

SWINDON BOROUGH COUNCIL

LOCAL AIR QUALITY PROGRESS REPORT / DETAILED ASSESSMENT FOR NITROGEN DIOXIDE 2005

Compiled in accordance with DEFRA Progress Report Guidance
document LAQM.PRG(03)

Local Air Quality Management

2005 Progress / Detailed Assessment Report

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1. Executive Summary:

The Local Air Quality Management process requires Local Authorities to continuously assess the levels of 7 pollutants within their districts for which

Central Government have prescribed objective standards and compliance dates. A timetable for the submission of progress reports is also established.

This 2005 Progress Report identifies Swindon's monitoring activities in this regard and tabulates data recorded.

In contrast to the Updating & Screening Report, produced in the spring of 2003, which indicated that all objective standards were expected to be met by the compliance dates, the 2004 Progress Report confirmed the need to further investigate Nitrogen Dioxide levels at **one site in Kingshill Road. Previous monitoring at this site was indicating that there was a risk that the annual mean standard for this pollutant would be exceeded** in the vicinity of the site, and that the designation of an Air Quality Management Area, might be necessary.

The deployment of co-located tubes at the site in question has since improved the integrity of the data being captured thus improving confidence in the subsequent assessment of the situation.

As indicated at Appendix 2, the co-located tubes have returned data over a period of 9 months with the average value being 37.2 ug/m³ representing 93% of the 40 ug/m³ objective standard.

It is considered, therefore, that there is no risk that the objective standard for Nitrogen Dioxide will be breached by the compliance date, and there is no intention to declare an Air Quality Management Area in this locality.

2. Overview of Air Pollution Monitoring activities:

Swindon's Local Air Quality Management activities currently involve continuous monitoring, of Nitrogen Dioxide and Sulphur Dioxide levels, in accordance with the Department of Environment, Food and Rural Affairs (DEFRA) policy & technical guidance.

Previous screening & assessment exercises, undertaken in the years 2000 & 2003, have not indicated any likelihood of any of the objective standards being breached at relevant locations within the Borough.

However, in line with requirements, a watching brief continues to be kept on the developing situation with regard to Nitrogen Dioxide levels, particularly in close proximity to busy roads.

Monitoring of Smoke & Sulphur Dioxide also continues.

2.1 Nitrogen Dioxide:

Nitrogen Dioxide (NO₂) has to be considered as part of the group of Nitrogen Oxides (NO_x) comprising Nitric Oxide (NO) & Nitrogen Dioxide (NO₂). All combustion processes produce some NO_x but only NO₂ is associated with adverse effects on human health. The main source of NO_x in the UK is road transport which accounted for approx.47% of emissions and this figure is considerably higher in urban areas where traffic congestion is often prevalent.

NO₂ is produced by the oxidation of Nitric Oxide in the atmosphere and there is a complex relationship between emissions of NO_x and the resulting concentration of NO₂ which is dependant upon the proportions of NO in the primary emission and the availability of atmospheric oxidant, especially Ozone.

The Air Quality standard for NO₂ is:

40ug/m³ measured as an Annual Mean, to be achieved by end of 2005

200ug/m³ not to be exceeded more than 18 times/year measured a 1-hour mean, to be achieved by end of 2005

In 1993 Central Government initiated the establishment, in conjunction with Local Authorities and other partners, of a national network of sites to monitor ambient Nitrogen Dioxide levels deploying passive diffusion tubes. Monitoring of NO₂ levels, using the diffusion tube technique, has been carried out at a number of sites across the Borough since 1993.

These tubes, which are prepared by pipetting 30ml of a solution of 20% triethanolamine in water onto metal grids in the end cap, are exposed for a period of one month in accordance with the national survey protocol.

Bristol City Council Scientific Services unit has been contracted to supply and analyse the tubes since the start of the exercise. The laboratory does not hold UKAS accreditation for NO₂ tube analysis, but does participate in the Workplace Analysis Scheme for Proficiency (WASP) for NO₂ tubes. At the last round of performance assessment (round 66 – December 2004) the laboratory recorded a 'good' classification.

The laboratory participates in a Quality Control programme operated by the National Environmental Technology Centre (NETCEN) for which they recorded 'good' classification for all of the monthly assessments in the year 2004.

They have also participated in a NO₂ field inter-comparison scheme for 2004, controlled by NETCEN and organised by the Health & Safety Laboratory. Their average Coefficient of Variation of Triplets of Tubes for the year 2004 was 5.9% and their average Percentage Bias and 95% Confidence Interval of Mean was 17% and 9% respectively.

A total of 20 sites are now being operated in Swindon, data from 4 of which is contributed to the National data-base. Results for all sites are tabulated at Appendix 2.

No continuous, real-time, monitoring of NO₂ is currently being undertaken within Swindon.

2.2 Smoke & Sulphur Dioxide:

The main source of sulphur dioxide (SO₂) in the UK is power stations, with other industrial combustion processes also generating significant emissions. Domestic sources now only account for 4% of emissions, although these can be locally significant if concentrated in a particular locality.

The Air Quality standard for SO₂ is:

350ug/m³ measured as a 1-hour mean not to be exceeded more than 24 times/year, to be achieved by end 2004

125ug/m³ measured as a 24-hour mean not to be exceeded more than 3 times/year, to be achieved by end 2004

266ug/m³ measured as a 15-minute mean not to be exceeded more than 35 times/year, to be achieved by end 2005

Local exceedences of the objectives (principally the 15-minute mean) may occur in the vicinity of small combustion plant burning coal or oil.

Neither of the above scenarios is known, or believed, to exist or occur at any location within Swindon.

Daily monitoring of Smoke and Sulphur Dioxide levels have continued at a site in the Ferndale Road area of Swindon (Grid Ref: SU 4147 1858), as they have done since 1963. The progressive reduction in levels of these pollutants over the past 30+ years has already been confirmed by this monitoring exercise.

The site is one of approx 165 operating across the country for which data is collated by NETCEN, on behalf of DEFRA, to produce National Annual statistics.

Results for Swindon's site are tabulated at Appendix 1.

2.3 Particulate Matter (PM₁₀):

There is a wide range of emission sources which contribute to PM₁₀ concentrations in the UK, which are generally divided into the categories of *Primary, Secondary & Coarse Particles*.

The expected reduction in particle emission in future years is different for each source type. Emissions from road transport will be influenced by new legislation on vehicle emission standards; emissions from secondary sources will be largely governed by controls on power generation, industrial and transport SO₂ and NO_x emissions, both in Europe and the UK; emissions of coarse particles are largely uncontrolled, and in general are not expected to decline.

