08	0.88	02/09	- 10/09	1.07	30/09	- 07/10	0.69	04/11	- 11/11	0.41	02/12	- 09/12	0.41
	08/07	- 15/07	2.49	05/08	- 12/08	1.26	10/09	- 16/09	1.07	07/10	- 14/10	0.65	11/11	- 18/11	0.37	09/12	- 16/12	1.78
	15/07	- 22/07	1.05	12/08	- 19/08	N	16/09	- 23/09	0.85	14/10	- 21/10	0.77	18/11	- 25/11	1.51	16/12	- 23/12	1.28
	22/07	- 29/07	1.19	19/08	- 26/08	1.23	23/09	- 30/09	0.98	21/10	- 28/10	0.33	25/11	- 02/12	0.57			
				26/08	- 02/09	N				28/10	- 04/11	0.46						
Arithmetic Mean	1.46		1.12		0.99		0.58		0.71		1.16							
Standard Deviation	0.69		0.21		0.10		0.18		0.54		0.70							
Valid Samples	4		3		4		5		4		3							

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5322 Hebden Bridge 2 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	02/01 - 08/01	9.09	29/01 - 05/02	14.31	26/02 - 05/03	2.63	02/04 - 09/04	2.77	30/04 - 07/05	3.12	04/06 - 11/06	5.90
	08/01 - 15/01	6.16	05/02 - 12/02	2.85	05/03 - 12/03	8.65	09/04 - 16/04	2.24	07/05 - 14/05	1.79	11/06 - 18/06	3.12
	15/01 - 22/01	7.27	12/02 - 19/02	N	12/03 - 19/03	1.65	16/04 - 23/04	2.07	14/05 - 21/05	2.99	18/06 - 25/06	1.87
	22/01 - 29/01	6.60	19/02 - 26/02	2.50	19/03 - 26/03	2.85	23/04 - 30/04	2.77	21/05 - 28/05	1.83	25/06 - 02/07	0.82
					26/03 - 02/04	1.23			28/05 - 04/06	4.41		
Arithmetic Mean	7.28		6.56		3.40		2.46		2.83		2.93	
Standard Deviation	1.29		6.72		3.01		0.36		1.08		2.19	
Valid Samples	4		3		5		4		5		4	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	02/07 - 09/07	2.71	29/07 - 06/08	2.65	03/09 - 10/09	1.32	01/10 - 08/10	0.59	29/10 - 05/11	7.30	03/12 - 10/12	2.68
	09/07 - 16/07	7.02	06/08 - 13/08	5.91	10/09 - 17/09	2.34	08/10 - 15/10	2.05	05/11 - 12/11	3.46	10/12 - 17/12	1.85
	16/07 - 23/07	N	13/08 - 20/08	3.51	17/09 - 24/09	5.34	15/10 - 22/10	5.12	12/11 - 19/11	2.27	17/12 - 24/12	9.44
	23/07 - 29/07	1.10	20/08 - 27/08	2.56	24/09 - 01/10	5.99	22/10 - 29/10	4.76	19/11 - 26/11	5.17	24/12 - 07/01	1.27
			27/08 - 03/09	2.01					26/11 - 03/12	6.17		
Arithmetic Mean	3.61		3.33		3.75		3.13		4.87		3.81	
Standard Deviation	3.06		1.54		2.27		2.18		2.03		3.80	
Valid Samples	3		5		4		4		5		4	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5323 Preston Montford 2 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	01/01 - 08/01	6.41	29/01 - 05/02	2.59	27/02 - 05/03	1.88	02/04 - 09/04	1.23	30/04 - 07/05	0.71	04/06 - 10/06	3.32
	08/01 - 15/01	3.29	05/02 - 12/02	0.52	05/03 - 12/03	2.31	09/04 - 16/04	2.72	07/05 - 14/05	0.45	10/06 - 18/06	1.25
	15/01 - 22/01	2.21	12/02 - 19/02	0.63	12/03 - 26/03	0.79	16/04 - 22/04	4.28	14/05 - 21/05	4.46	18/06 - 25/06	1.06
	22/01 - 29/01	1.39	19/02 - 27/02	0.38	26/03 - 02/04	0.57	22/04 - 30/04	1.24	21/05 - 28/05	3.59	25/06 - 02/07	1.65
									28/05 - 04/06	2.94		
Arithmetic Mean	3.32		1.03		1.39		2.37		2.43		1.82	
Standard Deviation	2.20		1.05		0.84		1.45		1.77		1.03	
Valid Samples	4		4		4		4		5		4	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	02/07 - 09/07	0.64	30/07 - 06/08	1.40	03/09 - 10/09	0.48	01/10 - 08/10	0.61	29/10 - 05/11	3.07	05/12 - 10/12	1.89
	09/07 - 16/07	2.99	06/08 - 13/08	2.42	10/09 - 17/09	0.63	08/10 - 15/10	0.91	05/11 - 12/11	0.84	10/12 - 17/12	2.06
	16/07 - 23/07	1.05	13/08 - 20/08	1.15	17/09 - 24/09	5.48	15/10 - 22/10	1.73	12/11 - 19/11	0.48	17/12 - 24/12	3.22
	23/07 - 30/07	0.43	20/08 - 27/08	0.74	24/09 - 01/10	4.69	22/10 - 29/10	3.71	19/11 - 26/11	2.70	24/12 - 31/12	0.48
			27/08 - 03/09	0.75					26/11 - 05/12	2.08		
Arithmetic Mean	1.28		1.29		2.82		1.74		1.83		1.91	
Standard Deviation	1.17		0.69		2.64		1.40		1.13		1.12	
Valid Samples	4		5		4		4		5		4	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5324 Bentra - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	31/12	- 07/01	04/02	- 11/02	04/03	- 11/03	02/04	- 08/04	29/04	- 06/05	03/06	- 10/06
	07/01	- 14/01	11/02	- 19/02	11/03	- 19/03	08/04	- 15/04	06/05	- 14/05	10/06	- 17/06
	14/01	- 22/01	19/02	- 25/02	19/03	- 26/03	15/04	- 22/04	14/05	- 20/05	17/06	- 24/06
	22/01	- 28/01	25/02	- 04/03	26/03	- 02/04	22/04	- 29/04	20/05	- 27/05	24/06	- 03/07
	28/01	- 04/02							27/05	- 03/06		
Arithmetic Mean	2.86		2.52		2.17		1.50		1.74		3.58	
Standard Deviation	1.32		0.69		1.35		0.49		0.95		2.43	
Valid Samples	5		4		4		4		5		4	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	03/07	- 09/07	29/07	- 05/08	02/09	- 09/09	30/09	- 07/10	04/11	- 11/11	02/12	- 09/12
	09/07	- 16/07	05/08	- 12/08	09/09	- 18/09	07/10	- 14/10	11/11	- 19/11	09/12	- 17/12
	16/07	- 22/07	12/08	- 19/08	18/09	- 23/09	14/10	- 21/10	19/11	- 25/11	17/12	- 23/12
	22/07	- 29/07	19/08	- 28/08	23/09	- 30/09	21/10	- 28/10	25/11	- 02/12	23/12	- 30/12
			28/08	- 02/09			28/10	- 04/11				
Arithmetic Mean	1.63		1.28		2.41		1.82		1.78		2.09	
Standard Deviation	0.29		0.21		0.31		0.43		0.78		0.67	
Valid Samples	4		5		4		5		4		4	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5325 Pitlochry - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	03/01 - 10/01	0.68	30/01 - 06/02	1.52	27/02 - 06/03	0.82	03/04 - 10/04	0.60	01/05 - 08/05	0.46	29/05 - 05/06	0.93
	10/01 - 16/01	1.35	06/02 - 18/02	0.46	06/03 - 13/03	0.67	10/04 - 17/04	0.67	08/05 - 16/05	0.76	05/06 - 12/06	0.81
	16/01 - 23/01	1.02	18/02 - 21/02	0.39	13/03 - 20/03	0.52	17/04 - 24/04	0.49	16/05 - 22/05	0.61	12/06 - 19/06	0.72
	23/01 - 30/01	0.78	21/02 - 27/02	0.56	20/03 - 27/03	0.60	24/04 - 01/05	0.77	22/05 - 29/05	0.47	19/06 - 27/06	0.73
					27/03 - 03/04	0.65					27/06 - 04/07	0.50
Arithmetic Mean	0.96		0.73		0.65		0.63		0.57		0.74	
Standard Deviation	0.30		0.53		0.11		0.11		0.14		0.16	
Valid Samples	4		4		5		4		4		5	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	04/07 - 10/07	0.79	31/07 - 07/08	0.80	04/09 - 11/09	0.41	02/10 - 09/10	0.56	31/10 - 06/11	0.39	04/12 - 11/12	0.45
	10/07 - 17/07	0.54	07/08 - 15/08	0.89	11/09 - 18/09	0.55	09/10 - 16/10	0.75	06/11 - 13/11	0.36	11/12 - 18/12	0.37
	17/07 - 24/07	N	15/08 - 21/08	0.94	18/09 - 26/09	0.90	16/10 - 23/10	0.43	13/11 - 20/11	1.09	18/12 - 24/12	1.09
	24/07 - 31/07	0.44	21/08 - 28/08	0.76	26/09 - 02/10	0.46	23/10 - 31/10	0.79	20/11 - 27/11	1.31	24/12 - 05/01	0.29
			28/08 - 04/09	0.66					27/11 - 04/12	0.44		
Arithmetic Mean	0.59		0.81		0.58		0.63		0.72		0.55	
Standard Deviation	0.18		0.11		0.22		0.17		0.45		0.36	
Valid Samples	3		5		4		4		5		4	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.



National Environmental Technology Centre  
 Site: 5329 Cam Forest - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	03/01	- 10/01	1.08	31/01	- 07/02	1.76	28/02	- 07/03	0.69	04/04	- 11/04	0.68	02/05	- 09/05	0.93	30/05	- 06/06	1.47
	10/01	- 17/01	0.76	07/02	- 14/02	0.67	07/03	- 14/03	0.57	11/04	- 18/04	0.63	09/05	- 16/05	0.68	06/06	- 13/06	N
	17/01	- 24/01	0.71	14/02	- 21/02	<0.45	14/03	- 21/03	0.50	18/04	- 24/04	0.81	16/05	- 23/05	0.72	13/06	- 20/06	0.49
	24/01	- 31/01	0.88	21/02	- 28/02	<0.45	21/03	- 28/03	0.62	24/04	- 02/05	0.63	23/05	- 30/05	1.07	20/06	- 27/06	0.53
							28/03	- 04/04	0.46							27/06	- 04/07	0.49
Arithmetic Mean	0.86		0.72		0.57		0.69		0.85		0.74							
Standard Deviation	0.17		0.73		0.09		0.09		0.18		0.48							
Valid Samples	4		4		5		4		4		4							

MONTH	JUL		AUG		SEP		OCT		NOV		DEC							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	04/07	- 11/07	0.87	01/08	- 08/08	0.88	29/08	- 05/09	1.04	03/10	- 10/10	0.64	31/10	- 07/11	0.80	28/11	- 05/12	0.95
	11/07	- 18/07	1.14	08/08	- 15/08	0.88	05/09	- 12/09	1.07	10/10	- 17/10	0.56	07/11	- 14/11	0.33	05/12	- 12/12	0.45
	18/07	- 25/07	0.69	15/08	- 22/08	1.50	12/09	- 19/09	0.85	17/10	- 24/10	0.45	14/11	- 21/11	0.43	12/12	- 19/12	0.88
	25/07	- 01/08	0.74	22/08	- 29/08	0.86	19/09	- 26/09	1.86	24/10	- 31/10	0.98	21/11	- 28/11	1.29	19/12	- 26/12	0.53
							26/09	- 03/10	1.09							26/12	- 02/01	0.41
Arithmetic Mean	0.86		1.03		1.18		0.66		0.71		0.64							
Standard Deviation	0.20		0.31		0.39		0.23		0.44		0.25							
Valid Samples	4		4		5		4		4		5							

