



London Air Quality Network Summary Report 2018

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1 Introduction

This report details the results of air pollution measurements made on the London Air Quality Network during 2018. Measurements have been presented with specific reference to the UK Air Quality Strategy (AQS) Objectives and the EU Limit Values.

The London Air Quality Network (LAQN) is a unique resource, providing robust air pollution measurements that are essential to underpin air quality management and health studies. The public face of the network, the LondonAir web site (www.londonair.org.uk), is visited by thousands of Londoners seeking hourly updated air pollution information.

The LAQN was formed in 1993 to coordinate and improve air pollution monitoring in London. The majority of London's 33 boroughs supply measurements to the network with additional measurements from local authorities surrounding London, thereby providing an overall perspective of air pollution in London and the Home Counties.

The LAQN is operated and managed by the Environmental Research Group (ERG) at King's College London. QA/QC audits are carried out by the National Physical Laboratory (NPL). Each borough funds air quality monitoring in its own area. The Department of Environment, Food and Rural Affairs (Defra) funds King's to operate the Marylebone Road site and to maintain several of the LAQN sites as affiliate sites to the UK Automatic Urban and Rural Network (AURN). This Defra support assists the operation of the overall LAQN. Analysis of LAQN measurements has been augmented by measurements from directly-funded Defra sites in London. Measurements from Defra sites were provided by Ricardo Energy and Environment from the National Air Quality Archive and were included within the LAQN database. Transport for London has also funded monitoring to help assess the air pollution impacts of the Congestion Charging Scheme and Low Emission Zone and some sites have been funded by Business Improvement Districts (BIDs).

2 Air quality Strategy Objectives and EU Limit Values

There is ample evidence of the adverse health effects caused by air pollution (WHO, 2006). In response to these health impacts, the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland (Defra, 2008) sets out the UK’s way forward on air quality issues, details objectives to be achieved, and proposes measures to help reach them. These UK objectives largely reflect EU Limit Values (EC, 2008). The GLA and the London boroughs and district councils outside the capital have responsibilities for the management of air quality and must work towards the attainment of AQS objectives. The AQS Objectives and EU Limit Values are detailed in Table 1. Monitoring progress towards the attainment of these Objectives and Limit Values forms a core activity for the LAQN.

Pollutant	Concentration	Measured as	To be achieved by (UK)	To be achieved by (EU)
Carbon Monoxide (CO)	10.0 mg m ⁻³	Maximum daily running 8-hour mean	31 December 2003	1 January 2005
Nitrogen Dioxide (NO ₂)	200 µg m ⁻³ not to be exceeded more than 18 times a year	1-hour mean	31 December 2005	1 January 2010
Sulphur dioxide (SO ₂)	40 µg m ⁻³	Annual mean	31 December 2005	1 January 2010
	350 µg m ⁻³ , not to be exceeded more than 24 times a year	1-hour mean	31 December 2005	n/a
	125 µg m ⁻³ , not to be exceeded more than 3 times a year	24-hour mean	31 December 2004	1 January 2005
Ozone (O ₃)	266 µg m ⁻³ , not to be exceeded more than 35 times a year	15-minute mean	31 December 2005	1 January 2005
	100 µg m ⁻³ not to be exceeded more than 10 times a year	8 hourly running or hourly mean	31 December 2005	n/a
Ozone (O ₃)	Target of 120 µg/m ³ not to be exceeded more than 25 times a year averaged over 3 years		n/a	31 December 2010
Particles (PM ₁₀) (gravimetric)	50 µg m ⁻³ , not to be exceeded more than 35 times a year	Daily mean	31 December 2004	1 January 2005
Particles (PM _{2.5}) (gravimetric)	40 µg m ⁻³	Annual mean	31 December 2004	1 January 2005
	25 µg m ⁻³	Annual mean	2020	1 January 2015
	20% cut in urban background exposure	Annual mean	2010 - 2020	2010 - 2020

Table 1: AQS Objectives and EU Limit Values.

3 Results

The AQS Objective results measured at LAQN sites during 2018 are detailed in Tables 2 to 8.

