2013 Air Quality Progress Report for London Borough of Ealing

In fulfillment of Part IV of the
Environment Act 1995
Local Air Quality Management

June 2014

Ealing
www.ealing.gov.uk

Local Authority Officer	Rizwan Yunus
Department	Regulatory Services
Address	London Borough of Ealing Perceval House 14-16 Uxbridge Road London W5 2HL
Telephone	020 8825 8515
e-mail	rizwan.yunus@ealing.gov.uk
Date	June 2014

London Borough of Ealing 2013 Progress Report

Prepared by: ..... Checked by: .....

Dr Avril Challoner
Graduate Scientist (AECOM)

Sam Pollard
Associate Director (AECOM)

Approved by: .....

Sam Pollard
Associate Director (AECOM)

Rev No	Comments	Date
1	Draft for client comment	20/06/2014

AECOM Ltd, 10th Floor, Sunley House, 4 Bedford Park, Croydon, CR0 2AP, UK
Telephone: 0870 905 0906 Website: http://www.aecom.com

Job No 60319857 Reference 06/14 Date Created June 2014

Executive Summary

In fulfilment of its Local Air Quality Management duties, the London Borough of Ealing commissioned AECOM Ltd to compile its 2013 Air Quality Progress Report. This Progress Report documents changes in monitored pollutant concentrations within the Borough since the publication of the London Borough of Ealing's 2012 Updating and Screening Assessment. New local developments and planning applications which have the potential to affect air quality are also summarised, along with relevant local air quality policies, strategies, Local Transport Plans and Climate Change initiatives.

In 2012 the London Borough of Ealing undertook monitoring at five continuous monitoring sites and 98 NO_2 diffusion tubes within the Borough.

Exceedences of the annual mean nitrogen dioxide (NO_2) air quality objective were monitored in 2012 at the Hanger Lane Gyratory, Horn Lane and Western Avenue automatic monitoring stations. The monitored hourly mean NO_2 concentrations at the Hanger Lane Gyratory site exceeded the 1-hour NO_2 air quality objective, as in previous years, with 173 exceedances of the hourly NO_2 standard of 200 µg/m^3 recorded compared to the 18 permitted. At the Western Avenue monitoring station, where data capture was only 54.2%, the 98th percentile of hourly mean NO_2 concentrations was 200 µg/m^3 suggesting the 1-hour NO_2 air quality objective was also potentially exceeded at this location.

Exceedences of the annual mean NO_2 objective (40 µg/m^3) were also monitored in 2012 at 38 diffusion tube sites. Of the 51 tubes exceeding the annual mean objective, 10 recorded concentrations above 60 µg/m^3 indicating potential exceedances of the hourly mean NO_2 objective at these locations.

No exceedences of the annual mean particulate matter (PM_{10}) objective (40 µg/m^3) were recorded at the monitoring sites in Ealing in 2012. The daily mean PM_{10} air quality objective (50 µg/m^3, not to be exceeded more than 35 times a year) was also achieved at all monitoring sites. The highest concentrations were found at the Horn Lane monitoring site where an annual mean concentration of 37.5 µg/m^3 and 22 days when average PM_{10} concentrations were above 50 µg/m^3 were recorded.

Benzene diffusion tube data shows continued achievement of the annual mean concentration of 5 µg/m^3. Due to continued achievement of the objective it can be concluded that Benzene monitoring is no longer required within the Borough.

In conclusion, the results of this 2013 Progress Report indicate that a Detailed Assessment is not currently required and the existing Air Quality Management Area is to be retained.

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Appendices

1 Introduction

1.1 Description of Local Authority Area

The London Borough of Ealing, located in west London, is home to over 300,000 people and covers approximately 55 square kilometres. The Borough consists of seven main areas: Acton, Ealing, Greenford, Hanwell, Northolt, Perivale and Southall. It comprises of both urban and rural areas, has a large number of parks and open spaces, as well as large amounts of housing, commercial and industrial areas. The Borough contains more than 13,000 businesses and includes half of the largest industrial and business park in London, Park Royal.

The Council regulates 84 Part B industrial and other minor processes. There are two Part A installations within the Borough; Vale Europe Ltd and GW Neale Ltd. The main source of air pollution comes from busy and congested roads, including the A40, A406, A4020, A4127 and A4000 that run through the Borough.

The whole Borough has been declared an Air Quality Management Area (AQMA) for nitrogen dioxide (NO_2) and particulate matter less than 10 µm in diameter (PM_{10}).

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the LAQM process.

They are not intended to be as detailed as Updating and Screening Assessment Reports,. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in England are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre µg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m^3	Running annual mean	31.12.2003
	5.00 µg/m^3	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10}) (gravimetric)	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m^3	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

Summary of Previous Review and Assessments

A Borough-wide Air Quality Management Area (AQMA) was declared in 2000 as a result of exceedences of the NO_2 and PM_{10} air quality objectives. An Air Quality Action Plan (AQAP)[1] was subsequently published in 2003.

The outcomes of previous rounds of LAQM review and assessment are summarised in Table 1.2. The latest Updating and Screening Assessment report produced by the London Borough of Ealing[2] highlighted the need to maintain the AQMA and continue monitoring of nitrogen dioxide and PM_{10} concentrations within the Borough.

Figure 1.1 Map of AQMA Boundaries

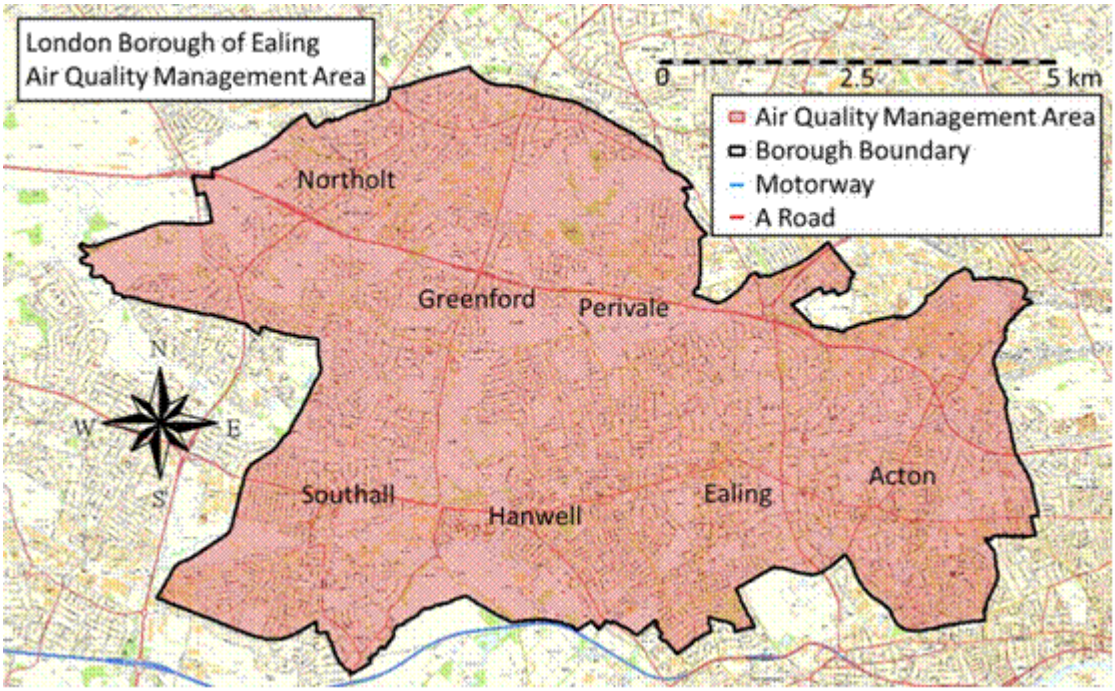


Table 1.2 Summary of Previous Rounds of Review and Assessment

Report	Date produced	Outcome
Stage 1 and 2	May-99	Need for Stage 3 for NO_2, PM_{10}, SO, CO and Pb.
Stage 3	Jan-00	Need to declare AQMA for NO_2 and PM_{10}.
Stage 4	Dec-00	Declaration of whole Borough AQMA for NO_2 and PM_{10}
Air Quality Action Plan	Apr-03	Action Plan adopted.
USA 2004	Apr-04	Detailed assessment for PM required for EWS Goods Yard, Horn Lane.
USA 2006	Apr-06	AQMA retained for whole Borough.
Detailed Assessment of PM_{10}	May-06	AQMA retained for whole Borough.
Progress Report 2007	Apr-07	No other sources require detailed assessment.
Progress Report 2008	Apr-08	No other sources require detailed assessment.
USA 2009	Jun-09	AQMA retained and additional monitoring required.
Further Assessment of NO_2	Feb-11	Extend monitoring close to rail line at sites with relevant exposure.
Progress Report 2011		AQMA retained
USA 2012	Dec-12	AQMA retained

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

The London Borough of Ealing currently operates five automatic monitoring stations. Two are situated at roadside sites, one at an industrial site, one at a near road site and one at an urban background location.

During 2012, all sites were operated as part of the London Air Quality Network[3]. Details of the relevant Quality Assurance / Quality Control (QA/QC) procedures that were followed during the monitoring are provided in Appendix A. **Error! Reference source not found.** and Table 2.1 provide details of the automatic monitoring sites located in the Borough.

Figure 2.1 Map of Automatic Monitoring Sites

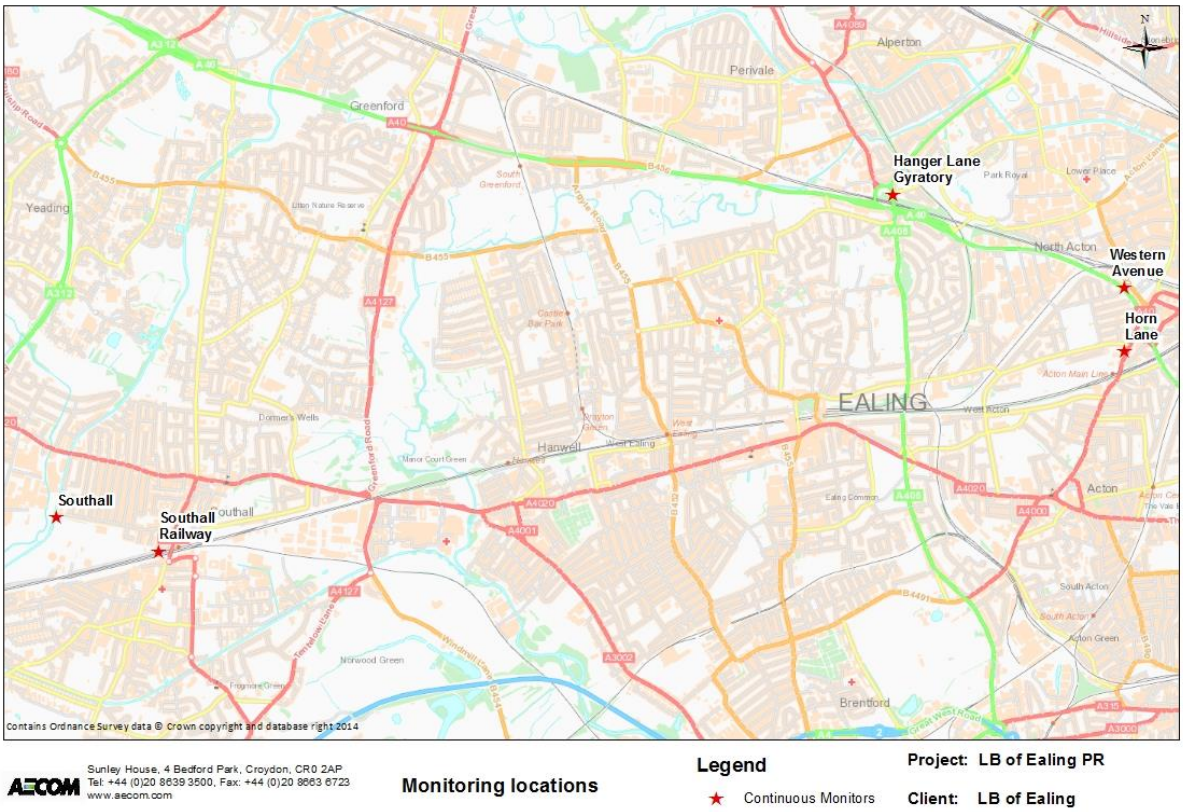


Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
Hanger Lane Gyratory	Roadside	518537	182708	NO_2, PM_{10}	Y	Chemiluminescence, TEOM	Y (4)	3	Y
Horn Lane	Industrial	520432	181428	NO_2, PM_{10}	Y	Chemiluminescence, TEOM	Y (8)	2.5	Y
Southall	Urban Background	511677	180071	NO_2, PM_{10}, $PM_{2.5}$, O_3	Y	Chemiluminescence, FDMS	Y (17)	N/A	N
Southall Railway	Near road	512514	179795	NO_2, PM_{10}	Y	Chemiluminescence, TEOM	Y (22)	1	Y
Western Avenue	Roadside	520430	181950	NO_2, PM_{10}	Y	Chemiluminescence, TEOM	Y (4)	4	Y

2.1.2 Non-Automatic Monitoring Sites

The London Borough of Ealing historically monitored annual mean nitrogen dioxide concentrations using passive diffusion tubes at 126 sites located throughout the Borough. This was reduced to 97 sites in 2012, with four triplicate sites co-located with four air quality monitoring stations (Southall, Hanger Lane, Horn Lane and Western Avenue). **Error! Reference source not found.** and Table 2.2 provides details of the diffusion tube sites operated within the Borough during 2012.

Figure 2.2 Map of Non-Automatic Monitoring Sites

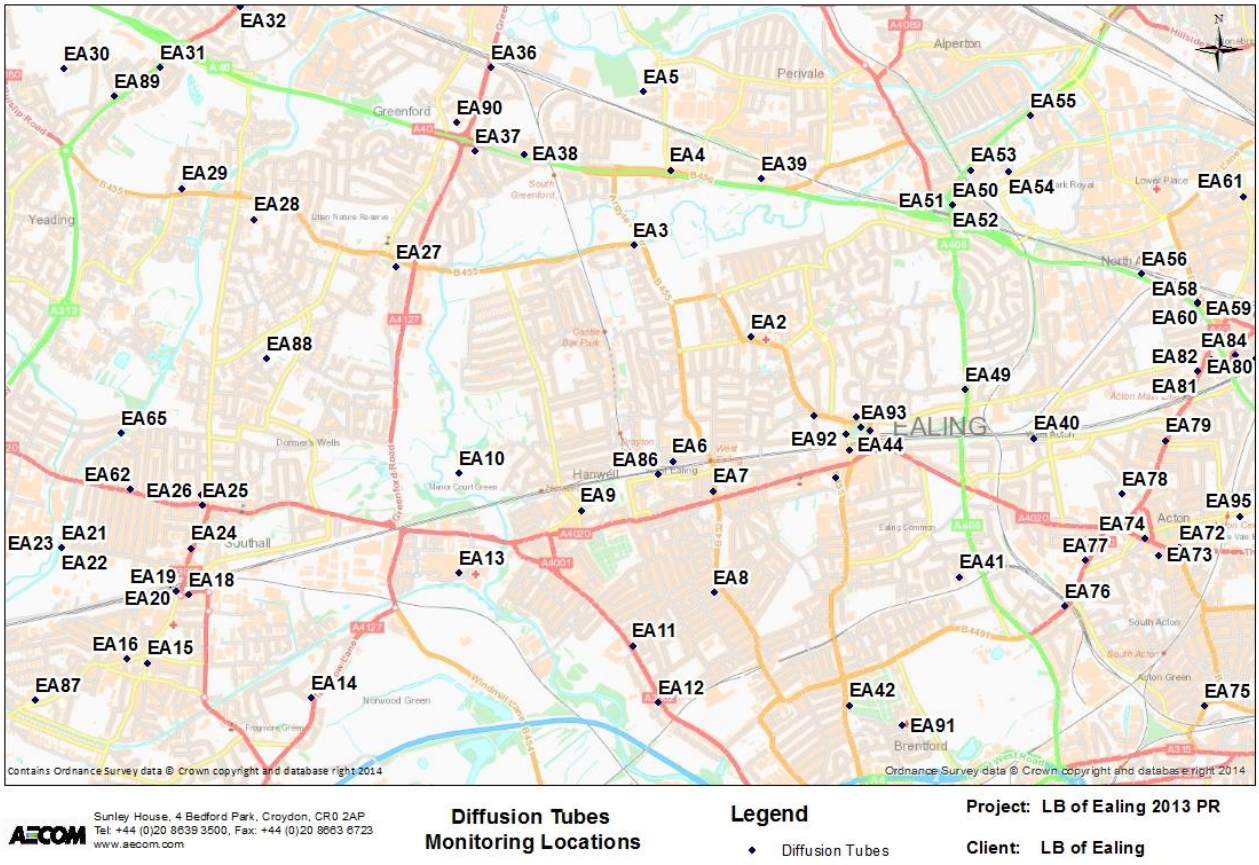


Table 2.2 Details of 2012 Non- Automatic Monitoring Sites

Site No	Address	Site type	OS Grid Ref		Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
			X	Y						
1	31 Castlebar Road, Ealing,W5 2DJ	NR	517472	181088	NO_2	Y	N	Y(F)	19.28	Y
2	12 Castlebar Hill, Ealing,W5 1TE	B	516992	181698	NO_2	Y	N	Y (F)	20	Y
3	1-4 Peal Gardens, West Ealing,W13 OBA	R	516089	182400	NO_2	Y	N	Y (F)	5	Y
4	2 Horsenden Lane South, Greenford, UB6 8AB	R	516368	182978	NO_2	Y	N	Y (F)	5	Y
5	Perivale Wood, r/o 36-38 Sunley Gardens, Greenford,UB6 7PE	B	516160	183582	NO_2	Y	N	Y (L)	44.7	N
6	41 Manor Road, West Ealing,W13 OJA	NR	516387	180738	NO_2	Y	N	Y (F)	11.71	Y
7	44 Felix Road, West Ealing, W13 0NU	NR	516273	180637	NO_2	Y	N	Y(F)	15.21	Y
8	1 Kirn Road, Ealing, W13 0UB	R	516699	180509	NO_2	Y	N	Y (F)	4.00	Y
9	16 Balfour Road Ealing, W13 9TN	NR	516703	179728	NO_2	Y	N	Y (F)	4.69	Y
10	20 Church Road, Hanwell, W7 1DR	B	515680	180360	NO_2	Y	N	Y (F)	25	Y
11	Brent Lodge Park, Church Road, Hanwell,W7 3BP	R	514740	180643	NO_2	Y	N	Y (F)	N/A	N

