# Royal Borough of Kensington and Chelsea
# Air Quality Annual Status Report for 2016
# Date of publication: July 2017

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



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

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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.

# 1.     Air Quality Monitoring

## 1.1     Locations

Following a major public consultation in the summer of 2000 a decision was reached by the full Council to declare the whole of the borough an Air Quality Management Area (AQMA).  The Order making the declaration came into force on the 6th December 2000 and was based on exceedences of nitrogen dioxide ($NO_2$) and particulate matter ($PM_{10}$).

**Figure 1.  Map of RBKC AQMA Boundary**

**Table B.** Details of Automatic Monitoring Sites for 2016

| Site Code | Site Name | OS Grid Ref | | Site Type | In AQMA? | Does this location represent worst-case exposure | Relevant exposure (Y/N) 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 | X524045 | Y 181752 | Urban background LAQN & AURN affiliate | Y | N | Y - 10m | Approx within 8m of St Charles Square | 3 | Nitrogen oxides PM₁₀ Carbon monoxide Sulphur dioxide Ozone Other Defra/ERG monitoring undertaken: PM₁₀ & PM₂.₅ | Chemiluminescent FDMS and TEOM GFC Fluorescence UV Photometric FDMS , partisols |
| AURN to Sept 2012 | Cromwell Rd/ Cromwell Rd 2 | X 26524 | Y 178965 | Roadside, AURN | Y | N | Y - 10m | 4m from Cromwell Road | 2 | Nitrogen oxides Carbon monoxide Sulphur dioxide Other monitoring undertaken: Lead and heavy metals | Chemiluminescent GFC Fluorescence UV Partisol |
| KC2 | Cromwell Rd 2 | X 26524 | Y 178965 | Roadside, LAQN | Y | N | Y - 10m | Approx within 4m of Cromwell Rd and 5m of Queens Gate. | 2 | PM₁₀ PM₂.₅ | FDMS FDMS |
| AURN | West London Closed in 2007 | X 25026 | Y 178741 | Urban background AURN | Y | N | n/a | 50m from Warwick Rd | n/a | Nitrogen oxides Carbon monoxide | Chemiluminescent |
| | Knightsbridge | | | Kerbside, | Y | Y | Y – 1m | Located on | 3 | Nitrogen oxides | Chemiluminescent |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| KC3 | | X 27518 | Y 179395 | LAQN | | | | the kerb of Hans Road 1.5 and 4m from Brompton Rd | | | |
| KC4 | Kings Rd Chelsea | X 27268 | Y 178089 | Roadside, LAQN | Y | N | Y 14m | Approx 8m from Kings Rd | 3 | Nitrogen oxides | Chemiluminescent |
| KC5 | Earls Court | X 25695 | Y 178363 | Kerbside, LAQN | Y | Y | Y -1m | Sited on the kerb of Earls Court Rd (0.5m) | 2 | $PM_{10}$ gravimetric Nitrogen oxides | Partisol plus Chemiluminescent |

**Figure 2.  Map of Automatic Monitoring Sites**
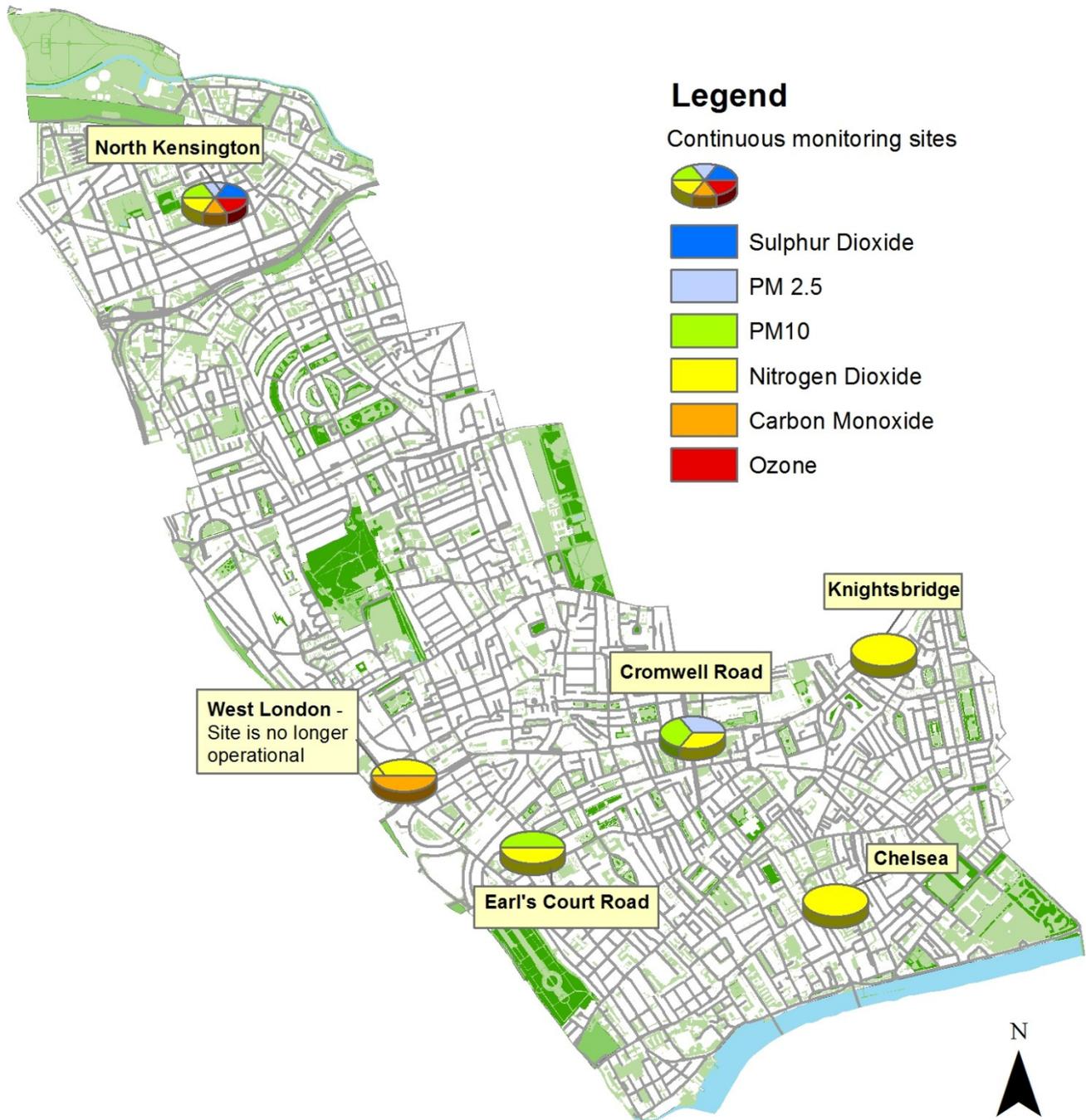
Status: Final
Date: April 2014
Author:Environmental Quality

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

| Site ID | Site Name | OS Grid Ref X (m) and Y (m) | | Site Type | In AQMA? | Distance from monitoring site to relevant exposure (m). Relevant exposure (y/n). | 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) | Worst-case Location ? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| KC31 | Ladbroke Grove/Nth Ken Library | X 524342 | Y 181271 | Roadside | Y | Y – 6 | 3.5 | 5 | NO$_2$ | N | No |
| KC32 | Holland Park | X 524784 | Y 179599 | Urban Background | Y | Y – 5 | 380 | 4 | NO$_2$ | N | No |
| KC33 | Cromwell Rd/ Earls Court Rd | X 525355 | Y 178841 | Roadside | Y | Y – 1 | 1.1 | 2.1 | NO$_2$ | N | Yes |
| KC34 | Dovehouse Street | X 527164 | Y 178103 | Urban Centre | Y | Y – 30 | 26 | 2.8 | NO$_2$ | N | No |
| KC35 | Brompton Road/ Cottage Place | X 527192 | Y 179185 | Roadside | Y | Y – 40 | 8 | 1.5 | NO$_2$ | N | No |
| KC38 | Earls Court Station | X 525548 | Y 178556 | Roadside | Y | Y - 1 | 1.7 | 2.7 | NO$_2$ | N | Yes |
| KC39 | Lots Road/ Upcerne Road | X 526317 | Y 177022 | Roadside | Y | Y – 30 | 8.1 | 2.5 | NO$_2$ | N | No |
| KC40 | Brompton Road | X 527214 | Y 179153 | Urban Centre | Y | Y – 20 | 65 | 2.7 | NO$_2$ | N | No |
| KC41 | Ladbroke Crescent | X 524294 | Y 181200 | Urban Background | Y | Y – 8 | 70 | 2.2 | NO$_2$ | N | No |
| KC42 | Pembridge Square Library | X 525191 | Y 180705 | Roadside | Y | Y – 9 | 6 | 3.1 | NO$_2$ | N | No |
| KC43 | St Marks Grove | X 525950 | Y 177487 | Urban Background | Y | Y – 12 | 38 | 2.3 | NO$_2$ | N | No |
| KC44 | Donne Place | X 527335 | Y 178810 | Urban Background | Y | Y – 15 | 55 | 2.4 | NO$_2$ | N | No |
| KC45 | Chatsworth Court | X 525263 | Y 178936 | Roadside | Y | Y – 13 | 13 | 2 | NO$_2$ | N | No |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| KC46 | Marlborough Court-closed | X 525157 | Y 178892 | Roadside | Y | Y n/a | 8 | 2 | NO$_2$ | N | No |
| KC47 | Sion Manning School | X 524046 | Y 181758 | Urban Background | Y | Y - 10 | 8.5 | 2.1 | NO$_2$ | Y | No |
| KC48 | Sloane Square | X 528011 | Y 178675 | Roadside | Y | Y – 1 | 7 | 3 | NO$_2$ | N | No |
| KC49 | Harrods | X 527516 | Y 179395 | Urban Centre | Y | Y – 1 | 4 | 2.5 | NO$_2$ | Y | Yes |
| KC50 | Chelsea Physic Garden (Gate) | X 527726 | Y 177727 | Roadside | Y | Y – 1 | 4 | 2.9 | NO$_2$ | N | No |
| KC51 | Chelsea Physic Garden (Met Station) | X 527690 | Y 177800 | Urban Background | Y | Y – 3 | 92 | 1.5 | NO$_2$ | N | No |
| KC52 | Sloane Avenue | X 527411 | Y 178659 | Roadside | Y | Y – 5 | 2.6 | 2.4 | NO$_2$ | N | No |
| KC53 | Walmer House | X 523792 | Y 181189 | Urban Background | Y | Y – 20 | 12.5 | 2.3 | NO$_2$ | N | No |
| KC54 | Cromwell Rd/ Natural History Museum | X 526550 | Y 178968 | Roadside | Y | Y – 10 | 3.1 | 2.6 | NO$_2$ | y | No |
| KC55 | Blantyre St | X 526608 | Y 177429 | Urban Background | Y | Y - 20 | 100 | 3 | NO$_2$ | N | No |
| KC56 | Chelsea Old Town Hall | X 527268 | Y 178089 | Roadside | Y | Y - 14 | 9 | 3.1 | NO$_2$ | Y | No |
| KC57 | Pavilion St/ Sloane Ave | X 527889 | Y 179145 | Roadside | Y | Y – 25 | 3 | 2.4 | NO$_2$ | N | No |
| KC58 | Kensington H St/Kensington Church St | X 525630 | Y 179674 | Roadside | Y | Y – 1 | 13 | 2.7 | NO$_2$ | N | No |
| KC59 | Kensington High St/Argyll St | X 525342 | Y 179464 | Kerbside | Y | Y - 1 | 0.7 | 2.5 | NO$_2$ | N | No |
| KC60 | Old Brompton Rd/ | X 526231 | Y 178425 | Kerbside | Y | Y – 8 | 0.7 | 2.5 | NO$_2$ | N | No |

| | Draycott Ave | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| KC61 | Fulham Rd/ Limerston St | X 526377 | Y 177867 | Roadside | Y | Y – 20 | 10 | 2.4 | NO$_2$ | N | No |
| KC64 | Warwick Road | X 524825 | Y 178902 | Roadside | Y | Y – 8 | 3.5 | 2.6 | NO$_2$ | N | No |
| KC65 | Barlby Road | X 523899 | Y 182113 | Roadside | Y | Y – 20 | 0.5 | 2.5 | NO$_2$ | N | No |
| KC66 | Acklam Road | X 524541 | Y 181893 | Railway | Y | Y – 18 | 16 | 2.5 | NO$_2$ | N | No |
| KC67 | Southern Row | X 524056 | Y 182148 | Railway | Y | Y – 55 | 38 | 2.5 | NO$_2$ | N | Yes |
| KC68 | Exhibition Road | X 526863 | Y 179060 | Kerbside | Y | Y – 0.5 | 0.5 | 2.1 | NO$_2$ | N | Yes |
| KC69 | Darfield Way | X 523587 | Y180893 | Background | Y | Y – 2 | 11.7 | 2.0 | NO2 | N | No |
| KC01 | Ladbroke Grove/Nth Ken Library | X 524342 | Y 181271 | Roadside | Y | Y – 6 | 3.5 | 5.5 | Benzene | N | No |
| KC02 | Holland Park | X 524784 | Y 179599 | Urban Background | Y | Y – 5 | 380 | 4 | Benzene | N | No |
| KC03 | Warwick Rd - Petrol Station (forecourt) now closed | X 524911 | Y 178736 | Petrol station | Y | Y – n/a | N/A | 3 | Benzene | N | No |
| KC04 | Dovehouse Street | X 527111 | Y 178165 | Urban Background | Y | Y – 30 | 45 | 2.2 | Benzene | N | No |
| KC05 | Pembridge Square Library | X 525191 | Y 180705 | Roadside | Y | Y – 9 | 6 | 4 | Benzene | N | No |
| KC0X | Old Brompton Rd/ Clareville Grove Petrol St | X 526496 | Y 178553 | Petrol station | Y | Y - 3 | 12 | | Benzene | N | No |