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5330 Cwmystwyth - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	31/12	- 08/01	4.98	30/01	- 06/02	1.67	27/02	- 06/03	0.99	30/03	- 03/04	1.40	01/05	- 09/05	0.71	29/05	- 05/06	2.13
	08/01	- 15/01	3.78	06/02	- 12/02	0.88	06/03	- 12/03	1.73	03/04	- 10/04	1.02	09/05	- 16/05	0.75	05/06	- 12/06	0.94
	15/01	- 23/01	1.70	12/02	- 21/02	0.58	12/03	- 19/03	0.84	10/04	- 17/04	2.81	16/05	- 22/05	1.53	12/06	- 19/06	1.16
	23/01	- 30/01	2.74	21/02	- 27/02	0.76	19/03	- 30/03	0.50	17/04	- 25/04	2.35	22/05	- 29/05	2.41	19/06	- 27/06	0.59
										25/04	- 01/05	4.46				27/06	- 04/07	0.81
Arithmetic Mean	3.30		0.97		1.01		2.41		1.35		1.13							
Standard Deviation	1.40		0.48		0.52		1.35		0.80		0.59							
Valid Samples	4		4		4		5		4		5							

MONTH	JUL		AUG		SEP		OCT		NOV		DEC							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	04/07	- 10/07	0.93	31/07	- 10/08	0.85	04/09	- 15/09	0.58	29/09	- 07/10	0.64	28/10	- 06/11	1.31	27/11	- 07/12	1.50
	10/07	- 17/07	0.81	10/08	- 15/08	1.64	15/09	- 23/09	1.61	07/10	- 13/10	0.78	06/11	- 12/11	1.14	07/12	- 16/12	1.24
	17/07	- 25/07	0.78	15/08	- 21/08	1.37	23/09	- 29/09	1.67	13/10	- 22/10	1.17	12/11	- 19/11	0.63	16/12	- 23/12	2.23
	25/07	- 31/07	1.04	21/08	- 28/08	0.63				22/10	- 28/10	4.87	19/11	- 27/11	0.84	23/12	- 31/12	0.53
				28/08	- 04/09	0.59												
Arithmetic Mean	0.89		1.01		1.29		1.86		0.98		1.37							
Standard Deviation	0.12		0.47		0.61		2.02		0.30		0.70							
Valid Samples	4		5		3		4		4		4							

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5331 Rosemaund - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	01/01 - 08/01	6.44	29/01 - 05/02	1.57	26/02 - 05/03	0.98	02/04 - 09/04	0.85	30/04 - 07/05	0.98	04/06 - 11/06	0.93
	08/01 - 15/01	2.33	05/02 - 12/02	1.15	05/03 - 12/03	1.41	09/04 - 16/04	2.64	07/05 - 14/05	0.48	11/06 - 18/06	0.87
	15/01 - 22/01	2.79	12/02 - 19/02	0.83	12/03 - 19/03	0.53	16/04 - 24/04	1.94	14/05 - 21/05	0.79	18/06 - 25/06	0.54
	22/01 - 29/01	N	19/02 - 26/02	0.67	19/03 - 26/03	0.83	24/04 - 30/04	1.67	21/05 - 28/05	2.07	25/06 - 02/07	1.25
					26/03 - 02/04	0.46			28/05 - 04/06	1.38		
Arithmetic Mean	3.85		1.05		0.84		1.78		1.14		0.90	
Standard Deviation	2.25		0.40		0.38		0.74		0.61		0.29	
Valid Samples	3		4		5		4		5		4	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	02/07 - 10/07	0.74	30/07 - 06/08	0.67	03/09 - 10/09	0.50	02/10 - 08/10	1.27	29/10 - 05/11	1.03	03/12 - 10/12	2.44
	10/07 - 16/07	0.47	06/08 - 13/08	0.93	10/09 - 17/09	0.71	08/10 - 15/10	0.90	05/11 - 12/11	0.92	10/12 - 17/12	1.10
	16/07 - 23/07	0.77	13/08 - 20/08	1.31	17/09 - 24/09	1.21	15/10 - 22/10	0.85	12/11 - 19/11	0.58	17/12 - 24/12	N
	23/07 - 30/07	0.85	20/08 - 27/08	0.98	24/09 - 02/10	N	22/10 - 29/10	4.03	19/11 - 26/11	1.11	24/12 - 07/01	0.33
			27/08 - 03/09	0.68					26/11 - 03/12	2.23		
Arithmetic Mean	0.71		0.91		0.81		1.76		1.17		1.29	
Standard Deviation	0.17		0.26		0.37		1.52		0.63		1.07	
Valid Samples	4		5		3		4		5		3	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5333 Fairseat - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	07/01 - 14/01	8.08	04/02 - 11/02	1.69	04/03 - 11/03	1.93	01/04 - 08/04	1.78	29/04 - 05/05	1.50	03/06 - 10/06	4.24
	14/01 - 21/01	2.74	11/02 - 18/02	1.65	11/03 - 18/03	1.91	08/04 - 15/04	2.45	05/05 - 13/05	1.01	10/06 - 17/06	1.25
	21/01 - 28/01	5.03	18/02 - 25/02	0.87	18/03 - 25/03	2.04	15/04 - 22/04	2.81	13/05 - 20/05	0.87	17/06 - 24/06	1.44
	28/01 - 04/02	4.07	25/02 - 04/03	0.93	25/03 - 01/04	1.31	22/04 - 29/04	1.95	20/05 - 27/05	2.62	24/06 - 01/07	1.72
									27/05 - 03/06	5.32		
Arithmetic Mean	4.98		1.28		1.80		2.25		2.27		2.16	
Standard Deviation	2.27		0.45		0.33		0.47		1.84		1.40	
Valid Samples	4		4		4		4		5		4	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	01/07 - 08/07	1.37	29/07 - 05/08	1.15	02/09 - 09/09	0.70	30/09 - 07/10	1.82	04/11 - 11/11	0.85	02/12 - 09/12	1.22
	08/07 - 15/07	2.62	05/08 - 12/08	2.04	09/09 - 16/09	1.47	07/10 - 14/10	0.62	11/11 - 18/11	0.58	09/12 - 16/12	1.81
	15/07 - 22/07	3.01	12/08 - 19/08	1.85	16/09 - 23/09	1.85	14/10 - 21/10	1.41	18/11 - 25/11	N	16/12 - 23/12	2.04
	22/07 - 29/07	2.12	19/08 - 26/08	1.65	23/09 - 30/09	2.16	21/10 - 28/10	3.11	25/11 - 02/12	N	23/12 - 30/12	1.79
			26/08 - 02/09	0.58			28/10 - 04/11	4.98				
Arithmetic Mean	2.28		1.45		1.55		2.39		-		1.71	
Standard Deviation	0.71		0.59		0.63		1.71		-		0.35	
Valid Samples	4		5		4		5		2		4	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5334 Bylchau - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	02/01 - 08/01	8.51	29/01 - 05/02	2.09	26/02 - 07/03	0.46	02/04 - 10/04	0.34	30/04 - 08/05	0.46	03/06 - 12/06	0.87
	08/01 - 16/01	4.17	05/02 - 12/02	1.20	07/03 - 12/03	0.87	10/04 - 17/04	0.96	08/05 - 14/05	0.22	12/06 - 18/06	0.79
	16/01 - 23/01	1.80	12/02 - 19/02	0.35	12/03 - 19/03	2.31	17/04 - 23/04	2.17	14/05 - 21/05	0.57	18/06 - 26/06	0.35
	23/01 - 29/01	0.71	19/02 - 26/02	0.22	19/03 - 26/03	0.33	23/04 - 30/04	0.40	21/05 - 28/05	2.51	26/06 - 02/07	0.26
					26/03 - 02/04	0.21			28/05 - 03/06	3.51		
Arithmetic Mean	3.80		0.97		0.83		0.97		1.45		0.57	
Standard Deviation	3.46		0.86		0.86		0.85		1.47		0.31	
Valid Samples	4		4		5		4		5		4	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	02/07 - 09/07	N	31/07 - 06/08	0.77	03/09 - 10/09	0.29	01/10 - 08/10	0.31	29/10 - 05/11	1.47	27/11 - 11/12	0.46
	09/07 - 16/07	N	06/08 - 13/08	1.29	10/09 - 17/09	0.38	08/10 - 17/10	0.29	05/11 - 12/11	0.40	11/12 - 17/12	1.49
	16/07 - 24/07	1.35	13/08 - 21/08	0.61	17/09 - 23/09	2.12	17/10 - 22/10	1.91	12/11 - 19/11	0.21	17/12 - 24/12	1.16
	24/07 - 31/07	0.33	21/08 - 28/08	1.49	23/09 - 01/10	3.13	22/10 - 29/10	4.37	19/11 - 27/11	0.67		
			28/08 - 03/09	0.34								
Arithmetic Mean	-		0.90		1.48		1.72		0.69		1.04	
Standard Deviation	-		0.48		1.39		1.92		0.56		0.53	
Valid Samples	2		5		4		4		4		3	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5335 Crai - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	24/12	- 16/01	N	07/02	- 13/02	2.15	28/02	- 03/04	N	03/04	- 14/04	2.91	02/05	- 08/05	0.67	30/05	- 06/06	1.09
	16/01	- 23/01	2.59	13/02	- 20/02	0.52				14/04	- 24/04	2.16	08/05	- 19/05	0.60	06/06	- 13/06	0.85
	23/01	- 07/02	2.44	20/02	- 28/02	0.58				24/04	- 02/05	1.30	19/05	- 30/05	0.73	13/06	- 20/06	2.24
																20/06	- 26/06	0.38
																26/06	- 03/07	0.67
Arithmetic Mean	-		1.08		-		2.12		0.67		1.05							
Standard Deviation	-		0.92		-		0.80		0.07		0.72							
Valid Samples	2		3		0		3		3		5							

MONTH	JUL		AUG		SEP		OCT		NOV		DEC							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	03/07	- 14/07	N	01/08	- 08/08	0.72	29/08	- 05/09	0.54	03/10	- 10/10	0.70	31/10	- 07/11	1.66	28/11	- 05/12	2.78
	14/07	- 18/07	0.95	08/08	- 15/08	1.28	05/09	- 12/09	0.88	10/10	- 17/10	0.58	07/11	- 14/11	0.75	05/12	- 12/12	2.15
	18/07	- 25/07	1.06	15/08	- 22/08	2.00	12/09	- 19/09	0.61	17/10	- 24/10	1.67	14/11	- 21/11	1.02	12/12	- 19/12	1.97
	25/07	- 01/08	0.71	22/08	- 29/08	0.73	19/09	- 26/09	1.53	24/10	- 31/10	N	21/11	- 28/11	1.26	19/12	- 24/12	1.92
							26/09	- 03/10	0.95							24/12	- 01/01	0.63
Arithmetic Mean	0.91		1.18		0.90		0.98		1.17		1.89							
Standard Deviation	0.18		0.60		0.39		0.59		0.38		0.78							
Valid Samples	3		4		5		3		4		5							

