The Royal Borough of Kensington & Chelsea
Air Quality Annual Status Report for 2018
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This report provides a detailed overview of air quality in Kensington and Chelsea during 2018. 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

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Abbreviations

AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BEB	Buildings Emission Benchmark
CAB	Cleaner Air Borough
CAZ	Central Activity Zone
EV	Electric Vehicle
GLA	Greater London Authority
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LLAQM	London Local Air Quality Management
NRMM	Non-Road Mobile Machinery
PM$_{10}$	Particulate matter less than 10 micron in diameter
PM$_{2.5}$	Particulate matter less than 2.5 micron in diameter
TEB	Transport Emissions Benchmark
TfL	Transport for London

Table A.   **Summary of National Air Quality Standards and Objectives**

Pollutant	Objective (UK)	Averaging Period	Date[1]
Nitrogen dioxide - NO_2	200 μg m^{-3} not to be exceeded more than 18 times a year	1-hour mean	31 Dec 2005
	40 μg m^{-3}	Annual mean	31 Dec 2005
Particles - PM_{10}	50 μg m^{-3} not to be exceeded more than 35 times a year	24-hour mean	31 Dec 2004
	40 μg m^{-3}	Annual mean	31 Dec 2004
Particles - $PM_{2.5}$	25 μg 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 μg m^{-3} not to be exceeded more than 35 times a year	15 minute mean	31 Dec 2005
	350 μg m^{-3} not to be exceeded more than 24 times a year	1 hour mean	31 Dec 2004
	125 μg 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

Figure A.   AQMA Boundary (entire boundary)
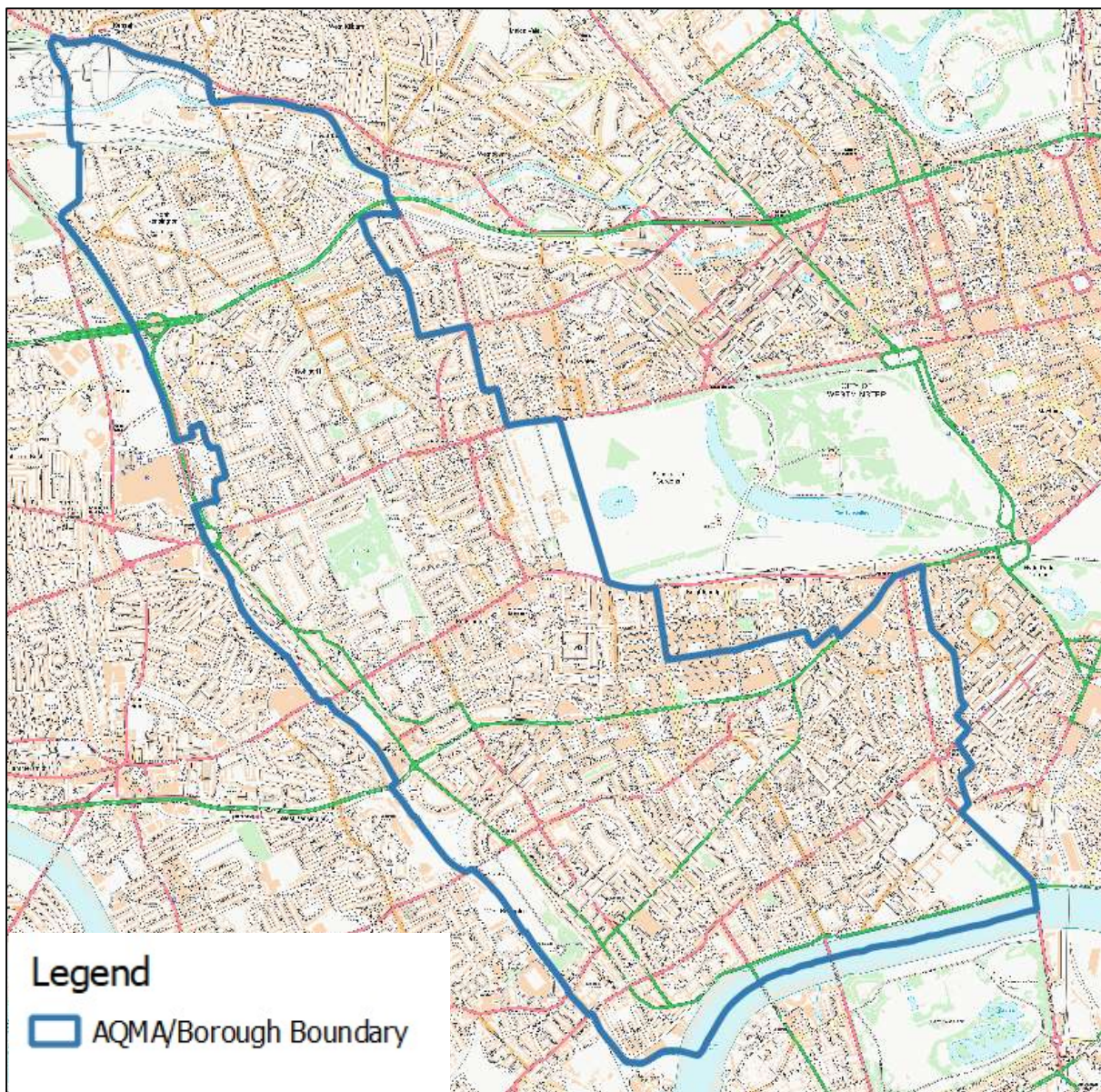
1. Air Quality Monitoring

1.1 Locations

Table B. Details of Automatic Monitoring Sites for 2018

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
KC1	North Kensington	524045	181752	Urban Background, LAQN & AURN affiliate site	Y	10	8m to St Charles Square	3	NO_2, CO, PM_{10}, $PM_{2.5}$, SO_2, O_3	Chemiluminescent, FIDAS, GFC, Fluorescence UV, Photometric
KC2	Cromwell Road	526522	178965	Roadside	Y	10	4m to Cromwell Road and 5m to Queens Gate	2	NO_2, PM_{10}	Chemiluminescent, FDMS
KC3	Knightsbridge	527516	179395	Kerbside	Y	1	1.5m to Hans Road, 4m from Brompton Road	3	NO_2	Chemiluminescent
KC4	Kings Road Chelsea	527267	178089	Roadside	Y	14	8m from Kings Road	3	NO_2	Chemiluminescent
KC5	Earls Court	525700	178357	Kerbside	Y	1	0.5m to Earls Court Road	2	NO_2, PM_{10}	Chemiluminescent BAM 1020 Heated

Note: In previous ASRs $PM_{2.5}$ was also reported at KC2, the FDMS monitor was removed from this monitoring site on the 27th of October 2017.

Figure B.   Automatic Monitoring Sites
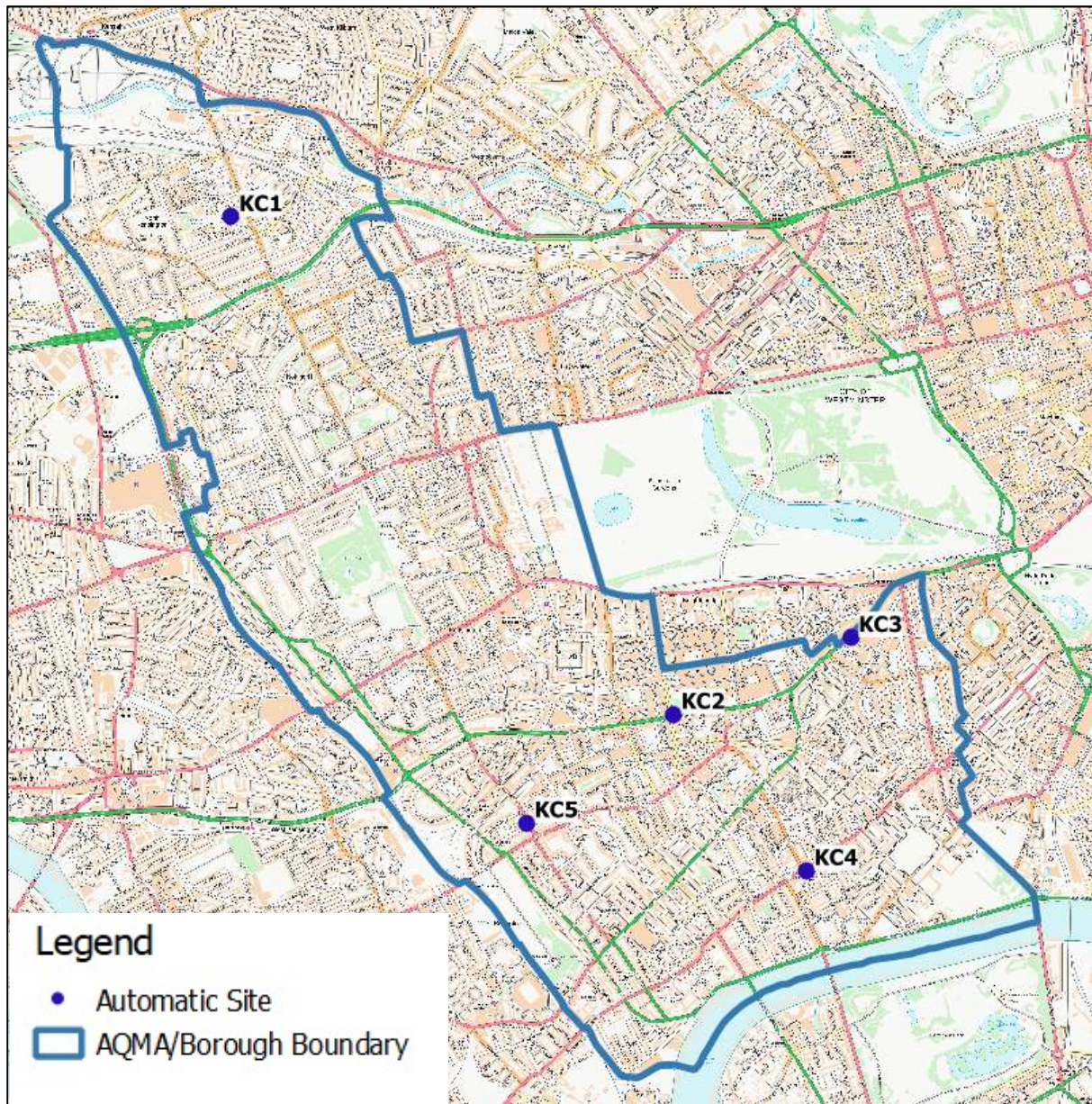
Table C.   Details of Non-Automatic Monitoring Sites for 2018

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	Tube co-located with an automatic monitor? (Y/N)
KC31	Ladbroke Grove/North Kensington Library	524342	181271	Roadside	Y	6	3.5	5	NO$_2$	N
KC32	Holland Park	524784	179599	Urban Background	Y	5	380	4	NO$_2$	N
KC33	Cromwell Rd/ Earls Court Rd	525355	178841	Roadside	Y	1	1.1	2.1	NO$_2$	N
KC34	Dovehouse Street	527164	178103	Urban Centre	Y	30	26	2.8	NO$_2$	N
KC35	Brompton Road/ Cottage Place	527192	179185	Roadside	Y	40	8	1.5	NO$_2$	N
KC38	Earls Court Station	525548	178556	Roadside	Y	1	1.7	2.7	NO$_2$	N
KC39	Lots Road/ Upcerne Road	526317	177022	Roadside	Y	30	8.1	2.5	NO$_2$	N
KC40	Brompton Road	527214	179153	Urban Centre	Y	20	65	2.7	NO$_2$	N

KC41	Ladbroke Crescent	524294	181200	Urban Background	Y	8	70	2.2	NO$_2$	N
KC42	Pembridge Square Library	525191	180705	Roadside	Y	9	6	3.1	NO$_2$	N
KC43	St Marks Grove	525950	177487	Urban Background	Y	12	38	2.3	NO$_2$	N
KC44	Donne Place	527335	178810	Urban Background	Y	15	55	2.4	NO$_2$	N
KC45	Chatsworth Court	525263	178936	Roadside	Y	13	13	2	NO$_2$	N
KC47	Sion Manning School	524046	181758	Urban Background	Y	10	8.5	2.1	NO$_2$	Y -Triplicate
KC48	Sloane Square	528011	178675	Roadside	Y	1	7	3	NO$_2$	N
KC49	Harrods	527516	179395	Urban Centre	Y	1	4	2.5	NO$_2$	Y
KC50	Chelsea Physic Garden (Gate)	527726	177727	Roadside	Y	1	4	2.9	NO$_2$	N
KC51	Chelsea Physic Garden (Met Station)	527690	177800	Urban Background	Y	3	92	1.5	NO$_2$	N
KC52	Sloane Avenue	527411	178659	Roadside	Y	5	2.6	2.4	NO$_2$	N

KC53	Walmer House	523792	181189	Urban Background	Y	20	12.5	2.3	NO_2	N
KC54	Cromwell Rd/ Natural History Museum	526522	178968	Roadside	Y	10	3.1	2.6	NO_2	Y - Triplicate
KC55	Blantyre St	526608	177429	Urban Background	Y	20	100	3	NO_2	N
KC56	Chelsea Old Town Hall	527268	178089	Roadside	Y	14	9	3.1	NO_2	Y
KC57	Pavilion St/ Sloane Ave	527889	179145	Roadside	Y	25	3	2.4	NO_2	N
KC58	Kensington H St/Kensington Church St	525630	179674	Roadside	Y	1	13	2.7	NO_2	N
KC59	Kensington High St/Argyll St	525342	179464	Kerbside	Y	1	0.7	2.5	NO_2	N
KC60	Old Brompton Rd/ Draycott Ave	526231	178425	Kerbside	Y	8	0.7	2.5	NO_2	N
KC61	Fulham Rd/Limerston St	526377	177867	Roadside	Y	20	10	2.4	NO_2	N
KC64	Warwick Road	524825	178902	Roadside	Y	8	3.5	2.6	NO_2	N
KC65	Barlby Road	523899	182113	Roadside	Y	20	0.5	2.5	NO_2	N

KC66	Acklam Road	524541	181893	Railway	Y	18	16	2.5	NO_2	N
KC67	Southern Row	524056	182148	Railway	Y	55	38	2.5	NO_2	N
KC68	Exhibition Road	526863	179060	Kerbside	Y	0.5	0.5	2.1	NO_2	N
KC69	Darfield Way	523587	180893	Urban Background	Y	2	11.7	2.0	NO_2	N
KC70	Oakley Street	527170	177982	Kerbside	Y	4	0.5	2.0	NO_2	N
KC71	Oakley Street	527267	177811	Kerbside	Y	5	0.5	2.0	NO_2	N
KC72	Oakley Street	527329	177718	Kerbside	Y	4.5	0.5	2.0	NO_2	N
KC73	Oakley Street	527229	177917	Kerbside	Y	4.5	0.5	2.0	NO_2	N
KC01	Ladbroke Grove/Nth Ken Library	524342	181271	Roadside	Y	6	3.5	5.5	C_6H_6	N
KC02	Holland Park	524784	179599	Urban Background	Y	5	380	4	C_6H_6	N
KC04	Dovehouse Street	527111	178165	Urban Background	Y	30	45	2.2	C_6H_6	N
KC05	Pembridge Square Library	525191	180705	Roadside	Y	9	6	4	C_6H_6	N
KC06	Old Brompton Rd/ Clareville Grove Petrol St	526496	178553	Petrol station	Y	3	12	N/A	C_6H_6	N

During 2018 an additional four NO_2 diffusion tube sites have been added to the non-automatic monitoring network; Sites 70, 71, 72, and 74 which are all located on Oakley Street that runs from King's Road and adjoins to Albert Bridge. In September 2018 an additional co-location study was installed within the borough under the ID KC2-1/2/3, within 2018 there were only 2 months of data capture therefore the details of this Site, in addition to the co-location study results will be presented within next year's ASR.

There has been no change to the number of C_6H_6 diffusion tube monitoring sites within the automatic network.