Grey highlighted row denotes closed site
Orange highlighted rows  denote Benzene locations

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**Figure 3. Map of Non-Automatic Monitoring**

| Site code | Diffusion tube location |
|-----------|-------------------------|
| KC31 | Ladbroke Grove/North Kensington Library |
| KC32 | Holland Park |
| KC33 | Cromwell Road/Earls Court Road |
| KC34 | Dovehouse Street |
| KC35 | Brompton Road/Cottage Place |
| KC38 | Earls Court Station |

| Site code | Diffusion tube location |
|-----------|-------------------------|
| KC39 | Lots Road/Upcerne Road |
| KC40 | Brompton Road |
| KC41 | Ladbroke Crescent |
| KC42 | Pembridge Square |
| KC43 | St Marks Grove |
| KC44 | Donne Place |
| KC45 | Chatsworth Court |
| KC46 | Malborough Court -closed |
| KC47 | Sion Manning School |
| KC48 | Sloane Square |
| KC49 | Harrods |
| KC50 | Chelsea Physic Gardens 1 |
| KC51 | Chelsea Physic Gardens 2 |
| KC52 | Sloane Avenue School |
| KC53 | Walmer House |
| KC54 | Cromwell Road/Natural History Museum |
| KC55 | Blantyre Street |
| KC56 | Chelsea Old Town Hall |
| KC57 | Pavillion St/Sloane Square |
| KC58 | Kensington High Street/Campden Hill Rd |
| KC59 | Kensington High Street/Argyll St |
| KC60 | Old Brompton Rd |
| KC61 | Fulham  Rd/Limerston St |
| KC64 | Warwick Road |
| KC65 | Barlby Road |
| KC66 | Acklam Road |
| KC67 | Octavia House/Southern Row |
| KC68 | Exhibition Road |
| KC69 | Darfield Way |



**Legend**

● NO2 diffusion tube sites
— Roads
▬ Conservation sites
▢ Borough boundary

N

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Status: Final
Date: April 2014
Author:Environmental Quality

**Figure 4.  Map of non-automatic benzene monitoring sites**
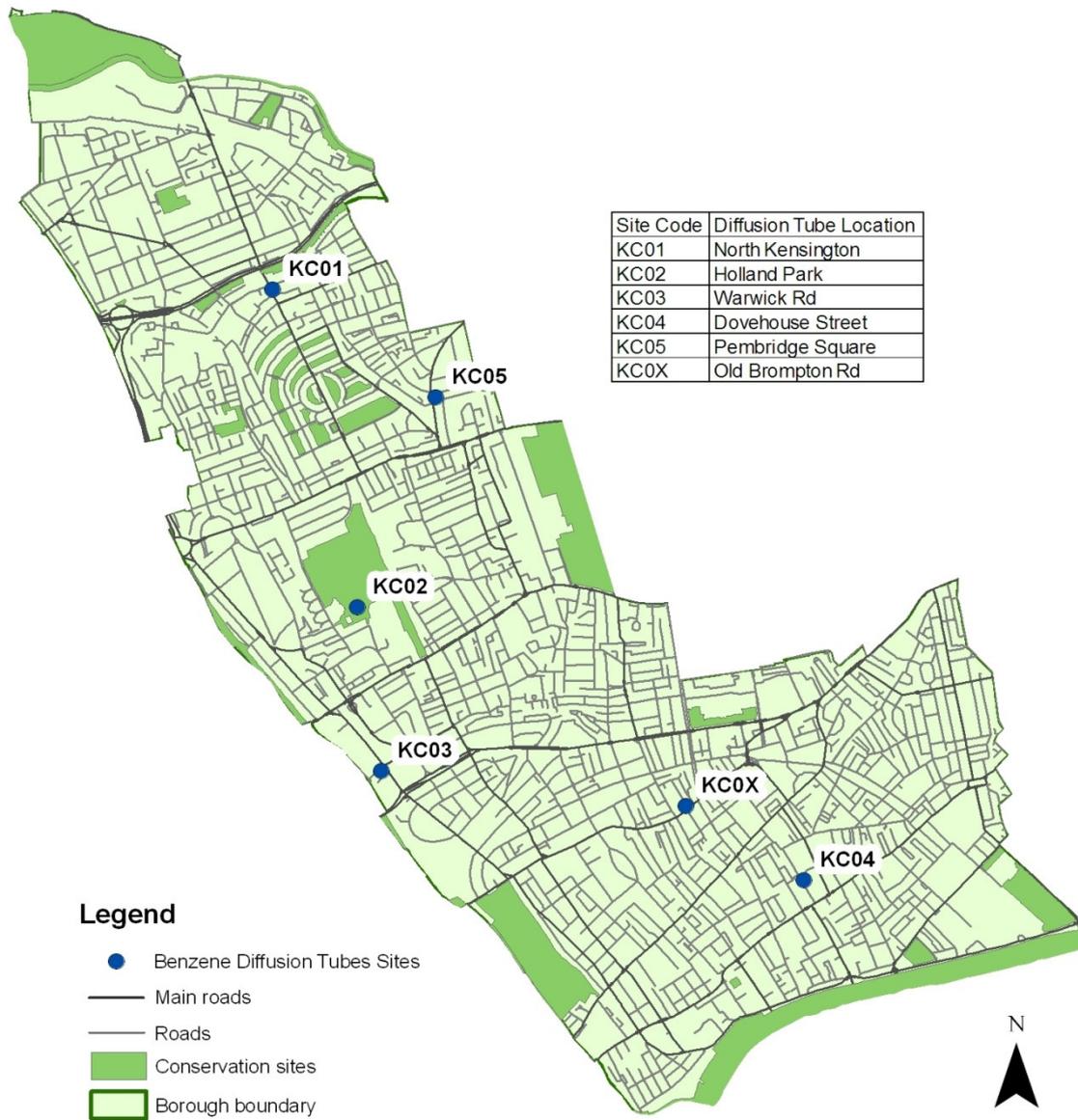


| Site Code | Diffusion Tube Location |
|-----------|-------------------------|
| KC01 | North Kensington |
| KC02 | Holland Park |
| KC03 | Warwick Rd |
| KC04 | Dovehouse Street |
| KC05 | Pembridge Square |
| KC0X | Old Brompton Rd |

Legend

● Benzene Diffusion Tubes Sites
— Main roads
— Roads
■ Conservation sites
□ Borough boundary

N

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**Status: Final**
**Date: April 2011**
**Author:Environmental Quality**

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## 1.2 Comparison of Monitoring Results with AQOs

**Table D.** Annual Mean NO2 Ratified and Bias-adjusted Monitoring Results (µg m$^{-3}$)

| Site ID | Location | Site Type | Valid data capture for monitoring period % [a] | Valid data capture 2016 % [b] | 2016 Data Capture No. of months | Annual mean concentrations (µg/m$^3$) Adjusted for bias (shown below) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2010 DT BAF 1.06 | 2011 DT BAF 1.02 | 2012 DT BAF 1.04 | 2013 [c] DT BAF 1.14 | 2014 [c] DT BAF 1.03 | 2015 [c] DT BAF 1.07 | 2016 | 2016 (Distance corrected) |
| KC1 | North Kensington | Automatic | 99 | 99 | | 37 | 36 | 37 | 37 | 34[d] | 32 | 35 | n/a |
| KC5 | Earls Court | Automatic | 99 | 99 | | 113 | 100/101 | 101 | 95 | 93 | 91 | 86 | 76 |
| KC2 | Cromwell Rd 2 | Automatic | 98 | 98 | | 74 | 66 | 69 | 60 | 56 | 55 | 58 | 51.9 |
| KC3 | Knightsbridge | Automatic | 96 | 96 | | 91 | 81 | 92 | 90 | 72[d] | 71 | 80 | 84.1 |
| KC4 | Kings Road Chelsea | Automatic | 100 | 100 | | 91 | 91 | 92/93 | 84 | 76[d] | 73 | 78 | 109.5 |
| KC31 | Ladbroke Grove/Nth Ken Library | Diffusion tube (DT) | 100 | 100 | 12 | 60.0 | 52.9 | 52.6 | 60.9 | 53.5 | 49.26 | 55.50 | 62.7 |
| KC32 | Holland Park | Diffusion tube (DT) | 100 | 100 | 12 | 32.8 | 29.0 | 29.1 | 34.0 | 29.2 | 27.49 | 29.87 | n/a |
| KC33 | Cromwell Road/Earls Court Rd | Diffusion tube (DT) | 92 | 92 | 11 | 91.2 | 83.6 | 84.2 | 106.3 | 98.2 | 84.45 | 104.50 | 80.0 |
| KC34 | Dovehouse Street | Diffusion tube (DT) | 100 | 100 | 11 | 44.9 | 42.6 | 42.4 | 50.3 | 45.1 | 40.76 | 43.70 | 42.9 |
| KC35 | Brompton Road/Cottage Place | Diffusion tube (DT) | 100 | 100 | 11 | 66.8 | 71.8 | 81.3 | 90.9 | 82.4 | 75.68 | 80.67 | 75.5 |

| ID | Location | Method | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KC38 | Earls Court Station | Diffusion tube (DT) | 100 | 100 | 12 | 96.1 | 95.3 | 100.7 | 108.8 | 100.7 | 99.01 | 101.03 | 109 |
| KC39 | Lots Road/Upcerne Road | Diffusion tube (DT) | 100 | 100 | 12 | 40.7 | 33.4 | 34.0 | 37.1 | 34.5 | 32.51 | 38.53 | 36.6 |
| KC40 | Brompton Road | Diffusion tube (DT) | 100 | 100 | 12 | 49.5 | 49.9 | 49.1 | 52.9 | 44.1 | 41.56 | 45.14 | n/a |
| KC41 | Ladbroke Crescent | Diffusion tube (DT) | 100 | 100 | 12 | 40.9 | 35.5 | 34.8 | 41.7 | 36.7 | 34.60 | 38.16 | n/a |
| KC42 | Pembridge Square Library | Diffusion tube (DT) | 92 | 92 | 11 | 46.4 | 43.5 | 43.8 | 50.9 | 42.4 | 41.16 | 46.19 | 45.1 |
| KC43 | St Marks Grove | Diffusion tube (DT) | 100 | 100 | 12 | 40.8 | 34.8 | 36.5 | 47.1 | 38.7 | 34.22 | 36.18 | n/a |
| KC44 | Donne Place | Diffusion tube (DT) | 100 | 100 | 12 | 45.3 | 39.9 | 42.1 | 47.0 | 40.0 | 39.60 | 46.13 | n/a |
| KC45 | Chatsworth Court | Diffusion tube (DT) | 100 | 100 | 12 | 52.0 | 51.7 | 50.5 | 57.9 | 53.5 | 48.58 | 52.61 | 47.3 |
| KC47 | Sion Manning School | Diffusion tube (DT) | 100 | 100 | 12 | 37.1 | 32.3 | 33.8 | 36.7 | 32.9 | 27.45 | 34.21 | n/a |
| KC48 | Sloane Square | Diffusion tube (DT) | 100 | 100 | 12 | 86.3 | 82.4 | 80.8 | 86.6 | 73.9 | 63.03 | 72.33 | 72.3 |
| KC49 | Harrods | Diffusion tube (DT) | 100 | 100 | 12 | 79.0 | 70.6 | 80.0 | 94.0 | 74.5 | 69.70 | 87.5 | 108.1 |
| KC50 | Chelsea Physic Garden (Gate) | Diffusion tube (DT) | 92 | 92 | 12 | 57.5 | 56.4 | 58.5 | 62.9 | 59.4 | 48.19 | 56.4 | 53.9 |
| KC51 | Chelsea Physic Garden (Met Station) | Diffusion tube (DT) | 92 | 92 | 11 | 36.8 | 33.2 | 33.5 | 36.6 | 33.3 | 31.58 | 36.18 | n/a |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KC52 | Sloane Ave. nr Marlborough school | Diffusion tube (DT) | 100 | 100 | 12 | 59.4 | 51.5 | 56.5 | **65.3** | 58.4 | 52.89 | 64.5 | **59.6** |
| KC53 | Walmer House | Diffusion tube (DT) | 100 | 100 | 12 | 49.4 | 46.3 | 48.5 | 53.6 | 48.4 | 42.60 | 47.0 | **n/a** |
| KC54 | Cromwell Rd/Natural History Museum | Diffusion tube (DT) | 92 | 92 | 11 | **70.7** | **73.2** | **73.4** | **80.6** | **73.7** | 62.94 | **72.5** | **71.9** |
| KC55 | Blantyre St | Diffusion tube (DT) | 75 | 75 | 12 | 44.3 | 40.6 | 41.7 | 48.8 | 44.1 | 35.45 | 49.02 | n/a |
| KC56 | Chelsea Old Town Hall | Diffusion tube (DT) | 100 | 100 | 12 | **80.6** | **84.3** | **87.1** | **88.2** | **74.4** | **63.65** | **72.70** | **103.2** |
| KC57 | Pavilion St/Sloane Ave | Diffusion tube (DT) | 100 | 100 | 12 | 57.7 | 52.5 | 53.5 | 59.0 | 54.4 | 43.62 | 56.22 | **53.3** |
| KC58 | Kensington H St/Kensington Church St | Diffusion tube (DT) | 100 | 100 | 12 | **68.2** | 58.1 | **62.4** | **75.0** | 58.9 | 50.94 | 59.73 | **86.9** |
| KC59 | Kensington H St/Argyll St | Diffusion tube (DT) | 100 | 100 | 12 | **82.2** | **83.0** | **83.4** | **86.9** | **74.9** | **70.31** | **78.97** | **76** |
| KC60 | Old Brompton Rd/Draycott Ave | Diffusion tube (DT) | 100 | 100 | 12 | **78. 9** | **69.3** | **68.6** | **75.1** | **69.9** | **61.22** | **73.1** | **54.7** |
| KC61 | Fulham Rd/Limerston St | Diffusion tube (DT) | 100 | 100 | 12 | **63.5** | **60.5** | 54.9 | **64.7** | 54.6 | 51.54 | 61.0 | **54.0** |
| KC64 | Warwick Rd | Diffusion tube (DT) | 100 | 100 | 12 | **63.0** | 49.0 | 49.6 | 55.5 | 54.8 | 50.55 | 58.3 | **50.6** |
| KC65 | Barlby Road* | Diffusion tube (DT) | 100 | 100 | 12 | **40.8** | 38.8 | 38.0 | **47.2** | **40.5** | 33.08 | 41.3 | **n/a** |
| KC66 | Acklam Road* | Diffusion tube (DT) | 92 | 92 | 12 | **45 9** | **43.5** | 39.9 | **45.4** | **44.2** | 34.43 | 55.8 | **n/a** |