The Air Quality standard for PM₁₀ is:

40ug/m³ measured as an Annual Mean, to be achieved by end of 2004

50ug/m³ measured as a 24-hour mean not to be exceeded more than 35 times/year, to be achieved by end of 2004

Continuous monitoring equipment, which uses a light-scattering technique, (Osiris monitor, Serial No. TNO 2171) was installed in mid-August 2001 at a site in Bridge End Road, Swindon with the specific objective of gauging the daily variations and the average values of particulate matter in the locality. The site was chosen, at that time, to represent a probable 'worse-case' scenario within the Swindon urban area, on the basis that the immediate locality contained both a scrap metal recycling plant and a stone

crushing/aggregate handling plant. Additionally, the monitor is, sited on a lamp-post which is within 0.5m of the kerbside of a busy arterial road.

Since that time the stone crushing/aggregate handling activities have ceased and perceptible fugitive emissions have consequently reduced.

Maintenance issues connected with the equipment have prompted a re-evaluation of the value of the data being provided. Hence the unit has been de-commissioned since February 2004.

3. Commentary:

This report arises from the requirement, embodied in Part IV of the Environment Act 1995, for local authorities to continually review and assess air quality within their area, and to establish a system of local air quality management (LAQM) within their area, in support of the UK Government's strategy to achieve the air quality objectives. The formal framework for the process was originally shaped with the issue of prescriptive review and assessment guidance by DEFRA (then Department of Transport, Local Government and the Regions [DTLR]) in 2000.

The first round of the process required the production, by all Local Authorities, of a detailed report on existing ambient levels of the following 7 specified pollutants:

- ◆ Benzene
- ◆ 1,3 Butadiene
- ◆ Carbon Monoxide
- ◆ Lead
- ◆ Nitrogen Dioxide
- ◆ Particulate Matter
- ◆ Sulphur Dioxide

Accordingly, the authority conducted a screening exercise to assess the impact of these pollutants and the likelihood, or otherwise, of levels existing, or arising in the future, which would exceed the objective standards prescribed by the Air Quality Regulations 2000 which were adopted at the inception of the process.

Swindon's Stage 3 review and assessment report of, January 2001, confirmed the determination that there was no likelihood of any of the pollutants exceeding the objective standards, within the relevant timescale, at 'relevant locations' within the district. 'Relevant locations' are described as places where members of the public are regularly present outside of buildings or other natural or man-made structures and are likely to be exposed over the averaging period of the objective.

No Air Quality Management Areas were therefore required or established. The report was submitted to DEFRA for appraisal and the conclusions were accepted.

In 2003 all local authorities were required to conduct a further, second round, Review and Assessment of the same 7 pollutants against the slightly revised

requirements of the Air Quality (Amendment) Regulations 2002. (Tabulated in Appendix 3.)

The methodology of assessment was slightly modified to streamline the process, eliminating one of the reporting stages which had been required in 2000. The requirement in 2003 was to conduct an initial updating and screening assessment (USA) to determine the likelihood of all objective standards being met, or otherwise. This was to be followed by a Detailed Assessment if there was a risk of any objective standard not being met.

Swindon Borough Council's USA again confirmed that there was no identified likelihood of exceedence of the objective standards for any of the pollutants occurring, within the respective timescales.

There was, therefore, no requirement to conduct a Detailed Assessment, and consequently no Air Quality Management Areas, as referred to in Section 83 of the Environment Act 1995, have been established in Swindon.

4. Monitoring Activities:

Predictably, as in many urban areas, the traffic generated pollutant Nitrogen Dioxide gives the greatest cause for concern in Swindon and presents the greatest potential for the declaration of Air Quality Management areas in Swindon in the future.

During the past year Swindon's air pollution monitoring programme has continued substantially unchanged with Nitrogen Dioxide levels being constantly monitored at a total of 20 locations throughout the Borough using the diffusion tube technique. A creditable 97.4% data capture rate has been secured.

As in previous years Bristol City Council Scientific Services unit have provided the diffusion tube analysis service.

In 2002 no sites recorded values which exceeded the annual mean objective (40ug/m³), based upon the uncorrected data. This was reported in the 2003 Updating & Screening Assessment document.

However, the application of appropriate bias correction factors suggested that site Nos. 5 (bottom of Kingshill Road), 12 (Swindon Bus Station) & 14 (top of Kingshill Road) should be considered to have had marginal exceedences (approx 5%) in 2002.

Similarly, sites 12 and 14 both recorded bias corrected values some 25% above the objective in 2003.

The Kingshill Road site (No.14) is an equivalent 'kerbside' site with the tube being sited on a lamp-post set back 1 metre from the kerb. This site, too, was determined as being a likely 'hot-spot', being towards the top of a relatively steep hill on a principle arterial road where traffic often labours up the hill at slow speed, with consequently elevated NO_x emissions likely to occur. This site does represent 'relevant exposure' with a terrace of 14 residential properties lying just 1.3 metres from the kerb edge, some 35 metres down hill from the monitoring location. The properties would necessarily fall within an Air Quality Management Area should future recorded levels continue to exceed the NO₂ objective value.

Of interest is a comparison of annual mean results between site 5 (situated at the bottom of Kingshill Road) and site 14 (situated at the top of Kingshill Road), both of which are sited 1 metre from the kerb. During the years 2000 & 2002 the correlation between the sites was fairly close, whereas in the years 2001 & 2003 site 14 recorded significantly higher values. Precise conclusions are difficult to establish.

A comparison between the (non-bias corrected) annual mean values for these sites, for the year 2004, again confirms a fairly close correlation (Site 5 = 36.71 ug/m³; Site 14 = 38.56 ug/m³). However, a comparison of the 5 month period during which co-located tubes have been exposed at Site 14 indicates

a wider range of variation (Site 5 = 38.62 ug/m³; Site 14 [+18 & 19, averaged] = 34.95 ug/m³).

The application of the specified correction factor for estimating the 2005 NO₂ from the bias corrected 2002 data at site 14 [Box 6.6, LAQM. TG(03)] (0.892/0.969) i.e. 42.05 x 0.920537, suggests a likely concentration of 38.71ug/m³ will pertain in that year, but the application of the correction factor for the year 2003 (0.892/0.941) i.e. 49.59 x 0.947928 indicates that a concentration of 47.01ug/m³ (117.5%) will pertain. The projected concentration for 2010 is (0.734/0.941, i.e. 49.59 x 0.780021) 38.68ug/m³

In response to these indications that Site 14, at the top of Kingshill Road, might be at risk of breaching the objective a more detailed study of the locality was initiated, in August 2004. This has involved the deployment of 3 co-located tubes (labelled as, additionally, Nos. 18 & 19) at the site and the establishment of two new sites (Nos. 20 & 21) within the wider locality of the Kingshill Road for the purpose improving the robustness of, and therefore confidence in, the monitoring data.