Site No	Address	Site type	OS Grid Ref		Pollutants Monitored	In AQMA ?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure ?
			X	Y						
12	Hobbayne First School, Greenford Avenue, Hanwell,W7 1HA	NR	515477	181081	NO_2	Y	N	Y (F)	46	Y
13	255 Boston Road, Hanwell,W7 2AT	NR	516080	179318	NO_2	Y	N	Y(L)	10.62	Y
14	6 Boston Gardens, Boston Road Hanwell, W7 2AN	R	516277	178882	NO_2	Y	N	Y (F)	12.16	Y
15	Moot House Ealing Hospital, Uxbridge Road, Southall, UB1 3HW	B	514740	179876	NO_2	Y	N	Y (F)	N/A	N
16	4 Minterne Avenue, Southall,UB2 4LL	NR	513606	178917	NO_2	Y	N	Y(F)	11.51	Y
17	55 King Street, Southall, UB2 4DQ	R	512341	179186	NO_2	Y	N	Y (F)	3.75	Y
18	18 Western Road, Southall,UB2 5DU	NR	512181	179219	NO_2	Y	N	Y (F)	7.5	Y
19	Featherstone Primary School, Western Road, Southall,UB2 5JT	NR	511475	178899	NO_2	Y	N	Y (L)	23	Y
20	150 Brent Road, Southall, UB2 5LD	NR	511170	179251	NO_2	Y	N	Y (F)	7.70	Y
21	2 Merrick Road, Southall, UB2 4AU	NR	512657	179712	NO_2	Y	N	Y (L)	14.30	Y

Site No	Address	Site type	OS Grid Ref		Pollutants Monitored	In AQMA ?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure ?
			X	Y						
22	Martin Court, Southbridge Way, Southall, UB2 4QW	NR	512560	179739	NO_2	Y	N	Y (F)	27.51	Y
23	1 Randolph Road, Southall,UB1 1BL	R	512514	179795	NO_2	Y	N	Y (L)	1.89	Y
24	Blair Peach School, Beaconsfield Road, UB1 1DD(***AQMS***) (**Tri**)	B	511680	180071	NO_2	Y	Y	Y (O)	50.00	N
25	Blair Peach School, Beaconsfield Road,UB1 1DD (***AQMS***) (**Tri**)	B	511680	180071	NO_2	Y	Y	Y (O)	50.00	N
26	Blair Peach School, Beaconsfield Road, UB1 1DD(***AQMS***) (**Tri**)	B	511680	180071	NO_2	Y	Y	Y (O)	50.00	N
27	Hambrough Primary School, South Road, Southall,UB1 1SF	NR	512673	180069	NO_2	Y	N	Y (F)	10.75	Y
28	11 The Broadway, Southall, UB1 3PX	R	512768	180400	NO_2	Y	N	Y (F)	4.31	N
29	7 Greenford Avenue, Southall, UB1 2AA	NR	512753	180478	NO_2	Y	N	Y (F)	8.95	N
30	Jubilee Gardens Library, Jubilee Gardens, Southall,UB1 2TJ	R	513263	181526	NO_2	Y	N	Y (L)	N/A	N
31	205 Windmill Lane, Greenford, UB6 9DW	R	514259	182234	NO_2	Y	N	Y (F)	5.00	Y

Site No	Address	Site type	OS Grid Ref		Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
			X	Y						
32	Greenford High School, Lady Margaret Road, Southall, UB1 2GU	B	513158	182600	NO_2	Y	N	Y (L)	N/A	N
33	2 Shadwell Drive, Northolt, UB5 6DB	NR	512603	182837	NO_2	Y	N	Y (F)	13.98	Y
34	Northolt Library, 388-404 Church Road, Northolt, UB5 5AU	NR	512089	183545	NO_2	Y	N	Y(F)	22.00	Y
35	32 Irving Avenue, Northolt, UB5 5LX	B	511698	183760	NO_2	Y	N	Y (F)	35.00	N
36	213 Church Road, Northolt, UB5 5BE	NR	512442	183769	NO_2	Y	N	Y (F)	12.38	Y
37	31 Mandeville Road, Northolt, UB5 5HF	NR	513056	184241	NO_2	Y	N	Y (F)	12.59	Y
38	126 Petts Hill, Northolt, UB5 4NW	NR	513794	185348	NO_2	Y	N	Y (F)	9.42	Y
39	1504 Greenford Road, Greenford, UB6 0HR	NR	515402	185313	NO_2	Y	N	Y (F)	10.54	Y
40	79 Whitton Avenue East, Greenford, UB6 0QD	NR	516867	184689	NO_2	Y	N	Y (F)	14.71	Y
41	914 Greenford Road Greenford,UB6 8QN	R	514985	183770	NO_2	Y	N	Y (F)	2.30	Y
42	Oldfield Primary School, Oldfield Lane North, Greenford, UB6 8PR	B	514722	183345	NO_2	Y	N	Y (F)	64.00	N

Site No	Address	Site type	OS Grid Ref		Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
			X	Y						
43	19 Runnymede Gardens Greenford, UB6 8SX	NR	515240	183102	NO_2	Y	N	Y (F)	11.20	Y
44	12 Blenheim Close, Greenford, UB6 8ET	R	514863	183122	NO_2	Y	N	Y (F)	9.38	Y
45	4 Thirlmere Avenue, Perivale, UB6 8EF	B	517072	182912	NO_2	Y	N	Y (F)	46.50	N
46	Oakley House, Oakley Avenue,Ealing,W5 3SB	NR	519167	180915	NO_2	Y	N	Y (F)	20.47	Y
47	53-61 St Pauls Close, Ealing,W5 3JX	NR	518594	179848	NO_2	Y	N	Y (F)	11.00	N
48	South Ealing Cemetery, Popes Lane Ealing, W5 4NA	B	517750	178860	NO_2	Y	N	Y (F)	32.00	N
49	Clayponds Hospital, Sterling Place Ealing, W5 4RN	B	518153	178709	NO_2	Y	N	Y (F)	138.00	N
50	12 Bond Street Ealing, W5 5AP	R	517644	180613	NO_2	Y	N	Y (F)	2.70	Y
51	8 Spring Bridge Road, Ealing, W5 2AA	R	517745	180827	NO_2	Y	N	Y(F)	3.00	Y
52	Gordon Road, Ealing,W5 2UU	K	517718	180944	NO_2	Y	N	Y(L)	1.00	Y
53	Haven Green Court, Haven Green Ealing, W5 2UZ	NR	517803	181082	NO_2	Y	N	Y(F)	16.93	Y
54	27 Haven Green, Ealing, W5 2NZ	R	517940	181092	NO_2	Y	N	Y(F)	12>08	Y

Site No	Address	Site type	OS Grid Ref		Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
			X	Y						
55	21 Haven Lane Ealing, W5 2HZ	R	518022	181114	NO_2	Y	N	Y(F)	2.35	Y
56	41-42 Haven Green, Ealing,W5 2NX	R	517909	180971	NO_2	Y	N	Y(F)	3	Y
57	Middle of Haven Green, Ealing,W5 2UP	NR	517834	181000	NO_2	Y	N	Y(L)	N/A	N
58	64 Hanger Lane, Ealing,W5 2JH	NR	518635	181288	NO_2	Y	N	Y (F)	12.68	Y
59	Fernlea House, Hanger Lane, Ealing,W5 1EF (***AQMS***) (**Tri**)	R	518541	182707	NO_2	Y	Y	Y (F)	4.00	Y
60	Fernlea House, Hanger Lane, Ealing,W5 1EF (***AQMS***) (**Tri**)	R	518541	182707	NO_2	Y	Y	Y (F)	4.00	Y
61	Fernlea House, Hanger Lane, Ealing,W5 1EF (***AQMS***) (**Tri**)	R	518541	182707	NO_2	Y	Y	Y (F)	4.00	Y
62	25 Waverley Gardens, Park Royal, NW10 7EX	NR	518680	182979	NO_2	Y	N	Y (F)	10.13	Y
63	6 Brentmead Gardens, Park Royal, NW10 7DS	NR	518976	182963	NO_2	Y	N	Y (F)	8.40	N
64	3 Iveagh Terrace Park Royal,NW10 7SY	NR	519142	183399	NO_2	Y	N	Y (F)	27.24	Y
65	5 Wendover Court, Western Avenue Acton, W3 0TG	NR	519997	182178	NO_2	Y	N	Y (F)	11.00	Y

Site No	Address	Site type	OS Grid Ref		Pollutants Monitored	In AQMA ?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure ?
			X	Y						
66	322 & 324 Western Avenue, Acton, W3 OPL (***AQMS***) (***Tri***)	R	520430	181950	NO_2	Y	Y	Y	5	Y
67	322 & 324 Western Avenue, Acton, W3 OPL (***AQMS***) (***Tri***)	R	520430	181950	NO_2	Y	Y	Y	5	Y
68	322 & 324 Western Avenue, Acton, W3 OPL (***AQMS***) (***Tri***)	R	520430	181950	NO_2	Y	Y	Y	5	Y
69	326 Western Avenue, Acton, W3 0PL	NR	520426	181958	NO_2	Y	N	Y(F)	11.35	Y
70	94 North Acton Road, Park Royal, NW10 7AY	NR	520780	182775	NO_2	Y	N	Y (F)	7.18	Y
71	1 Shaftesbury Gardens, Park Royal, NW10 6LJ	NR	512206	180522	NO_2	Y	N	Y (F)	17.10	Y
72	39 Old Oak Lane,Park Royal, NW10 6EJ	NR	521587	182684	NO_2	Y	N	Y (F)	6.14	N
73	27 Wells House Road, Park Royal, NW10 6ED	NR	521305	181966	NO_2	Y	N	Y (F)	6.23	N
74	4 St Andrews Road, Acton,W3 7NE	R	512138	180953	NO_2	Y	N	Y (F)	8.20	N
75	98 Western Avenue, Acton, W3 7TZ	NR	521173	180981	NO_2	Y	N	Y (F)	10.00	Y
76	6 Western Avenue, Acton, W3 7UD	R	521549	180923	NO_2	Y	N	Y (F)	5.30	Y
77	57 Old Oak Common Lane, Acton, W3 7DD	NR	521557	180996	NO_2	Y	N	Y (F)	11.00	Y

Site No	Address	Site type	OS Grid Ref		Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
			X	Y						
78	205 Old Oak Road, Acton, W3 7HH	R	521614	180852	NO_2	Y	N	Y (F)	4.73	Y
79	17 The Vale Acton, W3 7SH	R	521720	180084	NO_2	Y	N	Y (F)	4.82	Y
80	177A The Vale Acton, W3 7RD	R	521088	180046	NO_2	Y	N	Y (L)	5.00	Y
81	Maples Nursery East Churchfield Road, Acton, W3 7LL	NR	520754	180316	NO_2	Y	N	Y (F)	10.00	Y
82	East Acton Primary School, East Acton Lane, Acton,W3 7HA	NR	521093	180613	NO_2	Y	N	Y (F)	11.55	Y
83	88 High Street Acton, W3 6QX	R	520285	180075	NO_2	Y	N	Y(F)	5.00	Y
84	35-61Church Road, Acton,W3 8QE	NR	520128	180016	NO_2	Y	N	Y (F)	10.00	Y
85	182 High Street, Acton, W3 9NN	R	520026	180141	NO_2	Y	N	Y (F)	4.00	Y
86	Southfields School, Southfields Road Chiswick, W4 1BD	NR	521200	179500	NO_2	Y	N	Y (F)	8.00	Y
87	44 Acton Lane Acton, W4 5ED	R	520480	178854	NO_2	Y	N	Y (F)	8.12	Y
88	122 Gunnersbury Lane, Acton, W3 9BA	R	519404	179620	NO_2	Y	N	Y (F)	8.86	Y
89	48 Gunnersbury Lane, Acton, W3 8EG	NR	519562	179977	NO_2	Y	N	Y (F)	16.66	Y

Site No	Address	Site type	OS Grid Ref		Pollutants Monitored	In AQMA ?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure ?
			X	Y						
90	15 Lantry Court, Lexden Road, Acton, W3 9PE	B	519849	180485	NO_2	Y	N	Y (F)	N/A	N
91	156 Horn Lane Acton, W3 6PH	NR	520180	180896	NO_2	Y	N	Y (F)	6.00	Y
92	317 Horn Lane, Acton,W3 0BU (***AQMS***) (***Tri***)	R	520432	181428	NO_2	Y	Y	Y	3	Y
93	317 Horn Lane, Acton,W3 0BU (***AQMS***) (***Tri***)	R	520432	181428	NO_2	Y	Y	Y	3	Y
94	317 Horn Lane, Acton,W3 0BU (***AQMS***) (***Tri***)	R	520432	181428	NO_2	Y	Y	Y	3	Y
95	5 Leamington Park, Acton, W3 6TJ	NR	520532	181517	NO_2	Y	N	Y (F)	11.00	Y
96	36 Wales Farm Road, Acton, W3 6UE	NR	520724	181552	NO_2	Y	N	Y (F)	9.91	Y
97	67-72 Seaclose Close, Acton, W3 6TF	R	520880	181531	NO_2	Y	N	N (F)	5.00	N
98	59 Perry Avenue Acton, W3 6YH	NR	520942	181483	NO_2	Y	N	Y (F)	6.32	Y

Notes: For 'Site Type' NR = Near Road, R = Roadside, B = Background and K = Kerbside.

In Relevant Exposure column, diffusion tubes located on residential façades are shown with an F in brackets, those on lampposts with an L in brackets and those on other street furniture with an O in brackets.

Triplicate sites are highlighted

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

Automatic Monitoring Data

In 2012 the London Borough of Ealing reduced its number of automatic monitoring stations, closing the stations at Acton Town Hall (roadside) and Ealing Town Hall (urban background). Currently there are five automatic monitoring stations in operation which measure NO_2: Southall, Southall Railway, Hanger Lane Gyratory, Horn Lane and Western Avenue, the results from which in recent years are shown in Table 2.3 and Table 2.4.

Data capture was low at Western Avenue in 2012 (54.2%). As data capture was below 75% the monitored annual mean NO_2 concentration at this site required annualisation in accordance with the methodology in Box 3.2 in LAQM.TG(09). Details of this calculation can be found in Appendix A.

Exceedances of the 40 µg/m^3 annual mean objective were observed at three of the five monitoring stations (Hanger Lane Gyratory, Horn Lane and Western Avenue) in all years between 2010 and 2012. The highest annual mean concentration in 2012 (95.0 µg/m^3) was recorded at the Hanger Lane Gyratory site.

Monitored hourly mean NO_2 concentrations at the Hanger Lane Gyratory site also exceeded the 1-hour NO_2 objective in 2012, as in previous years, with 173 exceedances of the hourly NO_2 standard of 200 µg/m^3 recorded compared to the 18 permitted. The 99.8th percentile of hourly mean NO_2 concentrations recorded at Western Avenue in 2012, which was calculated as data capture at this site was less than 90%, suggests that the hourly mean NO_2 objective was potentially also exceeded at this site. No other sites monitored exceedances of the 1 hour NO_2 objective.

Error! Reference source not found. shows trends in monitored NO_2 concentrations at each of the automatic monitoring sites over the last five years. Concentrations appear to have remained relatively constant all sites apart from at the Hanger Lane Gyratory site where monitored concentrations appear to show a slight downward trend, despite an elevated concentration in 2012.

Table 2.3 Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2012 %	Annual Mean NO_2 Concentration ($\mu g/m^3$)				
				2008	2009	2010	2011	2012
Hanger Lane Gyratory	Roadside	Y	98.5	**103.0**	**93.0**	**91.5**	**79.2**	**95.0**
Horn Lane	Industrial	Y	90.3	-	-	**54.2**[a]	**58.1**[a]	**53.4**
Southall	Urban Background	Y	91.2	31.0	31.0	30.8	28.6	34.7
Southall Railway	Near road	Y	93.1	-	-	-	37.2	35.4
Western Avenue	Roadside	Y	54.2	-	-	**67.7**	**61.7**	**69.8**[a]

Notes: In bold, exceedence of the NO_2 annual mean AQS objective of $40\mu g/m^3$

[a] Where data captures are less than 90%, data have been annualised.

Figure 2.3 Trends in Annual Mean NO_2 Concentrations Measured at Automatic Monitoring Sites

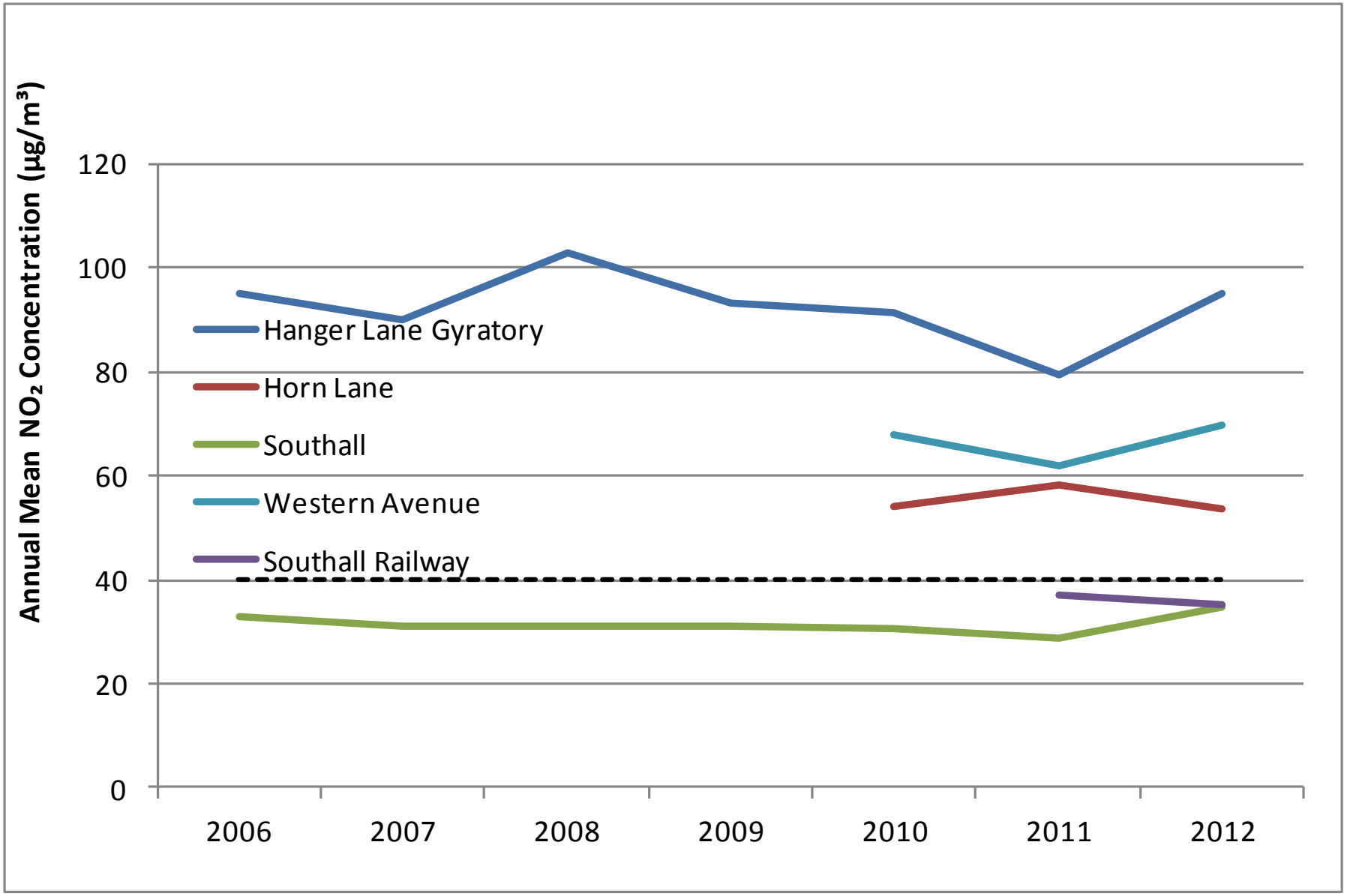


Table 2.4 Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2012 %	Number of Hourly Means > 200µg/m^3				
				2008	2009	2010	2011	2012
Hanger Lane Gyratory	Roadside	Y	98.5	**84.0**	**166.0**	**134 (231)**	**66**	**173**
Horn Lane	Industrial	Y	90.3	-	-	0 (138)	14 (192)	2
Southall	Urban Background	Y	91.2	0	0	0	0	0
Southall Railway	Near road	Y	93.1	-	-	-	0 (126)	0
Western Avenue	Roadside	Y	54.2	-	-	9 (185)	2 (168)	10 **(200)**

Notes: In bold, exceedence of the NO_2 hourly mean AQS objective (200µg/m^3 – not to be exceeded more than 18 times per year)

Where data capture for the full calendar year was less than 90%, the 99.8th percentile of hourly means is shown in brackets.

