London Borough of Ealing
Air Quality Annual Status Report for 2016
Date of publication: 04/05/2017

This report provides a detailed overview of air quality in Ealing during 2016. It has been produced to meet the requirements of the London Local Air Quality Management statutory process[1].

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[1] LLAQM Policy and Technical Guidance 2016 (LLAQM.TG(16)). https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/working-boroughs

CONTENTS

Tables

Figures

Abbreviations

AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AURN	Automatic Urban and Rural Network
BEB	Buildings Emission Benchmark
BID	Business Improvement District
CAB	Cleaner Air Borough
CAZ	Central Activity Zone
DPH	Director of Public Health
DsPH	Directors of Public Health
EV	Electric Vehicle
EBBID	Ealing Broadway Business Improvement District
FDMS	Filter Dynamics Measurement System
GLA	Greater London Authority
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LAQN	London Air Quality Network
LIP	Local Implementation Plan
LBE	London Borough of Ealing
LES	Low Emission Strategy
LLAQM	London Local Air Quality Management
MAQF	Mayor of London's Air Quality Fund
NRMM	Non-Road Mobile Machinery
PHE	Public Health England
PM_{10}	Particulate matter less than 10 micron in diameter
$PM_{2.5}$	Particulate matter less than 2.5 micron in diameter
RSD	Remote Sensing Detector
STARS	Sustainable Travel: Active Responsible Safe
TEB	Transport Emissions Benchmark
TEOM	Tapered Element Oscillating Microbalance
TfL	Transport for London
WRRR	Work Related Road Risk

Table A. Summary of National Air Quality Standards and Objectives

Pollutant	Objective (UK)	Averaging Period	Date[1]
Nitrogen dioxide - NO_2	200 $\mu g\ m^{-3}$ not to be exceeded more than 18 times a year	1-hour mean	31 Dec 2005
	40 $\mu g\ m^{-3}$	Annual mean	31 Dec 2005
Particles - PM_{10}	50 $\mu g\ m^{-3}$ not to be exceeded more than 35 times a year	24-hour mean	31 Dec 2004
	40 $\mu g\ m^{-3}$	Annual mean	31 Dec 2004
Particles - $PM_{2.5}$	25 $\mu g\ m^{-3}$	Annual mean	2020
	Target of 15% reduction in concentration at urban background locations	3 year mean	Between 2010 and 2020
Sulphur Dioxide (SO_2)	266 $\mu g\ m^{-3}$ not to be exceeded more than 35 times a year	15 minute mean	31 Dec 2005
	350 $\mu g\ m^{-3}$ not to be exceeded more than 24 times a year	1 hour mean	31 Dec 2004
	125 $\mu g\ m^{-3}$ mot to be exceeded more than 3 times a year	24 hour mean	31 Dec 2004

Note: [1]by which to be achieved by and maintained thereafter

1. Air Quality Monitoring

1.1 Locations

The London Borough of Ealing currently operates three automatic monitoring stations following the closure of the Ealing Southall Railway site during 2014 and Ealing Southall at the end of 2015. Of the three remaining monitoring stations two are roadside sites and one is classified as an industrial site. All sites were operated as part of the London Air Quality Network[2]. Two different analysers for PM_{10} are active at the Horn Lane monitoring station, a TEOM and a TEOM-FDMS. Consistent with the London Air Quality Network classification, data from the two instruments is reported as two separate stations (EA8 Horn Lane and EI8 Horn Lane TEOM). Details of the relevant Quality Assurance/Quality Control (QA/QC) procedures that were followed during the monitoring are provided in Appendix A.

Figure 1 and Table B provide details of the automatic monitoring sites located in the Borough. All of the currently operational monitoring sites measure NO_2 and PM_{10}.

[2] LAQN London Air Quality Network. Available online: www.londonair.org.uk. Accessed: 22/07/2016

Figure 1: Map of Automatic Monitoring Sites

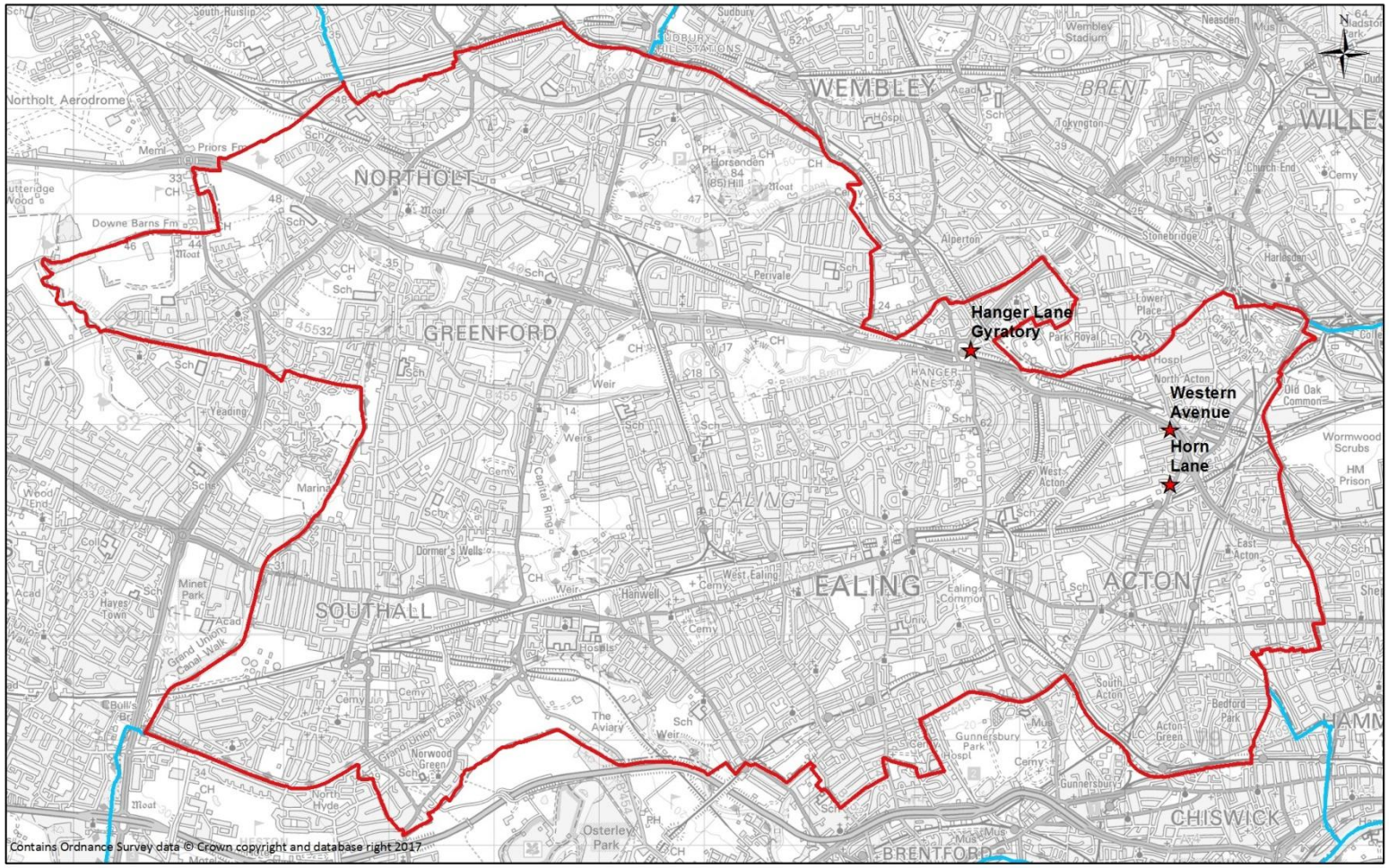


Table B. Details of Automatic Monitoring Sites Operational during 2016

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
EA6 Hanger Lane Gyratory	Hanger Lane Gyratory	518537	182708	Roadside	Y	4	3	2.0	NO_2, PM_{10}	Chemiluminescence, TEOM
EA8 Horn Lane	Horn Lane	520432	181428	Industrial	Y	8	2.5	1.8	NO_2, PM_{10}	Chemiluminescence, PM_{10} by FDMS
EI8 Horn Lane TEOM	Horn Lane	520432	181428	Industrial	Y	8	2.5	1.8	PM_{10}	TEOM
EI1 Western Avenue	Western Avenue	520430	181950	Roadside	Y	4	4	2.0	NO_2, PM_{10}	Chemiluminescence, TEOM

The London Borough of Ealing historically monitored annual mean nitrogen dioxide concentrations using passive diffusion tubes at 126 sites located throughout the Borough. This has since been reduced to 78 in 2016. There are three triplicate sites, co-located with the three automatic air quality monitoring stations.

Figure 2 and Table C provides details of the diffusion tube sites operated within the Borough during 2016. Changes to the diffusion tube network since 2015 include discontinuation of monitoring at 13 sites to focus on the worst locations of relevant exposure; installation of one new monitoring site; and the relocation of one site to ensure appropriate spatial coverage in relevant receptor locations.

The following sites have been closed:

- EA2 St David's Home, 12 Castlebar Hill, Ealing,W5 1TE
- EA12 255 Boston Road, Hanwell,W7 2AT
- EA15 Moot House, Ealing Hospital, Uxbridge Road, Southall, UB1 3HW
- EA19 22 Bulls Bridge Road, Southall, UB2 5LU
- EA23 1 Randolph Road,Southall,UB1 1BL
- EA33 Greenford High School, Lady Margaret Road, Southall, UB1 2GU
- EA47 53-61 St Pauls Close, Ealing,W5 3JX
- EA49 South Ealing Cemetery, Popes Lane, Ealing, W5 4NA
- EA53 Haven Green Court, Haven Green, Ealing, W5 2UZ
- EA88 Acton Care Centre, 48 Gunnersbury Lane, Acton,W3 8EG
- EA95 Electric Substation Building, Poulton Court, Victoria Road, Acton, W3 6EJ
- EA98 67-72 Seacole Close, Acton, W3 6TF

The following site has been newly set up:

- EA23 25 Lady Margaret Road, Southall, UB1 2RA

And the following site has been relocated:

- EA16 4 Minterne Avenue, Southall, UB2 4LL to EA13 2 St Marys Avenue South, Southall, UB2 4LS.

Note that site ID codes for a number of sites changed between 2015 and 2016. For ease of reference site ID codes for 2015 and 2016 are shown in Table C and Table D.

Figure 2: Map of Non-Automatic Monitoring Sites (2016 Site IDs)

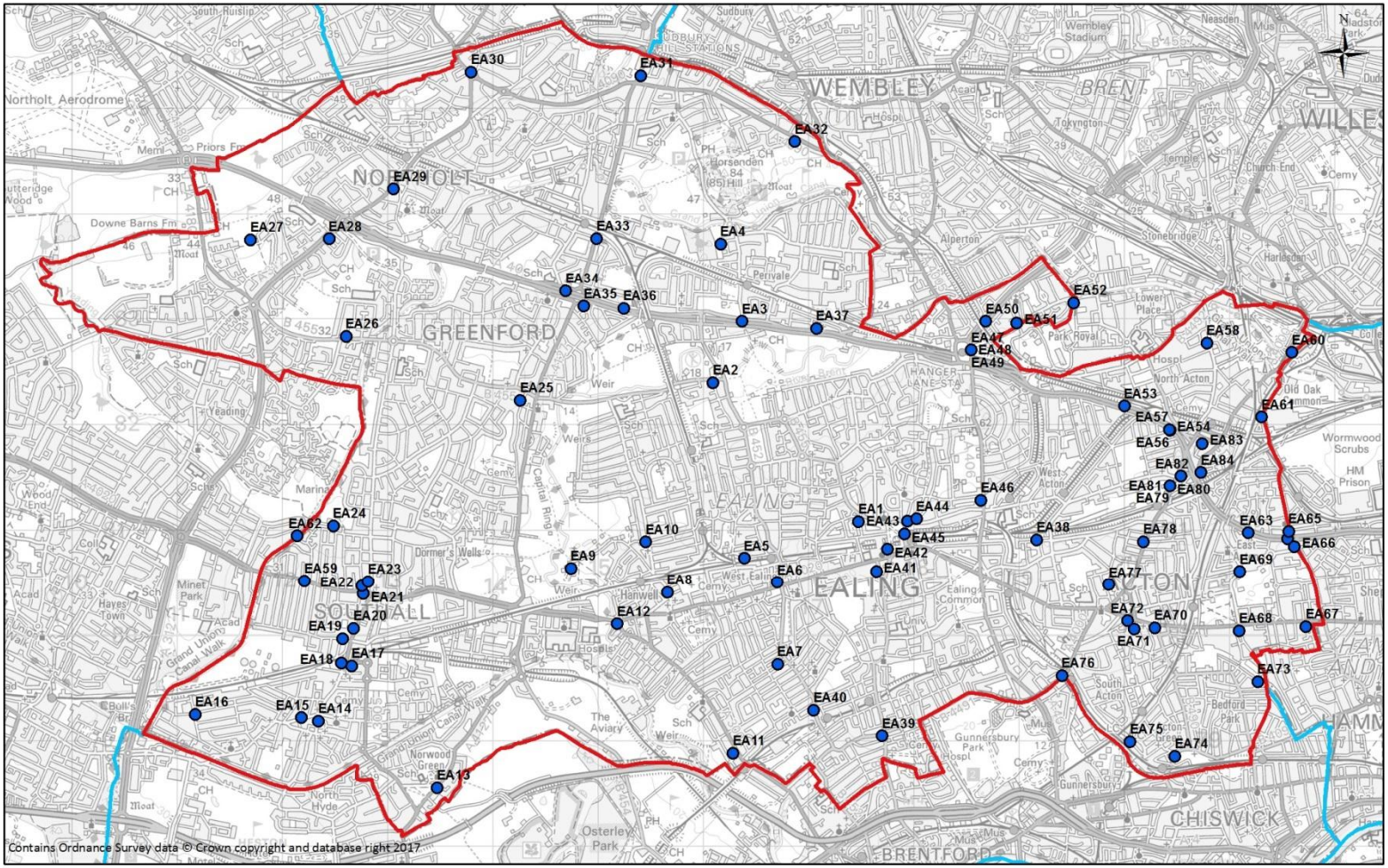


Table C. Details of Non-Automatic Monitoring Sites for 2016

Site ID (2015)	Site ID (2016)	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
EA01	EA01	31 Castlebar Road, Ealing,W5 2DJ	517472	181088	Roadside	Y	0 m	19.3	N/A	NO_2	N
EA03	EA02	1-4 Peal Gardens, West Ealing,W13 OBA	516089	182400	Roadside	Y	0 m	5	N/A	NO_2	N
EA04	EA03	2 Horsenden Lane South, Greenford, UB6 8AB	516368	182978	Roadside	Y	0 m	5	N/A	NO_2	N
EA05	EA04	1-11 Clover House, Gilbert White Close, Perivale, UB6 7FH	516163	183719	Background	Y	0 m	44.7	N/A	NO_2	N
EA06	EA05	41 Manor Road, West Ealing,W13 OJA	516387	180738	Roadside	Y	0 m	4	N/A	NO_2	N
EA07	EA06	1 Kirn Road, West Ealing, W13 0UB	516699	180509	Roadside	Y	0 m	2	N/A	NO_2	N
EA08	EA07	12 Balfour Road, West Ealing, W13 9TN	516703	179728	Roadside	Y	0 m	0.4	N/A	NO_2	N
EA09	EA08	40 Church Road, Hanwell, W7 1DL	515656	180415	Roadside	Y	0 m	5.3	N/A	NO_2	N
EA10	EA09	Brent Lodge Park, Church Road, Hanwell,W7 3BP	514740	180643	Background	Y	0 m	30	N/A	NO_2	N
EA11	EA10	74a Greenford Avenue, Hanwell, W7 3QS	515451	180894	Roadside	Y	0 m	5	N/A	NO_2	N
EA13	EA11	6 Boston Gardens, Boston Road, Hanwell, W7 2AN	516277	178882	Roadside	Y	0 m	10	N/A	NO_2	N
EA14	EA12	200 Uxbridge Road, Hanwell, W7 3TB	515180	180111	Roadside	Y	0 m	3.3	N/A	NO_2	N
EA16	EA13	2 St Marys Avenue South, Southall, UB2 4LS	513468	178553	Roadside	Y	0 m	12	N/A	NO_2	N
EA17	EA14	55 King Street, Southall, UB2 4DQ	512341	179186	Roadside	Y	0 m	3.3	N/A	NO_2	N
EA18	EA15	18 Western Road, Southall,UB2 5DU	512181	179219	Roadside	Y	0 m	7.5	N/A	NO_2	N