Data from these sites has now been collected for a period of 12 months and is being continuously assessed. Although not conducted over a calendar year, this study has spanned the full range of seasons and therefore has acceptable credibility (albeit that bias correction of the data is not possible).

To date, the co-located tubes (at Site 14 [+18 & 19]) have returned an average value of 35.6 ug/m³, representing 89% of the objective value (40 ug/m³).

The two newly established sites (Nos. 20, sited 7 metres from the kerbside of Kingshill Road, & 21, sited 1.3 metres from the kerbside of Kingshill Road) have returned values of 23.3 & 31.9 ug/m³ respectively.

This evidence from this more detailed study therefore suggests that there is **no likelihood** that the objective standard for NO₂ will be exceeded at any point in Kingshill Road.

Monitoring will continue at this, and all other sites, with the objective of plotting trends in Nitrogen Dioxide levels.

In addition to the specific exercise to evaluate the situation in Kingshill Road, a further monitoring site (Site 22) has just been established to focus on Air Quality levels in the immediate vicinity of the A419 trunk road, to the east of the Borough in advance of proposed carriageway improvements that will involve the provision of a high-level fly-over to the concern of residents of an adjacent housing estate. This will enable before and after comparisons to be made.

The Bus Station monitoring site was established as a 'worst case scenario' site in response to a local community council request. Whilst the second

round review and assessment guidance required the assessment of nitrogen dioxide levels at bus stations, the criteria determined that this should only apply to bus stations that are not enclosed, and which had a flow of greater than 1000/day. Swindon's Bus Station may be classified as partially enclosed (with the tube being sited beneath the peripheral canopy) and bus throughput rates were determined as being in the region of 920/day. Additionally, no 'relevant exposure' within 10 metres of the station is considered to occur. Hence no detailed further assessment was proposed.

The continuous smoke & sulphur dioxide monitoring station, sited at Ferndale Road, Swindon has been maintained until the end of 2004 and continues to provide confirmation that the concentration of these pollutants remains at a very low level.

(Results are tabulated at Appendix 1.)

5. Local Developments:

Industrial sources of pollution within the Swindon locality have remained stable during the past year with no new significant industrial processes having been established during the past year, and no complaints concerning pollution events arising from any existing authorised processes having been received.

The re-location of the town's main hospital, from Okus to Commonhead, at the south-eastern extremity of the town, occurred from the beginning of 2002, with a predictable impact upon traffic flow patterns within the town. No detectable impact upon localised traffic generated pollution levels has occurred however, and indeed the site at Kingshill Road might have been expected to be returning lower values given that Kingshill Road was a significant feeder road to the old hospital at Okus.

Studies are taking place into the provision of a new feeder road to link the northern expansion zone with the main west to east arterial road (Great Western Way).

Several options for the route of this road are presently under consideration, and a primary determining factor is the potential impact upon pollution levels in the vicinity of any residential premises which will border the new route. Consultants are charged with modelling the potential impact of each of the route options.

The proposed development of the 'front garden', to the south of the town, has recently received approval in principle.

Whilst the ultimate scale of the development will be significant, the potential impact of traffic-generated pollutants upon all of the existing feeder roads has been modelled by consultants who report that no exceedences of Nitrogen Dioxide or Particulate Matter arising from the development are predicted to occur at any locations within the next 10 years.

The re-location of Swindon's bus depot, from the central Swindon location, adjacent to the bus station, which it has occupied for some 50+ years is scheduled to occur by the end of the year. The new site is situated adjacent to the Great Western Way arterial road. Effects upon traditional bus movements and flows, and hence pollution levels, about the central area of the town will be monitored.

Appendix 1

Sulphur Dioxide Monitoring Data

Ferndale Road Monitoring site, Swindon [Grid ref: SU 147 858]
(Urban Background classification - Site code 3220002)

This continuous monitoring station, measuring Smoke & Sulphur Dioxide levels has been established on the site at the ex-Ferndale Road Secondary school (now occupied by Oxford Brookes university) since 1963 and has confirmed the progressive reduction in levels of these pollutants since the decline of the railway workshops in this locality, the phasing out of coal burning steam locomotive power in the late 1960's and the progressive move away from coal as a staple fuel for home heating.

	Annual Mean value ug/m ³	Equivalent annual mean p.p.b.
1990/91	20	8
1991/92	18	7
1992/93	14	5
1993/94	12	5
1994/95	13	5
1995/96	13	5
1996/97	11	4
1997/98	10	4
1998/99	10	4
2000	9	3
2001	9	3
2002	7	3

Guidance advises that measured daily mean concentrations should be multiplied by a factor of 1.25 to take account of a general tendency for bubbler samplers to under-read at high concentrations.

In the year 2002 the highest recorded daily concentration at this site was 13 ug/m³, which was recorded on a total of 32 days during the year. Applying the correction factor produces a figure of 16.25ug/m³. During 2001 the highest figure was 24ug/m³ [recorded on 3 days] (30ug/m³ corrected).

Appendix 2

2000 Nitrogen Dioxide diffusion tube results: ug/m3**Objective Standard:**

200 ug/m3 not to be exceeded more than 18 times per year, measured as a 24-hour mean to be achieved by the end of 2005
40 ug/m3 measured as an Annual Mean to be achieved by the end of 2005

(Note: DEFRA guidance advises that if the Annual Mean objectives are not exceeded, Authorities may confidently assume that the short-term (1-hour) objectives will also be met).