| Site | Location | Method | a | b | No. months | | | | | | | | |
|------|----------|--------|---|---|-----|---|---|---|---|---|---|---|---|
| KC67 | Southern Row* | Diffusion tube (DT) | 100 | 100 | 12 | 43.6 | 43.8 | 42.3 | 48.7 | 44.2 | 36.21 | 45.1 | n/a |
| KC68 | Exhibition Road | Diffusion tube (DT) | 92 | 92 | 11 | 55.9 | <u>60.6</u> | 48.0 | 58.3 | 52.9 | 44.64 | *51.0* | *49.0* |
| KC69 | Darfield Way | Diffusion tube (DT) | 100 | 100 | 12 | n/a | <u>n/a</u> | n/a | n/a | 48.7 | 39.34 | 46.1 | n/a |

KC47 and KC54 are the mean results of triplicate exposure.  Additionally KC47, KC49, KC54 and KC56 are all co-located with continuous analysers.

**Bold** indicates an exceedence of the annual mean objective of 40 µg/m$^3$.

NO2 annual means in excess of 60 µg m$^3$ indicating a potential exceednace of the NO2 hourly mean AQS objective are shown in **bold and underlined**

Where the capture rate is less than 90% for the year results may not be representative of the full year and should only be used as for guidance only

[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] Data capture for Cromwell Rd automatic monitoring site is 63% for 2015. Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% (9 months) however this has not been undertaken. Source: Londonair.org.uk

d – LAQN ratified annual mean updated from previous year reported annual mean

DT = Diffusion Tube

BAF = Bias Adjustment Factor`

**Table E.**  **NO2 Automatic Monitor Results: Comparison with 1-hour Mean Objective**

| Site ID | Location | Valid data capture for monitoring period % [a] | Valid data capture 2016 % [b] | Number of Hourly Means > 200 µgm$^{-3}$ | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2010 | 2011 | 2012 | 2013 [c] | 2014 [c d] | 2015 [c] | 2016 |
| KC1 | North Kensington | 99 | 99 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| KC5 | Earls Court* | 99 | 99 | **515** | **386** | **323** | **140** | *212* | **135** | **120** |
| KC2 | Cromwell Rd 2 | 98 | 98 | 3 | 1 | 4 | 2 | 0 | *0 (119.7)* | *1* |
| KC3 | Knightsbridge | 96 | 96 | **307** | **181** | **500** | **466** | *109* | **97** | **262** |
| KC4 | Kings Road Chelsea | 100 | 100 | **63** | **76** | **74** | **47** | *5* | **9** | **54** |

Notes: Exceedance of the NO$^2$ short term AQO of 200µgm$^3$ over the permitted 18 days per year 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%, however this has not been undertaken.
[d] Means the 99.8$^{th}$ percentile of hourly means is shown in brackets as the period of valid data was less than 90%
2014 data (in italics) is provisional and should be treated with caution. Source Londonair.org.uk.
**Bold** indicates an exceedance of the hourly mean objective.

**Table F.** Annual Mean PM10 Automatic Monitoring Results ($\mu$g m$^{-3}$)

| Site ID | Location and method | Adjst. Method | Valid data capture for monitoring period 2016 % [a] | Valid data capture 2016 % [b] | Annual mean concentrations ($\mu$g/m$^3$) | | | | | | |
|---------|--------------------|---------------|------------------------------------------------------|-------------------------------|-------------|-------------|-------------|------|-------------|-------------|------|
| | | | | | 2010[c] | 2011[c] | 2012[c] | 2013 | 2014[c] | 2015[c] | 2016 |
| KC1 | N Kensington TEOM | VCM | 99 | 99 | 20 | 23 | 20 | 23 | 17 | 16 | 19 |
| KC1 | N Kensington FDMS | None | 89 | 89 | 21 | 24 | 20 | 23 | *23* | 20 | 20 |
| AURN | N Kensington Partisol | None | 90 | 90 | 16 | 19 | 18 | *19* | 18 | 16 | 25 |
| KC2 | Cromwell Rd 2 VCM corrected /FDMS from 2010 | VCM | 96 | 96 | 29 | 27 | 27 | 26 | *25* | *23* | *22* |
| KC5 | Earls Court Partisol | None | 97 | 97 | 34 | 33 | 34 | 34 | 31 | 27 | 28 |

Notes: Exceedance of the PM$_{10}$ annual mean AQO of 40 $\mu$gm$^{-3}$ 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%, however this has not been undertaken
Data in *italics* is provisional and should be treated with caution.

**Table G.**        **PM10 Automatic Monitor Results: Comparison with 24-Hour Mean Objective**

| Site ID | Location and method | Valid data capture for monitoring period % [a] | Valid data capture 2016 % [b] | Number of Daily Means > 50 µgm⁻³ / Number of exceedences of 24 hourly mean >50 µg/m³ - 35 are permitted | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2010 [c] | 2011 [c] | 2012 [c] | 2013 | 2014 [c d] | 2015 [c] | 2016 |
| KC1 | N. Kensington TEOM | 99 | 99 | 3 | 15 | 7 | 9 | 0 | 1 | 7 |
| KC1 | North Kensington FDMS | 89 | 89 | 3 | 17 | 12 | 9 | 10 (36.7) | 7 | 10 |
| AURN | North Kensington Partisol | 90 | 90 | 2 | 14 | 11 | 8 | N/A | 0 | 4 |
| KC2 | Cromwell Rd 2 TEOM/FDMS | 96 | 96 | 11 | 8 (42.1) | 13 | 12 | 11 (39.1) | 4 | 8 |
| KC5 | Earls Court Partisol | 97 | 97 | 30 | 42 | 43 | 39 | 25 | 15 | 19 |

Data in *italics* is provisional and should be treated with caution.

Notes: Exceedance of the PM 10 short term AQO of 50 µgm3 over the permitted 35 days per year or where the 90.4th percentile exceeds 50 µgm3 are shown in bold.

Where the period of valid data is less than 90% of a full year, the 90.4th percentile is shown in brackets after the number of exceedances.

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

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

c Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%, however this has not been undertaken

dMeans the 99.8th percentile of hourly means in brackets as the period of valid data was less than 90%

**Table H.        Annual Mean PM2.5 Automatic Monitoring Results (μg m-3)**

| Site ID | Location | Valid data capture for monitoring period % [a] | Valid data capture 2016 % [b] | Annual Mean Concentration ($\mu gm^{-3}$) (Cap Level 25μg/m3) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2010 | 2011 | 2012 | 2013 | 2014 [c] | 2015 [c] | 2016 |
| KC1 | North Kensington FDMS | 94 | 94 | 14 | 16.4 | 14.5 | 14.7 | 15.9 | 10.9 | 12.1 |
| AURN | N Kensington Partisol | 80 | 80 | 11 | 14 | 11 | 12 | 10 | 9 | 18 |
| KC2 | Cromwell Rd 2  FDMS | 93 | 93 | 16 | 16.6 | 14.8 | 15.8 | N/A | 14.7 | 17.4 |

Notes: Exceedance of the PM $_{2.5}$ annual mean AQO of 25 μgm$^3$ are shown in **bold**

Data in *italics* is provisional and should be treated with caution.

[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%, however this has not been undertaken

**Table I.  SO2 Automatic Monitor Results for 2016: Comparison with Objectives**

| Site ID | Location | Valid data capture for monitoring period % [a] | Valid data capture 2016 % [b] | Annual Mean | Number of Exceedences 2016 | | |
|---|---|---|---|---|---|---|---|
| | | | | | 15-minute mean Objective (>266 $\mu g/m^3$) | 1-hour mean Objective (>350 $\mu g/m^3$) | 24-hour mean Objective (>125 $\mu g/m^3$) |
| KC1 | North Kensington | 90 | 90 | 2.3 | 0 | 0 | 0 |

Exceedances of the $SO_2$ AQOs are shown in **bold** (15-min mean >266 $\mu g/m^3$ = 35 allowed a year, 1-hour mean >350 $\mu g/m^3$= 24 allowed a year, 24-hour mean >125 $\mu g/m^3$ = 3 allowed / 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" as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if valid data capture is less than 75%.

**Table J    Benzene Annual Average Benzene Levels Using Diffusion Samplers (µg/m3)**

| Year | KC01 Ladbroke Grove/Nth Ken Library | KC02 Holland Park | KC03 Warwick Rd Petrol St. (forecourt) | KC04 Dovehouse St | KC05 Pembridge Square Library | KC0X Old Brompton Rd/Clareville Grove Petrol St |
|------|------|------|------|------|------|------|
| 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 | Closed | 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 |

| 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* |

**Monitoring Data Summary:**

We currently undertake sampling at five locations using 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 objectives have been set for the assessment of benzene, a running annual mean of 16.25µg/m$^3$ (any exceedences shown in bold) to be met by 31.12.2003 and a more stringent annual mean of 5µg/m$^3$ (any exceedences shown in italics) to be achieved by 31.12.2010.

The highest levels of benzene have generally been recorded at the petrol station sites.  The table above shows the 2010 objective has been met at all sites since 2007; the 2003 (16.25µg/m$^3$) objective has been met since 2000 (the measured annual mean is assumed to be the equivalent of the running annual mean).

After an initial steep decline, all sites (apart from the petrol station site) have generally shown a much more gradual reduction. Whilst little change was observed between 2013 and 2014, results for 2015 show a slight increase between 2014 and 2015 across all sites has occurred. In 2016 a high reading was recorded at KC0X, this will be reviewed 2018 to establish whether this is an going trend or a one off high result.