Site ID (2015)	Site ID (2016)	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
EA20	EA16	150 Brent Road, Southall, UB2 5LD	511170	179251	Roadside	Y	0 m	7.7	N/A	NO_2	N
EA21	EA17	2 Merrick Road, Southall, UB2 4AU	512657	179712	Roadside	Y	0 m	12	N/A	NO_2	N
EA22	EA18	Martin Court, Southbridge Way, Southall, UB2 4QW	512560	179739	Other	Y	0 m	30.5	N/A	NO_2	N
EA24	EA19	16 Beaconsfield Road, Southall, UB1 1DW	512570	179969	Roadside	Y	0 m	5.8	N/A	NO_2	N
EA28	EA20	Hambrough Primary School, South Road, Southall,UB1 1SF	512673	180069	Roadside	Y	0 m	10	N/A	NO_2	N
EA29	EA21	11 The Broadway, Southall, UB1 3PX	512768	180400	Roadside	Y	0 m	4	N/A	NO_2	N
EA30	EA22	3 Greenford Avenue, Southall, UB1 2AA	512753	180478	Roadside	Y	0 m	7	N/A	NO_2	N
New in 2016	EA23	25 Lady Margaret Road, Southall, UB1 2RA	512812	180516	Roadside	Y	0 m	6.3	N/A	NO_2	N
EA31	EA24	Clubhouse, Spike Bridges Park, West Avenue, Southall, UB1 2AR	512482	181047	Background	Y	N/A	N/A	N/A	NO_2	N
EA32	EA25	205 Windmill Lane, Greenford, UB6 9DW	514259	182234	Roadside	Y	0 m	8	N/A	NO_2	N
EA34	EA26	2 Shadwell Drive, Northolt, UB5 6DB	512603	182837	Roadside	Y	0 m	28.5	N/A	NO_2	N
EA35	EA27	32 Irving Avenue, Northolt, UB5 5LX	511698	183760	Background	Y	0 m	113	N/A	NO_2	N
EA36	EA28	213 Church Road, Northolt, UB5 5BE	512442	183769	Roadside	Y	0 m	12.4	N/A	NO_2	N
EA37	EA29	31 Mandeville Road, Northolt, UB5 5HF	513056	184241	Roadside	Y	0 m	9	N/A	NO_2	N
EA38	EA30	126 Petts Hill, Northolt, UB5 4NW	513794	185348	Roadside	Y	0 m	9	N/A	NO_2	N
EA39	EA31	1504 Greenford Road, Greenford, UB6 0HR	515402	185313	Roadside	Y	0 m	5.3	N/A	NO_2	N

Site ID (2015)	Site ID (2016)	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
EA40	EA32	79 Whitton Avenue East, Greenford, UB6 0QD	516867	184689	Roadside	Y	0 m	5	N/A	NO_2	N
EA41	EA33	914 Greenford Road,Greenford,UB6 8QN	514985	183770	Roadside	Y	0 m	3.3	N/A	NO_2	N
EA42	EA34	6 Karoline Gardens, Greenford, UB6 9JP	514691	183269	Roadside	Y	0 m	9.1	N/A	NO_2	N
EA43	EA35	12 Blenheim Close, Greenford, UB6 8ET	514863	183122	Roadside	Y	0 m	9.5	N/A	NO_2	N
EA44	EA36	19 Runnymede Gardens, Greenford,UB6 8SX	515240	183102	Roadside	Y	0 m	1.2	N/A	NO_2	N
EA45	EA37	4 Thirlmere Avenue, Perivale, UB6 8EF	517072	182912	Roadside	Y	0 m	46.5	N/A	NO_2	N
EA46	EA38	Oakley House, Oakley Avenue, Ealing, W5 3SB	519167	180915	Roadside	Y	0 m	20.5	N/A	NO_2	N
EA48	EA39	158 South Ealing Road, Ealing, W5 4QL	517694	179045	Roadside	Y	0 m	3.5	N/A	NO_2	N
EA50	EA40	213 Northfields Ave, West Ealing, W13 9QU	517045	179292	Roadside	Y	0 m	5.2	N/A	NO_2	N
EA51	EA41	12 Bond Street, Ealing, W5 5AP	517644	180613	Roadside	Y	0 m	2.7	N/A	NO_2	N
EA52	EA42	8 Spring Bridge Road,Ealing,W5 2AA	517745	180827	Roadside	Y	0 m	3	N/A	NO_2	N
EA54	EA43	27 Haven Green, Ealing,W5 2NZ	517940	181092	Roadside	Y	0 m	1	N/A	NO_2	N
EA55	EA44	21 Haven Lane, Ealing,W5 2HZ	518022	181114	Roadside	Y	0 m	2.4	N/A	NO_2	N
EA56	EA45	41-42 Haven Green, Ealing,W5 2NX	517909	180971	Roadside	Y	0 m	3	N/A	NO_2	N
EA57	EA46	64 Hanger Lane,Ealing,W5 2JH	518635	181288	Roadside	Y	0 m	0.7	N/A	NO_2	N
EA58	EA47	Fernlea House, Hanger Lane, Ealing,W5 1EF (AQMS) (Tri)	518541	182707	Roadside	Y	0 m	4	N/A	NO_2	Y
EA59	EA48	Fernlea House, Hanger Lane, Ealing,W5 1EF (AQMS) (Tri)	518541	182707	Roadside	Y	0 m	4	N/A	NO_2	Y

Site ID (2015)	Site ID (2016)	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
EA60	EA49	Fernlea House, Hanger Lane, Ealing,W5 1EF (AQMS) (Tri)	518541	182707	Roadside	Y	0 m	4	N/A	NO_2	Y
EA61	EA50	25 Waverley Gardens, Park Royal, NW10 7EX	518680	182979	Roadside	Y	0 m	1.8	N/A	NO_2	N
EA62	EA51	3 Iveagh Terrace, Park Royal,NW10 7SY	518976	182963	Roadside	Y	0 m	33	N/A	NO_2	N
EA63	EA52	Rainsford Court, Rainsford Road, Park Royal, NW10 7RJ	519515	183155	Roadside	Y	0 m	12.9	N/A	NO_2	N
EA64	EA53	Wendover Court, Western Avenue,Acton,W3 0TG-Grnd Floor	519997	182178	Roadside	Y	0 m	11	N/A	NO_2	N
EA65	EA54	322 & 324 Western Avenue, Acton, W3 OPL (AQMS) (Tri)	520430	181950	Roadside	Y	N/A	5	N/A	NO_2	Y
EA66	EA55	322 & 324 Western Avenue, Acton, W3 OPL (AQMS) (Tri)	520430	181950	Roadside	Y	N/A	5	N/A	NO_2	Y
EA67	EA56	322 & 324 Western Avenue, Acton, W3 OPL (AQMS) (Tri)	520430	181950	Roadside	Y	N/A	5	N/A	NO_2	Y
EA68	EA57	326 Western Avenue, Acton, W3 0PL	520426	181958	Roadside	Y	0 m	11.4	N/A	NO_2	N
EA69	EA58	94 North Acton Road, Park Royal, NW10 7AY	520780	182775	Roadside	Y	0 m	6	N/A	NO_2	N
EA70	EA59	1 Shaftesbury Gardens, Park Royal, NW10 6LJ	512206	180522	Roadside	Y	0 m	5	N/A	NO_2	N
EA71	EA60	39 Old Oak Lane, Park Royal, NW10 6EJ	521587	182684	Roadside	Y	0 m	5	N/A	NO_2	N
EA72	EA61	165 Wells House Road, Park Royal, NW10 6EA	521301	182076	Roadside	Y	0 m	5	N/A	NO_2	N
EA73	EA62	4 St Andrews Road, Acton,W3 7NE	512138	180953	Roadside	Y	0 m	8.6	N/A	NO_2	N
EA74	EA63	98 Western Avenue, Acton, W3 7TZ	521173	180981	Roadside	Y	0 m	10	N/A	NO_2	N

Site ID (2015)	Site ID (2016)	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
EA75	EA64	6 Western Avenue, Acton, W3 7UD	521549	180923	Roadside	Y	0 m	4.6	N/A	NO_2	N
EA76	EA65	71 Old Oak Common Lane (PO), Acton,W3 7DD	521557	180996	Roadside	Y	0 m	11	N/A	NO_2	N
EA77	EA66	205 Old Oak Road, Acton, W3 7HH	521614	180852	Roadside	Y	0 m	4.7	N/A	NO_2	N
EA78	EA67	17 The Vale, Acton, W3 7SH	521720	180084	Roadside	Y	0 m	19.4	N/A	NO_2	N
EA79	EA68	Warple Way, Acton, W3 0RH	521088	180046	Roadside	Y	0 m	2.2	N/A	NO_2	N
EA80	EA69	Old School House, East Acton Lane, Acton,W3 7HA	521093	180613	Roadside	Y	0 m	11.5	N/A	NO_2	N
EA81	EA70	88 High Street, Acton, W3 6QX	520285	180075	Roadside	Y	0 m	5	N/A	NO_2	N
EA82	EA71	15a Church Road, Acton, W3 8QE	520092	180063	Roadside	Y	0 m	10	N/A	NO_2	N
EA83	EA72	182 High Street, Acton, W3 9NN	520026	180141	Roadside	Y	0 m	4	N/A	NO_2	N
EA84	EA73	26 Hawkshead Road, Chiswick, W4 1AD	521264	179560	Background	Y	0 m	8	N/A	NO_2	N
EA85	EA74	44 Acton Lane, Chiswick, W4 5ED	520480	178854	Roadside	Y	0 m	5	N/A	NO_2	N
EA86	EA75	90 Bollo Lane, Chiswick, W4 5LX	520050	178991	Roadside	Y	0 m	5	N/A	NO_2	N
EA87	EA76	122 Gunnersbury Lane, Acton, W3 9BA	519404	179620	Roadside	Y	0 m	8.9	N/A	NO_2	N
EA89	EA77	15 Lantry Court, Lexden Road, Acton, W3 9PE	519849	180485	Background	Y	0 m	N/A	N/A	NO_2	N
EA90	EA78	156 Horn Lane, Acton, W3 6PH	520180	180896	Roadside	Y	0 m	6	N/A	NO_2	N
EA91	EA79	317 Horn Lane, Acton,W3 0BU (AQMS) (Tri)	520432	181428	Roadside	Y	N/A	3	N/A	NO_2	Y
EA92	EA80	317 Horn Lane, Acton,W3 0BU (AQMS) (Tri)	520432	181428	Roadside	Y	N/A	3	N/A	NO_2	Y
EA93	EA81	317 Horn Lane, Acton,W3 0BU (AQMS) (Tri)	520432	181428	Roadside	Y	N/A	3	N/A	NO_2	Y

Site ID (2015)	Site ID (2016)	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
EA94	EA82	5 Leamington Park, Acton, W3 6TJ	520532	181517	Roadside	Y	0 m	11	N/A	NO_2	N
EA96	EA83	Lyra Court, Portal Way, Acton, W3 6DB	520739	181824	Roadside	Y	Lamppost	5	N/A	NO_2	N
EA97	EA84	36 Wales Farm Road, Acton, W3 6UE	520724	181552	Roadside	Y	0 m	5	N/A	NO_2	N

1.2 Comparison of Monitoring Results with AQOs

Currently, the London Borough of Ealing operates a network of 84 diffusion tubes across 78 sites (including 3 triplicate sites co-located with continuous analysers). The diffusion tubes are prepared and analysed by Environmental Scientifics Group (using the 20% Triethanolamine (TEA) in water 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 good with all diffusion tubes recording a data capture of 9 months (i.e. 75% of the calendar year) or greater.

EA7 Ealing Southall was closed at the end of 2015, so currently there are three automatic monitoring stations in operation, which measure NO_2: Hanger Lane Gyratory (EA6), Horn Lane (EA8) and Western Avenue (EI1).

The annual mean NO_2 results from the automatic monitoring stations and diffusion tube locations for the last seven years are shown in Table D. Data capture was generally good in 2016, with all three automatic monitoring stations achieving 85% or above. All of the diffusion tube monitoring locations had at least 9 months of valid data for 2015 (i.e. 75% data capture or greater).

Exceedances of the 40 $\mu g.m^{-3}$ annual mean objective were observed at all three continuous monitoring stations (Hanger Lane Gyratory, Horn Lane and Western Avenue) in all years between 2010 and 2016. The highest annual mean concentration in 2016 (76 $\mu g.m^{-3}$) was recorded at the Hanger Lane Gyratory site. In total, 38 diffusion tubes at 32 locations recorded concentrations greater than the 40 $\mu g.m^{-3}$ air quality objective in 2016. Of these 38 tubes exceeding the annual mean air quality objective, 9 tubes at 6 locations recorded concentrations above 60 $\mu g.m^{-3}$. Concentrations greater than 60 $\mu g.m^{-3}$ indicate the likelihood of the 1-hour NO_2 objective (200 $\mu g.m^{-3}$, not to be exceeded more than 18 times per year) being exceeded.

The maximum recorded NO_2 concentration in 2016 was 75.6 $\mu g.m^{-3}$ at site EA64 at 6 Western Avenue, Acton. This location has recorded concentrations of 69 $\mu g.m^{-3}$ and above in each of the last seven years.