Diffusion Tube Monitoring Data

Up until 2012, the London Borough of Ealing network of diffusion tubes numbered 126, however in 2012 this was reduced to 98 diffusion tubes, including four triplicate sites. The diffusion tubes are prepared and analysed by Gradko (using the 20% Triethanolamine in acetone method). Details of the QA/QC procedures applied to the diffusion tube results are summarised in Appendix A. Data capture for the diffusion tubes was generally high with only two of the 98 tubes requiring annualisation, details of which can be found in Appendix B.

In total, 38 of the diffusion tubes recorded concentrations greater than the 40 µg/m^3 air quality objective in 2012. Of the 51 tubes exceeding the annual mean air quality objective, 10 recorded a value above 60 µg/m^3. Concentrations greater than 60 µg/m^3 indicate a risk of the 1-hour NO_2 objective being exceeded.

The results for 2012 are shown in Table 2.5 and results from 2009 to 2012 for the locations at which monitoring is currently undertaken are shown in Table 2.6.

The maximum recorded value in 2012 was 81.7 µg/m^3 from the diffusion tubes co-located with the AQMS at Hanger Lane, Ealing. This location has recorded concentrations above 70 µg/m^3 for the previous four years.

Table 2.5 Results of NO_2 Diffusion Tubes 2012

Site ID	Site Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (%)	2012 Annual Mean (Bias Adjustment Factor = 0.96)
1	31 Castlebar Road, Ealing,W5 2DJ	NR	Y	N	91.70%	36.8
2	12 Castlebar Hill, Ealing,W5 1TE	B	Y	N	91.70%	30.4
3	1-4 Peal Gardens West Ealing,W13 OBA	R	Y	N	91.70%	36
4	2 Horsenden Lane South Greenford, UB6 8AB	R	Y	N	91.70%	**61.4**
5	Perivale Wood, r/o 36-38 Sunley Gardens, Greenford, UB6 7PE	B	Y	N	91.70%	27.7
6	41 Manor Road, West Ealing,W13 OJA	NR	Y	N	91.70%	35.2
7	44 Felix Road, West Ealing, W13 0NU	NR	Y	N	91.70%	37.9
8	1 Kirn Road, Ealing, W13 0UB	R	Y	N	91.70%	**51.4**
9	12 Balfour Road, Ealing, W13 9TN	NR	Y	N	91.70%	29.8
10	20 Church Road, Hanwell, W7 1DR	B	Y	N	91.70%	38.3
11	Brent Lodge Park Church Road, Hanwell,W7 3BP	R	Y	N	91.70%	28.9
12	Hobbayne First School, Greenford Avenue, Hanwell,W7 1HA	NR	Y	N	83.30%	36.5
13	255 Boston Road, Hanwell,W7 2AT	NR	Y	N	91.70%	34.6
14	6 Boston Gardens Boston Road, Hanwell, W7 2AN	R	Y	N	83.30%	36.5
15	Ealing Hospital Uxbridge Road, Southall, UB1 3HW	B	Y	N	91.70%	29.2
16	4 Minterne Avenue, Southall, UB2 4LL	NR	Y	N	91.70%	28.9
17	55 King Street, Southall, UB2 4DQ	R	Y	N	83.30%	**56.3**
18	18 Western Road, Southall, UB2 5DU	NR	Y	N	83.30%	**41.9**
19	Featherstone Primary School Western Road,Southall,UB2 5JT	NR	Y	N	58.30%	**42.4**
20	150 Brent Road, Southall, UB2 5LD	NR	Y	N	91.70%	**41**
21	2 Merrick Road, Southall, UB2 4AU	NR	Y	N	75.00%	38.4

Site ID	Site Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (%)	2012 Annual Mean (Bias Adjustment Factor = 0.96)
22	Martin Court, Southbridge Way Southall, UB2 4QW	NR	Y	N	91.70%	38.6
23	1 Randolph Road, Southall, UB1 1BL	R	Y	N	91.70%	39.9
24	Blair Peach School, Beaconsfield Road, UB1 1DD (Southall *AQMS*) (Tri)	B	Y	Y	91.70%	28.2
25	Blair Peach School, Beaconsfield Road, UB1 1DD (Southall *AQMS*) (Tri)	B	Y	Y	91.70%	28.7
26	Blair Peach School, Beaconsfield Road, UB1 1DD (Southall *AQMS*) (Tri)	B	Y	Y	91.70%	29.1
27	Hambrough Primary School South Road, Southall, UB1 1SF	NR	Y	N	91.70%	**44.9**
28	11 The Broadway, Southall, UB1 3PX	R	Y	N	91.70%	**60.9**
29	7 Greenford Avenue, Southall, UB1 2AA	NR	Y	N	91.70%	36.8
30	Jubilee Gardens Library Jubilee Gardens, Southall, UB1 2TJ	R	Y	N	91.70%	33.5
31	205 Windmill Lane, Greenford, UB6 9DW	R	Y	N	91.70%	37.9
32	Greenford High School Lady Margaret Road, Southall, UB1 2GU	B	Y	N	91.70%	37.1
33	2 Shadwell Drive, Northolt, UB5 6DB	NR	Y	N	91.70%	32.5
34	Northolt Library 388-404 Church Road,Northolt,UB5 5AU	NR	Y	N	91.70%	**41.6**
35	32 Irving Avenue, Northolt, UB5 5LX	B	Y	N	83.30%	29.9
36	213 Church Road, Northolt, UB5 5BE	R	Y	N	91.70%	**44.6**
37	31 Mandeville Road, Northolt, UB5 5HF	R	Y	N	75.00%	**46.2**
38	126 Petts Hill, Northolt, UB5 4NW	R	Y	N	91.70%	**40.8**
39	1504 Greenford Road Greenford, UB6 0HR	NR	Y	N	91.70%	38.6
40	79 Whitton Avenue East Greenford, UB6 0QD	NR	Y	N	91.70%	30.4
41	914 Greenford Road Greenford, UB6 8QN	R	Y	N	91.70%	39.5

Site ID	Site Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (%)	2012 Annual Mean (Bias Adjustment Factor = 0.96)
42	Oldfield Primary School Oldfield Lane North,Greenford,UB6 8PR	B	Y	N	91.70%	38.9
43	19 Runnymede Gardens Greenford, UB6 8SX	NR	Y	N	91.70%	**44.7**
44	12 Blenheim Close, Greenford, UB6 8ET	R	Y	N	83.30%	**43.2**
45	4 Thirlmere Avenue, Perivale, UB6 8EF	B	Y	N	91.70%	35.7
46	Oakley House Oakley Avenue, Ealing,W5 3SB	NR	Y	N	91.70%	32.3
47	53-61 St Pauls Close, Ealing,W5 3JX	NR	Y	N	83.30%	30.9
48	South Ealing Cemetery Popes Lane, Ealing, W5 4NA	B	Y	N	91.70%	31.2
49	Clayponds Hospital Sterling Place, Ealing, W5 4RN	B	Y	N	83.30%	29.8
50	12 Bond Street, Ealing, W5 5AP	R	Y	N	83.30%	**49.3**
51	8 Spring Bridge Road,Ealing,W5 2AA	R	Y	N	91.70%	**66.8**
52	Gordon Road, Ealing,W5 2UU	K	Y	N	91.70%	**47.2**
53	Haven Green Court Haven Green, Ealing, W5 2UZ	NR	Y	N	91.70%	**50.4**
54	27 Haven Green, Ealing,W5 2NZ	R	Y	N	91.70%	38.7
55	21 Haven Lane, Ealing,W5 2HZ	R	Y	N	91.70%	36.8
56	41-42 Haven Green, Ealing,W5 2NX	R	Y	N	91.70%	**52.1**
57	Middle of Haven Green, Ealing,W5 2UP	NR	Y	N	66.70%	**47.5**
58	64 Hanger Lane, Ealing, W5 2JH	NR	Y	N	83.30%	**44.4**
59	Fernlea House, Hanger Lane, Ealing W5 1EF (Hanger Lane *AQMS*) (Tri)	R	Y	Y	91.70%	**75**
60	Fernlea House, Hanger Lane, Ealing W5 1EF (Hanger Lane *AQMS*) (Tri)	R	Y	Y	91.70%	**81.7**
61	Fernlea House, Hanger Lane, Ealing W5 1EF (Hanger Lane *AQMS*) (Tri)	R	Y	Y	91.70%	**79.3**

Site ID	Site Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (%)	2012 Annual Mean (Bias Adjustment Factor = 0.96)
62	25 Waverley Gardens, Park Royal, NW10 7EX	R	Y	N	83.30%	**51.8**
63	6 Brentmead Gardens Park Royal,NW10 7DS	NR	Y	N	91.70%	34.4
64	3 Iveagh Terrace, Park Royal,NW10 7SY	R	Y	N	91.70%	**45**
65	5 Wendover Court, Western Ave, Acton	NR	Y	N	83.30%	**56**
66	324 Western Avenue, Acton, W3 OPL (Western Ave *AQMS*) (*Tri*)	R	Y	Y	91.70%	**74.5**
67	324 Western Avenue, Acton W3 OPL (Western Ave *AQMS*) (*Tri*)	R	Y	Y	91.70%	**73.8**
68	324 Western Avenue, Acton, W3 OPL (Western Ave *AQMS*) (*Tri*)	R	Y	YY	91.70%	**75.1**
69	326 Western Avenue, Acton, W3 0PL	NR	Y	N	91.70%	**59.9**
70	94 North Acton Road Park Royal, NW10 7AY	NR	Y	N	91.70%	38.9
71	1 Shaftesbury Gardens Park Royal, NW10 6LJ	NR	Y	N	91.70%	**43.4**
72	39 Old Oak Lane, Park Royal, NW10 6EJ	NR	Y	N	91.70%	**51.1**
73	27 Wells House Road Park Royal, NW10 6ED	NR	Y	N	83.30%	36.7
74	4 St Andrews Road, Acton,W3 7NE	R	Y	N	91.70%	**42.3**
75	98 Western Avenue, Acton, W3 7TZ	NR	Y	N	91.70%	**51.8**
76	6 Western Avenue, Acton, W3 7UD	R	Y	N	91.70%	**70.8**
77	57 Old Oak Common Lane, Acton,W3 7DD	NR	Y	N	83.30%	**49.6**
78	205 Old Oak Road, Acton, W3 7HH	R	Y	N	91.70%	**55.2**
79	17 The Vale, Acton, W3 7SH	R	Y	N	91.70%	**49.5**
80	177A The Vale, Acton,W3 7RD	R	Y	N	91.70%	**48.3**
81	Maples Nursery East Churchfield Road, Acton, W3 7LL	NR	Y	N	91.70%	34.8

Site ID	Site Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (%)	2012 Annual Mean (Bias Adjustment Factor = 0.96)
82	East Acton Primary School, East Acton Lane, Acton,W3 7HA	NR	Y	N	83.30%	35.9
83	88 High Street, Acton, W3 6QX	NR	Y	N	83.30%	**54.7**
84	35-61Church Road,Acton,W3 8QE	NR	Y	N	83.30%	39.5
85	182 High Street, Acton, W3 9NN	R	Y	N	83.30%	**48.9**
86	Southfields School Southfields Road, W4 1BD	NR	Y	N	91.70%	**40.4**
87	44 Acton Lane, Acton, W4 5ED	R	Y	N	91.70%	**40.1**
88	122 Gunnersbury Lane,Acton,W3 9BA	R	Y	N	91.70%	37.6
89	48 Gunnersbury Lane, Acton,W3 8EG	NR	Y	N	91.70%	36.1
90	15 Lantry Court Lexden Road, Acton, W3 9PE	B	Y	N	91.70%	31.7
91	156 Horn Lane,Acton,W3 6PH	NR	Y	N	83.30%	**40.7**
92	317 Horn Lane, Acton,W3 0BU (Horn Lane *AQMS*) (*Tri*)	R	Y	Y	91.70%	**53.2**
93	317 Horn Lane, Acton,W3 0BU (Horn Lane *AQMS*) (*Tri*)	R	Y	Y	91.70%	**54.7**
94	317 Horn Lane, Acton,W3 0BU (Horn Lane *AQMS*) (*Tri*)	R	Y	Y	91.70%	**47**
95	5 Leamington Park, Acton, W3 6TJ	NR	Y	Y	91.70%	**46.6**
96	36 Wales Farm Road, Acton,W3 6UE	NR	Y	N	91.70%	**44.8**
97	67-72 Seaclose Close, Acton, W3 6TF	R	Y	N	91.70%	**40.3**
98	59 Perry Avenue, Acton, W3 6YH	NR	Y	N	91.70%	39.6

Notes: For Site Type NR = Near Road, R = Roadside, B = Background and K = Kerbside.

In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

Underlined, annual mean > 60µg/m^3, indicating a potential exceedence of the NO_2 hourly mean AQS objective

[a] These values have been "annualised" in accordance with the methodology within Box 3.2 of LAQM.TG(09) as full calendar year data capture was less than 75%. See Appendix A for further details.

Table 2.6 Results of NO_2 Diffusion Tubes (2009 to 2012)

Site Name	Site Type	Within AQMA?	Annual Mean NO_2 Concentration ($\mu g/m^3$) - Adjusted for Bias			
			2009[a]	2010[a]	2011 (Bias Adjustment Factor = 1.01)	2012 (Bias Adjustment Factor = 0.96)
31 Castlebar Road, Ealing,W5 2DJ	NR	Y	N/A	**57.3**	38.1	36.8
12 Castlebar Hill, Ealing,W5 1TE	B	Y	35.1	32.3	33	30.4
1-4 Peal Gardens, West Ealing,W13 OBA	R	Y	37.3	39.1	38.8	36
2 Horsenden Lane South, Greenford, UB6 8AB	R	Y	**58**	**60.1**	**61.9**	**61.4**
Perivale Wood r/o 36-38 Sunley Gardens, Greenford,UB6 7PE	B	Y	31.1	25.7	28.2	27.7
41 Manor Road, West Ealing,W13 OJA	NR	Y	N/A	N/A	**54**	**53.2**
1 Kirn Road, Ealing, W13 0UB	R	Y	**50**	**57.9**	**52.1**	**51.4**
16 Balfour Road, Ealing, W13 9TN (kerbside until 2011)	NR	Y	38.6	35.9	29.3	29.8
20 Church Road, Hanwell, W7 1DR	B	Y	37.1	**41.9**	36	38.3
Brent Lodge Park, Church Road, Hanwell,W7 3BP	R	Y	29.9	29.4	27.2	28.9
255 Boston Road, Hanwell, W7 2AT	NR	Y	N/A	N/A	33.7	34.6
6 Boston Gardens Boston Road, Hanwell, W7 2AN	R	Y	**49.7**	39.5	37.1	36.5
Ealing Hospital Uxbridge Road, Southall, UB1 3HW	B	Y	**46.8**	**46.3**	28.6	29.2
4 Minterne Avenue, Southall,UB2 4LL	NR	Y	34.4	**42.8**	30.2	28.9
55 King Street, Southall, UB2 4DQ	R	Y	N/A	N/A	**63.3**	**56.3**
18 Western Road, Southall,UB2 5DU	NR	Y	N/A	N/A	38.6	**41.9**
150 Brent Road, Southall, UB2 5LD	NR	Y	N/A	N/A	**42.8**	**41**
2 Merrick Road, Southall, UB2 4AU	NR	Y	**40.9**	**45.7**	**43.1**	38.4
Martin Court Southbridge Way, Southall, UB2 4QW	NR	Y	N/A	N/A	**42.3**	38.6
Blair Peach School, Beaconsfield Road UB1 1DD (Southall *AQMS*) (Tri)	B	Y	33.8	31.3	30.8	28.2