Site 1^:	GWR Museum , Faringdon Road, Swindon	<i>(Roadside site - 2.7m from Emlyn Square) Grid Ref: SU 146 847</i>
Site 2^:	Pipers Way, Swindon	<i>(Intermediate site – 30m from Pipers roundabout) Grid Ref: SU 159 829</i>
Site 3^:	Roussel Laboratory, Kingfisher Drive, Swindon	<i>(Urban background site – 123m from Dorcan Way) Grid Ref: Su 185 853</i>
Site 4^:	Crowdys Hill School, Jefferies Avenue, Swindon	<i>(Urban background site – 170m from Cricklade Road) Grid Ref: SU 158 868</i>
Site 5:	F/O 186 Kingshill Road, Swindon	<i>(1m from Kingshill Road, at bottom of hill) Grid Ref: SU 142 839</i>
Site 6	Chalet School, Queens Drive, Swindon	<i>(14.3m from Queens Drive) Grid Ref: SU 160 849</i>
Site 7:	Link Centre, Tewkesbury Way, Swindon	<i>(61m from Tewkesbury Way) Grid Ref: SU 117 844</i>
Site 8:	Thornhill, South Marston	<i>(on Thornhill roundabout Grid Ref: SU 189 871</i>
Site 9:	Village Hall, South Marston	<i>(10m from Old Vicarage Lane) Grid Ref: SU 193 879</i>
Site 10:	Ermin Street, Blunsdon	<i>(on dual-carriageway central reservation) Grid Ref: SU 147 899</i>
Site 11:	South Street, Swindon	<i>(Established Nov.1999) (1m from kerbside in South Street, adj. 25 Bow Court) Grid Ref: SU 152 839</i>
Site 12:	Swindon Bus Station	<i>(Established Nov.1999) (within Bus Station) Grid Ref: SU 153 840</i>
Site 13:	Meadow Way, Badbury Wick	<i>(Established Dec.1999) (70m from M4 Motorway kerbside) Grid Ref: SU 194 809</i>
Site 14:	Kingshill Road/Clifton Street, Swindon	<i>(Established Dec.1999) (1m from kerbside of Kingshill Road, towards top of hill) Grid Ref: SU 147 838</i>
Site 15:	Westcott Place, Swindon	<i>(Established Dec.1999) (1.4m from kerbside of Westcott Place) Grid Ref: SU 141 841</i>
Site 16:	F/O 483 Cricklade Road, Swindon	<i>(Established Dec.1999) (5.5m from kerbside of Cricklade Road) Grid Ref: SU 157 860</i>
Site 17:	Bruce Street Bridges, Swindon	<i>(Established Dec.1999) (5.5m from kerbside of Bruce Street roundabouts) Grid Ref: SU 138 855</i>
Site 18:	Validation sample	<i>(*located at site 5) (Moved to site 14 from August 2004)</i>
Site 19:	Validation sample	<i>(*located at site 14, Established Aug. 2004)</i>
Site 20:	S/O 130 Kingshill Road, Swindon	<i>(Established Aug. 2004) (7m from kerbside) Grid Ref: SU 146 838</i>
Site 21:	F/O 63 Kingshill Road, Swindon	<i>(Established Aug. 2004) (1.3m from kerbside) Grid Ref: SU 145 839</i>
Site 22:	39 Edale Moor, Liden, Swindon	<i>(Established March 2005) (39m from A419) Grid Ref: SU 193 830</i>

site no.	Jan.	Feb.	Mar.	Apr.	May	June.	July	Aug	Sept	Oct	Nov	Dec
1^	44.1	36.6	41.3	36.1	19.5	34.8	27.9	25.9	35	23.8	38.5	33.2
2^	29.5	24.9	22.6	23.1	22.8	20.2	12.4	20.3	19.9	20.5	22	25.6
3^	31.5	26.3	26.4	18.3	18.9	15.5	16.2	18.4	22.4	18.9	20.1	30
4^	34.2	n/r	22.9	19.7	15.6	18	10.4	21.6	20.4	38.9	31.9	26.5
5	54.7	39.6	43.3	43.5	43.8	43.7	31.7	42.1	40.2	31.9	40.5	49.8
6	49.7	46.8	43.2	30.5	32.6	33.4	24.2	34.3	32.7	26.4	49.8	39.4
7	34.6	29.9	32.9	23.9	n/r	18.9	16.3	18.6	17	20.8	24.9	25.9
8	44.2	41.7	29.1	30.3	19.8	29.1	14.6	26.2	36.2	35.4	49.8	36.7
9	36	27.7	23.4	14.5	13.1	15.3	8.9	15.3	15.7	19.1	26.6	27.3
10	42.3	29.8	41.1	37.4	28	35.4	29.7	32.5	28.6	30.8	30.9	36.4
11	39.6	32.7	33.9	27.6	22.1	16.6	15.2	20.1	24.1	25.2	30.5	34.7
12	43.6	45.9	49	41.9	37.5	50.4	35.2	35.8	36.4	44	58	47.7
13	46.5	42.6	43.2	25.1	27.4	34.6	21	31.1	26.5	30.5	39.5	42.7
14	49.9	59.1	55.1	42.7	51.4	63.1	38.5	54.1	39.8	39.9	49.6	41.5
15	47.8	46.7	53	53.6	48.8	33.7	30.8	37	44.8	n/r	n/r	48.3
16	51	44.9	48.9	35.1	38.8	33.7	29.2	39.6	34.8	40.8	42.6	37.1
17	42.7	28.9	39.7	42.3	50.1	29.9	22.5	33	27.8	20.3	31.5	42
18*	32.1	46.5								36.1	40.8	50.9

Sites marked ^ contribute to the National Survey and are classified accordingly.

2000 Annual Mean Values:

Site 1^:	<i>(2.5m from kerbside at Emlyn Square)</i>	33.1 ug/m3 (82.75%)	12 samples
Site 2^:	<i>(30m from Pipers Roundabout)</i>	22.0 ug/m3 (55.00%)	12 samples
Site 3^:	<i>(123 m from Dorcan Way)</i>	21.9 ug/m3 (54.75%)	12 samples
Site 4^:	<i>(170m from Cricklade Road)</i>	23.7 ug/m3 (59.25%)	11 samples
Site 5:	<i>(1m from kerbside at bottom of Kingshill Road)</i>	42.1 ug/m3 (105.25%)	12 samples
Site 6:	<i>(14.3m from Queens Drive)</i>	36.9 ug/m3 (92.25%)	12 samples
Site 7:	<i>(61m from Tewksbury Way)</i>	24.0 ug/m3 (60.00%)	11 samples
Site 8	<i>(on Thornhill Roundabout)</i>	32.8 ug/m3 (82.00%)	12 samples
Site 9:	<i>(10 m from Old Vicarage Lane)</i>	20.2 ug/m3 (50.50%)	12 samples
Site 10:	<i>(on dual-carriageway central reservation)</i>	33.6 ug/m3 (84.00%)	12 samples
Site 11	<i>(1m from kerbside at South Street)</i>	26.9 ug/m3 (67.25%)	12 samples
Site 12:	<i>(within Bus Station)</i>	43.8 ug/m3 (109.50%)	12 samples
Site 13:	<i>(74m from M4 Motorway)</i>	34.2 ug/m3 (85.50%)	12 samples
Site 14:	<i>(1m from kerbside at top of Kingshill Road)</i>	48.7 ug/m3 (121.75%)	12 samples
Site 15:	<i>(1.4m from kerbside at Westcott Place)</i>	44.5 ug/m3 (111.25%)	10 samples
Site 16:	<i>(5.5 m from Cricklade Road)</i>	39.7 ug/m3 (99.25%)	12 samples
Site 17:	<i>(5.5 m from Bruce Street Roundabout)</i>	34.2 ug/m3 (85.50%)	12 samples
Site 18:	Validation sample for Site 5	41.3 ug/m3 (103.25%)	5 samples
	<i>Average of sites 5 & 18 =</i>	41.7 ug/m3 (104.25%)	

