

**City of London Corporation**  
**Air Quality Annual Status Report for 2016**  
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This report provides a detailed overview of air quality in the City of London during 2016. It has been produced to meet the requirements of the London Local Air Quality Management statutory process<sup>1</sup>.

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

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## **Abbreviations**

AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BEB	Buildings Emission Benchmark
CAB	Cleaner Air Borough
CAZ	Central Activity Zone
EV	Electric Vehicle
GLA	Greater London Authority
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LLAQM	London Local Air Quality Management
NRMM	Non-Road Mobile Machinery
PM <sub>10</sub>	Particulate matter less than 10 micron in diameter
PM <sub>2.5</sub>	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**

<b>Pollutant</b>	<b>Objective (UK)</b>	<b>Averaging Period</b>	<b>Date<sup>1</sup></b>
Nitrogen dioxide - NO <sub>2</sub>	200 µg m <sup>-3</sup> not to be exceeded more than 18 times a year	1-hour mean	31 Dec 2005
	40 µg m <sup>-3</sup>	Annual mean	31 Dec 2005
Particles - PM <sub>10</sub>	50 µg m <sup>-3</sup> not to be exceeded more than 35 times a year	24-hour mean	31 Dec 2004
	40 µg m <sup>-3</sup>	Annual mean	31 Dec 2004
Particles - PM <sub>2.5</sub>	25 µg m <sup>-3</sup>	Annual mean	2020
	Target of 15% reduction in concentration at urban background locations	3 year mean	Between 2010 and 2020
Sulphur Dioxide (SO <sub>2</sub> )	266 µg m <sup>-3</sup> not to be exceeded more than 35 times a year	15 minute mean	31 Dec 2005
	350 µg m <sup>-3</sup> not to be exceeded more than 24 times a year	1 hour mean	31 Dec 2004
	125 µg m <sup>-3</sup> not to be exceeded more than 3 times a year	24 hour mean	31 Dec 2004

Note: <sup>1</sup>by which to be achieved by and maintained thereafter

## 1. Air Quality Monitoring

### 1.1 Locations

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

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
CT2	Farringdon Street	531625	181201	Kerbside	Y	0 m	1m	1.5	PM <sub>2.5</sub>	BAM
CT2*	Farringdon Street	531620	181239	Kerbside	Y	0 m	1m	1.5	PM <sub>2.5</sub>	BAM
CT3	Sir John Cass School	533475	181179	Urban Background	Y	0 m	N/A	1.5	PM <sub>10</sub>	BAM
CT3	Sir John Cass School	533475	181179	Urban Background	Y	0 m	N/A	1.5	PM <sub>2.5</sub>	BAM
CT3**	Sir John Cass School	533475	181179	Urban Background	Y	0 m	N/A	1.5	NO <sub>2</sub>	Chemiluminescent
CT4	Beech Street	532141	181861	Roadside	Y	0 m	1m	3	PM <sub>10</sub>	TEOM
CT4	Beech Street	532176	181862	Roadside	Y	0 m	1m	2	NO <sub>2</sub>	Chemiluminescent
CT6**	Walbrook Wharf	532528	180784	Roadside	Y	0 m	1m	3	NO <sub>2</sub>	Chemiluminescent
CT8	Upper Thames Street	532834	180691	Roadside	Y	0 m	2m	1.5	PM <sub>10</sub>	TEOM

\*new location as of July 2016 as a result of the Cycle Super Highway works

\*\* diffusion tube co-location

**Table C Details of Non-Automatic Monitoring Sites**

**Table C(i) Long term monitoring diffusion tube sites (data beyond 2010)**

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
CL5	St. Bartholomew's Hospital courtyard	531901	181571	Urban Background	Y	0 m	N/A	1.5	NO <sub>2</sub>	N
CL38	St. Andrew's Church, Queen Victoria St	531851	180962	Roadside	Y	0 m	2m	3	NO <sub>2</sub>	N
CL39	St. Dunstan's Church, Fleet St	531235	181155	Roadside	Y	0 m	2m	1.5	NO <sub>2</sub>	N
CL55	Speed House, Barbican Centre	532482	181799	Urban Background	Y	0 m	N/A	0.5	NO <sub>2</sub>	N
CL40	Guinness Trust Estate, Mansell St.	533791	181027	Roadside	Y	0 m	3m	2	NO <sub>2</sub>	N

**Table C(ii) Sir John Cass School Monitoring (data since 2013)**

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA ?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
SJC1, 6 and 8	Rear playground (co-location)	533475	181179	Urban Background	Y	0 m	N/A	1.5m	NO <sub>2</sub>	Y
SJC2	Yr 6 classroom	533508.9	181173.2	'indoor'	Y	0 m	N/A	second floor	NO <sub>2</sub>	N
SJC 3	Roof (front)	533503.5	181161.9	Urban Background	Y	0 m	23m	16m (1.5m above roof)	NO <sub>2</sub>	N
SJC4	Front playground	533498.3	181148.9	Roadside	Y	0 m	15m	1m below Street level	NO <sub>2</sub>	N
SJC5	Aldgate Railings	533515.6	181151.4	Roadside	Y	0 m	5m	2m	NO <sub>2</sub>	N
SJC7	Roof (back)	533496.9	181168.4	Urban Background	Y	0 m	32m	16m (1.5m above roof)	NO <sub>2</sub>	N

**Table C(iii) Cheapside Business Alliance BID – Business Monitoring Project (data for 2016)**

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
CH1	Hugo Boss (Cheapside)	532260.4	181205.4	Kerbside	Y	0 m	1m	2m	NO <sub>2</sub>	N
CH2	Santander (Cheapside)	532457.2	181154.6	Kerbside	Y	0 m	1m	2m	NO <sub>2</sub>	N
CH3	Core Restaurant (Watling St)	532445.8	181041.5	Roadside	Y	0 m	2m	2m	NO <sub>2</sub>	N
CH4	33 Cannon Street	53238.57	181011.1	Kerbside	Y	0 m	1m	2m	NO <sub>2</sub>	N
CH5	New Change Street	532135.9	181210.4	Kerbside	Y	0 m	1m	2m	NO <sub>2</sub>	N
CH6	150 Cheapside	532138.5	181295.5	Kerbside	Y	0 m	1m	2m	NO <sub>2</sub>	N
CH7	BT Building (St Martin's-le-Grand)	532127	181360.3	Kerbside	Y	0 m	1m	2m	NO <sub>2</sub>	N
CH8	Noble Street (corner with Gresham St)	532204.5	181428.9	Roadside	Y	0 m	2m	2m	NO <sub>2</sub>	N
CH9	King Edward Street	532035.6	181373.0	Kerbside	Y	0 m	1m	2m	NO <sub>2</sub>	N
CH10	St Paul's Bus Stop (Cannon St)	532106.7	181084.7	Kerbside	Y	0 m	1m	2m	NO <sub>2</sub>	N



**Table C (iv) Bank Area Monitoring (data for 2016)**

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
Bank 1	Cannon Street	532628.4	180916.0	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 2	Queen Victoria Street	532576.3	180931.9	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 3	King Street	532460.7	181167.5	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 4	Corner of Poultry and QVS	532630.9	181111.6	Roadside	Y	0 m	4m	2m	NO <sub>2</sub>	N
Bank 5	Magistrates Court	532644.9	181092.6	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 6	King William Street	532795.4	180980.2	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 7	Lombard and KWS	532759.8	181071.6	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 8	Lombard Street	532853.1	181017.6	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 9	Lombard Street and Cornhill	532723.0	181099.6	Roadside	Y	0 m	3m	2m	NO <sub>2</sub>	N
Bank 10	Cornhill Bank Junction	532729.3	181107.2	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 11	Cornhill-Royal Exchange	532822.0	181123.0	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 12	Threadneedle Street	532841.0	181192.9	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 13	31 Old Broad Street	533036.0	181376.4	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 14	Wormwood Street	533077.9	181445.0	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 15	3 London Wall	532923.0	181509.1	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 16	81 London Wall	532664.5	181552.3	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 17	55 Moorgate	532693.1	181497.7	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 18	85 Gresham Street	532693.1	181497.7	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N
Bank 19	Lothbury	532723.6	181265.3	Roadside	Y	0 m	2m	2m	NO <sub>2</sub>	N
Bank 20	Princes Street	532649.3	181224.6	Kerbside	Y	0 m	<1m	2m	NO <sub>2</sub>	N

## 1.2 Comparison of Monitoring Results with AQOs

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

**Table D. Annual Mean NO<sub>2</sub> Ratified & Bias-adjusted Results for Automatic Monitoring (µg m<sup>-3</sup>)**

Site ID	Site type	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2016 % <sup>b</sup>	Annual Mean Concentration (µg m <sup>-3</sup> )						
				2010 <sup>c</sup>	2011 <sup>c</sup>	2012 <sup>c</sup>	2013 <sup>c</sup>	2014 <sup>c</sup>	2015 <sup>c</sup>	2016 <sup>c</sup>
CT3 (John Cass)	Urban Background	n/a	99	<b>55</b>	<b>45</b>	<b>47</b>	<b>47</b>	<b>45</b>	<b>42</b>	<b>42</b>
CT4 (Beech St)	Roadside	n/a	99	<b><u>81</u></b>	<b><u>67</u></b>	<b><u>79</u></b>	<b><u>81</u></b>	<b><u>80</u></b>	<b><u>89</u></b>	<b><u>85</u></b>
CT 6 (Walbrook)	Roadside	n/a	97	<b><u>118</u></b>	<b><u>103**</u></b>	<b><u>115</u></b>	<b><u>122</u></b>	<b><u>122</u></b>	<b><u>98</u></b>	<b><u>92</u></b>

Notes: Exceedance of the NO<sub>2</sub> annual mean AQO of 40 µg m<sup>-3</sup> are shown in **bold**.

NO<sub>2</sub> annual means in excess of 60 µg m<sup>-3</sup>, indicating a potential exceedance of the NO<sub>2</sub> hourly mean AQS objective are shown in bold and underlined.

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

<sup>b</sup> 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%)

<sup>c</sup> Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

\*\* 74% data capture annualised

**Table E. Annual Mean NO<sub>2</sub> Ratified and Bias-adjusted Results for Diffusion Tube Sites (µg m<sup>-3</sup>)**

**Table E (i) Annual Mean NO<sub>2</sub> monitoring results for long term diffusion tube sites (µg m<sup>-3</sup>)**

Site ID	Site type	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2016 % <sup>b</sup>	Annual Mean Concentration (µgm <sup>-3</sup> )						
				2010 <sup>c</sup>	2011 <sup>c</sup>	2012 <sup>c</sup>	2013 <sup>c</sup>	2014 <sup>c</sup>	2015 <sup>c</sup>	2016 <sup>c</sup>
CL5	Urban Background	n/a	92	<b>42</b>	<b>45</b>	<b>43</b>	<b>42</b>	<b>43</b>	38	<b>49</b>
CL38	Roadside	n/a	92	<b><u>61</u></b>	<b><u>63</u></b>	<b>56</b>	<b><u>64</u></b>	<b>59</b>	<b>53</b>	<b>56</b>
CL39	Roadside	n/a	100	<b><u>87</u></b>	<b><u>98</u></b>	<b><u>93</u></b>	<b><u>87</u></b>	<b><u>80</u></b>	<b><u>87</u></b>	<b><u>81</u></b>
CL55	Urban Background	n/a	100	36	38	37	37	34	33	35
CL40	Roadside	n/a	100	<b>56</b>	<b><u>65</u></b>	<b><u>60</u></b>	<b>59</b>	<b>59</b>	<b>56</b>	<b>51</b>

Notes: Exceedance of the NO<sub>2</sub> annual mean AQO of 40 µgm<sup>-3</sup> are shown in **bold**.