Key to site types:

RU	=	Rural
S	=	Suburban
U	=	Urban background
R	=	Roadside
K	=	Kerbside
I	=	Industrial

Key to network and funding status

AA	=	Affiliated to UK AURN. Final data set published by DEFRA
A	=	AURN DEFRA funded. Final data set published by DEFRA
T	=	TfL funded
O	=	Other non local authority funding (annotated in brackets after site name)

All other instruments are funded by the respective local authorities

3.1 Carbon Monoxide

Site Name	Type	Capture Rate (%)	No occurrences of rolling 8hr mean $\geq 10\text{mgm}^{-3}$ (8.6ppm)	Achieved?
Kensington and Chelsea - North Ken ^{AA}	U	98	0	yes
Westminster - Marylebone Road ^{AA}	K	98	0	yes

Table 2: AQS Objective results for CO

Summary

- All sites achieved the CO rolling 8 hourly mean objective.
- Large reductions in CO over last 20 years with the introduction of catalytic converters on petrol vehicles.
- Small number of sites still measuring CO.

3.2 Nitrogen Dioxide

Site Name	Type	Capture Rate (%)	Annual Mean $\leq 40 \mu\text{g m}^{-3}$	Annual Mean Achieved?	No more than 18 occurrences of hourly mean $> 200 \mu\text{g m}^{-3}$ (104.7ppb)	Hourly Mean Achieved?
Barking and Dagenham - Rush Green	S	82	24	n/a	0	n/a
Barking and Dagenham - Scrattons Farm	S	93	26	yes	0	yes
Bexley - Belvedere	S	93	28	yes	0	yes
Bexley - Belvedere West	U	99	21	yes	0	yes
Bexley - Slade Green ^{AA}	S	99	23	yes	0	yes
Brent - ARK Franklin Primary Academy	R	96	46	no	0	yes
Brent - Ikea	R	90	71	no	1	yes
Brent - John Keble Primary School	R	100	39	yes	0	yes
Brent - Neasden Lane	I	98	39	yes	0	yes
Camden - Bloomsbury ^A	U	99	36	yes	0	yes
Camden - Euston Road	R	75	86	n/a	18	n/a
Camden - Holborn (Bee Midtown) ^D	K	69	67	n/a	0	n/a
Camden - Swiss Cottage ^{AA}	K	96	54	no	2	yes
Castle Point - Hadleigh	R	97	23	yes	0	yes
City of London - Beech Street	R	95	69	no	27	no
City of London - Sir John Cass School	U	97	32	yes	0	yes
City of London - Walbrook Wharf	R	99	87	no	37	no
Croydon - Norbury	K	100	49	no	0	yes
Croydon - Park Lane	R	100	41	no	0	yes
Croydon - Purley Way A23	R	100	31	yes	0	yes
Ealing - Acton Vale	U	100	29	yes	0	yes
Ealing - Hanger Lane Gyrotory	R	79	68	n/a	0	n/a
Ealing - Horn Lane	I	98	44	no	0	yes
Ealing - Western Avenue	R	67	53	n/a	0	n/a
Enfield - Bowes Primary School	R	99	44	no	0	yes
Enfield - Bush Hill Park	S	100	26	yes	0	yes
Enfield - Derby Road	R	99	35	yes	0	yes
Enfield - Prince of Wales School	U	98	23	yes	0	yes
Greenwich - A206 Burrage Grove	R	100	35	yes	0	yes
Greenwich - Blackheath	R	100	35	yes	0	yes
Greenwich - Eltham ^{AA}	S	96	16	yes	0	yes
Greenwich - Falconwood	R	99	39	yes	0	yes
Greenwich - Fiveways Sidcup Rd A20	R	99	40	yes	0	yes
Greenwich - John Harrison Way	R	43	34	n/a	0	n/a
Greenwich - Plumstead High Street	R	100	33	yes	0	yes
Greenwich - Trafalgar Road (Hoskins St)	R	98	43	no	1	yes
Greenwich - Westthorne Avenue	R	97	38	yes	0	yes
Greenwich - Woolwich Flyover	R	96	57	no	0	yes
Hackney - Old Street ^T	R	99	50	no	0	yes
Haringey - Priory Park South ^{AA}	U	99	23	yes	0	yes
Haringey - Haringey Town Hall ^{AA}	R	100	39	yes	0	yes
Harrow - Pinner Road	R	100	39	yes	0	yes
Harrow - Stanmore	U	57	20	n/a	0	n/a