Site Name	Site Type	Within AQMA?	Annual Mean NO_2 Concentration ($\mu g/m^3$) - Adjusted for Bias			
			2009[a]	2010[a]	2011 (Bias Adjustment Factor = 1.01)	2012 (Bias Adjustment Factor = 0.96)
Blair Peach School, Beaconsfield Road, UB1 1DD (Southall *AQMS*) (Tri)	B	Y	31.2	30.5	28.7	28.7
Blair Peach School, Beaconsfield Road UB1 1DD (Southall *AQMS*) (Tri)	B	Y	33.9	28	29.4	29.1
Hambrough Primary School South Road,Southall,UB1 1SF	NR	Y	**46.7**	**53.7**	**47.2**	**44.9**
11 The Broadway, Southall, UB1 3PX	R	Y	**68.1**	**66.4**	**69.3**	**60.9**
7 Greenford Avenue, Southall, UB1 2AA	NR	Y	35.8	39.2	38.8	36.8
205 Windmill Lane, Greenford, UB6 9DW	R	Y	**40.3**	**44.3**	**40.9**	37.9
Greenford High School Lady Margaret Road, Southall, UB1 2GU	B	Y	N/A	**44.6**	35	37.1
2 Shadwell Drive, Northolt, UB5 6DB (Kerbside during 2009 & 2010 and then near road on façade from 2011)	NR	Y	**48.4**	**42.1**	32.9	32.5
213 Church Road, Northolt, UB5 5BE	NR	Y	N/A	N/A	**45.3**	**44.6**
126 Petts Hill, Northolt, UB5 4NW	NR	Y	38.5	**42.3**	**40.1**	**40.8**
1504 Greenford Road, Greenford, UB6 0HR	NR	Y	N/A	N/A	39.5	38.6
79 Whitton Avenue East, Greenford, UB6 0QD (kerbside prior to 2011)	NR	Y	**40.8**	**44.1**	30.3	30.4
914 Greenford Road,Greenford,UB6 8QN	R	Y	**40.8**	**43.2**	**41.8**	39.5
19 Runnymede Gardens, Perivale, UB6 8SX (Kerbside during 2009/2010 and then Roadside from 2011)	NR	Y	**71.2**	**79.3**	**43.3**	**44.7**
12 Blenheim Close, Greenford, UB6 8ET	R	Y	37.9	**48.3**	39.9	**43.2**
4 Thirlmere Avenue,Perivale, UB6 8EF	B	Y	N/A	N/A	38.5	35.7
Oakley House, Oakley Avenue,Ealing,W5 3SB	NR	Y	N/A	N/A	33.6	32.3
53-61 St Pauls Close, Ealing,W5 3JX	NR	Y	N/A	N/A	29.1	30.9
South Ealing Cemetery Popes Lane, Ealing, W5 4NA	B	Y	34.8	32.6	30.2	31.2
12 Bond Street, Ealing, W5 5AP	R	Y	**51**	**54.3**	**57**	**49.3**
8 Spring Bridge Road, Ealing, W5 2AA	R	Y	N/A	**68.2**	**71.8**	**66.8**

Site Name	Site Type	Within AQMA?	Annual Mean NO_2 Concentration ($\mu g/m^3$) - Adjusted for Bias			
			2009[a]	2010[a]	2011 (Bias Adjustment Factor = 1.01)	2012 (Bias Adjustment Factor = 0.96)
Haven Green Court Haven Green, Ealing, W5 2UZ	NR	Y	N/A	**42.4**	39.5	**50.4**
27 Haven Green, Ealing,W5 2NZ (kerbside until 2011)	R	Y	**40.8**	**42.7**	39.6	38.7
21 Haven Lane, Ealing,W5 2HZ	R	Y	36.3	**40.1**	**41.4**	36.8
41-42 Haven Green, Ealing,W5 2NX	R	Y	N/A	N/A	**60.8**	**52.1**
64 Hanger Lane,Ealing,W5 2JH	NR	Y	N/A	N/A	**42.7**	**44.4**
Fernlea House, Hanger Lane, Ealing,W5 1EF (Hanger Lane AQMS) (Tri)	R	Y	**71.6**	**77.9**	**77.1**	**75**
Fernlea House, Hanger Lane, Ealing,W5 1EF (Hanger Lane AQMS) (Tri)	R	Y	**73.2**	**78.6**	**80.6**	**81.7**
Fernlea House, Hanger Lane, Ealing,W5 1EF (Hanger Lane AQMS) (Tri)	R	Y	**74.5**	**76.1**	**78.5**	**79.3**
25 Waverley Gardens,Park Royal, NW10 7EX	NR	Y	N/A	N/A	**54.9**	**51.8**
6 Brentmead Gardens, Park Royal (Roadside 2009/2010 and on facade from 2011)	NR	Y	**43**	**40.5**	36.3	34.4
3 Iveagh Terrace, Park Royal	NR	Y	N/A	N/A	**44.5**	**45**
5 Wendover Court, Western Avenue,Acton,W3 0TG	NR	Y	**58.5**	**67.4**	38.9	**56**
322 & 324 Western Avenue, Acton, W3 OPL (Western Ave *AQMS*) (*Tri*)	R	Y	N/A	**72.4**	**77.8**	**73.8**
322 & 324 Western Avenue, Acton, W3 OPL (Western Ave *AQMS*) (*Tri*)	R	Y	N/A	**67.9**	**72.8**	**75.1**
322 & 324 Western Avenue, Acton, W3 OPL (Western Ave *AQMS*) (*Tri*)	R	Y	N/A	**73.1**	**73.5**	**74.5**
326 Western Avenue, Acton, W3 0PL	R	Y	**51.4**	**62.6**	**62.5**	**59.9**
94 North Acton Road, Park Royal, NW10 7AY	NR	Y	39	**42.9**	39.8	38.9
1 Shaftesbury Gardens, Park Royal, NW10 6LJ	NR	Y	N/A	N/A	**42.1**	**43.4**
39 Old Oak Lane,Park Royal, NW10 6EJ	NR	Y	**52.1**	**56.7**	**54.1**	**51.1**

Site Name	Site Type	Within AQMA?	Annual Mean NO_2 Concentration ($\mu g/m^3$) - Adjusted for Bias			
			2009[a]	2010[a]	2011 (Bias Adjustment Factor = 1.01)	2012 (Bias Adjustment Factor = 0.96)
27 Wells House Road, Park Royal, NW10 6ED	NR	Y	**40.9**	**43.4**	39.9	36.7
4 St Andrews Road, Acton,W3 7NE	R	Y	**48**	**50.7**	**43.4**	**42.3**
98 Western Avenue, Acton, W3 7TZ	NR	Y	**51.9**	**57.1**	**51.4**	**51.8**
6 Western Avenue, Acton, W3 7UD	R	Y	**72.1**	**79.8**	**70.4**	**70.8**
57 Old Oak Common Lane, Acton,W3 7DD	NR	Y	**53.5**	**56.5**	**53.2**	**49.6**
205 Old Oak Road, Acton, W3 7HH	R	Y	**67.2**	**76.9**	**59.7**	**55.2**
17 The Vale, Acton, W3 7SH	R	Y	N/A	N/A	**50.1**	**49.5**
East Acton Primary School East Acton Lane, Acton, W3 7HA	NR	Y	35.8	37.8	**40.4**	35.9
Acton Health Centre,35-61Church Road,Acton,W3 8QE	NR	Y	33.4	39.6	32.9	39.5
182 High Street, Acton, W3 9NN	R	Y	**55.9**	**64.9**	**67.4**	**48.9**
44 Acton Lane, Chiswick, W4 5ED	R	Y	**50.7**	**57.2**	**41.8**	**40.1**
122 Gunnersbury Lane,Acton,W3 9BA	R	Y	**44.5**	**51.1**	38.1	37.6
48 Gunnersbury Lane, Acton,W3 8EG	NR	Y	**50.8**	**52**	37	36.1
15 Lantry Court, Lexden Road, Acton, W3 9PE	B	Y	**67**	33.4	30.5	31.7
156 Horn Lane,Acton,W3 6PH	NR	Y	**45.6**	**49.4**	**46.6**	**40.7**
317 Horn Lane, Acton,W3 0BU (Horn Lane *AQMS*) (*Tri*)	R	Y	N/A	**59.6**	**59.6**	**54.7**
317 Horn Lane, Acton,W3 0BU (Horn Lane *AQMS*) (*Tri*)	R	Y	N/A	**57.1**	**56.8**	**47**
317 Horn Lane, Acton,W3 0BU (Horn Lane *AQMS*) (*Tri*)	R	Y	N/A	**58.6**	**54**	**53.2**
5 Leamington Park, Acton, W3 6TJ	NR	Y	**44.7**	**47.5**	**48.6**	**46.6**
36 Wales Farm Road, Acton,W3 6UE	NR	Y	N/A	N/A	**48.5**	**44.8**

Notes: In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

Underlined, annual mean > 60µg/m^3, indicating a potential exceedence of the NO_2 hourly mean AQS objective

[a]2009 data bias adjusted using national factors of 0.89 for roadside and kerbside sites, 0.90 for near road sites and 1.02 for urban background sites. Similarly, 2010 data bias adjusted using local factors of 1.02, 1.06 and 1.01. The bias adjustment methods for 2009 and 2010 are presented in previous LAQM reports.

Figure 2.4 to Figure 2.12 show trends in annual mean NO_2 concentrations recorded at diffusion tubes in the LB of Ealing from 2009 to 2012. The general trend appears to be a slight reduction in annual mean concentrations over the five year period. Due to differences in diffusion tube referencing over the past five years, addresses have been used to describe the locations of the diffusion tubes shown.