NO<sub>2</sub> annual means in excess of 60 µg m<sup>-3</sup>, indicating a potential exceedance of the NO<sub>2</sub> hourly mean AQS objective are shown in bold and underlined.

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

<sup>b</sup> 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%)

<sup>c</sup> Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

**Table E (ii) Annual Mean NO<sub>2</sub> monitoring results for Sir John Cass School ( $\mu\text{g m}^{-3}$ )**

Site ID	Site type	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2016 % <sup>b</sup>	Annual Mean Concentration ( $\mu\text{g m}^{-3}$ )			
				2013 <sup>c</sup>	2014 <sup>c</sup>	2015 <sup>c</sup>	2016 <sup>c</sup>
SJC1/6/8** (rear playground)	Urban Background	n/a	97	<b>47</b>	<b>46</b>	<b>41</b>	<b>39</b>
SJC2 (classroom)	'inside'	n/a	92	36	35	34	32
SJC3 (roof, front)	Urban Background	n/a	100	<b><u>60</u></b>	<b>55</b>	<b>49</b>	<b>45</b>
SJC4 (front playground)	Urban Background	n/a	100	<b>59</b>	<b>52</b>	<b>48</b>	<b>43</b>
SJC5 (front railings)	Roadside	n/a	100	<b><u>69</u></b>	<b><u>63</u></b>	<b><u>61</u></b>	<b>52</b>
SJC7 (roof, back)	Urban Background	n/a	100	--	<b>48</b>	<b>46</b>	<b>44</b>

Notes:

**\*\*triplicate co-location started in 2016, duplicate tubes in 2014 and 2015 and a single tube in 2013**

Exceedance of the NO<sub>2</sub> annual mean AQO of 40  $\mu\text{g m}^{-3}$  are shown in **bold**.

NO<sub>2</sub> annual means in excess of 60  $\mu\text{g m}^{-3}$ , indicating a potential exceedance of the NO<sub>2</sub> hourly mean AQS objective are shown in bold and underlined.

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

<sup>b</sup> 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%)

<sup>c</sup> Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% - **RESULTS IN 2013 ANNUALISED**

**Table E (iii) Annual Mean NO<sub>2</sub> monitoring results for the Cheapside area ( $\mu\text{g m}^{-3}$ )**

Site ID (see table C for location)	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2016 % <sup>b</sup>	2016 Annual mean – bias adjusted <sup>c</sup>
CH1	n/a	75	<b><u>65</u></b>
CH2	n/a	67	<b><u>63</u></b> <sup>c</sup>
CH3	n/a	75	<b>50</b>
CH4	n/a	83	<b><u>71</u></b>
CH5	n/a	25	<b><u>66</u></b> <sup>c</sup>
CH6	n/a	75	<b>59</b>
CH7	n/a	50	<b><u>62</u></b> <sup>c</sup>
CH8	n/a	75	<b>48</b>
CH9	n/a	67	<b><u>55</u></b> <sup>c</sup>
CH10	n/a	67	<b><u>70</u></b> <sup>c</sup>

Notes:

Exceedance of the NO<sub>2</sub> annual mean AQO of 40  $\mu\text{g m}^{-3}$  are shown in **bold**.

NO<sub>2</sub> annual means in excess of 60  $\mu\text{g m}^{-3}$ , indicating a potential exceedance of the NO<sub>2</sub> hourly mean AQS objective are shown in bold and underlined.

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

<sup>b</sup> 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%)

<sup>c</sup> Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% - **RESULTS CH2, CH5, CH7, CH9 and CH10 annualised**

**Table E (iv) Annual Mean NO<sub>2</sub> monitoring results for the Bank area ( $\mu\text{g m}^{-3}$ )**

Site ID (see table C for location)	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2016 % <sup>b</sup>	2016 Annual mean – bias adjusted <sup>c</sup>
BANK 1	n/a	92	<b><u>78</u></b>
BANK 2	n/a	92	<b><u>72</u></b>
BANK 3	n/a	83	<b><u>52</u></b>
BANK 4	n/a	83	<b><u>71</u></b>
BANK 5	n/a	92	<b><u>66</u></b>
BANK 6	n/a	92	<b><u>76</u></b>
BANK 7	n/a	92	<b><u>57</u></b>
BANK 8	n/a	92	<b><u>59</u></b>
BANK 9	n/a	100	<b><u>68</u></b>
BANK 10	n/a	75	<b><u>71</u></b>
BANK 11	n/a	100	<b><u>61</u></b>
BANK 12	n/a	75	<b><u>85</u></b>
BANK 13	n/a	83	<b><u>59</u></b>
BANK 14	n/a	100	<b><u>64</u></b>
BANK 15	n/a	100	<b><u>64</u></b>
BANK 16	n/a	100	<b><u>60</u></b>
BANK 17	n/a	83	<b><u>69</u></b>
BANK 18	n/a	100	<b><u>53</u></b>
BANK 19	n/a	67	<b><u>45<sup>c</sup></u></b>
BANK 20	n/a	75	<b><u>78</u></b>

Notes:

Exceedance of the NO<sub>2</sub> annual mean AQO of 40  $\mu\text{g m}^{-3}$  are shown in **bold**.

NO<sub>2</sub> annual means in excess of 60  $\mu\text{g m}^{-3}$ , indicating a potential exceedance of the NO<sub>2</sub> hourly mean AQS objective are shown in bold and underlined.

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

<sup>b</sup> 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%)

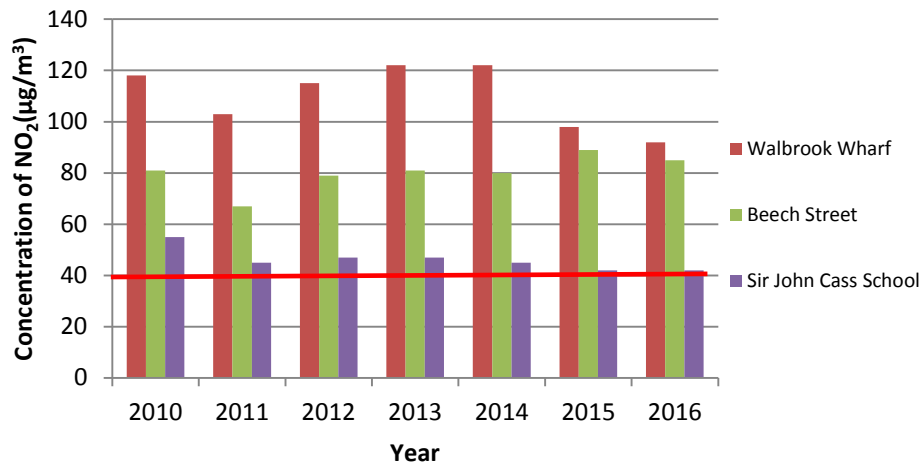
<sup>c</sup> Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% - **Result for Bank 19 has been annualised**

### Narrative on the 7 Year Trend

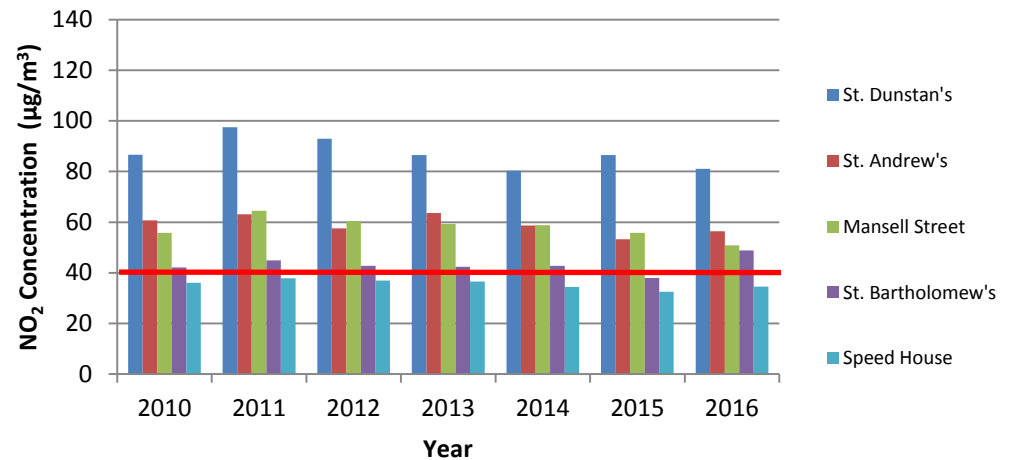
Since 2010, background NO<sub>2</sub> sites have been generally decreasing, with the Speed House diffusion tube site being below to AQO since 2010 (although slightly increased on last year). Although the St Bartholomew's diffusion tube was showing a downward trend and was below the AQO in 2015, is has increased again in 2016 to a 7 year high; the reasons behind this are being investigated. Sir John Cass School continuous monitoring remains just above the objective at 42µgm<sup>-3</sup>. Also see the narrative below regarding the diffusion tube monitoring at this location.

Roadside sites remain above the annual average AQO and show a greater variability over the 7 years. In 2016 Walbrook Wharf reached a 7 year low as a result of Cycle Super Highway works which reduced capacity on the road by 25%. We have also noted a 7 year low at a roadside residential development on Mansell Street.

**Annual average NO<sub>2</sub> concentrations from continuous monitoring sites 2010- 2016**



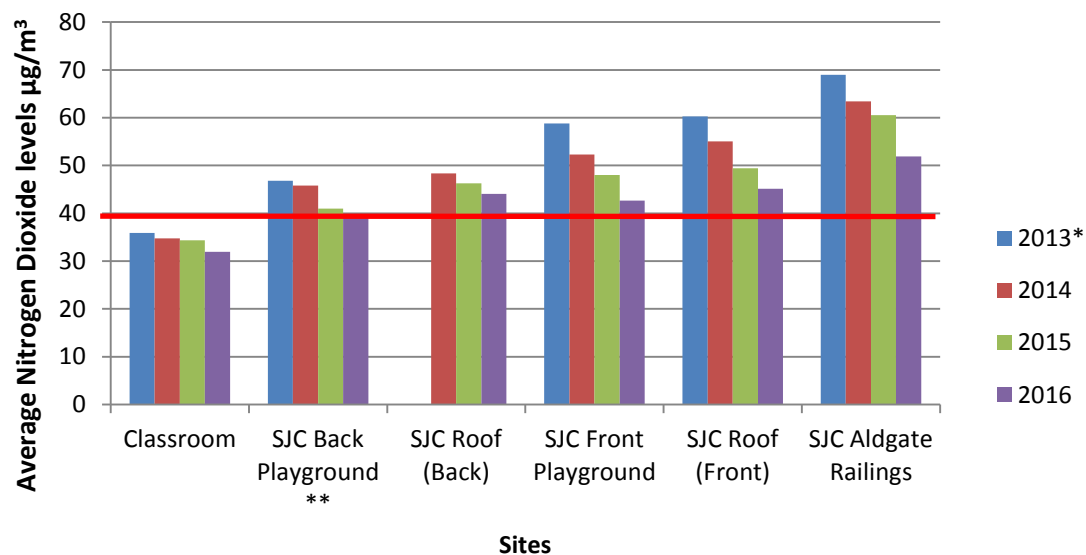
**Annual average NO<sub>2</sub> Concentrations from diffusion tube sites 2010- 2016**



Additional NO<sub>2</sub> diffusion tube monitoring has been conducted since 2013 at the Sir John Cass Foundation Primary School and is included below together with other diffusion tube monitoring which has a full year for 2016. The results at Sir John Cass are showing a steady decline across all areas of the school; in particular the roadside site (Aldgate Railings) has decreased considerably as a result of traffic changes on Aldgate.