Table D. Annual Mean NO_2 Ratified and Bias-adjusted Monitoring Results ($\mu g\ m^{-3}$)

Site ID (2015)	Site ID (2016)	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Annual Mean Concentration ($\mu g.m^{-3}$)						
					2010 [c]	2011 [c]	2012 [c]	2013 [c]	2014 [c]	2015 [c]	2016 [c]
EA6 Hanger Lane Gyratory		Automatic	97%	97%	91.5	79.2	95.0	74.3	70.8	85	76
EA8 Horn Lane		Automatic	97%	97%	54.2	58.1	53.4	56.6	47.6	48	48
EI1 Western Avenue		Automatic	88%	88%	67.7	61.7	69.8	63.9	65.7	60.3	60.1
EA01 [e]	EA01	Diffusion tube	100%	100%	57.3	38.1	36.8	30.8	30.7	30.2	31.6
EA03	EA02	Diffusion tube	100%	100%	39.1	38.8	36.0	31.1	31.6	34.0	32.6
EA04	EA03	Diffusion tube	100%	100%	60.1	61.9	61.4	53.1	61.7	64.3	61.0
EA05	EA04	Diffusion tube	100%	100%	N/A	N/A	N/A	N/A	21.7	23.3	22.8
EA06 [f]	EA05	Diffusion tube	100%	100%	39.9	35.1	35.2	29.6	29.4	30.9	31.6
EA07	EA06	Diffusion tube	92%	92%	57.9	52.1	51.4	46.8	48.9	50.1	47.9
EA08 [g]	EA07	Diffusion tube	100%	100%	35.9	29.3	29.8	26.9	26.1	26.2	25.6
EA09 [h]	EA08	Diffusion tube	100%	100%	41.9	36.0	38.3	30.1	28.1	35.4	36.4
EA10	EA09	Diffusion tube	100%	100%	29.4	27.2	28.9	23.5	23.5	24.7	23.8
EA11	EA10	Diffusion tube	100%	100%	N/A	N/A	N/A	36.5	37.4	36.4	36.2
EA13	EA11	Diffusion tube	92%	92%	39.5	37.1	36.5	33.1	32.4	33.5	34.2
EA14	EA12	Diffusion tube	100%	100%	N/A	N/A	N/A	52.6	54.5	49.5	49.8
EA16	EA13 [i]	Diffusion tube	100%	100%	42.8	30.2	28.9	25.1	25.0	25.6	31.9
EA17	EA14	Diffusion tube	100%	100%	N/A	63.3	56.3	47.3	47.9	48.6	48.9
EA18	EA15	Diffusion tube	100%	100%	N/A	38.6	41.9	36.4	36.3	36.7	36.6
EA20	EA16	Diffusion tube	100%	100%	N/A	42.8	41.0	37.6	39.5	40.3	38.5
EA21	EA17	Diffusion tube	100%	100%	45.7	43.1	38.4	32.6	30.5	31.9	33.4

[e] Location changed in 2011.
[f] Location changed in 2011.
[g] Kerbside prior to 2011.
[h] Location changed in 2015.
[i] Location changed in 2016.

Site ID (2015)	Site ID (2016)	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Annual Mean Concentration (μg.m^{-3})						
					2010 [c]	2011 [c]	2012 [c]	2013 [c]	2014 [c]	2015 [c]	2016 [c]
EA22	EA18	Diffusion tube	100%	100%	N/A	42.3	38.6	33.2	34.1	35.1	36.7
EA24	EA19	Diffusion tube	100%	100%	N/A	N/A	N/A	39.6	37.6	36.8	36.3
EA28	EA20	Diffusion tube	100%	100%	53.7	47.2	44.9	41.1	39.2	37.1	39.3
EA29	EA21	Diffusion tube	100%	100%	66.4	69.3	60.9	55.2	54.2	53.5	52.7
EA30	EA22	Diffusion tube	100%	100%	39.2	38.8	36.8	29.2	30.7	32.6	34.9
New in 2016	EA23	Diffusion tube	100%	100%	N/A	N/A	N/A	N/A	N/A	N/A	48.0
EA31	EA24	Diffusion tube	75%	75%	N/A	N/A	N/A	30.4	21.7	25.0	25.7
EA32	EA25	Diffusion tube	100%	100%	44.3	40.9	37.9	33.2	33.7	34.2	35.5
EA34[j]	EA26	Diffusion tube	100%	100%	42.1	32.9	32.5	27.8	28.7	28.2	28.5
EA35	EA27	Diffusion tube	100%	100%	N/A	N/A	29.9	22.6	23.8	24.8	24.1
EA36	EA28	Diffusion tube	100%	100%	N/A	45.3	44.6	42.1	41.7	42.5	42.5
EA37	EA29	Diffusion tube	100%	100%	N/A	N/A	46.2	40.2	39.6	42.5	40.0
EA38	EA30	Diffusion tube	100%	100%	42.3	40.1	40.8	32.5	35.6	37.5	37.3
EA39[k]	EA31	Diffusion tube	92%	92%	52.0	39.5	38.6	33.5	34.4	34.5	33.9
EA40	EA32	Diffusion tube	100%	100%	44.1	30.3	30.4	26.1	26.3	26.8	27.1
EA41	EA33	Diffusion tube	100%	100%	43.2	41.8	39.5	36.5	39.1	40.6	39.3
EA42	EA34	Diffusion tube	92%	92%	N/A	N/A	N/A	42.2	47.5	48.8	42.2
EA43	EA35	Diffusion tube	100%	100%	48.3	39.9	43.2	38.6	36.6	39.4	39.0
EA44[l]	EA36	Diffusion tube	92%	92%	79.3	43.3	44.7	39.4	41.2	41.9	39.1
EA45	EA37	Diffusion tube	100%	100%	41.4	38.5	35.7	31.0	32.1	31.3	31.1
EA46	EA38	Diffusion tube	100%	100%	N/A	33.6	32.3	28.6	26.3	27.6	29.5
EA48	EA39	Diffusion tube	92%	92%	N/A	N/A	N/A	57.3	60.3	62.4	62.1
EA50	EA40	Diffusion tube	100%	100%	N/A	N/A	N/A	37.9	34.6	35.4	36.6
EA51	EA41	Diffusion tube	100%	100%	54.3	57.0	49.3	50.7	47.3	49.0	48.6

[j] Kerbside during 2009 and 2010 and then near-road on building façade from 2011.
[k] Location changed in 2011.
[l] Kerbside during 2009 and 2010 and then roadside from 2011.

Site ID (2015)	Site ID (2016)	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Annual Mean Concentration (μg.m^{-3})						
					2010 [c]	2011 [c]	2012 [c]	2013 [c]	2014 [c]	2015 [c]	2016 [c]
EA52	EA42	Diffusion tube	92%	92%	68.2	71.8	66.8	61.4	61.3	62.3	61.9
EA54[m]	EA43	Diffusion tube	100%	100%	42.7	39.6	38.7	32.5	33.0	32.6	33.6
EA55	EA44	Diffusion tube	100%	100%	40.1	41.4	36.8	33.8	32.4	35.2	35.4
EA56	EA45	Diffusion tube	100%	100%	N/A	60.8	52.1	48.4	51.4	49.4	48.0
EA57	EA46	Diffusion tube	100%	100%	N/A	42.7	44.4	38.7	39.4	38.4	39.5
EA58	EA47	Diffusion tube	100%	100%	77.9	77.1	75.0	75.1	79.6	80.3	71.5
EA59	EA48	Triplicate Diffusion tube	100%	100%	78.6	80.6	81.7	74.3	81.6	79.1	74.8
EA60	EA49	Triplicate Diffusion tube	100%	100%	76.1	78.5	79.3	74.7	79.6	79.6	73.4
EA61	EA50	Triplicate Diffusion tube	100%	100%	49.6	54.9	51.8	49.7	50.0	52.6	49.8
EA62[n]	EA51	Diffusion tube	100%	100%	49.5	44.5	45.0	40.6	40.9	41.1	39.6
EA63	EA52	Diffusion tube	100%	100%	N/A	N/A	N/A	N/A	34.4	34.5	33.6
EA64	EA53	Diffusion tube	100%	100%	67.4	38.9	56.0	59.3	56.0	56.4	55.7
EA65	EA54	Triplicate Diffusion tube	100%	100%	72.4	77.8	73.8	68.2	70.5	69.9	62.1
EA66	EA55	Triplicate Diffusion tube	100%	100%	67.9	72.8	75.1	66.7	70.0	68.1	57.7
EA67	EA56	Triplicate Diffusion tube	100%	100%	73.1	73.5	74.5	67.6	70.6	68.8	60.9
EA68	EA57	Diffusion tube	100%	100%	62.6	62.5	59.9	57.3	55.6	58.1	52.1
EA69	EA58	Diffusion tube	100%	100%	42.9	39.8	38.9	34.2	35.5	38.0	38.1
EA70	EA59	Diffusion tube	100%	100%	N/A	42.1	43.4	37.8	36.5	40.2	37.7
EA71	EA60	Diffusion tube	100%	100%	56.7	54.1	51.1	50.5	53.0	54.4	49.6
EA72[o]	EA61	Diffusion tube	100%	100%	43.4	39.9	36.7	39.8	41.3	45.7	40.5
EA73	EA62	Diffusion tube	100%	100%	50.7	43.4	42.3	35.8	40.2	40.0	38.1
EA74	EA63	Diffusion tube	100%	100%	57.1	51.4	51.8	48.2	50.8	49.8	49.9
EA75	EA64	Diffusion tube	100%	100%	79.8	70.4	70.8	69.2	77.4	82.5	75.3
EA76	EA65	Diffusion tube	100%	100%	56.5	53.2	49.6	48.1	47.8	49.4	49.2

[m] Kerbside until 2011.
[n] Roadside in 2009 and 2010 and on façade from 2011.
[o] Changed from 27 Wells House Road in 2014.

Site ID (2015)	Site ID (2016)	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Annual Mean Concentration (µg.m^{-3})						
					2010 [c]	2011 [c]	2012 [c]	2013 [c]	2014 [c]	2015 [c]	2016 [c]
EA77	EA66	Diffusion tube	100%	100%	76.9	59.7	55.2	58.6	57.4	60.7	58.9
EA78	EA67	Diffusion tube	100%	100%	N/A	50.1	49.5	44.3	40.3	41.4	40.9
EA79	EA68	Diffusion tube	100%	100%	N/A	N/A	N/A	43.1	39.8	38.2	39.4
EA80	EA69	Diffusion tube	92%	92%	37.8	40.4	35.9	29.5	31.9	30.4	31.1
EA81	EA70	Diffusion tube	100%	100%	N/A	N/A	54.7	56.2	56.9	55.5	56.0
EA82[p]	EA71	Diffusion tube	100%	100%	39.6	32.9	39.5	30.6	36.4	33.7	35.1
EA83	EA72	Diffusion tube	100%	100%	64.9	67.4	48.9	59.0	53.9	55.8	54.7
EA84	EA73	Diffusion tube	100%	100%	N/A	N/A	N/A	27.7	26.4	26.1	27.0
EA85	EA74	Diffusion tube	100%	100%	57.2	41.8	40.1	38.4	38.0	41.1	37.8
EA86	EA75	Diffusion tube	100%	100%	N/A	N/A	N/A	N/A	33.5	35.2	34.9
EA87	EA76	Diffusion tube	100%	100%	51.1	38.1	37.6	33.5	33.4	32.2	33.1
EA89[q]	EA77	Diffusion tube	100%	100%	33.4	30.5	31.7	26.9	25.9	25.9	26.2
EA90	EA78	Diffusion tube	100%	100%	49.4	46.6	40.7	42.2	42.3	42.2	43.1
EA91	EA79	Triplicate Diffusion tube	100%	100%	59.6	59.6	54.7	51.8	48.2	52.3	51.0
EA92	EA80	Triplicate Diffusion tube	92%	92%	57.1	56.8	47.0	50.1	50.7	51.6	51.1
EA93	EA81	Triplicate Diffusion tube	100%	100%	58.6	54.0	53.2	51.5	46.4	52.2	50.4
EA94	EA82	Diffusion tube	100%	100%	47.5	48.6	46.6	41.9	40.9	43.7	43.7
EA96	EA83	Diffusion tube	100%	100%	N/A	N/A	N/A	N/A	43.1	47.8	47.5
EA97[r]	EA84	Diffusion tube	100%	100%	52.9	48.5	44.8	44.7	43.2	45.6	43.9

Notes: Exceedance of the NO_2 annual mean AQO of 40 µg.m^{-3} are shown in bold. N/A = no result available.

NO_2 annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in bold and underlined.

[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%.

[p] Changed from 35-61 Church Road in 2014.

[q] Changed location in 2010.

[r] Changed locations.

Figure 3 shows the trends in NO_2 concentrations at automatic monitoring sites in the Borough for the 2009 – 2016 period, whilst Figure 4 to Figure 9 show the trends in NO_2 concentrations for the same period at non-automatic monitoring sites grouped by monitoring site type: urban background and roadside sites.

At the automatic monitoring sites (Figure 3) there is evidence of small reductions in NO_2 concentrations between 2009 and 2016, although there is significant variability from year to year. At Horn Lane, concentrations of NO_2 have remained steady since 2014, whilst at Western Avenue concentrations appear to have levelled off since 2015. Larger year-to-year variations in NO_2 concentrations have been observed at the Hangar Lane Gyratory monitoring station, although concentrations over the time period 2009 to 2016 have decreased.

At urban background diffusion tube sites (Figure 4), there is evidence of a slight decrease in NO_2 concentrations between 2009 and 2013, followed by stable concentrations between 2013 and 2016 (Thirlmere Avenue - Perivale, South Ealing Cemetery, Brent Lodge Park, Greenford High School and Castlebar Hill – Ealing diffusion tube sites). For the majority of roadside sites (Figure 5 to Figure 9) the reductions in NO_2 concentrations between 2009 and 2013 are smaller than the apparent downward trend of the urban background sites. Between 2013 and 2016 NO_2 concentrations at roadside locations have remained stable or have increased slightly.