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

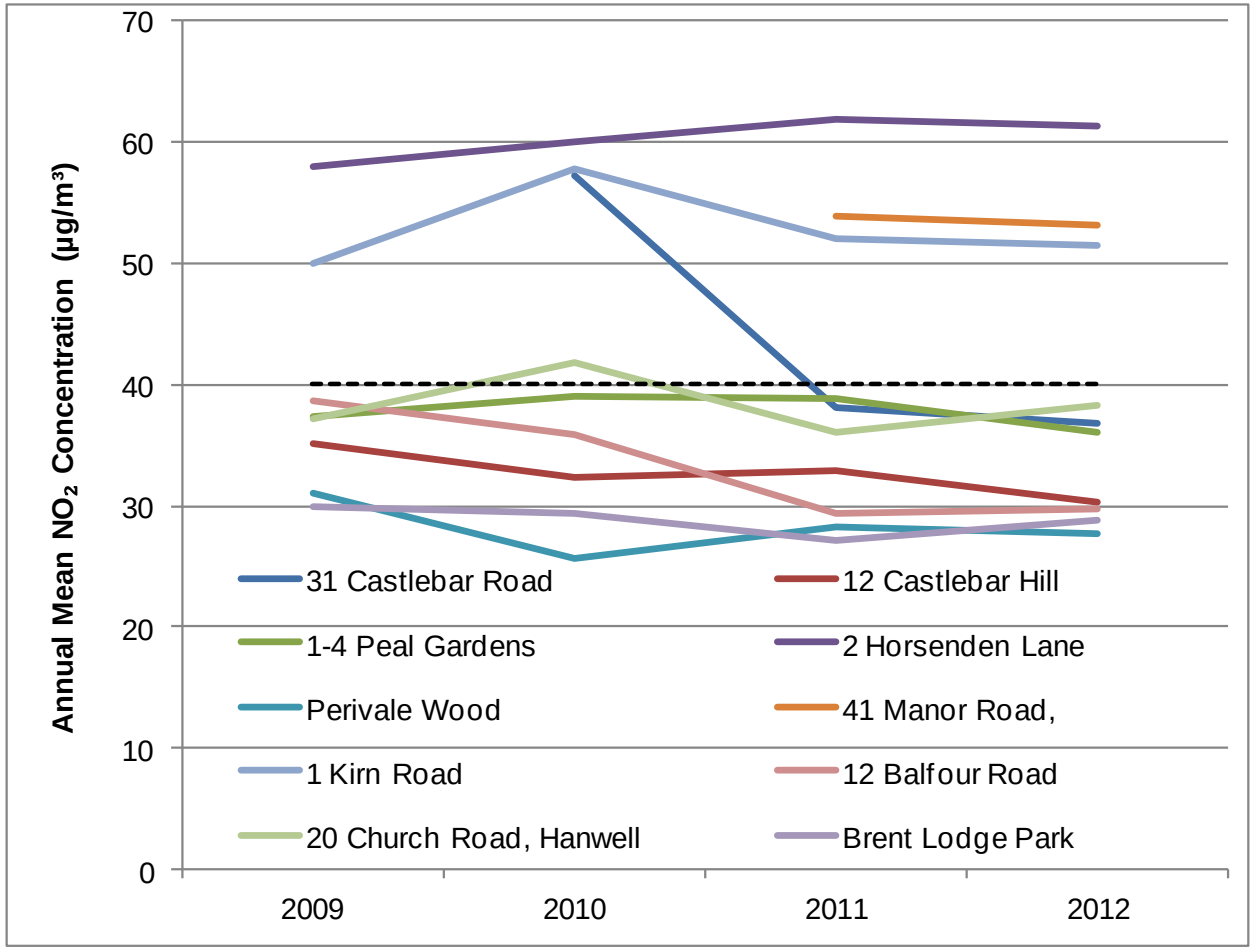


Figure 2.5 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

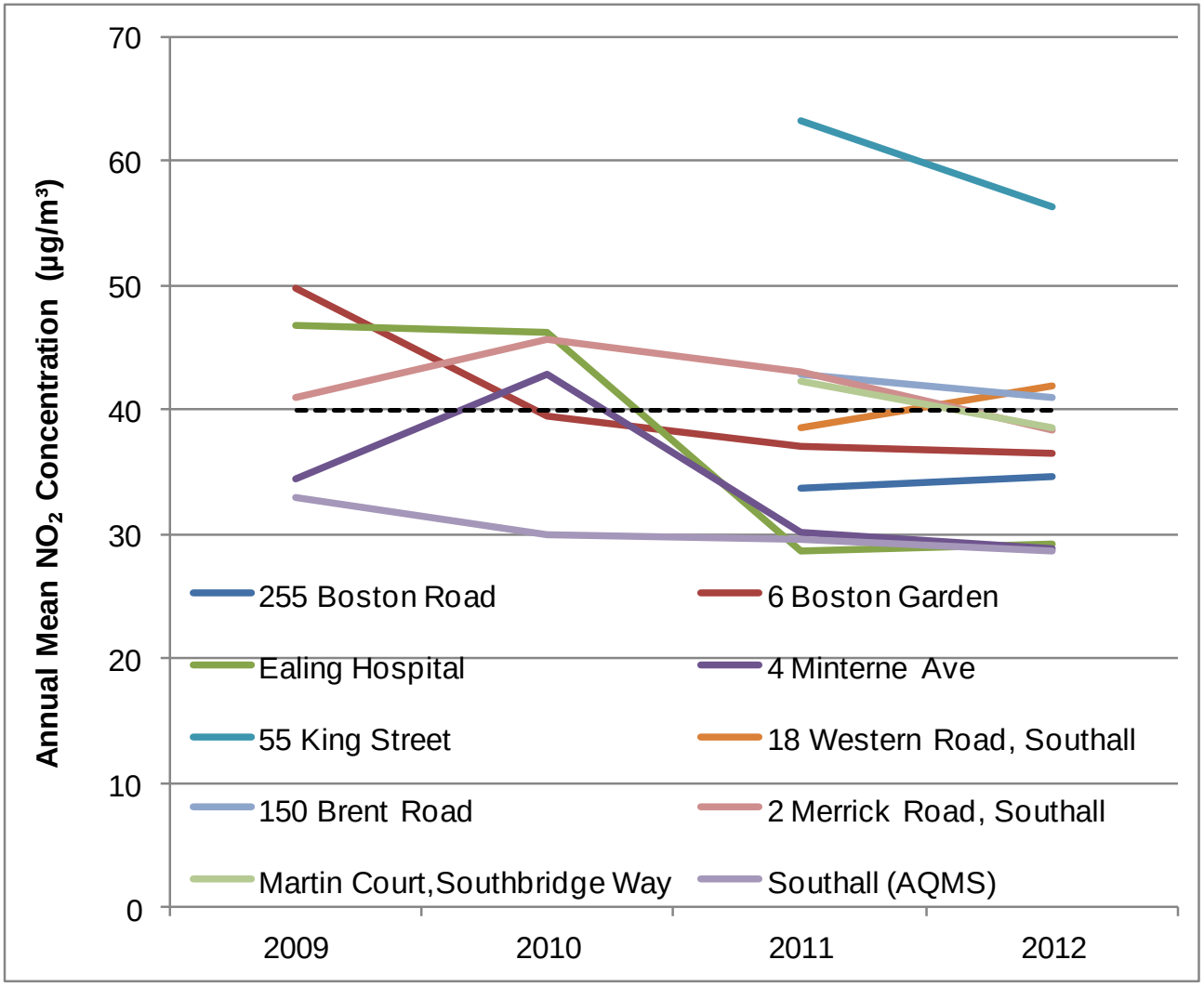


Figure 2.6 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

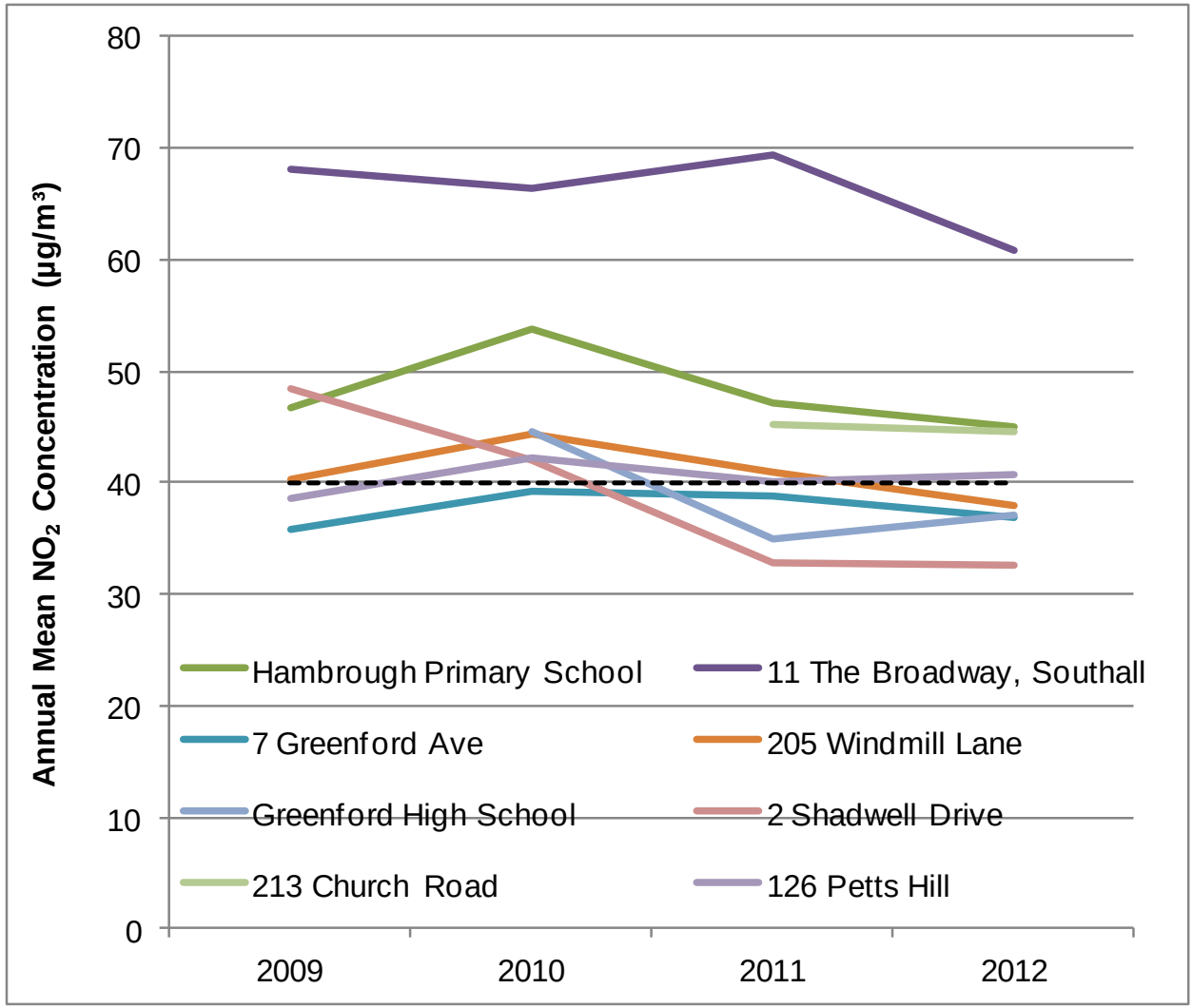


Figure 2.7 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

Figure 2.8 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

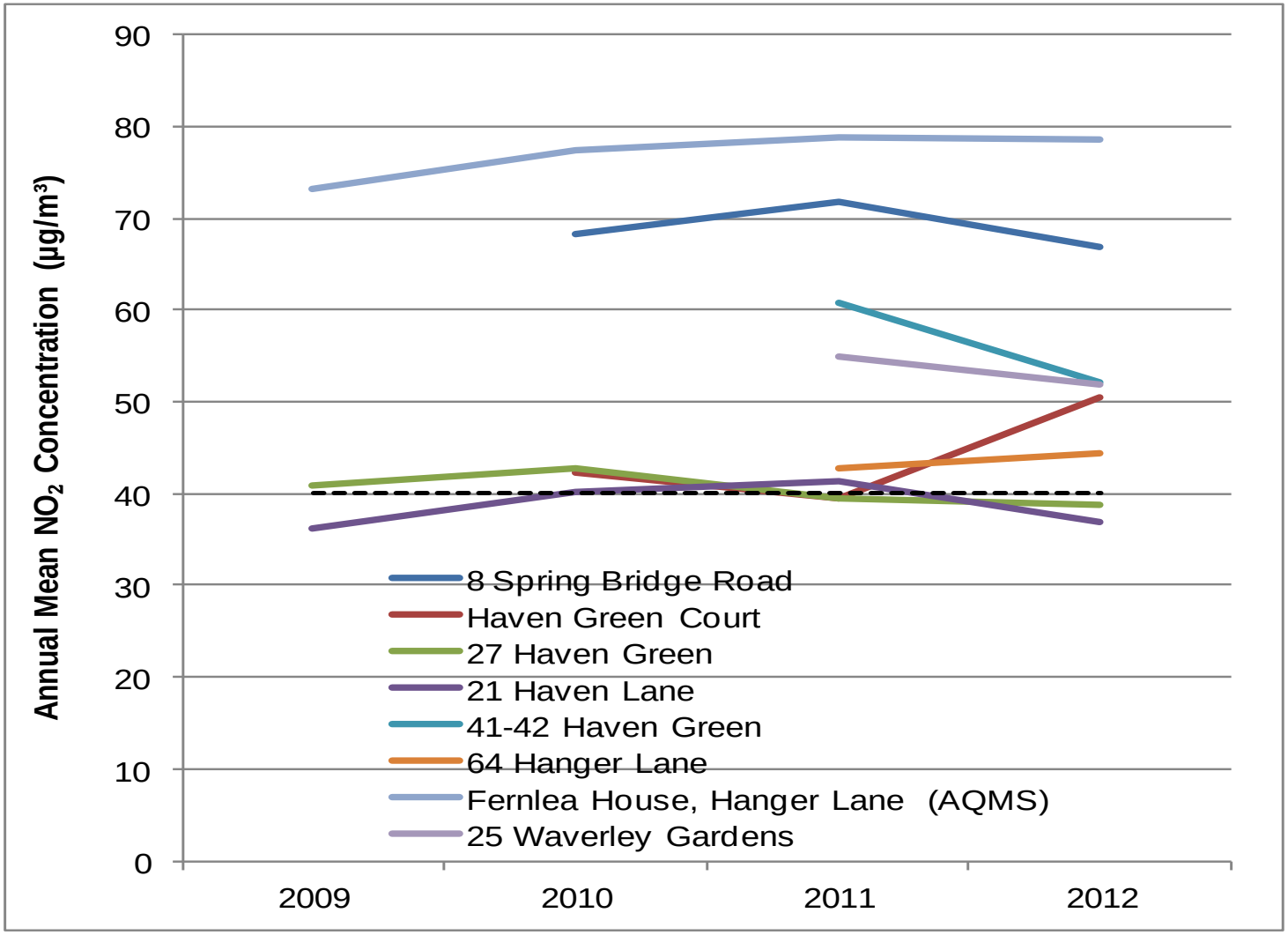


Figure 2.9 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

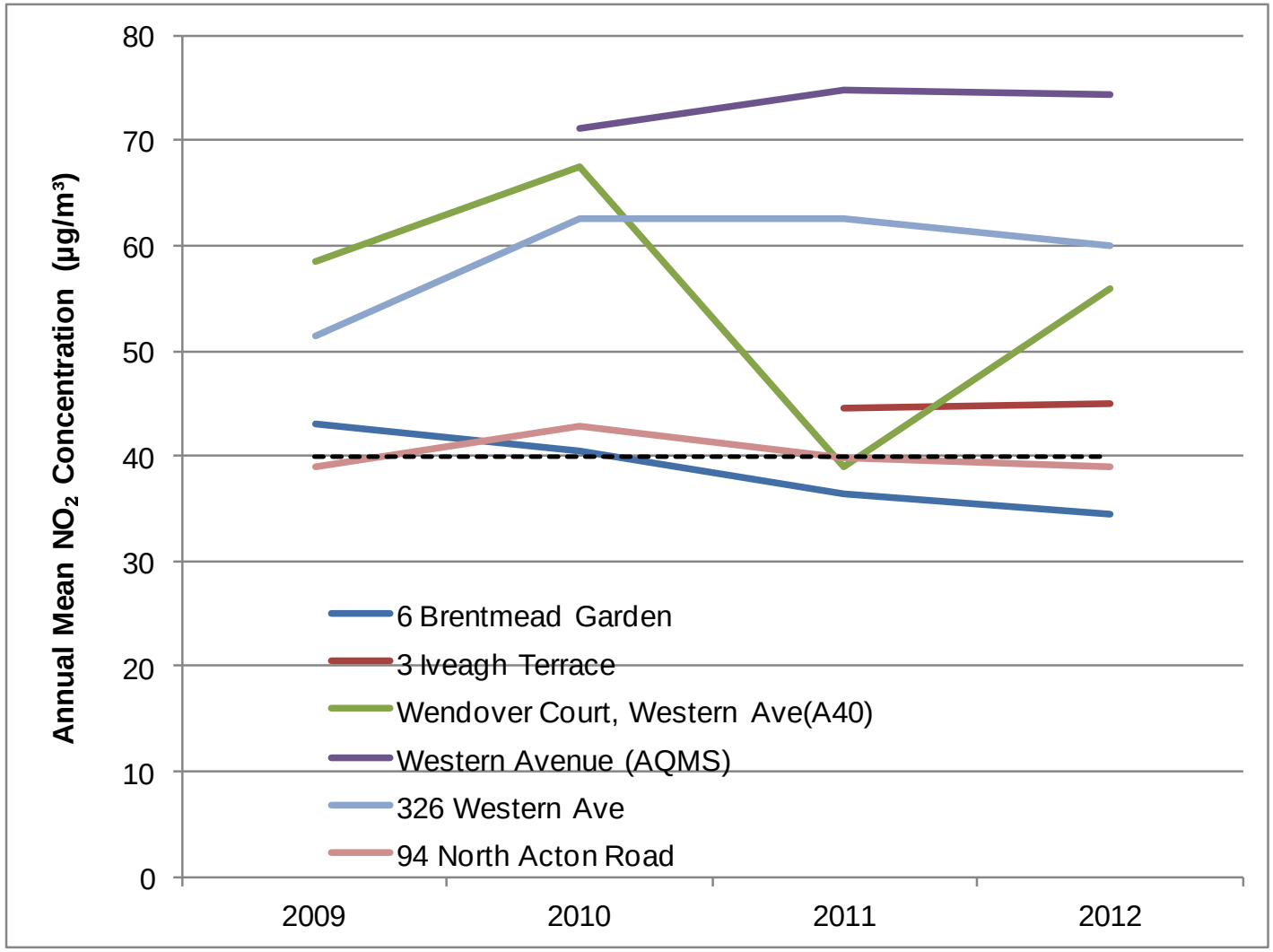


Figure 2.10 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

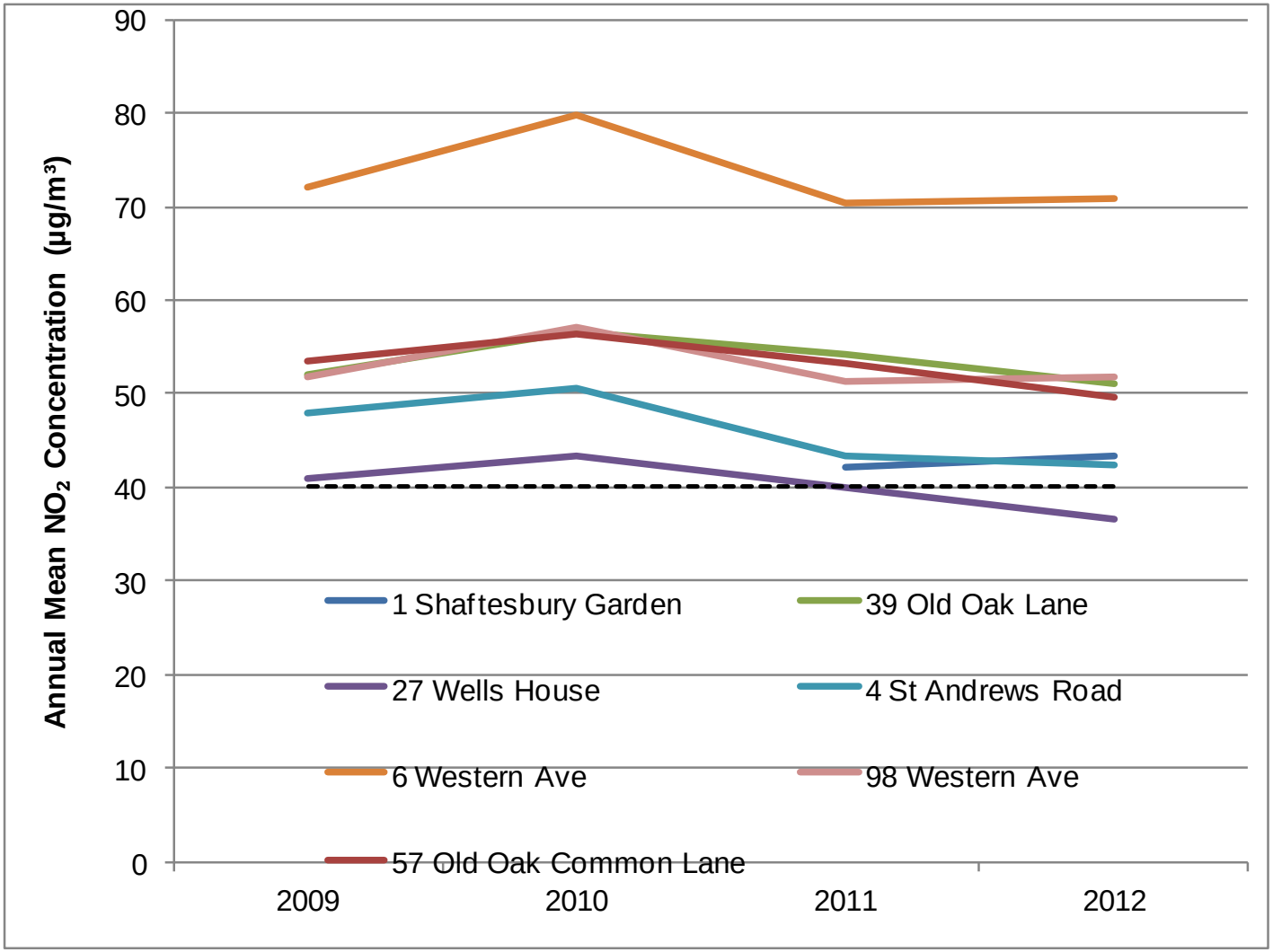


Figure 2.11 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

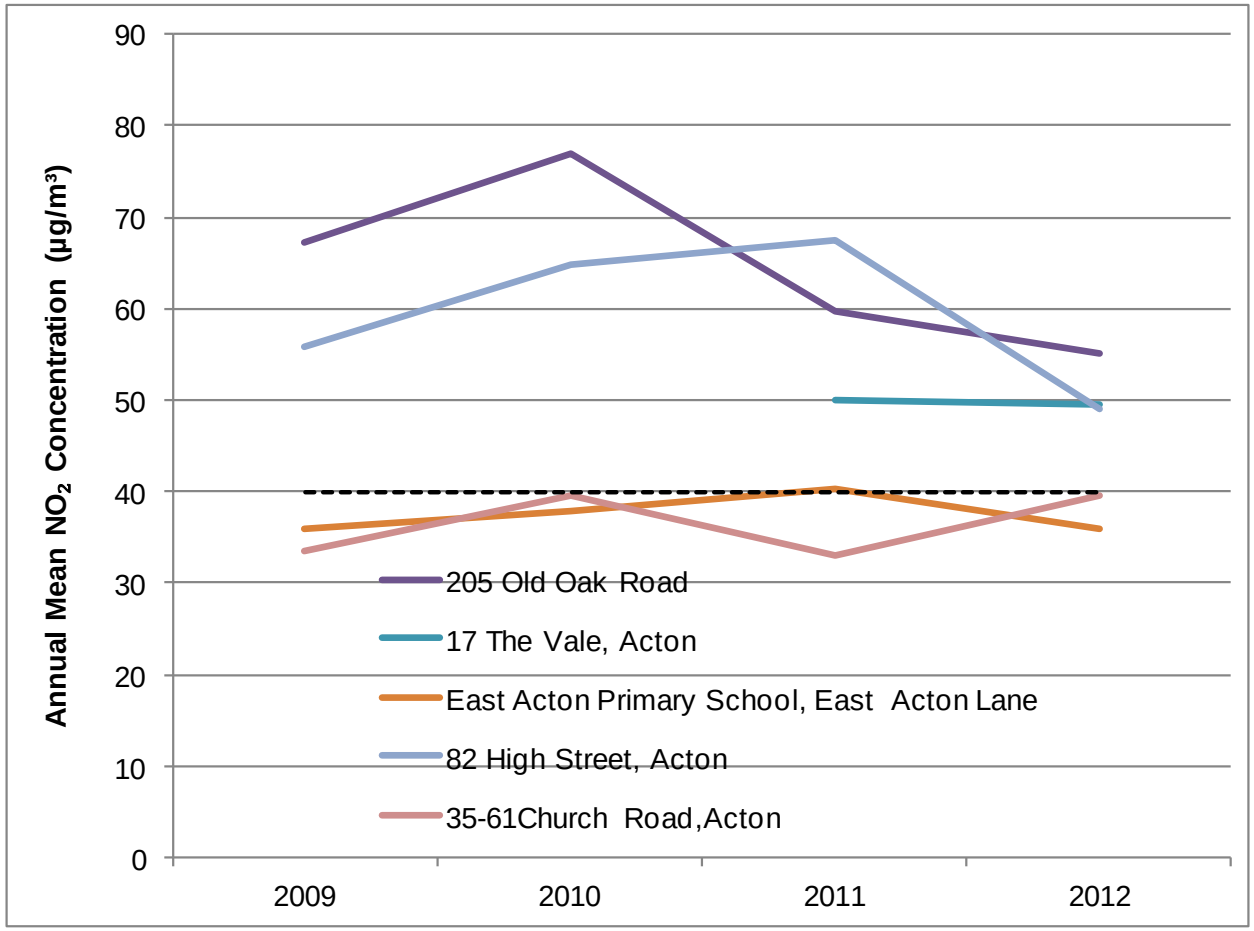
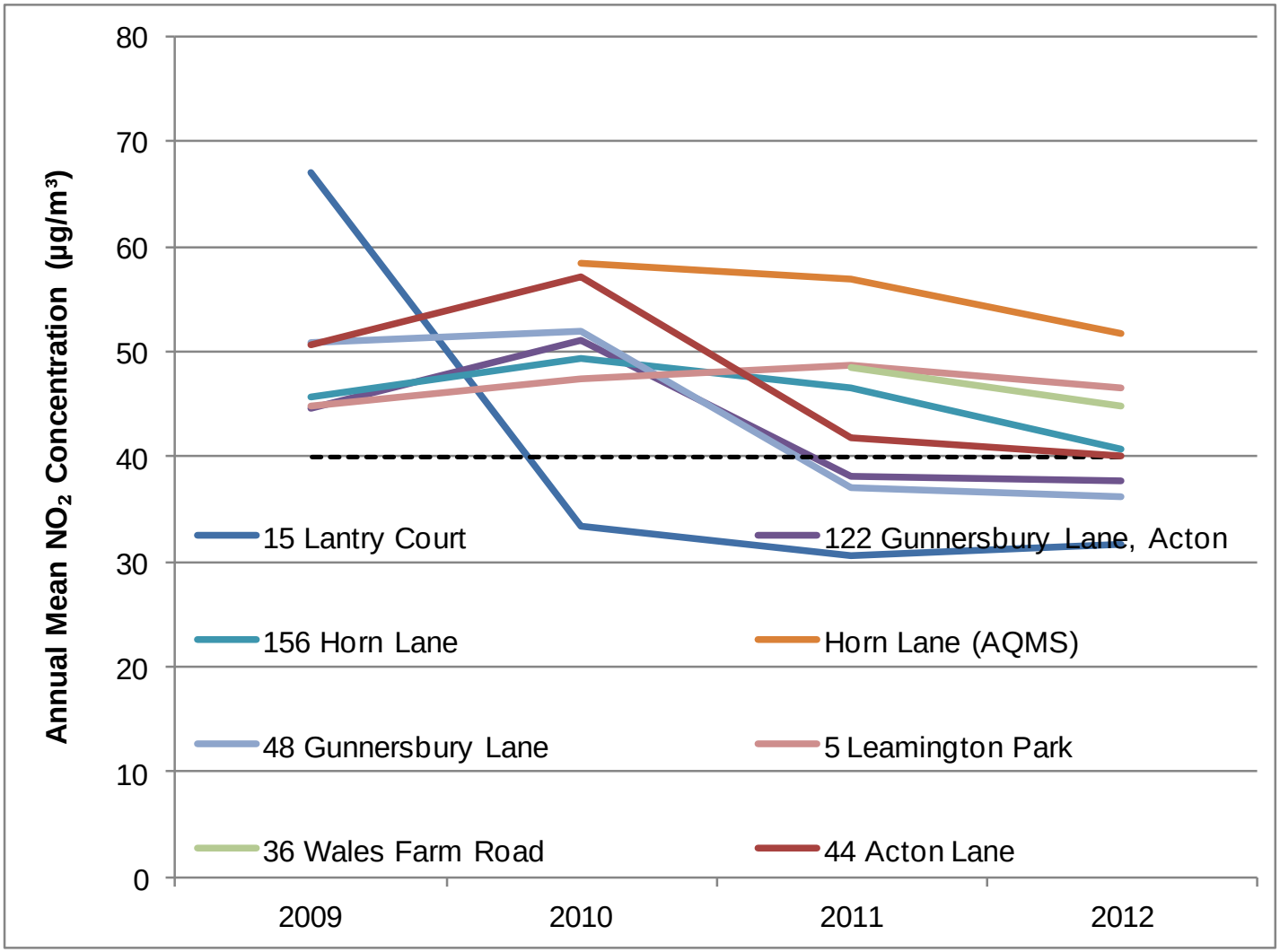


Figure 2.12 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites



2.2.2 Particulate Matter (PM_{10})

PM_{10} concentrations are measured at five locations in the LB of Ealing, as shown in Table 2.7. TEOMs are used to monitor PM_{10} at all sites. In addition to this there is a co-located FDMS being used at the Southall site. Where applicable therefore, monitoring data has been corrected for the use of TEOMs using the Volatile Correction Model[1].

