AIR QUALITY SUMMARY 2011

1.0 NITROGEN DIOXIDE DIFFUSION TUBES – WINCHESTER CITY CENTRE

LOCATION	GRID REF (SU)	2011 AVERAGE BIAS CORRECTED		PERCENTAGE CHANGE FROM 2010
		UG/M3	Percentage Collection	
Site 1, 10 Eastgate St	48563 29391	42.1	55.6	12.3
Site 2, Greyfriars 3	48566 29560	38.4	100.0	2.8
Site 3, Friarsgate	48426 29523	31.8	100.0	-6.7
Site 4, Upper Brook St	48227 29504	40.6	100.0	-2.9
Site 5, Roadside Monitor	48213 29504	46.8	100.0	-2.0
Site 6, Roadside Monitor	48213 29504	47.1	100.0	-2.3
Site 7, Roadside Monitor	48213 29504	46.9	100.0	2.7
Site 8, St Georges St	48106 29541	59.2	100.0	-2.0
Site 9, St Georges St Lad	48163 29512	71.5	100.0	27.5
Site 10, Jewry St	48046 29692	62.5	66.7	26.8
Site 11, Southgate St	47918 29413	46.6	100.0	11.2
Site 12, Sussex St	47804 29741	38.5	100.0	-3.3
Site 13, City Road	47963 29875	41.4	100.0	3.3
Site 14, 74 Northwalls	48234 29794	45.5	100.0	-1.3
Site 15, Wales St	48842 29820	31.7	88.9	-11.0
Site 16, Alresford Rd	49557 29437	37.4	88.9	6.6
Site 17, Chesil St	48679 29068	46.2	100.0	3.1
Site 18, Stockbridge Rd	47534 30006	27.6	88.9	-3.9
Site 19, Andover Rd	47745 30456	34.8	77.8	6.4
Site 20, Worthy Rd 1	48092 30411	33.0	100.0	-3.9
Site 21, Worthy Rd 2	48092 30411	33.9	100.0	-1.5
Site 22, Worthy Rd 3	48092 30411	32.7	100.0	0.8
Site 23, St Cross Rd	47842 29050	40.1	100.0	4.2
Site 24, Romsey Rd	47495 29511	63.3	100.0	2.6
Site 25, Andover Rd	47898 30065	40.2	77.8	5.3
Site 26, Bus Station	48427 29401	43.1	88.9	-0.3

RED = Exceeds air quality objective

2.0 NITROGEN DIOXIDE DIFFUSION TUBES – DISTRICT WIDE STUDY 2011

GRID REF'S (SU)	49443 28927	46537 24704	46659 24655	46414 24279	46030 23672	45920 23331	45505 22345	46694 24642
LOCATION F= Building Façade R = Roadside location	Twyford (F)	Otterbourne (R)	Kings Worthy (F)	New Alresford (R)	Denmead (R)	Wickham (R)	Bishops Waltham (R)	Whiteley (R)
%AGE COLLECTION	88.9	100.0	100.0	88.9	77.8	100.0	100.0	44.4
BIAS CORRECTED in ug/m3	33.4	35.8	28.8	36.9	23.2	34.2	37.3	31.3
Percentage change from 2010	-3.2	5.5	1.1	4.5	1.0	0.4	5.7	-1.7

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
2009	1	3	0	3	N/A	N/A
2010	1	4	0	0	N/A	N/A
2011	3	9	0	0	N/A	N/A
	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
2009	18.0	21.0	26.0	**48.0**	NA	NA
2010	17.0	22.0	27.0	**50.0**	NA	NA
2011	20.0	27.0	26.0	**46.0**	NA	NA
	Numbers in red FAILED the annual mean objective					

5.0 TECHNICAL NOTES

5.1 Diffusion Tube Data

All diffusion tubes were from Gradko and used a mixture of 20 Percent TEA in water. This is the third year that this formulation has used as in accordance with DEFRA recommendations.

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 local bias correction calculated for 2011 was 1.02, which is very similar to 1.03 calculated for 2010. The national bias correction factor for Gradko 20 Percent TEA in water produced by DEFRA is lower at 0.9 but 1.02 is within the spread of results obtained at other locations.

Two of the sites have triplicate samples to investigate precision of the tubes. The data for 2011 shows all sites have good precision with coefficients of variation for all sampling periods and locations being less than 20 percent with an average of less than 10 percent (0.3 and 1.9 for the two triplicate sites).

The Town Centre diffusion tubes have been located to represent nearest relevant public exposure locations i.e. domestic building facades. To save money a few sites have been dropped from the study. These are:

- Triplicate samples at Greyfriars dropped, two other triplicate sites kept
- Jewry St – One of two sampling sites, site with highest average kept
- Southgate St - One of two sampling sites, site with highest average kept
- Northwalls - One of two sampling sites, site with highest average kept
- Romsey Rd Hillier's - Always well below air quality objective as some distance from road.

The District wide diffusion tube survey continued this year using the same sites as for the last two year; except for the removal of the Hursley site which was well below the air quality objective. 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 2011 was greater than 90 percent. The lowest collection efficiency was for the roadside nitrogen dioxide results at 91 percent. This

was due to the failure of the air conditioning unit in the summer (June 11) which had to be fully replaced. During this period the analyser had to be turned off as the temperature in the cabinet was too high for the instruments tolerance.

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 instruments are fully serviced every six months by external contractors.

All data was ratified by an external air quality consultant (AQDM).

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 failures are spatially concentrated within the one way system around the town centre.

The diffusion tubes are located on building facades, therefore the nearer the buildings are to the road, the higher the results.

The current average trend in recent years appears to be mainly flat with no significant evidence of an overall improvement or degradation in air quality. It is noted that there has been a large increase in two locations (Jewry St and one of the two sites on St Georges St) which remains unexplained. Future monitoring will indicate if this increase continues at these locations.

7.2 Nitrogen dioxide – District

In 2011 all sites were in compliance with the annual mean objective giving similar overall results to 2010.

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

All sites are in compliance with both the current 24 hour and annual objectives. It is considered that there is now sufficient evidence to show overall compliance with the air quality objectives for PM_{10} and a detailed assessment report has now been submitted and accepted by DEFRA recommending that Winchester undeclare the air quality management area (AQMA) with regards to this parameter. However,

monitoring will continue to at least the end of 2012 to provide further reassurance regarding this conclusion.

7.4 Carbon monoxide – Winchester Town Centre

Monitoring no longer performed.