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5336 Husborne Crawley 2 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	31/12	- 07/01	04/02	- 11/02	04/03	- 11/03	01/04	- 08/04	29/04	- 06/05	03/06	- 10/06
	07/01	- 14/01	11/02	- 18/02	11/03	- 18/03	08/04	- 15/04	06/05	- 13/05	10/06	- 17/06
	14/01	- 21/01	18/02	- 25/02	18/03	- 01/04	15/04	- 22/04	13/05	- 20/05	17/06	- 24/06
	21/01	- 28/01	25/02	- 04/03			22/04	- 29/04	20/05	- 27/05	24/06	- 01/07
	28/01	- 04/02							27/05	- 03/06		
Arithmetic Mean	4.11		1.39		2.88		2.91		1.84		1.53	
Standard Deviation	1.85		0.38		0.74		1.83		0.97		0.36	
Valid Samples	5		4		3		4		5		4	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	01/07	- 08/07	29/07	- 05/08	02/09	- 09/09	30/09	- 07/10	04/11	- 11/11	02/12	- 11/12
	08/07	- 15/07	05/08	- 12/08	09/09	- 16/09	07/10	- 15/10	11/11	- 18/11	11/12	- 16/12
	15/07	- 22/07	12/08	- 19/08	16/09	- 23/09	15/10	- 21/10	18/11	- 25/11	16/12	- 23/12
	22/07	- 29/07	19/08	- 26/08	23/09	- 30/09	21/10	- 28/10	25/11	- 02/12	23/12	- 30/12
			26/08	- 02/09			28/10	- 04/11				
Arithmetic Mean	1.78		2.36		1.71		3.24		2.37		3.13	
Standard Deviation	0.91		1.08		0.50		1.73		1.87		1.62	
Valid Samples	4		5		4		5		4		4	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5337 Ratcliffe 18 - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	02/01 - 09/01	5.71	30/01 - 06/02	3.03	27/02 - 06/03	4.10	03/04 - 10/04	3.45	01/05 - 08/05	1.48	29/05 - 05/06	4.50
	09/01 - 16/01	3.92	06/02 - 13/02	4.76	06/03 - 13/03	3.28	10/04 - 17/04	7.40	08/05 - 15/05	2.64	05/06 - 12/06	1.92
	16/01 - 23/01	4.19	13/02 - 20/02	3.11	13/03 - 20/03	3.72	17/04 - 24/04	5.64	15/05 - 22/05	6.40	12/06 - 19/06	2.77
	23/01 - 30/01	3.72	20/02 - 27/02	4.29	20/03 - 27/03	7.05	24/04 - 01/05	2.50	22/05 - 29/05	4.82	19/06 - 26/06	2.61
					27/03 - 03/04	2.19					26/06 - 03/07	3.60
Arithmetic Mean	4.39		3.79		4.07		4.75		3.84		3.08	
Standard Deviation	0.91		0.86		1.81		2.20		2.20		1.00	
Valid Samples	4		4		5		4		4		5	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	03/07 - 10/07	3.64	31/07 - 07/08	3.25	04/09 - 11/09	3.76	02/10 - 09/10	2.62	30/10 - 06/11	2.52	04/12 - 11/12	3.81
	10/07 - 17/07	3.23	07/08 - 14/08	6.32	11/09 - 18/09	3.22	09/10 - 16/10	2.08	06/11 - 13/11	2.36	11/12 - 18/12	2.30
	17/07 - 24/07	4.62	14/08 - 21/08	4.95	18/09 - 25/09	1.95	16/10 - 23/10	4.72	13/11 - 20/11	1.08	18/12 - 23/12	12.46
	24/07 - 31/07	1.16	21/08 - 28/08	N	25/09 - 02/10	2.92	23/10 - 30/10	3.86	20/11 - 27/11	2.04	23/12 - 29/12	1.56
			28/08 - 04/09	N					27/11 - 04/12	3.54		
Arithmetic Mean	3.16		4.84		2.96		3.32		2.31		5.03	
Standard Deviation	1.46		1.54		0.76		1.19		0.89		5.04	
Valid Samples	4		3		4		4		5		4	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.



National Environmental Technology Centre  
 Site: 5338 Forsinain - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	31/12	- 07/01	<0.25	04/02	- 11/02	0.31	04/03	- 11/03	0.32	01/04	- 08/04	0.21	29/04	- 06/05	0.18	03/06	- 10/06	0.33
	07/01	- 14/01	0.40	11/02	- 18/02	0.21	11/03	- 18/03	0.24	08/04	- 15/04	0.37	06/05	- 13/05	<0.18	10/06	- 17/06	0.21
	14/01	- 21/01	0.41	18/02	- 25/02	0.25	18/03	- 25/03	0.20	15/04	- 22/04	0.84	13/05	- 20/05	0.23	17/06	- 24/06	0.35
	21/01	- 28/01	0.20	25/02	- 04/03	<0.16	25/03	- 01/04	0.20	22/04	- 29/04	0.28	20/05	- 27/05	0.19	24/06	- 01/07	0.14
	28/01	- 04/02	0.23							27/05	- 03/06	0.18						
Arithmetic Mean			0.27			0.21			0.24			0.42			0.18			0.26
Standard Deviation			0.13			0.10			0.06			0.28			0.05			0.10
Valid Samples			5			4			4			4			5			4

MONTH	JUL		AUG		SEP		OCT		NOV		DEC							
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End						
	01/07	- 08/07	0.25	28/07	- 05/08	0.36	02/09	- 09/09	0.25	30/09	- 07/10	N	04/11	- 11/11	0.21	02/12	- 09/12	0.21
	08/07	- 15/07	0.34	05/08	- 12/08	0.27	09/09	- 16/09	0.22	07/10	- 14/10	0.48	11/11	- 16/11	0.28	09/12	- 16/12	0.20
	15/07	- 28/07	0.21	12/08	- 19/08	0.39	16/09	- 23/09	0.23	14/10	- 22/10	0.31	16/11	- 25/11	0.86	16/12	- 23/12	0.30
				19/08	- 26/08	0.47	23/09	- 30/09	0.28	22/10	- 28/10	0.25	25/11	- 02/12	0.44	23/12	- 30/12	0.33
				26/08	- 02/09	0.40				28/10	- 04/11	0.40						
Arithmetic Mean			0.26			0.38			0.25			0.36			0.45			0.26
Standard Deviation			0.07			0.07			0.03			0.10			0.29			0.07
Valid Samples			3			5			4			4			4			4

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5339 Appleacre - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	01/01 - 08/01	3.73	29/01 - 05/02	3.01	26/02 - 05/03	1.63	02/04 - 09/04	1.74	30/04 - 07/05	1.04	04/06 - 11/06	1.32
	08/01 - 15/01	4.85	05/02 - 12/02	1.07	05/03 - 12/03	2.83	09/04 - 16/04	1.99	07/05 - 14/05	0.78	11/06 - 18/06	0.80
	15/01 - 22/01	3.65	12/02 - 19/02	1.60	12/03 - 19/03	0.17	16/04 - 23/04	1.92	14/05 - 21/05	0.95	18/06 - 25/06	1.16
	22/01 - 29/01	4.41	19/02 - 26/02	0.98	19/03 - 26/03	2.54	23/04 - 30/04	1.13	21/05 - 28/05	0.85	25/06 - 29/06	0.60
					26/03 - 02/04	1.37			28/05 - 04/06	2.04		
Arithmetic Mean	4.16		1.67		1.71		1.69		1.13		0.97	
Standard Deviation	0.57		0.94		1.05		0.39		0.52		0.33	
Valid Samples	4		4		5		4		5		4	

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	29/06 - 13/07	N	30/07 - 06/08	0.89	03/09 - 10/09	0.38	01/10 - 08/10	0.58	29/10 - 05/11	2.63	03/12 - 10/12	1.30
	13/07 - 16/07	0.53	06/08 - 13/08	2.10	10/09 - 17/09	0.26	08/10 - 15/10	1.03	05/11 - 12/11	1.91	10/12 - 17/12	1.91
	16/07 - 23/07	0.57	13/08 - 20/08	2.46	17/09 - 24/09	1.85	15/10 - 22/10	0.64	12/11 - 19/11	1.21	17/12 - 24/12	3.63
	23/07 - 30/07	0.49	20/08 - 27/08	1.10	24/09 - 01/10	1.97	22/10 - 29/10	2.26	19/11 - 26/11	4.65	24/12 - 31/12	2.02
			27/08 - 03/09	1.63					26/11 - 03/12	4.09		
Arithmetic Mean	0.53		1.64		1.12		1.13		2.90		2.22	
Standard Deviation	0.04		0.66		0.92		0.78		1.45		1.00	
Valid Samples	3		5		4		4		5		4	

Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

National Environmental Technology Centre  
 Site: 5340 Garrary - Sulphur Dioxide as S (SO<sub>2</sub> - S)  
 Concentration in air (µg S m<sup>-3</sup>)

Weekly measurements, collection-day - non standard  
 Summary for January 1997 to December 1997

MONTH	JAN		FEB		MAR		APR		MAY		JUN	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
Arithmetic Mean	-	-	-	-	-	-	-	-	-	-	-	-
Standard Deviation	-	-	-	-	-	-	-	-	-	-	-	-
Valid Samples	0	0	0	0	0	0	0	0	0	0	0	0

MONTH	JUL		AUG		SEP		OCT		NOV		DEC	
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
									31/10 - 07/11	1.42	28/11 - 07/12	0.81
									07/11 - 14/11	0.40	07/12 - 12/12	<0.42
									14/11 - 21/11	0.44	12/12 - 19/12	0.90
									21/11 - 28/11	0.86	19/12 - 26/12	0.95
											26/12 - 02/01	0.32
Arithmetic Mean	-	-	-	-	-	-	-	-		0.78		0.64
Standard Deviation	-	-	-	-	-	-	-	-		0.47		0.35
Valid Samples	0	0	0	0	0	0	0	0	4			5

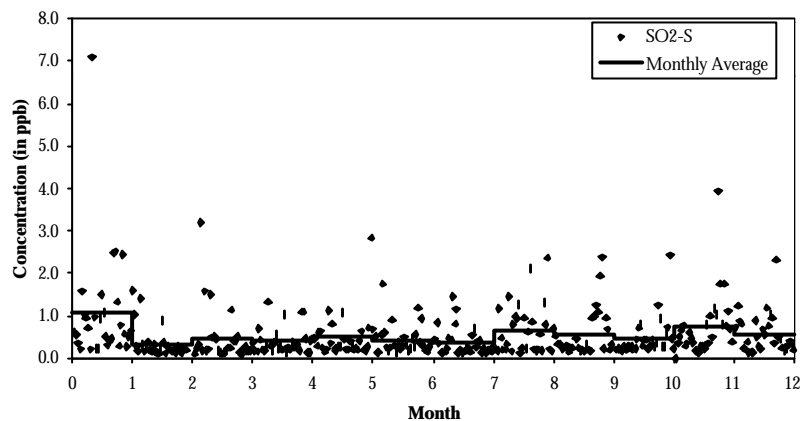
Notes (1) N = no measurement; (2) Measurements preceded by < are below the Limit of Detection. The measurement has been included in the calculation of the statistical parameters at 50% of its value; (3) Statistical parameters calculated only if data capture is greater than 75%.

# Appendix 3

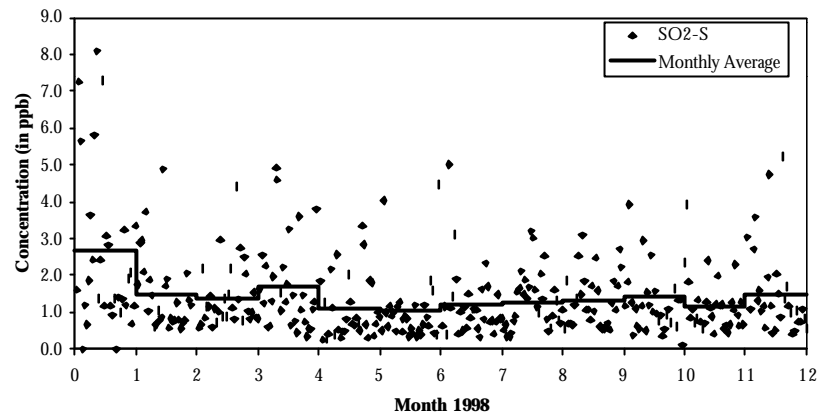
## GRAPHS OF MEASURED AND MONTHLY MEAN SO<sub>2</sub> CONCENTRATIONS

Note: In the graphs that follow, the monthly-averaged concentration has been set to zero if the data capture was less than 75% for the month.