2001 Nitrogen Dioxide diffusion tube results - ug/m3

All site details as 2000 (except Site 2)

NOTE: Beginning January 2001, the classifications of sites contributing to the National survey were altered by NETCEN with the effect that Site Nos 1 & 16 are now 'Roadside' sites,(being sites 1 – 5 metres from a busy road, but may be up to 15metres) with sites 3 & 4 'Urban Background' sites,(being sites >50 metres from a busy road and typically in a residential area).

Site No. 2 now re-located at Leamington Grove, Swindon [Grid Ref: SU 166 827] from 01/01/01 and deleted from National Survey .

Site No.16 classified as a 'Roadside' Site contributing to National Survey from 01/01/01 - Due to repeated loss of tubes, this site re-located to F/O 461 Cricklade Road with effect from 02/10/2001; due to further repeated loss of tubes, this site re-located again to opposite side of Cricklade Road, F/O No. 422 (lamp-post 124, 2.6m from kerbside) with effect from 04/03/2003.

site no.	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1^	n/r	42.3	28.5	33.9	34.7	25.2	23.9	23.2	29.3	30.8	35.5	n/r
2	35.5	31.7	30.6	20.2	15.6	8.8	9.7	13.5	17.7	14.5	30.3	21.5
3^	30.3	36.3	24.3	19.2	23.3	12.3	16.8	15.7	13.6	17.2	32.6	28.7
4^	n/r	29.4	26.2	20.7	19.5	10	14.1	16.9	15.6	24.6	34.4	26.5
5	25.9	50.4	37.3	35.6	18.9	28.9	n/r	33.6	29.9	39	56.6	35.9
6	39.1	47	31.9	41.1	28.8	24.5	27.8	29.8	21.4	21.4	45.5	28.9
7	28.3	36.3	26.3	18.6	23.1	12.7	n/r	17.8	n/r	23.4	34.6	26.3
8	36.8	33.9	32.9	21.9	20.5	16.2	25.4	15.2	21.4	27.7	47.6	25.8
9	21	26.7	22.4	18.5	14.3	11.8	14.6	12.5	18.3	15.5	34.4	25.5
10	28.2	42.8	33	28.6	44.7	20.3	26.4	24	32.8	28.8	41.1	38.8
11	44.9	n/r	33.3	26.3	25.7	11.3	15.3	17.7	19	25.2	35.4	19.2
12	50.5	56.3	52.2	57.9	50.3	23.6	35.5	35.5	33.7	37.1	57.7	n/r
13	38.5	46	39.7	36.1	25.4	14.7	22.6	21.6	13.8	31.3	52.8	n/r
14	44.9	61.65	55.7	43.6	49.1	28.3	40.6	37.9	29.1	37.4	44.8	46.9
15	n/r	52.6	n/r	39.2	28	23.4	n/r	32.8	37	42	n/r	n/r
16^	34	48.9	n/r	n/r	n/r	22.1	n/r	n/r	n/r	23.1	n/r	29.5
17	56.9	46.2	43.2	28.8	40.5	19.7	17.2	22.1	24.2	30.5	42.3	40.8
18*	37.3	49.9	47.2	32	31.4	15	n/r	33.5	35.2	36.8	34.7	29.8

2001 Annual Mean Values:

Site 1^:	30.73 ug/m3	(76.83%)	10 samples
Site 2:	20.80 ug/m3	(52.00%)	12 samples
Site 3^:	22.53 ug/m3	(56.33%)	12 samples
Site 4^:	21.63 ug/m3	(54.08%)	11 samples
Site 5:	35.64 ug/m3	(89.10%)	11 samples
Site 6:	32.27 ug/m3	(80.68%)	12 samples
Site 7:	24.74 ug/m3	(61.85%)	10 samples
Site 8:	27.19 ug/m3	(67.98%)	12 samples
Site 9:	19.63 ug/m3	(49.08%)	12 samples
Site 10:	32.46 ug/m3	(81.15%)	12 samples
Site 11:	24.85 ug/m3	(62.13%)	11 samples
Site 12:	44.57 ug/m3	(111.43%)	11 samples
Site 13:	31.14 ug/m3	(77.85%)	11 samples
Site 14:	43.33 ug/m3	(108.33%)	12 samples
Site 15:	36.43 ug/m3	(91.08%)	7 samples
Site 16^:	31.52 ug/m3	(78.80%)	5 samples
Site 17:	34.37 ug/m3	(85.93%)	12 samples
Site 18*:	34.80 ug/m3	(87.00%)	11 samples

Average of Sites 5 & 18 = 35.22 ug/m3 (88.05%)

2002 Nitrogen Dioxide diffusion tube results - ug/m3**All sites as 2001**

site no.	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1^	34.8	24.4	34.7	38.7	n/r	21.1	29.4	29	28.7	29.3	19.5	20.9
2	20.3	19.8	19.1	n/r	11.5	11.5	10.2	7.9	22.2	20.3	25	29.6
3^	26.9	n/r	n/r	16.4	19.5	7.9	18.2	16.9	20.7	24.8	25.9	39.7
4^	31	22.7	17.5	18.2	12.2	15.6	14.5	13.4	23.1	24.5	26.9	10.6
5	n/r	38.9	60.1	40.2	44.7	n/r	18.8	28.9	35	37.5	44	41.3
6	31.4	30.3	42.4	29.5	28.9	22.2	12.9	13.5	24	37.4	34.4	26.7
7	25.6	29.9	36.5	18.9	n/r	n/r	17.6	14.7	17.7	14.8	18.5	29.4
8	32.4	21.7	27.8	23.2	n/r	13.2	26.9	16	17.6	32.2	26.9	20.8
9	44.8	21.7	36.1	13.2	13.1	18.5	17.4	8.9	12.7	22.2	12.2	27.3
10	26.9	23.6	31.3	20.6	20.6	19.7	27.1	26.5	45.7	37.7	28.6	23.3
11	31.6	27.1	33.5	20.5	19	n/r	13.4	n/r	23.4	11.2	8.2	31.3
12	41.7	14.4	44.8	47.9	46	30.5	40.8	30.2	45.7	46.7	47.3	30.6
13	31.8	26.8	37.7	31.5	40.4	45.1	35.4	19	31.6	34.4	21.7	17.4
14	47.4	31	44.3	34.5	39.7	n/r	n/r	35.3	48.2	47.4	20.8	37.2
15	33.1	n/r	30.3	n/r	n/r	15.2	40.9	28.7	48	45.6	53.1	29.8
16^	44	18.7	36.2	23.8	22.5	15.9	n/r	22.7	n/r	n/r	n/r	n/r
17	28.5	21.2	33.1	30	28.5	15.5	22.2	17.8	43.6	38.1	37.8	42.0
18*	n/r	33.6	46.4	n/r	32.1	n/r	29.4	29.4	32	26.8	41.8	38.3