## 2.      Action to Improve Air Quality

**Table K.  Commitment to Cleaner Air Borough Criteria**

| Theme | Criteria | | Achieved (Y/N) | Evidence |
|---|---|---|---|---|
| **1. Political leadership** | *1.a* | Pledged to become a Cleaner Air for London Borough (at cabinet level) by taking significant action to improve local air quality and signing up to specific delivery targets. | Y | The Council has made this pledge. |
| | *1.b* | Provided an up-to-date Air Quality Action Plan (AQAP), fully incorporated into LIP funding and core strategies. | Y | The 2016 Air Quality and Climate Change Action Plan is available online at - https://www.rbkc.gov.uk/environment/air-quality/air-quality-and-climate-change-action-plan-2016-2021-0 <br><br> Incorporated into  LIP process/public health via a number of projects including using LIP to match fund air quality projects including the Clean Air Better Buisness project.  Regular programme Transport/Highways LIP meetings are held with air quality officers to discuss how air quality may be embedded in other LIP projects. |
| **2. Taking action** | 2.a | Taken decisive action to address air pollution, especially where human exposure and vulnerability (e.g. schools, older people, hospitals etc) is highest. | Y | Many relevant actions have been taken – examples given here are further explained in Table K: <br> • Action 3 – Support school and community campaigns to reduce smoking at home. <br> • Action 65– Promote green infrastructure (walls, roofs) and other eco-initiatives in schools. <br><br> Also action 68. |
| | 2.b | Developed plans for business engagement (including optimising deliveries and supply chain), retrofitting public buildings using the RE:FIT framework, integrating no engine idling awareness raising into the work of civil enforcement officers, (etc etc). | Y | Many relevant actions have been taken – examples given here are further explained in Table K: <br> • Action 12 – Improve the energy efficiency of the six main Council buildings. <br> • Action 36 – Increase public awareness to reduce engine idling. |

| | | | | |
|---|---|---|---|---|
| | | | | • Action 52 – Support businesses to reduce their emissions from deliveries.<br><br>Also actions: 13, 14, 15, 16, 17, 49, 50. |
| | **2.c** | Integrated transport and air quality, such as: improving traffic flows on borough roads to reduce stop/start conditions, improving the public realm for walking and cycling, and introducing traffic reduction measures. | Y | Many relevant actions have been taken – examples given here are further explained in Table K:<br>• Action 40 – Encourage car clubs to go electric.<br>• Action 44 – Open up more one-way streets to cyclists using both directions.<br>• Also actions 37, 43 |
| | **2.d** | Made additional resources available to improve local air quality, including by pooling its collective resources (s106 funding, LIPs, parking revenue, etc). | Y | The Council continues to draw on s106 funding (see Action 73) and LIP money. Since 2010 £145,000 has been collected from s106 agreements for air quality purposes. This money will continue to be collected. |
| **3. Leading by example** | **3.a** | Invested sufficient resources to complement and drive action from others. | Y | The Environmental Health department continues to have 2.7 full-time equivalent posts to carry out its air quality obligations. It also gains from partnership work with the Climate Change Team and has been able to fund a post from s106 funding. |
| | **3.b** | Maintained an appropriate monitoring network so that air quality impacts within the borough can be properly understood | Y | The Council maintains 5 automatic monitoring stations and > 30 passive diffusion tube sampling sites, and has established a long-running data set to assess trends in pollution levels. |
| | **3.c** | Reduced emissions from council operations, including from buildings, vehicles and all activities. | Y | The Council set a target to reduce carbon emissions from its own operations and from key contractors by 40% by March 2020, based on the 2007/2008 levels. Although figures are recorded and given here as CO2 emission reductions, these indicate a reduction in nitrogen dioxide as well.<br><br>An action plan was developed and is constantly monitored to ensure that the Council's 40% carbon reduction target is achieved in 2020.<br><br>An example of work would be that six schools have had heating controls work done since July 2016, after the heating health checks were carried out.<br><br>St Joseph's Catholic Primary School: This work is |

| | | | | |
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| | | | | estimated to save 6.4 tonnes of CO2 annually. Ashburnham Primary School: This work is estimated to have saved 3.6 tonnes of CO2 annually. Oxford Gardens Primary School: This work is estimated to save 4.9 tonnes CO2 annually. St Charles Catholic Primary School: This work is estimated to save 1.1 tonnes of CO2 annually. St Cuthbert's Catholic Primary School. This work has also resulted in reduced NO2 emissions. |
| | **3.d** | Adopted a procurement code which reduces emissions from its own and its suppliers activities, including from buildings and vehicles operated by and on their behalf (e.g. rubbish trucks). | *Y* | The Climate Change Team is working with individual teams championing the lease of electric vehicles, such as Parks Police and their electric van.<br><br>Suez is planning to make rounds more efficient Plans to reduce number of tips for refuse collection vehicles.<br><br>All new vehicles have Euro 6 engines (no retrofitting of old vehicles will take place).<br><br>Long-term (post 2016/2017)- Sub-contractor Suez are interested in exploring bio-fuel and electric vehicle options once the technology is reliable. Suez has an internal team to investigate these potential technologies. |
| **4. Using the planning system** | **4.a** | Fully implemented the Mayor's policies relating to air quality neutral, combined heat and power and biomass. | *Y* | The Planning department confers with Environmental Health to ensure that all major applications are accompanied by an air quality assessment, and that proposals including CHP and biomass conform with the Mayor's Sustainable Design and Construction SPG Planning permissions, and conditions set, reflect the requirement for developments to be air quality neutral. (See Actions 28, 29) |
| | **4.b** | Collected s106 from new developments to ensure air quality neutral development, *where possible* . | *Y* | (See Table K - Action 73) Since 2010 £145,000 has been collected from s106 agreements for air quality purposes. This money will continue to be collected. |

| | | | | |
|---|---|---|---|---|
| | 4.c | Provided additional enforcement of construction and demolition guidance, with regular checks on medium and high risk building sites. | Y | (See Table K -Action 27) Developers of major sites are obliged to submit demolition/ construction management plans, and where required, to install automatic dust and air quality monitoring in accordance with the Mayor's Control of Dust and Emissions SPG.  The monitoring data is scrutinized remotely by Council officers. Medium and high risk sites are routinely checked. |
| **5. Integrating air quality into the public health system** | 5 | Included air quality in the borough's Health and Wellbeing Strategy and/or the Joint Strategic Needs Assessment. | Y | The Kensington and Chelsea Health and Wellbeing Strategy 2016-2021 was adopted February 2017. The KCHWS states the following:-(page 11) – "We will continue to encourage people to incorporate active travel into everyday journeys, create safer routes and raise participation in cycling. We will work to encourage the creation of school travel plans and cycle initiatives to contribute to reducing road traffic accidents. Our borough's poor air quality affects all of us – bringing forward everyone's death by nearly 16 months on average. This compares with the least polluted area, rural Cumbria, where the reduction in life is an average of 4 months.  But it also affects vulnerable groups more acutely, particularly young children and people living with chronic heart and respiratory diseases". |
| **6. Informing the public** | 6.a | Raised awareness about air quality locally. | Y | Breathe London, Airtext and Walkit schemes are promoted (see Table K - Action 2).  Awareness raising also carried out see Actions:  24, 36, 37, 41, 46, 49, 51, 69.<br><br>Completed 3 Vehicle Idling Action Days in 2016. |

## 2.1    *Air Quality Action Plan Progress*

**Table L.  Delivery of Air Quality Action Plan Measures**

| Measure | Action | Progress<br><br>• Emissions/Concentration data<br>• Benefits<br>• Negative impacts / Complaints | Further information |
|---|---|---|---|
| **1.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. | Project with Global Action Plan completed.  Air Quality is now a high priority in Public Health Business Plan and further work with vulnerable patients anticipated. | |
| 2. **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 continues to provide funding for AirText.  Work being planned to promote service to schools and nurseries. | |
| 3 **Support school and community campaigns to reduce smoking at home** | Carry out air quality campaign through the 'Healthy School Partnership' at primary schools and 'Thrive Tribe' in the community to reduce domestic smoking at home. | (No local pollution benefit) | Schools initiative not started. Thrive Tribe have been running a 'Smoke Free' campaign since September 2016 to reduce exposure to tobacco smoke at home. |
| 4 **Support initiatives to improve outdoor air quality** | Identify local needs including smoke free areas and air pollution abatement through 'Healthy Parks/Playgrounds' initiative. | Not started | |
| 5 **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. | (No local pollution benefit) | PHE guidance published in July 2016. Review of e-cigarette policy undertaken by PH in 2017 with a view to informing workplace and Council vaping policies. Not yet developed into policy guidance for commercial premises. Due to rapidly evolving body of evidence all policies relating to vaping are reviewed regularly. |

| | | | |
|---|---|---|---|
| 6 **Promote initiatives to reduce smoking at home** | Ensure 'Smoke Free Homes' is promoted through the NHS 'Stop Smoking Service'. | (No local pollution benefit) | Stop Smoking Service providers 'Kick It' have been running a smoke free homes campaign since September 2016 and this is ongoing. The intervention includes, smoke free pledges, distributing PHE smoke free packs and engagement with London Fire Brigade for home safety and training. |
| **7 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. | On-going, lead is Cycle Officer. | Encouraging health trainer, NHS Health Check and GP navigator clients to cycle is done if it fits within the personal plans identified by the client. |
| **8 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 poverty in line with the 'Healthier Homes' scheme. | The borough has been involved with the Big London Energy Switch for several auctions and will continue to promote tariff switching as a way of cutting bills and reducing fuel poverty. | |
| 9 **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. | Web message on the Council website: https://www.rbkc.gov.uk/environment/air-quality/indoor-air-quality | |
| **10 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 through home energy visits by trained green experts. | Following on from a successful pilot project, the Climate Change Team developed the Green Doctors scheme (Warm Homes Support the Vulnerable) in partnership with 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. Between 16/17, around 400 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. The visits were mainly delivered in the Council's | Out of the 400 visits, around 160 were delivered through the Warmth scheme in 16/17. Still waiting for the final report. For the first 120 visits delivered between January to March 2016, the results were:<br>• 29,489 kg of combined carbon avoided per annum through the installation of small measures and behaviour change intervention in 120 households;<br>• £7439.86 of combined savings on energy and water bills through installation of small measures and behaviour change interventions in all 120 households; |

| | | owned social housing estates, and 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.<br>RBKC has also been part of the WARMTH programme, coordinated by Groundwork and funded by the British Gas Home Energy Fund which is a health/housing scheme, working in partnership with 11 London boroughs and multiple local referring agencies. The programme delivers an in-home energy and wellbeing visit giving financial and health advice to some of London's most vulnerable households and connect clients to further external services on offer | • 758, 075 litres of water saved annually through the installation of water saving measures in all 120 households;<br>• 100% of clients rated the project as excellent to good;<br>• A Net Social Return on Investment of £5.55 – 6.80 for every £1 spent. |
|---|---|---|---|
| **11**<br>**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. | Case studies are being worked on in relation to several current projects (for social housing buildings and schools) and will be published on the Council's website in 2017. | |
| **12**<br>**Improve the energy efficiency of the six main Council's buildings** | Deliver energy efficiency projects in six of the Council's main facilities (Town Hall, Chelsea Old Town Hall, Pembroke Road, Carlyle building, Violet Melchett and Pembroke road car park). | Several projects have been delivered for each of the major sites:<br>Kensington Town Hall, Chelsea Old Town Hall, Pembroke Road, Carlyle Building and Violett Melchett Complex.<br>    Estimated total carbon saving: 222.96 tonnes | Kensington Town Hall: convert Town Hall heating from MTHW to LTHW - Carbon Savings 56.16 tonnes. To repair pipe insulation with a foil finish mineral wool pipe section. Fit Velcro mats to valves, flanges etc. - Carbon Savings 18 tonnes. Chelsea Old Town Hall: LEDs rollout across the building - Carbon Savings 7.7 tonnes. Upgrade and optimisation of the BMS system and provide Daikin Connectivity - Carbon Savings 37 tonnes. Pembroke Road: Upgrade and optimisation of the BMS system and provide Daikin Connectivity - Carbon Savings 49 tonnes. Carlyle Building: Install new BMS control for heating system - to include remote control functionality to maximise |

| | | | time control- Carbon Savings 8.5 tonnes. Supply and install 75 off 5ft 58W T8 fitting with 25W LED with integral sensor and driver to basement corridor - Carbon Savings 16.8 tonnes. Repair and replace missing lagging on hot water systems in plantroom - Carbon Savings 9.2 tonnes. Violett Melchett Complex: Replace Thorn 2D lamps with 10W LED units with sensors - Carbon Savings 20.6 tonnes. |
|---|---|---|---|
| **13 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). | Westway Information Centre has now closed. Training Centre at Pembroke Road relocated to Kensington Town Hall in August 2016. Vacant accommodation has been mothballed. | Proposal to move all weekend and out of hours working to G29 at KTH – This will allow the main KTH building to be powered down during those periods. |
| **14 New Marlborough primary school to be performing at a high standard of energy efficiency** | Reduce energy consumption in the redeveloped Marlborough school complex. | School is in construction phase, aiming for BREEAM 'Very Good'. The climate change team is part of the project team ensuring sustainability and energy efficiency is considered at all stages of the project. The school is scheduled for completion July 2017 | |
| **15 Continue to insulate the heating systems in schools** | Deliver and support Flange & Valve insulation projects to a large number of schools. | Four schools have undertaken boiler insulation work (flange and value) improvement projects since July 2016. These works are estimated to save 11.8 tonnes of CO2 annually. Chelsea Open Air Nursery – the school is estimated to save 2.2 tonnes of CO2 annually. Park Walk Primary School – 0.3 tonnes of CO2 are estimated to save annually at this school. Servite Primary School – the school is estimated to save 7.2 tonnes of CO2 annually. St Cuthbert's Catholic Primary School – the school is estimated to save 2.1 tonnes of CO2 annually. | |
| **16** | Make sure that boilers in schools are set up | Deliver heating health check projects to a large | Six schools have had heating controls work done since |

| | | | |
|---|---|---|---|
| **Make sure that boilers in schools are set up and controlled to better adapt heating to each school's needs** | and controlled to better adapt heating to each school's needs | number of schools. | July 2016, after the heating health checks were carried out.