Site Name	Type	Capture Rate (%)	Annual Mean <= 40 ug ^m ⁻³	Annual Mean Achieved?	No more than 18 occurrences of hourly mean > 200ug ^m ⁻³ (104.7ppb)	Hourly Mean Achieved?
Havering - Rainham	R	100	30	yes	0	yes
Havering - Romford	R	84	38	n/a	0	n/a
Hillingdon - Keats Way ^A	S	93	46	no	0	yes
Islington - Arsenal	U	98	27	yes	0	yes
Islington - Holloway Road	R	100	47	no	0	yes
Kensington and Chelsea - North Ken ^{AA}	U	75	27	n/a	0	n/a
Kingston Upon Thames - Cromwell Road	R	73	55	n/a	1	n/a
Kingston Upon Thames - Kingston Vale	R	80	36	n/a	0	n/a
Kingston Upon Thames - Tolworth Broadway	R	96	44	no	0	yes
Lambeth - Bondway Interchange	I	99	54	no	0	yes
Lambeth - Brixton Road	K	65	99	n/a	83	no
Lambeth - Streatham Green	U	99	34	yes	0	yes
Lewisham - Catford	U	99	37	yes	0	yes
Lewisham - Loampit Vale	R	99	46	no	0	yes
Lewisham - New Cross	R	96	42	no	0	yes
Merton - Morden Civic Centre 2	R	100	48	no	0	yes
Redbridge - Gardner Close	R	94	37	yes	0	yes
Redbridge - Ley Street	U	97	31	yes	0	yes
Reigate and Banstead - A23 Hooley	R	28	52	n/a	0	n/a
Reigate and Banstead - Horley ^{AA}	S	87	20	n/a	0	n/a
Reigate and Banstead - Horley South East	S	98	25	yes	0	yes
Reigate and Banstead - Poles Lane	RU	99	16	yes	0	yes
Richmond Upon Thames - Barnes Wetlands	S	97	20	yes	0	yes
Richmond Upon Thames - Castelnau	R	99	31	yes	0	yes
Richmond Upon Thames - Chertsey Road (high level)	R	94	34	yes	0	yes
Richmond Upon Thames - Chertsey Road (low level)	R	93	36	yes	0	yes
Sevenoaks - Bat and Ball	R	99	25	yes	0	yes
Sevenoaks - Greatness Park	U	99	15	yes	0	yes
Southwark - A2 Old Kent Road ^{AA}	R	85	41	n/a	0	n/a
Southwark - Elephant and Castle	U	99	32	yes	0	yes
Sutton - Beddington Lane	I	96	25	yes	0	yes
Sutton - Beddington Lane north	I	96	29	yes	0	yes
Sutton - Wallington	K	99	47	no	0	yes
Sutton - Worcester Park	K	100	52	no	7	yes
Thurrock - Calcutta Road Tilbury	R	98	30	yes	0	yes
Thurrock - London Road (Grays) ^A	U	97	25	yes	0	yes
Thurrock - London Road (Purfleet)	R	97	52	no	0	yes
Thurrock - Stanford-le-Hope ^{AA}	R	99	28	yes	0	yes
Tower Hamlets – Blackwall ^T	R	99	51	no	0	yes
Tower Hamlets - Mile End Road ^{AA}	R	96	47	no	0	yes
Wandsworth - Battersea	R	65	34	n/a	0	n/a

Site Name	Type	Capture Rate (%)	Annual Mean $\leq 40 \mu\text{g m}^{-3}$	Annual Mean Achieved?	No more than 18 occurrences of hourly mean $> 200 \mu\text{g m}^{-3}$ (104.7ppb)	Hourly Mean Achieved?
Wandsworth - Lavender Hill (Clapham Jct)	R	94	42	no	0	yes
Wandsworth - Putney	U	87	35	n/a	0	n/a
Wandsworth - Putney High Street	K	90	68	no	26	no
Wandsworth - Putney High Street Facade	R	86	62	n/a	5	n/a
Wandsworth - Tooting High Street	R	91	53	no	2	yes
Wandsworth - Wandsworth Town Hall	U	97	38	yes	0	yes
Westminster - Buckingham Palace Road	R	85	52	n/a	1	n/a
Westminster - Cavendish Square	R	57	57	n/a	0	n/a
Westminster - Covent Garden	U	99	39	yes	0	yes
Westminster - Horseferry Road ^A	U	97	31	yes	0	yes
Westminster - Marylebone Road ^{AA}	K	98	85	no	29	no
Westminster - Oxford Street	K	87	63	n/a	3	n/a
Westminster - Oxford Street East	R	54	68	n/a	11	n/a
Westminster - Strand (Northbank BID) ^O	R	95	88	no	34	no
Windsor and Maidenhead - Aldebury Road	U	96	18	yes	0	yes
Windsor and Maidenhead - Clarence Road	R	99	34	yes	0	yes
Windsor and Maidenhead - Frascati Way	R	99	36	yes	0	yes

Table 3: AQS Objective results for NO₂

NO₂ ppbV measurements have been converted to $\mu\text{g m}^{-3}$ by multiplying by 1.9125 as recommended in Defra's Local Air Quality Management Technical Guidance (Defra, 2016).