2002 Annual Mean Values:*Bias correction factor = 1.09: values indicated in [] brackets*

Site 1^:	28.23 ug/m3 (70.58%)	[30.77ug/m3]	[76.93%]	11 samples
Site 2:	17.95 ug/m3 (44.88%)	[19.57ug/m3]	[48.93%]	11 samples
Site 3^:	21.69 ug/m3 (54.23%)	[23.64ug/m3]	[59.10%]	10 samples
Site 4^:	19.18 ug/m3 (47.95%)	[20.91ug/m3]	[52.73%]	12 samples
Site 5:	38.94 ug/m3 (97.35%)	[42.44ug/m3]	[106.10%]	10 samples
Site 6:	27.80 ug/m3 (69.50%)	[30.30ug/m3]	[75.75%]	12 samples
Site 7:	22.36 ug/m3 (55.90%)	[24.37ug/m3]	[60.93%]	10 samples
Site 8:	23.52 ug/m3 (58.80%)	[25.64ug/m3]	[64.10%]	11 samples
Site 9:	20.68 ug/m3 (51.70%)	[22.54ug/m3]	[56.35%]	12 samples
Site 10:	27.63 ug/m3 (69.08%)	[30.12ug/m3]	[75.30%]	12 samples
Site 11:	21.92 ug/m3 (54.80%)	[23.89ug/m3]	[59.73%]	10 samples
Site 12:	38.88 ug/m3 (97.20%)	[42.38ug/m3]	[105.95%]	12 samples
Site 13:	31.07 ug/m3 (77.68%)	[33.87ug/m3]	[84.68%]	12 samples
Site 14:	38.58 ug/m3 (96.45%)	[42.05ug/m3]	[105.13%]	10 samples
Site 15:	36.07 ug/m3 (90.18%)	[39.32ug/m3]	[98.30%]	9 samples
Site 16^:	26.43 ug/m3 (66.08%)	[28.81ug/m3]	[72.03%]	7 samples
Site 17:	29.86 ug/m3 (74.65%)	[32.55ug/m3]	[81.38%]	12 samples
Site 18*:	34.42 ug/m3 (86.05%)	[37.52ug/m3]	[93.80%]	9 samples

Average of Sites 5 & 18 = 36.68 ug/m3 (91.70%) [39.98ug/m3] [99.95%]

2003 Nitrogen Dioxide diffusion tube results – ug/m3

All sites as 2002 excepting Site 16, which was re-located, due to repeated tube loss, to opposite side of road, F/O 422 Cricklade Road with effect from 04/03/03

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1^	37.0	44.7	35.3	32.9	26.4	38.8	24.9	30.3	32.5	41.0	40.0	40.8
2	27.7	29.4	25.3	20.5	10.5	13.9	11.6	18.7	17.6	26.3	25.9	31.6
3^	30.9	34.8	30.5	25.2	5.8	18.0	13.9	22.1	25.1	30.5	36.4	33.2
4^	26.5	24.7	28.8	22.7	14.4	18.3	11.9	16.1	24.5	25.0	N/r	27.8
5	45.6	34.9	44.8	40.6	21.0	39.8	33.0	33.0	46.8	34.9	39.6	44.5
6	41.7	42.4	31.3	34.6	25.9	41.2	30.6	29.6	35.4	38.8	38.0	37.3
7	30.5	33.0	32.2	26.1	16.1	16.8	17.5	23.6	23.3	25.4	31.1	32.2
8	36.6	44.2	16.4	31.8	21.5	18.0	27.2	N/r	N/r	34.5	50.4	44.9
9	27.5	34.3	23.6	18.4	9.9	16.1	12.9	15.6	19.8	23.6	29.5	30.5
10	38.7	47.7	33.0	44.0	30.7	25.4	25.6	49.6	42.5	36.2	36.1	46.4
11	31.8	39.9	34.0	28.0	15.0	15.7	17.6	17.4	21.6	32.5	41.3	40.3
12	52.5	50.4	61.6	45.9	49.8	52.9	43.1	45.9	53.7	51.4	61.5	58.3
13	42.0	48.0	42.8	39.2	24.9	36.9	36.3	33.2	45.7	31.8	42.5	39.7
14	53.4	63.9	50.6	48.9	35.7	57.1	51.1	50.8	59.1	44.2	52.9	52.2
15	47.3	n/r	n/r	39.0	29.9	31.1	27.1	33.2	36.3	42.9	42.1	51.9
16^	n/r	n/r	42.8	40.2	23.8	30.7	27.8	38.6	45.2	37.2	41.5	49.3
17	35.5	56.8	60.8	48.1	19.9	27.8	21.7	38.2	30.6	43.8	38.6	46.0
18*	45.5	50.8	58.6	36.5	28.5	37.5	34.0	40.8	38.9	35.5	43.5	48.4

