AIR QUALITY 2006

1.0 CORRECTED NITROGEN DIOXIDE DIFFUSION TUBES – TOWN CENTRE

Site	Mean Concentration in ug/m3	Tubes Missing
Site 1, 10 Eastgate St	44.8	0
Site 2, Greyfriars 1	44.1	2
Site 3, Greyfriars 2	45.5	0
Site 4, Greyfriars 3	44.1	2
Site 5, Friarsgate	36.7	0
Site 6, Middle Brook St	49.7	0
Site 7, Roadside Monitor	49.6	2
Site 8, Roadside Monitor	49.1	4
Site 9, Roadside Monitor	53.7	2
Site 10, St Georges St TC	67.1	0
Site 11, St Georges St Lad	72.5	1
Site 12, Jewry St CH	53.3	1
Site 13, Jewry St FK	61.0	0
Site 14, Southgate St DV	45.4	0
Site 15, Southgate St CH	55.7	1
Site 16, Sussex St	47.4	0
Site 17, City Road	48.9	1
Site 18, 74 Northwalls	54.8	0
Site 19, 15 Northwalls	41.5	1
Site 20, Wales St	39.3	2
Site 21, Alresford Rd	44.9	6
Site 22, Chesil St	47.7	5
Site 23, Romsey Rd HL	31.5	0
Site 24, Stockbridge Rd	30.2	0
Site 25, Andover Rd	36.4	1
Site 26, Worthy Rd 1	39.0	1
Site 27, Worthy Rd 2	37.7	0
Site 28, Worthy Rd 3	38.4	0
Site29, St Cross Rd	41.5	2
Site 30, Romsey Road	64.9	0
Site 31, Andover Rd	45.2	1
Site 32, Bus Station	55.6	4
Site 33, Parchment St	39.0	2
Site 34, Middle Brook St	31.0	3

RED = Exceeds air quality objective

2.0 CORRECTED NITROGEN DIOXIDE DIFFUSION TUBES – M3 STUDY OTTERBOURNE

SAMPLING PERIOD	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9	NEW SITE 9
	ALL RESULTS IN PPB (BLANK SUBTRACTED)									
10/01/06 - 08/02/06	18.6	16.5	18.1	22.8	19.6	17.5	15.7	17.7	12.4	x
08/02/06 - 14/03/06	13.6	10.7	15.5	20.1	17.1	13.1	12.5	14.6	8.8	x
14/03/06 - 20/04/06	9.8	11.8	12.5	16.8	13.2	10.8	9.4	10.9	7.9	x
20/04/06 - 25/05/06	12.9	16.0	13.7	16.9	Missing	10.8	9.9	12.9	9.3	x
25/05/06 - 06/07/06	Missing	16.4	14.9	17.0	6.0	10.7	8.6	Missing	2.3	x
06/07/06 - 24/08/06	8.1	16.0	12.4	15.8	Missing	9.6	8.6	Missing	X	16.7
24/08/06 - 27/09/06	11.4	18.3	14.9	16.0	Missing	11.1	11.0	12.0	X	15.8
27/09/06 - 02/11/06	12.5	20.7	14.1	15.7	10.9	10.1	10.5	12.4	X	13.8
02/11/06-07/12/06	15.1	19.6	18.2	19.4	Missing	14.5	13.6	17.4	X	15.6
07/12/06 - 12/01/07	13.7	18.5	16.1	16.2	15.0	13.7	13.1	15.2	X	16.3
YEARLY AVERAGE	**12.9**	**16.5**	**15.0**	**17.7**	**13.6**	**12.2**	**11.3**	**14.2**	**8.2**	**15.6**
BIAS CORRECTED in ug/m3	**31.0**	**39.7**	**36.3**	**42.6**	**32.9**	**29.4**	**27.2**	**34.1**	**19.6**	**37.7**