Figure C.   Non-Automatic NO₂ Monitoring Sites
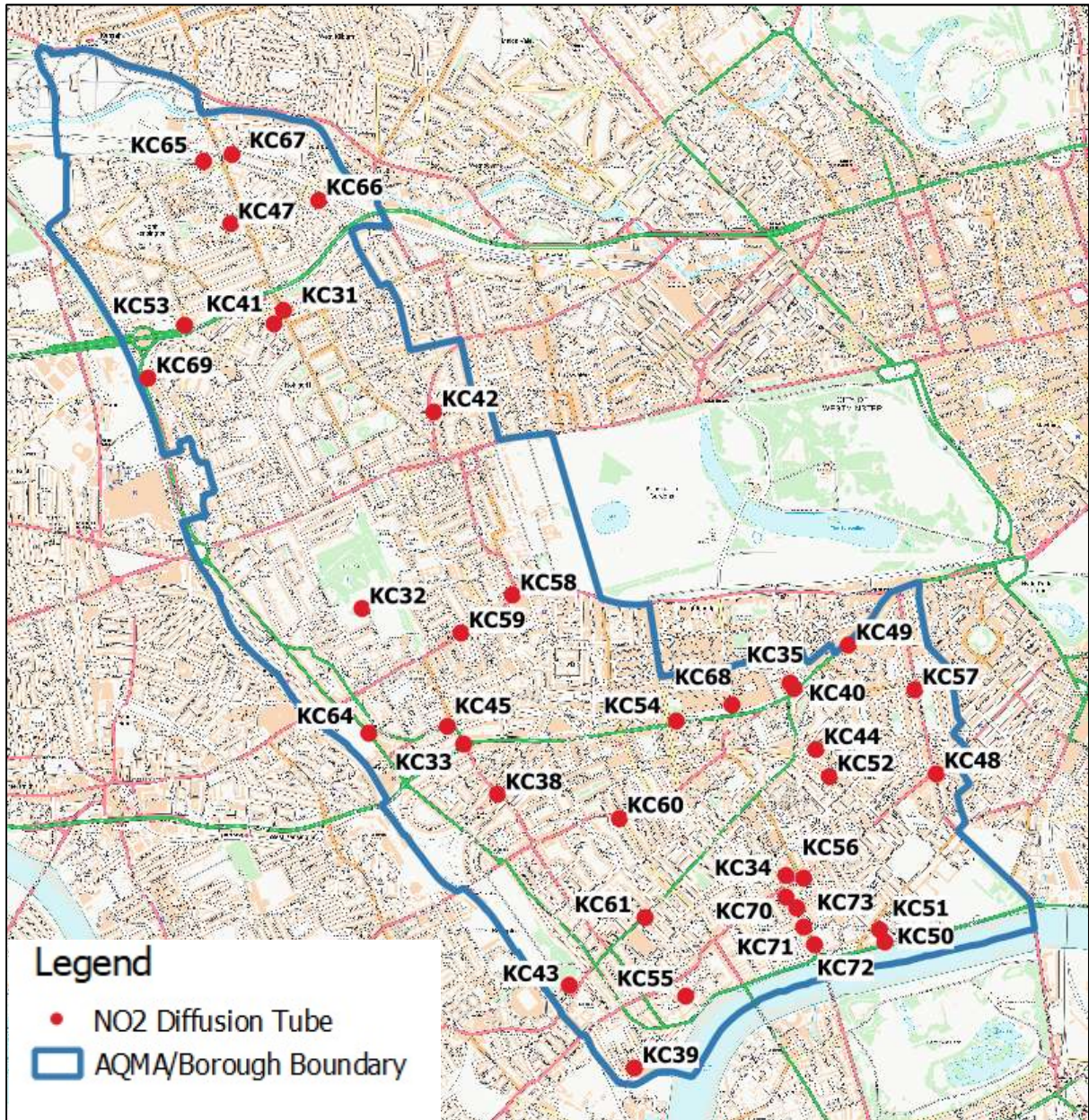
Figure D.   Non-Automatic C$_6$H$_6$ Monitoring Sites
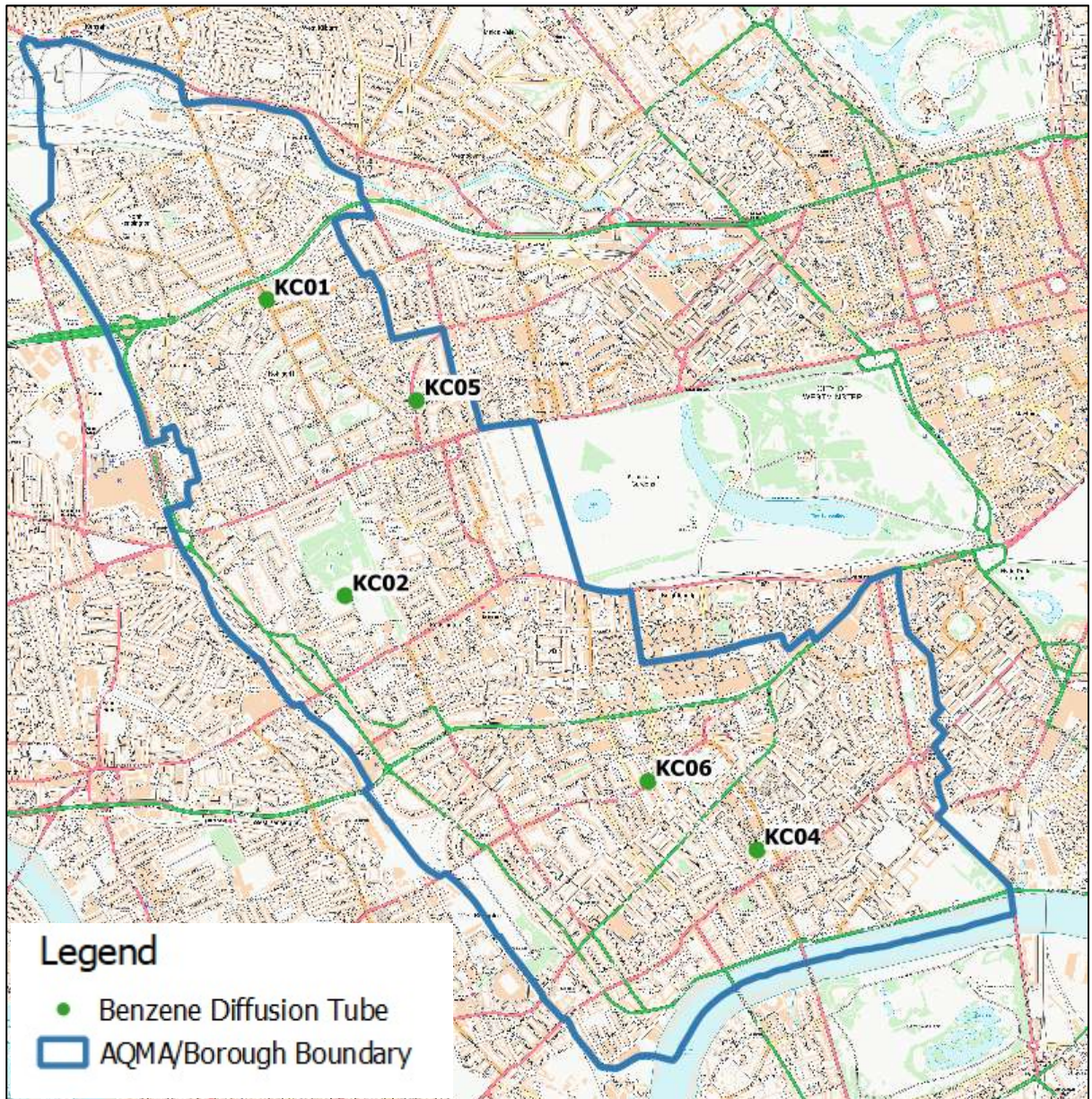
1.2 Comparison of Monitoring Results with AQOs

The results presented are after adjustments for "annualisation" and for distance to a location of relevant public exposure, the details of which are described in Appendix A.

Table D. Annual Mean NO₂ Ratified and Bias-adjusted Monitoring Results (µg m⁻³)

Site ID	Site type	Valid data capture for monitoring period % ᵃ	Valid data capture 2018 % ᵇ	Annual Mean Concentration (µg m⁻³) ᶜ							
				2012	2013	2014	2015	2016	2017	2018	2018 Distance Corrected
KC1	Automatic	99.2	99.2	37	37	34	32	35	33	29.1	N/A
KC2	Automatic	99.6	99.6	**69**	**60**	56	55	58	51	**47.6**	**43.0**
KC3	Automatic	99.8	99.8	**92**	**90**	**72**	**71**	**80**	**66**	**66.4**	**62.8**
KC4	Automatic	99.6	99.6	**92**	**84**	**76**	**73**	**78**	**63**	59.6	50.4
KC5	Automatic	99.9	99.9	**101**	**95**	**93**	**91**	**86**	**78**	**78.7**	**70.1**
KC31	DT	100.0	100.0	52.6	**60.9**	53.5	49.3	55.5	52.2	42.8	– ᵍ
KC32	DT	91.7	91.7	29.1	34.0	29.2	27.5	29.9	31.5	26.2	N/A
KC33	DT	100.0	100.0	**84.2**	**106.3**	**98.2**	**84.5**	**104.5**	**106.1**	**84.0**	**77.4**
KC34	DT	91.7	91.7	42.4	50.3	45.1	40.8	43.7	43.7	39.0	N/A
KC35	DT	58.3	58.3	**81.3**	**90.9**	**82.4**	**75.7**	**80.7**	**77.9**	58.5	43.6

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean Concentration (µg m^{-3}) [c]							2018 Distance Corrected
				2012	2013	2014	2015	2016	2017	2018	
KC38	DT	100.0	100.0	**100.7**	**108.8**	**100.7**	**99.0**	**101.0**	**119.2**	**75.8**	**71.5**
KC39	DT	100.0	100.0	34.0	37.1	34.5	32.5	38.5	34.7	30.6	- [g]
KC40	DT	41.7	41.7	**49.1**	**52.9**	**44.1**	**41.6**	**45.1**	- [e]	32.5	N/A
KC41	DT	91.7	91.7	34.8	**41.7**	36.7	34.6	38.2	37.7	32.2	N/A
KC42	DT	100.0	100.0	**43.8**	**50.9**	**42.4**	**41.2**	**46.2**	**45.4**	38.4	36.7
KC43	DT	100.0	100.0	36.5	**47.1**	38.7	34.2	36.2	36.6	30.0	N/A
KC44	DT	100.0	100.0	**42.1**	**47.0**	**40.0**	39.6	**46.1**	**41.0**	35.5	N/A
KC45	DT	100.0	100.0	**50.5**	**57.9**	53.5	48.6	52.6	50.3	44.9	41.9
KC47	DT	100.0 / 100.0 / 100.0 [d]	100.0 / 100.0 / 100.0 [d]	33.8	36.7	32.9	27.5	34.2	33.3	27.7	N/A
KC48	DT	100.0	100.0	**80.8**	**86.6**	**73.9**	**63.0**	**72.3**	**71.8**	58.4	57.2
KC49	DT	16.7	16.7	**80.0**	**94.0**	**74.5**	**69.7**	**87.5**	- [e]	- [e]	-
KC50	DT	83.3	83.3	**58.5**	**62.9**	**59.4**	**48.2**	**56.4**	**52.7**	**41.0**	40.3

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean Concentration (µg m^{-3}) [c]							
				2012	2013	2014	2015	2016	2017	2018	2018 Distance Corrected
KC51	DT	100.0	100.0	33.5	36.6	33.3	31.6	36.2	39.5	27.7	N/A
KC52	DT	100.0	100.0	**56.5**	**65.3**	**58.4**	**52.9**	**64.5**	**56.1**	**49.4**	**45.1**
KC53	DT	100.0	100.0	**48.5**	**53.6**	**48.4**	**42.6**	**47.0**	**49.0**	**40.7**	N/A
KC54	DT	91.7 / 75.0 / 75.0 [d]	91.7 / 75.0 / 75.0 [d]	**73.4**	**80.6**	**73.7**	**62.9**	**72.5**	**70.9**	57.3	48.7
KC55	DT	100.0	100.0	**41.7**	**48.8**	**44.1**	35.5	**49.0**	**48.0**	40.5	N/A
KC56	DT	100.0	100.0	**87.1**	**88.2**	**74.4**	**63.7**	**72.7**	**68.0**	59.9	**50.9**
KC57	DT	100.0	100.0	**53.5**	**59.0**	**54.4**	**43.6**	**56.2**	**57.2**	47.1	39.8
KC58	DT	91.7	91.7	**62.4**	**75.0**	**58.9**	**50.9**	**59.7**	**62.7**	48.0	**47.5**
KC59	DT	100.0	100.0	**83.4**	**86.9**	**74.9**	**70.3**	**79.0**	**74.9**	**66.5**	**61.0**
KC60	DT	91.7	91.7	**68.6**	**75.1**	**69.9**	**61.2**	**73.1**	**71.3**	51.8	43.6
KC61	DT	100.0	100.0	**54.9**	**64.7**	**54.6**	**51.5**	**61.0**	**52.3**	45.2	39.8
KC64	DT	100.0	100.0	**49.6**	**55.5**	**54.8**	**50.6**	**58.3**	**46.5**	**42.5**	39.3

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean Concentration (µg m^{-3}) [c]							2018 Distance Corrected
				2012	2013	2014	2015	2016	2017	2018	
KC65	DT	100.0	100.0	38.0	**47.2**	**40.5**	33.1	**41.3**	**40.9**	34.5	30.3
KC66	DT	100.0	100.0	39.9	**45.4**	**44.2**	34.4	**55.8**	**46.2**	38.5	N/A
KC67	DT	100.0	100.0	**42.3**	**48.7**	**44.2**	36.2	**45.1**	**46.0**	36.8	N/A
KC68	DT	100.0	100.0	**48.0**	58.3	52.9	44.6	51.0	51.9	**42.1**	**40.9**
KC69	DT	100.0	100.0	-	-	**48.7**	39.3	**46.1**	**47.1**	35.8	N/A
KC70 [f]	DT	100.0	91.7	-	-	-	-	-	-	**55.5**	**45.3**
KC71 [f]	DT	100.0	91.7	-	-	-	-	-	-	**44.0**	37.8
KC72 [f]	DT	100.0	91.7	-	-	-	-	-	-	**59.6**	**47.3**
KC73 [f]	DT	90.9	83.3	-	-	-	-	-	-	**44.0**	38.0

Notes: Exceedance of the NO$_2$ annual mean AQO of 40 µg m^{-3} are shown in **bold**

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%

[d] Data capture presented for each of the triplicate tubes

[e] Data capture was below 25% for the year, therefore annualisation was not completed and data was not presented

[f] Monitoring began at sites KC70-KC73 in February 2018

[g] Distance correction not completed due to monitored concentration higher than background concentration

N/A – Distance correction not completed at Urban Background / Urban Centre / Railway monitoring locations

Charts are presented below to show the NO_2 annual mean concentrations across the seven year period as detailed in Table D above; Figure E presents annual mean concentrations at Roadside and Kerbside monitoring locations, and Figure F presents annual mean concentrations at Urban Background, Urban Centre and the two Railway monitoring locations. As per the results in Table D, a concentration for KC49 for 2017 or 2018 has not been presented due to the data capture at this location being below 25% for both years.

It can be seen that there has been a reduction in annual mean NO_2 concentration at every monitoring site across the borough. Across the diffusion tube monitoring sites this may partially be attributed to a lower bias adjustment factor being applied to the raw annual means than in previous years; the bias adjustment factor used to adjust the 2018 results was 0.98 calculated, as per previous years, from the co-located diffusion tube study completed at the boroughs North Kensington monitoring station. As can be seen within Table A.4, the 0.98 2018 factor is lower than the factor used by the borough for the previous nine years. Bias adjustment is an important aspect of diffusion tube monitoring and all calculations, as detailed in Appendix A have been completed in line with LLAQM.TG(16)[1] guidance.

In addition to the reduction in NO_2 concentration experienced at all diffusion tube locations between 2017 and 2018, there was a reduction in the annual mean NO_2 concentration experienced the automatic monitoring sites KC1, KC2 and KC4, but a slight increase experienced at KC3 and KC4. The three automatic monitoring sites that experienced a decline presented their lowest annual mean NO_2 concentrations across the period of seven years.