Summary

- 79 sites achieved the 90% data capture requirement.
- 50 of these sites achieved the annual mean objective for nitrogen dioxide (NO₂) of not exceeding 40 $\mu\text{g m}^{-3}$.
- 29 of the 79 sites did not achieve the annual mean objective.
- Three of these sites recorded an annual mean of twice the legal limit or above.
- 65 sites achieved the hourly mean objective of no more than 18 occurrences of an hourly mean greater than 200 $\mu\text{g m}^{-3}$.
- Six sites exceeded the hourly mean objective for NO₂.
- This is a further improvement compared to 2017. A smaller proportion of sites (37%) exceeded the annual mean objective in 2018 compared to 41% in 2017 and 55% in 2016. Six sites exceeded the hourly mean objective in 2018 compared to 9 sites in 2017 and 24 sites in 2016. The number of hourly exceedences fell at many sites.
- The main source of NO₂ in London is diesel traffic emissions.

3.3 Nitrogen Oxides

Site Name	Type	Capture Rate (%)	Annual Mean NO _x as NO ₂ ug m ⁻³
Barking and Dagenham - Rush Green	S	82	37
Barking and Dagenham - Scrattons Farm	S	93	41
Bexley - Belvedere	S	93	39
Bexley - Belvedere West	U	99	30
Bexley - Slade Green ^{AA}	S	99	36
Brent - ARK Franklin Primary Academy	R	96	93
Brent - Ikea	R	90	199
Brent - John Keble Primary School	R	100	68
Brent - Neasden Lane	I	98	79
Camden – Bloomsbury ^A	U	99	54
Camden - Euston Road	R	75	248
Camden - Holborn (Bee Midtown) ^O	K	69	162
Camden - Swiss Cottage ^{AA}	K	96	127
Castle Point - Hadleigh	R	97	37
City of London - Beech Street	R	95	183
City of London - Sir John Cass School	U	97	49
City of London - Walbrook Wharf	R	99	234
Croydon - Norbury	K	100	128
Croydon - Park Lane	R	100	101
Croydon - Purley Way A23	R	100	70
Ealing - Acton Vale	U	100	44
Ealing - Hanger Lane Gyratory	R	79	240
Ealing - Horn Lane	I	98	91
Ealing - Western Avenue	R	67	133
Enfield - Bowes Primary School	R	99	94
Enfield - Bush Hill Park	S	100	37
Enfield - Derby Road	R	99	77
Enfield - Prince of Wales School	U	98	42
Greenwich - A206 Burrage Grove	R	100	59
Greenwich - Blackheath	R	100	72
Greenwich – Eltham ^{AA}	S	96	24
Greenwich - Falconwood	R	99	79
Greenwich - Fiveways Sidcup Rd A20	R	99	99
Greenwich - John Harrison Way	R	43	63
Greenwich - Plumstead High Street	R	100	64
Greenwich - Trafalgar Road (Hoskins St)	R	98	88
Greenwich - Westthorne Avenue	R	97	76
Greenwich - Woolwich Flyover	R	96	166
Hackney - Old Street ^T	R	99	109
Haringey - Priory Park South ^{AA}	U	99	32
Haringey - Haringey Town Hall ^{AA}	R	100	74
Harrow - Pinner Road	R	100	86
Harrow - Stanmore	U	57	28
Havering - Rainham	R	100	55
Havering - Romford	R	84	79

