

2009 Air Quality Monitoring Overview

In 2009, five different air quality pollutants were monitored in the Borough: nitrogen dioxide; particulate matter (PM10 & PM2.5); sulphur dioxide; carbon monoxide and ozone. These are monitored by diffusion tubes located across the Borough and at three continuous monitoring stations (at Sunbury Cross; Oaks Road Stanwell; and adjacent to M25 north of junction 13). The pollutants are monitored as follows at each location:

Diffusion Tubes	M25	Oaks Road	Sunbury Cross
Nitrous oxides (nitrogen dioxide)	Nitrous oxides (nitrogen dioxide)	Nitrous oxides (nitrogen dioxide)	Nitrous oxides (nitrogen dioxide)
	Ozone	Ozone	
	Particulate Matter (PM10 & PM2.5)	Particulate Matter (PM10 & PM2.5)	Particulate Matter (PM10)
	Sulphur dioxide		

Results of the monitoring are compared against the following National Air Quality Objectives:

Pollutant	Air Quality Objective	
	Concentration	Measured as
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1 hour mean
	40 $\mu\text{g}/\text{m}^3$	Annual mean
Particles (PM10)	50 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 35 times a year	1 hour mean
	40 $\mu\text{g}/\text{m}^3$	Annual mean
Carbon Monoxide	10.0 mg/m^3	Running 8-hour mean
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 24 times a year	1 hour mean

125 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 3 times a year 24 hour mean

266 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 35 times a year 15 minute mean

There is no national air quality objective for ozone. Levels of sulphur dioxide and carbon monoxide measured at the M25 site are below each of the relevant national air quality objectives. Discussion follows on the monitoring results for nitrogen dioxide and particulate matter.

Monitoring of benzene via diffusion tubes at a location near a petrol station was discontinued in 2007, as levels were found to be well below the relevant objectives. A BTEX diffusion tube was added at Long Lane, Stanwell in December 2009 in response to the London Borough of Hounslow's 2009 Updating & Screening Assessment report that recommended further assessment of a fuel oil depot on the boundary of the two Councils. Results from this location will become available in 2010.

Nitrogen Dioxide

This is the principal pollutant of concern in the Borough and is monitored at all locations. Five additional diffusion tube monitoring locations were added to the network in 2007, so we now have the first year's results for these (SP43 to SP47). In 2008, the Council joined a Highways Agency study of levels of nitrogen dioxide at houses close to major roads. This added three new diffusion tube monitoring locations to the network (HA1 to HA3), as follows:

- HA1 – Moor Lane, Staines (within 25m of M25 motorway)
- HA2 – Harrison Way, Shepperton (45m from M3 motorway)
- HA3 – London Road Staines (on A30 by Crooked Billet roundabout)

In February 2008, one diffusion tube at Knowle Green, Staines (SP40) was discontinued. This was a duplicate tube location, so monitoring, via SP39, continues there. As our network now includes two triplicate tube locations [i.e. two places where three diffusion tubes are co-located at the same point] this duplicate was no longer necessary. One monitoring point, SP46 at Elmsleigh Centre Staines, was relocated nearby in 2008 due to persistent theft of diffusion tubes.

The Highways Agency survey collates its data across the financial year (i.e. April to march) as opposed to the financial year. The results are presented in the table below:

	April 2008 to March 2009	April 2009 to March 2010
HA1 – Moor Lane	44.6	Not yet available
HA2 – Harrison Way	39.6	Not yet available

Results from each of the diffusion tube locations in the Council's own network are presented in the table overleaf, corrected for method bias against the Oaks Road continuous monitoring station, for the last three years. From the table it can be seen that the diffusion tubes showed concentrations greater than the 40 $\mu\text{g}/\text{m}^3$ annual average objective at 12 locations around the Borough in 2007 and 2008, though not at all the same locations. In 2009 the objective was exceeded at 9 locations – corresponding to locations of exceedance in the previous year, with the exception of one of the triplicate tubes at The Haven, Sunbury – collocated with the Sunbury Cross continuous monitoring station. The annual average concentrations at these locations are generally lower than 2008, but often higher than the 2007 results. The result at SP36, St Ignatius School, Green Street, Sunbury, a location which exceeded the objective in 2007 and 2008 was very close to the 40 $\mu\text{g}/\text{m}^3$ annual average objective. Where levels were below the objective in 2009 they were also generally lower than results from 2007 and 2008.

Concentrations of nitrogen dioxide at the monitoring stations in Oaks Road Stanwell were below the national air quality objective of 40 $\mu\text{g}/\text{m}^3$ for annual average, and comply with the objective for hourly mean levels too. As with previous years, the annual average objective could be being exceeded at locations close to the M25 motorway.

In 2009 the annual average nitrogen dioxide concentration measured at the Sunbury Cross monitoring station, at 43.2 $\mu\text{g}/\text{m}^3$, exceeded the national air quality objective of 40 $\mu\text{g}/\text{m}^3$ for the first time since monitoring started at the site in late 2006. This level is some 20% higher than recorded in 2008. With this annual average concentration the hourly objective is unlikely to be exceeded at the monitoring station, though diffusion tube results for 2009 continue to indicate that it may be exceeded at relevant locations near Sunbury Cross. The Council has commissioned some detailed modeling of this area. Results of this work should be available in late Summer 2010.