Concentrations in 2012 at all sites were found to meet the annual mean objective of 40 µg/m^3. The highest annual mean PM_{10} concentration occurred at Horn Lane, with a value of 37.5 µg/m.

Figure 2.13 shows the trends in PM_{10} concentrations between 2009 and 2012 for the five monitoring locations, which appear to suggest that annual PM_{10} concentrations have remained relatively stable over this period.

No exceedences of the annual mean particulate matter (PM_{10}) objective (40 µg/m^3) were recorded at the monitoring sites in Ealing in 2012, as shown in Table 2.8. The daily mean PM_{10} air quality objective (50 µg/m^3, not to be exceeded more than 35 times a year) was also achieved at all monitoring sites. The highest concentrations were found at Horn Lane which recorded annual mean concentrations of 37.5 µg/m^3 and 22 days when average PM_{10} concentrations were above 50 µg/m^3.

[1] Volatile Correction Model http://www.volatile-correction-model.info/Default.aspx Accessed:24/4/2014

Table 2.7: Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2012 %	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean PM_{10} Concentration ($\mu g/m^3$)				
					2008	2009	2010	2011	2012
Hanger Lane Gyratory	Roadside	Y	99.1	Y	-	-	-	30.8	29.1
Horn Lane	Industrial	Y	95.8	Y	**42.0**	38.6	**41.5**	36.3	37.5
Southall	Urban Background	Y	80.5	Y	20.0	19.9	20	21.7	22.9
Southall Railway	Near road	Y	96.6	Y	-	-	-	23.3	22.9
Western Avenue	Roadside	Y	39.6	Y	-	-	-	31.2	30.4[a]

Notes: In bold, exceedence of the PM_{10} annual mean AQS objective of $40\mu g/m^3$

Figure 2.13 Trends in Annual Mean PM_{10} Concentrations

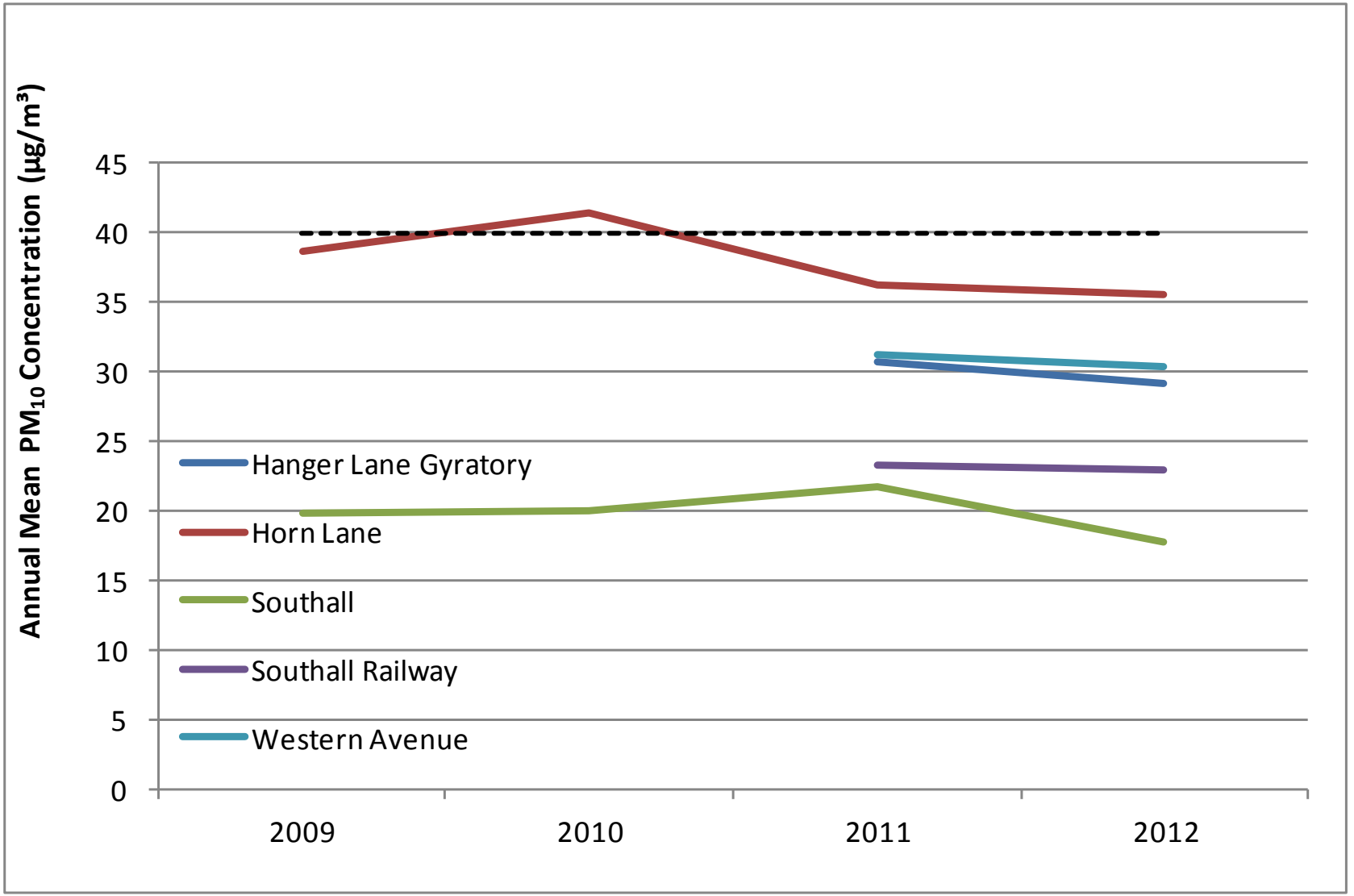


Table 2.8 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2013 (%)	Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m^3				
					2008	2009* [c]	2010* [c]	2011* [c]	2012* [c]
Hanger Lane Gyratory	Roadside	Y	96.6	Y	-	-	-	29 (47)	8
Horn Lane	Near Road	Y	93.7	Y	**103**	**71 (60)**	**91**	**59**	22
Southall	Background	Y	98.2	Y	4	4	2	9	5
Southall Railway	Roadside	Y	98.2	Y	-	-	-	5 (31)	4
Western Avenue	Roadside	Y	82.0	Y	-	-	-	23 (45)	10 (45)

Notes: In bold, exceedence of the PM_{10} daily mean AQS objective (50µg/m^3 – not to be exceeded more than 35 times per year)

Where data capture for the full calendar year was less than 90%, the 90.4th percentile of 24-hour means is shown in brackets

2.2.3 Sulphur Dioxide (SO_2)

The London Borough of Ealing operated one site (Ealing Town Hall) that monitored sulphur dioxide in the Borough. The site was however closed in January 2012 and no monitoring has since been conducted.

2.2.4 Benzene

Until the end of 2011 the London Borough of Ealing operated three roadside passive diffusion tube sites that measured benzene within the Borough. In 2012 the Church Road and Acton Town Hall sites were discontinued, while the Hanger Lane Gyratory continued to operate. All diffusion tubes achieved the annual mean objective of 5 µg/m^3.

Site Ref.	OS Grid Ref		Site Type	Annual Average Benzene Concentrations µg/m^3				
	X	Y		2008	2009	2010	2011	2012
Hanger Lane Gyratory	518540	182700	R	1.8	2.1	1.6	1.9	1.1
Church Road	512676	183993	R	1.4	1.7	1.4	1.0	N/A
Acton Town Hall	520306	180055	R	1.1	1.6	1.3	1.2	N/A

2.2.5 Other Pollutants Monitored

2.2.5.1 Ozone (O_3)

Ozone monitoring is conducted at the Southall automatic monitoring station. Local objectives for improving ground level ozone are not included in the Air Quality Regulations as it is considered to be a regional pollutant. The UK Air Quality Strategy does however suggest a running 8-hour average of 100µg/m^3 should not be exceeded more than 10 times per year. Ozone concentrations at this site were found to be significantly greater than the suggested criteria.

Table 2.9 Results of Automatic Monitoring for O_3

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2012 % [b]	Number of Daily Means > 50µg/m^3 2012
Southall	Urban Background	Y	95.4	95.4	36

2.2.5.2 Particulate Matter ($PM_{2.5}$)

The London Borough of Ealing commenced $PM_{2.5}$ monitoring in 2012 at the at the Southall urban background site. Concentrations for the first year of monitoring are shown in Table 2.10**Error! Reference source not found.**. Monitoring was also conducted at the closed Acton Town Hall site from 1985 until 2011.

Table 2.10 Results of Automatic Monitoring for $PM_{2.5}$

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2012 %	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m^3) 2012
Southall	Background	Y	63.7	63.7	Y	9.7

2.2.6 Summary of Compliance with AQS Objectives

The London Borough of Ealing has examined the results from air quality monitoring in the Borough.

Annual mean and hourly mean concentrations of nitrogen dioxide remain in exceedence of the air quality objectives at numerous locations within the current borough-wide AQMA.

Measured PM_{10} concentrations did not exceed the annual mean objective for any continuous monitoring site, the same is true for the daily mean PM_{10} objective.

The basis for the declaration of the current AQMA therefore remains unchanged and the AQMA should remain.

3 New Local Developments

LB of Ealing confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

LB of Ealing confirms that all the following have been considered:

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

4 Local / Regional Air Quality Strategy

A number of air quality projects have been undertaken by the London Borough of Ealing in recent years as shown in Table 4.1. The results of these projects will be used to inform the revision of LB Ealing's Air Quality Action Plan during 2014/2015. Projects such as the final one in the table 'Transforming a hotspot' has the potential to reduce the significant number of exceedences for PM_{10} seen in the Horn Lane area of Acton.

Table 4.1 Summary of New Air Quality Strategy Actions

Year	Title of Project
2011/2012	Emissions from diesel trains in London
2011/2012	Remote sensing of NO_2 exhaust emissions from road vehicles
2012/2013	Scenario development to inform air quality action planning in the London Borough of Ealing

5 Planning Applications

There are a number of large developments in the LB of Ealing that have received planning permission for a first phase of multi phase schemes. The largest of these developments are documented below.

Havelock estate, Southall

900 residential homes with first phase approved by the council and construction due to begin in summer 2014. The developer for this scheme is Catalyst Housing. Construction is due to be completed by 2025.

Copley Close Estate, West Ealing

The council's 2008 estates review highlighted that Copley Close needs a lot of work to bring it up to the government's Decent Homes standard. The LB of Ealing proposes the demolition of the current 76 units and the construction of 211 new residential units. This redevelopment is due to be constructed with the planning application currently in the consultation phase.

South Acton Estate, Acton

A house redevelopment scheme with a total of 2,600 residential properties over 11 phases due for completion in 2026. LB of Ealing granted the phase 3 planning application in March 2014. The first two phases are currently under construction.

Green Man Estate, West Ealing

Redevelopment of the Green Man Estate in West Ealing due to be completed from 2009 – 2018 over four phases. Currently phase one and two are in construction and the planning application is being prepared for phase three. The phase four planning application with be submitted. Once completed the development will comprise of 706 new residential properties, a new gym, community cafe, energy centre and 401 car parking spaces. The project includes the demolition of the 464 current properties and multi-storey car park on site.

Southall Gasworks development

This is an 85 acre Brownfield site which is seeking planning permission for 20,000sqm of residential, 14,200sqm for non-food retail, 5,850sqm of food retail, 1,750sqm of Class A3-A5 uses; 650sqm of hotel, 3,000 sqm of conference and banqueting, 24,450sqm of multi-storey car park, 2,550sqm of health care facilities, 3,450sqm of education facilities, 3,500sqm of office/studio units, 390sqm of sports pavilion, 600sqm of energy centre, associated car and cycle parking, landscaping, public realm, open space and children's play-space. Phase one is due for completion in 2019.

Thames Tunnel-Acton Storm Tanks, Canham Road, Acton

Construction is assumed to start in 2018 and be complete by 2021. Work includes construction of underground structures to connect the existing Acton Storm Relief combined sewer overflow to a shaft approximately 31 m deep and with an internal diameter of approximately 15 m. As of March 12th 2014 the Secretary of State has 3 months in which to make their decision on the acceptance or refusal of the Thames Tideway Tunnel project.

High Speed 2 (HS2)

Construction is due to begin on the North Acton and Park Royal section of HS2 railway line in 2018.

6 Air Quality Planning Policies

These section details any planning policies that make reference to air quality, together with any new policies or guidance of relevance to air quality.

On 10 December 2013 the LB of Ealing's new Local Plan4 superseded any saved policies in the Unitary Development Plan (UDP) that was adopted on 12 October 2004. The existing development plan for the LB of Ealing currently comprises the following documents (together with an associated Adopted Policies Map 5):

- London Plan
- Development (or Core Strategy) DPD, April 2012
- Development Sites DPD, December 2013
- Development Management DPD, December 2013

The relevant air quality is Policy 7A which discusses amenities and planning decisions.

"***A*** *Development which in the course of its operations will cause emissions of any sort must;*

- *not erode the amenity of surrounding uses or the site itself*
- *take all reasonable steps to ameliorate these emissions*
- *provide all necessary evidence of mitigation that is requested by the local planning authority*

B *The requirement to properly regulate and ameliorate emissions applies also to functionally separate areas within a given development, for instance between separate flats or dwellings.*

C *Sensitive uses will not be permitted where these would achieve acceptable levels of amenity only by substantially sealing residents or users off from their surrounding environment.*

D *Development that is sensitive to operational emissions of a particular type must avoid locating in areas in which there are established concentrations of such emissions that cannot be properly"*

London Plan policy 7.14

Developers are to design their schemes so that they are at least 'air quality neutral'.

London Plan policy 5.3, 7.14

Developments should be designed to minimise the generation of air pollution.

London Plan policy 3.2, 5.3, 7.14

Developments should be designed to minimise and mitigate against increased exposure to poor air quality.

London Plan policy 5.3, 7.14

Developers should select plant that meets the standards for emissions from combined heat and power and biomass plants set out in Appendix 7.

The London Plan and the Mayor's Air quality Strategy set out that developments are to be at least 'air quality neutral'. To enable the implementation of this policy Building emission benchmarks (BEB) have been produced for buildings' operation and transport across London based on the latest technology (including its effectiveness and viability). Developments that do not exceed these benchmarks will be considered to avoid any increase in NOx and PM emissions across London as a whole and therefore be 'air quality neutral'. The benchmarks will be kept under review and will be updated in line with technological and commercial advances.

All planning development should comply with London Plan policy 7.14. A minimum benchmark requirement is the provision and installation of Ultra Low NOx boilers with maximum NOx Emissions of under 0.040 g/kWh in addition to enhanced fabric insulation in exceedance of Building Regulations Part L 2010.

In April 2013 the Cabinet pledged the London Borough of Ealing to commit to take action to improve local air quality, and become an air quality exemplar borough, in accordance with the Air Quality Exemplar Qualifying Criteria.

7 Local Transport Plans and Strategies

This is a statutory document prepared by each London Borough under the Greater London Authority Act 1999, and sets out the policy context and proposals of the Borough for the implementation of the Mayor of London's Transport Strategy.

The main relevant policy in terms of air quality in the second Local Implementation Plan (LIP) for transport strategies and plans[6] is LIP Objective 4 i.e. 'Improve quality of life for residents, businesses and visitors to the borough, protecting and enhancing the urban and natural environment'. Other policies that affect air quality are:

- *Objective 2 – Increase sustainable travel capacity and key links in the borough*
- *Objective 3 - Smooth the flow of traffic and improve journey time reliability for all road-users, particularly bus passengers, cyclists and pedestrians*
- *Objective 5: - Promote healthy travel behaviour through a shift to more walking and cycling."*

The LIP notes roads which are known as particularly poor areas for air quality, these areas include road corridors with heavy vehicle flows such as the A40, A406 and A4020 (Uxbridge Road).

8 Climate Change Strategies

The London Borough of Ealing set out its Climate Change policy for 2011 to 2014 in a document released on September 18th 2008. This strategy aimed to reduce Ealing borough's contribution to climate change with a target to achieve a 10% reduction in per capita carbon dioxide emissions by 2010/11 from a 2005 baseline.

The adopted development management plan[7] for LB of Ealing sets out the updated Climate change strategy as Policy 5.2.

Policy 5.2: Minimising Carbon Dioxide Emissions: Planning Decisions

- *"With regards to planning permission, all major new-build residential developments are required to achieve the following standards under the Code for Sustainable Homes, or equivalent:*
    - *2012 onwards - Level 4*
    - *2016 onwards - Level 5*

- *all other new residential development in Ealing must achieve Code for Sustainable Homes Level 4 as a minimum.*

- *major residential developments consisting of the refurbishment of existing buildings, including the conversion of existing buildings to form flats, are required to achieve a BREEAM Domestic Refurbishment Scheme rating of Excellent, or equivalent.*

- *major non-residential developments are required to achieve a minimum Very Good rating under the most up-to-date BREEAM or equivalent scheme and make reasonable endeavours to achieve Excellent and Outstanding.*

- *other new development including residential extensions and conversions should undertake energy efficiency improvements up to 10% of the value of the proposed works."*

9 Implementation of Action Plans

The LB of Ealing is in the process of updating its Air Quality Action Plan. The updated plan is due to be published in 2014 / 2015.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

In 2012 the London Borough of Ealing undertook monitoring at five continuous monitoring sites and with 98 NO_2 diffusion tubes within the Borough.