### Sir John Cass School - 2013-2016 Average NO<sub>2</sub> (µg/m<sup>3</sup>)

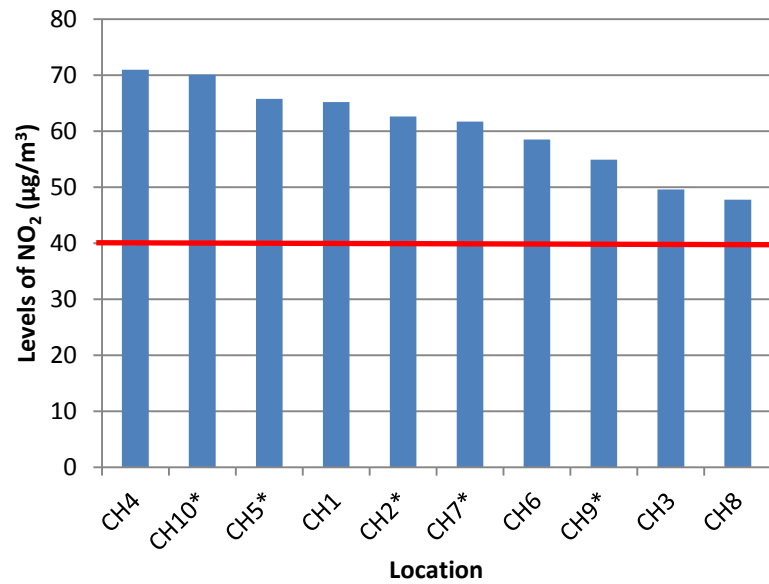
(\* annualised / \*\* average of multiple tubes since 2014)



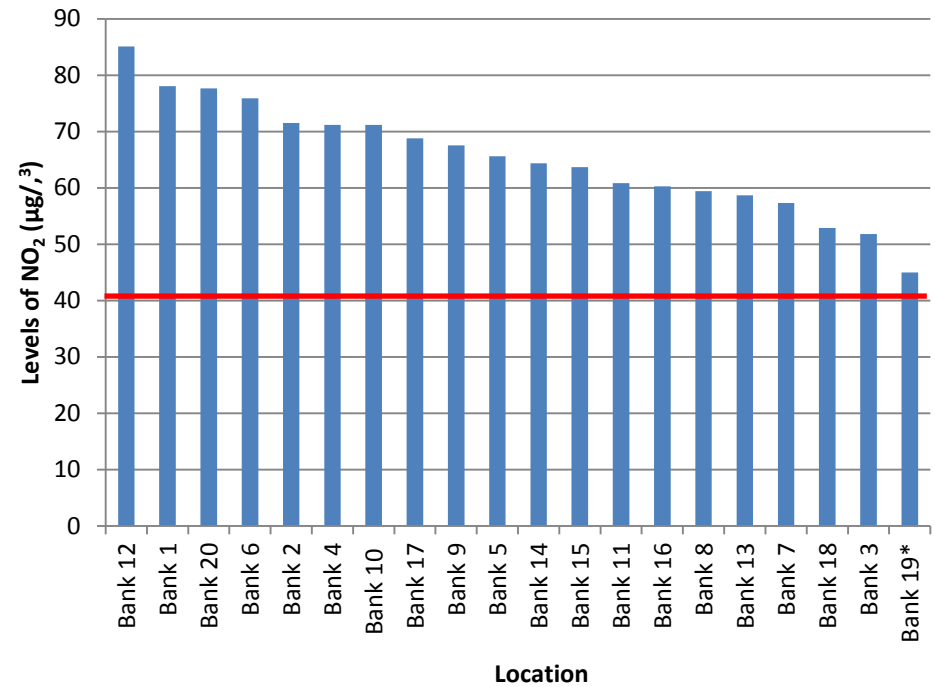


The Cheapside Business Alliance is conducting monitoring to inform their businesses of pollution levels in the BID area; the tube changes are conducted by the BID Ambassadors. The Bank Area monitoring is being conducted as a baseline to look at differences when the Bank junction changes happen. All sites are above the AQO and the monitoring will continue in order to demonstrate trends and to consider the impact of changes in the area.

**Levels of NO<sub>2</sub> Around Cheapside in 2016 (\*annualised)**



**Levels of NO<sub>2</sub> in the Bank area in 2016 (\*annualised)**



**Table F. NO<sub>2</sub> Automatic Monitor Results: Comparison with 1-hour Mean Objective**

Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2016 % <sup>b</sup>	Number of Hourly Means > 200 µgm <sup>-3</sup>						
			2010 <sup>c</sup>	2011 <sup>c</sup>	2012 <sup>c</sup>	2013 <sup>c</sup>	2014 <sup>c</sup>	2015 <sup>c</sup>	2016 <sup>c</sup>
CT3 (John Cass)	n/a	99	3	0	0	0	0	0	0
CT4 (Beech St)	n/a	99	<b>134</b>	<b>42</b>	<b>176</b>	<b>125</b>	<b>175</b>	<b>212</b>	<b>144</b>
CT 6 (Walbrook)	n/a	97	<b>641</b>	<b>231**</b>	<b>483</b>	<b>771</b>	<b>656</b>	<b>203</b>	<b>145</b>

Notes: Exceedance of the NO<sub>2</sub> short term AQO of 200 µgm<sup>-3</sup> over the permitted 18 days per year are shown in **bold**.

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

<sup>b</sup> 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%)

<sup>c</sup> Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

\*\* 74% data capture annualised, see appendix

### **Narrative on the 7 Year Trend**

Both roadside sites have exceeded the hourly AQO to varying degrees over the past 7 years and continue to exceed; the background site has not exceeded the hourly AQO since 2010.

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

Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2016 % <sup>b</sup>	Annual Mean Concentration ( $\mu\text{g m}^{-3}$ )						
			2010 <sup>c</sup>	2011 <sup>c</sup>	2012 <sup>c</sup>	2013 <sup>c</sup>	2014 <sup>c</sup>	2015 <sup>c</sup>	2016 <sup>c</sup>
CT3 (John Cass)	n/a	99	18	21	19	22	20	23	24
CT4 (Beech St)	n/a	98	30	29	28	32	25	28	25
Ct8 (Upper Thames St)	n/a	97	37	37	34	39	34	<b>41</b>	35

Notes: Exceedance of the PM<sub>10</sub> annual mean AQO of 40  $\mu\text{g m}^{-3}$  are shown in **bold**.

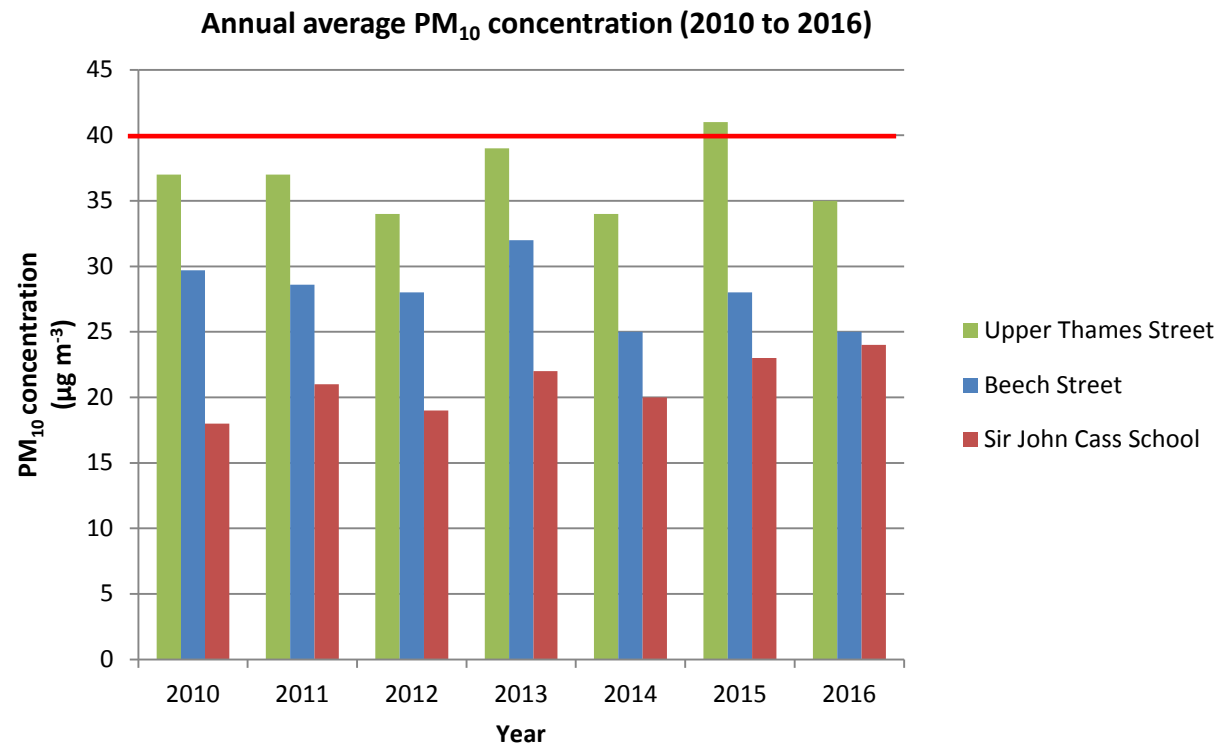
<sup>a</sup> data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

<sup>b</sup> 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%)

<sup>c</sup> Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

### Narrative on the 7 Year Trend

The annual PM<sub>10</sub> levels across the City's monitoring network have been below the AQO except in 2015, when it is thought that the exceedences related to local activity from a deconstruction site and Cycle Super Highway work which were both in close proximity to the analyser.



**Table H. PM<sub>10</sub> Automatic Monitor Results: Comparison with 24-Hour Mean Objective**

Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2016 % <sup>b</sup>	Number of Daily Means > 50 µg m <sup>-3</sup>						
			2010 <sup>c</sup>	2011 <sup>c</sup>	2012 <sup>c</sup>	2013 <sup>c</sup>	2014 <sup>c</sup>	2015 <sup>c</sup>	2016 <sup>c</sup>
CT3 (John Cass)	n/a	99	2	14	9	8	5	3	11
CT4 (Beech St)	n/a	98	26	<b>35</b>	<b>42</b>	<b>35</b>	19	17 (41)	16
CT8 (Upper Thames St)	n/a	97	<b>55</b>	<b>47</b>	<b>43</b>	<b>51</b>	25	<b>72</b>	<b>45</b>

Notes: Exceedance of the PM<sub>10</sub> short term AQO of 50 µg m<sup>-3</sup> over the permitted 35 days per year or where the 90.4th percentile exceeds 50 µg m<sup>-3</sup> 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.