St Joseph's Catholic Primary School: This work is estimated to save 6.4 tonnes of CO2 annually. Ashburnham Primary School: This work is estimated to have saved 3.6 tonnes of CO2 annually. Oxford Gardens Primary School: This work is estimated to save 4.9 tonnes CO2 annually. St Charles Catholic Primary School: This work is estimated to save 1.1 tonnes of CO2 annually. St Cuthbert's Catholic Primary School: This work is estimated to save 1.1 tonnes of CO2 annually. |
| **17 Continue to install LED energy-efficient lighting in schools** | Deliver lighting projects within selected schools to increase the use of LEDs and energy saving fittings. | (No local pollution benefit) | • Three schools have had LED installations done since August 2016. This work is estimated to save 42.5 tonnes of CO2 annually.<br>• Bevington Primary School: This work is estimated to save 14.78 tonnes of CO2 annually.<br>• St Charles Catholic Primary School: This work is estimated to save 15.2 tonnes of CO2 annually. Oxford Gardens Primary School: This work is estimated to save 12.6 tonnes of CO2 annually. |
| **18 Introduce more energy efficient street lighting** | Introduce more energy-efficient street lighting | (No local pollution benefit) | Reductions of 129 tonnes of CO2 and 95.6kg of NO2 |
| **19 Produce an energy strategy for council housing** | Complete the council housing energy strategy to guarantee energy efficiency and more resilient buildings in the Council's housing stock and reduce fuel poverty. | Housing Energy Strategy approved by RBKC TMO in March 2016 . Has now been submitted to RBKC . | |
| **20 Develop planned** | Complete the review of communal boilers from council housing and develop a planned programme of replacements and | Lowerwood Court communal boiler procured and currently on site for renewal; due to distribution pipework being replaced in the last ten years' | Feasibility studies commissioned and completed to five prioritised sites totaling 1190 homes supplied by communal heating to identify most suitable renewal |

| | | | |
|---|---|---|---|
| **programme of communal boiler upgrades and renewals within council housing** | upgrade works. When possible, install individual controlled heating within flats. | individual control to follow in future program of works. | option to incorporate efficiency of plant and providing residents with individual control and billing.<br><br>Renewal of communal boiler to Convent Estate serving 100 homes.<br>Five full system feasibility studies completed. |
| **21 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). | 100 domestic boilers replaced with A rated combi boilers since March 2015. | |
| **22 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. | 200 measures completed to date. | |
| **24 Raise awareness on air quality and climate change issues amongst council tenants.** | Raise awareness of air quality and climate change issues, by advising council tenants on efficient use of heating systems using specific guidelines. | Two Green doctor events held in 2016/17 | |
| **25 Explore the opportunity to install renewable energy technologies in the council's social housing (e.g. solar** | Through additional or external fundings. 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. | The Climate Change Team is currently exploring the opportunity to develop community owned energy projects in the north of the borough (in a deprived area) and some of the sites explored are social housing estates managed by KCTMO. | Potential sites for solar PV identified; Support agreed with RE:New (Capita) scheme to progress feasibility studies. |

| | | | |
|---|---|---|---|
| panels) | | | |
| **26 Implement the forthcoming legislation related to CO2 emissions for new developments and major refurbishments** | Support implementation of the government's Housing Standards Review with regard to energy standards through emerging alterations to the London Plan, revisions to the Local Plan, determination of planning applications and through building regulations. | The Council has included text in the Local Plan Partial Review to update Policy CE1: Climate Change in light of the Government's Housing Standards Review. The approach for London is different from the national approach and the proposed Policy CE1 refers to the London Plan. | |
| **27 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. | The Council's Environmental Health department has adopted a Code of Construction Practice which imposes more onerous requirements on high impact developments. In parallel with this the Planning Department has introduced a new planning policy on basement development which restricts their scale and thereby construction impacts. It has also specified more onerous requirements to manage construction traffic linked to basements. | |
| **28 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. | Transport update: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 contribution to offset the remaining carbon. The Climate Change team has identified projects where this money could be spent.<br><br>Policy CE1 also requires BREEAM very good to be achieved for non-residential development of 1,000 sq m or more. | Climate Change Update: Investigating the opportunity to install a carbon offsetting fund in RBKC and the GLA Zero Carbon Homes by October 2016.<br>From the 1 April 2017, the Council has fully implemented the zero carbon standard through the creation of a Carbon Offset Fund. New proposals will be assessed against this standard using information provided in their energy assessment.<br>https://www.rbkc.gov.uk/planning-and-building-control/planning-policy/carbon-offset-fund-0<br>New proposals will be assessed against this standard using information provided in their energy assessment (see the Mayor's Energy Planning guidance for further information). The Council's carbon offset price is £1,800 per tonne of carbon. The Carbon Offset fund is set up in response to the requirements of the London Plan and the Mayor of London' Sustainable Design and Construction |

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| | | | Supplementary Planning Guidance. Where it is demonstrated that a 100 percent reduction in emissions cannot be achieved on-site, the Council has established a carbon offset fund for cash in lieu contributions from developers to meet the standard off-site. The offset monies received will then be spent on carbon offsetting projects around the borough to achieve carbon savings.<br>It is likely that this will allow us to improve Council or public buildings through retrofit or innovative technology. |
| **29**<br>**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. | Transport Update: Policy CE1 provides the decision making framework to make informed decisions on Decentralised Energy, Combined Heating Power, Biomass and Biofuel. The reasoned justification together with the policy make clear the approach and should enable informed decisions to be taken. The guidance and the policy need to be weighed up against Policy CE5 which deals with air quality. Again the reasoned justification and the policy itself provide the framework for decision taking. Where conflict occurs between the two The Director of Environmental Health's advice would be sought. | Local Plan Policy CE1 Climate Change has been updated through the Local Plan Partial Review - see www.rbkc.gov.uk/planningpolicy |
| **30**<br>**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. | In December 2016 Imperial College completed the site investigation works on the Network Rail land and their consultant engineers have now concluded their feasibility design which has enabled the College to engage with potential contractors to discuss their construction methodology proposals. They are expecting to have initial responses returned in late April. | |
| **31**<br>**Publish online real-time information about the** | Publish online real-time information on $CO_2$ emissions from Council's main buildings, as well as energy generated by the Council's solar panels. | (No local pollution benefit) | See live energy use data from the Royal Borough RBKC introduced a carbon saving reporting web-based platform to display its live energy consumption data/performance information to ensure it is transparent about the way the Council uses energy |

| | | | and to show the improvements we are making. This is published on the Climate Change page: https://www.rbkc.gov.uk/greenerborough/welcome-to-greener-borough<br><br>The platform will be reviewed in 2017 for improvements to increase engagement with staff and schools on carbon reduction initiatives. |
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| **energy used and generated by the Council's main buildings** | | | |
| **32 Continue to reduce the Council's vehicle emissions** | Start with a review of the engine types of all Council vehicles to find opportunities to procure the cleanest Council Fleet. | Energy Saving Trust will deliver a Green Fleet Review for RBKC funded by the Department for Transport by end of April. The report will calculate the carbon footprint of the fleet based on an in depth review of all the vehicles used by the Council. Recommendations on more fuel efficient and clean vehicles using the whole-life cost analysis will be provided. The review also looks at what policies the Council has in place for its fleet and will compare them against best practice. Recommendations will outline the best opportunities for reducing and controlling the Council's grey fleet usage. EST will be looking to identify whether Ultra-Low Emission Vehicles (ULEVs) could be operationally feasible in the fleet. | |

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| **33**<br>**Continue to reduce emissions from our contractor's waste collection and street cleaning vehicles** | Work with our contractor SITA to reduce emissions from its fleet. | All new vehicles have Euro 6 engines (no retrofitting of old vehicles will take place). This doesn't impact CO2 but significant lowers NOx and PM10 emissions.<br><br>In 15/16, SUEZ (new name for SITA) have reduced CO2 emissions by 32.9% or 424 tonnes of CO2 since 2007/08 (baseline year).<br><br>Suez (Council contractor) are aiming to make collection routes more efficient where possible. For example, the garden waste service collections have been reduced -<br><br>Suez are interested in exploring bio-fuel and electric vehicle options once the technology is reliable. Suez has an internal team to investigate these potential technologies and they are currently trialling a hybrid cage vehicle. | Suez (Council contractor) are aiming to make collection routes more efficient where possible. For example, the garden waste service collections have been reduced from 3 days a week collection to one day per week FROM April 2017.<br>Suez are interested in exploring bio-fuel and electric vehicle options once the technology is reliable. Suez has an internal team to investigate these potential technologies and they are currently trialling a hybrid cage vehicle. |
| **34**<br>**Maintain an up-to-date Council Travel Plan** | Undertake staff survey and site audits, and revise the travel plan. | Staff survey undertaken in Spring 2017 as first step. | |
| **35**<br>**Increase public awareness of vehicle emission controls** | Carry out roadside operations to test vehicle exhaust emissions. | In collaboration with the Traffic Police and in liaison with DVSA, roadside assessments will continue to be held with advisory leaflets and high visibility on-site promotion.<br>The last event in November 2015 resulted in approximately 35 leaflets being handed to motorists. | |
| **36**<br>**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. | 3 anti-idling campaigns undertaken across the Borough in 2016<br><br>Signs installed by street enforcement at hot spot areas to encourage reducing idling of engines. | |
| **37**<br>**Encourage residents to** | Increase the diesel surcharge to encourage less polluting vehicle choices. Cease provision of Euro 5 exemption in 2017 once | The surcharge was raised to £40 in 2016 and the exemption for Euro 5 vehicles will be removed in April 2017 | |

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| choose low emission vehicles by raising diesel surcharge | Euro 6 diesels are available. | | |
| **38 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 staff shortage | |
| **39 Increase number of on-street charging points for electric vehicles** | Expand the availability of on-street charging points for electric vehicles. | 13 additional on-street charging points were installed in summer 2017. We are also trialling the use of lamp columns for charging electric vehicles. | |
| **40 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 are engaging with London Councils on the design of the Go Ultra Low Cities Scheme funding for electrifying car club fleets, but are aware of issues around State Aid. In the meantime, we no longer have any diesel cars in the car club fleet (excluding vans). | |
| **41 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 2016-17, 42 schools have accredited travel plans, 15 at gold level, 5 at silver and 22 at bronze level. A further 4 schools started a new travel plan that will be accredited next year. | |
| **42 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. | 870 sessions of cycle training took place with adults in 2016-17, a further 1,057 sessions took place with children. | |
| **43 Help the Mayor of** | Work with the Mayor of London to improve cycle routes in London by introducing the Cycling Grid | By the end of March 2017, all but one route of the cycling Grid had been completed, and this was on track to complete by the end of April 2017, with | |

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| **London to create cycling grid of specially designed routes** | | wayfinding to be done by summer 2017. | |
| **44 Open up more one-way streets to cyclists using both directions.** | Continue to convert one-way streets to two-way operation for cycling. | We introduced several new two-way cycling schemes as part of the Grid project (action 43) and also opened up a route in Phillimore Walk as a low-traffic alternative to Kensington High Street | |
| **45 Create safe areas for cyclists at traffic lights** | Consider opportunities for introducing Advanced Stop Lines for cyclists when reviewing traffic signals. | We have identified 22 junctions where ASLs would be feasible, and these will be implemented in 17/18. | |
| **46 Support residents to take action in their local areas and implement community energy projects** | Encourage and empower residents to help tackle climate change and reduce energy consumption in their local areas and homes. Stimulate attitude and behaviour change through community energy projects and energy workshops/training. | Several energy efficiency workshops and drop-in-sessions were organised and delivered in 16/17 across the borough as per below:<br><br>Attended several community events to promote energy efficiency schemes and delivered sessions at Al Manaar and Dalgarno Trust community centre etc<br><br>The Council published the thermal heat loss maps of the borough and launch a web-based tool to help residents identify if their house could improve its energy efficiency and is losing heat. Residents are now able to see how much heat their building/home is losing through its roof by viewing the heat loss map. The Council is planning to develop a community owned renewable project in the north of the borough (deprived area) and install solar panels on the Dalgarno community centre, schools and social housing estates. Feasibility studies and financial models were carried out. | |
| **47 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 | Partnered with Groundwork London to delivered several energy advice trainings/sessions at Dalgarno Trust Centre, Al Manaar Muslim Cultural Heritage Centre, Open Age, New Horizon. These sessions provided advice on how to save energy | |