Site Name	Type	Capture Rate (%)	Annual Mean NO _x as NO ₂ µg m ⁻³
Hillingdon - Keats Way ^A	S	93	88
Islington - Arsenal	U	98	39
Islington - Holloway Road	R	100	111
Kensington and Chelsea - North Ken ^{AA}	U	75	41
Kingston Upon Thames - Cromwell Road	R	73	140
Kingston Upon Thames - Kingston Vale	R	80	77
Kingston Upon Thames - Tolworth Broadway	R	96	97
Lambeth - Bondway Interchange	I	99	112
Lambeth - Brixton Road	K	65	247
Lambeth - Streatham Green	U	99	55
Lewisham - Catford	U	99	67
Lewisham - Loampit Vale	R	99	99
Lewisham - New Cross	R	96	86
Merton - Morden Civic Centre 2	R	100	113
Redbridge - Gardner Close	R	94	72
Redbridge - Ley Street	U	97	53
Reigate and Banstead - A23 Hooley	R	28	135
Reigate and Banstead - Horley ^{AA}	S	87	30
Reigate and Banstead - Horley South East	S	98	39
Reigate and Banstead - Poles Lane	RU	99	20
Richmond Upon Thames - Barnes Wetlands	S	97	28
Richmond Upon Thames - Castelnau	R	99	56
Richmond Upon Thames - Chertsey Road (high level)	R	94	73
Richmond Upon Thames - Chertsey Road (low level)	R	93	69
Sevenoaks - Bat and Ball	R	99	50
Sevenoaks - Greatness Park	U	99	22
Southwark - A2 Old Kent Road ^{AA}	R	85	87
Southwark - Elephant and Castle	U	99	46
Sutton - Beddington Lane	I	96	41
Sutton - Beddington Lane north	I	96	50
Sutton - Wallington	K	99	109
Sutton - Worcester Park	K	100	120
Thurrock - Calcutta Road Tilbury	R	98	56
Thurrock - London Road (Grays) ^A	U	97	41
Thurrock - London Road (Purfleet)	R	97	149
Thurrock - Stanford-le-Hope ^{AA}	R	99	54
Tower Hamlets – Blackwall ^T	R	99	115
Tower Hamlets - Mile End Road ^{AA}	R	96	101
Wandsworth - Battersea	R	65	64
Wandsworth - Lavender Hill (Clapham Jct)	R	94	81
Wandsworth - Putney	U	87	51
Wandsworth - Putney High Street	K	90	172
Wandsworth - Putney High Street Facade	R	86	145
Wandsworth - Tooting High Street	R	91	117
Wandsworth - Wandsworth Town Hall	U	97	66

Site Name	Type	Capture Rate (%)	Annual Mean NO _x as NO ₂ µgm ⁻³
Westminster - Buckingham Palace Road	R	85	108
Westminster - Cavendish Square	R	57	127
Westminster - Covent Garden	U	99	56
Westminster - Horseferry Road ^A	U	97	48
Westminster - Marylebone Road ^{AA}	K	98	241
Westminster - Oxford Street	K	87	189
Westminster - Oxford Street East	R	54	153
Westminster - Strand (Northbank BID) ^O	R	95	218
Windsor and Maidenhead - Aldebury Road	U	96	28
Windsor and Maidenhead - Clarence Road	R	99	68
Windsor and Maidenhead - Frascati Way	R	99	76

Table 4: Annual Mean values for NO_x

NO_x ppbV measurements have been converted to µgm⁻³ by multiplying by 1.9125 as recommended in Defra’s Local Air Quality Management Technical Guidance (Defra, 2016).

3.4 Ozone

Site Name	Type	Capture Rate (%)	No more than 10 days where maximum rolling 8hr mean $\geq 100 \mu\text{g}\text{m}^{-3}$ (50ppb)	Achieved?
Bexley - Belvedere West	U	99	34	no
Bexley - Slade Green	S	100	30	no
Brent – Ikea ^T	R	99	0	yes
Camden - Bloomsbury ^A	U	98	11	no
Greenwich - Eltham ^{AA}	S	100	26	no
Greenwich - Falconwood	R	99	5	yes
Greenwich - Plumstead High Street	R	100	0	yes
Greenwich - Westhorne Avenue ^T	R	97	3	yes
Greenwich - Woolwich Flyover ^T	R	99	2	yes
Hackney - Old Street ^T	R	99	5	yes
Haringey - Priory Park South ^{AA}	U	95	23	no
Hillingdon - Keats Way ^A	S	98	12	no
Kensington and Chelsea - North Ken ^{AA}	U	98	29	no
Redbridge - Ley Street	U	89	19	no
Reigate and Banstead - Poles Lane	RU	97	41	no
Richmond Upon Thames - Barnes Wetlands	S	100	32	no
Sevenoaks - Greatness Park	U	83	52	no
Southwark - Elephant and Castle	U	99	11	no
Thurrock - London Road (Grays) ^A	U	96	18	no
Tower Hamlets – Blackwall ^T	R	99	2	yes
Westminster - Marylebone Road ^{AA}	K	99	1	yes

Table 5: AQS Objective results for O₃

O₃ ppbV measurements have been converted to $\mu\text{g}\text{m}^{-3}$ by multiplying by 1.9957.

Summary

- 8 sites out of 19 which achieved the 90% data capture requirement achieved the 8 hourly mean AQS objective for O₃ of no more than ten days measuring a daily mean greater than or equal to $100\mu\text{g}\text{m}^{-3}$.
- 13 sites exceeded the objective, including ten in urban background or suburban locations in London, one urban background site in Essex, one in Kent and one rural site in Surrey. This is an increase in sites exceeding the objective compared to 2017, particularly in London. There was also a large increase in the number of exceedance days at all sites compared to 2017.
- O₃ is a regional pollutant. It is greater away from busy roads as it is scavenged by NO_x from traffic. The higher number of exceedance days across London could be partly a result of the reduction in NO_x concentrations. Summer 2018 was also hotter and sunnier than average with long periods of heatwave conditions which lead to increased ozone concentrations.