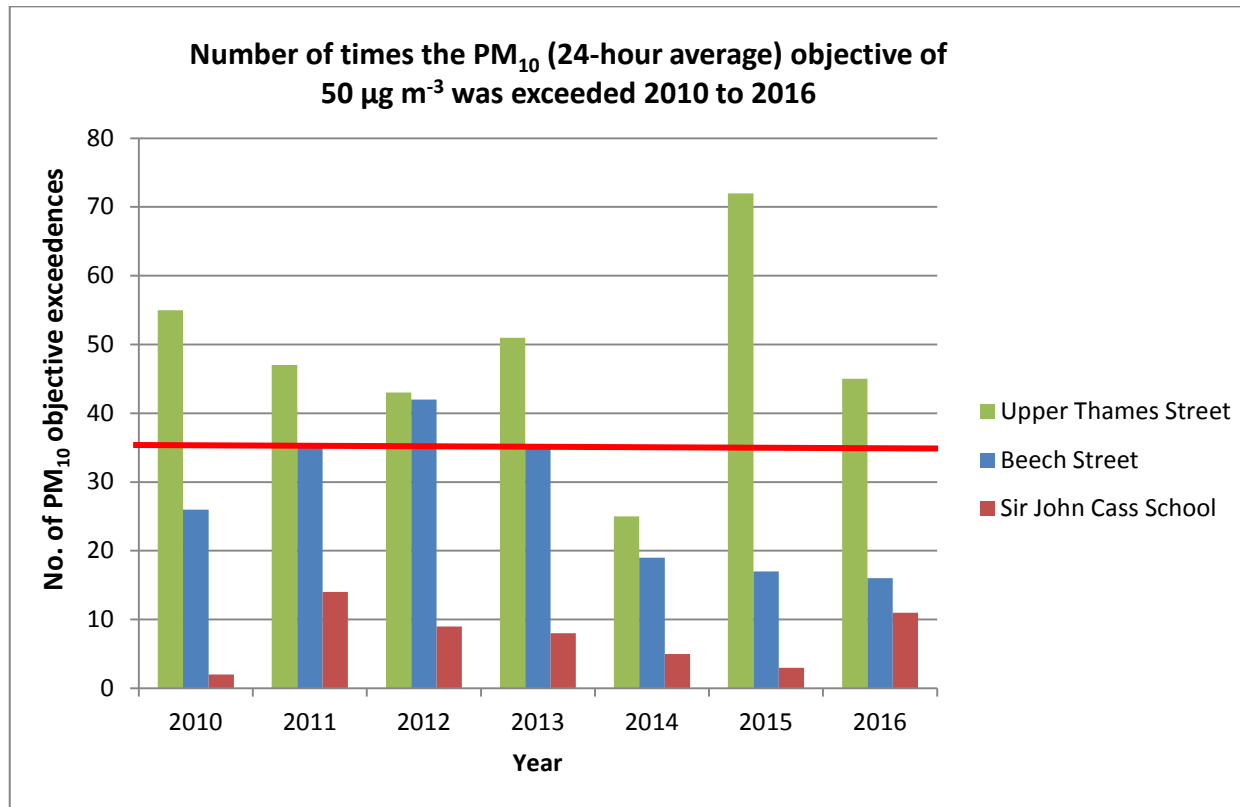
<sup>a</sup> data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

<sup>b</sup> 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%)

<sup>c</sup> Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

### Narrative on the 7 Year Trend

The background site at Sir John Cass (CT3) has not exceeded the short term AQO of  $50\mu\text{g m}^{-3}$  over the past 7 years. It is thought that the increase in exceedences in 2016 could relate to the construction activity around the school. Upper Thames Street has exceeded it in all years (except 2014). The highest number of exceedences recorded at Upper Thames Street was in 2015 and are thought to relate a to local activity from a deconstruction site and Cycle Super Highway work which were both in close proximity to the analyser. Regular tunnel washing started in Beech Street in 2014 and is believed to have contributed to a reduction in the number of exceedences at this location.



**Table I. Annual Mean PM<sub>2.5</sub> Automatic Monitoring Results (µg m<sup>-3</sup>)**

Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2016 % <sup>b</sup>	Annual Mean Concentration (µgm <sup>-3</sup> )					
			2011 <sup>c</sup>	2012 <sup>c</sup>	2013 <sup>c</sup>	2014 <sup>c</sup>	2015	2016 <sup>c</sup>
CT2 Farringdon	91	41	<b>29</b>	<b>30</b>	<b>27</b>	<b>26</b>	22/17**	16**
CT3 (John Cass)	n/a	87	no monitoring					15

Notes:

**\*\*January-August 2015 (non-reference equivalent) / August-October 2015 (reference equivalent) site closed after October 2015 and relocated in July 2016**

Exceedance of the PM<sub>2.5</sub> annual mean AQO of 25 µgm<sup>-3</sup> are shown in **bold**.

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

<sup>b</sup> 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%)

<sup>c</sup> Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

### **Narrative on the 7 Year Trend**

The kerbside site at Farringdon exceeded the annual mean Air Quality Standard in all years prior to 2015. A new EU reference equivalent BAM was installed in August 2015, but was taken offline in October 2015 due to the Cycle Super Highway Works; therefore data capture is reduced for 2015 (and 2016) and two values are provided to separate the data for two monitoring methods; the 2015 data has not been annualised due to the number of changes at this site. The reference equivalent BAM was re-installed in July 2016 in a slightly changed location, approximately 30m north of the Junction, still kerbside. The annualised figure is below the standard. The late installation is why there is reduced data capture in this year. The annual mean at Sir John Cass School is below the standard.

## 2. Action to Improve Air Quality

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

Theme	Criteria	Achieved (Y/N)	Evidence
<b>1. Political leadership</b>	<b>1.a</b>	Y	Letter of commitment to Mayor of London 23rd April 2013 signed by chairman of PHES Committee
	<b>1.b</b>	Y	<p>The City of London Air Quality Strategy 2015 – 2020 is available at <a href="http://www.cityoflondon.gov.uk/air">www.cityoflondon.gov.uk/air</a>. The strategy contains an action plan which is updated every year.</p> <p>The strategy has been incorporated into the LIP, which was published in December 2011. It contains eight key transport objectives, two are relevant to improving air quality:</p> <p>LIP 2011.1: To reduce the pollution of air, water and soils and excessive noise and vibration caused by transport in the City.</p> <p>LIP 2011.4: To reduce the adverse effects of transport in the City on health, particularly health impacts related to poor air quality and excessive noise and the contribution that travel choices can make to sedentary lifestyles</p> <p>Air quality has been incorporated into the Core Strategy as CS15: .....’Requiring development to positively address: local air quality, particularly nitrogen dioxide and particulates (PM<sub>10</sub>) the City’s Air Quality Management Area pollutants’.</p>



<b>2. Taking action</b>	<b>2.a</b>	Taken decisive action to address air pollution, especially where human exposure and vulnerability (e.g. schools, older people, hospitals etc) is highest.	Y	<p>The City Corporation is implementing a Low Emission Neighbourhood (LEN) in the Barbican and Golden Lane area. This zone includes the City's largest residential area, the Guildhall School of Music and drama, the City of London School for Girls and extends out to Barts hospital.</p> <p>The LEN was launched at a well-attended event in January 2017. Detailed air quality monitoring is underway in the area.</p> <p>The City Corporation is continuing to support Bart Health NHS Trust to deliver air quality improvements. This included speaking to ambulance drivers about engine idling at Barts Sustainability day.</p> <p>Focused action around Sir John Cass school has led to improvements in air quality with annual average nitrogen dioxide levels in the playground and around the school decreasing over recent years. There are ongoing actions at the school associated with air filtration and greening.</p>
	<b>2.b</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	<p>Focussed business engagement in the LEN area has commenced. Businesses are being encouraged to commit to actions to reduce their impact on local air pollution. A series of workshops for businesses is planned for 2017 and 2018.</p> <p>The City held monthly no idling engine action days in 2016 and is the lead authority for the MAQF London wide project which will enter its second year in April 2017. City staff, businesses and residents have been trained to take part in the action days. Several A-boards advising drivers to switch off when parked have been placed in problem areas in the City. Permanent no idling road signs have been placed in 16 streets.</p> <p>Civil Enforcement officers have been trained to speak to drivers about engine idling and write to companies whose drivers are found with engines idling. The number of vehicles found idling in the City while parked has reduced significantly since the action days and associated activity commenced.</p>

	<b>2.c</b>	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	<p>Alterations to Aldgate Gyratory are now complete and local monitoring data has revealed a reduction in concentrations of nitrogen dioxide at Sir John Cass School</p> <p>Changes to Bank Interchange will take place Spring 2017. Air quality has been measured for over a year at 20 locations to provide a baseline. The City Corporation will continue to monitor air quality in the area to assess the impact both at Bank junction itself and further afield</p> <p>The City Corporation is investigating options for introducing electric charging points for taxis at taxi rest bays and looking at options for zero emission taxi ranks. The City is also looking at the feasibility of making Beech Street a 'Zero Emission' street to encourage taxi drivers to move over to the new zero emission capable vehicles. There are plans for the City of London Lord Mayor to pilot one of the new zero emission capable taxis.</p> <p>The City Corporation is looking into options for reducing congestion in the Square Mile.</p> <p>The 2016 traffic count data has revealed a drop in all types of motorised traffic in the City from previous years. The number of motorised vehicles counted in 2016 was 24% less than in 2015.</p>
	<b>2.d</b>	Made additional resources available to improve local air quality, including by pooling its collective resources (s106 funding, LIPs, parking revenue, etc).	Y	LIP funding for 2016/ 17, 2017/18 and 2018/19 of £100,000 each year has been allocated to support implementation of a Low Emission Neighbourhood.
<b>3. Leading by example</b>	<b>3.a</b>	Invested sufficient resources to complement and drive action from others.	Y	<p>A new air quality team was established in September 2016 to reflect the priority placed on improving air quality by the City of London Corporation.</p> <p>An air quality policy group and air quality operational group was also established with representatives from Transport and Urban Realm to drive action across departments.</p> <p>There is significant cross departmental support for air quality policy at the City Corporation.</p>

<b>3.b</b>	Maintained an appropriate monitoring network so that air quality impacts within the borough can be properly understood	Y	<p>The City Corporation continues to run an effective monitoring network. Data is made available to the public on the <a href="#">London Air Website</a></p> <p>The City Corporation runs 3 x continuous NOx analysers, 2 x TEOMs and 2 x BAMs measuring particulates. An additional PM2.5 BAM analyser was installed in Sir John Cass School playground in January 2016.</p> <p>The City supports the automatic network with 47 diffusion tubes, an Osiris particle monitor and 2 x AQ mesh</p> <p>The City is also supporting businesses in the Low Emission Neighbourhood to undertake air quality monitoring outside their premises.</p> <p>The City hired an electric air quality monitoring vehicle to drive around the Square Mile over the course of five days to establish the location of air pollution hot spots.</p>
<b>3.c</b>	Reduced emissions from council operations, including from buildings, vehicles and all activities.	Y	<p>Significant emission savings have already been implemented to reduce emissions from the corporate fleet including a decision not to purchase any more diesel vehicles unless there are no viable alternatives.</p> <p>The Energy Savings Trust completed a review of the City Corporation fleet and City Police fleet in January 2017. This was with a view to identifying further opportunities for the purchase of zero and ultra-low emission vehicles.</p>
<b>3.d</b>	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	<p>The City of London Procurement Code requires officers and contractors to:</p> <p>‘observe and adhere to <i>The City Air Quality Strategy 2015 – 2020</i> standards to reduce the impact on local air quality for major contracts namely £100,000 and above for supplies and services or £400,000 and above for works’.</p>

<b>4. Using the planning system</b>	<b>4.a</b>	Fully implemented the Mayor's policies relating to air quality neutral, combined heat and power and biomass.	Y	All approved planning applications must meet the Mayor's requirements relating to AQ neutral and CHPs. See main body of this report for details.  Planning officers all received training on air quality requirements in early 2017.
	<b>4.b</b>	Collected s106 from new developments to ensure air quality neutral development, <i>where possible</i> .	Y	All new major developments have been considered to be air quality neutral to date so no additional S106 has been made available.
	<b>4.c</b>	Provided additional enforcement of construction and demolition guidance, with regular checks on medium and high risk building sites.	Y	A detailed audit has been undertaken of 10 major construction and demolition sites and a report produced with recommendations for minimising emissions further from construction and demolition in the Square Mile.  Other City sites have also been audited as part of the joint Mayors Air Quality Fund Project coordinated by the London Borough of Merton.  The 8th edition of the Code of Practice has been published for consultation. It reflects ongoing best practice in the industry.
<b>5. Integrating air quality into the public health system</b>	<b>5</b>	Included air quality in the borough's Health and Wellbeing Strategy and/or the Joint Strategic Needs Assessment.	Y	The City Corporation Health and Wellbeing Strategy includes air quality as a key theme and can be found at <a href="https://www.cityoflondon.gov.uk/services/health-and-wellbeing/Pages/about-us.aspx">https://www.cityoflondon.gov.uk/services/health-and-wellbeing/Pages/about-us.aspx</a>  The specific objective around air quality is to:  <i>Oversee the implementation of the air quality strategy and support the implementation of Low Emission Neighbourhoods.</i>  Recommendations made to the City Health and Wellbeing Board on how it could support the City air quality agenda is detailed as a case study in the March 2017 publication by Defra and PHE : Air Quality – A Briefing for Directors of Public Health

<b>6. Informing the public</b>	<b>6.a</b>	Raised awareness about air quality locally.	Y	<p>Version 2 of the free CityAir smart phone app was released in November 2016. The relative amounts of pollution on three routes are available so the user can make a more informed judgement about which route to take.</p> <p>Newsletters have appeared in Healthwatch and City Resident advising readers of how to reduce exposure to air quality</p> <p>The idling engines programme continues to receive wide spread media coverage</p> <p>Recruitment is underway for a temporary post to support air quality communications within the Air Quality Team.</p>
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## 2.1 Air Quality Action Plan Progress

Table K provides a brief summary of the City of London Corporation progress against the Air Quality Action Plan, showing progress made this year. New projects which commenced in 2016 are shown at the bottom of the table.

