AIR QUALITY SUMMARY 2008

1.0 NITROGEN DIOXIDE DIFFUSION TUBES – WINCHESTER CITY CENTRE

LOCATION	GRID REF (SU)	2008 AVERAGE BIAS CORRECTED		PERCENTAGE CHANGE FROM 2007
		UG/M3	MISSING TUBES (out of 11)	
Site 1, 10 Eastgate St	48563 29391	37.8	0	-2.0
Site 2, Greyfriars 1	48566 29560	37.5	0	-8.6
Site 3, Greyfriars 2	48566 29560	38.8	0	-6.3
Site 4, Greyfriars 3	48566 29560	37.8	0	-6.6
Site 5, Friarsgate	48426 29523	31.6	0	-6.7
Site 6, Upper Brook St	48227 29504	47.4	0	1.3
Site 7, Roadside Monitor	48213 29504	45.2	0	-10.9
Site 8, Roadside Monitor	48213 29504	46.0	0	-8.5
Site 9, Roadside Monitor	48213 29504	46.2	0	-10.4
Site 10, St Georges St	48106 29541	57.8	0	-12.0
Site 11, St Georges St Lad	48163 29512	60.7	3	-2.8
Site 12, Jewry St	48046 29692	45.0	1	-9.4
Site 13, Jewry St	48029 29666	55.2	0	-6.5
Site 14, Southgate St	47918 29413	42.1	0	-6.4
Site 15, Southgate St	47929 29409	48.6	0	-11.7
Site 16, Sussex St	47804 29741	43.9	0	-0.6
Site 17, City Road	47963 29875	38.8	0	-8.1
Site 18, 74 Northwalls	48234 29794	44.9	0	-3.6
Site 19, 15 Northwalls	48297 29789	35.2	1	-4.2
Site 20, Wales St	48842 29820	33.1	0	-14.9
Site 21, Alresford Rd	49557 29437	38.3	1	-7.1
Site 22, Chesil St	48679 29068	41.4	1	-5.0
Site 23, Romsey Rd (Hilliers)	47003 29425	24.1	0	-1.8
Site 24, Stockbridge Rd	47534 30006	25.7	0	-14.8
Site 25, Andover Rd	47745 30456	33.8	0	-8.5
Site 26, Worthy Rd 1	48092 30411	31.7	0	-11.6
Site 27, Worthy Rd 2	48092 30411	32.7	1	-11.4
Site 28, Worthy Rd 3	48092 30411	33.2	0	-9.8
Site29, St Cross Rd	47842 29050	39.4	2	-9.0
Site 30, Romsey Rd	47495 29511	53.1	1	-19.6
Site 31, Andover Rd	47898 30065	38.2	1	-5.7
Site 32, Bus Station	48427 29401	41.8	3	-16.0
Site 33, Parchment St	48173 29568	30.8	2	-5.1
Site 34, Middle Brook St	48368 29624	25.3	2	-12.5

RED = Exceeds air quality objective

2.0 NITROGEN DIOXIDE DIFFUSION TUBES – DISTRICT WIDE STUDY

GRID REF'S (SU)	48062 24372	46690 24645	42835 25162	49161 32291	58828 32707	65915 12047	57305 1173	55331 17399	53638 08258
LOCATION F= Building Façade R = Roadside location	**Twyford (F)**	**Otterbourne (R)**	**Hursley (F)**	**Kings Worthy (F)**	**New Alresford (R)**	**Denmead (R)**	**Wickham (R)**	**Bishops Waltham (R)**	**Whiteley (R)**
	ALL RESULTS IN PPB (BLANK SUBTRACTED)								
DATE									
09/01/08 - 13/02/08	19.7	19.6	11.0	27.2	19.9	14.7	21.8	20.5	21.0
13/02/08 - 12/03/08	MISSING	20.3	10.4	27.7	19.9	14.6	19.0	18.8	18.7
12/03/08 - 09/04/08	16.2	19.3	8.4	24.1	16.2	11.5	17.5	15.8	14.3
09/04/08 - 15/05/08	19.0	16.7	9.9	13.4	18.6	9.3	16.6	17.9	13.4
15/05/08 - 03/07/08	15.2	17.4	6.9	12.4	16.0	8.6	16.0	16.7	11.8
03/07/08 - 07/08/08	14.0	15.0	5.6	12.6	14.9	8.4	14.0	17.9	14.4
07/08/08 - 02/09/08	13.5	11.5	5.6	12.9	14.1	8.7	13.6	17.6	13.5
02/09/08 - 01/10/08	18.4	19.1	7.9	13.0	16.3	9.0	15.9	18.2	19.9
01/10/08 - 29/10/08	15.8	18.9	7.9	15.2	17.5	12.8	16.2	19.0	16.5
29/10/08 - 25/11/08	19.1	21.2	10.0	15.8	18.7	13.4	20.0	18.2	16.2
25/11/08 - 31/12/08	20.4	24.4	13.0	18.6	24.5	17.6	21.2	21.3	19.5
YEARLY AVERAGE (PPB)	17.1	18.5	8.8	17.5	17.9	11.7	17.4	18.3	16.3
%AGE COLLECTION	91	100	100	100	100	100	100	100	100