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| | advice to their local community. | and water, encourage householders to adopt energy efficiency measures and behaviours and reduce energy bills; also, to promote the Council's free home energy scheme and Healthier Homes. | |
| **48 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. | (No local pollution benefit) | Analysed the RBKC carbon dioxide emissions data (CO2) published by DECC in June 2015 for the period 2005-2013. The data published in June 2016 and June 2017 will be analysed together and reports will be produced in 2017 to highlight results. |
| **49 Support local businesses and large organisations to reduce emissions from their operations** | Offer environmental advice and sources of technical information to local businesses and large organisations on how to reduce their CO2 and air pollution emissions. | Piloted a project with businesses in the King's Road in 2016, by engaging with 129 retail businesses to encourage them to close their doors when the heating / air-conditioning is on or when there are high levels of air pollution. The action of closing the door both prevents energy being wasted and reduces carbon consumption. The pilot project resulted in 23 businesses pledging to close their doors. Results from the pilot found showed an increase of 9% in retailers closing their doors following the engagement period. If these retailers continued to close their doors for one year, potentially 240 tonnes of carbon dioxide emissions would be saved.<br><br>Reviewing the Carbon Trust Green Business Fund in 2017 and planning to engage with SMEs in 2017 to help them apply and identify opportunities to reduce their energy costs. | |
| **50 Work actively with some large business organisations to help them to reduce their emissions** | Increase the number of businesses participating in emission reduction initiatives by concentrating on large organisations in line with the Healthy Workplace Charter. Starting with those already approached, but not previously ready to commit. | clickcollect. London highlighted by Healthy Workplace Advisor in quarterly newsletter. | |
| **51 Encourage** | Work with major destination venues in line with the Healthy Workplace Charter to | Policy CK2 ensures that opportunities exist for convenience shopping and other facilities which make | |

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| **visitors to major venues to walk or cycle.** | reduce trips using private and public transport by promoting active travel (walking and cycling), using customised maps and adapting existing publicity materials. | life local throughout the borough. Policy CK3 of the Consolidated Local Plan supports walkable neighbourhoods and neighbourhood facilities and this works towards increasing the number of facilities where appropriate opportunities arise. Relevant planning applications are assessed against these policies. The strategic objective for the Better Travel Choices chapter is for walking, cycling and public transport to be safe, easy, attractive and inclusive. Policy CT1 is concerned with improving alternatives to car use and there are a variety of policy criteria to achieve this. Relevant planning applications are assessed against the policy criterion. | |
| **52 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. | The Council in partnership with LBs of Hammersmith and Fulham and Lambeth is working on the concept of a freight consolidation hub in South London (Low Emission Logistics) initially to handle its own deliveries- officer from this project currently collecting data from the council. | |
| **53 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). | There is ongoing work with the Council's main contractors (Suez, Quadron, GLL and Amey) to reduce their energy consumption, fleet usage and operations. | The contractors are included in the scope of the 40% carbon reduction target and performance is monitored quarterly by the Climate Change Programme Board.<br><br>Carbon reduction target for 16/17 (tonnage emission)<br>    o   Suez: 842<br>    o   GLL: 1,239<br>    o   Other contractors: 601<br>An action plan was developed and is constantly monitored to ensure that the Council's 40% carbon reduction target is achieved in 2020.<br>Carbon reduction target for 16/17 (tonnage emission) Suez: 842 , GLL: 1,239, Other contractors: 601. An action plan was developed and is constantly monitored to ensure that the Council's 40% carbon reduction target is achieved in 2020. |
| **54 Continue to develop the Community Kitchen** | Continue to develop the Community Kitchen Garden scheme which encourages residents and community groups to grow seasonal fresh fruit and vegetables. Local production eliminates deliveries (zero food | (No local pollution benefit). | Ten new community gardens have been installed across the Borough, including at Notting Barns House, Convent Gardens Estate and St Charles Square. More gardens are planned for 2017/18. |

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| **Garden scheme** | miles) and helps tackle childhood obesity. | | |
| **55**<br>**Pilot the commercial production of fresh products from market gardens in the borough** | Set up Cultivating Kensington & Chelsea to develop market gardens, allowing the commercial production of fruit, vegetable, plant seedlings and cut flowers. | (No local pollution benefit) | A new charity called Cultivating Kensington and Chelsea was established in March 2016. Successfully growing and selling fruit and vegetable seedlings, with all profits used to support community gardening in the Borough. |
| **56**<br>**Increase recycling by Council staff members** | Refresh the promotion of recycling to members of Council staff. | (No local pollution benefit) | 4 waste audits were carried out in 16/17 to monitor the recycling rate in the Council's offices. By end of 2017, an improved methodology will be developed to assess whether the Council's recycling rates have increased.<br><br>Five Recycling and Energy Workshops have been delivered since November 2016 to RBKC with the aim to increase staff awareness, increase recycling rate and reduce energy consumption in the Council's offices. More than 70 members of staff attended. This will be replicated during team meetings.<br>Recycling presentations/trainings will be included in the Council's induction package.<br>Recycling facilities have been successfully introduced in all the Council's office buildings (Great & Small Hall, Customer Service Centre, Committee Rooms etc.) and across all 6 libraries in the borough and in Holland Park Offices in 16/17. Around 65 recycling bins installed.<br>12 RBKC employees attended the recycling competition in November 2016.<br>In 16/17 increased the communication materials were produced internally: posters, recycling video, blog posts, articles in KCBriefly. |
| **57**<br>**Conduct an awareness raising campaign for residents to increase waste** | Conduct awareness raising campaign for residents on waste recycling how to decrease contamination. | (No local pollution benefit) | The contamination rate for 16/17 remained to 14.1% and the recycling rate increased from 23% to 25.9%. Further awareness raising and campaigns are being implemented to increase recycling rates. |

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| recycling rate and decrease contamination | | | |
| **58 Produce a Local Flood Risk Management Strategy.** | Produce a Local Flood Risk Management Strategy (LFRMS), required by the Flood Risk Regulations 2009 and the Flood and Water Management Act 2010. | (No local pollution benefit) | The Local Flood Risk Management Strategy is now adopted. Actions that come from this include looking at flood prevention measures in Critical Drainage Areas and these are currently being investigated. |
| **59 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. | (No local pollution benefit) | Thames Water appear to have paused work on the Counters Creek scheme. Their long term intentions are currently unclear but officially they are continuing with the project. Clarity will be sought from Thames Water with regard to a timetable for moving forward. |
| **60 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. | (No local pollution benefit) | Policy CE2 (Flood prevention policy) requires all development in Flood Risk Zones 2 and 3, in Critical Drainage Areas or sites greater than 1 Ha to provide Flood risk protection measures which would include SUDS. The policy has been strengthened as part of the Local Plan review and this will be submitted to the Planning Inspectorate for examination at the beginning of May. |
| **61 Retrofit SuDs in existing properties** | Install SuDs such as rainwater retention features in existing properties. | (No local pollution benefit) | Arundel Gardens permeable paving scheme is currently being implemented. The new draft policy CE2 (j) encourages the retrofitting of SUDS in buildings even if the development will not have drainage implications. This will be submitted for examination at the beginning of May. |
| **62 Mitigate against increases in area of impermeable land by** | Use the planning control process to reduce the loss of front gardens by resisting paving | (No local pollution benefit) | Draft Policy CE2 (i) now resists impermeable surfaces in gardens and landscaped areas. The policy will apply only where planning permission is required and much paving takes place under permitted development. The Authority's Monitoring Report will deal with the success of the policy. It will be submitted for examination at the beginning of May. |

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| **stopping the paving of front gardens** | | | |
| **63**<br>**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. | (No local air pollution benefit) | Available at https://www.rbkc.gov.uk/planning-and-building-control/planning-policy/flooding/sustainable-drainage-systems |
| **64**<br>**Install at least one green roof** | Install, as a pilot project, at least one green roof or comparable green infrastructure, in locations to be confirmed. | A Green roof has been installed on the Al Manaar Muslim Cultural Heritage Centre. The second green roof will be installed in the autumn 2017 on an Octavia social housing estate on Portland Road. | |
| **65**<br>**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. | (No local pollution benefit) | The service has developed a programme in partnership with food explorers around schools either building their own food garden and or visiting the edible garden developed at the Holland Park Ecology Centre. The team have Delivered approx.18 Food explorer sessions in the last 12 months. In addition, the service have delivered 154 Environmental education sessions and 224 Forest school sessions from Holland Park. |
| **66**<br>**Support the development of food growing gardens in schools** | Work with schools to encourage and support them in the delivery of food growing gardens. | (No local pollution benefit) | New food growing gardens were installed at Bevington, St Marys, Barlby Road, Ashburnham, Kensington Academy and Marlborough. Gardening support and training was provided to 18 schools. |
| **67**<br>**Support the development of community food waste composting initiatives** | Encourage and support the development of small scale community food waste composting initiatives | (No local pollution benefit) | Food waste composting is working well at Henry Dicken Community Kitchen Garden. The other community gardens compost their green waste. |
| **68**<br>**Investigate whether targeted greening of** | Assess the benefits of greening measures on school premises and other institutions close to busy roads, using the evaluation report on the green screen at St Cuthbert with St Matthias school and its capacity to reduce | Green Screen Study published at https://www.londonair.org.uk/london/asp/news.asp?newsId=NKGreenscreen2017 | The screen was found to be an effective pollution barrier once the ivy had started growing and a significant impact could be seen once the screen had matured. The ivy screen led to a decrease in the pollution concentrations on the playground side of the |

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| **areas can reduce exposure to poor air quality** | NO2 and fine particle levels. | | screen by 24% for NO2 and 38% for PM10; both were higher than the measurement uncertainty and thus significant. Comparing school hours independently a reduction in concentrations of up to 36% and 41% were found for NO2 and PM10, respectively. This demonstrates that the screen is very effective during daytime hours, when both emissions and exposure are highest. |
| **69 Build and publicise green screens between Westway roads and sports area** | In cooperation with the Westway Trust and TfL, install green screens adjacent to the games area, and next to one of the Westway sliproads and raise awareness of air quality in the local environment. | 54 m (2.8 m high) length of ivy based green screening installed and completed by April 2016. | Director for Environmental Health developing further opportunities for collaborative work with the Westway Trust. |
| **70 Use greening measures to reduce pedestrians' exposure to poor air quality on Cromwell Road** | Develop the air quality aspect of the Cromwell Road green corridor project. Proposal set to re-landscape part of Cromwell Road's southern sidewalk. | This project is now managed by TfL and is on hold as scheme being linked to other local transport schemes. | |
| **71 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. | (No local pollution benefit) | It is estimated that 60% of major planning applications have been commented on. |
| **72 Join Climate Local, the commitment by local authorities to** | Join Climate Local to take advantage of the Local Government Association initiative providing additional support to reduce CO2 emissions and improve resilience to the effects of climate change. | (No local pollution benefit) | Action completed – The Climate Local does not exist anymore<br>RBKC signed in March 2015 the Local Government Associations (LGA) Climate Change commitment – called Climate Local, which aimed to support Councils' efforts both to reduce carbon emissions and |

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| **address climate change** | | | to increase resilience to a changing climate. |
| **73 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. | Since 2010 £145,000 has been collected from s106 agreements for air quality purposes. This money will continue to be collected under s106. Air quality contributions will very much be dependent on the nature of planning applications received - where appropriate it is sought. This will not necessarily always involve an increase in air quality action fund contributions. | |
| **74 Push for the borough to be included in the Ultra Low Emission Zone (ULEZ)** | As part of the TfL/GLA Engagement Group, enter discussions with the new Mayor of London on the potential to increase the air quality benefits in the borough of the ULEZ proposal, and/or tightening the LEZ. | (Information obtained and assessed?) The Council responded positively to the Mayor of London's proposal to extend the ULEZ to the North and South Circular Roads by 2020. | |
| **75 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. | (Whole of the borough served by the scheme?) We have continued to lobby TfL to extend the scheme to serve the whole of the borough. | |
| **76 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. | The Mayor of London has announced that the Kensington High Street corridor will be a Low Emission Bus Zone. We have engaged with TfL to seek information on the composition of the bus fleet, most of which will have to meet Euro 6 standards by 2019 because of the ULEZ. | |
| **77 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. | The Council continues to support a station and has made representations to TfL and Government.<br><br>Lobbying continues for a King's Road Crossrail station as part of CR2. This involves both high level meetings involving the Leader of the Council and officer led meetings with TfL dealing with the practicalities. | |
| **78 Lobby TfL for** | Continue to work with Crossrail sponsors on feasibility of a Kensal Portobello | Work continues apace on the provision of a Crossrail station at Kensal – the Network Rail GRIP process for | |

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| **increased public transport links in the borough** | Crossrail station at Canal Way. | the development of the station has now begun and GRIP 1 will be completed in July. Close liaison continues with the landowners to ensure that a station is incorporated into the masterplanning process. Consideration of funding mechanisms has begun. | |
| **79 Lobby TfL and the Mayor of London to reduce emissions from taxis** | Lobby TfL/Mayor of London to make the decommisioning scheme for 10 year old taxis mandatory. . | RBKC responded to a second consultation on the ULEZ in August 2015, which dealt with issues around taxis and PHVs. The response called on the Mayor to retain his original proposal to move to a ten year rolling age limit for taxis. The Mayor did not agree with this position. | |
| **80 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. | No specific lobbying action on eco-driving but we have supplied anti-idling initiative leaflets to TfL's Enforcement and On-Street Operations team. | |
| **81 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). | The Government has recently undertaken the housing standards review and there are no indications that there is any appetite to review the environmental standards at the present time.<br><br>However, as stated in 26 and 27 above, the standards being used in London are more onerous that the national standards. For major residential schemes the Council is seeking zero carbon homes in-line with the London Plan. | Local Plan Policy CE1 Climate Change has been updated through the Local Plan Partial Review - see www.rbkc.gov.uk/planningpolicy.<br><br>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. |
| **82 Ensure that responses to formal consultations focus on reducing or** | Assert the Council's aspirations for improving air quality and tackling climate change in all responses to Government and regional consultations. | The Council has continued to respond to important consultation exercises on influencing future air quality e.g. Defra's consultation (late 2015): Draft Plans to Improve Air Quality – Tackling NO2 in our Towns and Cities, and otherwise GLA's consultation: Draft LLAQM Policy and Technical Guidance. | |