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

<b>Policy</b>	<b>Action</b>	<b>Progress</b>	<b>Further information</b>
<b>1. Air quality monitoring</b>	An annual report of air quality data will be published and placed on the City Corporation web site.	The 2015 Annual Summary Status Report public facing document is on the <a href="#">City website</a> .	
	Current data from air quality monitors will be made available to the public on the London Air Quality Network web site.	Data from all continuous analysers is available on the <a href="#">London Air Quality Network web site</a>	
	Air quality data will be used to generate pollution alerts and messages via the CityAir Smart Phone App and the CityAir App web site	Version 2 of the CityAir App was released in November 2016. The relative amounts of pollution on 3 routes are available so the user can make a more informed judgement about which route to take.	

Policy	Action	Progress	Further information
	The air quality monitoring requirements of the City will be reviewed annually.	<p>The monitoring needs of the City are constantly reviewed. There are now 47 diffusion tubes measuring nitrogen dioxide. Business engagement will lead to more monitoring as local businesses get involved.</p> <p>The City supports residents and workers to measure pollution on various routes that they take by loaning personal exposure monitoring equipment and analysing and returning the data to the user.</p>	
<b>2. Political influence and commitment</b>	The City Corporation will explore further options for joint action with politicians in neighbouring authorities.	<p>The City Corporation led a joint study into the potential air quality impacts of Demand Side Response by using standby diesel generators, with the City of Westminster.</p> <p>The City Corporation led a London wide behaviour change project to reduce the amount of unnecessary engine idling.</p> <p>The City Corporation is part of London Councils' 'Task &amp; Finish' Group to support its response in influencing the Mayor of London's forthcoming Environment Strategy.</p> <p>A representative from the City Corporation is on the newly established CIEH Air Quality Expert Panel.</p>	
	The City Corporation will continue to place air quality as an important political priority and support local and London-wide action through its Supporting London Group, Port Health and Environmental Service Committee and Health and Wellbeing Board.	<p>A detailed report was presented to the Audit and Risk Management Committee on work underway to improve air quality in the Square Mile. Progress with specific actions is being monitored.</p> <p>A new air quality policy board and separate air quality operational group with Transport Planning and Urban Realm has been established to oversee and implement some aspects of the work.</p>	
	The City Corporation will consider options for using local legislation to help improve local air quality	<p>No specific local legislation is planned at present as there is a call for a new national Clean Air Act. The City Corporation is part of a working group to support this.</p> <p>Officers are working with the Office for Low Emission Vehicles &amp; Department for Transport on the proposals to develop the first zero emissions street in the UK in Beech Street.</p>	

Policy	Action	Progress	Further information
	The City Corporation will make resources available through Community Infrastructure Levy, Section 106 and Local Implementation Plan funding to improve local air quality.	£100,000 LIP funding and S106 funding has been made available to support the implementation of a Low Emission Neighbourhood in the Barbican / Golden Lane area.	
	The City Corporation will ensure that all relevant Corporate strategies and polices will reflect the importance of improving local air quality and reducing exposure.	A draft air quality Supplementary Planning Document has been produced and the final version is expected in May 2017. The SPD provides further detail on Local Plan Air Quality Policies and supporting strategies. City Corporation Area Strategies reflect the aim of improving public health by reducing exposure to pollution. The City Freight Strategy also incorporates objectives to improve air quality.	
<b>3. Working with the Mayor of London</b>	The City Corporation will continue to liaise with Greater London Authority and Transport for London over additional action to reduce emissions from buses and taxis.	Feasibility, site surveys & trial holes for rapid charge points for taxis has been undertaken. The Transport for London framework contract is due to be launched in Spring 2017. Charge points should be installed from Summer 2017 onwards.	
	The City Corporation will consider options for supporting the adoption of zero emission capable taxis across London	The City Corporation has approached London Taxi Company and offered to host or sponsor trials for zero emission capable (ZEC) taxis in the City of London. The City Corporation is assessing the potential for introducing new ZEC only taxi ranks. A feasibility study to make Beech Street a zero emission street is underway which would be a huge incentive for ZEC taxis.	

Policy	Action	Progress	Further information
	<p>The City Corporation will apply for further funding from the Mayor's Air Quality Fund as the opportunity arises.</p>	<p>The MAQF idling engine behaviour change campaign involves 12 local authorities see the <a href="#">Vehicle Idling Website</a></p> <p>The City Corporation is part of the London Low Emissions Construction Partnership project and Non Road Mobile Machinery compliance checking project.</p> <p>The MAQF project to look at the impact of using standby generators for demand side response is complete.</p> <p>Unsuccessful applications were made for Defra air quality grant to support the transition to electric and hybrid fleet for the City Corporation and City Police fleets and to develop a cost effective mechanism for assessing if vehicles are operation in zero emission mode.</p>	
	<p>The City Corporation will support the GLA with the introduction of the Ultra-Low Emission Zone.</p>	<p>The City Corporation has provided written responses to the Mayor's first two consultations on the emission surcharge and proposed changes to the ULEZ and is supportive of both.</p> <p>A further response will be sent for the next phase of the consultation due in Spring 2017.</p>	
	<p>The City Corporation will define local air quality focus areas, to complement the GLA air quality focus areas, and develop specific plans to improve air quality and reduce exposure in these areas</p>	<p>Focussed action around Barts hospital, Sir John Cass School and the City residential estates has led to a reduction in levels of air pollution at all locations. Further focus areas have been defined and plans will be developed to improve air quality in these areas.</p> <p>The City hired an electric air quality monitoring vehicle to drive around the Square Mile over the course of five days to establish the location of air pollution hot spots to inform the location of future focus areas</p>	
	<p>Once the implications on air quality of the Mayor of London's key proposals are known, the City Corporation will model air quality to 2020 to establish what additional action is required to meet the air quality limit values across the Square Mile.</p>	<p>Further modelling of different traffic management scenarios is being undertaken for the Low Emission Neighbourhood area and additional modelling will be carried out once the Mayor of London's major plans for the ULEZ have been confirmed.</p>	



Policy	Action	Progress	Further information
	The City Corporation will aim to become a Mayor of London designated Clean Air Borough as soon as possible.	The City Corporation was awarded Clean Air Borough status in 2016 and will ensure that sufficient local action is taken to maintain this status.	
<b>4. Working with other external organisations</b>	The City Corporation will continue to engage with businesses in the Square Mile under the CityAir programme. This will commence with businesses in the Barbican area with the support of local residents involved in the Citizen Science air quality monitoring programme.	Detailed business engagement has commenced with the business community in the Low Emission Neighbourhood. The City Corporation continues to work with the Cheapside Business Alliance on air quality.	
	The City Corporation will work with businesses in the Cheapside Business Improvement District to raise the profile of air quality and obtain support for action to reduce emissions associated with their activities.	The City Corporation works with the Cheapside Business Alliance to monitor air quality at 10 locations in the area; deal with unnecessary engine idling; support greening proposals; low emission deliveries and servicing and provide cargo bikes. The City also supported the development of low pollution walking routes.	
	The City Corporation will work with major City businesses to consider options for phasing out standby generators that run solely on diesel.	This will be carried out through the business engagement project in the Low Emission Neighbourhood	
	The City Corporation will continue to provide the Chair for the London Air Quality Steering Group and work with neighbouring boroughs as part of the Central London Air Quality Cluster Group.	This is an on-going action. All meetings take place at the City Corporation offices. The City Corporation is a member of London Councils' Task & Finish Group to support its response in influencing the Mayor of London's forthcoming Environment Strategy.	

Policy	Action	Progress	Further information
	The City Corporation will look for opportunities to support research into solutions for improving air quality and reducing exposure	As part of the Low Emission Neighbourhood, the City Corporation is planning to work with the Barbican Centre to use artwork to raise awareness of air pollution and exposure. The City Corporation has also facilitated engagement between City of London School for Girls and Kings College London to further understand the toxicology and effects of air pollution on health. An application has been made for funding to support research into the way that air quality in the City varies at a micro scale.	
	The City Corporation will further develop work with Bart's Health NHS Trust to reduce the impact of the trust on local air quality and raise awareness among vulnerable patients.	The three year engagement project with Barts Health NHS Trust ended in March 2016. Barts hospital is actively supporting the City Corporation no idling action days and the City Corporation has offered to support Barts in reducing their servicing and deliveries and fleet movements, and help them shift to zero emission capable vehicles.	
<b>5. Reducing emissions from transport</b>	The City Corporation will continue to support measures to encourage safe cycling in the Square Mile.	The new 'Quietway' route through the City is being launched in Spring 2017. Air quality will be promoted at the launch event.	
	The City Corporation will continue to enforce its policy of no unnecessary vehicle engine idling in the Square Mile and erect street signs in areas of concern.	The City held monthly no idling engine action days in 2016 and is the lead authority for the MAQF London wide project which will enter its second year in April 2017. City staff, businesses and residents have been trained to take part in the action days. Several A-boards advising drivers to switch off when parked have been placed in problem areas in the City. 16 permanent road signs have also been placed in hotspot areas. Civil Enforcement officers speak to drivers about engine idling and write to companies whose drivers are found with engines idling. The number of vehicles found idling in the City while parked has reduced significantly since this coordinated action commenced.	