2003 Annual Mean Values:*Bias correction factor = 0.92: values indicated in [] brackets*

Site 1^:	35.38 ug/m3 (88.45%) [32.55ug/m3] [81.38%]	12 samples
Site 2:	21.58 ug/m3 (53.95%) [19.85ug/m3] [49.63%]	12 samples
Site 3^:	25.53 ug/m3 (63.83%) [23.49ug/m3] [58.73%]	12 samples
Site 4^:	21.88 ug/m3 (54.70%) [20.13ug/m3] [50.33%]	11 samples
Site 5:	38.21 ug/m3 (95.53%) [35.15ug/m3] [87.88%]	12 samples
Site 6:	35.57 ug/m3 (88.93%) [32.72ug/m3] [81.80%]	12 samples
Site 7:	25.65 ug/m3 (64.13%) [23.60ug/m3] [59.00%]	12 samples
Site 8:	32.55 ug/m3 (81.38%) [29.95ug/m3] [74.88%]	10 samples
Site 9:	21.80 ug/m3 (54.50%) [20.06ug/m3] [50.15%]	12 samples
Site 10:	37.99 ug/m3 (94.98%) [34.95ug/m3] [87.38%]	12 samples
Site 11:	27.93 ug/m3 (69.83%) [25.70ug/m3] [64.25%]	12 samples
Site 12:	52.25 ug/m3 (130.63%) [48.07ug/m3] [120.18%]	12 samples
Site 13:	38.58 ug/m3 (96.45%) [35.49ug/m3] [88.73%]	12 samples
Site 14:	51.66 ug/m3 (129.15%) [47.53ug/m3] [118.83%]	12 samples
Site 15:	38.08 ug/m3 (95.20%) [35.03ug/m3] [87.58%]	10 samples
Site 16^:	37.71 ug/m3 (94.28%) [34.69ug/m3] [86.73%]	10 samples
Site 17:	38.98 ug/m3 (97.45%) [35.86ug/m3] [89.65%]	12 samples
Site 18*:	41.54 ug/m3 (103.85%) [38.22ug/m3] [95.55%]	12 samples

Average of sites 5 & 18 = 39.88 ug/m3 (99.70%) [36.69 ug/m3] [91.73%]

2004 Nitrogen Dioxide diffusion tube results – ug/m3

Sites 19, 20 & 21 established from August 2004

Sites 18 & 19 validating Site 14 from August 2004 (Validation of site 5 ceased)

Site 20 – Side of 130 Kingshill Road (7.0 m from kerbside) [Grid Ref: SU 146 838]

Site 21 – Front of 63 Kingshill Road (1.3 m from kerbside) [Grid Ref: SU 145 839]

Site No.	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1^	26.3	37.7	28.8	33.0	30.1	26.2	29.7	29.3	23.0	34.1	40.3	34.9
2	21.4	25.6	19.7	15.9	16.4	10.1	12.6	13.7	16.1	20.7	26.9	23.2
3^	27.3	28.2	21.2	25.5	19.9	13.9	17.9	20.1	19.6	26.1	36.8	23.6
4^	28.0	28.9	23.4	19.6	14.1	14.2	15.7	18.9	20.2	N/r	31.1	32.8
5	40.3	39.1	N/r	38.6	29.6	26.6	36.5	38.6	35.3	38.1	41.4	39.7
6	41.3	36.7	28.2	28.7	29.1	32.0	30.2	37.2	37.2	34.5	41.5	30.9
7	18.1	32.2	19.3	20.0	18.2	15.5	20.5	19.8	28.3	22.6	29.5	31.6
8	38.4	39.1	29.9	32.3	N/r	21.0	N/r	34.3	25.2	36.7	41.6	44.8
9	23.6	23.3	18.3	16.4	15.4	15.0	14.9	18.0	16.9	18.4	28.7	23.1
10	33.6	41.4	29.3	32.7	40.4	20.8	33.6	38.1	39.2	37.6	42.1	34.8
11	25.2	31.1	23.9	23.4	21.9	12.0	16.6	20.2	20.9	27.7	34.9	29.4
12	49.1	58.4	43.3	42.1	44.9	47.9	47.1	48.2	48.5	44.3	41.1	54.2
13	36.8	37.4	32.5	35.5	27.4	29.8	33.3	45.3	36.9	35.9	37.8	43.7
14	46.0	53.7	33.0	46.2	32.8	30.4	43.6	39.9	33.8	30.3	34.2	38.8
15	30.5	42.3	28.4	26.7	38.1	28.4	25.9	31.2	27.9	34.3	41.2	33.8
16^	30.0	44.9	32.4	34.5	35.4	21.1	24.8	30.7	29.0	N/r	35.7	37.9
17	27.3	39.1	29.1	31.6	33.5	18.2	22.2	23.1	30.5	29.8	29.0	35.0
18*	40.4	40.6	N/r	30.7	32.2	31.2	35.8	35.5	33.2	29.2	35.0	35.0
19*								36.6	33.6	28.5	35.1	45.5
20								18.4	20.5	35.4	27.0	26.0
21								27.7	28.8	21.8	37.0	36.4

2004 Annual Mean Values:*Bias correction factor = 0.97; Values indicated in [] brackets*

Site 1^:	31.12 ug/m3 (77.80%) [30.19 ug/m3] [75.48%]	12 samples
Site 2:	18.53 ug/m3 (46.33%) [17.97 ug/m3] [44.93%]	12 samples
Site 3^:	23.34 ug/m3 (58.35%) [22.64 ug/m3] [56.60%]	12 samples
Site 4^:	22.45 ug/m3 (56.13%) [21.78 ug/m3] [54.45%]	12 samples
Site 5:	36.71 ug/m3 (91.78%) [35.61 ug/m3] [89.03%]	11 samples
Site 6:	33.96 ug/m3 (84.90%) [32.94 ug/m3] [82.35%]	12 samples
Site 7:	22.97 ug/m3 (57.43%) [22.28 ug/m3] [55.70%]	12 samples
Site 8:	34.33 ug/m3 (85.83%) [33.30 ug/m3] [83.25%]	10 samples
Site 9:	19.33 ug/m3 (48.33%) [18.75 ug/m3] [46.88%]	12 samples
Site 10:	35.30 ug/m3 (88.25%) [34.24 ug/m3] [85.60%]	12 samples
Site 11:	23.93 ug/m3 (59.83%) [23.21 ug/m3] [58.03%]	12 samples
Site 12:	47.43 ug/m3 (119.33%) [46.01 ug/m3] [115.03%]	12 samples
Site 13:	36.03 ug/m3 (90.08%) [34.95 ug/m3] [87.38%]	12 samples
Site 14:	38.56 ug/m3 (96.40%) [37.40 ug/m3] [93.50%]	12 samples
Site 15:	32.39 ug/m3 (80.98%) [31.42 ug/m3] [78.55%]	12 samples
Site 16^:	32.40 ug/m3 (81.00%) [31.43 ug/m3] [78.58%]	11 samples
Site 17:	29.03 ug/m3 (72.58%) [28.16 ug/m3] [70.40%]	12 samples
Site 18*:a	35.15 ug/m3 (87.88%) [34.10 ug/m3] [85.25%]	6 samples
b	33.58 ug/m3 (83.95%) [32.57 ug/m3] [81.43%]	5 samples
Site 19:	35.86 ug/m3 (89.65%) [34.78 ug/m3] [86.95%]	5 samples
Site 20:	25.46 ug/m3 (63.65%) [24.70 ug/m3] [61.75%]	5 samples
Site 21:	30.34 ug/m3 (75.85%) [29.43 ug/m3] [73.58%]	5 samples