Figure E.   Annual Mean NO$_2$ Concentrations: Roadside/Kerbside Monitoring Locations

Figure F.   Annual Mean NO₂ Concentrations: Urban Background/Urban Centre/Railway Monitoring Locations
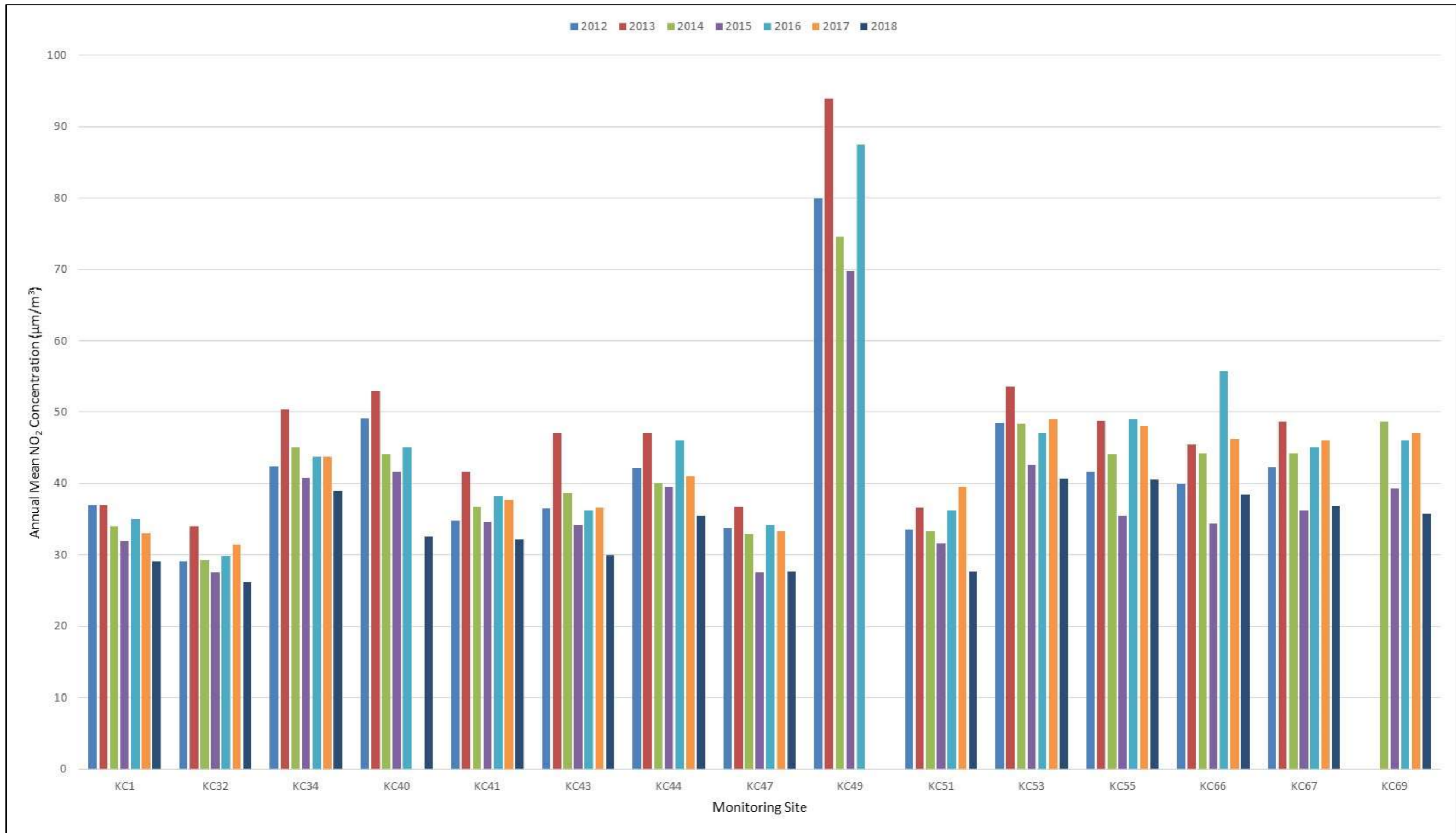
Table E.   NO₂ Automatic Monitor Results: Comparison with 1-hour Mean Objective

Site ID	Valid data capture for monitoring period % ᵃ	Valid data capture 2018 % ᵇ	Number of Hourly Means > 200 μg m⁻³ ᶜ						
			2012	2013	2014	2015	2016	2017	2018
KC1	99.2	99.2	1	0	0	0	0	1	0
KC2	99.6	99.6	4	2	0	0 (1197)	1	0	0
KC3	99.8	99.8	**500**	**466**	**109**	**97**	**262**	**92**	**43**
KC4	99.6	99.6	**74**	**47**	5	9	**54**	4	0
KC5	99.9	99.9	**323**	**140**	**212**	**135**	**120**	**24**	**29**

Notes: Exceedance of the NO₂ short term AQO of 200 μg m⁻³ over the permitted 18 hours per year are shown in **bold**.
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%

As in 2017, compliance with the NO₂ short term AQO was achieved for 2018 monitoring data at three out of the five monitoring locations within the borough; KC1, KC2 and KC4. The monitoring sites KC3 and KC5 exceeded the short term AQO during 2018, and have exceeded the AQO each year for the seven years of data presented. In 2018 KC3 experienced a slight increase in annual mean concentration but recorded the lowest number of 1-hour NO₂ mean concentrations in excess of 200 μg m⁻³ over the past seven years, the 43 recorded during 2018 was 49 lower than the number recorded in 2017. KC5 experienced a slight increase from 24 recorded within 2017 to 29 recorded within 2018, this remains far lower than pre 2017 figures, but remains in excess of the short term AQO.

Figure G presents the number of 1-hour means in excess of the AQO since 2012. For KC2 in 2015 the actual number of 1-hour means in excess of the AQO have been plotted rather than the 99.8ᵗʰ percentile value, due to the data capture being low (51.2%) at KC2 within 2015 there may have been further

exceedances experienced. It can be seen that there has been a downward trend from 2012 to 2018 for sites KC3, KC4 and KC5, and that KC1 and KC2 have remained at a consistent number throughout the seven year period with less than five 1-hour NO_2 mean concentrations in excess of 200 µg m^{-3} for each year.

Figure G.   Number of NO₂ 1-hour Means > 200 µg m^{-3}
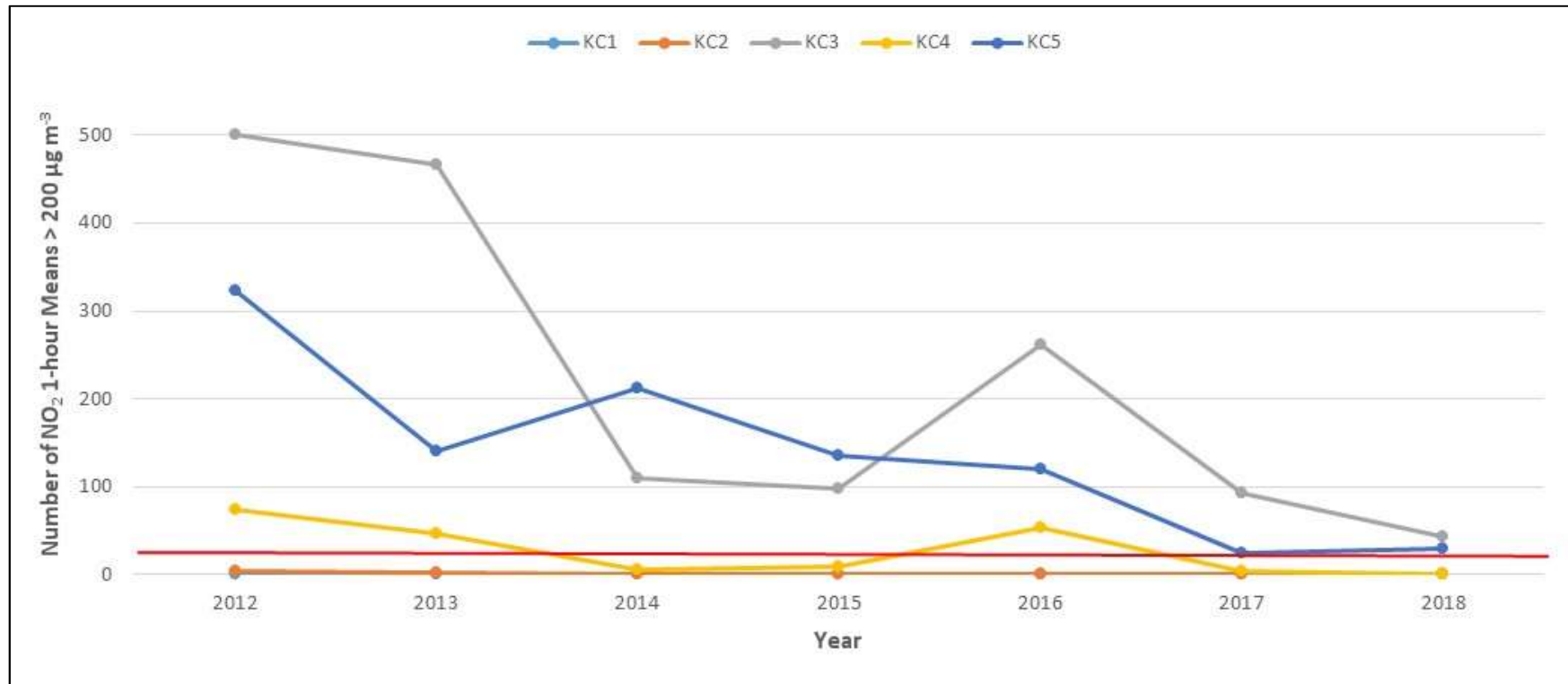
Note: Data capture for was less than 85% in for KC2 during 2015 (51%). The monitored number of 1-hour means in excess of 200 µg m^{-3} have been plotted rather than the 99.8th percentile value of 1-hour means.

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

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean Concentration (µg m^{-3}) [c]						
			2012	2013	2014	2015	2016	2017	2018
KC1	100	100	20	23	23	20	20	17	14.2
KC2	92.2	92.2	27	26	25	23	22	20	18.1
KC5	99.4	58.6 [d]	34	34	31	27	28	27	25.2

Notes: Exceedance of the PM$_{10}$ annual mean AQO of 40 µg m^{-3} are shown in **bold**.

[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%

[d] The Gravimetric Partisol that was located at the KC5 monitoring site was removed on the 26th of October 2017, this was replaced by a heated 1020 BAM that began registering data at 17:00 on the 30th of May 2018

The Gravimetric Partisol that had previously been located at the KC5 site was removed during October 2017, this was replaced by a heated 1020 BAM within May 2018. Due to data capture at KC5 being below 75% during 2018, the monitoring data was annualised to obtain a representative annual mean concentration. During 2018, as it has been for the past seven years, compliance with the PM$_{10}$ annual mean AQO was achieved at all three monitoring sites where PM$_{10}$ concentrations are monitored. In addition the lowest annual mean concentrations of PM$_{10}$ at all three monitoring sites was experienced across the past seven years during 2018.

Figure H presents the annual mean PM$_{10}$ concentrations since 2012. It can be seen that there has been a gradual decline in concentrations experienced at KC2 and KC5 between 2012 and 2017, whereas the concentrations at KC1 have remained more stable across the period.

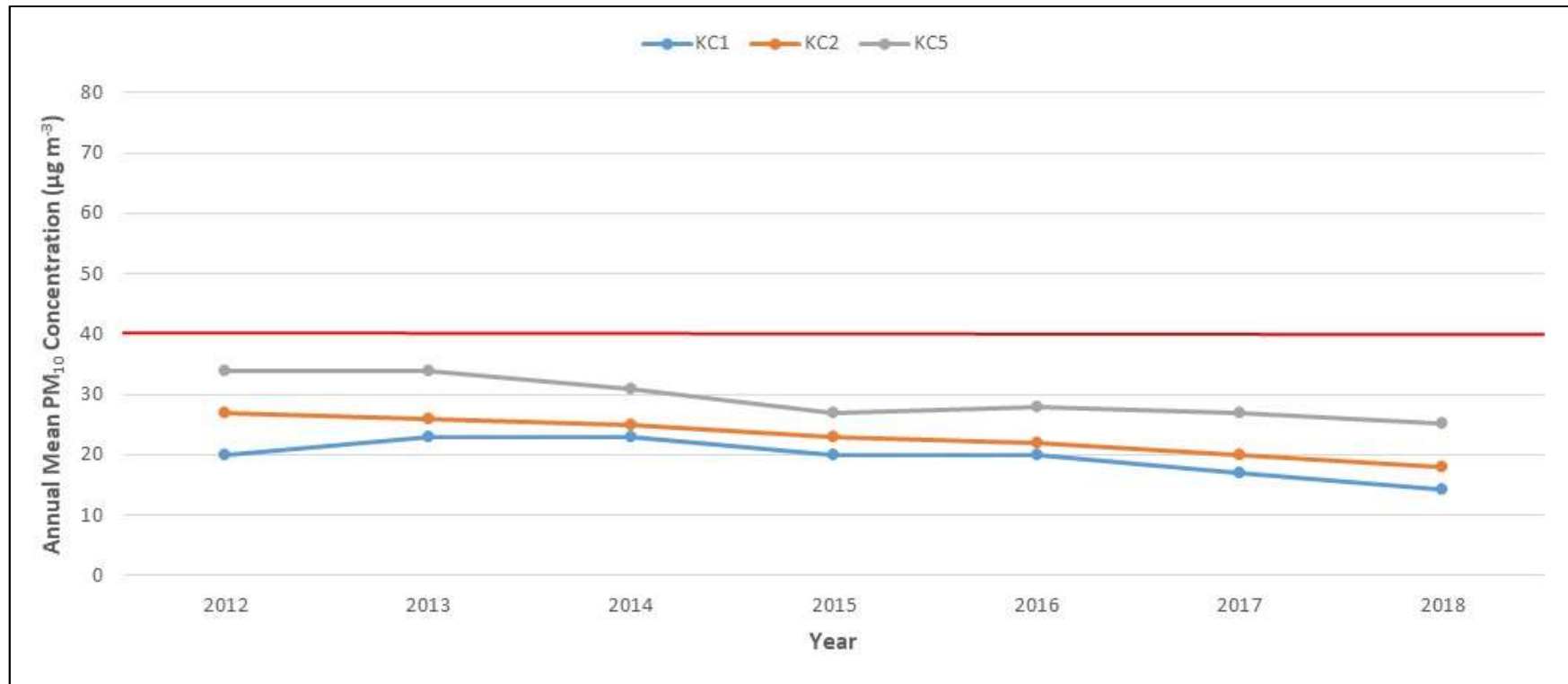**Figure H.   Annual Mean PM$_{10}$ Automatic Monitoring Results**

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 2018 % [b]	Number of Daily Means > 50 µg m^{-3}						
			2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
KC1	100	100	12	9	10 (36.7)	7	10	16	1
KC2	92.2	92.2	13	12	11 (39.1)	4	8	6	0
KC5	99.4	58.6 [c]	**43**	**39**	25	15	19	18	4 (33.2)

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 85% of a full year, the 90.4[th] 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] The Gravimetric Partisol that was located at the KC5 monitoring site was removed on the 26th of October 2017, this was replaced by a heated 1020 BAM that began registering data at 17:00 on the 30th of May 2018

During 2018, compliance with the PM$_{10}$ short term AQO was achieved at all three monitoring sites. There has not been an exceedance of the short term AQO since KC5 exceeded the permitted 35 days in 2013. Monitoring in 2018 resulted in the lowest number of daily means in excess of the short term PM$_{10}$ AQO at all three monitoring sites across the past seven years.

Figure I presents the number of daily means in excess of the short term PM$_{10}$ AQO across the three monitoring sites since 2012. It can be seen that there has been a decline experienced at all sites compared between 2012 and 2018, with 2018 resulting in the lowest numbers since 2018.

Figure I.   Number of PM_{10} Daily Means > 50 µg m^{-3}
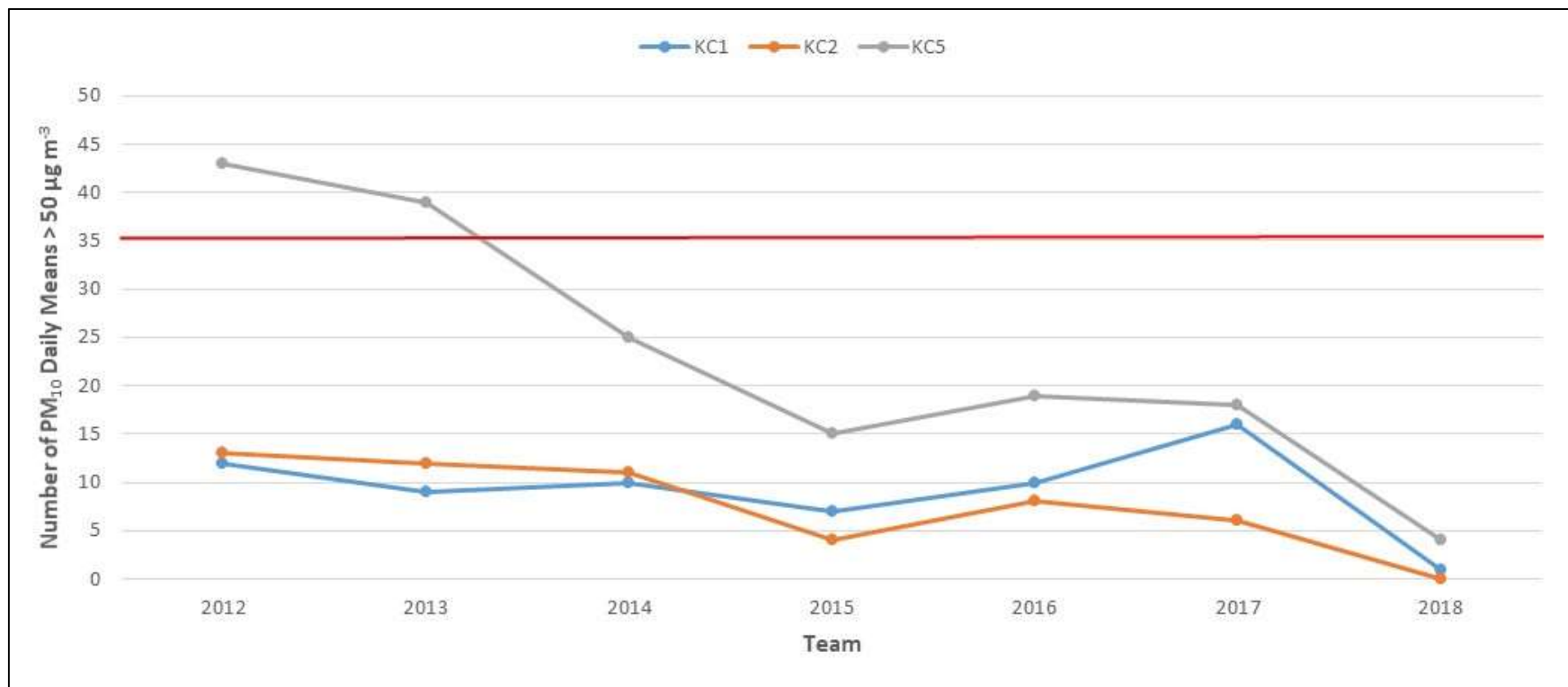
Note: Data capture for was less than 85% for KC1 (74.1%) and KC2 (63.5%) in 2014, and for KC5 (58.6%) in 2018. The monitored number of daily means in excess of 50 µg m^{-3} have been plotted rather than the 90.4th percentile value of daily means.