Figure 3: Annual mean NO_2 concentrations at Automatic Monitoring sites

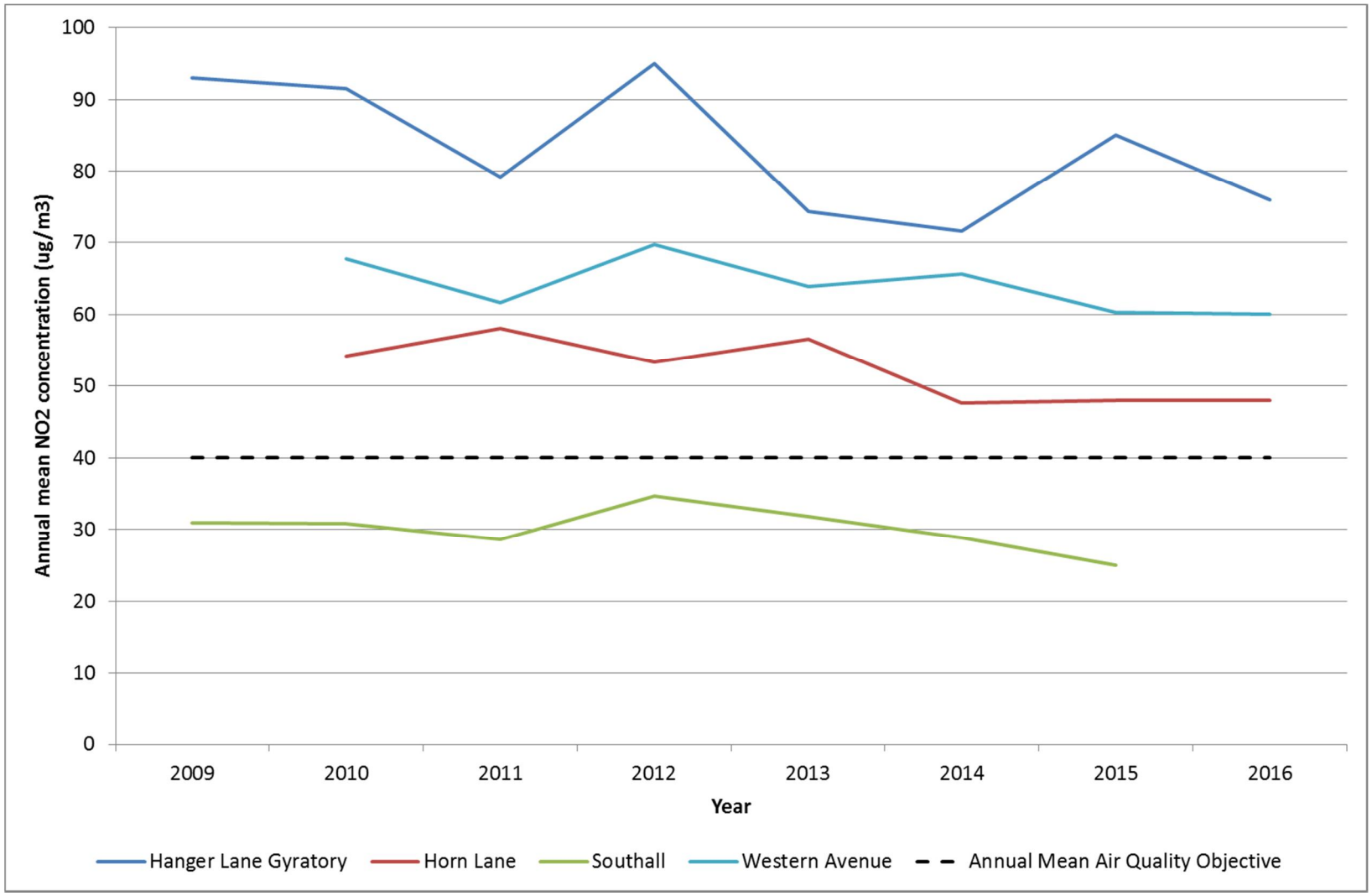


Figure 4: Annual mean NO_2 concentrations at Urban Background sites

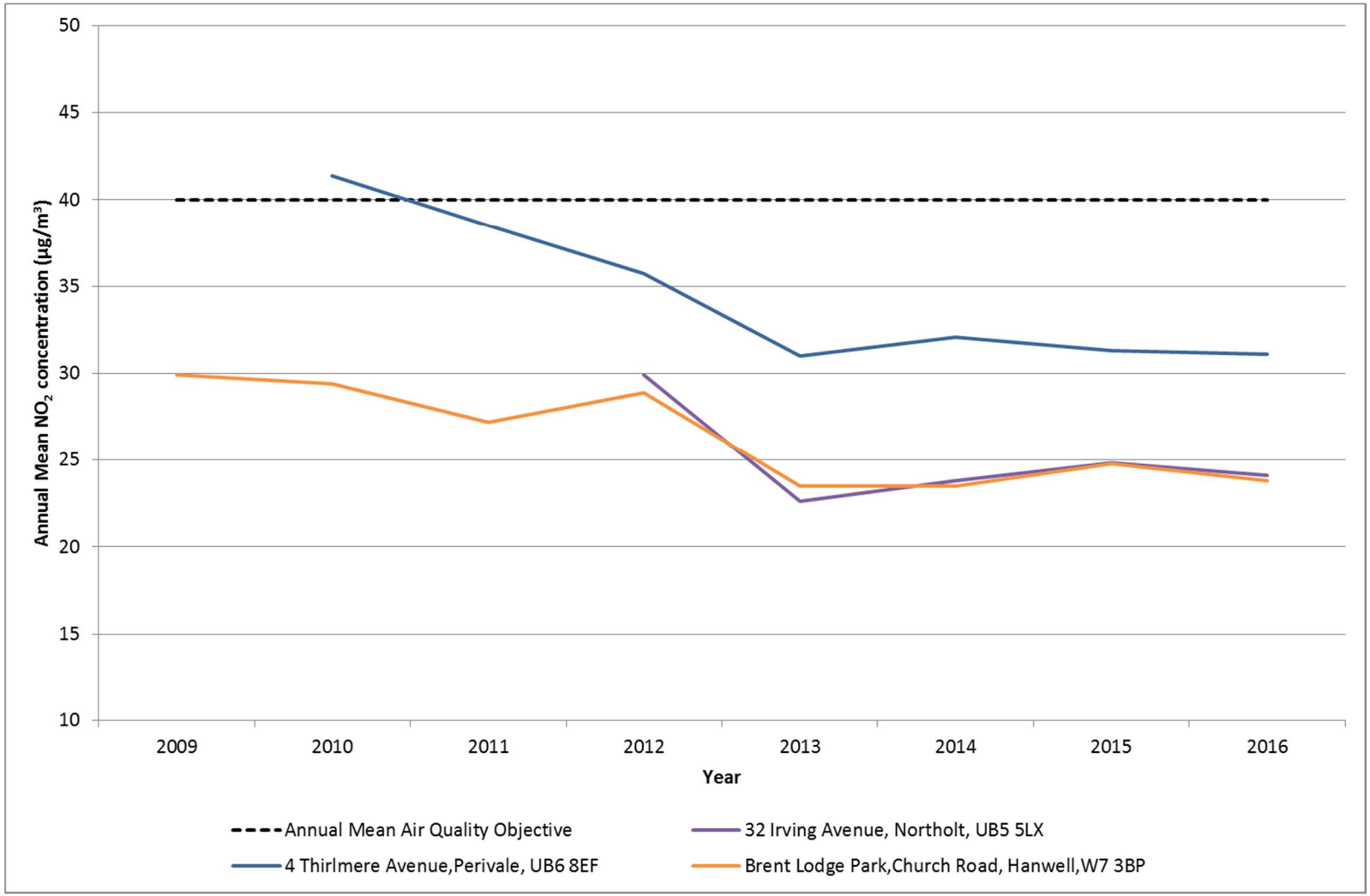


Figure 5: Annual mean NO_2 concentrations at Roadside sites (1)

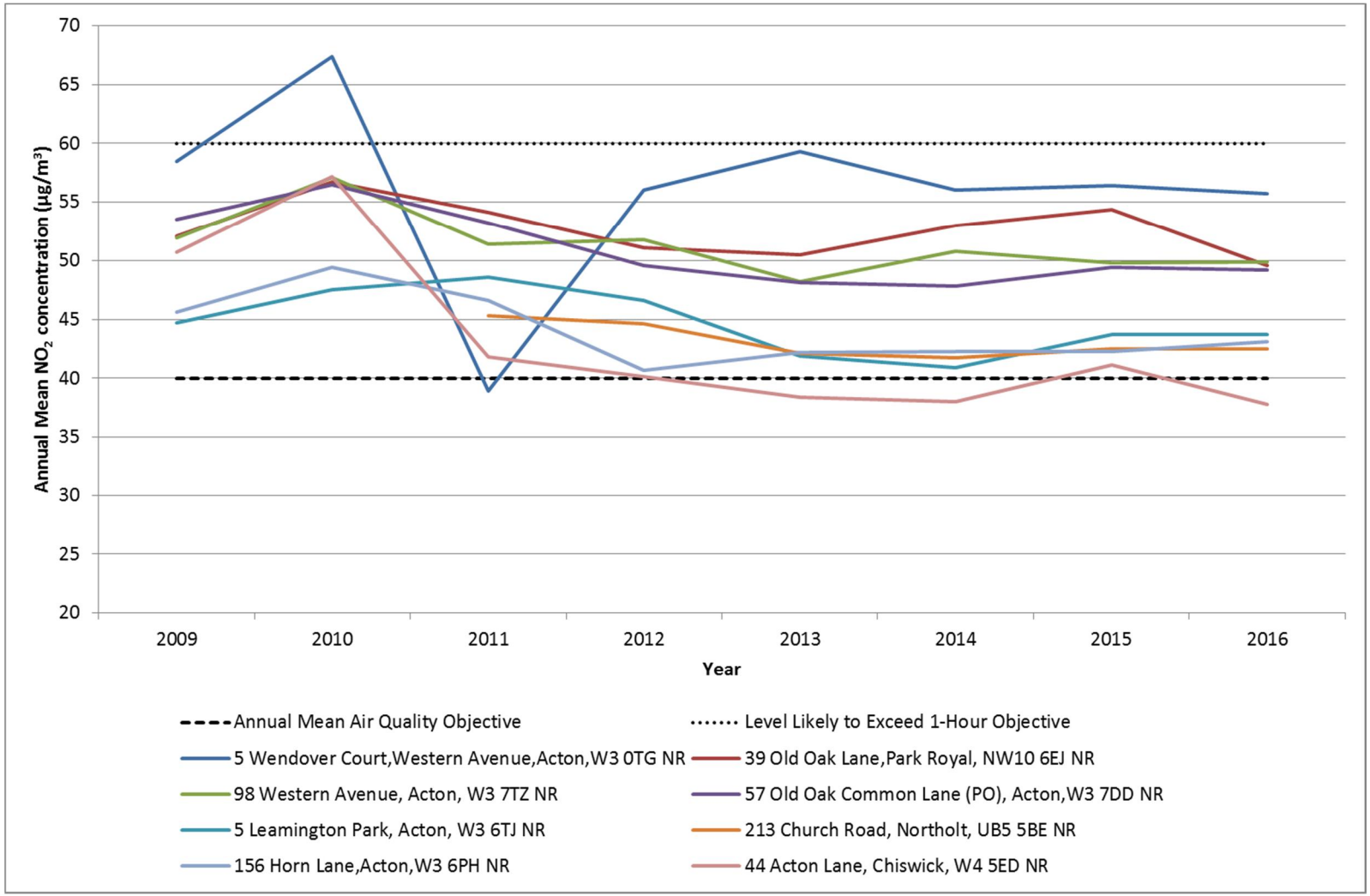


Figure 6: Annual mean NO_2 concentrations at Roadside sites (2)

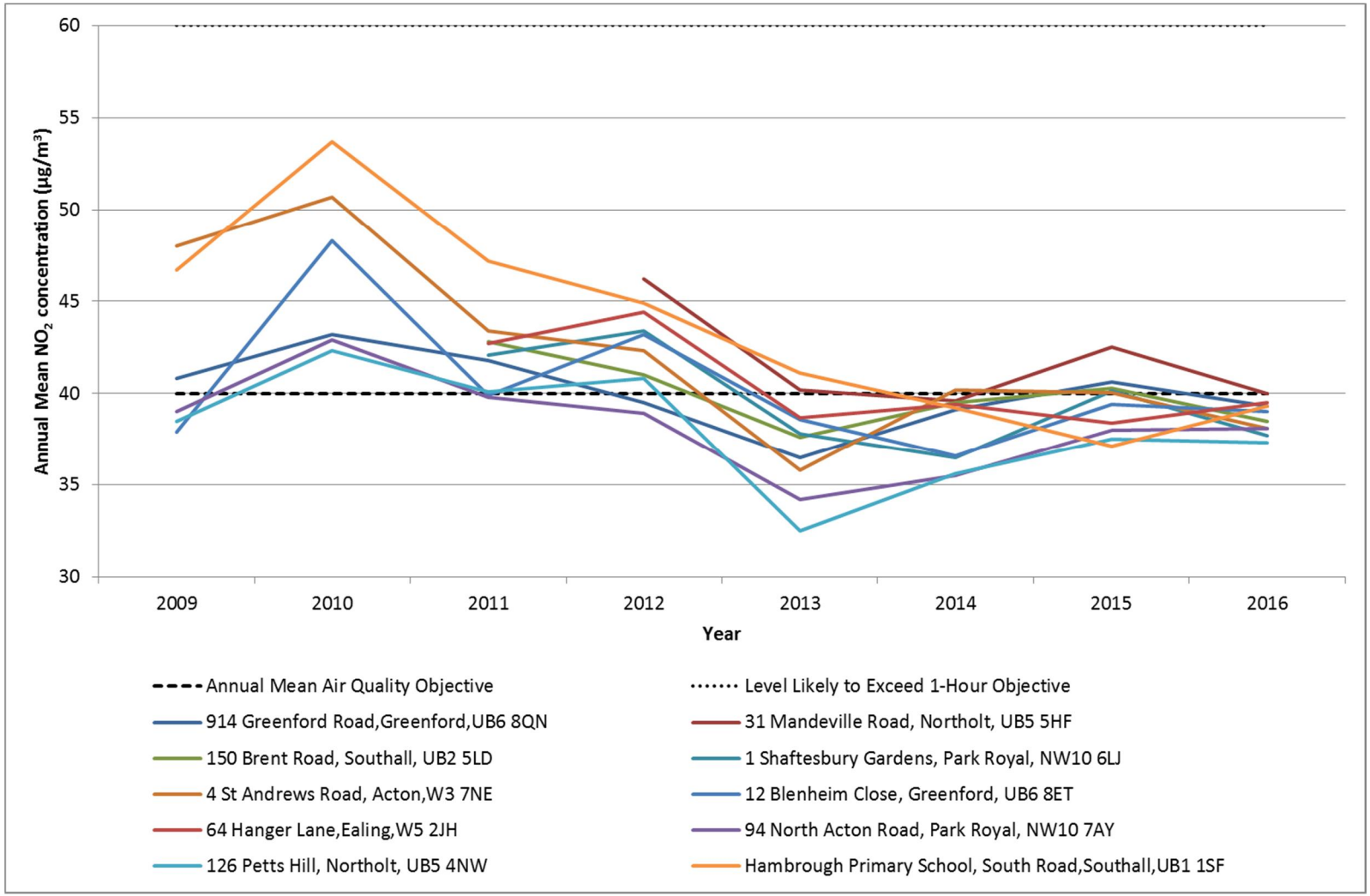


Figure 7: Annual mean NO_2 concentrations at Roadside sites (3)