Results for the continuous monitoring stations are as follows:

Location	Number of Exceedences of Hourly Mean (200 $\mu\text{g}/\text{m}^3$)			Annual Mean Concentrations ($\mu\text{g}/\text{m}^3$)		
	2007	2008	2009	2007	2008	2009
Sunbury Cross	1	0	0	38.6	35.1	43.2
Heathrow Oaks Road	1	0	1	37.2	35.4	34.4
M25 J13	31	12	N/a	57.3	52.4	N/a
Objective	18	18	18	40	40	40

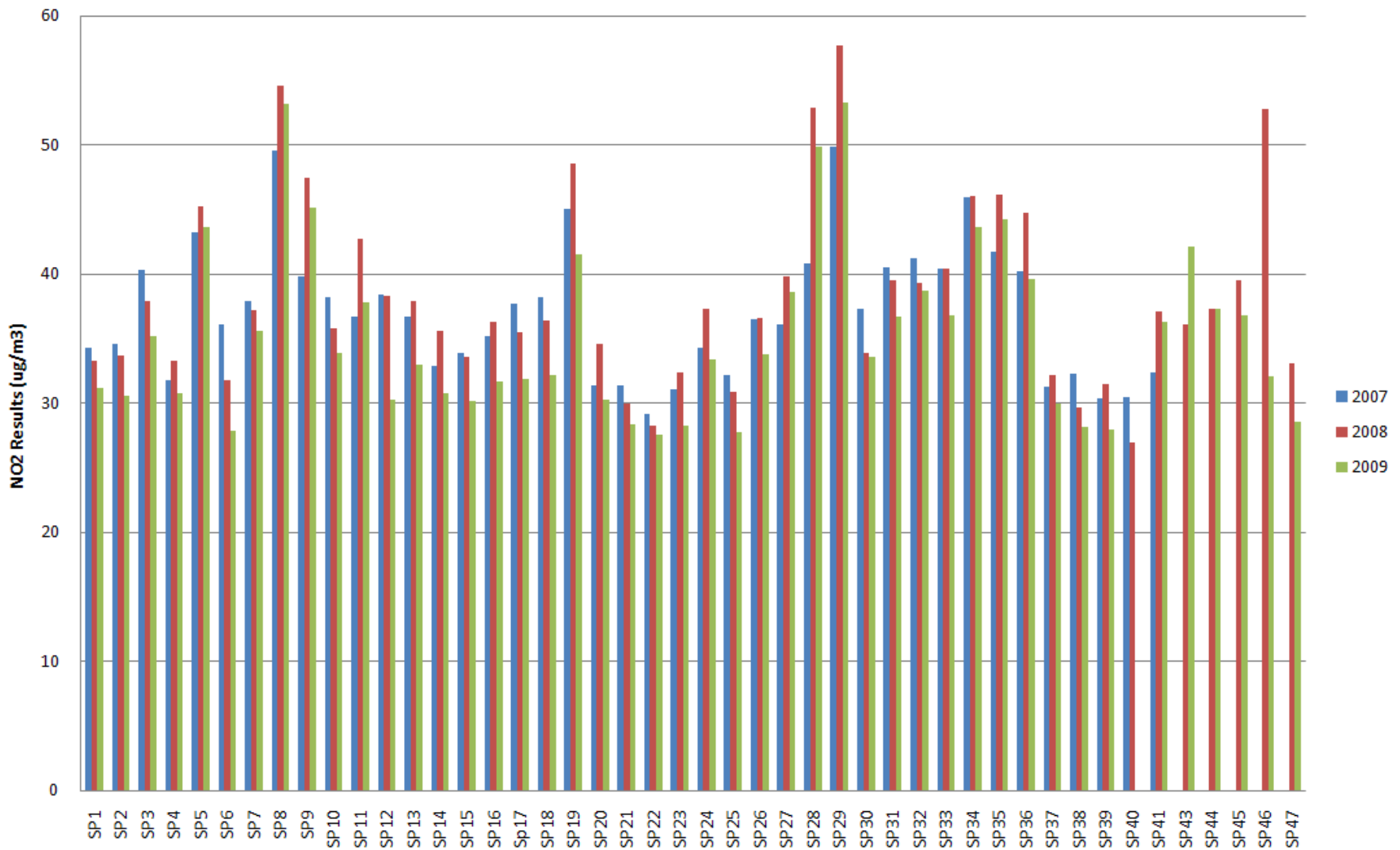
Site ID	Location	Annual mean concentrations ($\mu\text{g}/\text{m}^3$)		
		2007 ^a	2008 ^b	2009 ^c
SP1	Staines High Street	34.3	33.3	31.2
SP2	Market Square, Staines	34.6	33.7	30.6
SP3	Wraysbury Road	40.3	37.9	35.2
SP4	Benwell Centre, Sunbury	31.8	33.3	30.8
SP5	Church Street, Ashford	43.3	45.3	43.7
SP6	Goffs Road, Ashford Common	36.1	31.8	27.9
SP7	High Street, Shepperton	37.9	37.2	35.6
SP8	The Parade, Sunbury Cross	49.6	54.6	53.2
SP9	Staines Road West, Sunbury	39.8	47.5	45.2
SP10	Walton Bridge Road	38.2	35.8	33.9
SP11	Halliford Bypass	36.7	42.8	37.8
SP12	Stanwell New Road, Stanwell North	38.4	38.3	30.3
SP13	Shortwood County Infant School, Stanwell North	36.7	37.9	33.0
SP14	Flintlock Close, Stanwell	32.9	35.6	30.8
SP15	Horton Road, Stanwell Moor	33.9	33.6	30.2
SP16,	Oaks Road/Russell Drive, Stanwell South	35.2	36.3	31.7
SP17,		37.7	35.5	31.9
SP18		38.2	36.4	32.2
SP19	Bedfont Road/Long lane, Stanwell South	45.1	48.6	41.5
SP20	Greenlands Road, Staines	31.4	34.6	30.3
SP21	Lincoln Way, Ashford	31.4	30.0	28.4
SP22	Manor Mead School Shepperton	29.2	28.3	27.6
SP23	Greeno Crescent, Shepperton	31.1	32.4	28.3
SP24	Yeoveney Close, Staines	34.3	37.3	33.4
SP25	Moor Lane, Staines	32.2	30.9	27.8
SP26	St Mary's Crescent, Staines	36.5	36.6	33.8
SP27	Church Street, Staines	36.1	39.8	38.6
SP28	London Road, Staines	40.8	52.9	49.9
SP29	London Road, Staines	49.9	57.7	53.3
SP30	Horton Road, Stanwell Moor	37.3	33.9	33.6
SP31	Ashford Hospital, Stanwell	40.5	39.5	36.7
SP32	Feltham Road, Ashford	41.2	39.3	38.7
SP33	Ford Close, Ashford	40.4	40.4	36.8
SP34	School Road, Ashford	46.0	46.1	43.7
SP35	Vicarage Road, Sunbury	41.7	46.2	44.3
SP36	St Ignatius School, Sunbury	40.2	44.8	39.6
SP37	Nr Abbeyfields, Thames Side, Laleham	31.3	32.2	30.0
SP38	Laleham CofE primary, Laleham	32.3	29.7	28.2
SP39	Knowle Green, Staines	30.4	31.5	28.0
SP40	Knowle Green, Staines	30.5	27.0	
SP41	Green Street, Sunbury	32.4	37.1	36.3
SP43,	The Haven, Sunbury	n/a	36.1	42.1
SP44,		37.3	37.3	
SP45		39.5	36.8	
SP46	Elmsleigh Centre	n/a	52.8	32.1
SP47	Hadrian Way, Stanwell	n/a	33.1	28.6