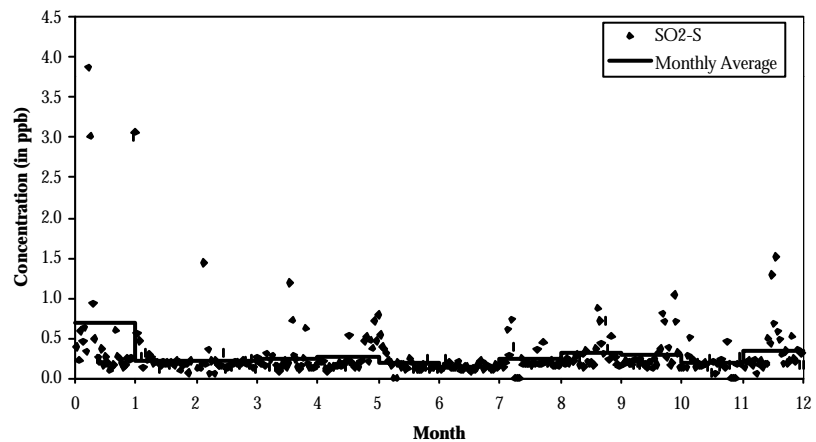
5002 Eskdalemuir



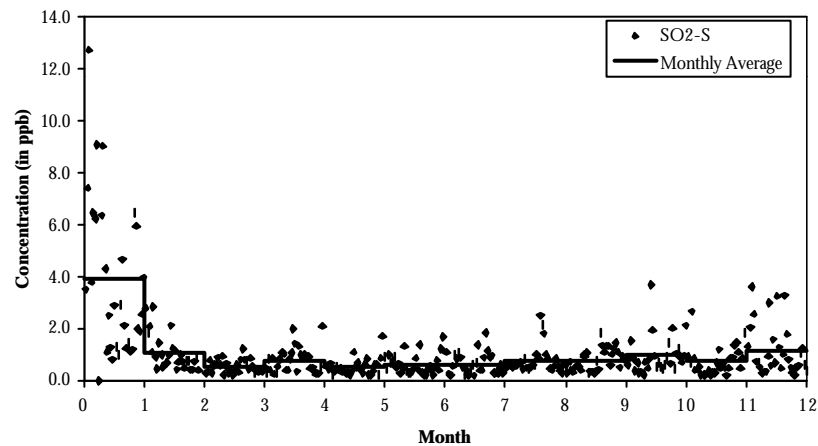
5004 Stoke Ferry



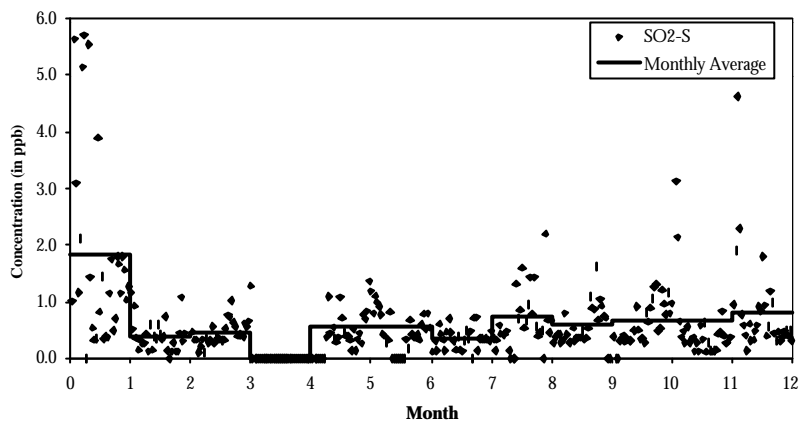
5006 Lough Navar



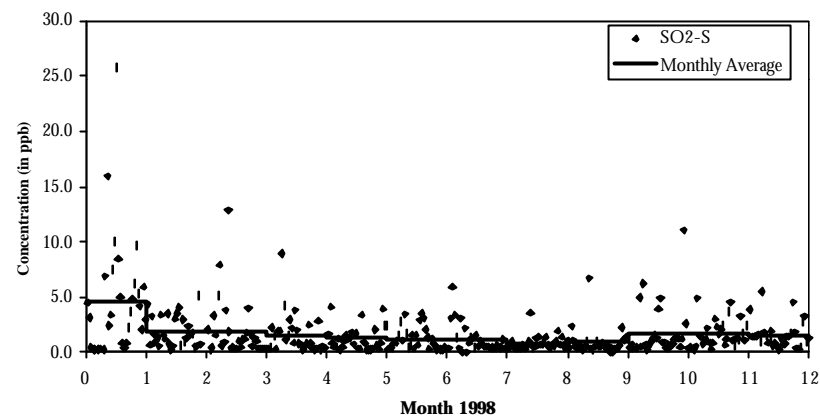
5007 Barcombe Mills



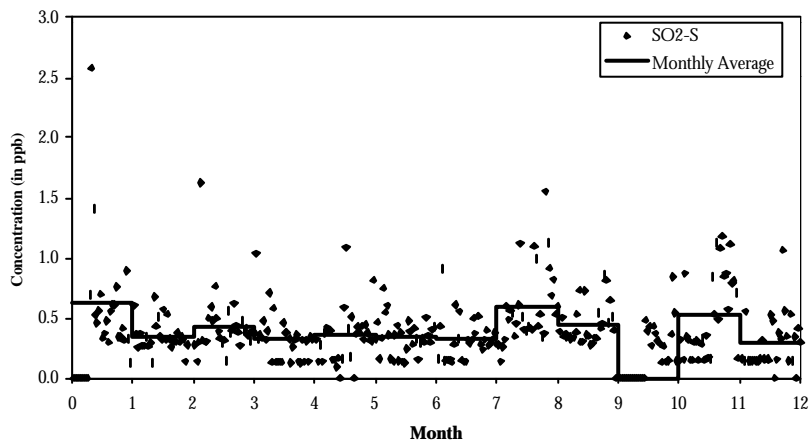
5008 Yarner Wood



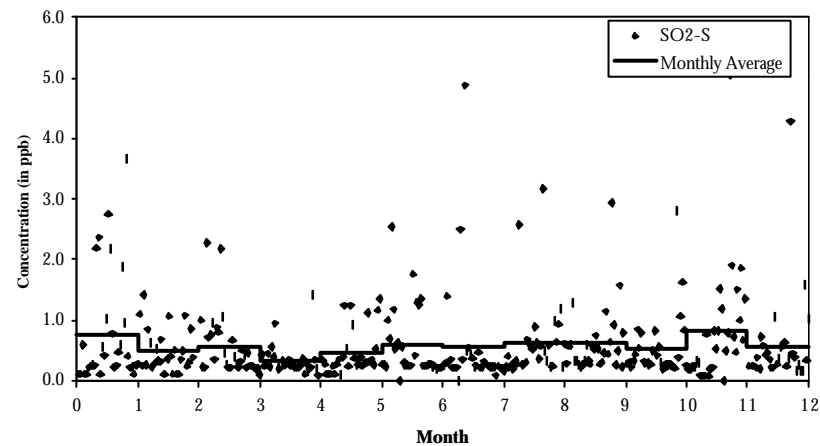
5009 High Muffles



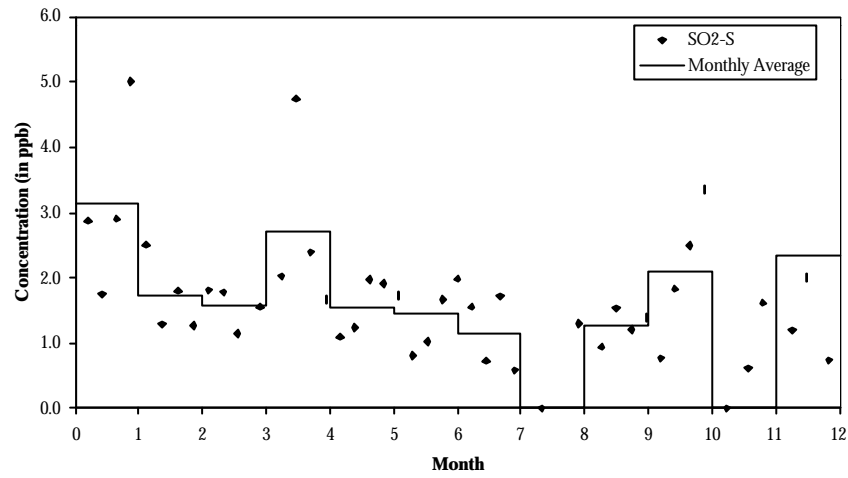
5010 Strathvaich Dam



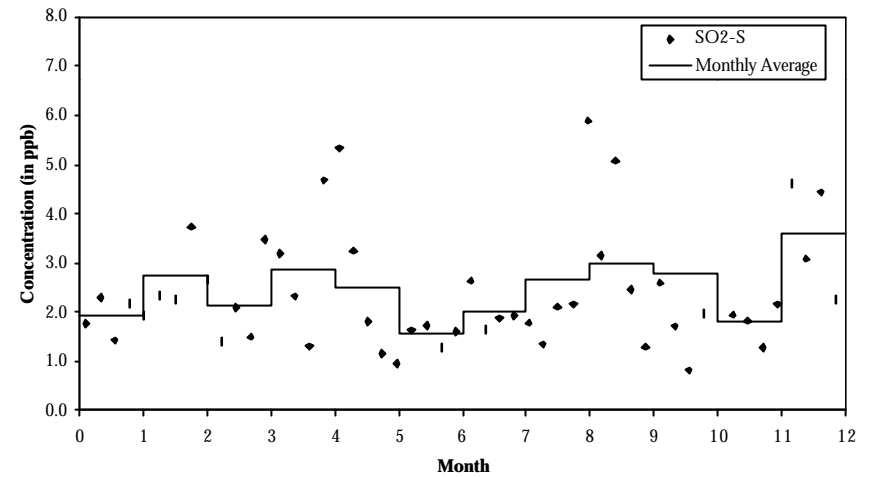
5011 Glen Dye



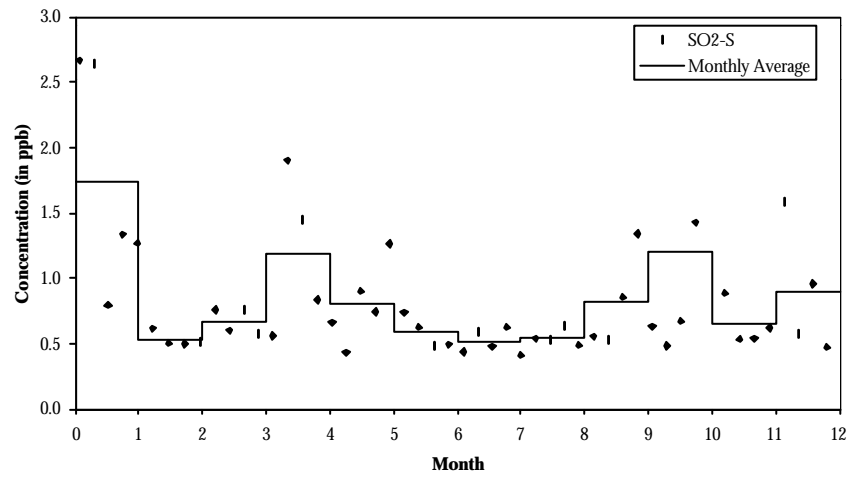
**5301 Brockhill 1**



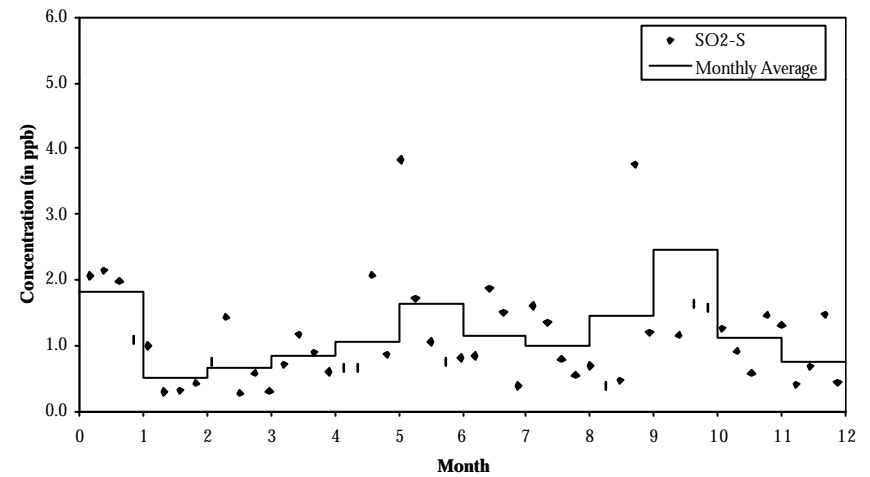
**5303 Caenby 1**



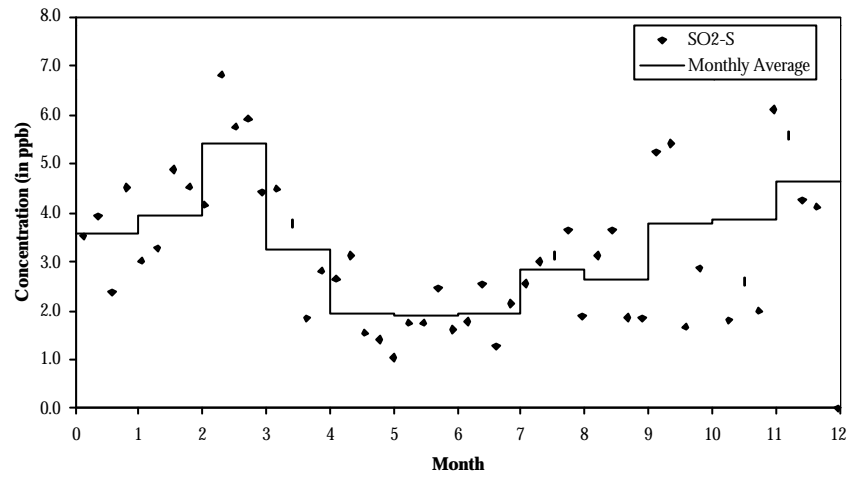
**5304 Camborne 1**



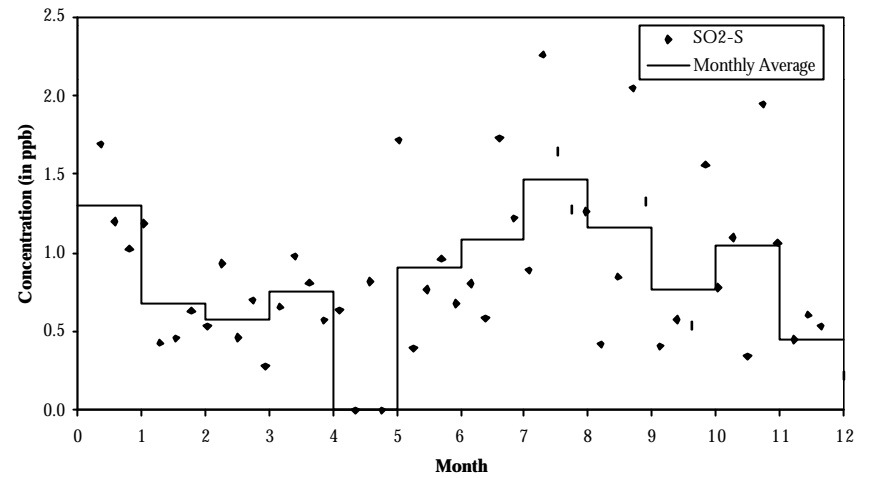
**5305 Camphill 1**



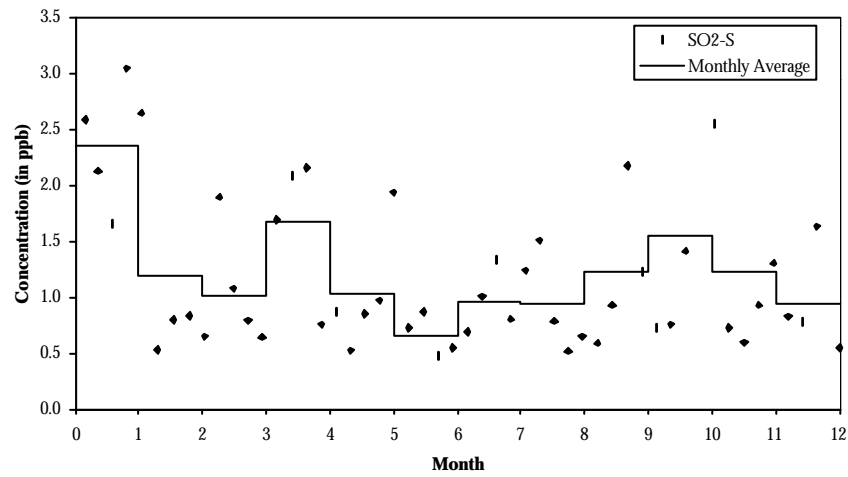
**5306 Cardington 2**



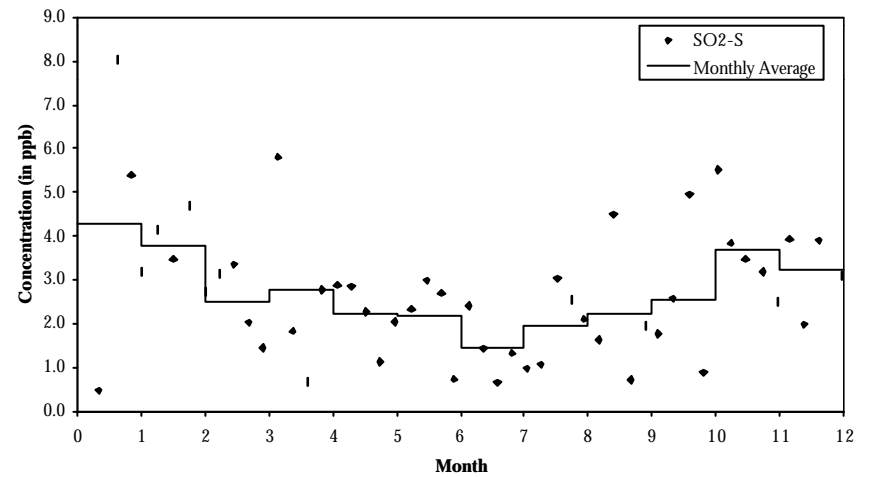
**5308 Corpach 1**



**5309 Cresselly 1**

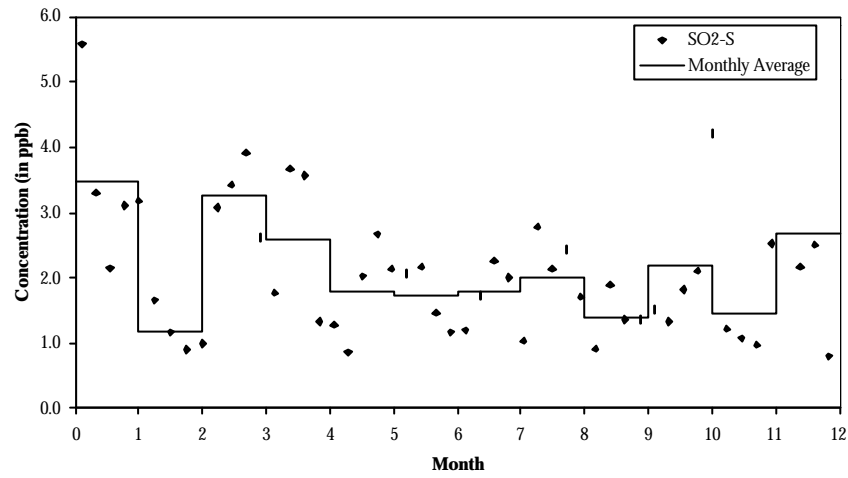


**5310 Etton 1**

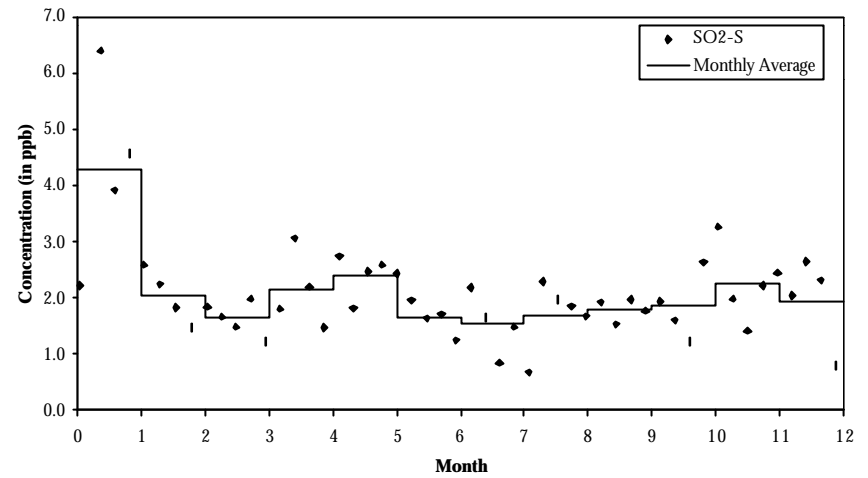




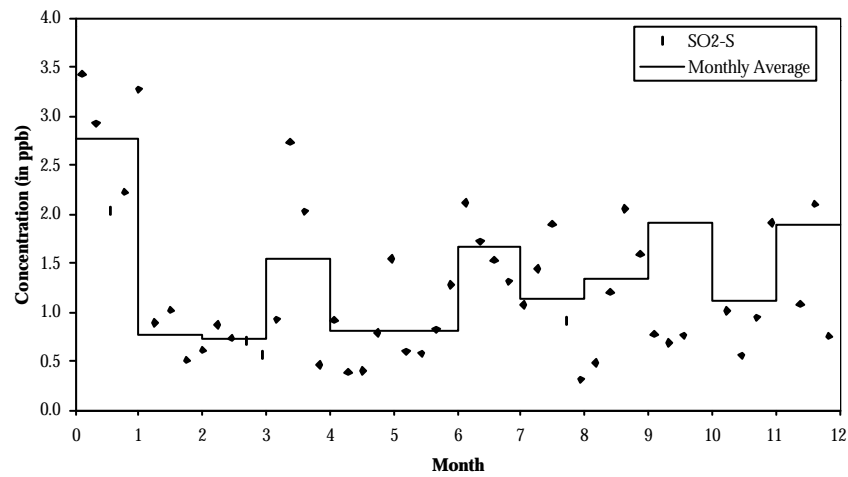
**5312 Husborne Crawley 1**



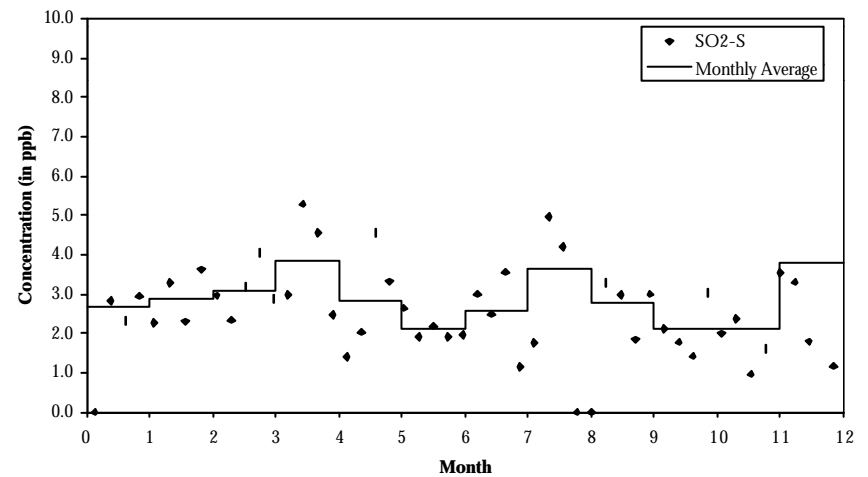
**5313 Little Horkesley 1**



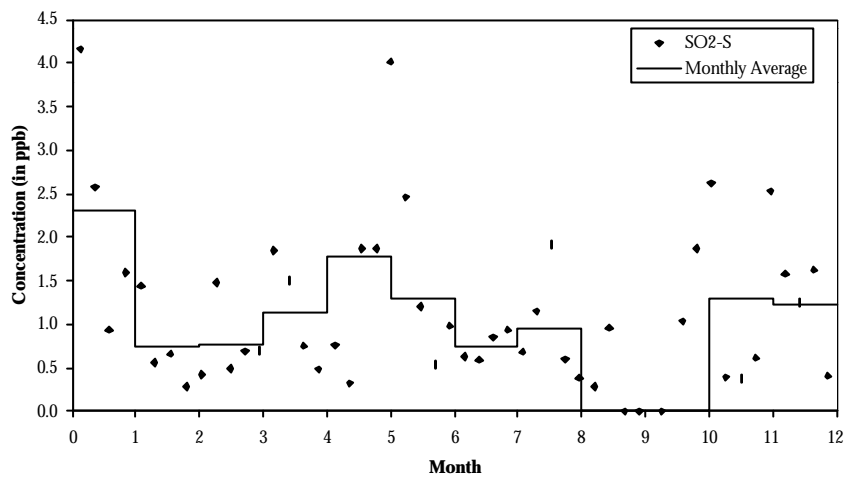