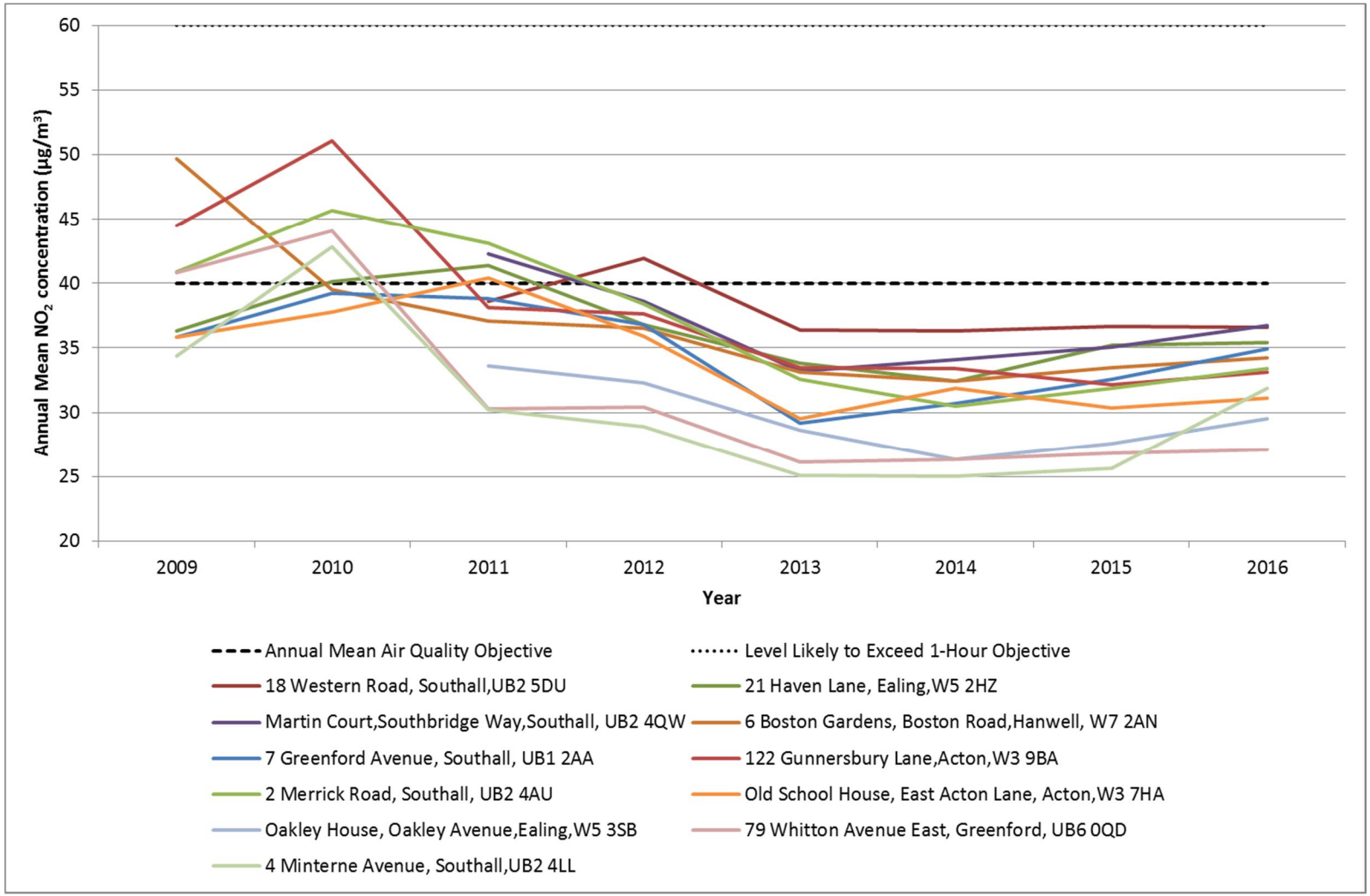


Figure 8: Annual mean NO_2 concentrations at Roadside sites (4)

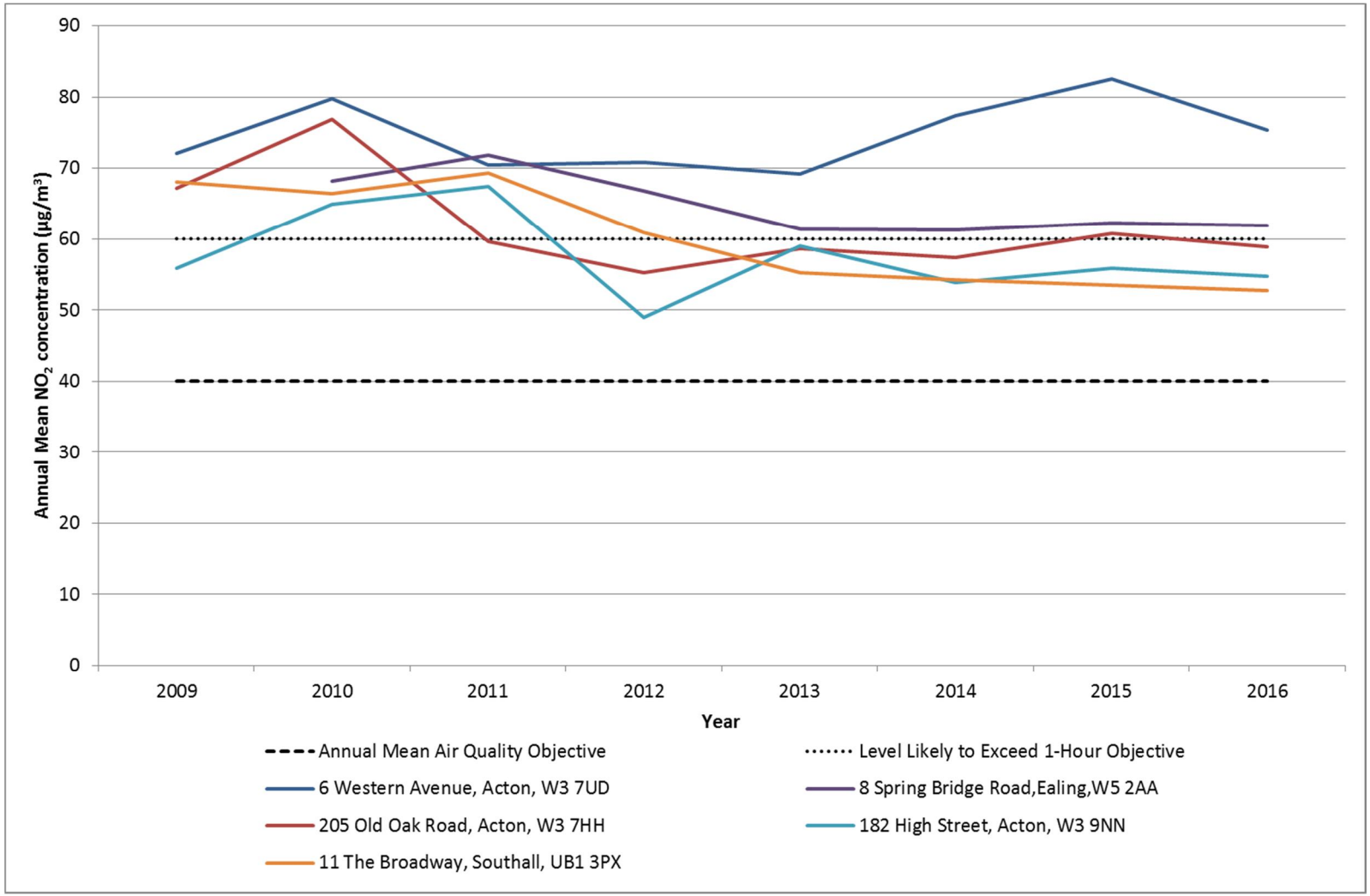


Figure 9: Annual mean NO_2 concentrations at Roadside sites (5)

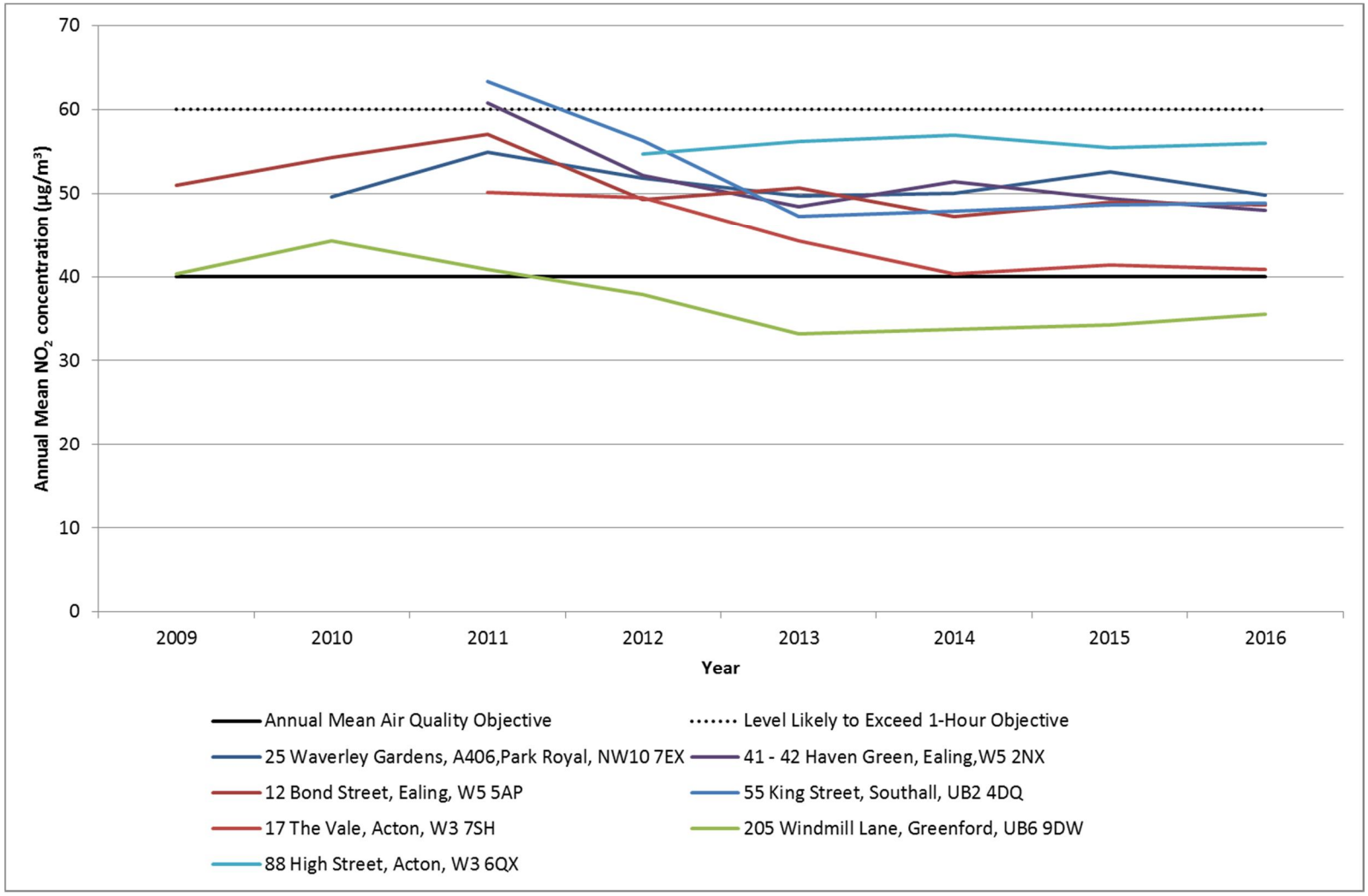


Table E. NO_2 Automatic Monitor Results: Comparison with 1-hour Mean Objective

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Number of Hourly Means > 200 µg.m^{-3}						
			2010 [c]	2011 [c]	2012 [c]	2013 [c]	2014 [c]	2015 [c]	2016 [c]
EA6 Hanger Lane Gyratory	97%	97%	134 (231)	66	173	56	17 (205)	98	45
EA8 Horn Lane	97%	97%	0 (138)	14 (192)	2	0 (152)	0	3	1
EI1 Western Avenue	88%	88%	9 (185)	2 (168)	10	17 (202)	17	2 (179)	22

Notes: Exceedance of the NO_2 short term AQO of 200 µg.m^{-3} over the permitted 18 days per year are shown in bold. N/A = no result available.
[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year
[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)
[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Table E shows the 1-hour NO_2 monitoring results for 2010 to 2016. Monitored hourly mean NO_2 concentrations at the Hanger Lane Gyratory site in 2016 exceeded the 1-hour NO_2 air quality objective, with 45 hours exceeding 200 µg.m^{-3}. The Hanger Lane monitoring site exceeded the 1-hour NO_2 objective in all years between 2010 and 2016.

The Western Avenue site exceeded the 1 hour NO_2 standard in 2016, with 22 hours of NO_2 concentrations greater than 200 µg.m^{-3}. The 1-hour NO_2 air quality objective was also exceeded at Western Avenue in 2013 on the basis of the 99.8th percentile of hourly mean NO_2 concentrations.

The monitoring station at Horn Lane recorded one exceedance of the 1-hour standard, well below the 18 hours permitted on a yearly basis. This result is consistent with recent years.

PM_{10} concentrations are currently measured at all three continuous monitoring locations in the London Borough of Ealing. TEOMs are used to monitor PM_{10} at all sites. The Horn Lane station is equipped with both TEOM and TEOM-FDMS analysers for PM_{10} monitoring and results from both are presented separately. The annual mean PM_{10} results are shown in Table F and the 24-hour mean PM_{10} results are presented in Table G.

Data capture in 2016 was good (i.e. >85%) at all locations.

Annual mean PM_{10} concentrations in 2016 at all sites were found to achieve the annual mean objective of 40 µg.m^{-3}. The annual mean objective has been achieved at all automatic monitoring locations in the Borough since 2011. The highest annual mean PM_{10} concentration in 2016 was recorded at Western Avenue (30 µg.m^{-3}).

Table F. Annual Mean PM_{10} Automatic Monitoring Results (µg.m^{-3})

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Annual Mean Concentration (µg.m^{-3})						
			2010 [c]	2011 [c]	2012 [c]	2013 [c]	2014 [c]	2015 [c]	2016 [c]
EA6 Hanger Lane Gyratory	90%	90%	N/A	30.8	29	30	26	25	24
EA8 Horn Lane	89%	89%	N/A	N/A	N/A	N/A	31.1	30.5	28
EI8 Horn Lane TEOM	97%	97%	42	36	34	38	34	27	26
EI1 Western Avenue	96%	96%	N/A	31.2	30.4	31.1	28	29	30

Notes: Exceedance of the PM_{10} annual mean AQO of 40 µg.m^{-3} are shown in bold. N/A = no result available.
[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year
[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)
[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

The 24-hour mean PM_{10} monitoring results are shown in Table G. The 24-hour mean air quality objective (50 µg.m^{-3}, not to be exceeded more than 35 times a year) was achieved at all monitoring locations in 2016. The daily mean PM_{10} objective was achieved at Horn Lane in 2016, as there were 17 days of PM_{10} greater than 50 µg.m^{-3} recorded by the TEOM and 19 recorded by the FDMS instrument. The Horn Lane site exceeded the daily objective in five of the last seven years, but has not exceeded the objective since 2014.