3.5 Sulphur Dioxide

Site Name	Type	Capture Rate (%)	No more than 35 occurrences of 15min mean $\geq 350 \mu\text{g}\text{m}^{-3}$ (100ppb)	Achieved?
Barking and Dagenham - Rush Green	S	78	0	n/a
Bexley - Slade Green	S	99	0	yes
Camden - Bloomsbury ^A	U	78	0	n/a
Enfield - Derby Road	R	57	0	n/a
Greenwich - Eltham	S	100	0	yes
Kensington and Chelsea - North Ken ^{AA}	U	72	0	n/a
Lambeth - Bondway Interchange	I	93	0	yes
Thurrock - London Road (Grays) ^A	U	96	0	yes
Westminster - Marylebone Road ^{AA}	K	92	0	yes

Table 6: AQS Objective results for SO₂

SO₂ ppbV measurements have been converted to $\mu\text{g}\text{m}^{-3}$ by multiplying by 2.6609 as recommended in Defra's Local Air Quality Management Technical Guidance (Defra, 2016).

Summary

- All five sites that achieved the 90% data capture requirement achieved the AQS objective of no more than 35 occurrences of 15 minute mean greater than 350 $\mu\text{g}\text{m}^{-3}$ for SO₂.
- No 15 minute mean SO₂ measurements greater than 350 $\mu\text{g}\text{m}^{-3}$ were recorded at any LAQN site.
- The 15 minute mean objective is the most stringent of the current AQS objectives for SO₂.
- The WHO Guidelines (WHO, 2006) recommended a significant reduction in the maximum daily mean concentration from the current 125 $\mu\text{g}\text{m}^{-3}$ to an eventual 20 $\mu\text{g}\text{m}^{-3}$. No sites in London exceeded this target in 2018. Although the number of sites measuring SO₂ has decreased, this represents a further improvement in SO₂ concentrations compared to preceding years when one or two sites have exceeded the guideline. The highest daily mean SO₂ concentration at Westminster – Marylebone Road was 14 $\mu\text{g}\text{m}^{-3}$ in 2018 compared to 22 $\mu\text{g}\text{m}^{-3}$ in 2017.

3.6 Particulate Matter PM₁₀

Site Name	Type	Capture Rate (%)	Annual Mean <= 40 ug ^m - ³	Annual Mean Achieved?	No more than 35 occurrences of daily mean >= 50ug ^m - ³	Daily Mean Achieved?
Barking and Dagenham - Scrattons Farm	S	57	19	n/a	0	n/a
Bexley - Belvedere	S	99	19	yes	3	yes
Bexley - Belvedere FDMS	S	89	19	n/a	7	n/a
Bexley - Belvedere West	U	99	19	yes	3	yes
Bexley - Belvedere West FDMS	U	98	15	yes	1	yes
Bexley - Slade Green	S	97	18	yes	1	yes
Brent - ARK Franklin Primary Academy	R	88	19	n/a	1	n/a
Brent - Ikea	R	99	32	yes	37	no
Brent - John Keble Primary School	R	84	20	n/a	1	n/a
Brent - Neasden Lane	I	99	28	yes	22	yes
Camden – Bloomsbury ^A	U	88	17	n/a	1	n/a
Camden - Coopers Lane	I	96	15	yes	1	yes
Camden - Euston Road	R	57	21	n/a	2	n/a
Camden - Swiss Cottage ^{AA}	K	97	21	yes	4	yes
City of London - Beech Street	R	96	25	yes	9	yes
City of London - Sir John Cass School	U	97	21	yes	3	yes
City of London - Upper Thames Street	R	92	32	yes	25	yes
Croydon - Park Lane	R	92	21	yes	1	yes
Ealing - Acton Vale	U	93	19	yes	2	yes
Ealing - Hanger Lane Gyratory	R	87	28	n/a	12	n/a
Ealing - Horn Lane FDMS ^{AA}	I	99	25	yes	7	yes
Ealing - Horn Lane TEOM	I	100	26	yes	6	yes
Ealing - Western Avenue	R	98	28	yes	14	yes
Enfield - Bowes Primary School	R	88	18	n/a	2	n/a
Greenwich - A206 Burrage Grove	R	99	18	yes	3	yes
Greenwich - Blackheath	R	98	22	yes	5	yes
Greenwich - Eltham	S	34	17	n/a	1	n/a
Greenwich - Falconwood	R	99	21	yes	2	yes
Greenwich - Fiveways Sidcup Rd A20	R	70	25	n/a	10	n/a
Greenwich - John Harrison Way	R	49	15	n/a	0	n/a
Greenwich - Plumstead High Street	R	99	18	yes	1	yes
Greenwich - Trafalgar Road (Hoskins St)	R	99	22	yes	4	yes
Greenwich - Westhorpe Avenue	R	97	18	yes	4	yes
Greenwich - Woolwich Flyover	R	100	25	yes	6	yes
Hackney - Old Street ^T	R	89	22	n/a	2	n/a
Harrow - Pinner Road	R	100	19	yes	1	yes
Harrow - Stanmore	U	56	15	n/a	0	n/a
Havering - Rainham	R	98	17	yes	1	yes
Havering - Romford	R	97	20	yes	2	yes
Hillingdon - Harlington	U	97	15	yes	1	yes
Islington - Arsenal	U	99	19	yes	1	yes
Islington - Holloway Road	R	99	20	yes	2	yes