**5314 Marshfield 1**



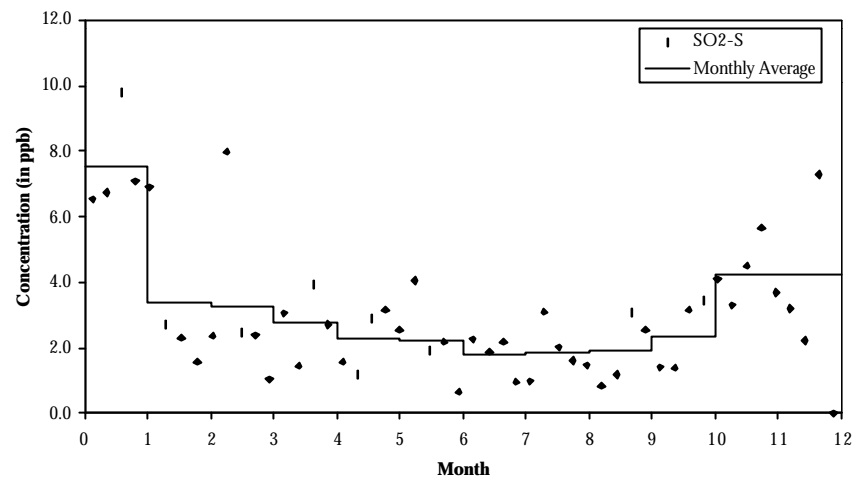
**5315 Ratcliffe 13**



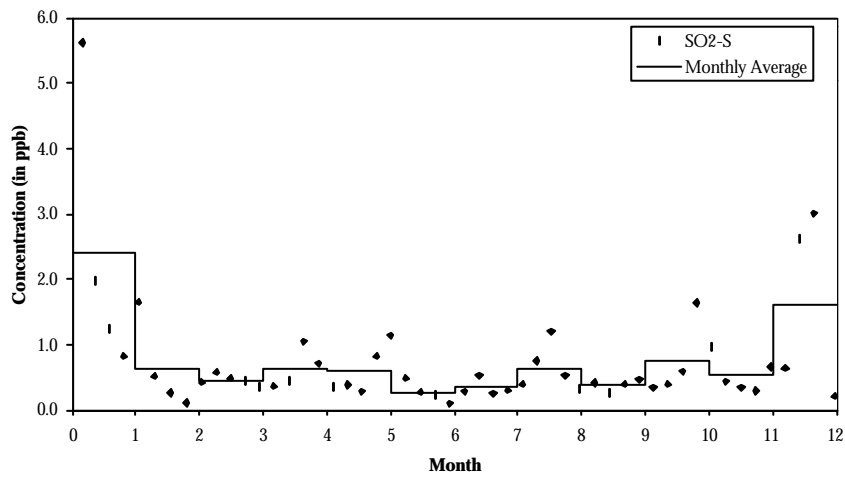
**5316 Rockbourne 1**



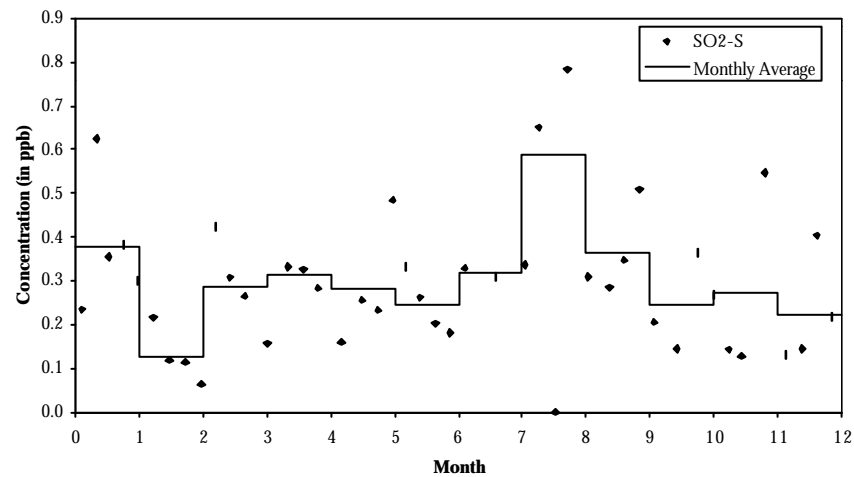
**5317 Wakefield 24**



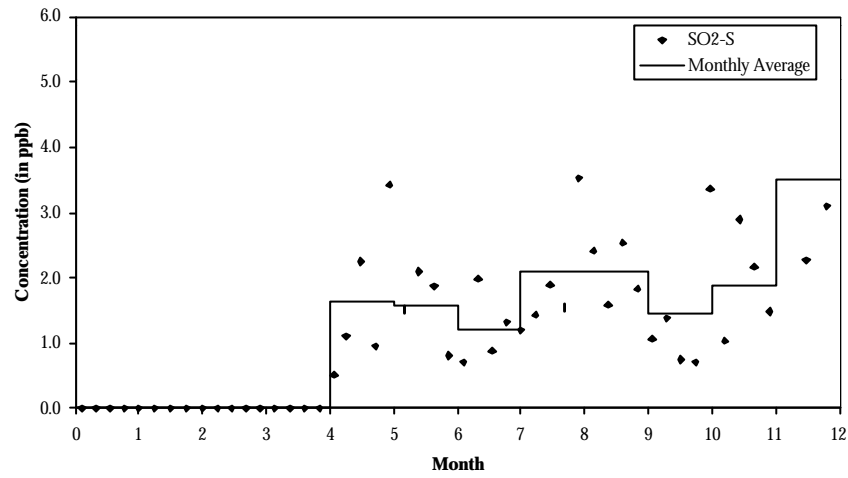
**5318 Waunfawr 1**



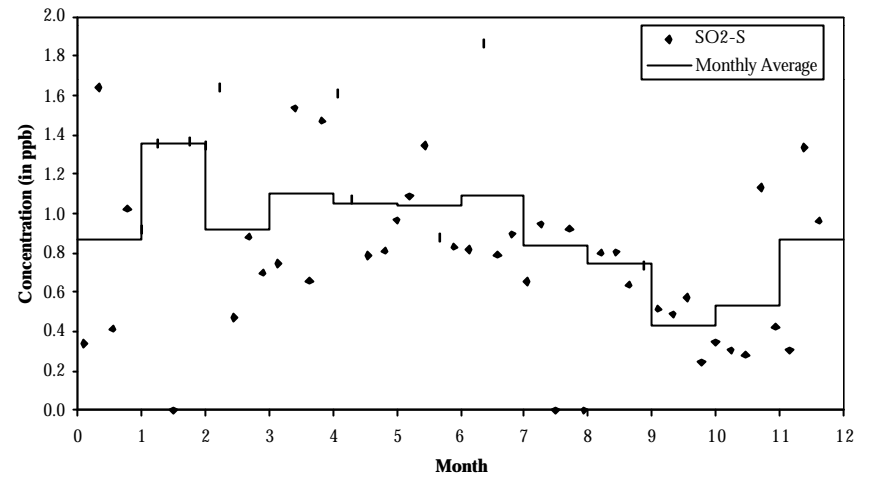
**5319 Fort Augustus 2**



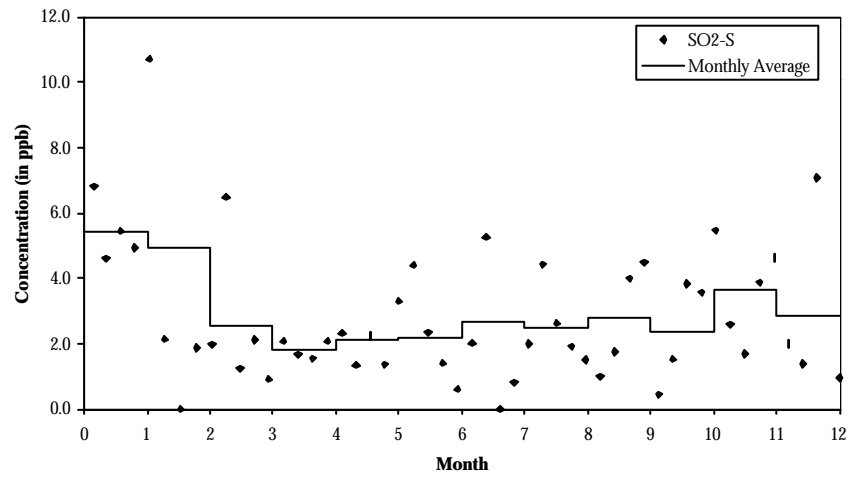
**5320 Loch Leven 2**



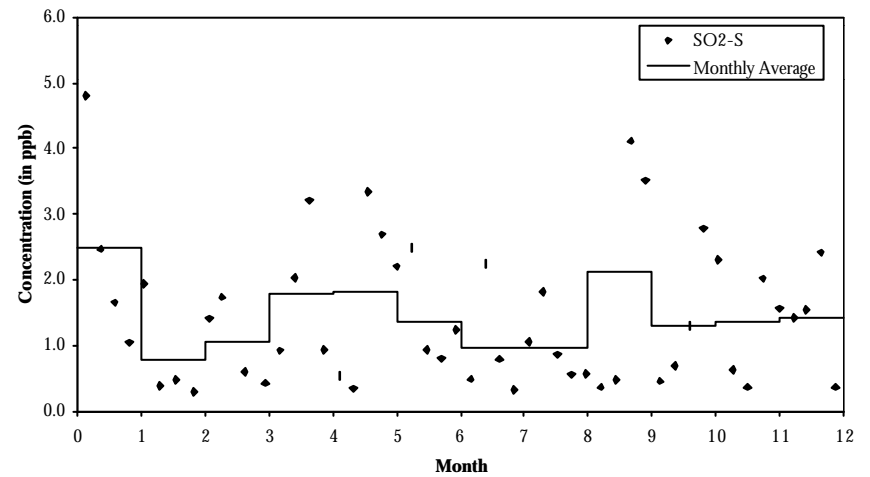
**5321 Redesdale 2**



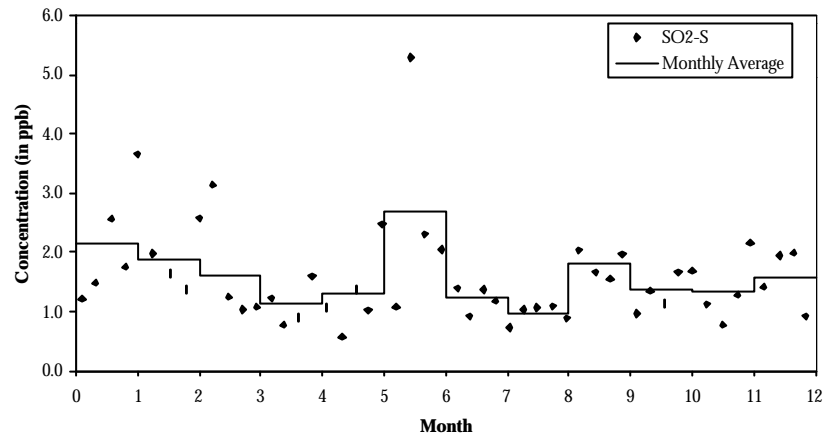
**5322 Hebden Bridge 2**



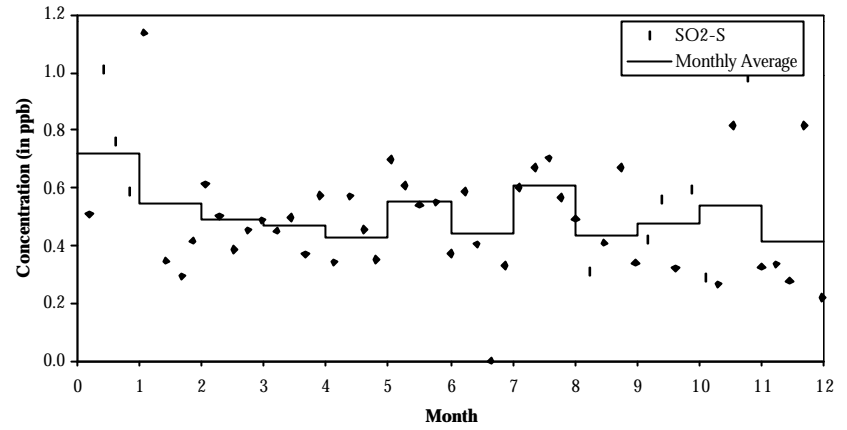
**5323 Preston Montford 2**



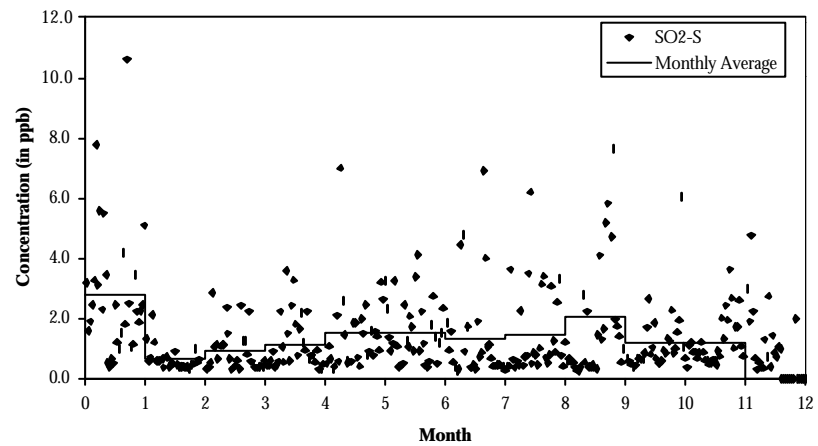
5324 Bentra



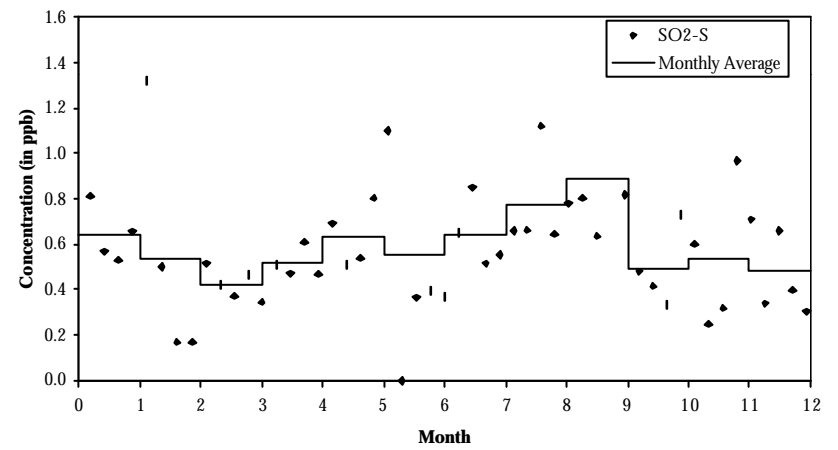
5325 Pitlochry



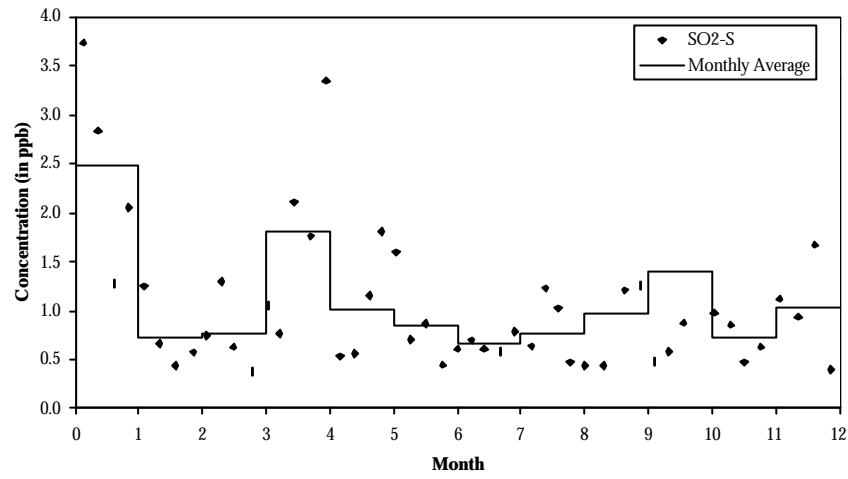
5326 Bush



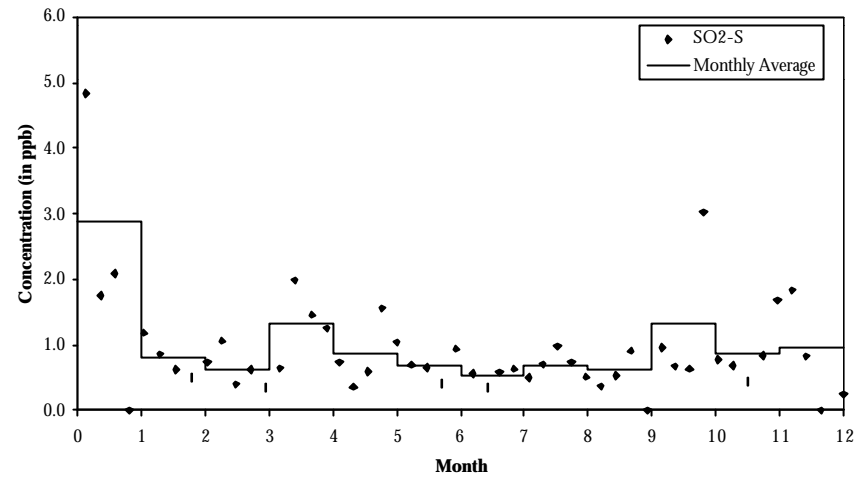
5329 Cam Forest



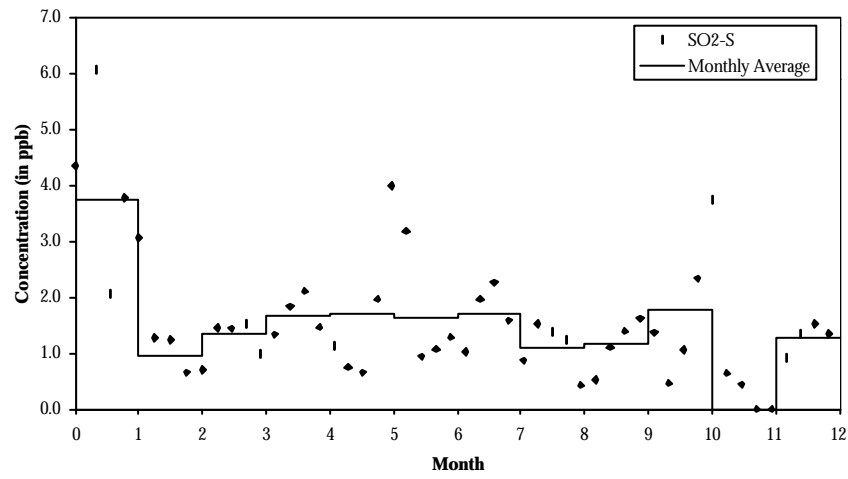
**5330 Cwmystwyth**



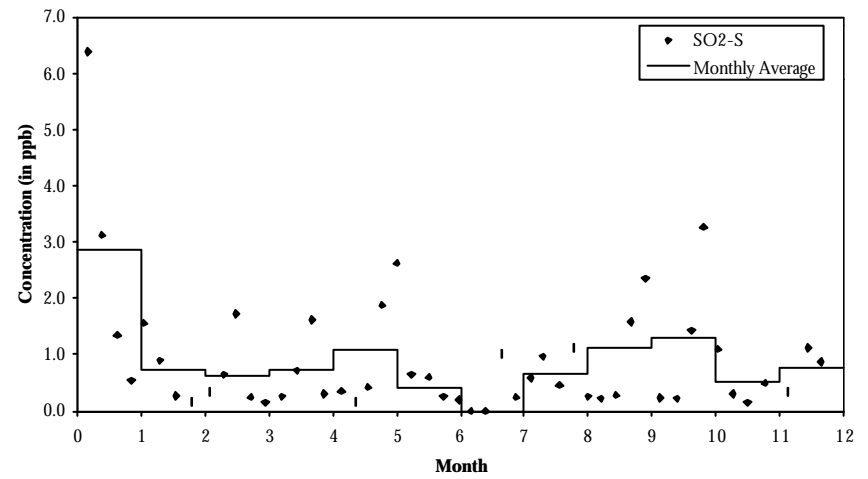
**5331 Rosemaund**



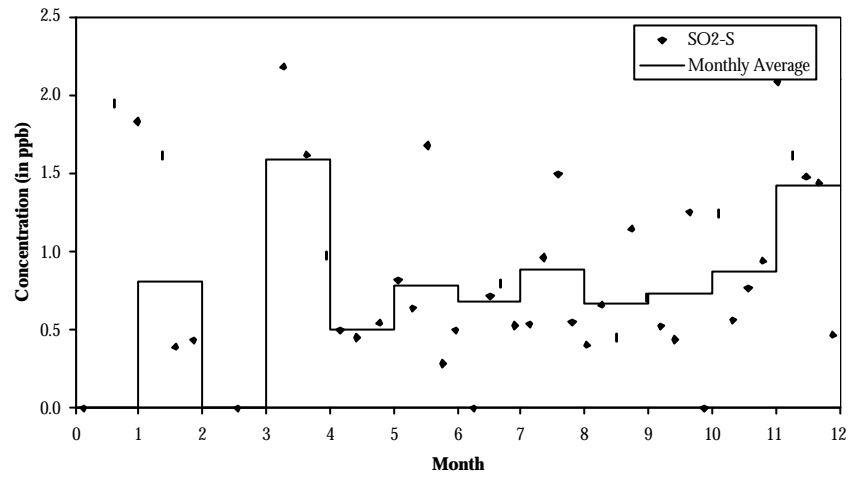
**5333 Fairseat**



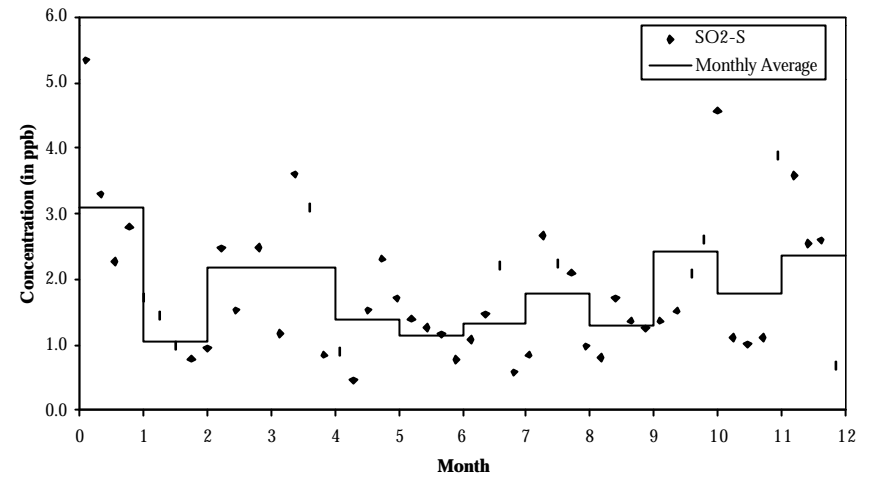
**5334 Bylchau**



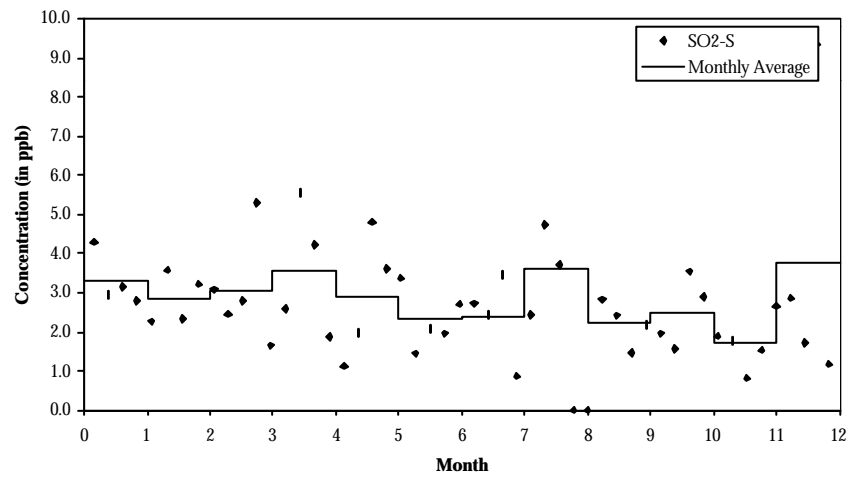
