AIR QUALITY 2005

1.0 CORRECTED NITROGEN DIOXIDE DIFFUSION TUBES – TOWN CENTRE

Site	Mean Concentration in ug/m3	Tubes Missing
Site 1, 10 Eastgate St	45.5	2
Site 2, Greyfriars 1	44.2	0
Site 3, Greyfriars 2	43.8	2
Site 4, Greyfriars 3	44.8	1
Site 5, Friarsgate	35.6	0
Site 6, Middle Brook St	48.4	0
Site 7, Roadside Monitor	54.1	1
Site 8, Roadside Monitor	52.8	1
Site 9, Roadside Monitor	53.1	1
Site 10, St Georges St TC	68.0	0
Site 11, St Georges St Lad	69.0	0
Site 12, Jewry St CH	55.2	1
Site 13, Jewry St FK	59.7	1
Site 14, Southgate St DV	46.6	0
Site 15, Southgate St CH	58.6	1
Site 16, Sussex St	48.3	1
Site 17, City Road	48.0	1
Site 18, 74 Northwalls	51.0	0
Site 19, 15 Northwalls	41.0	0
Site 20, Wales St	37.1	1
Site 21, Alresford Rd	34.2	7
Site 22, Chesil St	45.1	1
Site 23, Romsey Rd HL	25.6	1
Site 24, Stockbridge Rd	29.4	1
Site 25, Andover Rd	40.2	0
Site 26, Worthy Rd 1	38.0	0
Site 27, Worthy Rd 2	36.1	0
Site 28, Worthy Rd 3	37.3	1
Site29, St Cross Rd	45.2	2
Site 30, Romsey Road	64.2	3
Site 31, Andover Rd	44.4	0
Site 32, Bus Station	53.6	3
Site 33, Parchment St	35.5	5
Site 34, Middle Brook St	27.7	5

RED = Exceeds air quality objective

2.0 CORRECTED NITROGEN DIOXIDE DIFFUSION TUBES – ACROSS DISTRICT

SAMPLING PERIOD	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9
	ALL RESULTS IN PPB (BLANK SUBTRACTED)								
06/01/05 - 04/02/05		22.5	12.0	15.4	11.3	15.1	15.7	16.1	20.1
04/02/05 - 04/03/05	14.7	22.9	11.6	16.0	9.8	13.3	13.7	15.7	23.7
04/03/05 - 06/04/05	17.9	29.8	14.9	16.7	13.4	19.0	17.8	16.7	18.3
06/04/05 - 27/04/05	16.4	27.9	14.8	17.0	11.5	16.9	18.0	18.7	21.8
27/04/05 - 03/06/05	11.6	22.7	11.5	12.6	8.4	12.8	12.0	15.7	15.1
03/06/05 - 29/06/05	14.6	22.3	13.0	17.3	9.2	18.2	13.8	18.3	19.1
29/06/05 - 28/07/05	10.7	22.0	10.7	13.0	8.5	12.9	10.9	15.6	17.4
28/07/05 - 26/08/2005	9.3	18.2	8.9	9.5	7.5	12.4	12.6	15.0	18.3
26/08/2005 - 22/09/2005	15.8	27.7	13.4	16.5	9.7	14.6	15.0	18.0	18.3
22/09/2005 - 27/10/2005	14.5		14.7	15.7	11.7	17.0	15.3	18.8	15.4
27/10/2005 - 02/12/2005	15.2		15.2	17.8	12.5	16.2	17.3	18.7	19.0
02/12/2005 - 10/01/06	16.9	22.6	14.5	17.1	14.9	17.9	17.9	19.0	20.5
YEARLY AVERAGE (PPB)	**14.3**	**23.9**	**12.9**	**15.4**	**10.7**	**15.5**	**15.0**	**17.2**	**18.9**
BIAS CORRECTED ($\mu g/m^3$)	**33.4**	**55.6**	**30.1**	**35.8**	**24.9**	**36.2**	**34.9**	**40.0**	**44.1**