Table H. **Annual Mean PM$_{2.5}$ Automatic Monitoring Results (µg m^{-3})**

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean Concentration (µg m^{-3}) [c]						
			2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
KC1	100	100	14.5	14.7	15.9	10.9	12.1	12.0	9.2

Notes: Exceedance of the 2020 PM$_{2.5}$ annual mean AQO of 25 µg m^{-3} are shown in **bold**.
In previous ASRs PM$_{2.5}$ was also reported at KC2, the FDMS monitor was removed from this monitoring site on the 27th of October 2017.
[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%

During 2018, as it has been for the past seven years, compliance with the 2020 PM$_{2.5}$ annual mean AQO was achieved at the KC1 monitoring site. In addition the lowest annual mean concentrations of PM$_{2.5}$ was experienced across the past seven years during 2018. Figure J presents the annual mean PM$_{2.5}$ concentrations since 2012. It can be seen that there has been a gradual decline in concentrations experienced at KC1 between 2014 and 2017 after a period of increase between 2012 and 2013, with an overall reduction of 5.3 µg m^{-3} experienced in the monitored annual mean concentration recorded at KC1 in 2018 compared to 2012.

Previously, in addition to PM$_{2.5}$ monitoring completed at KC1, monitoring has also been completed at KC2. Due to an instrument fault, the FDMS that was located at KC2 was removed from site in October 2017, following this the Council agreed upon a temporary hire agreement with the service provider to ensure that monitoring of PM$_{2.5}$ continued. Currently the data for this hire period has not been made available. When this data is made available the ASR will be updated where required to take account of this data. This revision will include an update of monitoring data for both 2017 and 2018.

Figure J.   Annual Mean PM$_{2.5}$ Automatic Monitoring Results
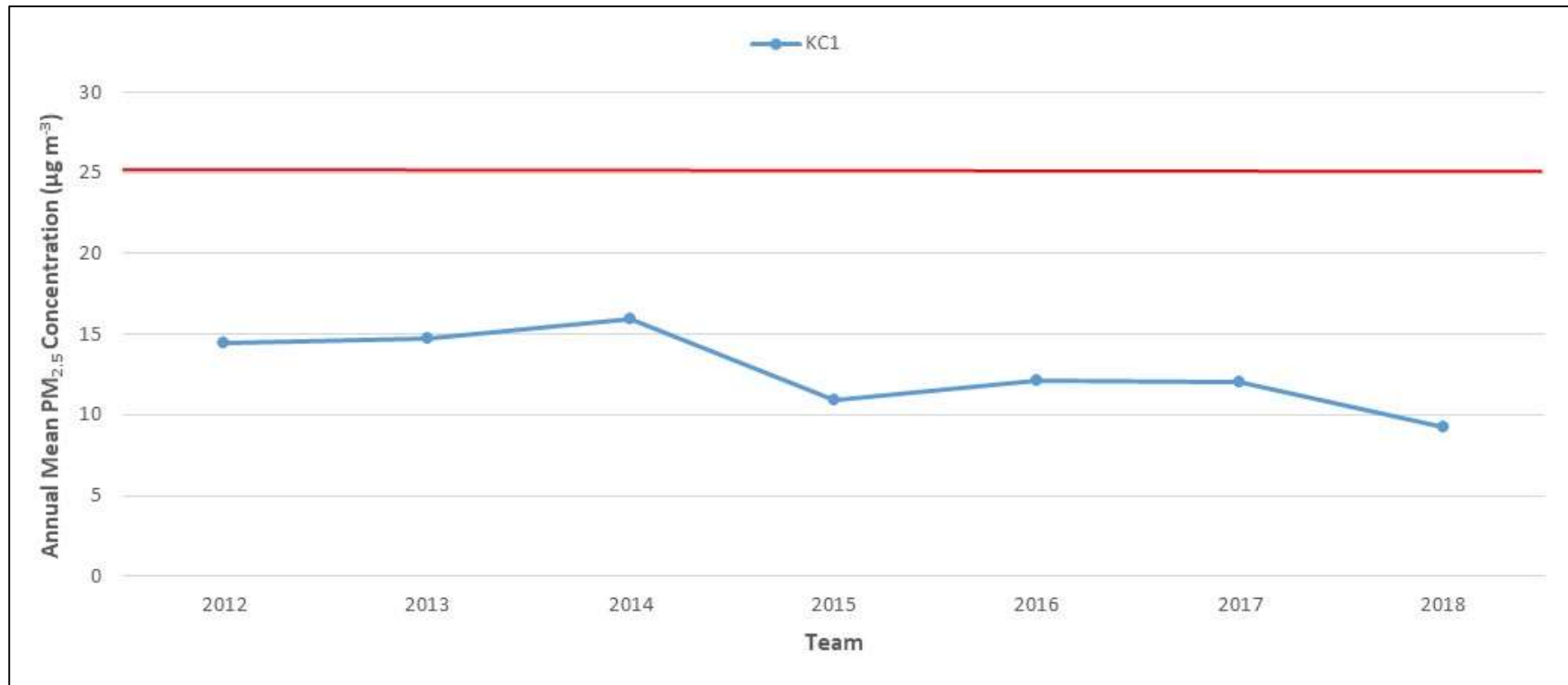
Table I. **SO$_2$ Automatic Monitoring Results: Comparison with Objectives**

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Number of Exceedances 2018		
			15-minute Objective (266 µg m^{-3})	1-hour Objective (350 µg m^{-3})	24-hour Objective (125 µg m^{-3})
KC1	95.8	95.8	0	0	0

Notes: Exceedance of the SO$_2$ air quality objectives are shown in **bold** (15-minute objective = 35 allowed per year, 1-hour mean = 24 allowed per year, 24-hour mean = 3 allowed per year).

[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%

During 2018, as within 2017 there were no mean values experienced at the KC1 monitoring site that exceeded either the 15-minute, 1-hour, or 24-hour SO$_2$ AQO concentration limits.

Table J.   Annual Mean Benzene Monitoring Results ($\mu g\ m^{-3}$)

Year	KC01	KC02	KC03 (Site discontinued 2007)	KC04	KC05	KC06
2000	5.1	3.1	11.4	2.6	4.2	-
2001	4.3	2.0	11.0	3.7	2.9	-
2002	4.9	1.8	12.5	2.1	2.6	-
2003	3.9	2.4	9.6	2.5	2.9	-
2004	2.1	1.2	9.5	1.4	1.6	-
2005	2.0	1.3	9.2	1.4	1.8	-
2006	2.3	1.9	9.2	1.7	2.0	5.7
2007	2.2	1.6	Site Discontinued	1.5	1.7	3.2
2008	2.3	1.6	-	1.6	2.0	2.8
2009	2.1	1.6	-	1.7	1.8	2.6
2010	1.6	1.0	-	1.2	1.6	1.7
2011	1.4	1.3	-	1.4	1.9	2.8
2012	1.2	1.1	-	1.0	1.1	1.6
2013	1.0	0.7	-	0.7	0.9	1.2

Year	KC01	KC02	KC03 (Site discontinued 2007)	KC04	KC05	KC06
2014	0.9	0.7	-	0.7	0.8	1.3
2015	1.25	0.78	-	1.0	0.94	1.8
2016	1.18	0.87	-	0.89	0.92	*6.75*
2017	0.57	0.56	-	0.55	0.61	0.73
2018	0.57	0.47	-	0.78	0.53	0.85

Benzene (C_6H_6) monitoring is currently completed at five locations across the borough using BTEX diffusion tubes, these include two roadside, two background, and one site in close proximity to a petrol station forecourt. The petrol station has operated stage two (in addition to stage one) vapour recovery since 2007.

Two AQOs have been set for the assessment of benzene, a running annual mean of 16.25 µg m^{-3} (any exceedances within Table J shown in **bold**) to be met by 31.12.2003, and a more stringent annual mean of 5 µg m^{-3} (any exceedances within Table J shown in *italics*) to be achieved by 31.12.2010.

Table J shows that the 2003 AQO has been met since 2000 (the measured annual mean is assumed to be the equivalent of the running annual mean), and since the introduction of the 2010 AQO only one annual mean concentration has been recorded in excess of 5 µg m^{-3}; site KC06 which is located a petrol station recorded an annual mean of 6.75 µg m^{-3} within 2016.

The highest annual mean concentration of benzene recorded every year since 2000 has been monitored at a site close to a petrol station, KC03 was located close to a petrol station before the sites discontinuation and KC06 is located close to a petrol station on Old Brompton Road / Clareville Grove.

Aside from the initially high concentrations monitored at the now discontinued NC03 site, monitored concentrations have been low at all of the monitoring sites. The only exceedance of the 2010 AQO was in 2016 at KC06, and following this high monitored value the concentration at the location reduced in both 2017 and 2018. Within 2018, as in 2017, there were no exceedances of the 2010 AQO at any monitoring location.

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2. Action to Improve Air Quality

2.1 Air Quality Action Plan Progress

Table K provides a brief summary of progress made by The Royal Borough of Kensington and Chelsea against the Air Quality Action Plan, showing progress made this year. The Measure numbers below represent those in the January 2019 version of the Royal Borough of Kensington and Chelsea Air Quality and Climate Change Action Plan (2016-2021) except those that begin with an 'X', e.g. X1, which refer to actions in the original version of the action plan.

Table K. Delivery of Air Quality Action Plan Measures

Measure	Action	2018 Progress • Emissions/Concentration data • Benefits • Negative impacts / Complaints
X1.Support vulnerable hospital discharge patients with heart and lung conditions	Provide air quality advice and home modifications to discharged hospital patients, particularly those most vulnerable (i.e. children/elderly) with heart and lung diseases.	Not yet started. We will explore opportunities for joined up working with adult social care and the NHS to provide quality advice and home modifications to discharged hospital patients particularly those most vulnerable (i.e. children/elderly) and those with heart and lung disease.
1. Support and promote air quality awareness programmes	Support and promote the schemes Breathe London, Airtext and Walkit to include CityAir/LondonAir and 'Breathe Better Together' principles to provide more information to a wider audience of subscribers.	Public Health has continued to fund air text. This has been promoted as part of clean air day promotions. There were 26 new subscribers since January 2018. There are currently 205 text subscribers and 50 voicemail subscribers.
2 Support school and community campaigns	Carry out air quality campaign through the 'Healthy School	CTRL Z the youth smoking prevention arm of Kick-it, continued through 2018 to work with children in borough schools. In the last financial year CTRL Z delivered 2434 interventions

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
to reduce smoking at home	Partnership' at primary schools and 'Thrive Tribe' in the community to reduce domestic smoking at home.	across RBKC through 77 workshops. It will come to an end in June 2019 and a new combined substance misuse/smoking cessation service for young people Is due to start on the 1st July. This service provides a range of proactive diversionary and preventative forms of drug, alcohol and smoking interventions, onward referrals and where appropriate treatment support.
3 Support initiatives to improve outdoor air quality	Identify local needs including smoke free areas and air pollution abatement through 'Healthy Parks/Playgrounds' initiative.	Not yet started. Work is currently being done in Westminster to adapt local park by laws. We will use this to inform work in RBKC.
X5 Produce policy guidance on the use of e-cigarettes in the workplace	Develop policy guidance for commercial premises on the use of e-cigarettes in the workplace to improve indoor air quality.	RBKC does not currently have a position on e-cigarettes.
4 Promote initiatives to reduce smoking at home	Ensure 'Smoke Free Homes' is promoted through the NHS 'Stop Smoking Service'.	The Stop Smoking Service providers 'Kick It' who have been running a smoke free homes campaign, ended in December 2018 and was replaced by One You. 182 service users made smoke free home pledges in 2018/19. The new service continues to reduce/stop smoking in the home. They record the number of Smoke Free home pledges made by Service Users. In the first ¼ 32 service users made this pledge.
5 Support financial saving schemes that aid residents living in fuel poverty	Support the delivery of the Big Energy Switch 2015, a collective energy switching scheme to help residents negotiate tariffs on gas and electricity and to aid residents living in fuel	The borough has been involved with the Big London Energy Switch for a number of auctions and will continue to promote tariff switching as a way of cutting bills and reducing fuel poverty. This is promoted through our website and press releases.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
	poverty in line with the 'Healthier Homes' scheme.	The borough also undertakes a number of different measures to ensure that those residents who do not have access to online switching can still receive assistance. Healthier Homes attends a number of events throughout the year including the annual Health Fair, Community Champions and Carer's events. Healthier Homes will visit individuals in their homes to assist with switching and tariff advice. Healthier Homes also supports and promotes the Winter Fuel Fund administered by the Kensington & Chelsea Foundation. This collects donated winter fuel payments and additional charitable donations and distributes them to older residents who have received very high fuel bills. 1. Healthier Homes undertakes home visits and will assist residents on an individual basis to identify the best tariffs for their circumstances and help them to switch. When we are able to work with the Green Doctors they will also undertake switching and tariff advice during their home visits.
X7 Encourage cycling as a non-polluting mode of transport and to combat obesity	Promote cycling through GPs, 'GP Navigator', 'Health Trainer' and 'Cycle Coordinator' schemes to improve heart/respiratory health, combat obesity and promote non-polluting transport modes.	In 2018, Go Golborne launched the Peddle and stride campaign which promoted active travel with the sustainable travel team. The Go Golborne behaviour change survey indicates that the number of children making active journeys to school increased from 50.2% to 53. 0% in 2018. The sustainable transport team is taking recommendations from the community street audit forward and integrated several into the local implementation plan. Walking maps continue to be disseminated across the borough.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		The social cycling programme offers ongoing cycle skills training sessions from complete beginners to advanced cycling. We trained over 200 people in 2018-19, most of them from BAME groups. 97 people who live, work or study in RBKC attended a bike maintenance training course and received a recycled bike after completion. In 2018 we delivered a series of photography walks with the residents of Samuel Lewis and Wiltshire Close states and produced a photo exhibition.
6 Discourage burning of logs and house coal	Launch an initial publicity drive backed up by yearly campaigns in the autumn to highlight pollution caused by burning non-smokeless fuels in household fireplaces backed up with enforcement for persistent offenders.	The Council continues to provide advice with regard to smoke control area. The Council website provides information about wood burning in the borough and is regularly updated when required
7 Support vulnerable residents to reduce energy consumption and bills	Support residents by providing energy efficiency advice and by installing small and low-cost energy efficiency measures to combat climate change. Reduce their energy bills and carbon footprint, through the Healthy Homes project and	Free home energy visits – Green Doctors The free Green Doctors home energy scheme is an ongoing project delivered by Groundwork London to support RBKC residents vulnerable to cold homes and / or whose health and wellbeing is compromised by poor housing conditions and inefficient homes. The project was launched in 2014 and has been delivered every year since.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
	through home energy visits by trained green experts.	Between 16/19 more than 600 home energy visits were delivered for RBKC residents, vulnerable to the effects of living in cold housing, identified as being elderly, on benefits and/or disadvantaged. Low energy efficiency measures (such as draught proofing, energy efficient light bulbs, radiator panels, TV power downs, shower heads etc.) were installed and winter warm packs were provided. In 2018, the Council has secured external funding from the Warm Homes Fund which is provided by the National Grid and administered by Affordable Warmth Solutions (AWS) to deliver a fuel poverty (home energy programme) project -Homes4Health for the next three years. This is a consortium partnership programme with London Boroughs of Hammersmith and Fulham, Camden and Hounslow and Octavia Housing. More than 600 vulnerable residents will benefit from the fuel poverty programme in RBKC for the next 3 years. The Council's Homes4Health programme provides free home energy support and visits to residents to help them keep warm, make their home energy efficient, save money on their energy bills and improve their health. Since September/October 2018 until May 2019, more than 90 home visits were delivered in RBKC through the Homes4Health programme. Between December 2018 and February 2019 around 15 Training/events in RBKC were delivered by Groundwork London and 237 people were engaged. Homes4Health A free energy efficiency home visit offering the following:

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		• Tailored energy efficiency advice • Advice on using the heating controls • Fitting/installing free small energy and water saving measures • Refer residents for larger measures • Further help on how to maximise use of fuel discounts • Offer impartial advice on switching fuel companies to save money • Improve resident understanding of utility bills by 1-2-1 advice
8 Promote case studies of higher-standard insulation and heating systems for existing buildings in the borough	Promote exemplar case studies about sustainable retrofit and regeneration schemes within the borough that have improved insulation and heating systems, and which have exceeded the minimum standards set out in Building Regulations.	The Council focused more in 2018 on developing and encouraging the uptake of solar panels for residents before the Feed in Tariff disappeared in March 2019 and building case studies on this. RBKC has registered to be part of Retrofit Together managed by Parity Projects from April 2019 to March 2020 to increase the uptake of retrofit across the borough and increase demand of the able to pay market. This scheme will also be available to Landlords who need to upgrade their properties to meet MEES. As part of this project, we are aiming to identify exemplar case studies of sustainable retrofit and promote successful energy efficiency retrofits in the borough. Case studies for LED projects completed in schools have been produced and will be published on the Council's website in 2019.
X12 Improve the energy efficiency of	Deliver energy efficiency projects in six of the Council's main facilities (Town Hall, Chelsea Old Town Hall, Pembroke Road, Carlyle building,	A major refurbishment has just been completed by Capital Projects for Chelsea Old Town Hall and one is currently in design stage for Pembroke Road.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
the six main Council's buildings	Violet Melchett and Pembroke road car park).	
X13 Improve the use of space in council buildings to increase occupancy and reduce overall energy demand	Improve the use of Council buildings making them more sustainable, flexible and cost- and space-efficient, so that the remaining sites are more energy efficient. This includes the closure of unsuitable and energy inefficient Council sites (e.g. Pembroke Road).	Council offices at Pembroke Road is scheduled for refurbishment with works taking place between November 2019 and June/July 2020; the planned works will increase staff capacity by 155%. The main purpose is to reduce the overall footprint of Council office accommodation and provide a more efficient use of built assets by relocating staff from rented buildings. The project will also include major (or possibly total) replacement of mechanical, electrical and plumbing services allowing more efficient and environmentally-friendly equipment and fittings to be installed.
9 Continue to insulate the heating systems in schools	Deliver and support Flange & Valve insulation projects to the remaining 11 schools to reduce carbon emissions and improve energy efficiency	During 18/19 there were no Flange and Valve insulation projects delivered in schools by the Council. There were no major requests during this period from schools for these type of insulation work. Out of the 31 RBKC schools, 21 had the flange and valve insulation carried out through the Council's energy efficiency programme and funding and some other schools have done it independently. We will investigate if any remaining schools could benefit from this during 2019/2020. There are two potential schools identified: St Joseph's Catholic Primary School and St Mary Abbots CE primary school.
10 Make sure that boilers in schools are set up and controlled	Deliver heating health check projects to a large number of schools	No heating health check projects were completed in 2018/19 as schools had not flagged any issues and the focus in 2018/19 was on LED lighting systems. These projects have more carbon savings attached.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
to better adapt heating to each school's needs		Since 2011, the Council delivered 11 heating health checks projects in schools. These projects are estimated to save 66.6 tonnes of CO2 per year in total and to bring £11,611 savings per year for all 11 schools. In 2018/19, one school was identified for a heating health check project (Ashburnham Community School). This was put on hold as Corporate Property colleagues confirmed that a new boiler was installed and they will be investigating this as part of their work schools' programme. The Council will commission a survey in 2019 to assess which schools require heating health checks.
11 Continue to install LED energy- efficient lighting in schools	Deliver energy efficiency lighting projects within schools to increase the use of LEDs and reduce CO_2.	Between 2014 and 2019 the Council delivered LED lighting projects in 16 schools. It is estimated that all these projects will bring around 178 tonnes of CO_2 reduction per year and £35,802 financial savings (as a total for all 16 schools). In 2018/19 four LED projects were commissioned at: Avondale Park Primary School, Ashburnham Community School, Bousfield Primary School and Thomas Jones School. These projects are expected to bring around 40 tonnes of CO_2 reduction per year and approximately £10,580 savings in total for all four schools per year. Avondale Park Primary School: This work is estimated to save 12.7 tonnes of CO_2 per year and £4,113 savings. Bousfield Primary School: This work is estimated to save 12 tonnes of CO_2 per year and £3,546 savings. Ashburnham Community School: This work is estimated to save 16 tonnes of CO_2 per year and £2,921 savings.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		The Council will continue to work with the schools. There are 10 schools included in the Council's carbon performance scope which will require an LED upgrade.
X18 Introduce more energy efficient street lighting	Introduce more energy-efficient street lighting	Reduction between 2017/18 to 2018/29 was 363 Tonnes of CO_2. Emission factor has changed to 0.30482; Nitrogen Dioxide Dioxide reduction is estimated at 267 tonnes. There are 14,808 lighting points in the Borough and 3,591 (24%) have been converted to LEDs.
12 Embed climate change and sustainability topics in the schools' curriculum	Organise the Children's Parliament on the Environment, deliver energy champions and climate change workshops/sessions and carbon reduction initiatives in schools	The Children's Parliament on the Environment took place in March 2018 and is a yearly event. Five RBKC schools (Ashburnham Community School, Christchurch School, Oratory School, Park Walk School, St Mary Abbots RC School) with the following topics: • Ashburnham Community School: Recycling and Single-use plastics; • Christchurch School: Sustainable & safe transport • Oratory School: Climate Change & energy saving tips • Park Walk School: Climate Change and food miles • St Mary Abbots: Clean air campaign Each school class benefited from four bespoke workshops related to their chosen topics. In 2018/19 two solar making workshops were organised by Repowering London for young people in North Kensington as part of the North Kensington Community Energy project and primary schools were invited.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		The Council will continue to work with schools to embed sustainability and climate change topics within the curriculum through bespoke events, workshops and assemblies A major refurbishment has just been completed by Capital Projects for Chelsea Old Town Hall and one is currently in design stage for Pembroke Road – Capital Projects to advise Environmental impact
13 Develop planned programme of communal boiler upgrades and renewals within council housing	Complete the review of communal boilers from council housing and develop a planned programme of replacements and upgrade works. When possible, install individual controlled heating within flats.	Three sites had communal boiler upgrades during 2018/19. In 2019/20 surveys and scoping work will be commissioned to look at the remaining 24 communal boilers and determine an appropriate redesign for replacement plant. The programme to install the new equipment will be run over the next three years. Funding for this major replacement work was agreed by Leadership team in February 2019 as part of the overall capital investment programme for across the housing stock.
14 Install ultra-low-nitrogen oxide (NOX) boilers in council housing	Install ultra-low pollution boilers in next phase of boiler replacement in social and council housing (Further phase planned for 2019-20).	The Council is responsible for 4,464 individual boilers and will be replacing them all with modern low emission boilers. 360 individual boilers were replaced during 18/19 and 500 are planned for 19/20.
15 Incorporate energy efficiency improvements into the Council's planned social housing renewal programme	Incorporate energy efficiency improvements into the planned renewal programme, for example: upgrade windows from single glazed to double glazed and improve the insulation standard for TMO properties when renewing roofs.	A capital programme of £267 million over the next seven years was approved by the Leadership team in February 2019. This investment plan was put together as a result of a stock condition survey undertaken in 2018/19. The majority of the stock investment begins in 2020/21 and is planned at £50 million for that and the two subsequent years. 2019/20 is a transition year where some relatively minor works are undertaken. There is a long lead in time for major construction projects, but preparation is underway this year on items

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		such as design, the submission of planning applications, the procurement of contractors and extensive resident consultation.
16 Explore the opportunity to install renewable energy technologies in the council's social housing (e.g. solar panels)	Through additional or external funding Renewables will be considered and explored but insulation and energy efficiency will be a higher priority. It will be undertaken when it is a practical and affordable solution.	From 2020/21 to 2023/24 over twenty blocks of flats will have new rooves installed. This presents a good opportunity to review the feasibility of installing solar panels. The CROHM (Carbon Reduction Options for Housing Managers) analysis will be presented to the RBKC Housing Team in July with the aim for the findings and recommendations to be included in/inform the work programme. The first community owned energy project was developed in RBKC in partnership with Repowering London in 2018. NKCE is the first community owned energy enterprise/power station in Kensington and Chelsea which installed 289 solar panels (86.27 kWp) on two local primary schools (Avondale Park and Thomas Jones) and a community centre – Dalgarno Trust - bringing clean, renewable energy to Kensington and Chelsea which is owned by the people. NKCE offers a local solution to tackling climate change. £83,000 needed to purchase and install the solar panels were raised through a community share offer. The 86.27 kWp solar panels will provide each building with clean electricity at a reduced price and create a fund of £28,000 (over the lifetime of the project). All while saving 32 tonnes of CO_2 each year (equivalent to powering around 23 homes) by replacing electricity that would otherwise be generated by coal and gas power stations. GLA's Solar Together Scheme – RBKC took part in Phase 2 from August 2018 to March 2019 to support residents to install solar panels at a highly competitive price and reduce energy bills and supply their homes with clean, local energy. The aim was to increase and encourage the uptake of renewables and solar panels in RBKC before the Feed in Tariff disappears. https://www.rbkc.gov.uk/greenerborough/solar-together-london 324 RBKC

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		residents have showed interest to install solar panels and 19 installations took place by end of March 2019. RBKC has registered to be part of Retrofit Together managed by Parity Projects from April 2019 to March 2020 to increase the uptake of retrofit across the borough and increase demand of the able to pay market. This scheme will also be available to Landlords who need to upgrade their properties to meet MEES.
17 Ensure that major building sites minimise dust and emissions including those from on-site mechanical plant	Apply the new London Plan – The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance and require low-emission NRMM with appropriate Euro standards on major redevelopment sites.	In 2018, the Council worked to revise its Code of Construction Practice (CoCP) to replace the original Code that was introduced in April 2016. This revised code was published by the Council on 1 April 2019. The Code has been expanded to cover the full range of impacts that construction work has on the local environment and residents including the impacts from dust and NRMM emissions. It sets out what the Council expects from developers and those involved in construction activities in the borough. The expectation is that all construction sites in the borough meet the requirements or best practice set out in the Code, reducing disruption for residents. The Council has set up a new joined-up team of officers with expertise in planning, transport and highways, street scene enforcement, parking and noise, vibration and dust called the Construction Management Team (CMT). This team will be responsible for approving and pro-actively monitoring much of the construction in the borough that falls within the remit of this Code, working alongside colleagues in existing teams such as Noise and Nuisance and Streetscene Enforcement.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		The Council continue to require Air Quality (Dust) Management plans in line with the Mayor's SPG are submitted for major developments in the borough via the planning regime.
18 Ensure that the planning system minimises impact of new development during operation	Utilise the planning application process to assess the implementation of energy strategies in major developments and make air quality and climate change recommendations.	The Local Plan Partial Review (LPPR) is still at examination. The Council will be in a position to adopt the policies within the plan when we receive the Inspector's report finding the LPPR sound. The LPPR may be found here: www.rbkc.gov.uk/planningpolicy In the LPPR, the current Policy CE5 has not been substantially changed, just updated to make it more clear. The reasoned justification accompanying the policy has also been strengthened. The LPPR Policy CE5 continues to require all major developments to submit and air quality assessment that will include impacts form their energy strategies. Local Plan policy Partial Review Policy Continues to resist biomass combustion and combined heat and power technologies/CCHP which may lead to an increase of emissions and seek to use greater energy efficiency and non-combustion renewable technologies to make carbon savings unless its use will not have a detrimental impact on air quality. The Local Plan Partial Review proposed Policy CE1 refers to the London Plan which requires 'zero carbon' homes for major residential development. In relation to this the Planning Department together with the Climate Change team has set up a carbon offset fund. Developments that cannot meet zero carbon on-site are expected to make a financial

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		contribution to offset the remaining carbon. The Climate Change team has identified projects where this money could be spent. The LPPR Policy CE1 also requires BREEAM very good to be achieved for non-residential development of 1,000sq m or more. In 2018, planning applications were reviewed for air quality impacts and this included developments with energy strategies.
19 Use the planning system to ensure that emissions from energy and heat sources in new developments are minimised	Make informed decisions on planning applications about 'Decentralised Energy' (DE) networks, 'Combined Heating Power (CHP)', biomass and biofuel, by considering the balance between air quality and carbon reduction benefits. Assess and make recommendations.	The Local Plan Partial Review (LPPR) is still at examination. The Council will be in a position to adopt the policies within the plan when we receive the Inspector's report finding the LPPR sound. The LPPR may be found here: www.rbkc.gov.uk/planningpolicy Specific sites policy previously highlighted areas where CHP could be utilised in developments in regeneration areas to achieve reductions in CO2 emissions. In the LPPR, these references have now been removed to make a more balanced decision of the sites suitability for the use of CHP due to air quality impacts and if carbon saving targets can be met using different methods with a lesser impact to local air quality.
20 Ensure any new homes forming part of major developments to be zero carbon	Apply the London Plan Policy 5.2 and utilise the Local Plan to request residential elements of all major schemes to achieve 100% reduction on site; if not possible, a minimum 35% reduction of regulated carbon	To accord with the requirements of the London Plan, from the 1 April 2017, the Council fully implemented the zero carbon standard through the creation of a Carbon Offset Fund. Regarding changes to LPPR Policy CE1, the Council will be in a position to adopt the policies within the plan when we receive the Inspector's report finding the LPPR sound.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
	emissions on-sit, and offset all remaining carbon emissions up to 100%.	
21 Improve walking and cycling access to White City	Provide new direct pedestrian and cycle routes by means of a bridge and a subway between the White City Opportunity Area and Norland and Notting Barns wards.	During 2018/19, the Council committed to provide capital funding to cover the full estimated cost of the bridge. However, an opportunity to secure the landing site needed was lost when the planning authority refused planning permission for the enabling development. The development proposal is the subject of a planning appeal. This project is stalled pending the receipt of the planning inspectorate's decision. No progress was made on the underpass in 2018/19. The impasse between Network Rail, Imperial College and LBHF is yet to be resolved.
22 Continue to reduce the Council's vehicle emissions	Deliver the Council's Green Fleet Strategy and Action Plan and implement the green procurement process to lease ultra-low emission vehicles and introduce a travel hierarchy with active travel at the core of it	The Green Fleet Strategy and Action Plan was approved in September 2018 and started to be implemented from October 2018 with the aim to green its fleet. The strategy and action plan only refers to the fleet users as well as the travel hierarchy which encourages cycling and walking amongst Council drivers. Starting from October 2018, the Council will only procure zero tailpipe emissions and/or ultra-low emissions vehicles with a low environmental impact vehicle such as electric and/or hybrid (petrol) where appropriate and if the technology is available and it is financially and operationally feasible. A travel hierarchy with active transport as being the priority and green criteria/procurement were included for selecting new vehicles.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		The strategy is aligned with the Council's commitment to tackle poor air quality and climate change. The Council's fleet generates greenhouse gas emissions and air pollutants which in 2016/2017 included 58/60 leased vehicles, out of which 34 were cars and 24 were vans. Through this strategy, the Council proposes to not only make significant progress in integrating clean and green vehicles into its fleet (procuring ultra-low emissions vehicles), but also reducing its mileage (exploring options to cut fuel consumption) and reducing the size of the fleet (where possible) and achieving a model shift for employees towards active travel (behaviour change). Workplace electric charging points will be installed at four Council offices (KTH, Pembroke Road, Holland Park and Tavistock Depot). £100k have been allocated from LIP funding for the period 2018-2020. The mayor's old polluting Bentley was sold and replaced with an electric car. There are around seven electric vehicles in the Council's and contractor's fleet with more than four vehicles in the pipeline to be leased by other departments. In 2018/19, 26 Council drivers received eco-driving training for electric cars. These trainings were organised by the Council through a subsidy offered by the Energy Saving Trust. The Energy Saving Trust estimated that drivers undertaking this training could reduce energy consumption from their vehicle by 16% and the range could increase by 20% if the drivers start applying the smart driving techniques learned through the training.
23 Continue to reduce emissions from our contractor's waste	Work with our contractor SITA to reduce emissions from its fleet.	In 2018/19, carbon emissions from Suez increased by 230 tonnes compared to 2017/18. This is due to several factors and waste projects such as: increased number of rounds for