**5335 Crai**



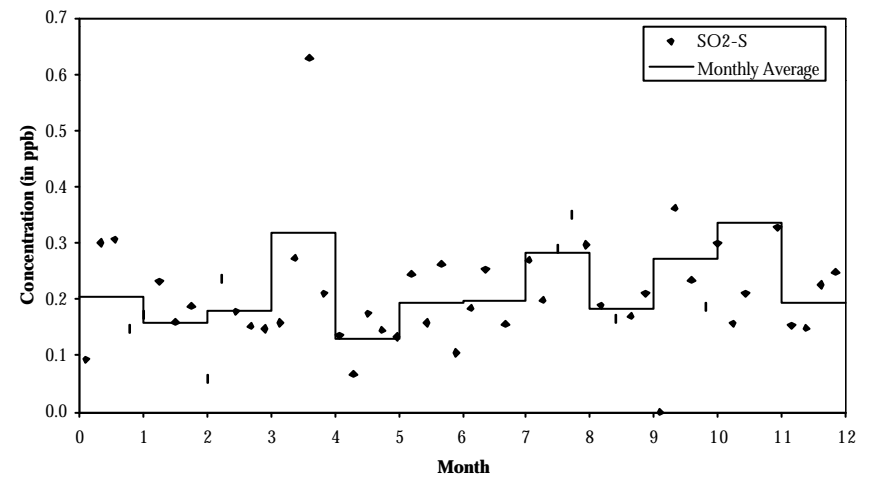
**5336 Husborne Crawley 2**



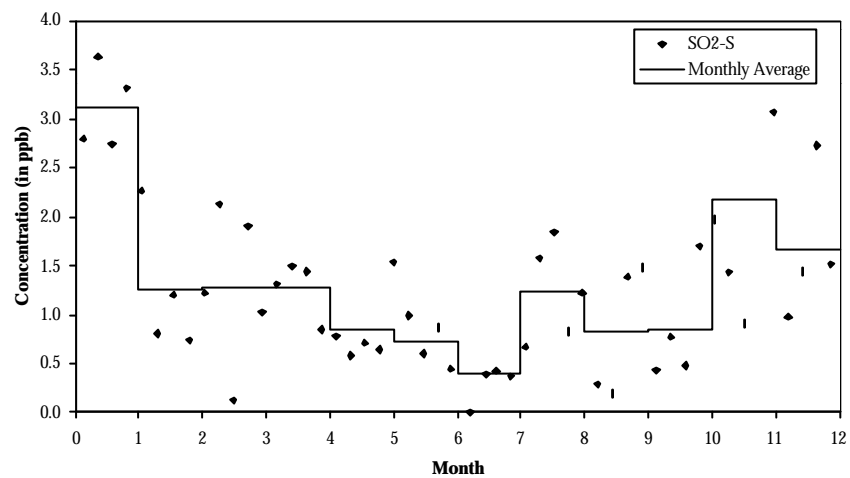
**5337 Ratcliffe 18**



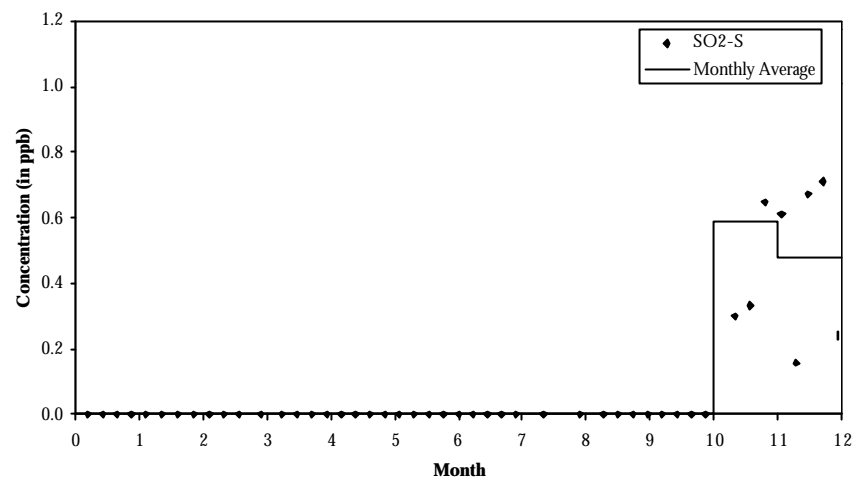
**5338 Forsinain**



5339 Appleacre



5340 Garry



# Appendix 4

## GEOSTATISTICS



## GEOSTATISTICS

The use of geostatistics in the analysis of United Kingdom precipitation composition concentrations is described by Webster *et al.* (1991). A geostatistics analysis may also be made of UK sulphur dioxide concentrations. A brief discussion is reproduced here. In a geostatistical treatment of spatial variability the concentration of sulphur dioxide in ambient air, averaged over a time period of one year, is treated as a regionalised random variable. It is assumed that the values at the sites are drawn from the distribution of a random variable with a constant mean. The variance, however, depends on the separation of the sites. For example, within one 20 km grid square the variance would probably be smaller than within a 200 km square. The dependence of the variance on separation (usually termed the lag) is described by a quantity known as the semi-variance:

$$g(h) = \frac{1}{2} \frac{\sum (z_1 - z_2)^2}{n} \quad 1$$

Where there are n pairs of data  $z_1, z_2$  separated by a distance h. A plot of the semi-variance against lag is called a **variogram**.

It can be shown that the variogram function (usually termed the variogram model) must be selected from one of a few allowed forms, each of which has one or more variable parameters which must be fitted to the experimental data. Models that are allowed are:

### Exponential

$$g(h) = c_0 + c_1(1 - e^{-\frac{h}{a}}) \quad 2$$

### Spherical

$$g(h) = c_0 + c_1 \left( \frac{3}{2} \frac{h}{a} - \frac{1}{2} \left( \frac{h}{a} \right)^3 \right) \quad 3$$

### Linear

$$g(h) = c_0 + wh^q \quad 4$$

The parameter  $c_0$ , known as the “nugget”, is the residual variance for collocated measurements and is a result of measurement error or variability on a scale smaller than the separation of the measurement sites. The “range”, “a”, is a measure of the separation beyond which the measurements are uncorrelated, and the “sill”, “ $c_0+c_1$ ”, is the maximum semi-variance. The linear model applies when the regionalised varia has an unlimited capacity for spatial dispersion. There is no sill and the parameter w is called the factor and q the exponent.

Once a variogram model has been found it can be used in an interpolation procedure known as kriging to produce contour maps from irregularly spaced data. In the kriging process the interpolated value is expressed as a linear combination of the measured data  $l_1 z_1 + l_2 z_2 + \dots$ . Using the variogram model the variance of the interpolated estimate can be expressed in terms of

the  $l_i$  and this variance is then minimised subject to the constraint that the  $l_i$  sum to 1. The result is the best unbiased linear estimate in that it has the smallest error in the statistical sense. A further advantage of using kriging is that the interpolation variance is known for each interpolated estimate and this can be mapped along with the concentration to provide a measure of the reliability of the map.

An exponential model is fitted to the experimental points in the variogram for  $\text{SO}_2$ , using a sill of 3.5 ppb, a range of 300 km and a nugget of 0.4 ppb.

# Appendix 5

## MONTHLY MEAN SO<sub>2</sub> CONCENTRATION MAPS