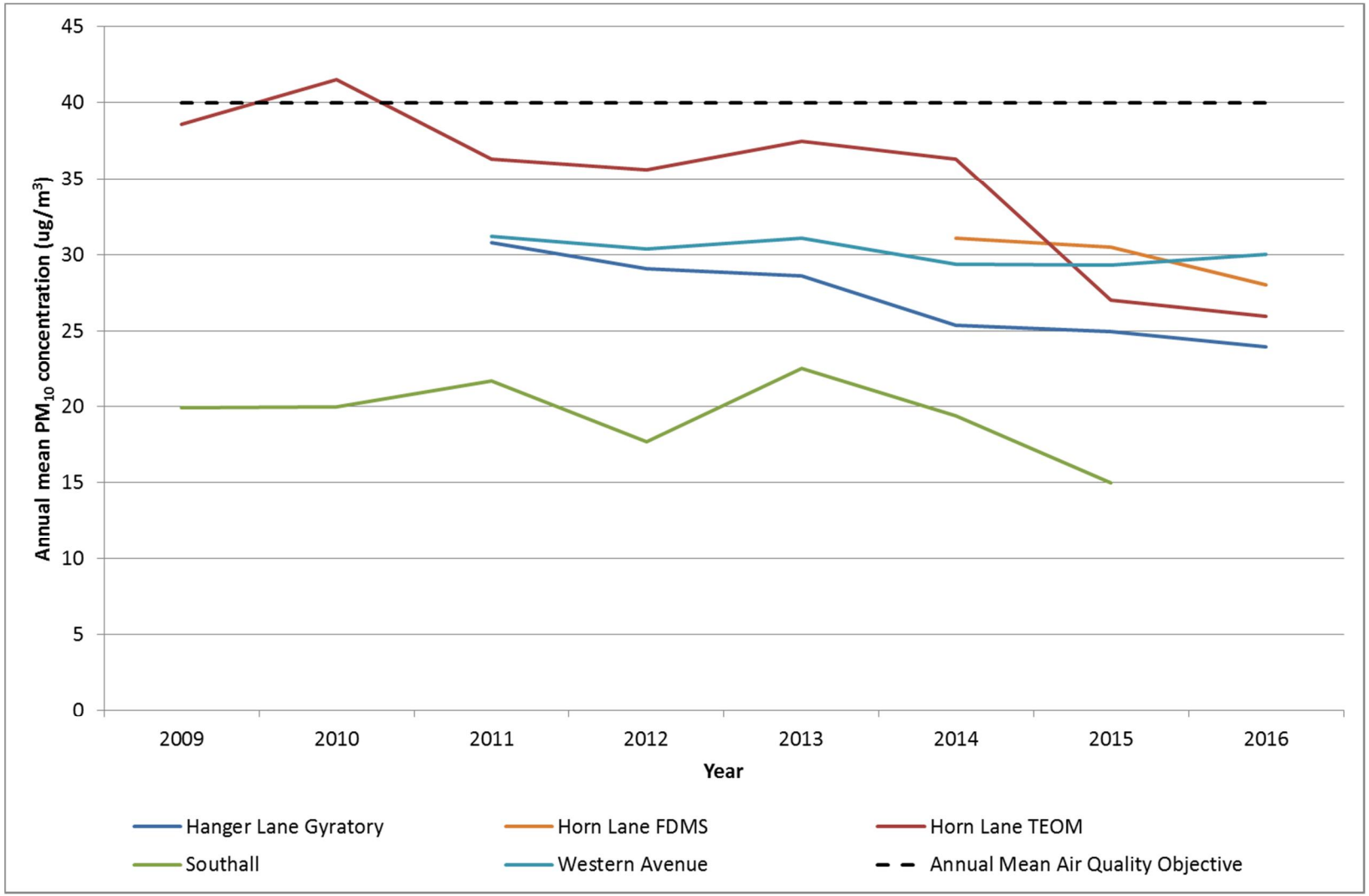
Table G. PM_{10} Automatic Monitor Results: Comparison with 24-Hour Mean Objective

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Number of Daily Means > 50 µg.m^{-3}						
			2010 [c]	2011 [c]	2012 [c]	2013 [c]	2014 [c]	2015 [c]	2016 [c]
EA6 Hanger Lane Gyratory	90%	90%	N/A	29 (47)	18	19	10	6	12
EA8 Horn Lane	89%	89%	N/A	N/A	N/A	N/A	22 (51)	11 (46)	19
EI8 Horn Lane TEOM	97%	97%	91	55	49	76	55	17	17
EI1 Western Avenue	96%	96%	N/A	23 (45)	10 (45)	22 (46)	22	22 (43)	24

Notes: Exceedance of the PM_{10} short term AQO of 50 µg.m^{-3} over the permitted 35 days per year or where the 90.4th percentile exceeds 50 µg.m^{-3} are shown in bold.
Where the period of valid data is less than 90% of a full year, the 90.4th percentile is shown in brackets after the number of exceedances.
[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year
[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)
[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Figure 10 shows the trends in PM_{10} concentrations between 2009 and 2016 for the three currently operational monitoring stations and the recently-closed Southall site. There is evidence of annual PM_{10} concentrations decreasing slightly over this period at all sites; however, at Western Avenue, the annual mean PM_{10} concentrations during this time period have been relatively stable.

Figure 10: Annual mean PM_{10} concentrations at Automatic Monitoring sites



2. Action to Improve Air Quality

Table J. Commitment to Cleaner Air Borough Criteria

Theme	Criteria		Achieved (Y/N)	Evidence
1. Political leadership	***1.a***	Pledged to become a Cleaner Air for London Borough (at cabinet level) by taking significant action to improve local air quality and signing up to specific delivery targets.	Y	No evidence required.
	1.b	Provided an up-to-date Air Quality Action Plan (AQAP), fully incorporated into LIP funding and core strategies.	Y	The draft revised AQAP was completed in March 2017 and consultation on the draft 2017 AQAP began in April 2017. Publication of the final document expected in autumn 2017.. The AQAP is required to be approved by the Head of Transport Services and the Director of Public Health to ensure full integration of the AQAP into transport and public health policies.
2. Taking action	**2.a**	Taken decisive action to address air pollution, especially where human exposure and vulnerability (e.g. schools, older people, hospitals etc) is highest.	Y	Monitoring and regulatory enforcement actions have continued at the Acton Goods Yard Horn Lane, throughout 2016/17. Both the annual and the 24-hour Air Quality Objectives for PM_{10} were achieved at Ealing Horn Lane AQMS in 2016. Council leader and air quality officer both attend regular liaison meetings with Goods Yard companies and residents representatives. The Council has made representations against the issue of an environmental permit for a large waste recycling activity, which it believes would be harmful to local air quality in the Acton Goods Yard area.
	2.b	Developed plans for business engagement (including optimising deliveries and supply chain), retrofitting public buildings using the RE:FIT framework, integrating no engine idling awareness raising into the work of civil enforcement officers, (etc etc)	Y	Ealing Broadway Business Improvement District Air Quality Exemplar project undertaken with MAQF funding has saved around 9,000 diesel vehicle trips each year. See https://www.london.gov.uk/sites/default/files/mayors_air_quality_fund_report_2016.pdf. The Council wants to roll out a similar initiative in the Park Royal industrial area in both Ealing and Brent boroughs. This project will involve up to 2,000 businesses and a scoping study

				will be completed by summer 2017.
	2.c	Integrated transport and air quality, including by improving traffic flows on borough roads to reduce stop/start conditions	Y	The Council has transport policies and projects to encourage alternatives to the private car and smooth the flow of traffic. The Council also has a comprehensive school travel programme including education and training to encourage more children to walk and cycle to school, one aim of which is to reduce the numbers of cars used for school journeys and thereby yielding air quality benefits. The Southall Broadway Boulevard project widened footways by 20% increasing pedestrian numbers by 22% whilst traffic lights were rationalised to reduce stop/start traffic and idling.
	2.d	Made additional resources available to improve local air quality, including by pooling its collective resources (s106 funding, LIPs, parking revenue, etc).	Y	For 2016/17 LIP included a specific annual budget to support air quality monitoring (£30K). s106 air quality funding has been routinely sought and received during 2016/17 for new developments, where appropriate.
3. Leading by example	**3.a**	Invested sufficient resources to complement and drive action from others	Y	Air quality officers have continued to work closely with transport planning and public health colleagues to secure air quality funding from external sources including the GLA and Defra. Budget of £30K (LIP) for air quality monitoring maintained for 2016/17.
	3.b	Maintained an appropriate monitoring network so that air quality impacts within the borough can be properly understood	Y	Three continuous monitoring stations maintained at worst case locations, one being AURN affiliated. The Council maintained a nitrogen dioxide diffusion tube network of >80 tubes changed monthly.
	3.c	Reduced emissions from council operations, including from buildings, vehicles and all activities.	N	We have a target to reduce corporate CO_2 emissions by 22% on 2012/13 levels by 2017/18. We exceeded this target with a 24% reduction in 2015/16 We also have a target to reduce corporate energy consumption (KWh) by 20% on 2012/13 levels by 2017/18. By 2015/16, we have achieved a 16% reduction in CO2 emissions against this target.
	3.d	Adopted a procurement code which reduces emissions from its own and its suppliers activities, including from buildings and vehicles operated by and on their behalf (e.g. rubbish	Y	Since April 1st 2016, all suppliers of WestTrans member boroughs have been required to comply with Work Related Road Risk (WRRR) requirements. This is a Responsible Procurement project designed to ensure greater road safety for

		trucks).		vulnerable road users and improve air quality via lower emissions from heavy goods vehicles used by our suppliers. The project is funded by Transport for London and delivered by WestTrans, in partnership with the West London Alliance, across the following seven local authorities: Barnet, Brent, Ealing, Hammersmith & Fulham, Harrow, Hillingdon and Hounslow. See http://www.westtrans.org/wla/wt2.nsf/pages/WT-211
4. Using the planning system	**4.a**	Fully implemented the Mayor's policies relating to air quality neutral, combined heat and power and biomass.	Y	Comments made to planning officers on all applications for planning permission currently include recommendations regarding air quality neutral, combined heat and power and biomass (where appropriate).
	4.b	Collected s106 from new developments to ensure air quality neutral development, ***where possible***	Y	A total of £77,643 s.106 contributions for new developments has been brought forward and collected in 2016/17, This amount has been carried over to 2016/17.
	4.c	Provided additional enforcement of construction and demolition guidance, with regular checks on medium and high risk building sites.	N	Staff resources were not available in 2016/17 to support this.
5. Integrating air quality into the public health system	**5**	Included air quality in the borough's Health and Wellbeing Strategy and/or the Joint Strategic Needs Assessment	Y	An air quality chapter was included in the 2012 Joint Strategic Needs Assessment. See https://www.ealing.gov.uk/download/downloads/id/9445/2012_jsna_chapter_-_air_quality.pdf This document is being kept under review by Public Health at Ealing and will be updated at the next opportunity.
6. Informing the public	**6.a**	Raised awareness about air quality locally	Y	airTEXT was promoted on the Council's website at https://www.ealing.gov.uk/info/201199/air_quality/2055/air_pollution_alert_service. Air quality information was available to the public during 2016/17 from the Council's monitoring stations via the LAQN website www.londonair.org.uk and an Ealing-specific version at www.ealingair.org.uk.

2.1 Air Quality Action Plan Progress

The current Air Quality Action Plan (AQAP) for Ealing was published in 2003. A new AQAP has been drafted and consulted upon with the Secretary of State, the Mayor of London, the Environment Agency, Transport for London and all neighbouring local authorities, including the West London Cluster Group. A large number of other bodies and organisations have also been consulted, including Ealing Friends of the Earth, residents groups, Ealing Civic Society and Ealing Public Transport User Group. The AQAP steering group responded to the consultation, and a new draft was prepared for public consultation, which was commenced in April 2017.

Table K provides a brief summary of progress on projects started in previous years, highlighting progress made this year. New projects that commenced in 2016 are shown at the bottom of the table.

All measures detailed below which aim to reduce PM_{10} will also have an impact on $PM_{2.5}$. The impacts of these measures, when assessed, will be linked to Public Health England's Outcomes Framework. $PM_{2.5}$ monitoring (by TEOM) has previously taken place at Acton Town Hall, a roadside monitoring site, from 9 September 1996 to 17 January 2012, and at Southall from 2012 to 26 January 2016.

Table K. Delivery of Air Quality Action Plan Measures

Years	Measure	Progress	Further information
2016/2017	Further actions to mitigate PM_{10} and $PM_{2.5}$ emissions from industrial sources and resuspension in Horn Lane, Acton	ONGOING · Deep cleaning of Horn Lane carriageway to complement actions taken by Acton Goods Yard occupiers. *Update: contractor appointed and ten deployments of specialist sweeper completed in 2016/17.* · No idling signage to be placed in Horn Lane in the vicinity of Goods Yard entrances. *Update: signs designed; manufacture and installation pending, expected mid-2017..* · Landscaping scheme in Horn Lane adjacent to Goods Yard to provide planting of species for capture of particulates – *Update: final design details being reviewed by LBE tree service. Commencement of works expected summer 2017.* · Indicative monitoring to be continued in Goods Yard – *monitoring carried out in 2016/17 and ongoing. Data online at www.llecp.org.uk/*	· Contact LB Ealing for updates

Years	Measure	Progress	Further information
2016/2017	Forecourt improvements at Ealing Broadway Station	ONGOING · Improved pedestrian and cycle access to Ealing Broadway Station. - *Works underway, to be delivered in 2017/18 as part of Crossrail works*	· See https://www.ealing.gov.uk/downloads/download/3256/ealing_broadway_station_forecourt_improvement_plans
2012/2016	Women on Wheels in Ealing	ONGOING · Women on Wheels in Ealing is a cycling club for women run by women with London Bike Hub providing help and support.	· See http://www.londonbikehub.com/wowe/
2016	West London Student Cycling Champion project	ONGOING · Project in collaboration between London Cycling Campaign and the WestTrans Partnership led by LB Ealing.	· Contact WestTrans for further information
2016	Improved access to public transport	ONGOING · Ongoing work at Acton Mainline Station, Ealing Broadway, Hanwell Station, Southall Station and West Ealing Station along the Paddington Main Line as part of the Crossrail programme.	· For details of access improvements at these stations, see http://www.crossrail.co.uk/route/western-section/

Years	Measure	Progress	Further information
2016/2022	Control of emissions from developments and buildings	ONGOING · Ensuring emissions from construction are minimised · Developing enforcement of Non Road Mobile Machinery (NRMM) air quality policies · Enforcing CHP and biomass air quality policies. Ensuring smaller developments use ultra-low NO_X Boilers. · Enforcing Air Quality Neutral policies - *all measures currently implemented through the planning system.*	
2016/2022	Ensuring adequate, appropriate, and well located green space and infrastructure is included in new developments	ONGOING · Included chapter on Green Space in Core Strategy.	· Focus on larger developments to implement on site green space
2016/2022	Investigate the potential for larger development areas to proactively assess air quality impacts cumulatively	ONGOING · Identified opportunities at Old Oak Common & Park Royal and Southall Gas Works.	· A Low Emission Strategy (LES) will be a useful tool to ensure air quality has thorough consideration.
2016/2017	Promoting and delivering energy efficiency retrofitting projects in workplaces and homes using the GLA RE:NEW and RE:FIT programmes to replace old boilers/top-up loft insulation in combination with other energy conservation measures.	ONGOING · Currently a 2 year programme being implemented.	
2016/2022	Ensure that Directors of Public Health (DsPH) have been fully briefed on the scale of the problem in your local authority area; what is being done, and what is needed. A briefing should be provided.	COMPLETE · DPH briefed by way of a briefing note and works closely with Regulatory Services via Public Health consultant	

Years	Measure	Progress	Further information
2016/2022	Public Health Teams should be supporting engagement with local stakeholders (businesses, schools, community groups and healthcare providers). They should be asked for their support via the DsPH when projects are being developed.	ONGOING · Actively working with voluntary sector and linking in to hospitals and pharmacies. · Provision of support to others re: work on engagement.	
2016/2022	Strengthening co-ordination with Public Health by ensuring that at least one Consultant-grade public health specialist within the borough has air quality responsibilities outlined in their job profile	COMPLETE · Health protection role embedded in Public Health	
2016/2022	Ensure that the Head of Transport has been fully briefed on the Public Health duties and the fact that all directors (not just Director of Public Health) are responsible for delivering them, as well as on air quality opportunities and risks related to transport in the borough. Provide a briefing which can be disseminated amongst the Transport team.	COMPLETE · There is a very active obesity group which works well with transport colleagues, particularly in relation to active travel. · PHE briefing given.	