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
collection and street cleaning vehicles		the food waste trial, introducing new vehicles in their fleet through the Growth Bid, and using additional vehicles for the night shifts. In 2018/19 Suez has delivered the below initiatives to reduce their carbon emissions: • The garden waste service was reduced from three collections a week to one collection a week. • A fleet review was undertaken by Suez in 2018/19 and all waste fleet heavy vehicles will be ULEZ compliant by October 2020. • The electrical trials were postponed due to delays on the market and technology not being available. Trial of mechanical electric sweepers & brooms during 2019/2020. There are 62 vehicles included in Suez's fleet and in 2018/19 the fuel consumption from these went up by 25%. As part of the Council's 40% carbon reduction target, Suez have a sub-target to reduce carbon emissions by 285 tonnes of CO_2. All replacement vehicles are Euro 6 compliant. In order to conform with the expanded ULEZ regulations from October 2020, we are seeking to replace the remaining non-compliant vehicles. We are currently working with colleagues from legal services and finance services.
24 Work with contractors to green their fleet and comply with ULEZ	Include requirements for contractors to use low and ultra-low emission vehicles as part of their operations and ensure their fleet is ULEZ compliant.	This is a new action from January 2019 and will be reported on next year.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
X34 Maintain an up-to-date Council Travel Plan	Undertake staff survey and site audits and revise the travel plan.	Next survey due September 2019.
25 Increase public awareness to reduce engine idling	Reduce idling of engines by raising awareness of public health and environmental benefits in addition to using enforcement powers to issue fines to those who persist. Carry out campaigns targeted at the public, fleet managers and council drivers, e.g. including a pamphlet in permit renewal paperwork. Erect temporary signage in target areas.	Work began to implement the actions arising from the GLAs school air quality audits at schools in the borough most affected by poor air quality, including implementation of some green walls. One air quality audit took place with a nursery and we are awaiting the outcome. Towards the end of 2018-19 we produced an idling engine leaflet to be distributed alongside resident permit renewal letters, as well as a flyer for CEOs to distribute to drivers observed idling. We will know more figures on distribution in 2019-20. Two vehicle Idling Action Days were completed, one with Peter Jones/John Lewis and another at Holy Trinity School. Events were attended with the public to hand out leaflets on the impact of idling on health including a stand-alone event on Clean Air Day 2018 on Kensington High Street.
X38 Review of effectiveness of parking permit fee structure in encouraging the uptake of cleaner vehicles	Review Parking Policy banding to encourage choice of lower-emission vehicles.	This work was postponed due to other work priorities and has now been restarted with a view of implementing changes in April 2020.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
X39 Increase number of on-street charging points for electric vehicles	Expand the availability of on-street charging points for electric vehicles.	Over 180 possible locations for new lamp column chargers are currently being explored by our contractor to check technical suitability. These would begin installation installed in late 2019-20. In December, the Council shortlisted 20 locations for rapid charging points. TfL is exploring technical feasibility for five of these locations, aiming for installation by the end of 2019-20.
X40 Encourage car clubs to go electric	Explore with car club operators the potential for introducing or increasing the number of electric cars or hybrid electric vehicles in their fleets.	We have introduced provisions to allow floating car club vehicles to operate in the borough from July 2019. There is a 50% discount in related permit fees for electric vehicles. Initially, we expect up to 25% of floating car club vehicles arriving in the borough to be electric. Our pricing structure should encourage this share to increase over time. At present none of our round trip car club operators have electric vehicles stationed in the borough. Ubeeqo are working with us to provide a small number of electric vehicles on new lamp column charging points in the near future.
X41 Encourage children to walk or cycle to school	Double the number of schools with Silver or Gold accredited School Travel Plans and promote walking and cycling to school as part of a combined effort to tackle childhood obesity. Introduce advice on engine idling in promoting and creating travel plans.	In 2017-18, 38 schools had accredited travel plans, 21 at gold level, 7 at silver and 10 at bronze level. New take up of school travel plans plateaued this year which is reflective of a London-wide trend, but we saw existing schools increase on the quality and delivery of initiatives of their travel plans, with many taking the next step to silver or gold accreditation. In May 2018 we held our third Dinosaur Discovery Walking Trail which has proved very popular with the school community and families.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
X42 Use cycle training to promote more cycling	Encourage greater use of cycling, by increasing the number of free cycle training sessions for residents, visitors and workers in the borough.	1,110 sessions of cycle training took place with adults and 1,532 sessions took place with children in 2018-19.
X43 Help the Mayor of London to create cycling grid of specially designed routes	Work with the Mayor of London to improve cycle routes in London by introducing the Cycling Grid	In 2018-19 we consulted on the first of five routes that make up 'Phase 2a'. Delivery of this route and consultation on the other four routes should be complete early 2019-20. Feasibility on a further five routes known as Phase 2b was undertaken in 2018-19.
26 Open up more one-way streets to cyclists using both directions.	Continue to convert one-way streets to two-way operation for cycling.	We consulted informally on several streets in 2018 and decided not to proceed with three of them, having listened to objections. We will proceed to the traffic order consultation on the remaining streets in 2019. We have also carried out a study to improve permeability for cycling along a corridor in Notting Hill.
27 Create safe areas for cyclists at traffic lights	Consider opportunities for introducing Advanced Stop Lines for cyclists when reviewing traffic signals.	We consulted on 36 new Advanced Stop Lines at nine traffic signal controlled junctions in 2018/19 and received a positive response. We will install them in 2019/20.
28 Support residents to take action in their local areas and implement	Encourage and empower residents to help tackle climate change and reduce energy consumption in their local areas and homes. Stimulate attitude and behaviour change	The first community energy project - North Kensington Community Energy (NKCE) was developed in 2018. Through this project, three solar power phone charger workshops were organised in partnership with Repowering and Westway Trust with more than 30 people attending.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
community energy projects	through community energy projects and energy workshops/training.	As part of NKCE, Repowering London have also completed a paid training programme for sixteen 16-19 year olds from the borough, providing knowledge and experience in engagement, renewable energy technology, energy efficiency, advocacy, marketing & branding and social media. educational workshops and solar assemblies will be carried out in three local primary schools involved in the project (Thomas Jones, Avondale and Bevington). Two big community energy events have been organised at Kensington Town Hall and Dalgarno Community Centre with more than 80 people attending to promote community energy projects in RBKC and NKCE. Weekly and bi-weekly meetings were organised with volunteers.
29 Support and encourage the development of community energy enterprises/co-ops	Support community groups to come together and generate clean local electricity and put profits back to the community through solar installation and ethical investment	The first energy coop was created in 2018 in RBKC – North Kensington Community Energy. With the support of the Mayor of London's 'London Community Energy Fund', Repowering and the RBKC Climate Change team secured grant funding to assess the technical and financial viability for a selection of sites in the North of the Borough. The sites included the following Council owned properties – Oxford Gardens Primary School, Bevington Primary School, Thomas Jones Primary School, Avondale Park Primary School and the Dalgarno Community Centre. There is an appetite to continue delivering community energy projects post March and develop models which will work without the FiT. Requests have been received to assess the solar suitability for other buildings such as Edward Woods Community Centre, Swinbrook estate, Asburnham school, Westway Leisure Centre etc. There are plans to develop NKCE 2 and install around 800 solar panels (200kWp) at Westway Leisure Centre and Repowering London is in the process of pre-registering the scheme before March 2019 to ensure this site will also benefit from FiT. Discussion and meetings took place with Westway Board of Trustees and Repowering London has secured funding from the Mayor

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		of London Community Energy Fund to deliver the structural surveys and feasibility studies for Phase 2.
30 Encourage and increase the renewable uptake and green energy in the borough	Deliver and facilitate pan-London solar schemes which support residents to install solar panels	The Council was part in the GLA's Solar Together Scheme 2018-2019 supporting residents to install solar through a group buying scheme for solar panels. It brings together households and local government to get high quality solar panels at a highly competitive price. 324 residents have expressed an interest and 19 installs have been completed. 19 RBKC households installed solar panels in RBKC through Solar Together Phase 2. It is estimated that this will save over 300 tonnes of carbon over the lifetime of the installations. https://www.rbkc.gov.uk/greenerborough/solar-together-london.
31 Identify and train green champions in the community	Identify and sign up green champions/leaders and residents' groups within the borough to initiate and support the delivery of energy reduction and energy generation projects or provide energy advice to their local community.	Through the Homes4Health programme, since September/October 2018 until May 2019, more than 90 home visits were delivered in RBKC through the Homes4Health programme. Through the North Kensington Community Energy project and the creation of a community benefit society in 2018 which is managed by residents, more than 20 active residents and volunteer have been identified as green champions. They all have an interest to develop sustainable and green projects in the borough. Attended several Environmental Roundtable meetings and Extinction Rebellion meetings in RBKC.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
32 Understand better the sources and quantities of greenhouse gas emissions across the borough	Analyse the sources and quantities of greenhouse gas emissions across the borough.	The Department for Business, Energy and Industrial Strategy (BEIS) released national data for 2016 carbon dioxide emissions (CO_2) broken down by local authorities and by sector. The data was published in June 2018 for the period 2005-2016. In 2016, Kensington and Chelsea Borough emitted a total of 0.91Mt of CO_2 comprising: • 481.7kt of industry & commercial emissions (53%) • 277.6kt of domestic emissions (30%) • 154.3kt of road transport emissions (17%) In 2016 the emissions from all the sectors decreased by 11.5% compared to 2015. When compared to 2005 emissions from all the sectors decreased by 34.6% The industry & commercial sector is the biggest emitting sector in the borough, representing 53% of the total emissions. Within this sector, electricity is by far the highest emitter of carbon, in 2016 contributing 64% of total emissions from this sector. Per capita all-sector emissions decreased by: • 30.12% since 2005 10.77% since 2015
33 Support local businesses and large organisations to	Offer environmental advice and sources of technical information to local businesses and large organisations on how to improve	Promoted several funding opportunities for SMEs through different channels and promoted the Solar Together scheme for SMEs in 18/19.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
reduce emissions from their operations	energy efficiency of their building operations	
34 Encourage visitors to major venues to walk or cycle.	Work with major destination venues in line with the Healthy Workplace Charter to reduce trips using private and public transport by promoting active travel (walking and cycling), using customised maps and adapting existing publicity materials.	The Local Plan Partial Review (LPPR) did not propose changes to policies CK2, CK3 or CT1 which remain in place and relevant to this action Cleaner air walking route established between High Street Kensington and Kensington Olympia and advertised by exhibitors.
35 Support businesses to reduce their emissions from deliveries	Support businesses to combine and rationalise deliveries (of 100 – 400 Kg loads) using low/zero emissions vehicles and local distribution hubs for final stage deliveries.	As part of the Defra Air Quality Grant – Clean Air Villages (CAV) project, two areas in the borough – Earl's Court and Ladbroke Grove – had CAVs established to work with businesses in the area. The Cross River Partnership worked with these businesses on behalf of the Council to reduce emissions from deliveries. As there are no BIDs or business forums in the borough, projects like these prove very useful to get businesses working together to make a difference locally. In Earl's Court the following was undertaken: • Two workshops were held with 6 businesses, a residents association and a local resident in attendance. 8 organisations in attendance (plus one resident/ former Member of Parliament • 2 seminars including 1-2-1 business engagement with 4 hotels and landowners as well as over 15 visits to hotels. • Regular meeting with relevant council departments who deal with commercial waste and businesses

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		• Attended a waste scrutiny meeting at the Council to look at consolidating waste suppliers • Conduced surveys with 31 businesses in the area which established that waste and laundry collection/delivery are two of the main services/deliveries in the area. • A Working Group was established of businesses to share knowledge of supply chain and local at local storage to minimise deliveries; quarterly meetings established In Ladbroke Grove, the following was undertaken: • Engagement with a large landowner, Westway Trust, businesses along the high street and the local market stakeholder group. Identified main issue for market traders and buisness was lack of space for storing deliveries and loading/unloading congestion. • Two seminars were held with 9 organisations attending • Three 1-2-1 business engagement meetings were undertaken. • One event with a local e-cargo bike company to provide services to local businesses As part of the MAQF Clean Air Better Business project, a clean air route was established between Kengsinton High Street Station and the venue at Kensington Olympia. A study was conducted by King's College London into the exposure to black carbon on this route identified that the concentrations along the clean air route were on average 50.1% lower than the standard route.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
36 Continue to work with our main contractors to reduce their energy consumption	Work in detail with the Council's main contractors (SITA, Quadron, Amey) to reduce their overall energy consumption related to the Council's operations (building use and vehicle fleets).	The Council continues to work and meet quarterly with its main contractors (Suez, Quadron & GLL) to reduce their energy consumption, green its fleet usage and operations and embed sustainability within their operations. Reconfiguring BMS controls carried out at the leisure centres. Environmental and energy clauses were included in the contract and procurement for the leisure centres in 2018 and several initiatives have been identified with GLL (the winning supplier): LED projects at Chelsea Sports Centre scheduled for January 2020 and LED project at Kensington Leisure Centre scheduled for December 2019, pool cover for the main pool at Kensington Leisure Centre for December 2019. Technology for monitoring water consumption trailed at Kensington leisure Centre. The contractors are included in the Council's 40% carbon reduction target and their performance is monitored quarterly by the Climate Change Programme Board. In 2018/19: • Suez (Council's Waste Contractor): 18% carbon emissions reduction since 2007/08 • GLL (Council's Leisure Centres Contractor): 25% carbon emissions reduction since 2007/08
37 Continue to develop the Community Kitchen Garden scheme	Continue to develop the Community Kitchen Garden scheme which encourages residents and community groups to grow seasonal fresh fruit and vegetables. Local production	Improvements, repairs and extensions have been carried out at the following existing gardens in 2018/19: World's End Estate Community Garden (a new plot has been installed and the existing infrastructure has been improved), Russel Road Community Garden,

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
	eliminates deliveries (zero food miles) and helps tackle childhood obesity.	Octavia House Community Garden, Portland Road Community Garden, Whitstable House Community Gardens. A fruit tree orchard has been planted at Whitstable House Community Garden. Entrance improvements are being delivered at Oxford Gardens Community Garden.
38 Commercial production of fresh fruit, vegetables and flower seelings through the charitable Cultivating Kensington and Chelsea gardens in the borough	Overseeing the operations of the Cultivating K&C and support volunteers in establishing policies and systems. All profits from sales to the community kitchen garden clubs	Weekly sales of fruit, vegetables and herbs seedlings are still occurring fortnightly at Olympia Station. A weekly Wednesday sale has been added and is taking place at the Market Garden Site. Improvements on profits and consistency of income have been made compared to last year. The quality of the plants being sold has improved since last year A new volunteer system has been implemented in 2019 and the RBKC Environment Projects Team have been supporting significantly Cultivating Kensington and Chelsea Scheme. A solar panel has been installed at Cultivating Kensington and Chelsea market garden project at Kensington Olympia to provide power for a heated propagator with support from Repowering London.
39 Increase recycling by Council staff members	Refresh the promotion of recycling to members of Council staff.	In 2018/19 four waste audits were carried out to monitor the recycling rate in the Council's offices. Additionally, contamination audits took place in the two main Council buildings: Kensington Town Hall and Pembroke Road offices. The average recycling rate for 2018/19 was calculated at 60% for Kensington Town Hall and Pembroke Road Offices.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		Ten Recycling and Energy Saving workshops were delivered in 2018/19 and 71 members of staff attended these. A campaign was organised and delivered during the national Recycle week (September 2018) to increase awareness internally regarding the correct recycling practices and single use plastics. In 2018 the Council passed a motion showing commitment to working towards reducing and phasing out non-essential plastics from all the Council's operational buildings and operations by 2020 where this is a feasible option. In May 2019 the Council adopted a Single-use Plastics Policy Statement and Action Plan containing actions that are aiming to address the following three areas: In-House (Council's operations and buildings), Schools (raising pupils' awareness), and the wider community (businesses and residents). One lunch and learn related to single-use plastics was delivered to colleagues at Pembroke Road Offices. Regular communications were produced for staff and published internally via blog posts, yammer and KCbriefly (internal newsletter). The Council is now working to put in place a more formal training package for staff which covers both recycling and climate change / energy saving issues.
40 Increase the municipal recycling rate by 2%	Deliver communication campaigns for residents, improve recycling infrastructure on estates, waste crew training and work with Commercial	Delivered reusable bags, leaflets and/or new and bespoke bins to over 80 estates. Updated leaflet that's inserted in packs of clear recycling bags - delivered quarterly for all properties receiving a kerbside collection. Ran Resource London's 'one bin is rubbish' campaign, on our livery. Promoted WRWA's 'End of the line for Waste' campaign, including holding two