BIAS CORRECTED in ug/m3	**33.4**	**36.1**	**17.2**	**34.2**	**34.9**	**22.8**	**34.0**	**35.8**	**31.8**

2005 Results	**-**	**44.1**	**-**	**-**	**35.8**	**24.9**	**-**	**40.0**	**34.9**

3.0 REAL TIME AIR QUALITY DATA - WINCHESTER CITY CENTRE

3.1 Short Term Air Quality Objectives

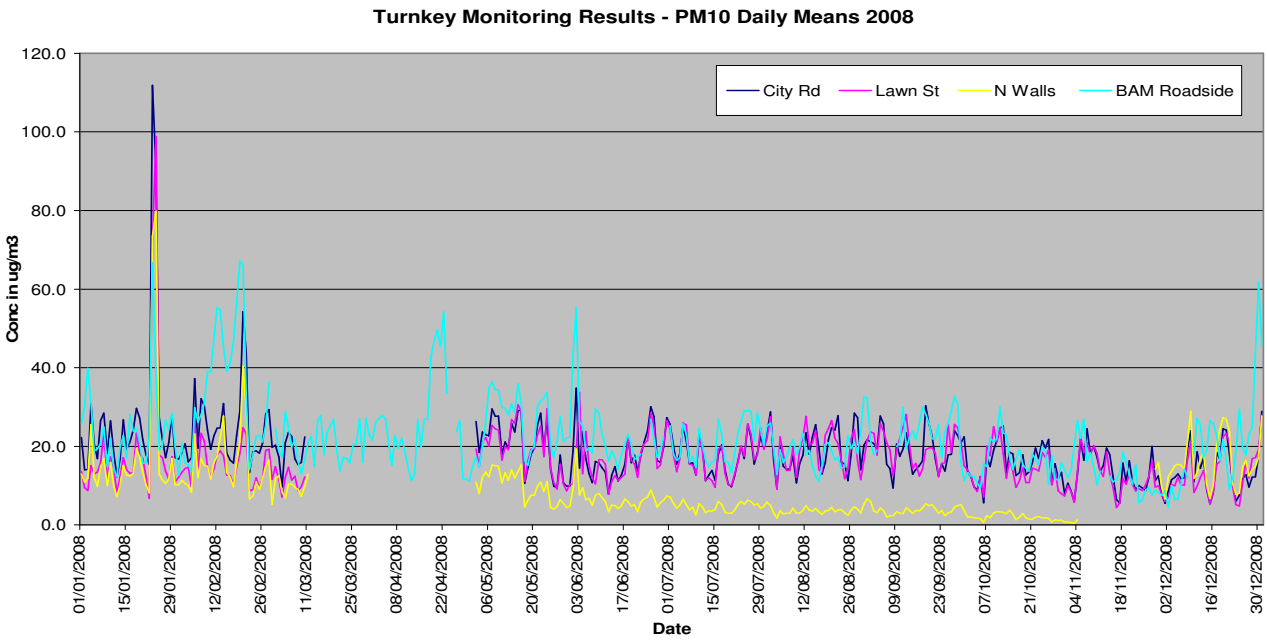
Year	Exceedances of Air Quality Objective					
	PM_{10} 50ug/m^3 (24 Hr Mean)		NO_2 200ug/m^3 (1 Hr Mean)		CO 10mg/m^3 (8hr running mean)	
	Background	Roadside	Background	Roadside	Background	Roadside
1997	8	22	0	**299**	0	0
1998	5	14	0	6	0	0
1999	1	3	0	8	0	0
2000	2	18	0	15	0	0
2001	3	16	0	12	0	0
2002	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
2007	10	15	0	0	NA	0
2008	5	9	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	28.0	**51.0**	NA	0.5
2007	19.0	25.0	27.0	**51.0**	NA	0.5
2008	18.0	22.0	27.0	**48.0**	NA	0.4
	Numbers in red FAILED the annual mean objective					