Years	Measure	Progress	Further information
2016/2022	Encourage schools to join the TfL STARS accredited travel planning programme by providing information on the benefits to schools and supporting the implementation of such a programme	ONGOING · Schools actively supported to join the STARS scheme - *15 Gold accredited, 16 Silver, 8 Bronze, 3 working towards accreditation (83 not engaged).* · 1 in 3 schools in Ealing currently engaged with the STARS scheme. · TfL award for Brentside High School - for an innovative approach to increase active travel. - *Students used smart phone technology to design their own walking app and a walking map with colour coded routes to school.*	· For information on the London-wide STARS scheme, see https://stars.tfl.gov.uk/About/About
2016/2022	Air quality at schools	ONGOING · Every school in the borough has a travel plan.	· Focus on minimising further exposure by siting new schools away from busy roads. · LB Ealing's school transport strategy: https://www.egfl.org.uk/services-to-schools/school-travel-plans-201617
2016/2022	Update Procurement policies to ensure sustainable logistical measures are implemented (and include requirements for preferentially scoring bidders based on their sustainability criteria)	ONGOING · Contract for waste handling includes sustainable logistics.	· Most significant measure identified as reducing trip distance (and hence emissions)

Years	Measure	Progress	Further information
2016/2022	Re-organisation of freight to support consolidation (or micro-consolidation) of deliveries, by setting up or participating in new logistics facilities, and/or requiring that council suppliers participate in these	PARTIALLY COMPLETED · Already underway in Ealing Broadway	· Mayor's Air Quality funded work at Ealing Broadway with BID paying costs. · MAQF funding similar scheme in Park Royal
2016/2022	Green Infrastructure	ONGOING · Planning policies encourage green roofs, green walls, Sustainable Urban Drainage Systems etc. · Defra air quality grant providing improvements for Horn Lane which includes green landscaping.	
2016/2022	Discouraging unnecessary idling by taxis, coaches and other vehicles (e.g. through anti-idling campaigns or enforcement activity)	ONGOING · No idling signage set up at Acton Goods Yard entrance; More signage to be provided in mid-2017 in Horn Lane. · Other idling hotspot sites identified for deployment of new signage. · Ongoing community engagement with parents and residents re anti-idling measures.	
2016/2017	Increasing the proportion of electric, hydrogen and ultra-low emission vehicles in Car Clubs	ONGOING · Work undertaken within WestTrans Partnership to increase EV fleet within car clubs.	
2016/2022	Very Important Pedestrian Days (e.g. no vehicles on certain roads on a Sunday) and similar initiatives	ONGOING · Play streets programmes in 25 different areas of the Borough.	

3. Planning Update and Other New Sources of Emissions

It has not been possible to populate Table L below with all the information required. In some cases, estimates have been provided, as indicated. The shortfall in data capture is due to several factors, including the need to develop new procedures across the relevant service areas for capturing the required data, a change in the database used for recording actions in the service areas concerned and a temporary lack of resource for data input. The shortfall in data reported will be addressed for next year's report as follows.

1. Pending full implementation of new procedures for inputting data by both planning and regulatory services staff, manual recording of required data has been put in place.

2. Out of the nine questions in the table, three will be addressed at the consultation stage, four will be retrieved from planning permissions (or conditions within them) and questions on s.106 and CIL payments will be dealt with on a case-by-case basis by keeping an internal log, as follows.

    a. *Consultation stage (Questions 1, 5 & 6):* Discussions are underway with Planning Services and IT aimed at improving the consultation procedure and ensure that the information required for the ASR is appropriately recorded and readily available. Plans include the customisation of the Council's planning portal ('Consultee Comments' page - https://pam.ealing.gov.uk/online-applications/) to accommodate tick boxes and other relevant information required in the above table.
    b. *Permission/Decision stage (Questions 2, 3, 4 & 10):* For this data to be extracted, it has been agreed with Planning Services that standard conditions will be revised. Planning Services will need to make sure that, ideally, standard conditions are applied, and where this is not possible, varied conditions are appropriately labelled with codes that are easily extracted for the purposes of this exercise. It has been agreed with Planning Services that specific training would be offered to Planning officers, explaining the importance of such codes.
    c. *Remaining questions (Questions 7 & 8):* s106 agreements and CIL payments are recorded manually.

Table L. Planning requirements met by planning applications in Ealing in 2016

	Condition	Number
1	Number of planning applications reviewed for air quality impacts	*750 (estimated)*
2	Number of planning applications required to monitor for construction dust	*400 (estimated)*
3	Number of CHPs/Biomass boilers refused on air quality grounds	0
4	Number of CHPs/Biomass boilers subject to GLA emissions limits and/or	*10 (estimated)*

	other restrictions to reduce emissions	
5	Number of AQ Neutral building and/or transport assessments undertaken	*100 (estimated)*
6	Number of AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	1
7	Number of planning applications with S106 agreements including other requirements to improve air quality	3
8	Number of planning applications with CIL payments that include a contribution to improve air quality	0
9	NRMM: Central Activity Zone and Canary Wharf Number of conditions related to NRMM included. Number of developments registered and compliant. Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy.	Not applicable
10	NRMM: Greater London (excluding Central Activity Zone and Canary Wharf) Number of conditions related to NRMM included. Number of developments registered and compliant. Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.	*150 conditions included (estimated)* Compliance not yet routinely monitored (see note below)

It is intended to put processes in place during 2017 to ensure that all relevant planning applications are reviewed and any air quality conditions, including NRMM conditions, are enforced.

3.1 New or significantly changed industrial or other sources

No new sources identified since the last Annual Status Report 2015.

Appendix A Details of Monitoring Site QA/QC

A.1 Automatic Monitoring Sites

During 2016, all three automatic monitoring sites in the Borough were operated as part of the London Air Quality Network (LAQN). Data have traceability to national standards and operational procedures defined for the LAQN. The Horn Lane site is also part of the national Automatic Urban and Rural Network (AURN), operated by the Environment Agency to monitor compliance with the EU Directives. AURN QA/QC procedures involve 4-weekly calibration of NO_x and SO_2 analysers and maintenance of particulate samplers, and quarterly calibration of O_3 analysers.

PM_{10} Monitoring Adjustment

Monitoring is conducted using TEOMs at two of the three automatic monitoring stations. There is therefore a need to eliminate the effect of changing humidity on the mass measurement; the TEOM is required to maintain the sample filter at an elevated temperature which may lead to losses of semi-volatile species such as ammonium nitrate. The Volatile Correction Model[4] uses local FDMS monitoring sites to correct TEOM measurements for the loss of volatile components of particulate matter that occur due to the high sampling temperatures employed by this instrument. This adjustment to PM_{10} data is provided by the London Air Quality Network.

A.2 Diffusion Tube Quality Assurance / Quality Control

AIR is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR PT is a new scheme, started in April 2014, which combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL Workplace Analysis Scheme for Proficiency (WASP) PT scheme.

AIR NO2 PT forms an integral part of the UK NO_2 Network's QA/QC, and is a useful tool in assessing the analytical performance of those laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM). Defra and the Devolved Administrations advise that diffusion tubes used for LAQM should be obtained from laboratories that have demonstrated satisfactory performance in the AIR-PT scheme.

The results for Environmental Scientifics Group (ESG) Didcot were overall satisfactory. ESG Didcot scored 100% satisfactory results between April 2015 and February 2016 (AR007, AR009, AR010 and AR012) and between September 2016 and February 2017 (AR016 and AR018), and 75% satisfactory results between April and August 2016 (AR013 and AR015).

Bias Adjustment Factor from Local Co-location Studies

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

LB Ealing carries out studies at three sites where triplicate diffusion tubes are co-located with automatic monitors for the purpose of deriving a local bias adjustment factor. In 2016, the average local bias adjustment factor, derived from these studies, was 0.81.

Two continuous monitors (Hanger Lane Gyratory and Horn Lane) had very good data capture (>90%), and adjustment factors of 0.85 and 0.77 respectively. The Western Avenue continuous monitor had a data capture of 75% for the co-located diffusion tube periods, and a calculated adjustment factor

of 0.80. Due to the lower data capture at this monitor, impact of its adjustment factor has been investigated further, and it was found that it had negligible impact on determining the average adjustment factor from all three sites.

Figures A.1 to A.4 show the details of the calculation of the local bias adjustment factors, and Figure A.4 additionally shows the calculated average local bias adjustment factor from the three sites with good data capture. The calculation of local bias adjustment factors takes into account both data capture from diffusion tubes and continuous monitors, and also the coefficient of variation (CV) of the triplicate diffusion tubes. If the CV is too high for a particular period, that period is not taken into account when calculating the local bias adjustment factor.

Figure A.1: Local bias adjustment factor calculation for Hanger Lane Gyratory co-location site

Hanger Lane Gyratory	EA47	EA48	EA49

Need to enter
Calculated for you
Result

	DIFFUSION TUBE DATA								AUTOMATIC DATA	
	Period	Start Date	End Date	Tube 1	Tube 2	Tube 3	Triplicate Mean	Standard Deviation	Coefficient of Variation	Period Mean	Data Capture (%)
January	1	08/01/2016	05/02/2016	98.3	106.9	104.3	103.17	4.4	4.3	82.2	99.1
February	2	05/02/2016	04/03/2016	95	95.1	97.6	95.90	1.5	1.5	55.6	69.6
March	3	04/03/2016	31/03/2016	91.6	95.9	88.9	92.13	3.5	3.8	73.4	97.8
April	4	31/03/2016	27/04/2016	103.6	107.2	107.1	105.97	2.1	1.9	86.3	99.8
May	5	27/04/2016	27/05/2016	90.9	98.5	97.7	95.70	4.2	4.4	75.5	99.9
June	6	27/05/2016	30/06/2016	69.2	73.1	68.6	70.30	2.4	3.5	64.4	99.6
July	7	30/06/2016	26/07/2016	87.6	89.8	94	90.47	3.3	3.6	72.8	92.1
August	8	26/07/2016	31/08/2016	80	79.5	81.1	80.20	0.8	1.0	64.4	99.8
September	9	31/08/2016	28/09/2016	96	95.9	104.2	98.70	4.8	4.8	81.3	100.0
October	10	28/09/2016	26/10/2016	69.6	73.5	71.5	71.53	2.0	2.7	66.7	99.7
November	11	26/10/2016	30/11/2016	86.5	99.4	78.6	88.17	10.5	11.9	85.6	99.9
December	12	30/11/2016	03/01/2017	96.8	99.6	100.2	98.87	1.8	1.8	88.7	99.7
	13										
										% with DC >=90%	91.7

	DTs	AUTOMATIC
Weighted Mean	90.5	76.9
Local Bias Adjustment Factor	0.85	

Figure A.2: Local bias adjustment factor calculation for Horn Lane co-location site

Horn Lane	EA79	EA80	EA81

Need to enter
Calculated for you
Result

	DIFFUSION TUBE DATA								AUTOMATIC DATA	
	Period	Start Date	End Date	Tube 1	Tube 2	Tube 3	Triplicate Mean	Standard Deviation	Coefficient of Variation	Period Mean	Data Capture (%)
January	1	08/01/2016	05/02/2016	68.2	70.7	69.9	69.60	1.3	1.8	52.5	99.0
February	2	05/02/2016	04/03/2016	58.2	63.8	64.4	62.13	3.4	5.5	53.0	99.9
March	3	04/03/2016	31/03/2016	71.3	64.6	67	67.63	3.4	5.0	50.9	99.7
April	4	31/03/2016	27/04/2016	65.9	60.4	67.5	64.60	3.7	5.8	48.5	100.0
May	5	27/04/2016	27/05/2016	68.2	70.1	65.3	67.87	2.4	3.6	46.8	99.9
June	6	27/05/2016	30/06/2016	52.1	51.8	47.2	50.37	2.7	5.5	39.1	81.6
July	7	30/06/2016	26/07/2016	56.8	0	50.5	53.65	4.5	8.3	33.4	92.3
August	8	26/07/2016	31/08/2016	53.1	45.8	56.4	51.77	5.4	10.5	36.6	99.8
September	9	31/08/2016	28/09/2016	51.5	59.9	60.5	57.30	5.0	8.8	42.4	99.7
October	10	28/09/2016	26/10/2016	65	61.6	57.5	61.37	3.8	6.1	50.0	99.6
November	11	26/10/2016	30/11/2016	77.7	79.1	69.9	75.57	5.0	6.6	60.6	99.8
December	12	30/11/2016	03/01/2017	71.8	69.5	75	72.10	2.8	3.8	61.6	99.5
	13										
										% with DC >=90%	91.7

	DTs	AUTOMATIC
Weighted Mean	63.4	48.4
Local Bias Adjustment Factor	0.76	

Figure A.3: Local bias adjustment factor calculation for Western Avenue co-location site, including average local bias adjustment factor

Western Avenue	EA54	EA55	EA56

Need to enter
Calculated for you
Result

	DIFFUSION TUBE DATA								AUTOMATIC DATA	
	Period	Start Date	End Date	Tube 1	Tube 2	Tube 3	Triplicate Mean	Standard Deviation	Coefficient of Variation	Period Mean	Data Capture (%)
January	1	08/01/2016	05/02/2016	76	61.4	84.4	73.93	11.6	15.7	75.0	99.3
February	2	05/02/2016	04/03/2016	107.7	71.6	77.9	85.73	19.3	22.5	73.5	99.1
March	3	04/03/2016	31/03/2016	77.5	73.7	73.5	74.90	2.3	3.0	61.6	99.7
April	4	31/03/2016	27/04/2016	80.1	75.3	79.8	78.40	2.7	3.4	65.3	93.4
May	5	27/04/2016	27/05/2016	76.7	76	69.7	74.13	3.9	5.2	54.5	70.0
June	6	27/05/2016	30/06/2016	58.1	55.7	58.9	57.57	1.7	2.9	41.7	68.4
July	7	30/06/2016	26/07/2016	70.1	69.3	68.2	69.20	1.0	1.4	41.1	33.2
August	8	26/07/2016	31/08/2016	61.7	48.7	66.3	58.90	9.1	15.5	43.1	99.9
September	9	31/08/2016	28/09/2016	77.9	75.4	81.8	78.37	3.2	4.1	57.0	99.4
October	10	28/09/2016	26/10/2016	62.6	68.3	65.7	65.53	2.9	4.4	49.3	99.7
November	11	26/10/2016	30/11/2016	93.2	79.2	84.9	85.77	7.0	8.2	67.4	99.8
December	12	30/11/2016	03/01/2017	83	104.9	95.8	94.57	11.0	11.6	74.1	90.8
	13										
										% with DC >=90%	75.0

	DTs	AUTOMATIC
Weighted Mean	76.7	61.7
Local Bias Adjustment Factor	0.80	

Average Local Bias Adjustment Factor	0.81

The national bias adjustment factor for co-location diffusion tube studies analysed by Environmental Scientifics Group (ESG) Didcot using a preparation method of 20% TEA/water is shown in Figure A.5 below, and was calculated to be 0.75.

Figure A.5: National bias adjustment factor spreadsheet for ESG Didcot co-location studies

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/17

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 2017
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:	Step 2:	Step 3:	Step 4:
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	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 a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data[2]	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 undo your selection, choose (All) from the pop-up list)	Year[5] (To undo 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)
ESG Didcot	20% TEA in water	2016	KS	South Lakeland District Council	12	41	30	34.6%	G	0.74
ESG Didcot	20% TEA in water	2016	KS	Marylebone Road Intercomparison	12	104	79	31.5%	G	0.76
ESG Didcot	20% TEA in water	2016		Overall Factor[3] (2 studies)				Use		0.75

Discussion of Choice of Factor to Use

For 2016 data it was decided to use the local bias adjustment factor on the basis that:

- it is locally-derived from three co-location sites,
- it is a more conservative factor, as it is the greater value (0.81 vs 0.75), and
- the national bias adjustment factor is based on two studies only.