Policy	Action	Progress	Further information
	<p>The City Corporation will encourage and implement measures that will lead to reduction in emissions from taxis, where practical. This will include support for the introduction of zero emission capable taxis in central London.</p>	<p>The City Corporation is investigating options for introducing electric charging points for taxis at taxi rest bays and looking at options for zero emission taxi ranks.</p> <p>The City is also looking at the feasibility of making Beech Street a 'Zero Emission' street to encourage taxi drivers to move over to the new zero emission capable vehicles.</p> <p>There are plans for the Lord Mayor to pilot one of the new zero emission capable taxis.</p>	
	<p>The City Corporation will look for opportunities to reduce the impact of freight distribution on air quality across central London and specifically work with businesses and the construction and demolition industry to identify opportunities for a reduction in vehicle movements, freight consolidation, zero-emission and low emission last mile deliveries</p>	<p>Delivery and Servicing Plan case studies being developed for several sites in the Low Emission Neighbourhood including the Guildhall and Barbican Centre.</p> <p>A newly established Freight team is working on:</p> <ul style="list-style-type: none"> <li>• the use of City Corporation property to establish a new consolidation centre; options for establishing micro-consolidation centres in the City;</li> <li>• special servicing and delivery measures for the Eastern Cluster;</li> <li>• establishing best practice in relation to existing City businesses using consolidation and 'non-peak time' servicing;</li> <li>• establishing a City Freight Forum of City stakeholders;</li> <li>• new planning guidance;</li> <li>• promotional campaigning including events for City firms;</li> <li>• options for re-timing of deliveries and servicing in parts of the City</li> </ul>	

Policy	Action	Progress	Further information
	The City Corporation will ensure that proposed changes to road schemes will be assessed for impact on local air quality.	Bank junction interim scheme will commence Spring 2017. Baseline air quality monitoring has been undertaken and will continue for at least another year to measure the impact. The City Corporation is also measuring the impact of timed closure on air quality. Areas of timed closure fall below the annual average target of 40µg/m <sup>3</sup> NO <sub>2</sub>	
	Options for implementing measures to significantly reduce the impact on pedestrians of air pollution in Beech Street will be considered in the Barbican Area Strategy Review.	A feasibility study is being undertaken into the options for significantly reducing the concentrations of nitrogen dioxide in Beech Street as part of the Mayor of London funded Low Emission Neighbourhood.	
<b>6. Reducing emissions from new developments</b>	Through the City of London Local Plan, developments that would result in deterioration of the City's nitrogen dioxide or PM <sub>10</sub> levels will be resisted. The City Corporation will require an air quality assessment for developments adjacent to sensitive premises such as residential properties, Doctors' surgeries, schools and St. Bartholomew's Hospital.	This is an on-going action which has been effective to date. Data for planning applications is provided in this report.	
	The City Corporation will discourage the use of biomass and biofuels as a form of energy in new developments	This is an on-going action which has been effective to date.	
	All gas boilers in commercial developments are required to have a NOx rating of <40mgNOx/kWh.	This is adhered to in all new developments. Details are provided in section 3	

Policy	Action	Progress	Further information
	NOx emissions from combined heat and power (CHP) plant will be required to meet the emission limits in the GLA document 'Biomass and CHP emission standards' March 2013.	NOx emissions from combined heat and power (CHP) plant are now required to meet the emission limits in the GLA document 'Biomass and CHP emission standards' March 2013. This is an on-going action that is adhered to. A system has been set up to record the number of CHP plant subject to GLA emissions limits and/or other restrictions to reduce emissions and the data is available in section 3.	
	All new developments with > 1000m <sup>2</sup> floor space or >10 residential units will need to demonstrate that they are air quality neutral in line with the requirements of London Plan Policy 7.14. If the development is not air quality neutral, off-setting will be required. Guidance will be produced outlining suitable options for offsetting in the Square Mile.	All air quality neutral assessments to date have revealed that the developments are air quality neutral. The number of air quality neutral assessments submitted is available in section 3.	
	The City Corporation will ensure that all boilers, generators and CHP plant are installed to ensure minimal impact on local air quality.	Planning conditions have been developed which ensure that all combustion plant terminate above roof level and meet the Mayor of London's Sustainable Design and Construction SPG emission limits	
	The City Corporation will develop a policy on the use of standby generators for generating energy other than when electricity supplies are interrupted.	The City Corporation has completed an assessment of the potential impact of using standby generators for short term operating reserve and Triad management and will be working with relevant stakeholders such as the Mayor of London and Defra to formulate policy to minimise the impact on local air quality.	
	The City Corporation will work with the construction and demolition industry to identify further opportunities of reducing emissions associated with building development.	On behalf of the City of London, Sir Robert McAlpine has conducted ten air quality compliance audits with reference to the City of London's Code of Practice for Deconstruction and Construction. SRM produced a report which considers barriers to compliance with the Code and includes best practice recommendations. The report also contains a review of new technologies to reduce the air quality footprint of construction and deconstruction sites.	

Policy	Action	Progress	Further information
	The City Corporation will update its best practice guide on minimising emissions from construction and demolition regularly in order to reflect best practice. All companies employed in demolition, construction and street works that work in the Square Mile will be required to adhere to it	The 8th edition of the Code of Practice has been published for consultation. It reflects ongoing best practice in the industry.	
<b>7. Leading by example</b>	The City Corporation will continue to look for opportunities for reducing emissions from its buildings, fleet and contractors' fleet.	The City Corporation applied for a Defra air quality grant to support the transition of City and Police vehicles to zero emission and zero emission capable. The application was unsuccessful. The Energy Savings Trust has completed an assessment of the City fleet with recommendations for reducing emissions including vehicles suitable for zero emission alternatives The City Police are considering options to trial photovoltaic cells on the roof of vehicles to reduce the need for engine idling to charge essential equipment	
	The City Corporation will ensure that major contracts include standards to reduce the impact on local air quality.	The City of London Procurement Code requires Officers and contractors to: 'observe and adhere to <i>The City Air Quality Strategy 2015 – 2020</i> standards to reduce the impact on local air quality for major contracts namely £100,000 and above for supplies and services or £400,000 and above for works'.	
	A pro forma air quality questionnaire will be developed for use in major policy reviews.	This is not yet complete and is programmed for 2017/18	
	The City Corporation will move away from using diesel in its own fleet wherever practical.	The City Corporation has adopted a policy of not purchasing any more diesel vehicles unless there are no viable alternatives.	

Policy	Action	Progress	Further information
<b>8. Recognising and rewarding good practice</b>	The City Corporation will continue to run an annual Sustainable City Award for air quality.	This award has now changed due to staffing changes at the City and is now coordinated by the London Sustainability Exchange. The award categories have been refined and there is no longer a specific air quality award. The awards are for Health and Wellbeing, Innovative Technology, Innovative Spaces and Sustainable Transport which all incorporate an air quality element. The Air Quality Manager at the City Corporation was a judge for the National Air Quality Awards in 2016 and was part of a working group to establish a national challenge prize for innovation.	
	The City Corporation will continue with its annual Considerate Contractors' Environment Award to encourage best practice and innovation in the industry.	The next awards will take place in May 2017	
<b>9. Raising awareness</b>	The City Corporation will continue to work with schools to provide information on how to reduce the impact of air pollution on children's health.	Sir John Cass Primary School continues to receive alerts from Kings College when pollution is predicted to be moderate or above. The school also receive periodic 'Air Quality Reports' for discussion and review at Governors meetings. The reports contain air quality monitoring data and trends together with information relating to air quality episodes across London. Assessments have been made for a new air conditioning system in the classroom for the nursery age children to protect them from air pollution. The installation will be funded by S106.	
	The City Corporation will source funding for further greening at Sir John Cass primary school.	The City has sourced funding to pay for the gardener to maintain and improve existing greening.	
	The City Corporation will continue to work with residents in the Square Mile to raise awareness of air quality	The City Corporation is working with residents as part of the Barbican Low Emission Neighbourhood. This includes the development of case studies with residents to understand what the impact on their health has been.	

Policy	Action	Progress	Further information
	The City Corporation will develop a general communications strategy to inform people of action they can take to reduce exposure to air pollution.	An overall communications strategy and a communications strategy for the LEN has been completed.	
	The City Corporation will continue to support City businesses at events to raise the profile of air quality and provide information for reducing exposure.	The City Corporation continues to support events organised by City businesses. Training has been provided for the team that manage the Clean City Awards so they can raise air quality and ways in which businesses can assist in their meetings. Air quality is also a feature of the newly established Active City Business Network.	
	The City Corporation will continue to promote and develop the CityAir Smart Phone App with and CityAirApp.com web site.	Version 2 of the CityAir App was released in November 2016. The relative amounts of pollution on three routes are available so the user can make a more informed judgement about which route to take. There are over 20,000 users of the app.	
<b>10. Air quality and public health</b>	The City Corporation will identify exposure hotspots with high footfall and high concentrations.	This has been complete and the map available with pedestrian numbers overlaying annual average nitrogen dioxide for 2015	
	The City of London will ensure that measures implemented to reduce emissions of NO <sub>2</sub> and PM <sub>10</sub> will also lead to a reduction in emissions of PM <sub>2.5</sub> .	All policies are assessed for impact on PM <sub>2.5</sub> emissions in addition to PM <sub>10</sub> and NO <sub>x</sub>	
	The City of London will continue to explore ways to reduce exposure of the population to air pollution.	The City Corporation has developed a pedestrian model and has incorporated air quality concentration data into the model to see where most people are exposed to poor air quality. This will act as a basis for further plans for minimising exposure to air pollution. Recommendations made to the City Health and Wellbeing Board on how it could support the City air quality agenda is detailed as a case study in the March 2017 publication by Defra and PHE : Air Quality – A Briefing for Directors of Public Health	
	The City will look at ways to extend the message about poor air quality on days of high pollution.	Air quality messages have been developed to disseminate externally and internally on days of high air pollution.	



<b>Policy</b>	<b>Action</b>	<b>Progress</b>	<b>Further information</b>
	As City Corporation Area Strategies are reviewed they will be assessed for public exposure to air pollution and measures taken to reduce exposure where practical.	Air quality considerations are being embedded into the review of the Moorgate area Strategy and the work for the development of the Cultural Hub around the Barbican area.	

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

Please see commentary alongside the data presented.

**Table L. Planning requirements met by planning applications in the City of London in 2016**

Condition	Number (approximate number)
Number of planning applications reviewed for air quality impacts	<b>14</b>
Number of planning applications required to monitor for construction dust	<p><b>53 permissions</b> conditioned in 2016 to comply with Code or Practice which refers to air quality monitoring requirements.</p> <p><b>19 sites</b> known to have conducted continuous monitoring (including Crossrail sites)</p>
Number of CHPs/Biomass boilers refused on air quality grounds	<b>none</b>
Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions	<p><b>12</b> planning permissions in 2016 subject to CHP emission controls.</p>
Number of AQ Neutral building and/or transport assessments undertaken	<p><b>15</b> Air Quality Neutral assessments conducted for building emissions. As all car free developments (except one), air quality neutral assessment for transport emissions either scoped out or conducted to demonstrate compliance.</p>
Number of AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	<b>none</b>

Condition	Number (approximate number)
<p>Number of planning applications with S106 agreements including other requirements to improve air quality</p>	<p style="text-align: center;"><b>none</b></p> <p>Depending on the particular project the air quality improvements would more than likely fall under Public Realm Improvements. As we now have a CIL we cannot request S106 contributions unless it is specific to the site otherwise it could be considered as double counting.</p> <p>Since implementing the City's CIL in July 2014 the City has not been requesting developers to contribute towards separate air quality improvements. This is now captured by the City's Regulation 123 list which is a list of infrastructure to be funded by CIL. See the <a href="#">list attached</a>.</p>
<p>Number of planning applications with CIL payments that include a contribution to improve air quality</p>	<p style="text-align: center;"><b>see above</b></p>

Condition	Number (approximate number)
<p><b>NRMM: Central Activity Zone and Canary Wharf</b></p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Please include confirmation that you have checked that the development has been registered at the <a href="#">Non Road Mobile Machinery Website</a> and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy.</p>	<p>In 2016, <b>53 permissions</b> conditioned to comply with the City of London Code of Practice which includes requirement to comply with stage IIIB (but not register on website). Code revised (currently under public consultation) to require registration with GLA website.</p> <p>In 2016/2017, compliance checks conducted as part of the London MAQF project (data provided by project) and separate compliance project where 10 sites were visited:</p> <ul style="list-style-type: none"> <li>• <b>66</b> active sites in Sept 2016 as per Planning Audit.</li> <li>• <b>50</b> sites registered on website with <b>24</b> fully compliant sites</li> <li>• <b>6</b> working towards compliance (any non-compliance is generally of an administrative nature with some plant requiring upgrade/exemption/removal and problems with the website)</li> <li>• <b>20</b> sites registered on the website but have not been audited (<b>8</b> sites known to be duplicate / test registrations)</li> <li>• <b>1</b> site although compliant does not want to use website (no action possible as GLA SPG and current Code does not specifically require it)</li> <li>• With regard to other sites: <b>9</b> sites were completed before audit so are no longer required to register, approximately <b>22</b> sites not registered or need to be checked (there activity may mean they do not need to register or they may be on the register under a different name).</li> </ul>
<p><b>NRMM: Greater London (excluding Central Activity Zone and Canary Wharf)</b></p>	<p>Not applicable</p>

### **Process to support the planning reporting requirements:**

- The planning department have received a briefing to alert them to air quality matters and the GLA reporting requirements. The department forwards relevant applications to Environmental Health for review and comment. To support this, the Air Quality Team receives a weekly planning list which shows the applications which have been validated so the team are aware of relevant applications.
- Air quality neutral assessments are a pre-validation requirement for all Major applications and the draft Air Quality SPD details the air quality assessment requirements (to support the air quality assessment policy in the City Corporation's Local Plan). As air quality impact and neutral assessments are reviewed, they are logged. As a 'back-up', from April 2017, they should also be appropriately referenced on the planning portal to allow an end of year 'document search' which would show the relevant applications containing air quality assessments.
- The City of London is able to use its planning database to extract the planning applications which have had the relevant standard conditions added (this is the number reported above).
- With regard to NRMM compliance, the City of London is currently part of the MAQF NRMM compliance project. The City Corporation is currently consulting on a charging mechanism for checking compliance with its Code of Practice (which references the need for the appropriate engine standard). The charging scheme would fund officer time regarding NRMM compliance checks going forward.