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
	Waste Team to increase business recycling capture	events in the borough. Carried out training session for container collector crews, on 'how to spot contamination'. Figures not finalised: 21.73% municipal recycling rate, (+0.64% from previous year).
41 Review and model different waste collection systems	Assess whether introducing a borough-wide food waste collection will be environmentally beneficial to identify solutions to improve waste collection rounds	Previous lifecycle analysis, conducted by WRWA, demonstrated that the additional carbon emissions from introducing separate vehicles to collect food waste, would almost certainly outweigh the small carbon savings from taking food waste for anaerobic digestion instead of energy from waste - this would worsen our EPS performance. There is also potentially, a huge cost of running this service. Work undertaken by Resource Futures, and supported by LWARB estimated the total cost to be over £500k, for a separate kerbside collection. However, we wanted to explore this further and use real data to model the outcomes. In February 2018 we introduced a separate food waste collection for roughly 1750 kerbside properties in the south of our borough. In September 2018 we expanded this service to roughly the same amount of properties in the north of the borough. We deliver free liners and have carried out doorstepping and communication campaigns, prior to rolling the service out and since it's been in operation, to achieve the highest tonnage possible. We are committed to using the data collected from our current service to model a borough wide kerbside food waste collection service, looking at the impact it will have on our recycling rates, carbon emissions and the total cost. This will be shared with the GLA for comment. As we are currently in the process of drafting our new waste contract tender to start in 2021, there will be flexibility built in to the specification, to introduce a borough-wide kerbside food waste collection, if we decide to do so, following the results of the modelling.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		We are committed to keeping the kerbside food waste collections we have in place, and it will be in the specification of the new tender. Another impact we must consider is that the government has stated, via the Resources and Waste Strategy and DEFRA's consistency consultation, that it will fund the start-up and ongoing costs, of introducing food waste collections. The timescales for when and how to apply for funding is not yet clear.
42 Deliver carbon reduction initiatives/campaign within the Council's offices to emissions and change	Implement and deliver the Greening the Office initiative and the Green Champions Scheme in Pembroke Road and at the Kensington Town Hall	The Council has a network of 19 internal green champions who are responsible for raising awareness within their teams on various recycling, energy reduction and other sustainability issues. In 2018/19 ten Recycling and Energy Saving workshops were delivered to staff (71 members of staff attended these). 5 different events were organised and delivered during the national Recycle Week in September 2018: (quiz, book swap at Pembroke Road and Kensington Town Hall, single-use plastics lunch & learn, pop-up stall at Kensington Town Hall and mini competition.
43 Develop a Single Use Plastic policy and action plan	Develop and deliver an action plan to minimise and phase out where feasible, the use of non-essential single-use plastics across the Council's operations and buildings, its contractors/suppliers, in schools and across the borough	In December 2018 the Council passed a motion showing commitment to reduce and phase out single-use plastics from three areas: In-House (Council's own buildings and operations), Schools (raising pupils' awareness) and Wider Community (residents and businesses). A single-use plastics policy statement and action plan was developed, and actions were devised for In-House, Schools and the Wider Community.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		• All single-use plastic cutlery items from the cafeteria were replaced with plant-based alternative options such as Vegware; • A plastic lunch and learn event for staff was organised and was attended by 12 colleagues; • Stationery from Kensington Town Hall has been moved in a centralised location in the Print Room. • The Council has mapped the possible locations where water fountains will be installed across the borough. • Working with the Events and Conferences Team to produce guidance for suppliers and event organisers in the borough. • Schools have been offered 1:1 support to work towards becoming plastic free. The Council's Single-use Plastics Policy Statement and Action Plan is requiring that all Council buildings should be free of non-essential single-use plastics by 2020. As part of this the Council will work with its own internal contractors and suppliers to encourage best practice in minimising their use of single-use plastics.
44 Increase the size of the existing Counters Creek Victorian sewer system	In partnership with Thames Water, facilitate work to increase the size of the existing Counters Creek Victorian sewer system to cope with flash flooding from intense rainstorms.	Thames Water consider that a strategic sewer is no longer needed. The Council is currently considering Thames Water's evidence. The other three elements of the scheme are • Sustainable drainage systems to reduce surface water run-off entering the sewers (most of the schemes are in the London Borough of Hammersmith and Fulham); • anti-flooding (FLIP) devices to stop the sewers surcharging into lower properties; and, • local sewer improvements: there is currently a live application for an underground sewage pumping station in Queensdale Road to reduce local flood risk.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		Further updates are provided on our webpage: https://www.rbkc.gov.uk/planning-and-building-control/planning-policy/flooding/counters-creek-project
45 Support the delivery of Sustainable Drainage Systems (SuDs) both in new developments and through retrofitting	Support the delivery of Sustainable Drainage Systems (SuDs) both in new developments and through retrofitting, to absorb and divert as much rainwater as possible away from the sewers during periods of heavy rainfall.	As per last year. The Local Plan Partial Review (LPPR) is currently at examination. Policy CE2(g) refers to the provision of SuDS. The Council will be in a position to adopt the policies within the plan when we receive the Inspector's report finding the LPPR sound.
X61 Retrofit SuDs in existing properties	Install SuDs such as rainwater retention features in existing properties.	Arundel Gardens was finalised in March 2017. Thames Water and Imperial College London are undertaking monitoring to ensure that the pilot project remain robust in terms of measurable outcomes so to influence future schemes. The new draft policy CE2(j) encourages the retrofitting of SuDS. The Local Plan Partial Review (LPPR) is currently at examination. The Council will be in a position to adopt the policies within the plan when we receive the Inspector's report finding the LPPR sound.
46 Mitigate against increases in area of impermeable land by stopping the paving of front gardens	Use the planning control process to reduce the loss of front gardens by resisting paving	As per last year. The Local Plan Partial Review (LPPR) is currently at examination. The new draft policy CE2(i) resists the increase in impermeable areas not just in front gardens but all landscaped areas. Also, the new draft policy CE2g(i) encourages the increase of permeable areas. The Council will be in a position to adopt the policies within the plan when we receive the Inspector's report finding the LPPR sound.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
47 Promote the use of the Council's SuDs tool for small developments	Continue to promote the use of the Council's SuDs tool for small developments.	This measure should be removed or reworded as: Promote the uptake of SuDS through adequate guidance. Since April 2019 we stopped using the SuDS tool as we noticed that developers were more aware of SuDS and that most of them were not using our tool but submitting their own calculations. Also the SuDS tool did not give us what we wanted for basement development. Although we stopped using the tool we included very detailed information on how to meet our policy on SuDS for minor and major applications. See link below. https://www.rbkc.gov.uk/planning-and-building-control/planning-policy/flooding/sustainable-drainage-systems
48 Promote green infrastructure (walls, roofs) and other eco-initiatives in schools	Further develop school participation in green infrastructure and eco-initiatives that enhance the curriculum, involve parents and lead to reduction of car use in collaboration with the Healthy School Partnership.	The service delivered 160 Environmental education sessions and 293 Forest School Sessions over the last 12 months, engaging 8021 pupils. Council officers attended Urbanwise 'ask the expert Sessions' with schools where pupils pose questions to council experts in air quality, sustainable transport and climate change. These sessions lead to the Children's Environmental Parliament describe in action 12 above.
49 Support the development of food growing gardens in schools	Work with schools to encourage and support them in the delivery of food growing gardens.	The food growing garden project in schools is continuing and around 10 schools have been supported in 2018/19 with their gardens.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
		After school garden sessions St. Cuthbert with St. Matthias Primary School have been delivered outside the school grounds at an environmental improvements project.
50 Support the development of community food waste composting initiatives	Encourage and support the development of small scale community food waste composting initiatives	Food waste composting schemes at community kitchen gardens are continuing and are managed by residents.
51 Review planning applications to ensure that biodiversity is improved, not damaged by new build and refurbishment	Check/review planning applications to ensure that development impacts on the borough's ecology are minimised and to maximise biodiversity gains from development by creating new habitat through green roofs.	It is estimated that less than 30% of applications had ecological input in the last year, major apps were focussed on. As part of the new Green Infrastructure guidance notes biodiversity was included providing information for developers around enhancements. The boroughs new biodiversity Action plan due this year will seek to promote Biodiversity net gain in new developments and the promotion of green infrastructure.
52 Require developers to contribute to local air quality improvements	Increase air quality action fund contributions to directly provide a resource for air quality specialists and to achieve actual air quality improvements.	Amount received between April and March 17/18 through s106 agreements was £60,346.34 (AMR 2019)
X74 Push for the borough to be included in the Ultra	As part of the TfL/GLA Engagement Group, enter discussions with the new Mayor of London on the potential to increase the air quality	After the Leadership Team supported the Mayor's consultations to extend the ULEZ to the N/S Circulars in February 2018, the Mayor announced that this will be implemented which

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
Low Emission Zone (ULEZ)	benefits in the borough of the ULEZ proposal, and/or tightening the LEZ.	means the ULEZ will apply to HGVs in RBKC from October 2020 and light vehicles from October 2021.
X75 Support TfL in ensuring the entire borough is part of the 'Cycle Hire' scheme	Support the expansion of the Cycle Hire scheme north of the Westway.	No expansion took place in 2018-19, however TfL are due to submit planning applications to expand two locations in 2019-20.
X76 Work with TfL to reduce emissions from buses in the borough	Lobby and work with TfL to ensure that all bus routes through the borough are ULEZ-compliant and explore options for hybrid buses to run in pure electric mode through the most polluted areas.	Changes have been made to the signal timings at the junction of Kensington Church Street and Kensington High Street which has reduced the amount of time buses spend queuing at these lights. Changes are due to be made to the signal timings at the junction of Earl's Court Road and Kensington High Street which will improve journey times for buses travelling along Kensington High Street and will result in less idling.
X77 Work with TfL to deliver Crossrail stations in the borough	Work with TfL on delivery of Crossrail 2 station in the King's Road area.	No progress. TfL's consultation on Crossrail 2 is on hold pending outcome of the Independent Affordability Review
X78 Lobby TfL for increased public transport links in the borough	Continue to work with Crossrail sponsors on feasibility of a Kensal Portobello Crossrail station at Canal Way.	On-going. GRIP 1 study completed, and focus is now on railway timetable modelling work.

Measure	Action	2018 Progress • **Emissions/Concentration data** • **Benefits** • **Negative impacts / Complaints**
X79 Lobby TfL and the Mayor of London to reduce emissions from taxis	Lobby TfL/Mayor of London to make the decommissioning scheme for 10 year old taxis mandatory.	We continue to work with TfL and the Taxi trade to reduce the Taxi congestion problems around Harrods. If successful, this should reduce the amount of taxi idling which takes place here.
53 Lobby the Government to continue providing incentives for solar installations	Feed in Tariff replacement to encourage solar uptake and to support community owned energy projects	Work with Repowering London to develop community energy models which will work post feed in tariff. Respond to consultations on Export Tariff proposed and lobby Government through LECF and different pan-London forums to encourage solar installations.
54 Lobby TfL and the Mayor of London to raise taxi drivers' awareness of techniques to reduce emissions	Lobby TfL/Mayor of London to establish eco-driving training as a requirement for all taxi and private cab drivers.	We continue to engage regularly with the Taxi Driver representative bodies as well as the Taxi team at TfL to raise issues over idling and illegal ranking in residential areas.
55 Lobby the government for higher environmental building standards	Continue lobbying the Government so that Local Authorities are allowed to set higher environmental standards for new buildings and major refurbishments that are higher than the current building regulations (Housing Standard Review).	Through the London Environment Coordinators Forum (LECF), THE Council lobbied the GLA for the zero carbon homes and carbon offset guidance to be produced and replied to the GLA's carbon offset survey to inform new policy and guidance on price per carbon, extending the zero carbon homes to major commercial developments. The Council will be in a position to adopt the policies within the plan when we receive the Inspector's report finding the LPPR sound.

3. Planning Update and Other New Sources of Emissions

Table L. **Planning requirements met by planning applications in Kensington and Chelsea in 2018**

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	79
Number of planning applications required to monitor for construction dust	26
Number of CHPs/Biomass boilers refused on air quality grounds	3
Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions	26
Number of developments required to install Ultra-Low NO$_x$ boilers	25
Number of developments where an AQ Neutral building and/or transport assessments undertaken	21
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	3
Number of planning applications with S106 agreements including other requirements to improve air quality	3 received
Number of planning applications with CIL payments that include a contribution to improve air quality	CIL is a single payment and not attributed to specific items.
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.	2 1 registered but inactive, and 1 not started
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.	26 conditions included 8 registered and compliant (4 of these were self-compliant) 2 worked towards and achieved compliance and 1 uncompliant (partly due to non-registration.

3.1 New or significantly changed industrial or other sources

There have been no new, or significantly changed industrial or other sources identified within the borough during 2018.

Appendix A   Details of Monitoring Site QA/QC

A.1   Automatic Monitoring Sites

Data management and Local Site Operator (LSO) duties for the Kensington & Chelsea's automatic monitoring stations has been completed by Ricardo Energy and Environment since November 2017. All real-time data from the monitoring stations is independently collected and validated on a daily basis. A combination of automatic and manual checks is used to assess data, identify and diagnose potential equipment faults and adjust data to take account of calibration tests. Automatic overnight calibrations are supplemented with regular manual calibrations of analysers. The procedures used conform to the EU standards that are a requirement of the AURN.

All data is also formally ratified and is available is available online by accessing the Air Quality England Website and selecting Kensington & Chelsea within the 'Select local authority' menu bar. During this process the validation decisions can be ratified with the benefit of hindsight and using greater information, such as service records, calibration records and the results of station audits. Station audits are carried out by Ricardo Energy and Environment's in house audit team.

In addition, due to the PM_{10} / $PM_{2.5}$ monitoring completed at the North Kensington monitoring site being affiliated to the AURN/LAQN monitoring network, independent calibration and audits are completed for the FIDAS monitors by Defra appointed contractors.

PM_{10} Monitoring Adjustment

PM_{10} monitoring is completed within the borough at three monitoring sites; KC1 with a FIDAS, KC2 with an FDMS, and KC5 with a 1020 heated BAM (installed May 2019). As per LLAQM guidance[1], through independent data validation completed by Ricardo Energy and Environment, the BAM data is corrected by dividing the raw data by 1.035. Monitoring data from the FDMS and FIDAS monitors do not require correction during their data validation stage.

All fully validated monitoring PM_{10} data is available through the Air Quality England Website.

A.2   Diffusion Tube Quality Assurance / Quality Control

NO_2 Diffusion Tubes

The NO_2 diffusion tubes for the year 2018 were supplied and analysed by Gradko International, with the 50% Triethanolamine (TEA) in acetone preparation method utilised. Gradko is a UKAS accredited laboratory that follows the procedures set out by Defra within Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance for Laboratories and Users, and strict internal QA/QC procedures to ensure that concentrations reported are as accurate as possible. In addition Gradko participate in two independent QA/QC schemes to ensure their performance is constantly independently reviewed.

1) AIR-PT

AIR is an independent proficiency-testing (PT) scheme that is operated by LGC standards and supported by the Health and Safety Laboratory (HSL). AIR-PT began in April 2014 and combined two long running PT schemes: LGC Standards STACKS PT scheme, and the HSL WASP PT scheme. AIR is a recognised performance-testing programme for labs undertaking NO_2 diffusion tube analysis as part of a wider UK NO_2 monitoring network. The AIR-PT results for Gradko during 2018 are presented in

Table A.1 below, it can be seen that a 100% result was achieved for all monitoring samples provided.

Further information on proficiency testing can be found at Defra's Local Air Quality Management webpages under QA/QC framework for NO_2 diffusion tube monitoring.

Table A.1   Gradko Performance within AIR-PT for NO_2 Diffusion Tubes – 2018

AIR PT AR024	AIR PT AR025	AIR PT AR027	AIR PT AR028
January – February 2018	April – May 2018	July – August 2018	September – October 2018
100%	100%	100%	100%

2) Network Field Inter-Comparison Exercise

Gradko International also takes part in the NO_2 Network Field Inter-Comparison Exercise, operated by the National Physical Laboratory (NPL), which complements the AIR-PT scheme in assessing sampling and analytical performance of diffusion tubes under normal operating conditions. This involves the regular exposure of a triplicate set of tubes at an Automatic Urban Network site (AURN) site where continuous chemiluminescent analysers measure NO_2 concentrations.

The inter-comparison exercise is completed at the Marylebone AURN monitoring station. Of particular interest is the bias of the diffusion tube measurement relative to the automatic analyser that gives an indication of accuracy. Performance criterion have been established for participating laboratories in line with the Air Quality Directive 2008/50/EC requirement for indicative monitoring techniques, as the 95% confidence interval of the annual mean bias which should not exceed ±25%.

In conjunction with this, a measure of precision is determined by comparing the triplicate co-located tube measurements, commonly referred to as the coefficient of variation (CoV). This value is useful for assessing the uncertainty of results due to sampling and analytical techniques. The NPL performance criterion for precision is that the mean coefficient of variation for the full year should not exceed 10%, should this be achieved the precision is given a score of 'good'.

Gradko operates well within the required level of performance in terms of accuracy and precision, as shown by the results presented in Table A.2 below.

Table A.2   Gradko NO₂ Network Field Inter-Comparison Results for 2018

Annual Mean Bias		Precision	
Performance Target	Gradko Annual Mean Bias	Performance Target	Gradko Precision
±25%	+ 6.5%	10%	Good

Benzene Diffusion Tubes

All benzene tubes were analysed by a Gradko International who are a UKAS accredited laboratory using desorption scanning gas chromatography/mass spectrometry (GC/MS). This method of analysis gives unequivocal identification of BTEX peaks. The analysis is carried out in accordance with the Gradko International Laboratory Quality Procedure GLM 4.

The accuracy of the Laboratory measurements are monitored by participation in the Laboratory Measurement Proficiency Scheme.

The measurement method used in the benzene survey were consistent with the sampling, analysis and QA/QC requirements of EN 14662-4: 2005 Ambient air quality – Standard method for measurement of benzene concentrations – Part 4: Diffusive sampling followed by thermal desorption and gas.

<u>Factor from Local Co-location Studies</u>

Kensington & Chelsea are part of the London Wide Environmental Programme (LWEP) for which a number of co-location studies are completed across seven London Boroughs. During 2018 triplicate diffusion tube monitoring was completed at two automatic monitoring sites within the borough; North Kensington – KC47, and Cromwell Road – KC54. Both of the co-location study results were included within the LWEP bias adjustment calculations as presented in Table A.3 due to passing both data capture and diffusion tube precision checks. The bias adjustment factors calculated at both monitoring sites are presented below in Figure A.1 and Figure A.2.

Figure A.1   North Kensington Bias Adjustment Factor Calculations

Figure A.2   Cromwell Road Bias Adjustment Factor Calculations

Checking Precision and Accuracy of Triplicate Tubes   AEA Energy & Environment — From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	03/01/2018	31/01/2018	72.16	71.68	70.58	71	0.8	1	2.0	56.11	98.96	Good	Good
2	31/01/2018	01/03/2018	62.29	71.32	65.58	66	4.6	7	11.4	55.98	99.57	Good	Good
3	01/03/2018	28/03/2018	67.41	72.57	72.94	71	3.1	4	7.7	57.90	99.07	Good	Good
4	28/03/2018	01/05/2018	53.26	55.21	61.21	57	4.1	7	10.3	51.27	100.00	Good	Good
5	01/05/2018	05/06/2018	50.48	54.24	56.36	54	3.0	6	7.4	48.61	99.40	Good	Good
6	05/06/2018	04/07/2018	53.32	52.73		53	0.4	1	3.8	42.85	99.71	Good	Good
7	04/07/2018	01/08/2018	50.07		51.68	51	1.1	2	10.3	39.57	99.55	Good	Good
8	01/08/2018	04/09/2018	41.98	39.88	42.30	41	1.3	3	3.3	33.54	99.75	Good	Good
9	04/09/2018	03/10/2018								38.60	99.43		Good
10	03/10/2018	31/10/2018	44.29							44.94	100.00		Good
11	31/10/2018	05/12/2018	60.07	58.78	62.45	60	1.9	3	4.6	50.83	99.64	Good	Good
12	05/12/2018	09/01/2019	64.86	58.52	54.42	59	5.3	9	13.1	49.29	99.88	Good	Good
13													

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

Overall survey --> Good precision / Good Overall

Site Name/ ID:

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

(Check average CV & DC from Accuracy calculations)

Accuracy   (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 10 periods of data
Bias factor A   0.83 (0.8 - 0.86)
Bias B   20%   (16% - 25%)
Diffusion Tubes Mean: 58 μgm^{-3}
Mean CV (Precision):   4
Automatic Mean: 49 μgm^{-3}
Data Capture for periods used: 100%
Adjusted Tubes Mean: 48 (47 - 50) μgm^{-3}

Accuracy   (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 10 periods of data
Bias factor A   0.83 (0.8 - 0.86)
Bias B   20%   (16% - 25%)
Diffusion Tubes Mean: 58 μgm^{-3}
Mean CV (Precision):   4
Automatic Mean: 49 μgm^{-3}
Data Capture for periods used: 100%
Adjusted Tubes Mean: 48 (47 - 50) μgm^{-3}

Jaume Targa, for AEA
Version 04 - February 2011

Table A.3   Bias Adjustment Factor and % Bias of all LWEP Monitored Co-Location Studies 2018

London Borough	Site Location	Diffusion Tube	Continuous Analyser	Correction Factor (A)	% Bias based on continuous monitor (B)
Kensington	North Kensington	28.2	27.6	0.98	2
Kensington	Cromwell Road	58.4	47.5	0.83	20
LWEP	Bloomsbury	40.5	36.6	0.90	11
Croydon	Park Lane	55.8	41.3	0.74	35
Croydon	London Road	57.2	49.0	0.87	15
Greenwich	Eltham	20.4	17.6	0.87	16
Greenwich	Blackheath	44.6	35.8	0.80	25
Greenwich	Westhorne Av	41.7	38.7	0.92	9
Greenwich	Burrage	34.8	35.1	0.98	2
Greenwich	Woolwich Flyover	63.9	56.7	0.89	13

London Borough	Site Location	Diffusion Tube	Continuous Analyser	Correction Factor (A)	% Bias based on continuous monitor (B)
Greenwich	Bexley Falconwood	49.5	39.1	0.79	27
Newham	Cam Road	38.4	29.1	0.76	32
Overall % Bias					17.25
Overall Bias Adjustment Factor				0.85	

Discussion of Choice of Factor to Use

In previous years the bias adjustment factor used to adjust the NO_2 diffusion tube raw data has been taken from the co-location study completed at boroughs AURN/LAQN affiliated site, North Kensington. This has previously been chosen as a Local Factor, rather than using the LWEP or National Bias Adjustment Factor. When compared to the bias adjustment factor calculated at the Cromwell Road monitoring site the diffusion tube monitoring at North Kensington showed a more accurate comparison to the automatic monitoring data. In addition the factor at North Kensington was calculated to be higher than at Cromwell Road, therefore a more conservative bias adjustment factor has been used to adjust the diffusion tube monitoring data.