The national factor for ESG Didcot is given in Figure A.5 from the review and assessment help desk website. The diffusion tube preparation method is 20% TEA/Water.

The bias adjustment factors used for LAQM purposes for the last five years are as follows:

2012 – 0.96

2013 – 0.76

2014 – 0.78

2015 – 0.83

2016 – 0.81.

A.3 Adjustments to the Ratified Monitoring Data

Short-term to Long-term Data Adjustment

Data capture for 2016 was higher than 75% for NO_2 and PM_{10} at all sites. No seasonal adjustment factors were required to be calculated.

Appendix B Full Monthly Diffusion Tube Results for 2016

Table N. NO_2 Diffusion Tube Results

Site ID	*Valid data capture for monitoring period %* [a]	*Valid data capture 2016 %* [b]	*Period Mean NO_2 Concentration ($\mu g/m^3$)*													
			Jan	*Feb*	*March*	*Apr*	*May*	*June*	*Jul*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Annual mean – raw data* [c]	*Annual mean – bias adjusted* [c]
EA1	100%	100%	41.8	43.9	40.4	36.6	36.1	28.0	27.8	28.5	34.9	51.3	50.0	50.9	39.2	31.6
EA2	100%	100%	44.1	46.8	44.2	34.9	42.6	32.7	30.1	30.2	40.6	39.9	49.8	50.3	40.5	32.6
EA3	100%	100%	86.6	76.0	69.5	74.4	71.1	68.4	81.4	68.8	78.7	62.7	79.8	91.5	75.7	61.0
EA4	100%	100%	37.7	31.6	31.4	24.5	24.0	19.8	18.4	20.7	29.3	25.5	33.8	42.2	28.2	22.8
EA5	100%	100%	41.9	61.8	38.9	32.1	33.5	29.5	28.3	29.2	37.1	34.9	48.2	54.5	39.2	31.6
EA6	92%	92%	35.4	67.0	65.7	62.2	60.4	N/A	49.9	51.5	59.5	55.5	67.4	79.8	59.5	47.9
EA7	100%	100%	35.1	38.8	31.4	30.8	17.0	26.9	21.7	23.5	28.9	33.8	43.4	50.3	31.8	25.6
EA8	100%	100%	38.4	50.1	48.4	45.5	48.1	41.5	32.5	34.1	43.7	45.5	54.5	60.1	45.2	36.4
EA9	100%	100%	37.5	35.0	29.7	25.3	27.3	21.8	23.1	22.6	29.7	26.2	36.3	39.3	29.5	23.8
EA10	100%	100%	51.4	49.5	49.6	44.8	46.9	35.6	31.7	36.0	42.6	43.9	51.0	56.6	45.0	36.2
EA11	92%	92%	50.3	48.8	46.9	46.1	47.0	37.8	37.7	34.3	36.2	40.4	N/A	41.2	42.4	34.2
EA12	100%	100%	67.2	63.4	57.2	64.6	68.4	54.8	49.6	47.3	65.4	60.1	67.3	76.2	61.8	49.8
EA13	100%	100%	47.0	39.2	39.8	36.6	40.8	31.2	33.9	33.7	41.6	37.3	47.1	47.2	39.6	31.9
EA14	100%	100%	66.3	63.8	61.1	59.4	66.9	60.2	55.4	51.9	66.8	31.7	68.6	75.9	60.7	48.9
EA15	100%	100%	49.6	46.5	48.2	45.4	45.3	40.2	37.5	37.5	42.2	43.3	55.8	54.1	45.5	36.6
EA16	100%	100%	54.6	54.7	52.7	42.8	46.3	39.7	39.8	36.1	46.5	44.4	53.8	62.3	47.8	38.5
EA17	100%	100%	47.1	46.1	39.5	39.8	39.1	38.2	34.0	34.3	37.9	40.6	46.9	53.7	41.4	33.4
EA18	100%	100%	38.7	46.8	47.3	44.6	45.3	39.6	57.2	36.3	41.3	44.9	48.7	56.1	45.6	36.7

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Period Mean NO_2 Concentration ($\mu g/m^3$)													
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data [c]	Annual mean – bias adjusted [c]
EA19	100%	100%	40.9	49.8	49.1	45.2	47.9	40.5	37.2	28.9	42.8	46.7	53.0	58.2	45.0	36.3
EA20	100%	100%	49.9	50.2	46.9	45.1	51.3	43.0	38.1	40.0	53.9	51.3	54.6	61.0	48.8	39.3
EA21	100%	100%	72.7	69.0	60.5	68.0	66.5	51.9	66.7	64.3	73.8	53.4	65.3	73.2	65.4	52.7
EA22	100%	100%	57.8	47.6	40.4	41.8	36.2	30.4	34.2	31.4	45.6	39.7	52.1	62.1	43.3	34.9
EA23	100%	100%	59.8	61.8	57.0	63.9	68.1	49.1	66.7	54.1	64.9	53.7	45.8	70.6	59.6	48.0
EA24	75%	75%	33.1	33.3	N/A	26.7	30.2	N/A	23.3	N/A	31.2	29.8	37.3	42.2	31.9	25.7
EA25	100%	100%	39.0	46.5	64.3	42.4	43.3	35.4	34.2	32.6	40.1	42.4	51.8	56.6	44.1	35.5
EA26	100%	100%	43.0	39.9	33.3	31.4	31.7	26.6	27.7	25.1	36.0	33.6	45.0	51.7	35.4	28.5
EA27	100%	100%	42.6	35.0	26.1	35.5	25.7	20.8	21.3	20.5	17.4	27.8	39.9	46.7	29.9	24.1
EA28	100%	100%	61.1	57.2	60.2	51.7	50.4	42.9	41.5	39.3	45.4	51.3	65.5	66.8	52.8	42.5
EA29	100%	100%	49.2	55.2	57.4	50.5	48.3	42.6	47.1	43.9	43.2	39.8	63.0	54.8	49.6	40.0
EA30	100%	100%	62.7	51.3	40.8	41.4	43.8	35.4	42.9	29.1	47.0	42.1	53.4	66.3	46.4	37.3
EA31	92%	92%	54.0	49.6	47.7	42.9	38.0	36.3	38.1	35.7	44.8	40.8	N/A	35.4	42.1	33.9
EA32	100%	100%	38.8	36.6	37.3	30.6	33.3	24.9	23.0	23.4	30.7	34.5	40.4	50.8	33.7	27.1
EA33	100%	100%	56.4	53.5	50.6	50.6	48.8	40.7	41.0	38.1	49.0	47.5	58.4	50.6	48.8	39.3
EA34	92%	92%	84.5	54.6	44.8	44.7	49.5	42.3	52.4	48.6	56.1	41.3	57.8	N/A	52.4	42.2
EA35	100%	100%	54.0	54.9	57.1	47.7	50.3	43.5	29.7	34.6	38.0	53.7	53.6	63.3	48.4	39.0
EA36	92%	92%	62.7	50.9	45.9	N/A	44.7	37.4	44.4	41.0	49.2	43.0	51.3	63.1	48.5	39.1
EA37	100%	100%	53.9	45.7	38.5	37.5	33.0	26.5	30.3	28.4	39.0	34.4	41.0	54.8	38.6	31.1
EA38	100%	100%	41.1	39.3	42.9	35.7	36.8	28.2	23.7	25.2	29.5	36.7	47.3	53.0	36.6	29.5
EA39	92%	92%	84.3	N/A	73.2	77.0	72.7	64.4	74.3	69.0	84.5	68.7	83.3	96.6	77.1	62.1
EA40	100%	100%	52.2	50.2	50.2	42.6	44.8	36.8	31.8	32.1	43.2	44.8	56.9	59.7	45.4	36.6
EA41	100%	100%	70.5	38.1	64.8	59.5	58.3	58.9	60.4	56.8	61.5	60.2	64.6	69.7	60.3	48.6

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Period Mean NO_2 Concentration ($\mu g/m^3$)													
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data [c]	Annual mean – bias adjusted [c]
EA42	92%	92%	73.9	69.2	N/A	80.4	83.8	75.4	72.4	72.2	80.4	71.8	76.8	89.3	76.9	61.9
EA43	100%	100%	52.1	44.8	43.2	38.5	38.6	28.9	34.1	31.5	40.9	39.1	49.5	59.4	41.7	33.6
EA44	100%	100%	53.2	52.2	45.5	39.2	39.6	29.2	36.5	33.3	41.4	43.4	53.1	60.0	43.9	35.4
EA45	100%	100%	67.6	61.0	58.9	58.0	64.7	49.4	52.8	52.4	58.2	53.1	64.3	74.5	59.6	48.0
EA46	100%	100%	59.2	54.4	53.9	50.9	53.6	35.1	33.5	33.6	46.6	47.4	59.5	61.1	49.1	39.5
EA47	100%	100%	98.3	95.0	91.6	103.6	90.9	69.2	87.6	80.0	96.0	69.6	86.5	96.8	88.8	71.5
EA48	100%	100%	106.9	95.1	95.9	107.2	98.5	73.1	89.8	79.5	95.9	73.5	99.4	99.6	92.9	74.8
EA49	100%	100%	104.3	97.6	88.9	107.1	97.7	68.6	94.0	81.1	104.2	71.5	78.6	100.2	91.2	73.4
EA50	100%	100%	49.3	65.4	67.8	61.8	70.0	50.0	56.5	58.1	57.5	64.8	73.4	66.7	61.8	49.8
EA51	100%	100%	51.9	55.4	52.7	48.5	50.0	36.7	41.2	41.7	43.5	50.3	59.1	58.5	49.1	39.6
EA52	100%	100%	43.5	49.7	43.5	41.1	43.0	31.0	30.1	32.4	40.0	45.1	56.9	43.8	41.7	33.6
EA53	100%	100%	66.2	68.9	75.4	78.4	75.8	59.4	56.1	54.3	63.3	68.2	80.4	83.4	69.2	55.7
EA54	100%	100%	76.0	107.7	77.5	80.1	76.7	58.1	70.1	61.7	77.9	62.6	93.2	83.0	77.1	62.1
EA55	100%	100%	61.4	71.6	73.7	75.3	76.0	55.7	69.3	48.7	75.4	68.3	79.2	104.9	71.6	57.7
EA56	100%	100%	84.4	77.9	73.5	79.8	69.7	58.9	68.2	66.3	81.8	65.7	84.9	95.8	75.6	60.9
EA57	100%	100%	71.3	69.4	70.0	71.6	66.9	45.9	55.7	45.9	55.7	65.1	75.2	83.9	64.7	52.1
EA58	100%	100%	52.9	53.1	47.1	43.2	47.2	32.0	34.9	38.2	46.7	46.4	53.8	71.9	47.3	38.1
EA59	100%	100%	50.0	54.7	51.7	47.3	45.3	32.9	34.3	36.6	47.5	45.7	57.5	57.6	46.8	37.7
EA60	100%	100%	54.6	54.8	69.7	65.5	69.1	53.4	53.5	54.0	67.3	60.0	63.4	73.1	61.5	49.6
EA61	100%	100%	56.9	46.4	53.9	52.0	58.4	39.9	41.6	43.7	48.3	46.1	58.3	58.3	50.3	40.5
EA62	100%	100%	56.6	47.2	44.5	47.7	45.8	36.5	42.3	38.8	50.6	42.4	55.3	59.8	47.3	38.1
EA63	100%	100%	64.9	65.7	70.4	63.3	71.2	51.4	48.2	46.7	58.3	61.3	69.4	72.8	62.0	49.9
EA64	100%	100%	90.3	97.1	94.5	102.2	107.9	86.4	85.6	82.6	86.3	98.9	93.4	96.5	93.5	75.3

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Period Mean NO_2 Concentration ($\mu g/m^3$)													
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data [c]	Annual mean – bias adjusted [c]
EA65	100%	100%	68.4	64.2	59.1	63.6	62.5	46.6	62.9	51.5	60.4	54.5	65.5	73.1	61.0	49.2
EA66	100%	100%	76.4	67.2	75.8	76.5	80.1	61.9	78.6	64.1	75.2	74.0	75.4	72.4	73.1	58.9
EA67	100%	100%	61.5	57.8	49.0	51.9	54.5	38.6	37.3	37.9	42.9	49.5	62.1	66.0	50.8	40.9
EA68	100%	100%	49.9	50.9	54.8	47.7	52.2	43.9	41.7	38.9	41.9	49.0	59.8	55.8	48.9	39.4
EA69	92%	92%	43.2	42.1	39.7	36.1	39.2	N/A	27.2	26.9	36.1	39.9	43.5	50.6	38.6	31.1
EA70	100%	100%	71.5	71.0	75.4	73.4	76.9	47.6	59.2	60.7	66.3	70.3	82.8	78.7	69.5	56.0
EA71	100%	100%	43.7	44.8	53.1	43.7	49.8	34.6	30.0	29.2	34.4	47.8	55.5	56.3	43.6	35.1
EA72	100%	100%	63.9	69.3	64.8	73.8	82.4	58.9	52.9	57.4	58.0	77.5	86.2	69.1	67.9	54.7
EA73	100%	100%	41.8	34.1	36.7	29.7	33.0	22.3	22.2	21.1	30.5	35.2	50.7	45.4	33.6	27.0
EA74	100%	100%	52.2	53.5	53.9	46.0	49.4	34.8	31.9	36.0	43.4	45.7	58.1	57.5	46.9	37.8
EA75	100%	100%	45.3	53.8	41.8	42.2	43.6	30.0	36.5	36.7	41.9	42.2	53.2	52.4	43.3	34.9
EA76	100%	100%	47.5	42.3	46.3	41.3	39.6	28.6	31.9	29.2	39.9	38.5	51.6	55.5	41.0	33.1
EA77	100%	100%	26.7	34.9	36.3	30.6	33.3	24.3	23.0	24.8	32.5	35.2	39.3	49.4	32.5	26.2
EA78	100%	100%	55.5	57.5	58.3	54.7	57.0	41.9	40.2	42.3	52.8	57.1	59.6	65.3	53.5	43.1
EA79	100%	100%	68.2	58.2	71.3	65.9	68.2	52.1	56.8	53.1	51.5	65.0	77.7	71.8	63.3	51.0
EA80	92%	92%	70.7	63.8	64.6	60.4	70.1	51.8	N/A	45.8	59.9	61.6	79.1	69.5	63.4	51.1
EA81	100%	100%	69.9	64.4	67.0	67.5	65.3	47.2	50.5	56.4	60.5	57.5	69.9	75.0	62.6	50.4
EA82	100%	100%	61.9	54.4	51.0	55.0	55.6	40.2	41.6	41.8	49.6	55.5	75.7	67.9	54.2	43.7
EA83	100%	100%	73.4	65.6	55.1	61.6	62.9	44.5	49.9	43.6	54.3	55.0	70.4	70.8	58.9	47.5
EA84	100%	100%	69.7	52.1	57.6	57.5	51.0	42.9	49.5	44.0	55.2	53.2	64.9	56.9	54.5	43.9

Exceedance of the NO_2 annual mean AQO of 40 $\mu g.m^{-3}$ are shown in bold.

NO_2 monthly means in excess of 60 $\mu g.m^{-3}$, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in bold and underlined.

[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%