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

We are currently investigating whether a new CHP installation (not subject to planning) is contributing to an increase in background levels at an urban background monitoring site.

## **Appendix A Details of Monitoring Site QA/QC**

### **A.1 Automatic Monitoring Sites**

<b>Site</b>	<b>Data Management</b>	<b>Site Serviced and Repaired by:</b>	<b>Site Audited by:</b>	<b>City of London Calibration and Maintenance</b>
CT2 (Farringdon Street)	Kings College	Enviro-Technology (biannual)	--	Filter change every 8 weeks
CT3 (Sir John Cass School)	Kings College	Enviro-Technology (biannual)	National Physics Laboratory (biannual)	Every 2 weeks and BAM filter change every 8 weeks
CT4 (Beech St NOx)	Kings College	Enviro-Technology (biannual)	National Physics Laboratory (biannual)	Every 2 weeks
CT4 (Beech St PM10)	Kings College	Enviro-Technology (biannual)	National Physics Laboratory biannual)	Filter change
CT6 (Walbrook Wharf)	Kings College	Enviro-Technology (biannual)	National Physics Laboratory (biannual)	Every two weeks
CT8 (Upper Thames Street)	Kings College	Enviro-Technology (biannual)	National Physics Laboratory (biannual)	Filter change

### **PM<sub>10</sub> Monitoring Adjustment**

PM<sub>10</sub> data from the two TEOM sites (CT4 Beech Street and CT8 Upper Thames Street) have been adjusted using the Volatile Correction Model (VCM). The BAM data at CT3 (PM<sub>10</sub>) has been corrected in line with the EU reference equivalent method by dividing by 1.211.

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

Tubes supplied by:	Gradko International Ltd, via Bureau Veritas for CL tubes and sourced directly for the other tubes.
Analysed by:	Gradko International Ltd.
Method:	50% Triethanolamine (TEA) in Acetone preparation method and analysed using U.V. Spectrophotometry.
adjustment:	The national bias adjustment factor for 2016 is 1.03 (based on 16 studies, version 2 created 03/17) as derived from the national bias adjustment calculator at: <a href="http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html">http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html</a> .  The <i>provisional</i> London Wide bias adjustment figure is 0.97 (based on 9 sites. The data is provisional because 3 of the sites require seven days of data to be ratified, but it is unlikely that this figure will change)

Gradko International Ltd is a UKAS accredited laboratory and participates in the AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO<sub>2</sub> tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO<sub>2</sub> concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance. In the latest available AIR-PT results, rounds AR012 (January to February 2016), AR013 (April to May 2016), AR015 (July to August 2016), AR016 (September to October 2016) and AR018 (January to February 2017) Gradko International Ltd have scored 100%. The percentage score reflects the results deemed to be satisfactory based upon the z-score of <math>\pm 2</math>. The latest AIR-PT results, when released are uploaded onto the [uk-air website](#).

The tube precision at Marylebone Road for the different diffusion tube suppliers is shown on the latest Diffusion Tube Bias Adjustment Factors Spreadsheet available on [uk-air website](#). The tube precision for the NO<sub>2</sub> Annual Field Inter-comparison at Marylebone Road (for the LW factor) was rated as 'Good'.

### Bias Adjustment Figures

2010	2011	2012	2013	2014	2015	2016
0.99	1.02	1.04	1	0.97	0.98	1.03

Factor from Local Co-location Studies (if available)

Triplicate co-locations were set up in 2016 at Walbrook Wharf (Roadside) and Sir John Cass Primary School (Urban background).

Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 $\mu\text{gm}^{-3}$	Tube 2 $\mu\text{gm}^{-3}$	Tube 3 $\mu\text{gm}^{-3}$	Triplicate Mean	CT3 ratified	
06/01/2016	03/02/2016	45.2	44.9	39.5	43.2	49.8	
03/02/2016	03/03/2016	35.4	34.6	36.5	35.5	45.8	
03/03/2016	30/03/2016	28.2	34.8		31.5	45.7	
30/03/2016	27/04/2016	31.9	33.9	30.6	32.1	45.0	
27/04/2016	26/05/2016	33.2	33.2	33.3	33.3	40.1	
26/05/2016	29/06/2016	33.1	31.4	34.9	33.1	32.5	
29/06/2016	27/07/2016	30.1	29.8	32.1	30.6	29.7	
27/07/2016	24/08/2016	34.2	33.3	32.0	33.2	28.7	
24/08/2016	28/09/2016	41.7	39.7	38.6	40.0	38.5	
28/09/2016	27/10/2016	41.6	40.7	38.8	40.4	39.6	
27/10/2016	30/11/2016	47.6	51.4	50.3	49.8	46.0	
30/11/2016	04/01/2017	52.2	53.3	55.1	53.5	57.6	BIAS
					<b>38.0</b>	<b>41.6</b>	<b>1.09</b>

Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 $\mu\text{gm}^{-3}$	Tube 2 $\mu\text{gm}^{-3}$	Tube 3 $\mu\text{gm}^{-3}$	Triplicate Mean	CT6 ratified	
06/01/2016	03/02/2016	80.7	87.7	81.1	83.2	75.2	
03/02/2016	03/03/2016	69.2	86.4	63.9	73.2	100.8	
03/03/2016	30/03/2016	69.0	62.4	69.5	67.0	98.0	
30/03/2016	27/04/2016	73.6	72.8	72.7	73.0	104.6	
27/04/2016	26/05/2016	91.8	77.8	77.6	82.4	90.3	
26/05/2016	29/06/2016	67.1	71.1	70.8	69.7	78.5	
29/06/2016	27/07/2016	85.0	80.4	72.9	79.4	85.0	
27/07/2016	24/08/2016	93.8	92.2	87.3	91.1	74.9	
24/08/2016	28/09/2016	91.0	99.4	91.5	94.0	102.7	
28/09/2016	27/10/2016	87.2	88.7	93.3	89.8	80.1	
27/10/2016	30/11/2016	86.5	90.8	90.5	89.2	99.4	
30/11/2016	04/01/2017	96.3	105.3	94.4	98.7	107.4	BIAS
					<b>82.5</b>	<b>91.4</b>	<b>1.11</b>

Discussion of Choice of Factor to Use

The following bias adjustment figures have been generated for 2016:

- The London Wide Environment Programme (LWEP) is: **0.97**
- National Bias factor available is: **1.03**
- Local Adjustment figure is: **1.1**

In making a decision with regard to which adjustment figure to use, reference was made to TG.06 (Box 4.10). The National bias adjustment figure incorporates the City of London triplicate exposure tubes and also provides a worst case scenario when comparing to the London adjustment figure; the National figure was therefore used.



### A.3 Adjustments to the Ratified Monitoring Data

#### Short-term to Long-term Data Adjustment

Data Adjustment was conducted for some diffusion tubes in 2016. Results are shown in Tables M. As there are many sites to be corrected, as per 4.191 of TG.16, for those sites with fewer than 9 months' worth of data, then the technique described in Box 4.9 of TG.16 was used. The Urban Background sites chosen were (Westminster – Horseferry was not used due to low data capture):

- Camden - Bloomsbury
- Kensington and Chelsea - North Kensington
- City of London – Sir John Cass School

Data adjustment was also conducted for Farringdon PM2.5 in 2016. Data adjustment was conducted for Walbrook Wharf in 2011. Results for automatic sites are shown below in Tables N.

**Table M. Short-Term to Long-Term Monitoring Data Adjustment – Diffusion Tubes**

**Table M (i) Bank 19**

Dates 2016		Camden <sub>A</sub>	Camden <sub>P</sub>	SJC <sub>A</sub>	SJC <sub>P</sub>	K&C <sub>A</sub>	K&C <sub>P</sub>	
21/12/2015	25/01/2016	50.5	50.5	47.9	47.9	37.9	37.9	43.5
25/01/2016	22/02/2016	42.8	42.8	39.3	39.3	31.8	31.8	36.8
22/02/2016	29/03/2016	50.9	50.9	48.1	48.1	39.8	39.8	44.9
29/03/2016	25/04/2016	39.5		44.0		33.2		
25/04/2016	23/05/2016	38.8		42.1		31.5		
23/05/2016	20/06/2016	37.2	37.2	32.5	32.5	26.7	26.7	45.2
20/06/2016	18/07/2016	23.4	23.4	28.1	28.1	17.2	17.2	34.0
18/07/2016	22/08/2016	28.7		30.3		20.9		
22/08/2016	21/09/2016	30.0	30.0	33.5	33.5	24.5	24.5	49.3
21/09/2016	24/10/2016	33.5		38.1		33.4		
24/10/2016	28/11/2016	50.3	50.3	45.6	45.6	44.5	44.5	52.4
28/11/2016	03/01/2016	60.4	60.4	57.4	57.4	55.4	55.4	59.6
<b>Total</b>		<b>40.5</b>	<b>43.2</b>	<b>40.6</b>	<b>41.6</b>	<b>33.1</b>	<b>34.7</b>	<b>45.7</b>
<b>ratio Am/P<sub>1</sub></b>		<b>0.9</b>		<b>1.0</b>		<b>1.0</b>		<b>TOTAL</b>
<b>average ratio</b>		<b>0.96</b>						<b>43.7</b>

**Table M (ii) CH 2**

Dates 2016		Camden <sub>A</sub>	Camden <sub>P</sub>	SJC <sub>A</sub>	SJC <sub>P</sub>	K&C <sub>A</sub>	K&C <sub>P</sub>	
08/01/2016	08/02/2016	53.8	53.8	46.8	46.8	28.1	28.1	58.2
08/02/2016	08/03/2016	49.5	49.5	47.6	47.6	40.7	40.7	50.1
08/03/2016	08/04/2016	46.2	46.2	45.0	45.0	35.8	35.8	53.2
08/04/2016	09/05/2016	41.1	41.1	46.0	46.0	34.8	34.8	66.1
09/05/2016	08/06/2016	37.3		32.8		26.2		
08/06/2016	11/07/2016	26.5		31.5		21.6		
11/07/2016	11/08/2016	29.6	29.6	30.7	30.7	20.2	20.2	47.1
11/08/2016	09/09/2016	30.0	30.0	34.0	34.0	26.0	26.0	63.7
09/09/2016	10/10/2016	32.4	32.4	38.8	38.8	31.8	31.8	72.4
10/10/2016	08/11/2016	49.0		45.7		43.9		
08/11/2016	01/12/2016							
01/12/2016	09/01/2017	57.9		56.0		54.0		62.0
<b>Total</b>		<b>41.2</b>	<b>40.4</b>	<b>41.4</b>	<b>41.3</b>	<b>33.0</b>	<b>31.1</b>	<b>59.1</b>
<b>ratio Am/P<sub>1</sub></b>		<b>1.02</b>		<b>1.00</b>		<b>1.06</b>		<b>TOTAL</b>
<b>average ratio</b>		<b>1.03</b>						<b>60.8</b>