The results from the air quality monitoring show annual mean concentrations of nitrogen dioxide remain in exceedence of the AQS objective within the AQMA. Exceedences occurred at 38 diffusion tube sites and the automatic monitoring stations at Hanger Lane Gyratory, Horn Lane and Western Avenue. The highest concentrations were at Hanger Lane Gyratory (95 µg/m^3). The 1-hour nitrogen dioxide was also exceeded at two continuous monitoring sites and potentially at eight of the diffusion tube sites.

The annual mean and daily mean objectives for PM_{10} were not exceeded at any of the continuous monitoring stations. Annual mean concentrations were highest at the Horn Lane site (37.5 µg/m^3).

Benzene diffusion tubes did not exceed the annual mean objective at the remaining Hangar Lane site during 2012. This is a continuing trend within the borough and it can be concluded that benzene monitoring is no longer required.

The basis for declaration of the AQMA with regards to NO_2 and PM_{10} remains unchanged and the borough-wide AQMA should therefore remain.

10.2 Conclusions relating to New Local Developments

LB of Ealing has identified a number of significant local developments that have the potential to impact upon local air quality once operational. These include two major infrastructure projects (Acton Storm Tanks as part of the Thames Tideway Tunnel project and the HS2 rail link) and a large number of new residential schemes. A number of the residential schemes are regeneration projects which will be replacing current housing stock and therefore the cumulative impact will be less than if construction was occurring on a brownfield site.

Impacts relating to the two major infrastructure projects will have been modelled as part of the planning application and therefore their impacts have already been assessed in detail. No further action is therefore considered necessary.

10.3 Proposed Actions

On the basis of the findings of the Progress Report the LB of Ealing proposes the following actions:

- Submit an Action Plan Progress Report in 2014 and an Updating and Screening assessment in 2015, in accordance with the LAQM Review and Assessment process.
- Continue to operate a network of diffusion tubes and continuous monitoring sites throughout the Borough to monitor NO_2 and PM_{10} concentrations in the Borough.
- Maintain the extent of the existing AQMA for NO_2 and PM_{10}.
- Benzene monitoring within the Borough is to be discontinued.

11 References

[1] London Borough of Ealing (2003), London Borough of Ealing Air Quality Action Plan.

[2] London Borough of Ealing (2009), Fourth Round Updating and Screening Assessment for London Borough of Ealing.

[3] London Air Quality Network (2012). Available online: www.londonair.org.uk. Accessed: 28/4/2014.

[4] Volatile Correction Model http://www.volatile-correction-model.info/Default.aspx. Accessed: 24/4/2014.

[5] LB of Ealing - Local Plan. Available at: http://www.ealing.gov.uk/info/200921/local_plans. Accessed: 28/4/2014

[6] LB of Ealing, Adopted Policies map. Available at: http://www.ealing.gov.uk/info/200921/local_plans/1513/policies_map. Accessed 28/4/2014

[7] LB of Ealing, Transport Strategies and Plans. Available at: http://www.ealing.gov.uk/info/100011/transport_and_streets/620/transport_strategies_and_plans/2 Accessed 28/4/2014.

[8] Adopted Development Management Plan (2013).

[9] Defra, National Diffusion Tube Bias Adjustment Factor Spreadsheet, Spreadsheet Version Number: 03/14. Available at http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html.

[10] Defra, WASP – Annual Performance Criteria for NO_2 Diffusion Tubes used in Local Air Quality Management (LAQM). Available at http://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html

[11] Volatile Correction Model. Available at: http://www.volatile-correction-model.info/Default.aspx Accessed 28/4/2014

Appendices

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

Bias adjustment is effectively a calculated factor which shows whether diffusion tubes are over or under reading ambient concentrations and therefore allows for a correction to be made.

In 2012 the London Borough of Ealing used the national factor for Gradko as given on the review and assessment help desk website[2]. The diffusion tube preparation method is 20% TEA/Water. Adjustment factors for the last three years were as follows:

- 2010- 1.02 for roadside and kerbside sites, 1.06 for near road sites and 1.02 for urban background sites, and 1.01
- 2011 -0.91
- 2012 - 0.96

QA/QC of diffusion tube monitoring

The Workplace Analysis Scheme for Proficiency (WASP)[3] is an independent analytical performance testing scheme, operated by the Health and Safety Laboratory (HSL). WASP formed a key part of the former UK NO_2 Network's QA/QC, and remains an important QA/QC exercise for laboratories supplying diffusion tubes to Local Authorities for use in their Local Air Quality Management work.

Defra and the Devolved Administrations advise that diffusion tubes used for LAQM should be obtained from laboratories that have demonstrated satisfactory performance in the WASP scheme.

The results for WASP Rounds 116 to 1119 (Jan 2012 - Dec 2012) show that Gradko where rated as 100% compliance.

[2] Defra, National Diffusion Tube Bias Adjustment Factor Spreadsheet, Spreadsheet Version Number: 03/14. Available at http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html
[3] Defra, WASP – Annual Performance Criteria for NO_2 Diffusion Tubes used in Local Air Quality Management (LAQM). Available at http://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html

Diffusion Tube Bias Adjustment Factors

Figure A.1 National Bias Adjustment Factor 2012

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/14

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2014
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List
If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List
If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down
If a year is not shown, we have no data[2]

Step 4: **Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.**
If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To make your selection, choose [All] from the pop-up list)	Year[5] (To make your selection, choose [All])	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2012	R	Wiltshire Council	11	38	40	-4.0%	G	**1.04**
Gradko	20% TEA in Water	2012	R	Dudley MBC	11	39	33	16.0%	G	**0.86**
Gradko	20% TEA in Water	2012	UB	Dudley MBC	10	27	26	3.1%	G	**0.97**
Gradko	20% TEA in Water	2012	R	Dudley MBC	11	43	42	2.0%	G	**0.98**
Gradko	20% TEA in water	2012	R	Monmouthshire County Council	9	47	42	12.7%	G	**0.89**
Gradko	20% TEA in water	2012	R	Cheshire West & Chester	11	40	45	-10.1%	G	**1.11**
Gradko	20% TEA in Water	2012	UB	East Herts Council	11	21	12	71.3%	G	**0.58**
Gradko	20% TEA in Water	2012	R	Gateshead Council	11	34	34	-1.4%	G	**1.01**
Gradko	20% TEA in Water	2012	R	Gateshead Council	11	36	37	-3.2%	G	**1.03**
Gradko	20% TEA in Water	2012	R	Gateshead Council	11	32	33	-2.6%	G	**1.03**
Gradko	20% TEA in Water	2012	R	Dudley MBC	9	55	60	-7.5%	G	**1.08**
Gradko	20% TEA in Water	2012	UB	Luton Borough Council	11	38	30	23.4%	G	**0.77**
gradko	20% TEA in water	2012	UC	Southampton City Council	11	30	33	-8.3%	G	**1.09**
Gradko	20% TEA in water	2012	R	Exeter City Council	11	34	34	-0.3%	G	**1.00**
Gradko	20% TEA in water	2012	R	Scarborough B C	11	32	37	-11.3%	G	**1.13**
Gradko	20% TEA in Water	2012	KS	Marylebone Road Intercomparison	11	106	94	12.1%	G	**0.89**
Gradko	20% TEA in water	2012	KS	New Forest DC	10	46	40	13.4%	G	**0.88**
Gradko	20% TEA in water	2012	R	New Forest DC	10	33	29	11.8%	G	**0.89**
Gradko	20% TEA in water	2012	R	Brighton & Hove City Council	11	41	37	10.5%	G	**0.91**
Gradko	20% TEA in water	2012	R	City of Lincoln Council	11	53	44	18.4%	G	**0.84**
Gradko	20% TEA in water	2012	R	Fareham Borough Council	9	38	39	-4.1%	G	**1.04**
Gradko	20% TEA in water	2012	R	NOTTINGHAM CITY COUNCIL	10	44	44	-0.2%	G	**1.00**
Gradko	20% TEA in water	2012	R	NOTTINGHAM CITY COUNCIL	11	43	41	4.9%	G	**0.95**
Gradko	20% TEA in water	2012	R	NOTTINGHAM CITY COUNCIL	10	46	47	-0.3%	G	**1.00**
Gradko	20% TEA in water	2012	R	The Highland Council	9	24	32	-24.1%	G	**1.32**
Gradko	20% TEA in water	2012	R	Wiltshire Council	10	36	35	3.3%	G	**0.96**
Gradko	20% TEA in Water	2012	UB	LB Waltham Forest	11	33	38	-11.8%	S	**1.13**
Gradko	20% TEA in water	2012	R	Pendle	10	39	32	20.6%	G	**0.83**
Gradko	20% TEA in water	2012	R	Lancaster City Council	10	46	42	11.3%	G	**0.90**
Gradko	20% TEA in water	2012	R	Lancaster City Council	11	37	36	2.1%	G	**0.98**
Gradko	20% TEA in water	2012	R	Wokingham Borough Council	9	32	34	-7.4%	G	**1.08**
Gradko	20% TEA in water	2012	R	London Borough of Ealing	10	55	54	1.8%	P	**0.98**
Gradko	20% TEA in water	2012	R	London Borough of Ealing	10	83	84	-0.3%	P	**1.00**
Gradko	20% TEA in water	2012	UB	London Borough of Ealing	9	32	36	-10.8%	G	**1.12**
Gradko	20% TEA in water	2012	B	Chelmsford City Council	11	19	14	30.9%	G	**0.76**
Gradko	20% TEA in water	2012		**Overall Factor[3] (35 studies)**				**Use**		**0.96**

Factor from Local Co-location Studies

Figure A.2: Results of 2012 Co-location Study at Southall Monitoring Station

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Automatic Method: Period Mean	Automatic Method: Data Capture (% DC)	Data Quality Check: Tubes Precision Check	Data Quality Check: Automatic Monitor Data
1	04/01/2012	01/02/2012	35.03	35.85	37.34	36	1.2	3	2.9	37.8	98.5	Good	Good
2	02/02/2012	01/03/2012	35.5	36.43	40.68	38	2.8	7	6.9	40.8	96.7	Good	Good
3	01/03/2012	28/03/2012	41.32	40.13	40.41	41	0.6	2	1.5	42.5	99.8	Good	Good
4	28/03/2012	26/04/2012	24.19	27.29	25.82	26	1.6	6	3.9	33.2	99.7	Good	Good
5	25/04/2012	30/05/2012	20.11	15.69	18.16	18	2.2	12	5.5	23.6	51.0	Good	r Data Capture
6	31/05/2012	27/06/2012	20.65	18.89	19.63	20	0.9	4	2.2	24.9	56.2	Good	r Data Capture
7	27/06/2012	01/08/2012	19.99	22.56	21.79	21	1.3	6	3.3	20.6	98.9	Good	Good
8	01/08/2012	30/08/2012	22.53	23.29	23.65	23	0.6	2	1.4	27.2	99.9	Good	Good
9	27/09/2012	30/10/2012	29.33	26.78	27.98	28	1.3	5	3.2	37.5	99.4	Good	Good
10	30/10/2012	28/11/2012	35.41	38.75	36.61	37	1.7	5	4.2	44.2	99.6	Good	Good
11	28/11/2012	04/01/2013	39.20	42.70	41.23	41	1.8	4	4.4	43.1	99.9	Good	Good
12													
13													
										Overall survey -->		Good precision	Good Overall

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Blair Peach School

Precision: 11 out of 11 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 9 periods of data	
Bias factor A	1.12 (1.04 - 1.23)
Bias B	-11% (-18% - -4%)
Diffusion Tubes Mean:	32 µgm^{-3}
Mean CV (Precision):	4
Automatic Mean:	36 µgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	36 (34 - 40) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 9 periods of data	
Bias factor A	1.12 (1.04 - 1.23)
Bias B	-11% (-18% - -4%)
Diffusion Tubes Mean:	32 µgm^{-3}
Mean CV (Precision):	4
Automatic Mean:	36 µgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	36 (34 - 40) µgm^{-3}

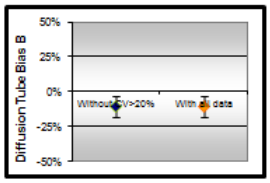


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Figure A.3: Results of 2012 Co-location Study at Hanger Lane Gyratory Monitoring Station

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	04/01/2012	01/02/2012	78.56	84.4	51.07	71	17.8	25	44.2
2	02/02/2012	01/03/2012	107.3	86.55	77.57	90	15.2	17	37.9
3	01/03/2012	28/03/2012	90.03	101.06	98.31	96	5.7	6	14.3
4	28/03/2012	26/04/2012		82.3	86.47	84	2.9	3	26.5
5	25/04/2012	30/05/2012	58.2	58.43	63.05	60	2.7	5	6.8
6	31/05/2012	27/06/2012		73.7	74.04	74	0.2	0	2.2
7	27/06/2012	01/08/2012	74.78	78.05	81.1	78	3.2	4	7.9
8	01/08/2012	30/08/2012	62.25	69.25	71.85	68	5.0	7	12.3
9	27/09/2012	30/10/2012	88.37	71.47	80.56	80	8.5	11	21.0
10	30/10/2012	28/11/2012	113.11	111.55	112.83	112	0.8	1	2.1
11	28/11/2012	04/01/2013	115.48	119.11	111.34	115	3.9	3	9.6
12									
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
97.1516	100.0	Poor Precision	Good
110.284	98.5	Good	Good
101.349	99.7	Good	Good
109.237	99.7	Good	Good
79	99.5	Good	Good
78	98.9	Good	Good
98	94.6	Good	Good
115	91.7	Good	Good
75.4987	99.6	Good	Good
100.052	99.9	Good	Good
94.0638	99.9	Good	Good
	Overall survey -->	Good precision	Good Overall

(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Hanger Lane 2012

Precision 10 out of 11 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%

Bias calculated using 10 periods of data
Bias factor A 1.12 (0.97 - 1.32)
Bias B -11% (-24% - 3%)
Diffusion Tubes Mean: 86 µgm^{-3}
Mean CV (Precision): 6
Automatic Mean: 96 µgm^{-3}
Data Capture for periods used: 98%
Adjusted Tubes Mean: 96 (83 - 113) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA

Bias calculated using 11 periods of data
Bias factor A 1.14 (0.99 - 1.33)
Bias B -12% (-25% - 1%)
Diffusion Tubes Mean: 85 µgm^{-3}
Mean CV (Precision): 7
Automatic Mean: 96 µgm^{-3}
Data Capture for periods used: 98%
Adjusted Tubes Mean: 96 (84 - 112) µgm^{-3}

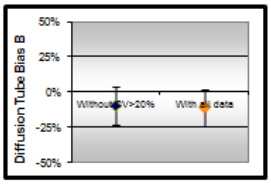

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Figure A.4: Results of 2012 Co-location study at Horn Lane Monitoring Station

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	04/01/2012	01/02/2012		65.63	65.23	65	0.3	0	2.5
2	02/02/2012	01/03/2012	88.14	70.84		79	12.2	15	109.9
3	01/03/2012	28/03/2012	73.94	69.22	60.98	68	6.6	10	16.3
4	28/03/2012	26/04/2012	55.95	49.93	51.48	52	3.1	6	7.8
5	25/04/2012	30/05/2012	26.71	27.28	26.24	27	0.5	2	1.3
6	31/05/2012	27/06/2012	40.18	39.67	47.23	42	4.2	10	10.5
7	27/06/2012	01/08/2012	49.72	48.8	48.67	49	0.6	1	1.4
8	01/08/2012	30/08/2010	43.34	46.17	39.70	43	3.2	8	8.1
9	30/08/2010	27/09/2012							
10	27/09/2012	30/10/2012	52.48	67.17		60	10.4	17	93.3
11	30/10/2012	28/11/2012	77.20	70.22	80.26	76	5.1	7	12.8
12	28/11/2012	04/01/2013	67.39	71.79	74.73	71	3.7	5	9.2
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
59.6	99.7	Good	Good
64.0	99.1	Good	Good
65.9	99.8	Good	Good
57.5	92.3	Good	Good
47.1	99.4	Good	Good
38.6	99.5	Good	Good
39.9	99.0	Good	Good
44.8	98.9	Good	Good
51.5	93.1		Good
52.8	49.3	Good	or Data Capture
62.7	99.9	Good	Good
59.4	99.8	Good	Good
	Overall survey -->	Good precision	Good Overall

(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Horn Lane 2012

Precision 11 out of 11 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%

Bias calculated using 10 periods of data
Bias factor A 0.94 (0.83 - 1.09)
Bias B 6% (-8% - 21%)
Diffusion Tubes Mean: 57 µgm^{-3}
Mean CV (Precision): 6
Automatic Mean: 54 µgm^{-3}
Data Capture for periods used: 99%
Adjusted Tubes Mean: 54 (48 - 63) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA

Bias calculated using 10 periods of data
Bias factor A 0.94 (0.83 - 1.09)
Bias B 6% (-8% - 21%)
Diffusion Tubes Mean: 57 µgm^{-3}
Mean CV (Precision): 6
Automatic Mean: 54 µgm^{-3}
Data Capture for periods used: 99%
Adjusted Tubes Mean: 54 (48 - 63) µgm^{-3}