SITE 1 - Gordon Road, Winchester

SITE 2 - City Road, Winchester

SITE 3 - Kingsworthy (A34)

SITE 4 - Broad St, New Alresford

SITE 5 - Denmead

SITE 6 - Wickham

SITE 7 - Whiteley

SITE 8 - Bishops Waltham

SITE 9 - Otterbourne

3.0 REAL TIME AIR QUALITY DATA - WINCHESTER TOWN CENTRE

3.1 Short Term Air Quality Objectives

Year	Exceedances of Air Quality Objective					
	PM_{10} 50ug/m^3 (24 Hr Mean)		NO_2 200ug/m^3 (1 Hr Mean)		CO 10mg/m^3 (8hr running mean)	
	Background	Roadside	Background	Roadside	Background	Roadside
1997	8	22	0	**299**	0	0
1998	5	14	0	6	0	0
1999	1	3	0	8	0	0
2000	2	18	0	15	0	0
2001	3	16	0	12	0	0
2002	2	21	0	**161**	0	0
2003	21	20*	0	**70**	0	0
2004	Not enough data	17	0	0	0	0
2005	8	13	1	6	NA	0
	Pass = less than 35 failures/year		Pass = less than 18 failures/year		Pass = No failures of objective	
	Numbers in red FAILED the short term mean air quality objectives					

3.2 Long Term Air Quality Objectives

Year	Compliance with Annual Mean Air Quality Objectives					
	Mean PM_{10} in ug/m^3 40ug/m^3 (Annual Mean)		Mean NO_2 in ug/m^3 40ug/m^3 (Annual Mean)		Mean CO in mg/m^3 No annual objective	
	Background	Roadside	Background	Roadside	Background	Roadside
1997	18.4	26.5	35.30	**82.7**	0.7	1.3
1998	17.2	21.9	39.7	**58.1**	0.5	1.3
1999	17.6	21.1	31.1	**60.2**	0.5	1.2
2000	16.4	21.2	33.0	**68.6**	0.5	1.2
2001	14.8	27.3	33.4	**50.8**	0.3	1.2
2002	19.8	28.9	27.3	**65.5**	0.3	1.0
2003	25.7	31.6	**41.1**	**55.8**	0.3	1.0
2004	Not enough data	29.8	29.4	**52.1**	0.3	0.8
2005	21.3	28.1	26.2	**53.5**	NA	0.5

Numbers in red FAILED the annual mean objective

4.0 TECHNICAL NOTES

4.1 Diffusion Tube Data

All diffusion tubes were from GRADKO and used a mixture of 50 percent TEA in water.

The results have been adjusted by using a locally generated bias correction factor using the procedure detailed in DEFRA guidance document Technical Guidance LAQM TG(03). This was calculated by locating three diffusion tubes adjacent to the roadside real time analyser and comparing results. The bias correction calculated for 2005 was **1.22,** which is very close to the previous correction factor for 2004 of 1.23.

The Town Centre diffusion tubes have been located to represent nearest relevant public exposure locations i.e. domestic building facades.

The District wide diffusion tube survey is roadside based and is therefore an over representation of public exposure.

4.2 Real Time Monitoring Results

The roadside site is located 2.75 metres from the kerb on St Georges St whilst the urban background site is located 18 metres from the kerb off Friarsgate. The background site samples at a height of 2.80 metres and the roadside site at 2.65 metres. New instruments (like for like) were installed in March 2005 as the increase in break downs and the time to order older replacement parts was resulting in a loss of data. However, this did result in down time for several weeks within March whilst this was performed. Due to the low levels of carbon monoxide being recorded at the background site this instrument was not replaced. Replacing instruments did cause a lower overall data capture for 2005 but this should be to the benefit of subsequent years. Two parameters were therefore below a 90 percent collection efficiency for the year. These were:

- Background CO – Instrument completely broke in February and was not replaced until new instrument was fitted in March. This gave a collection efficiency of only 65 percent for the year, although results are well below objectives at all times.