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| eliminating emissions | | | |
| **83 Lobby tyre, brake and clutch manufacturers to use materials which reduce small particles released through wear** | Instigate and support collaborative research and development to improve tyre, brake and clutch technology with materials that release substantially fewer particulates. | Issue raised with at meetings with transport providers, such as electric car clubs. | |

## 3.    Planning Update and Other New Sources of Emissions

**Table L.    Planning requirements met by planning applications in the Royal Borough of Kensington and Chelsea in 2016**

| Condition | Number |
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| Number of planning applications reviewed for air quality impacts | 34 |
| Number of planning applications required to monitor for construction dust | 21 |
| Number of CHPs/Biomass boilers refused on air quality grounds | - |
| Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions | 15 |
| Number of AQ Neutral building and/or transport assessments undertaken | 23 |
| Number of AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation | 1 |
| Number of planning applications with S106 agreements including other requirements to improve air quality | 3 |
| Number of planning applications with CIL payments that include a contribution to improve air quality | - |
| **NRMM: Central Activity Zone and Canary Wharf**<br>Number of conditions related to NRMM included.<br>Number of developments registered and compliant.<br>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 sites registered – not yet audited<br>Number of unregistered sites – unknown |
| **NRMM: Greater London  (excluding Central Activity Zone and Canary Wharf)**<br>Number of conditions related to NRMM included.<br>Number of developments registered and compliant.<br>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. | 4 conditions included<br>12 sites registered with 9 fully compliant<br>1 working towards compliance<br>Number of unregistered sites – unknown |

### *3.1    New or significantly changed industrial or other sources*

No new *or significantly changed industrial or other sources*

## Appendix A    Details of Monitoring Site QA/QC

### A.1    Automatic Monitoring Site
**Data collection, screening and validation**

Kings college London undertake data management of the councils monitoring data. Data is collected from each instrument every hour.  Data is subject to automatic and manual checks each day, 365(6) days per year (6 days per week manual checking).  Measurements are scaled immediately as they are collected using the latest calibration information from the Local Site Operator (LSO) or Equipment Support Unit (ESU). This ensures that accurate measurements are disseminated to the public.

 Validation and subsequent ratification of data (QA/QC) to be carried out every three months and finalised when QA/QC audit results are received. Measurements are available for download via the LondonAir website at www.londonair.org.uk

All continuous data is stored in the King's MS-SQL database in a locked server room in a secure area. The data is backed up onto physical media and stored in a safe off site.   During collection, data will be screened for any faults flagged by the instruments. Complex automatic validity checks are applied as the data is parsed into the database preventing dissemination of spurious measurements. Faults are reported immediately to the LSO or ESU.

**Routine calibration and independent checks**

Local site visits are undertaken fortnightly at the urban background site and weekly for the roadside Tapered Element Oscillating Microbalance (TEOM-FDMS) for the purposes of calibration, filter changes and instrument cleaning.  Equipment is additionally serviced at regular intervals.   Routine calibrations are undertaken by contractors.

Independent calibration and audit is carried out by Defra appointed contractors as part of their AURN responsibilities for the North Kensington site and for the Cromwell Rd site through a separate contract. Calibration certificates are provided by AEAT.  The National Physical Laboratory (NPL) undertake the London affiliate inter-calibration exercise.  The following checks are performed for the oxides of nitrogen, sulphur dioxide and carbon monoxide analysers:

Analyser response factors: The analyser samples a stable 'inter-calibration standard' which has been validated against a network primary standard.  The analyser also samples from a certified zero air source.

Analyser linearity:  The analyser response to a series of known concentrations covering the analyser range is noted.  A linear regression is then performed on the results.

Analyser 'noise' levels: This is the standard error of ten successive spot readings of analyser readings when fully stabilised on zero.

Nitrogen Oxides analyser converter efficiency: $NO_x$ analyser converter efficiency is determined using Gas Phase Titration at a range of concentrations, this uses a high concentration of NO and a known amount of $O_3$ which is subsequently converted to $NO_2$.

Estimation of site cylinder concentrations: The concentrations are evaluated by sampling from the site cylinder and comparison to analyser response factors determined from the 'inter-calibration standard'.

For particle analysers the following checks are performed:  Mass transducer calibration:  The mass transducer is

calibrated by placing pre-weighed filters on it and noting the change in the frequency that is induced.

Analyser flow rates: Flow rates are measured by calibrated flow audit measurement systems.  Leak checks are also carried out.


PM10 Monitoring Adjustment


**TEOM**

In the past TEOM data was corrected using a simple multiplication factor of 1.3.  Co-located instruments (TEOM and Partisol) at North Kensington in the past enabled us to compare the results, this had shown that adjusting the TEOM data by a factor of 1.3 gave a reasonable approximation of the annual average, but less reliable when applied to exceedances of the daily objective.  However co-location studies have shown that the instrument was not equivalent to the reference method and the FDMS measurement device was developed to correct the problem and in comparisons was shown to be equivalent to the EU reference method.   In 2008/09 Defra began the replacement of TEOM units with FDMS units on the particulate monitoring network.  Government guidance LAQM TG(09) states that the Volatile Correction Model (VCM) should be used to correct TEOM measurements for Local Air Quality Management purposes.  PM10 data is mainly collected using FDMS units and a partisol.

Data has been collected from the London Air Quality Network (LAQN) website (www.londonair.org.uk) operated by King's ERG.  TEOM measurements on the website are now adjusted by the CVC. The VCM uses FDMS purge measurements to correct TEOM measurements for the loss of volatile material.  This method is now recommended in Defra's TG (09) as the preferred method for correcting TEOM measurements for Local Air Quality Management purposes. This correction has been undertaken for data in the Council's two TEOM sites from 2004.  Data corrected using both the simple multiplication factor and the VCM method is included in the report.

**QA/QC of Gravimetric monitoring-Partisol**

The Partisol operating at the Earls Court Road site since May 2002 is a gravimetric sampler which is equivalent to the EU reference method.  Reference to the report has also been made to other Partisols operating in the borough by Defra.  However, the co-location trail1 raised concerns over the filter media used in these instruments and showed that an over estimation in measured concentrations resulted from the use of quartz filters. The filters used at the site are Teflon coated glass fibre (Emfab) filters which are not affected in the same way as quartz filters[7].   No correction factor is required for gravimetric instruments.

Verification of ambient temperature, verification of filter temperature, verification of ambient pressure and humidity, internal leak check, external leak check and flow verification are undertaken for the partisol at the time of audit and service.

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1 Maggs, R.,  Harrison, D., Carslaw, D. , Stevenson, K. (2009)  Analysis of Trends in Gravimetric Particulate Mass Measurements in the United Kingdom

## A.2    *Diffusion Tube Quality Assurance / Quality Control*

**QA/QC of NO$_2$ Diffusion tube data**

Bureau Veritas manage the data from the London Wide Environmental Programme (LWEP) diffusion tube networks, however the supply and analysis of the tubes is undertaken by Gradko International Ltd.   The diffusion tubes employed in the LWEP programme are prepared and analysed by UKAS accredited Gradko International Ltd. Diffusion tubes are prepared using the 50% triethanolamine with acetone method and analysed using UV spectrometry. The diffusion tubes are labelled, and kept refrigerated in plastic bags prior to and after exposure.

**Laboratory Performance in AIR/WASP NO2 Proficiency Testing (PT) Scheme**

QA/QC of diffusion tube laboratories is provided by the AIR-PT Scheme, which is operated by LGC Standards and supported by the Health and Safety Laboratory. The AIR-PT scheme started in 2014 combines the two long running schemes of the HSL Workplace Analysis Scheme for Proficiency (WASP) and the LGC Standards STACKS scheme.

Gradko International Ltd participates in the AIR-PT scheme and historically participated in the WASP scheme also. Each quarter each laboratory receives tubes with known concentrations of nitrite for analysis. The tubes also include duplicates allowing for precision and accuracy to be assessed.

The results are presented as the percentage of results where the z-score was between -2 and +2, which is deemed to be satisfactory. For 2016, the results for Gradko International were as follows:

**Table A2.1   Laboratory Summary Performance for AIR NO2 PT Rounds 12, 13, 15 and 16 2016**

| AIR PT AR012 | AIR PT AR013 | AIR PT AR015 | AIR PT AR016 |
|---|---|---|---|
| January – February 2016 | April – May 2016 | July – August 2016 | September – October 2016 |
| 100% | 100% | 100% | 100% |

**Network Field Inter-Comparison Exercise**

Gradko International Ltd also takes part in the NO2 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.

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'.

**Table A2.2   Summary of NO₂ Network Field Inter-Comparison Results, 2016**

| Annual Mean Bias | | Precision | |
|---|---|---|---|
| Performance Target | Gradko Annual Mean Bias | Performance Target | Gradko Precision |
| +25% | +2.3 | 10% | Good |

The laboratory of Gradko International Ltd follows the Practical Guidance document "Diffusion Tubes for Ambient NO₂ Monitoring: Practical Guidance for users and laboratories (Feb 2008)" (AEA on behalf of Defra). The preparation method:   50% TEA v/v in Acetone and the analytical method is U.V. Spectrophotometry. Analysis is carried out in accordance with documented in-house Laboratory Method GLM6. Results are not blank subtracted

 **Uncertainty of measurement:   3.82%+/-**                    **Limit of Detection:        0.066mg/m3***

**Benzene diffusion tube data**

All benzene tubes were analysed by 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 was 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.

**Diffusion Tube Bias Adjustment Factors:**

NO2 diffusion tube bias adjustment factors for 2001 to 2016 used in the reports. Mean correction factor and %bias from Co-location LWEP Studies 2001-2015 – N Kensington

**Table A2.3**

| Year | Mean Bias Adjustment | Mean % Bias |
|------|------|------|
| 2001 | 1.37 | -26.00 |
| 2002 | 1.35 | -26.00 |
| 2003 | 1.11 | -10.00 |
| 2004 | 1.10 | -9.00 |
| 2005 | 1.03 | -3.00 |
| 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 |

**Table A2.4   Bias Adjustment Factor and % Bias of LWEP Co-Location Study 2016 (North Kensington)**

| Diffusion Tube (KC47) | Continuous Analyser | Correction Factor (A) | % Bias based on continuous monitor (B) |
|------|------|------|------|
| 29.7 | 34.3 | 1.15 | -13 |

Source: Annual NO2 Diffusion Tube Report 2016 prepared for Royal Borough Kensington and Chelsea and the London Borough of Hammersmith and Fulham

**Factor from Local Co-location Studies**

Bureau Veritas conduct an 'in-house' co-location study to establish an LWEP bias adjustment factor based on triplicate NO$_2$ diffusion tubes sampling concurrently located with continuous analysers for a number of local authorities. They employ the DIFTAB.xls spreadsheet to calculate the factor.

**Table A2.5   Bias Adjustment Factor and % Bias of LWEP Co-Location Study 2016**

|  |  | Diffusion Tube | Continuous Analyser | Correction Factor (A) | % Bias based on continuous monitor (B) |
|---|---|---|---|---|---|
| **Kensington** | North Kensington | 29.7 | 34.3 | 1.15 | -13 |
| **Kensington** | Cromwell Road | 62.7 | 57.1 | 0.91 | 10 |
| **LWEP** | Bloomsbury | 42.1 | 41.5 | 0.97 | 3.33 |
| **Croydon** | London Road | 53.3 | 46.3 | 0.87 | 15 |
| **Greenwich** | Eltham | 20.2 | 21.2 | 1.04 | -4 |
| **Greenwich** | Blackheath | 45.2 | 45.9 | 1.01 | -1 |
| **Greenwich** | Westhorne Av | 39.3 | 40.9 | 1.05 | -5 |
| **Greenwich** | Woolwich Flyover | 69.2 | 63.7 | 0.92 | 9 |
| **Greenwich** | Bexley Falconwood | 50.3 | 44.8 | 0.86 | 16 |
| **Overall % Bias** |  |  |  |  | **2.60** |
| **Overall Bias Adjustment Factor** |  |  |  | **0.97** |  |

**Discussion of Choice of Factor to Use**

For 2016 a local bias adjustment factor based on the North Kensington monitoring station was considered to be the most suitable as it is based on data from the borough's AURN affiliated site which has triplicate diffusion tubes co-located with it.  Also comparison of the local factor and the LWEP with other co-located sites within the borough showed it gave the best fit to the continuous monitoring data.