7 month average of sites 5 & 18a = 35.13 ug/m3 (87.85%) [34.09 ug/m3] [85.23%]

5 month (2004) average of sites 14, 18b & 19 = 34.95 ug/m3 (87.38%) [33.90 ug/m3] [84.75%]

2005 Nitrogen Dioxide diffusion tube results – ug/m3

Site 22, Front of 59 Edale Moor, Liden (Grid Ref: SU 193 830) (39m from kerbside of northbound carriageway of A419) Established March 2005

Site No.	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
1^	33.5	32.6	31.9	23.8	24.1	20.8	21.9	23.2	29.6	32.7		
2	24.7	18.8	23.5	12.3	8.3	10.5	12.1	10.1	17.1	13.8		
3^	25.0	22.5	28.7	17.1	9.0	14.7	14.3	17.2	20.8	21.6		
4^	N/r	23.0	22.9	17.4	10.6	15.1	11.8	15.2	15.8	26.1		
5	32.6	26.7	44.4	31.1	24.5	20.5	30.7	27.2	31.1	37.8		
6	34.9	27.3	29.2	24.5	21.7	23.9	20.0	23.2	27.2	33.4		
7	25.3	23.0	23.5	14.6	11.0	11.2	17.1	16.6	20.5	22.9		
8	38.7	30.1	31.0	23.6	20.1	N/r	22.1	18.3	25.5	34.8		
9	18.7	16.1	20.8	17.2	9.2	7.4	10.7	11.2	17.0	19.3		
10	35.7	39.6	46.3	32.9	28.5	28.7	31.9	30.9	28.1	41.7		
11	34.8	25.0	32.7	N/r	12.5	15.2	N/r	14.3	16.6	26.2		
12	45.4	40.8	49.5	37.2	37.0	46.2	31.6	32.7	47.2	49.8		
13	35.0	37.3	38.3	38.6	22.7	22.7	24.7	24.9	39.5	39.9		
14	38.3	37.8	49.8	25.5	35.6	31.9	38.5	36.8	32.7	44.1		
15	32.3	N/r	34.9	24.5	18.6	24.5	19.9	26.6	29.9	34.1		
16^	59.2	36.7	37.9	25.7	21.3	21.9	22.9	27.7	30.5	34.8		
17	32.3	28.9	34.7	24.4	15.9	20.1	20.8	23.4	24.0	30.7		
18*	30.0	36.7	53.1	26.6	35.3	32.9	35.1	35.2	42.3	45.1		
19*	36.8	42.7	40.7	28.1	34.2	31.4	37.6	39.4	41.8	44.5		
20	28.3	27.7	28.1	23.3	12.4	14.9	17.8	17.2	20.4	25.5		
21	35.4	44.2	51.1	26.8	24.9	22.9	25.6	29.8	27.5	30.7		
22			23.2	19.1	14.9	26.8	18.1	15.2	19.0	31.6		

2005 Annual Mean Values:

Average to date:

Site 1^	26.94 ug/m3	7 samples
Site 2	15.74 ug/m3	7 samples
Site 3^	18.76 ug/m3	7 samples
Site 4^	16.80 ugm3	7 samples
Site 5	30.07 ug/m3	7 samples
Site 6	25.93 ug/m3	7 samples
Site 7	17.96 ug/m3	7 samples
Site 8	27.60 ug/m3	6 samples
Site 9	14.30 ug/m3	7 samples
Site 10	34.80 ug/m3	7 samples
Site 11	24.04 ug/m3	5 samples
Site 12	41.10 ug/m3	7 samples
Site 13	31.33 ug/m3	7 samples
Site 14	36.77 ug/m3	7 samples
Site 15	25.77 ug/m3	6 samples
Site 16^	32.23 ug/m3	7 samples
Site 17	25.30 ug/m3	7 samples
Site 18	35.67 ug/m3	7 samples
Site 19	35.93 ug/m3	7 samples
Site 20	21.79 ug/m3	7 samples
Site 21	32.99 ug/m3	7 samples
Site 22	20.42 ug/m3	5 samples

12 month (5 months in 2004 + 7 months in 2005) average of sites 14 [+18 & 19] = 36.12 ug/m3

Appendix 3

Objectives included in the Air Quality Regulations 2000 and (Amendment) Regulations 2002 for the purpose of Local Air Quality Management:

<u>Pollutant</u>	<u>Air Quality Objectives</u>		<u>Achievement</u>
	Concentration	Measured As	<u>Date</u>
Benzene <i>All authorities</i>	16.25 ug/m ³	Running Annual Mean	31.12.2003
<i>Authorities in England & Wales only</i>	5 ug/m ³	Annual Mean	31.12.2010
1,3 Butadiene	2.25 ug/m ³	Running Annual Mean	31.12.2003
Carbon Monoxide	10.0 mg/m ³	Maximum Daily running 8-hour Mean	31.12.2003
Lead	0.5 ug/m ³	Annual Mean	31.12.2004
	0.25 ug/m ³	Annual Mean	31.12.2008
Nitrogen Dioxide	200 ug/m ³ not to be exceeded more than 18 times per year	1-hour Mean	31.12.2005
	40 ug/m ³	Annual Mean	31.12.2005
Particles (PM ₁₀) (gravimetric)	50 ug/m ³ not to be exceeded more than 35 times	24-hour Mean	31.12.2004
	40 ug/m ³	Annual Mean	31.12.2004
Sulphur Dioxide	350 ug/m ³ not to be exceeded more than 24 times per year	1-hour Mean	31.12.2004
	125 ug/m ³ not to be exceeded more than 3 times per year	24-hour Mean	31.12.2004
	266 ug/m ³ not to	15-minute Mean	31.12.2005

Appendix 4

Glossary of Terms:

SO ₂	Sulphur Dioxide
NO ₂	Nitrogen Dioxide
NO _x	collective term to describe Nitric Oxide & Nitrogen Dioxide
PM ₁₀	Particulate Matter less than 10 microns in diameter
ug/m ³	Micrograms / cubic metre (i.e. one-millionth of a gram of pollutant per cubic metre)
DEFRA	Department of Environment, Food & Rural Affairs
DTLR	Department of Transport, Local Government and the Regions
DMRB	Design Manual for Roads & Bridges