^a Bias adjusted using a factor of 1.06

^b Bias adjusted using a factor of 1.00

^c Bias adjusted using a factor of 1.05

Spelthorne NO2 Diffusion Tube Results (bias adjusted)



Data for 2009 for the M25 J13 monitoring station has not yet been made available by the Highways Agency, who have reported that the delay is due an issue with data ratification of results. They have further advised that it may be necessary to revisit the ratification of the 2008 results – so these may need to be corrected in future reports.

Particulate Matter

This pollutant is now being monitored at each of the continuous monitoring stations in the Borough. The monitoring at Sunbury Cross has been funded by a grant from Defra through to December 2009 using a TEOM analyser following a study by the Council using an OSIRIS portable monitor in 2007/08. This funding secures two complete years of PM₁₀ monitoring data for this location. Results of the PM₁₀ monitoring are presented in the table below.

Location	Number of Exceedences of Daily Mean (50 µg/m ³)			Annual Mean Concentrations (µg/m ³)		
	2007	2008	2009	2007	2008	2009
Sunbury Cross	12	1	3	36.8 ¹	22.7 ²	21.1 ²
Heathrow Oaks Road	18	8	1	24.5	22.0	21.2
M25 J13	21	18	N/a	28.3	26.3	N/a
Objective	35	35	35	40	40	40

¹ Data from 22/11/07 to 26/2/08 using an OSIRIS, as reported in the Progress Report 2008

² Data from 20/11/08 to 31/12/09 with TEOM. Gravimetric equivalent - VCM Corrected

Results of monitoring over the past three years indicate that there is a general trend of reducing concentrations of particulate matter (as PM10) as an annual average and in the days where the mean concentration is elevated above 50 µg/m³.

There is no statutory obligation on councils to monitor fine particles (less than 2.5 µm diameter), though it is monitored at the M25 J13 and Oaks Road sites. The annual average concentration of PM2.5 measured at the M25 site in 2008 was 14.92 µg/m³. Results for Oaks Road in 2009 give an annual average concentration of 10.3 µg/m³. Both are well below the Government's proposed new objective of 25 µg/m³.