Site Name	Type	Capture Rate (%)	Annual Mean <= 40 ug ^m - ³	Annual Mean Achieved?	No more than 35 occurrences of daily mean >= 50ug ^m - ³	Daily Mean Achieved?
Kensington and Chelsea - North Ken FDMS ^{AA}	U	100	14	yes	1	yes
Kensington and Chelsea - North Ken FIDAS	U	100	14	yes	1	yes
Kingston Upon Thames - Cromwell Road	R	70	30	n/a	15	n/a
Kingston Upon Thames - Kingston Vale	R	80	22	n/a	2	n/a
Kingston Upon Thames - Tolworth Broadway	R	97	23	yes	2	yes
Lambeth - Bondway Interchange	I	99	34	yes	45	no
Lambeth - Brixton Road	K	62	30	n/a	13	n/a
Lambeth - Streatham Green	U	99	20	yes	3	yes
Lewisham - Honor Oak Park	U	9	13	n/a	0	n/a
Lewisham - Loampit Vale	R	97	19	yes	1	yes
Lewisham - Mercury Way	I	2	25	n/a	0	n/a
Lewisham - New Cross	R	96	21	yes	3	yes
Merton - Merton Road	R	52	32	n/a	13	n/a
Redbridge - Gardner Close	R	95	18	yes	1	yes
Redbridge - Ley Street	U	87	18	n/a	1	n/a
Reigate and Banstead - Horley	S	99	17	yes	0	yes
Reigate and Banstead - Horley FDMS	S	99	14	yes	1	yes
Richmond Upon Thames - Barnes Wetlands	S	95	14	yes	1	yes
Richmond Upon Thames - Castelnau	R	99	17	yes	1	yes
Richmond Upon Thames - Chertsey Road	R	94	21	yes	1	yes
Sevenoaks - Bat and Ball	R	99	22	yes	8	yes
Sevenoaks - Greatness Park	U	99	19	yes	1	yes
Sevenoaks - Sevenoaks Quarry	I	35	24	n/a	8	n/a
Southwark - A2 Old Kent Road ^{AA}	R	81	22	n/a	8	n/a
Southwark - Elephant and Castle	U	98	20	yes	2	yes
Sutton - Beddington Lane	I	98	22	yes	7	yes
Sutton - Beddington Lane north	I	98	22	yes	2	yes
Sutton - Wallington	K	98	23	yes	4	yes
Sutton - Worcester Park	K	99	20	yes	2	yes
Thurrock - London Road (Grays) ^A	U	94	19	yes	4	yes
Thurrock - London Road (Purfleet)	R	98	27	yes	14	yes
Thurrock - Stanford-le-Hope ^{AA}	R	81	18	n/a	3	n/a
Tower Hamlets – Blackwall ^T	R	93	24	yes	10	yes
Wandsworth - Battersea	R	99	25	yes	10	yes
Wandsworth - Lavender Hill (Clapham Jct)	R	99	21	yes	3	yes
Wandsworth - Putney	U	95	17	yes	1	yes
Wandsworth - Putney High Street	K	96	25	yes	3	yes
Wandsworth - Tooting High Street	R	97	23	yes	3	yes
Westminster - Cavendish Square	R	58	26	n/a	3	n/a
Westminster - Horseferry Road	U	97	17	yes	1	yes
Westminster - Marylebone Road TEOM	K	99	26	yes	5	yes
Westminster - Marylebone Road FDMS ^{AA}	K	97	24	yes	7	yes

Site Name	Type	Capture Rate (%)	Annual Mean \leq 40 $\mu\text{g}\text{m}^{-3}$	Annual Mean Achieved?	No more than 35 occurrences of daily mean \geq 50 $\mu\text{g}\text{m}^{-3}$	Daily Mean Achieved?
Westminster - Oxford Street	K	43	27	n/a	3	n/a
Westminster - Oxford Street East	R	51	26	n/a	1	n/a
Windsor and Maidenhead - Frascati Way	R	95	23	yes	2	yes

Table 7: AQS Objective results for PM₁₀.