The 2018 factor was calculated as 0.98, previous factors used by Kensington and Chelsea are presented in Table A.4. The 2018 bias adjustment factor is lower than the previous nine years, this can be seen within the adjusted diffusion tube monitoring data presented in Table D and Figures F and G.

Table A.4   Bias Adjustment Factors used by Kensington and Chelsea (2001-2018)

Year	Mean Bias Adjustment	Mean % Bias
2001	1.37	-26
2002	1.35	-26
2003	1.11	-10
2004	1.10	-9
2005	1.03	-3
2006	1.06	
2007	1.01	
2008	0.98	
2009	1.00	1.14
2010	1.06	-4.78
2011	1.02	-0.91
2012	1.04	-3
2013	1.14	-10
2014	1.03	-3
2015	1.07	-6
2016	1.15	-13
2017	1.15	-13
2018	0.98	2.0

A.3   Adjustments to the Ratified Monitoring Data

<u>Short-term to Long-term Data Adjustment</u>

In regards to the 2018 diffusion tube data set, the data capture for 2018 was below 75% at three monitoring sites; KC35, KC40 and KC49.Due to the data capture being below 25% at KC49 (16.7%) annualisation was not completed at this monitoring site. In addition annualisation was required for the PM_{10} monitoring completed at KC5 due to the new BAM being installed at the site during May 2018.

Annualisation of the three monitoring sites has been completed in line with Box 4.8 and 4.9 within LLAQM.TG(16)[1] and full working details are presented in Table A.6 and Table A.7. In completing the annualisation process, data has been taken from a number of automatic monitoring sites that are part of the LAQN/AURN. In line with LLAQM.TG(16)[1] the monitoring sites that have been used lie within a radius of approximately 50 miles of the sites to be annualised and have a data capture of 85% or above.

All monitoring stations that were used are background monitoring stations and as such are not influenced by local sources of air pollution such as road traffic emissions at roadside monitoring sites. The monitoring sites that were used are listed in Table A.5.

Table A.5   LAQN/AURN Monitoring Stations used for Annualisation

Pollutant	Background LAQN/AURN Sites used for Annualisation
NO_2	• North Kensington – Urban Background • Ealing Acton Vale – Urban Background • Wandsworth Putney – Urban Background
PM_{10}	• North Kensington – Urban Background • Ealing Acton Vale – Urban Background • Westminster Horseferry Road

Table A.6   Diffusion Tube Short Term to Long Term Monitoring Data Adjustment (2018)

Site ID	Unadjusted Diffusion Tube Mean ($\mu g\ m^{-3}$)	Annualisation Factor North Kensington	Annualisation Factor Ealing Acton Vale	Annualisation Factor Wandsworth Putney	Average Annualisation Factor	Annualised & Bias Adjusted Concentration ($\mu g\ m^{-3}$)
KC35	63.2	0.943	0.939	0.952	0.944	58.5
KC40	34.2	0.961	0.977	0.971	0.970	32.5

Table A.7   PM₁₀ Short Term to Long Term Monitoring Data Adjustment (2018)

Site ID	Unadjusted Monitored Mean (µg m⁻³)	Annualisation Factor North Kensington	Annualisation Factor Ealing Acton Vale	Annualisation Factor Westminster Horseferry Road	Average Annualisation Factor	Annualised Concentration (µg m⁻³)
KC5	23.1	1.119	1.069	1.085	1.091	25.2

Distance Adjustment

In line with LLAQM.TG(16)[1] distance correction has been applied to NO_2 monitoring sites that are not sited at locations of relevant exposure as detailed within Table C. The NO_2 Fall-Off with Distance Calculator (v4.2) has been used to predict the NO_2 concentration at a location of relevant exposure; the calculations are presented in Table A.8 below, with the predicted concentrations also presented in Table D and Table B.1.

To complete the NO_2 fall off with distance calculations a background value for each monitoring location is required. Background NO_2 concentrations for 2018 have been derived from the Defra Background Map database that has a current baseline of 2017.

Distance correction has been completed for all Roadside and Kerbside monitoring locations and not the Urban Background and Urban Centre locations. In addition distance correction was unable to be completed at a number of diffusion tube monitoring sites due to the 2018 monitored NO_2 concentration being higher than the 2018 background concentration as derived from the Defra background maps.

Table A.8   NO₂ Fall-Off with Distance Calculations

Site ID	Distance (m)		Annual Mean Concentration (µg m⁻³)		
	Monitoring Site to Kerb	Receptor to Kerb	Background	Monitored at Site	Predicted at Receptor
KC1	8	18	34.6	29.1	-
KC2	4	14	34.4	47.6	**43.0**
KC3	1.5	2.5	34.5	66.4	<u>**62.8**</u>
KC4	8	22	33.3	59.6	**50.4**
KC5	0.5	1.5	34.6	78.7	<u>**70.1**</u>
KC31	3.5	9.5	34.6	42.8	**40.6**
KC32	380	385	31.1	26.2	
KC33	1.1	2.1	34.6	84	<u>**77.4**</u>
KC34	26	56	33.3	39	-
KC35	8	48	34.5	58.5	**43.6**
KC38	1.7	2.7	34.6	75.8	<u>**71.5**</u>
KC39	8.1	38.1	32.2	30.6	-

KC40	65	85	34.5	32.5	-
KC41	70	78	34.6	32.2	-
KC42	6	15	32.6	38.4	36.7
KC43	38	50	28.1	30	29.6
KC44	55	70	33.3	35.5	-
KC45	13	26	34.6	44.9	**41.9**
KC47	8.5	18.5	34.6	27.7	-
KC48	7	8	31.9	58.4	**57.2**
KC49	4	5	34.5		-
KC50	4	5	29.4	41	**40.3**
KC51	92	95	29.4	27.7	-
KC52	2.6	7.6	33.3	49.4	**45.1**
KC53	12.5	32.5	33.4	40.7	37.9
KC54	3.1	13.1	34.4	57.3	**48.7**
KC55	100	120	32.2	40.5	-
KC56	9	23	33.3	59.9	**50.9**
KC57	3	28	34.5	47.1	39.8
KC58	13	14	33.2	48	**47.5**
KC59	0.7	1.7	33.2	66.5	**<u>61.0</u>**
KC60	0.7	8.7	34.4	51.8	**43.6**
KC61	10	30	32.2	45.2	39.8
KC64	3.5	11.5	32.5	42.5	39.3
KC65	0.5	20.5	28.1	34.5	30.3
KC66	16	34	34.6	38.5	37.2
KC67	38	93	29.5	36.8	-
KC68	0.5	1	32.4	42.1	**40.9**
KC69	11.7	13.7	31.1	35.8	35.5
KC70	0.5	4.5	29.4	55.5	**45.3**
KC71	0.5	5.5	29.4	44	37.8
KC72	0.5	5	29.4	59.6	**47.3**
KC73	0.5	5	29.4	44	38.0

Exceedances of the NO_2 annual mean AQO of 40 µg m^{-3} are shown in **bold**

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 **<u>underlined</u>**

Appendix B   Full Monthly Diffusion Tube Results for 2018

Table B.1   NO₂ Diffusion Tube Results

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean NO$_2$ (µg m^{-3})														
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data [c]	Annual mean – bias adjusted [c]	Distance corrected to nearest exposure [d]
KC31	99.2	99.2	45.4	44.0	52.7	37.3	44.4	44.1	42.8	34.7	40.5	44.3	47.3	47.0	**43.7**	**42.8**	- [f]
KC32	99.6	99.6	TM	26.1	29.3	27.6	21.9	17.9	20.5	19.8	21.8	59.1	21.1	29.2	26.8	26.2	N/A
KC33	99.8	99.8	108.7	84.4	83.8	82.6	79.8	87.2	91.9	76.4	88.6	84.1	86.4	74.1	**_85.7_**	**_84.0_**	**_77.4_**
KC34	99.6	99.6	46.8	TM	52.2	42.9	40.2	35.3	34.0	28.8	35.0	32.3	48.4	42.0	39.8	39.0	N/A
KC35	99.9	99.9	TM	55.8	71.2	59.3	68.8	TM	68.4	TM	TM	58.4	TM	60.6	**_63.2_**	58.5	43.6
KC38	100.0	100.0	86.6	82.5	76.0	66.5	79.1	76.3	86.6	74.5	74.4	73.5	78.3	73.6	**_77.3_**	**_75.8_**	**_71.5_**
KC39	91.7	91.7	33.9	34.4	37.1	32.7	30.6	25.8	28.0	20.3	26.3	32.8	40.2	32.7	31.2	30.6	- [f]
KC40	100.0	100.0	TM	TM	TM	TM	TM	TM	29.9	TM	26.2	35.3	40.1	39.3	34.2	32.5	N/A
KC41	91.7	91.7	33.0	35.4	41.0	28.7	32.2	25.5	TM	26.5	25.8	37.3	39.5	36.7	32.9	32.2	N/A
KC42	58.3	58.3	40.7	43.8	45.4	41.6	34.8	31.6	35.3	32.0	37.5	42.6	41.7	43.0	39.2	38.4	36.7
KC43	100.0	100.0	30.9	37.6	38.0	31.3	31.2	27.6	24.6	21.5	19.7	30.9	38.2	35.8	30.6	30.0	N/A
KC44	100.0	100.0	37.9	38.6	41.2	34.3	35.3	28.0	31.2	28.4	35.0	43.1	40.4	40.9	36.2	35.5	N/A
KC45	41.7	41.7	41.9	44.7	57.2	47.5	46.7	43.6	43.1	39.6	41.0	46.4	54.1	44.5	**45.9**	**44.9**	**41.9**
KC47	100.0	100.0	29.1	32.9	34.4	27.2	27.7	21.0	23.3	20.6	23.8	29.7	36.3	34.0	28.3	27.8	N/A
KC47	100.0	100.0	35.8	29.4	35.7	26.7	24.4	21.4	23.0	21.8	23.7	29.2	36.3	30.0	28.1	27.6	N/A
KC47	100.0	100.0	32.4	29.8	34.1	25.8	26.1	20.9	23.7	20.5	24.8	29.8	35.9	35.2	28.3	27.7	N/A

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean NO$_2$ (µg m^{-3})												Annual mean – raw data [c]	Annual mean – bias adjusted [c]	Distance corrected to nearest exposure [d]
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec			
KC48	100.0	100.0	70.7	62.6	63.0	59.2	63.4	62.6	59.3	47.8	50.9	64.8	48.8	62.4	**59.6**	**58.4**	**57.2**
KC49	16.7	16.7	TM	TM	TM	TM	TM	TM	68.1	TM	TM	TM	TM	60.7	<u>64.4</u>	-	-
KC50	83.3	83.3	42.4	37.2	39.0	39.1	40.7	44.7	52.8	33.3	37.9	TM	TM	51.0	**41.8**	**41.0**	40.3
KC51	100.0	100.0	32.7	31.1	30.6	27.4	29.1	26.2	25.7	21.2	26.0	25.1	31.4	32.2	28.2	27.7	N/A
KC52	100.0	100.0	45.8	51.4	58.5	46.5	59.0	57.5	49.5	39.5	47.8	47.4	51.4	50.8	**50.4**	**49.4**	**45.1**
KC53	100.0	100.0	42.3	40.0	45.7	38.4	42.2	36.5	41.3	40.1	42.4	39.6	43.5	46.0	41.5	**40.7**	N/A
KC54	91.7	91.7	72.2	62.3	67.4	53.3	50.5	53.3	50.1	42.0	TM	44.3	60.1	64.9	**56.4**	**55.3**	**47.4**
KC54	75.0	75.0	71.7	71.3	72.6	55.2	54.2	52.7	TM	39.9	TM	TM	58.8	58.5	**59.4**	**58.2**	**49.3**
KC54	75.0	75.0	70.6	65.6	72.9	61.2	56.4	TM	51.7	42.3	TM	TM	62.4	54.4	**59.7**	**58.5**	**49.5**
KC55	100.0	100.0	51.5	47.1	46.6	39.8	39.7	35.5	33.2	31.3	31.3	44.3	47.8	48.2	**41.4**	**40.5**	N/A
KC56	100.0	100.0	60.0	60.8	68.5	62.2	62.6	66.3	69.1	53.7	55.4	56.6	58.7	59.6	<u>61.1</u>	59.9	**50.9**
KC57	100.0	100.0	49.2	51.1	50.0	44.3	55.2	49.4	45.2	40.7	51.2	50.3	43.1	47.0	**48.1**	**47.1**	39.8
KC58	91.7	91.7	50.0	52.2	50.2	49.6	51.2	53.5	50.5	42.1	48.1	47.5	43.8	TM	**49.0**	**48.0**	**47.5**
KC59	100.0	100.0	72.2	65.4	67.5	57.1	74.6	73.0	67.6	61.1	76.5	70.9	59.5	68.9	<u>67.9</u>	<u>66.5</u>	<u>61.0</u>
KC60	91.7	91.7	61.4	48.2	57.2	44.1	57.5	50.8	55.2	44.6	49.4	54.8	58.3	TM	**52.9**	**51.8**	**43.6**
KC61	100.0	100.0	44.2	48.3	51.0	43.9	54.4	43.0	40.5	36.0	44.6	46.3	49.8	51.1	**46.1**	**45.2**	39.8
KC64	100.0	100.0	45.7	44.2	50.1	40.2	44.9	36.4	41.2	34.2	41.5	51.9	46.6	43.3	**43.3**	**42.5**	39.3
KC65	100.0	100.0	36.4	40.2	34.1	33.5	37.7	30.8	30.0	27.7	31.7	39.6	38.9	41.4	35.2	34.5	30.3
KC66	100.0	100.0	44.5	42.4	44.5	34.9	36.3	31.7	35.0	30.4	35.6	46.2	44.5	45.2	39.3	38.5	N/A
KC67	100.0	100.0	45.1	40.2	42.0	35.9	32.5	25.7	31.6	32.2	38.4	39.6	42.2	45.2	37.6	36.8	N/A
KC68	100.0	100.0	45.7	47.7	47.4	43.4	41.0	38.0	35.3	35.6	41.7	45.2	43.7	50.5	**42.9**	**42.1**	**40.9**

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2018 % [b]	Annual Mean NO$_2$ (µg m^{-3})												Annual mean – raw data [c]	Annual mean – bias adjusted [c]	Distance corrected to nearest exposure [d]
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec			
KC69	100.0	100.0	40.1	40.1	43.3	28.7	35.1	28.6	32.2	34.1	32.5	38.3	42.7	42.4	36.5	35.8	N/A
KC70	100.0	91.7	NR	53.8	62.6	52.8	58.8	52.6	68.6	45.7	59.9	52.0	58.4	57.6	**56.6**	**55.5**	**45.3**
KC71	100.0	91.7	NR	47.5	50.3	46.6	46.3	38.2	43.9	36.7	42.9	38.1	53.0	50.4	**44.9**	**44.0**	37.8
KC72	100.0	91.7	NR	59.3	52.8	63.3	69.4	65.8	69.4	54.7	62.7	50.0	73.0	48.9	**<u>60.9</u>**	**59.6**	**47.3**
KC73	90.9	83.3	NR	50.1	51.5	43.0	45.9	TM	43.4	32.8	39.5	41.1	50.6	50.8	**44.9**	**44.0**	38.0

Exceedance of the NO$_2$ annual mean AQO of 40 µg m^{-3} are shown in **bold**

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 **<u>underlined</u>**

[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%

[d] Distance corrected to nearest relevant public exposure

[e] Due to data capture being below 25% an annual mean concentration has not been presented for KC49

[f] Distance correction not completed due to monitored concentration higher than background concentration

TM – Tube Missing

NR – No Result, monitoring began at sites KC70-KC73 in February 2018

N/A – Distance correction not completed at Urban Background / Urban Centre / Railway monitoring locations