Site 1 = Gordon Road, Winchester
Site 2 = Shephards Down School, Compton
Site 3 = Pearson Lane, Shawford
Site 4 = Southdown Road, Compton (near road)
Site 5 = Highways Road, Otterbourne
Site 6 = Bourne Close, Otterbourne
Site 7 = Cranbourne Drive, Otterbourne
Site 8 = Chapel Lane, Otterbourne
Site 9 = Carmans Lane, Compton
New Site 9 = Southdown Road, Compton (property)

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**
2006	8	15	0	0	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
2006	20.0	27.0	28	**51.0**	NA	0.5

Numbers in red FAILED the annual mean objective

4.0 TURNKEY (OSIRIS LIGHT SCATTERING) PM10 MONITORING SITES

PARAMETER	BACKGROUND SITE (CO-LOCATED)	CITY ROAD (ROADSIDE)	NORTH WALLS (ROADSIDE)
ANNUAL MEAN OBJECTIVE (**40ug/m^3**)	20.0	22.1	19.8
FAILURES OF 24 HOUR OBJECTIVE. (**50ug/m^3 with no more than 35 failures /year**)	4	6	2
PERCENTAGE COLLECTION	85.5	88.2	83.0

5.0 TECHNICAL NOTES

5.1 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 2006 was **1.26,** which is very close to the previous correction factors of 1.22 and 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 has been suspended to allow for a study of exposures along the M3 in the Otterbourne area. Except for site 4, the locations have been chosen to represent nearest relevant public exposure locations i.e. domestic building facades.

5.2 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 and this has seen an increase in data collection efficiency with all instruments recording a greater than 95 percent collection efficiency.

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. All gases used for calibration have been independently certified.

All data was ratified externally using air quality consultants used by DEFRA.

5.3 Turnkey (Osiris) Monitoring Results

Three instruments were installed in December 2006 with funding from Hampshire County Council. One instrument is located at a roadside location (1.5 metres from kerb) at both City Road and North Walls, initially at a height of between 3 to 4 metres. In November 2006 these were relocated to a height of 2.5 metres to ensure a more representative sampling height and safer access. The third instrument is currently co-located at the background station. This has allowed the performance of the Osiris to be cross referenced to the fully approved methodology used at these sites and a bias correction factor calculated. For 2006 this was calculated to be 1.005.

These instruments use a light scattering methodology to provide 15 minute readings for particle (PM_{10}) concentrations. The instruments are checked remotely every fortnight by mobile phone connection and the pump filters are changed quarterly by site visit. These instruments are on a yearly service contract and the first service was performed in November 06.

There were some initial teething problems and this has resulted in collection efficiencies in the 80 percentage range. It is anticipated that this will improve in future years.

6.0 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
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

7.0 DISCUSSION

7.1 Nitrogen dioxide – Winchester Town Centre

Air quality results were similar to 2004 and 2005. 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 similar to 2005.

7.2 Nitrogen dioxide –M3 Otterbourne

Last years report identified exceedances of the annual average nitrogen dioxide objective at the Otterbourne roadside site (Otterbourne Road). In addition Eastleigh BC has identified areas on the M3 to the south of Winchester's District where failures are likely to occur at domestic residences. Therefore a study was commenced in Jan 2006 to study exposures at domestic properties in the Compton to Otterbourne area close to the M3. The Otterbourne (Otterbourne Road) roadside location (Site 4) used for the District wide study was kept for cross reference.

The results show that Site 4 was the only location failing the average nitrogen dioxide objective. However, results from the Compton area are close to the objective so this study will continue throughout 2007.

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

All sites are in compliance with both the current 24 hour and annual objectives. The Osiris monitoring extends coverage of PM_{10} data and shows as suspected that the roadside monitoring location is a likely to be a worse case scenario for Winchester City Centre.

Guidance received during 2006 suggests that the 2010 provisional objectives (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) will no longer be made a formal requirement for local air quality assessments. We have therefore suspended making comparisons with these objectives.

7.4 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.