All PM₁₀ measurements have been converted to reference equivalent by the methods recommended in Defra’s Local Air Quality Management Technical Guidance (Defra, 2016), i.e. TEOM measurements have been corrected using the Volatile Correction Model (VCM) and heated and unheated BAM measurements have been corrected using the divisors 1.2 and 1.035 respectively.

Summary

- All of the 62 sites that achieved the 90% data capture requirement met the annual mean AQS objective of 40 $\mu\text{g}\text{m}^{-3}$ for PM₁₀.
- Two sites did not meet the daily mean objective of no more than 35 days with a daily mean greater than 50 $\mu\text{g}\text{m}^{-3}$.
- Half of the sites that achieved the 90% data capture requirement (31) achieved the WHO guideline value of 20 $\mu\text{g}\text{m}^{-3}$ as an annual mean (WHO, 2006).

3.7 Particulate Matter PM_{2.5}

Site Name	Type	Instrument	Capture Rate (%)	Annual Mean ug ^m - ³
Bexley – Belvedere	S	TEOM*	99	8
Bexley - Belvedere West	U	TEOM*	99	8
Bexley - Slade Green ^{AA}	S	FDMS	99	12
Bexley – Thamesmead	S	TEOM*	19	8
Brent - ARK Franklin Primary Academy	R	TEOM*	97	8
Brent – Ikea ^T	R	TEOM*	99	12
Camden - Bloomsbury ^A	U	FDMS	92	10
Camden - Euston Road	R	FDMS	54	15
Camden - Swiss Cottage ^{AA}	K	FDMS	88	11
City of London - Farringdon Street	K	BAMH	92	16
City of London - Sir John Cass School	U	BAMH	91	12
Croydon - Norbury Manor	U	BAMH	94	12
Greenwich - A206 Burrage Grove	R	FDMS	97	13
Greenwich - Eltham ^{AA}	S	FDMS	83	10
Greenwich - Falconwood FDMS	R	FDMS	96	13
Greenwich - John Harrison Way	R	FDMS	49	10
Greenwich - Plumstead High Street	R	FDMS	99	13
Greenwich - Trafalgar Road (Hoskins St)	R	TEOM*	99	9
Greenwich - Westhorpe Avenue	R	FDMS	100	11
Greenwich - Woolwich Flyover ^T	R	TEOM*	100	12
Hackney - Old Street ^T	R	TEOM*	83	10
Havering - Rainham	R	FDMS	98	11
Hillingdon - Harlington ^A	U	FDMS	97	9
Kensington and Chelsea - North Ken FDMS ^{AA}	U	FDMS	75	9
Kensington and Chelsea - North Ken FIDAS	U	FIDAS	100	9
Lewisham - New Cross	R	FDMS	84	15
London Teddington Bushy Park	S	FDMS	95	11
Marylebone Rd - Partisol PM10 and Magee	K	GRAV	67	12
Redbridge - Gardner Close	R	BAM	90	15
Redbridge - Ley Street	U	BAMH	20	12
Sutton - Beddington Lane north	I	BAMH	97	12
Thurrock - Stanford-le-Hope ^{AA}	R	BAMH	98	10
Tower Hamlets – Blackwall ^T	R	FDMS	83	13
Westminster - Marylebone Road FDMS ^{AA}	K	FDMS	90	16

Table 8: Annual mean results for PM_{2.5}

FIDAS measurements have been corrected using the divisor 1.06, as recommended in in Defra’s Local Air Quality Management Technical Guidance (Defra, 2016). Instruments marked with a * are not considered a reference equivalent measurement method and do not currently have an agreed correction method.

Summary

- All 16 sites with data capture of 90% or more that used a reference equivalent measurement method achieved the EU limit value of $25 \mu\text{g m}^{-3}$ as an annual mean.
- Four sites with a data capture of 90% or more that used a reference equivalent measurement method achieved the WHO guideline value of $10 \mu\text{g m}^{-3}$ (WHO, 2006) which is an increase from one site in 2017.

4 References

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