- Background PM_{10} – New instrument had significant “teething problems” resulting in a lot of data loss between April and August - this caused a collection efficiency of only 80 percent for the year.

Particle results still use an unheated BAM 1024 analyser and have therefore had a correction factor applied as now recommended, data being divided by 1.2. All data from previous years has now had the same correction factor applied.

All results have been zero and spanned corrected with zero and span readings taken every 2 weeks in accordance with DEFRA guidance.

Data from June 2005 onwards is now ratified externally using air quality consultants used by DEFRA.

5.0 SUMMARY OF AIR QUALITY OBJECTIVES

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25μg/m^3	Running annual mean	31.12.2003
	5.00μg/m^3	Annual mean	31.12.2010
1,3-butadiene	2.25μg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10.0mg/m^3	Maximum daily running 8 hour mean	31.12.2003
Lead	0.5μg/m^3	Annual mean	31.12.2004
	0.25μg/m^3	Annual mean	31.12.2008
Nitrogen dioxide (Provisional)	200μg/m^3 not to be exceeded more than 18 times a year	1 Hour mean	31.12.2005
	40μg/m^3	Annual mean	31.12.2005
Particles (PM10) (Gravimetric)	50μg/m^3 not to be exceeded more than 35 times a year	24 hour mean	31.12.2004
	40μg/m^3	Annual mean	31.12.2004
	50μg/m^3 not to be exceeded more than 7 times a year[1]	24 hour mean	31.12.2010
	20μg/m^3 [1]	Annual mean	31.12.2010
Sulphur dioxide	350μg/m^3 not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125μg/m^3 not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266μg/m^3 not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1. New objectives not currently within regulations but guidance recommends inclusion in an assessment

6.0 DISCUSSION

6.1 Nitrogen dioxide – Winchester Town Centre

Air quality results were similar to 2004. Both sites are in compliance with the 24 hour mean objective but as in previous years only the background site complies with the annual mean objective.

The diffusion tube results also show that there are still areas adjacent to busy roads within the Air Quality Management Area (AQMA) that fail to meet the 2005 annual mean objective. The diffusion tubes are located on building facades therefore the nearer the buildings are to the road, the higher the results. This explains variations in the results for both Southgate St and North Walls, with much higher results being recorded on the side of the street where the buildings are closer to the road. Overall the geographical spread of non compliance is slightly wider than for 2004.

6.2 Nitrogen dioxide – Across the District

Only two sites exceeded the annual average nitrogen dioxide objective; these being at Winchester (City Road) and Otterbourne (Otterbourne Road). However these are roadside exposure locations and therefore over represent public exposure. This can be demonstrated by comparing the roadside City road average of 55.6µg/m^3 with the building façade average of 48µg/m^3. Levels at Otterbourne have decreased slightly over the 2004 result but continue to fail the annual mean objective. Therefore a more detailed study of the Otterbourne area will be conducted in 2006. Due to cost implications this means the district wide survey will be suspended for 2006 to fund this study.

6.3 Particles (PM_{10})– Winchester Town Centre

Both sites are in compliance with the current 24 hour and annual objectives.

However, there are new objectives for 2010 that require 50µg/m^3 as a 24 hour mean not be exceeded more than 7 times a year and 20µg/m^3 as an annual mean. Compliance with these objectives is currently not being achieved at either site.

Monitoring will therefore need to be continued to assess future compliance with these objectives. Funding from Hampshire County Council allowed three light scattering instruments to be commissioned in December 2005. This will increase the geographical coverage of particle data within the town centre in future years.

6.4 Carbon monoxide – Winchester Town Centre

No failures recorded. Due to the values being well below the air quality objective we have now ceased monitoring background levels of Carbon monoxide. Roadside monitoring will continue as Carbon monoxide levels are a good marker for transport related pollution.