**Table A2.6   Bias adjustment factor comparison**

|  | North Kensington (KC47) | Knightsbridge (KC49) | Kings road (KC56) |
|---|---|---|---|
| Continuous monitoring AM data | 34.3 | 80 | 78 |
| NK Local bias adjusted DT AM data | 34.21 | 87.48 | 72.70 |
| LWEP bias adjusted DT  AM data | 28.85 | 73.79 | 61.32 |

NK – North Kensington Diffusion tubes

## A.3    Adjustments to the Ratified Monitoring Data

<u>Distance Adjustment</u>

Where an exceedance has been measured at a monitoring site which is not representative of public exposure, the procedure specified in LLAQM.TG(16) has been used to estimate the concentration at the nearest receptor.

# Appendix B    Full Monthly Diffusion Tube Results for 2016

**Table N.**    NO$_2$ Diffusion Tube Results

| Site ID | Valid data capture for monitoring period % [a] | Valid data capture 2015 % [b] | Annual Mean NO$_2$ | | | | | | | | | | | | Annual mean – raw data [c] | Annual mean – bias adjusted [c] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Jan | Feb | March | Apr | May | June | Jul | Aug | Sept | Oct | Nov | Dec | | |
| KC 31 - Ladbroke Library | 100% | 100% | 45.51 | 47.84 | 44.44 | 50.50 | 51.58 | 50.96 | 34.95 | 39.45 | 45.98 | 49.61 | 59.47 | 58.79 | 48.26 | 55.50 |
| KC 32 - Holland Park | 100% | 100% | 29.16 | 29.35 | 23.72 | 23.06 | 23.99 | 20.22 | 19.05 | 20.10 | 25.21 | 26.01 | 30.54 | 41.30 | 25.98 | 29.87 |
| KC 33 - A4 Junction | 92% | 92% | 110.60 | 98.94 | 77.05 | 44.27 | 85.86 | 95.45 | 121.75 | 95.30 | 98.65 | 84.75 | 86.90 | | 90.87 | 104.50 |
| KC 34 - Dove House Green | 92% | 92% | 43.31 | 40.47 | 32.49 | 27.31 | 35.40 | 37.01 | 27.03 | | 35.51 | 39.40 | 51.05 | 48.98 | 38.00 | 43.70 |
| KC 35 - Brompton Rd | 92% | 92% | 71.41 | 59.69 | 64.99 | 61.29 | 75.85 | 74.93 | 75.76 | 71.57 | 76.03 | 67.76 | 74.85 | 67.65 | 70.15 | 80.67 |
| KC 38 - Earls Court Station | 100% | 100% | 95.94 | 79.89 | 78.96 | 81.03 | 84.91 | 90.78 | 92.68 | 80.85 | 94.76 | 84.45 | 94.26 | 95.77 | 87.86 | 101.03 |
| KC 39 - Upcerne Road | 100% | 100% | 32.92 | 36.24 | 31.55 | 28.74 | 32.81 | 31.25 | 23.21 | 25.95 | 31.34 | 35.71 | 47.04 | 45.30 | 33.50 | 38.53 |

| Site ID | Valid data capture for monitoring period % [a] | Valid data capture 2015 % [b] | Annual Mean NO$_2$ | | | | | | | | | | | | Annual mean – raw data [c] | Annual mean – bias adjusted [c] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Jan | Feb | March | Apr | May | June | Jul | Aug | Sept | Oct | Nov | Dec | | |
| KC 40 - Cottage Place | 100% | 100% | **44.79** | 36.51 | 33.72 | 36.59 | 39.18 | 35.83 | 32.37 | 30.49 | 39.40 | 38.03 | **51.19** | **52.88** | 39.25 | **45.14** |
| KC 41 - Ladbroke Crescent | 100% | 100% | 36.73 | 39.64 | 29.04 | 25.74 | 31.31 | 29.86 | 21.14 | 23.43 | 29.49 | 36.98 | **45.11** | **49.68** | 33.18 | 38.16 |
| KC 42 - Pembridge Library | 100% | 100% | **48.20** | **42.99** | 30.99 | 34.19 | 36.61 | 37.41 | 33.56 | 29.78 | **45.96** | **41.80** | **51.74** | **48.73** | 40.16 | **46.19** |
| KC 43 - St Marks Grove | 100% | 100% | 35.13 | 35.23 | 30.24 | 25.65 | 31.61 | 30.20 | 21.75 | 22.67 | 29.86 | 32.36 | 41.19 | 41.65 | 31.46 | 36.18 |
| KC 44 - Donne Place | 83% | 83% | **47.82** | **43.36** | **41.70** | 32.13 | 53.13 | 25.90 | | 29.60 | 38.55 | 37.72 | | **51.19** | 40.11 | **46.13** |
| KC 45 - Chatsworth Court | 100% | 100% | **49.38** | **46.27** | **40.10** | **40.15** | **48.00** | **44.46** | 33.79 | **42.63** | **50.01** | **40.76** | **56.42** | **57.00** | **45.75** | **52.61** |
| KC 47 - Sion Manning School | 100% | 100% | 34.62 | 32.43 | 26.27 | 25.83 | 29.54 | 24.81 | 19.03 | 20.53 | 27.92 | 31.45 | **40.60** | **44.88** | 29.83 | 34.30 |
| KC 47 - Sion Manning School | 100% | 100% | 35.63 | 33.70 | 27.30 | 25.77 | 26.92 | 25.18 | 18.78 | 21.59 | 26.54 | 31.93 | **40.46** | **44.57** | 29.86 | 34.34 |
| KC 47 - Sion Manning School | 100% | 100% | 35.28 | 33.78 | 25.99 | 24.97 | 26.14 | 25.48 | 19.97 | 21.17 | 27.52 | 30.32 | **39.81** | **44.13** | 29.55 | 33.98 |

| Site ID | Valid data capture for monitoring period % [a] | Valid data capture 2015 % [b] | Annual Mean NO$_2$ | | | | | | | | | | | | Annual mean – raw data [c] | Annual mean – bias adjusted [c] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Jan | Feb | March | Apr | May | June | Jul | Aug | Sept | Oct | Nov | Dec | | |
| KC 48 - Sloane Square | 100% | 100% | 64.83 | 62.67 | 47.38 | 57.76 | 73.69 | 69.93 | 57.12 | 56.37 | 64.38 | 58.90 | 73.69 | 68.06 | 62.90 | 72.33 |
| KC 49 - Hans Road | 92% | 92% | 63.66 | 67.78 | 80.49 | 77.15 | 95.46 | 78.18 | 57.19 | 68.11 | 80.91 | 75.04 | 92.81 | | 76.07 | 87.48 |
| KC 50 - Chelsea PG (gate) | 92% | 92% | 54.25 | | 40.22 | 43.74 | 43.38 | 44.81 | 45.55 | 48.11 | 54.57 | 45.33 | 59.06 | 60.23 | 49.02 | 56.38 |
| KC 51 - Chelsea PG (met) | 92% | 92% | 35.08 | 32.97 | 29.98 | 28.19 | 31.59 | 29.18 | 23.11 | 23.28 | 28.52 | 31.02 | 43.66 | 40.95 | 31.46 | 36.18 |
| KC 52 - Sloane Avenue | 100% | 100% | 57.71 | 55.50 | 49.09 | 50.24 | 60.71 | 53.49 | 48.08 | 52.39 | 56.54 | 57.00 | 71.07 | 60.72 | 56.05 | 64.45 |
| KC 53 - Walmer House | 100% | 100% | 45.95 | 40.08 | 36.43 | 38.48 | 38.51 | 38.94 | 34.70 | 33.93 | 43.35 | 37.54 | 50.11 | 52.46 | 40.87 | 47.00 |
| KC 54 - Natural History Museum | 100% | 100% | 82.03 | 72.05 | 63.61 | 59.97 | 61.96 | 60.06 | 52.26 | 51.78 | 64.42 | 54.30 | 69.10 | 77.06 | 64.05 | 73.66 |
| KC 54 - Natural History Museum | 92% | 92% | 82.10 | 69.47 | 62.38 | 57.35 | 64.12 | 55.11 | 51.26 | | 62.14 | 53.38 | 63.31 | 71.22 | 62.89 | 72.33 |
| KC 54 - Natural History Museum | 83% | 83% | 76.80 | | 58.37 | 55.55 | 64.92 | 56.67 | 49.34 | | 61.93 | 56.72 | 67.20 | 74.42 | 62.19 | 71.52 |

| Site ID | Valid data capture for monitoring period % [a] | Valid data capture 2015 % [b] | Annual Mean NO$_2$ | | | | | | | | | | | | Annual mean – raw data [c] | Annual mean – bias adjusted [c] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Jan | Feb | March | Apr | May | June | Jul | Aug | Sept | Oct | Nov | Dec | | |
| KC 55 - Blantyre Street | 75% | 75% | | 46.30 | 37.35 | | | 38.54 | 30.08 | 31.66 | 35.66 | 41.95 | 69.07 | 53.00 | 42.62 | 49.02 |
| KC 56 - Chelsea Old Town Hall | 100% | 100% | 67.99 | 62.54 | 55.34 | 61.78 | 71.12 | 63.15 | 55.86 | 48.58 | 68.85 | 57.30 | 72.67 | 73.47 | 63.22 | 72.70 |
| KC 57 - Sloane St/Pavilion St | 100% | 100% | 50.80 | 51.61 | 55.65 | 42.30 | 36.69 | 54.91 | 36.22 | 40.87 | 46.27 | 52.84 | 64.71 | 53.80 | 48.89 | 56.22 |
| KC 58 - Kensington High Street | 100% | 100% | 56.47 | 54.63 | 46.29 | 49.13 | 55.96 | 53.46 | 47.87 | 49.43 | 52.08 | 46.29 | 55.64 | 56.03 | 51.94 | 59.73 |
| KC 59 - Kens High St/Argyle St | 100% | 100% | 71.26 | 72.73 | 60.67 | 63.63 | 67.65 | 66.80 | 61.69 | 66.51 | 72.70 | 68.31 | 80.34 | 71.72 | 68.67 | 78.97 |
| KC 60 - Old Brompton Rd | 100% | 100% | 71.53 | 69.15 | 57.08 | 57.81 | 63.52 | 67.98 | 55.12 | 51.75 | 66.93 | 60.86 | 73.27 | 67.28 | 63.52 | 73.05 |
| KC 61 - Limerston Street | 100% | 100% | 55.03 | 51.29 | 51.49 | 43.61 | 61.93 | 57.45 | 43.55 | 47.86 | 51.46 | 49.93 | 63.64 | 59.17 | 53.03 | 60.99 |
| KC 64 - Warwick Rd | 100% | 100% | 55.03 | 51.87 | 45.28 | 40.81 | 52.79 | 56.45 | 37.66 | 40.53 | 49.72 | 55.46 | 60.16 | 62.88 | 50.72 | 58.33 |
| KC 65 - Barlby Rd | 100% | 100% | 39.03 | 36.89 | 31.31 | 31.07 | 35.43 | 33.75 | 24.63 | 29.49 | 34.87 | 36.95 | 48.41 | 48.96 | 35.90 | 41.28 |

| Site ID | Valid data capture for monitoring period %[a] | Valid data capture 2015 %[b] | Annual Mean NO$_2$ | | | | | | | | | | | | Annual mean – raw data[c] | Annual mean – bias adjusted[c] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Jan | Feb | March | Apr | May | June | Jul | Aug | Sept | Oct | Nov | Dec | | |
| KC 66 - Acklam Rd | 92% | 92% | **92.97** | **43.16** | 36.75 | 39.40 | 37.97 | | **71.14** | 32.91 | 38.47 | 39.27 | **51.75** | **50.21** | **48.55** | **55.83** |
| KC 67 - Southern Row | 100% | 100% | **47.41** | 37.66 | 33.27 | 35.82 | 32.33 | 35.27 | 32.70 | 32.45 | **39.91** | **39.95** | **47.32** | **56.28** | 39.20 | **45.08** |
| KC 68 - Exhibition Rd | 92% | 92% | **50.99** | **47.81** | **44.77** | 39.11 | **42.90** | **40.39** | 37.04 | 38.44 | **45.08** | **47.36** | **54.15** | | **44.37** | **51.02** |
| KC 69 - Darfield Way | 100% | 100% | **46.45** | **45.33** | 35.60 | 35.69 | 35.98 | 33.97 | 35.45 | 31.45 | **40.84** | 37.78 | **49.33** | **53.09** | **40.08** | **46.09** |
| KC 47 - Sion Manning School | 1.00 | 1.00 | 35.18 | 33.30 | 26.52 | 25.52 | 27.53 | 25.16 | 19.26 | 21.10 | 27.33 | 31.23 | **40.29** | **44.53** | 29.75 | 34.21 |
| KC 54 - Natural History Museum | 0.92 | 0.92 | **80.31** | **70.76** | **61.45** | **57.62** | **63.67** | **57.28** | **50.95** | **51.78** | **62.83** | **54.80** | **66.54** | **74.23** | **63.04** | **72.50** |

Exceedance of the NO$_2$ annual mean AQO of 40 μgm$^{-3}$ 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%

Blue highlighted rows denotes KC54 results of triplicate exposure and mean of triplicate exposure.

Orange highlighted rows denotes KC47 results of triplicate exposure and mean of triplicate exposure

KC47, KC49, KC54 and KC56 are co-located with continuous analysers.

**End**