4.0 TURNKEY (OSIRIS LIGHT SCATTERING) PM10 MONITORING SITES

PARAMETER	BACKGROUND SITE (CO-LOCATED) SU 48505 29524		CITY ROAD (ROADSIDE) SU 47966 29877		NORTH WALLS (ROADSIDE) SU 48462 29737	
	2007	**2008**	**2007**	**2008**	**2007**	**2008**
ANNUAL MEAN OBJECTIVE (**40ug/m^3**)	16.4	18.6	21.1	21.1	16.7	NA
FAILURES OF 24 HOUR OBJECTIVE. (**50ug/m^3 with no more than 35 failures /year**)	1	2	12	5	7	NA
PERCENTAGE COLLECTION	85.5	86	90.0	86	90.0	NA



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. This is the last year that this formulation will be used as in accordance with DEFRA recommendations the formulation has now been changed to 20 Percent TEA in water.

The results have been adjusted by using a locally generated bias correction factor using the procedure detailed in the new DEFRA guidance document Technical Guidance LAQM TG(09). This was calculated by locating three diffusion tubes adjacent to the roadside real time analyser and comparing results. The bias correction calculated for 2008 was 1.01 which compares well with the UWE national average of 1.05. Previous years are 1.08, 1.26, 1.22 and 1.23 for 2007 to 2004 respectively.

Three of the sites have triplicate samples to investigate precision of the tubes. The data for 2007 shows all sites have good precision with coefficients of variation for all sampling periods and locations being less than 20 percent (all but two results were below 10 percent) with an average of less than 10 percent (1.8. 1.1 and 2.3 for the three triplicate sites).

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 was recommenced this year with traffic data being used to establish revised locations. Where the site remains the same to that of 2005 then these results have been provided for comparison. The study is a mix of roadside sites and nearest domestic building facades. In general the older sites were roadside locations and these have been maintained in order to ensure consistency in data trends. The new sites have been located at distances representing the nearest domestic building façade in the study area.

5.2 Real Time Monitoring Results

The roadside site is located 2.75 metres from the kerb on St Georges St (Grid Ref SU 48506 29525) whilst the urban background site is located 18 metres from the kerb off Friarsgate (Grid Ref SU 48213 29504). 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.

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. Data collection efficiency for all instruments in 2008 was 96 percent or greater.

All results have been zero and spanned corrected with readings taken approximately every 2 weeks in accordance with DEFRA guidance. All gases used for calibration have been independently certified.

All data was ratified externally by one of the 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 2008 this was calculated to be 1.13, compared to 1.19 for 2007.

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.

There is a large gap in the data due to an excessive period of time taken by the equipment manufacturer to service and calibrate the instruments on a back to base basis. In addition the performance of the North Wall site after calibration was questionable and the instrument was sent back for investigation early November but no faults were found, although on its return the performance can be seen to be significantly different (see graph). Therefore we have no faith in the data from this instrument for a substantial period of 2008 and have not reported on this site.

6.0 SUMMARY OF RELEVANT AIR QUALITY OBJECTIVES

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Carbon monoxide	10.0mg/m^3	Maximum daily running 8 hour mean	31.12.2003
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

7.0 DISCUSSION

7.1 Nitrogen dioxide – Winchester City Centre

Both real time 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 show that there are still areas adjacent the main roads within the Air Quality Management Area (AQMA) that fail to meet the 2005 annual

mean objective. These are spatially concentrated within the one way system around the town centre with the highest levels being in St Georges Street, where the roadside real time analyser is located. This demonstrates that this site is monitoring a worst case scenario.

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 there appears to be an emerging downward trend in annual mean values.

7.2 Nitrogen dioxide – District

This year monitoring recommenced across the district to assess changes since 2005. The study was halted in 2006/07 whilst these resources were used to assess levels in the Otterbourne area near the M3.

In 2008 all sites were in compliance with the annual mean objective.

Last year concern was expressed by DEFRA with the non compliance of the Southdown Road, Otterbourne roadside site. This site has therefore been maintained as part of the district wide study and reassuringly shows compliance during 2008.

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 again that the roadside monitoring location is likely to be a worse case scenario for Winchester City Centre.

7.4 Carbon monoxide – Winchester Town Centre

No failures recorded. Due to the values being well below the air quality objectives we have now ceased monitoring for Carbon monoxide for 2009 onwards.