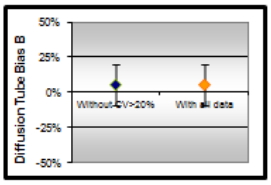

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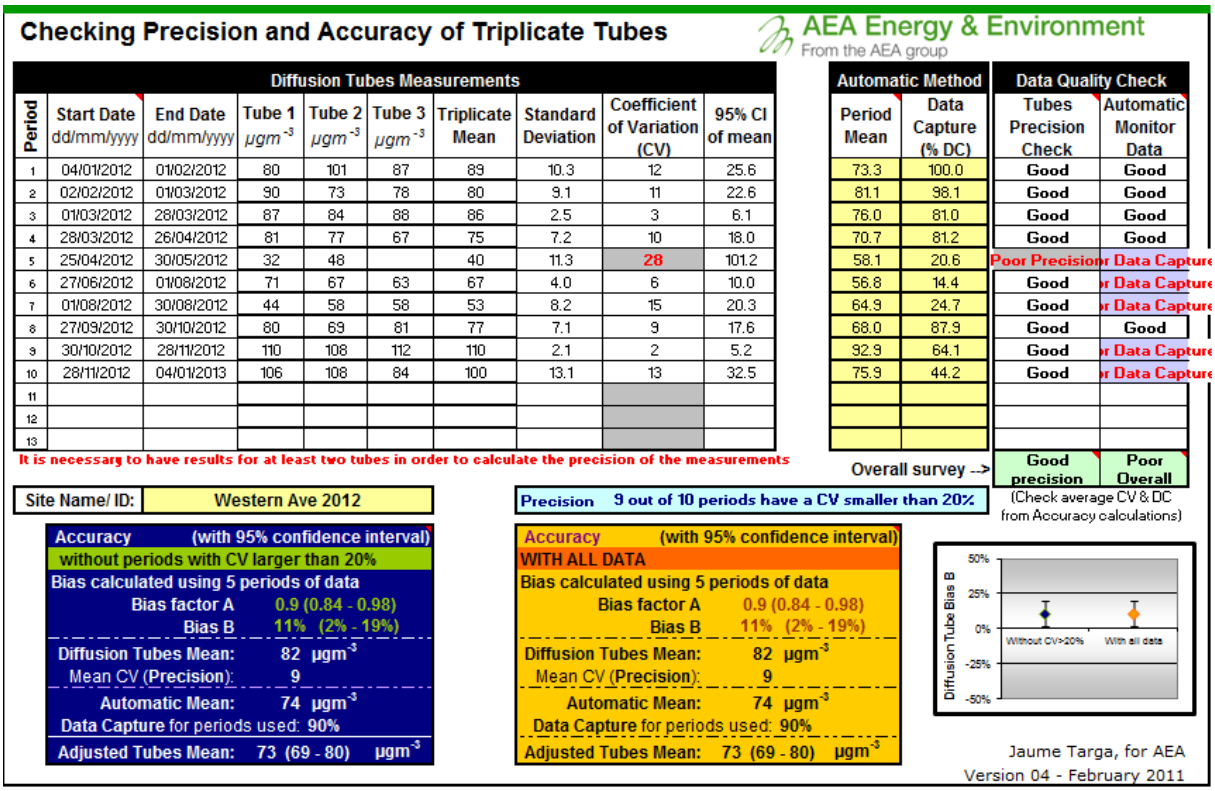
Figure A.5: Results of 2012 Co-location study with Western Avenue Monitoring Station



Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	04/01/2012	01/02/2012	80	101	87	89	10.3	12	25.6
2	02/02/2012	01/03/2012	90	73	78	80	9.1	11	22.6
3	01/03/2012	28/03/2012	87	84	88	86	2.5	3	6.1
4	28/03/2012	26/04/2012	81	77	67	75	7.2	10	18.0
5	25/04/2012	30/05/2012	32	48		40	11.3	28	101.2
6	27/06/2012	01/08/2012	71	67	63	67	4.0	6	10.0
7	01/08/2012	30/08/2012	44	58	58	53	8.2	15	20.3
8	27/09/2012	30/10/2012	80	69	81	77	7.1	9	17.6
9	30/10/2012	28/11/2012	110	108	112	110	2.1	2	5.2
10	28/11/2012	04/01/2013	106	108	84	100	13.1	13	32.5
11									
12									
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
73.3	100.0	Good	Good
81.1	98.1	Good	Good
76.0	81.0	Good	Good
70.7	81.2	Good	Good
58.1	20.6	Poor Precision	r Data Capture
56.8	14.4	Good	r Data Capture
64.9	24.7	Good	r Data Capture
68.0	87.9	Good	Good
92.9	64.1	Good	r Data Capture
75.9	44.2	Good	r Data Capture
Overall survey -->		Good precision	Poor Overall

(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Western Ave 2012

Precision 9 out of 10 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 5 periods of data
Bias factor A 0.9 (0.84 - 0.98)
Bias B 11% (2% - 19%)
Diffusion Tubes Mean: 82 µgm^{-3}
Mean CV (Precision): 9
Automatic Mean: 74 µgm^{-3}
Data Capture for periods used: 90%
Adjusted Tubes Mean: 73 (69 - 80) µgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 5 periods of data
Bias factor A 0.9 (0.84 - 0.98)
Bias B 11% (2% - 19%)
Diffusion Tubes Mean: 82 µgm^{-3}
Mean CV (Precision): 9
Automatic Mean: 74 µgm^{-3}
Data Capture for periods used: 90%
Adjusted Tubes Mean: 73 (69 - 80) µgm^{-3}

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Discussion of Choice of Factor to Use

Co-location studies were carried out at a number of air quality monitoring stations. However due to poor data capture and precision majority of these sites (as shown in Figure A.2 to A.5), it has been decided to use the nationally derived bias adjustment factor. It should be noted this factor (0.96) correlates well with the local bias-adjustment factor derived for the Horn Lane site, where good overall data capture was obtained (see Figure A.3.)

Short-term to Long-term Data adjustment

As data capture for 2012 was low for both NO_2 and PM_{10} at the Western Avenue Continuous monitoring site, seasonal adjustment factors were calculated to estimate the annual mean concentration from the measured period mean. In accordance with LAQM.TG(09) guidance, period and annual mean concentrations were calculated from three nearby background AURN monitoring sites having data capture rates of greater than 90%. This was done by using the mean annual mean / period mean ratio. For Western Avenue the calculated ratio was 0.95 for NO_2 and 1.02 for PM_{10}. Details of these calculations are presented below.

Table A.1 Short-Term to Long-Term Monitoring Data Adjustment Western Avenue Continuous Monitoring Site 2012 NO_2

Site	Annual Mean Concentration (µg/m^3)	Period Mean Concentration (µg/m^3)	Ratio
Ealing - Southall	34.72	35.82	0.97
Hillingdon - Harlington	34.38	36.38	0.95
Kensington and Chelsea - North Ken	36.58	39.11	0.94
Average			**0.95**

Table A.2 Short-Term to Long-Term Monitoring Data Adjustment Western Avenue Continuous Monitoring Site 2012 PM_{10}

Site	Annual Mean Concentration (µg/m^3)	Period Mean Concentration (µg/m^3)	Ratio
Harrow - Stanmore	17.99	17.61	1.02
Ealing - Horn Lane	35.55	33.85	1.05
Ealing - Hanger Lane Gyratory	29.14	28.83	1.01
Average			**1.02**

Appendix B: Monthly NO_2 Diffusion Tube Results

Table B.1: Raw Monthly NO_2 Diffusion Tube Results, 2012 ($\mu g/m^3$)

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average
1	42.1	45.3	51.3	32.8	26	24.6	27.7	30	N/D	47.1	46.5	48.6	38.4
2	37.1	39.5	39.8	28.7	17.8	24.1	22.8	24.1	N/D	31.8	46.2	36.7	31.7
3	37.7	43.8	42.1	36.7	31.6	29.6	27	33.3	N/D	32	45.2	53.2	37.5
4	58.7	65.3	71.5	65.4	41.7	53.4	55.4	54.8	N/D	60.6	92.7	84	63.9
5	31.2	35.9	36	23.8	18.4	19.1	20.6	22.5	N/D	30.3	36.8	42.4	28.8
6	37.6	41.5	42.8	34.5	24	28.7	28.6	25.7	N/D	35.6	48.2	56.4	36.7
7	44	43.2	48.3	40.4	26.8	28.4	28.2	30.4	N/D	38.8	54.4	51.8	39.5
8	55.7	59	65.4	51.1	37.9	39.7	45.6	52	N/D	50.7	68.6	62.9	53.5
9	36.6	34.5	41.6	27.4	21.5	18.7	19.9	23.2	N/D	31.2	42	45	31
10	38.5	45.8	52.6	37.6	27.7	25.6	29.2	30.2	N/D	39.5	52.6	59.2	39.9
11	43.6	37.7	35.3	26.8	17.9	19.5	21.6	25.7	N/D	26.4	38.6	38.5	30.1
12	36.2	44.6	50.5	35.5	21.3	23.1	24.9	29.1	N/D	35.7	46.6	46.9	35.9
13	39.7	45.2	49.8	32.7	28.5	24.4	29	28.4	N/D	33	42.6	42.8	36
14	41	44.3	53	42.2	30	26.4	27.1	30.5	N/D	35.3	N/D	50.8	38.1
15	33	33.5	38.8	28.8	21	20.3	19	20.9	N/D	35.8	39.7	43.8	30.4
16	37.2	32.6	42.4	29.4	20.2	18.9	20	22.2	N/D	29.5	39.3	40.1	30.1
17	55.3	N/D	60.3	58.3	49.2	51.4	56.4	55.4	N/D	65.9	67	67.3	58.6
18	45.3	44.5	47.3	43.3	39.2	N/D	32.8	36.1	N/D	37.4	54.6	56.1	43.6
19	55.3	N/D	N/D	39.6	26.2	28.5	N/D	37.1	N/D	N/D	62.9	62.8	45.4
20	51.7	43.9	51.9	36.1	31.9	32.1	27.9	35	N/D	41.3	55.7	62.4	42.7
21	45.1	43.9	49.9	42.2	30.6	30.5	29.3	N/D	N/D	36.4	N/D	51.8	40
22	44.9	47.8	47.3	39.1	31.3	30	31.8	31.3	N/D	34.5	58.1	45.7	40.2
23	40.7	45.8	53.5	31.2	33.2	31.6	34.5	34.6	N/D	42.7	53	56.8	41.6
24	35	35.5	41.3	24.2	20.1	20.7	20	22.5	N/D	29.3	35.4	39.2	29.4
25	35.9	36.4	40.1	27.3	15.7	18.9	22.6	23.3	N/D	26.8	38.7	42.7	29.9
26	37.3	40.7	40.4	25.8	18.2	19.6	21.8	23.6	N/D	28	36.6	41.2	30.3
27	43	44.2	50.2	48.1	39.8	38.7	40.4	44.3	N/D	48.1	59.9	57.2	46.7
28	40.2	62.2	68.9	61.4	51.8	62.1	65.2	64.7	N/D	51.9	94.8	74.8	63.4
29	54.8	39.9	47.4	33.5	24.2	25.9	28.9	32.3	N/D	33.8	52.8	48	38.3
30	38	46.6	45.1	31.5	20.6	22.2	25.3	28.8	N/D	33.4	44.1	48.4	34.9

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average
31	36.3	49.2	50.8	36.3	30.1	29.4	33.2	33.1	N/D	37.7	48.8	49.2	39.5
32	41	52	53.6	31.5	23.8	22.4	24.3	26.7	N/D	43.7	51.4	55.1	38.7
33	34.6	41.2	45.4	28.6	18.1	24.9	26.3	24.8	N/D	33.3	48.7	46.4	33.8
34	39	51.9	55.9	34.7	30.3	31.9	35.5	37.8	N/D	43.7	59.5	56.4	43.3
35	38.4	N/D	42.9	26.1	21	20.5	22.8	21.9	N/D	28.9	43.8	44.8	31.1
36	50	34.4	67.8	48.8	37.7	31.8	36.4	28.6	N/D	52.1	58.9	64.1	46.4
37	N/D	N/D	57.3	55	36.9	35.6	40.5	34.6	N/D	45.4	66.7	61.3	48.1
38	39.6	48.1	58	37.9	25.8	29.6	36.2	33.2	N/D	39.8	59.5	59.7	42.5
39	44.8	46.9	46.2	40.8	24	30.6	35.5	29.4	N/D	38.7	55.9	49.5	40.2
40	32.5	41.5	43.4	30	22.3	21.1	21.4	22	N/D	32.5	39	42.7	31.7
41	41.2	52.4	50.6	43.1	32.5	21.1	35.6	30.9	N/D	39.1	47.4	58.4	41.1
42	39.9	44.9	47.3	39	23.7	30.5	35.2	38.2	N/D	39.1	58.1	50.2	40.6
43	45.6	51.1	54.7	44.3	31.1	36.3	38.4	35.8	N/D	44.1	66.6	64.3	46.6
44	52.7	59	N/D	45.4	33.6	32.5	29.3	23.2	N/D	57	56.9	60.1	45
45	39.1	42.2	42.3	35.7	25	28.1	31.2	27	N/D	36.7	49.8	51.7	37.2
46	42.9	36.5	44.9	32.5	28.2	21.8	23.6	16.6	N/D	32	46.9	44.7	33.7
47	42.4	37.2	44.8	27.2	21.4	19.2	20.5	N/D	N/D	31.9	34.9	41.9	32.1
48	39.9	38.3	43.1	28.7	19.6	21.3	24.4	22.3	N/D	34.7	39.9	45.5	32.5
49	45.8	41.2	N/D	29.3	21	18.3	24.3	21	N/D	31.2	34.8	43.7	31.1
50	54.8	57.1	61.9	48.5	35.6	42.9	47.9	39	N/D	53.2	N/D	72.6	51.4
51	71	73.3	79.5	66.4	70.4	57.6	65.3	52.7	N/D	62.4	82.7	84.4	69.6
52	48.4	43.6	56.7	46.4	71	40.7	37.9	38.6	N/D	39.7	58.8	58.5	49.1
53	48.4	48.1	51.3	37.2	71.4	121.5	32.2	28.1	N/D	39.1	49.3	50.9	52.5
54	45.4	39.2	50.2	34.9	52.9	26.4	30.6	23.3	N/D	37.9	48.9	54.1	40.3
55	50.6	44.9	50.7	25.5	24.1	29.9	32.1	22.6	N/D	38	50.2	52.7	38.3
56	60.6	68.6	64.6	56.5	35.9	28	56.1	40.1	N/D	42.8	70.5	73.2	54.3
57	N/D	41.8	62	N/D	57.8	43.1	42.7	N/D	N/D	44.7	67	64.6	50.9
58	50.8	45.2	54	44.1	58.9	40.1	37.5	27.6	N/D	43.6	N/D	61	46.3
59	78.6	107.3	90	40.9	58.2	29.9	74.8	62.2	N/D	88.4	113.1	115.5	78.1
60	84.4	86.6	101.1	82.3	58.4	73.7	78.1	69.2	N/D	71.5	111.5	119.1	85.1
61	51.1	77.6	98.3	86.5	63.1	74	81.1	71.9	N/D	80.6	112.8	111.3	82.6
62	49	75	77.3	57.6	30.7	43.9	43.8	34.5	N/D	59.8	N/D	68.3	54
63	36.7	44	47.4	35.5	33.3	21.1	27.4	22.9	N/D	34.3	45.8	46.1	35.9

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average
64	53.5	60.9	46.7	47.6	47.9	39	31	27.5	N/D	39.7	59.4	61.9	46.8
65	63.1	60	73.2	51.4	38.3	53.4	47.7	37.8	N/D	73.7	84.4	N/D	58.3
66	80.4	90.4	86.8	81.2	31.7	72.1	71.2	43.7	N/D	80.4	109.9	105.9	77.6
67	100.7	72.6	83.6	76.7	47.6	55.1	66.7	58.0	N/D	68.7	107.6	108.1	76.9
68	87.3	78.1	88.4	67.0	80.3	60.9	63.2	57.7	N/D	81.4	111.8	84.5	78.2
69	66.8	59	69	52.5	45.2	48.6	54.6	41.1	N/D	63.4	103.5	82.6	62.4
70	49.2	43	47	38.4	34	30.5	33.9	25.9	N/D	34.1	56.6	52.7	40.5
71	49.6	52.8	47.3	39.9	41.1	31.8	34.2	30.3	N/D	45	64	61.6	45.2
72	45.6	59.2	74	51.5	45.1	43.8	47.8	46.1	N/D	27.6	72.3	73.1	53.3
73	50.4	42.5	48.2	40.5	30	24.7	30.9	26.5	N/D	36.3	N/D	52.1	38.2
74	46.3	42.1	50.1	41.9	31	34.6	38.5	32	N/D	45	63.6	60	44.1
75	59.1	57.7	58.1	51.9	40.4	44.2	42.4	37.6	N/D	60.1	72.2	69.8	54
76	70.7	91.8	43	87.1	28.6	71.7	72.9	49	N/D	81.5	112.3	103.1	73.8
77	61.4	53.4	56.7	58.3	28.9	44	49.8	35.4	N/D	57.6	N/D	71.7	51.7
78	57	62.4	70.1	63.6	27.8	29.8	60.1	45.4	N/D	58.9	79.1	78.2	57.5
79	58.7	51.5	61.7	44.2	67.9	36.6	39.5	33.9	N/D	43.1	64.3	66.5	51.6
80	56.7	55.8	55.8	51.6	26.8	41.5	42.2	38.2	N/D	52.9	65.7	66.5	50.3
81	41.6	41.5	44.8	32.7	35.5	26.4	25.7	25.1	N/D	34.1	45.1	46.5	36.3
82	42.1	42.2	58	43.9	19.8	27.9	28.2	26.5	N/D	38.9	N/D	46.9	37.4
83	67.2	60.8	44.6	37.4	N/D	49.8	49.3	45.8	N/D	58.4	78.2	78.5	57
84	46.3	N/D	69.8	54.4	44	21.4	23	23	N/D	34.9	45.7	48.5	41.1
85	68.8	61,46	47.7	31	43.2	51	49.6	41.5	N/D	30.6	74.3	71.3	50.9
86	42.3	35.6	77.7	60.5	47.1	23.8	22	22.5	N/D	32.1	48.4	51.1	42.1
87	49	44	49.7	33	37.3	33.2	33.4	32	N/D	38	53.8	55.8	41.7
88	40.2	39.7	54.2	40.5	36.2	27.1	31	27.3	N/D	36.8	48.4	49.3	39.2
89	43.2	40.5	45.2	35	27.2	25.5	28.1	29.2	N/D	41.2	50.6	47.9	37.6
90	35.9	35.3	47	33.1	28	20.6	21.7	22	N/D	34.9	40.2	44.3	33
91	50.7	50.4	43.3	26.1	37.4	41	29.3	43	N/D	42.4	N/D	60.1	42.4
92	34.5	88.1	73.9	56	26.7	40.2	49.7	43.3	N/D	52.5	77.2	67.4	55.4
93	65.6	70.8	69.2	49.9	27.3	39.7	48.8	46.2	N/D	67.2	70.2	71.8	57
94	65.2	28.7	61	51.5	26.2	47.2	48.7	39.7	N/D	15.2	80.3	74.7	48.9
95	51.4	48.6	52.3	39.8	60.8	40.2	37.8	37.6	N/D	43.4	63.5	59.1	48.6
96	46.2	44.8	54.1	43.5	39	42.9	40.5	36	N/D	46.5	60.6	59.5	46.7

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average
97	45.7	43.2	49.2	36.4	50.4	29.6	29.7	30.7	N/D	41.5	49.1	56.1	42
98	52.7	50.6	46.7	39.2	28.3	24.6	32.7	30.8	N/D	45.8	49.2	53.3	41.3

Notes: N/D = No Data