**Table M (iii) CH5**

Dates 2016		Camden <sub>A</sub>	Camden <sub>P</sub>	SJC <sub>A</sub>	SJC <sub>P</sub>	K&C <sub>A</sub>	K&C <sub>P</sub>	
08/01/2016	08/02/2016	53.8		46.8		28.1		
08/02/2016	08/03/2016	49.5	49.5	47.6	47.6	40.7	40.7	59.2
08/03/2016	08/04/2016	46.2		45.0		35.8		
08/04/2016	09/05/2016	41.1		46.0		34.8		
09/05/2016	08/06/2016	37.3		32.8		26.2		
08/06/2016	11/07/2016	26.5		31.5		21.6		
11/07/2016	11/08/2016	29.6	29.6	30.7	30.7	20.2	20.2	52.0
11/08/2016	09/09/2016	30.0	30.0	34.0	34.0	26.0	26.0	58.9
09/09/2016	10/10/2016	32.4		38.8		31.8		
10/10/2016	08/11/2016	49.0		45.7		43.9		
08/11/2016	01/12/2016							
01/12/2016	09/01/2017	57.9		56.0		54.0		
<b>Total</b>		<b>41.2</b>	<b>36.4</b>	<b>41.4</b>	<b>37.4</b>	<b>33.0</b>	<b>29.0</b>	<b>56.7</b>
<b>ratio Am/P<sub>1</sub></b>		<b>1.13</b>		<b>1.10</b>		<b>1.14</b>		<b>TOTAL</b>
<b>average ratio</b>		<b>1.13</b>						<b>63.9</b>

**Table M (iv) CH7**

Dates 2016		Camden <sub>A</sub>	Camden <sub>P</sub>	SJC <sub>A</sub>	SJC <sub>P</sub>	K&C <sub>A</sub>	K&C <sub>P</sub>	
08/01/2016	08/02/2016	53.8		46.8		28.1		
08/02/2016	08/03/2016	49.5	49.5	47.6	47.6	40.7	40.7	58.6
08/03/2016	08/04/2016	46.2	46.2	45.0	45.0	35.8	35.8	61.6
08/04/2016	09/05/2016	41.1	41.1	46.0	46.0	34.8	34.8	60.1
09/05/2016	08/06/2016	37.3		32.8		26.2		
08/06/2016	11/07/2016	26.5		31.5		21.6		
11/07/2016	11/08/2016	29.6		30.7		20.2		
11/08/2016	09/09/2016	30.0	30.0	34.0	34.0	26.0	26.0	64.5
09/09/2016	10/10/2016	32.4	32.4	38.8	38.8	31.8	31.8	70.2
10/10/2016	08/11/2016	49.0		45.7		43.9		
08/11/2016	01/12/2016							
01/12/2016	09/01/2017	57.9	57.9	56.0	56.0	54.0	54.0	73.2
<b>Total</b>		<b>41.2</b>	<b>42.9</b>	<b>41.4</b>	<b>44.6</b>	<b>33.0</b>	<b>37.2</b>	<b>64.7</b>
<b>ratio Am/P<sub>1</sub></b>		<b>0.96</b>		<b>0.93</b>		<b>0.89</b>		<b>TOTAL</b>
<b>average ratio</b>		<b>0.93</b>						<b>59.9</b>

**Table M (v) CH9**

Dates 2016		Camden <sub>A</sub>	Camden <sub>P</sub>	SJC <sub>A</sub>	SJC <sub>P</sub>	K&C <sub>A</sub>	K&C <sub>P</sub>	
08/01/2016	08/02/2016	53.8	53.8	46.8	46.8	28.1	28.1	51.3
08/02/2016	08/03/2016	49.5	49.5	47.6	47.6	40.7	40.7	54.4
08/03/2016	08/04/2016	46.2	46.2	45.0	45.0	35.8	35.8	50.8
08/04/2016	09/05/2016	41.1	41.1	46.0	46.0	34.8	34.8	62.9
09/05/2016	08/06/2016	37.3	37.3	32.8	32.8	26.2	26.2	67.5
08/06/2016	11/07/2016	26.5		31.5		21.6		
11/07/2016	11/08/2016	29.6	29.6	30.7	30.7	20.2	20.2	40.8
11/08/2016	09/09/2016	30.0	30.0	34.0	34.0	26.0	26.0	51.5
09/09/2016	10/10/2016	32.4		38.8		31.8		
10/10/2016	08/11/2016	49.0		45.7		43.9		
08/11/2016	01/12/2016							
01/12/2016	09/01/2017	57.9	57.9	56.0	56.0	54.0	54.0	58.4
<b>Total</b>		<b>41.2</b>	<b>43.2</b>	<b>41.4</b>	<b>42.4</b>	<b>33.0</b>	<b>33.2</b>	<b>54.7</b>
<b>ratio Am/P<sub>1</sub></b>		<b>0.95</b>		<b>0.98</b>		<b>0.99</b>		<b>TOTAL</b>
<b>average ratio</b>		<b>0.97</b>						<b>53.3</b>

**Table M (vi) CH10**

Dates 2016		Camden <sub>A</sub>	Camden <sub>P</sub>	SJC <sub>A</sub>	SJC <sub>P</sub>	K&C <sub>A</sub>	K&C <sub>P</sub>	
08/01/2016	08/02/2016	53.8		46.8		28.1		
08/02/2016	08/03/2016	49.5	49.5	47.6	47.6	40.7	40.7	69.4
08/03/2016	08/04/2016	46.2	46.2	45.0	45.0	35.8	35.8	54.5
08/04/2016	09/05/2016	41.1		46.0		34.8		
09/05/2016	08/06/2016	37.3	37.3	32.8	32.8	26.2	26.2	57.2
08/06/2016	11/07/2016	26.5	26.5	31.5	31.5	21.6	21.6	74.3
11/07/2016	11/08/2016	29.6	29.6	30.7	30.7	20.2	20.2	62.9
11/08/2016	09/09/2016	30.0	30.0	34.0	34.0	26.0	26.0	70.8
09/09/2016	10/10/2016	32.4	32.4	38.8	38.8	31.8	31.8	63.1
10/10/2016	08/11/2016	49.0		45.7		43.9		
08/11/2016	01/12/2016							
01/12/2016	09/01/2017	57.9	57.9	56.0	56.0	54.0	54.0	67.4
<b>Total</b>		<b>41.2</b>	<b>38.7</b>	<b>41.4</b>	<b>39.6</b>	<b>33.0</b>	<b>32.0</b>	<b>64.9</b>
<b>ratio Am/P<sub>1</sub></b>		<b>1.07</b>		<b>1.05</b>		<b>1.03</b>		<b>TOTAL</b>
<b>average ratio</b>		<b>1.05</b>						<b>68.0</b>

**Table M (vii) Sir John Cass School - 2013**

	Site Type	Annual Average	Period Ave 31/7/13-3/1/14	Ratio A/P
Camden - Bloomsbury	Urban Background	51.2	49.3	1.04
Sir John Cass School	Urban Background	46.5	44.4	1.05
K&C – North Kensington	Urban Background	36.7	38.1	0.96
Westminster – Horseferry Road	Urban Background	44.5	43.8	1.02
				<b>1.02</b>
<b>2013</b>	Site Type	Period Ave 31/7/13-3/1/14	annualised	bias adjusted (1)
SJC1	Urban Background	46.05	46.8	46.8
SJC2	inside	35.31	35.9	35.9
SJC3	Urban Background	59.32	60.3	60.3
SJC4	Urban Background	57.86	58.8	58.8
SJC5	Roadside	67.93	69.0	69.0

**Table N Short-Term to Long-Term Monitoring Data Adjustment - Automatic Analysers**

**Table N (i) CT2 - Farringdon 2016**

PM2.5	Site Type	Annual Average	Period Ave 26/07/16-31/12/16	
CT3 - Sir John Cass	Urban Background	14.9	16.4	0.91
Camden - Bloomsbury	Urban Background	12.0	13.9	0.86
K&C – North Kensington	Urban Background	12.1	13.4	0.90
CT2 - Farringdon	Kerbside	average	<b>17.6</b>	
		adjusted	<b>15.7</b>	

**Table N (ii) CT6 - Walbrook Wharf 2011**

Site data adjustment for Walbrook Wharf in 2011	Site Type	Annual Mean ( $\mu\text{g}/\text{m}^3$ )	Period Mean ( $\mu\text{g}/\text{m}^3$ )	Ratio
Westminster Horseferry Rd	Urban Background	40.3	44	91.74%
Tower Hamlets Poplar	Urban Background	34.2	39	87.5%
Camden Bloomsbury	Urban Background	48.5	51	95.96%
Kensington and Chelsea North Kensington	Urban Background	36	38	94.06%
Average				92.3%

**Distance Adjustment**

Given the nature of the City all monitoring is considered to be representative of public exposure.

## Appendix B Full Monthly Diffusion Tube Results for 2016

See co-location section for monthly results associated with the two co-location sites.

**Table O NO<sub>2</sub> Diffusion Tube Monthly Results**

Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2016 % <sup>b</sup>	Monthly NO <sub>2</sub>												Annual mean – raw data <sup>c</sup>	Annual mean – bias adjusted <sup>c</sup>
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec		
CL5	100	92	<b>51.2</b>	39.3	30.8		<b>42.7</b>	<b>42.8</b>	<b>46.9</b>	<b>44.0</b>	<b>61.7</b>	<b>43.3</b>	<b>55.2</b>	<b>62.9</b>	<b>47.3</b>	<b>48.8</b>
CL38	100	92	<b>53.2</b>	<b>48.1</b>	<b>45.5</b>	<b>47.7</b>	<b>58.2</b>	<b>65.3</b>	<b>51.4</b>	<b>49.7</b>	<b>65.8</b>		<b>64.6</b>	<b>53.3</b>	<b>54.8</b>	<b>56.4</b>
CL39	100	100	<b>77.2</b>	<b>65.1</b>	<b>69.1</b>	<b>82.2</b>	<b>83.9</b>	<b>86.7</b>	<b>82.9</b>	<b>86.5</b>	<b>96.1</b>	<b>76.9</b>	<b>76.7</b>	<b>61.6</b>	<b>78.7</b>	<b>81.1</b>
CL55	100	100	<b>41.9</b>	32.3	28.5	29.7	32.5	31.3	26.4	27.1	33.1	33.0	<b>45.5</b>	<b>40.1</b>	33.5	34.5
CL40	100	100	<b>61.2</b>	<b>52.1</b>	<b>46.8</b>	<b>48.4</b>	<b>43.3</b>	<b>48.7</b>	<b>43.3</b>	<b>43.5</b>	<b>60.6</b>	<b>44.0</b>	<b>52.7</b>	<b>48.3</b>	<b>49.4</b>	<b>50.9</b>

Exceedance of the NO<sub>2</sub> annual mean AQO of 40 µgm<sup>-3</sup> are shown in **bold**.

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

<sup>b</sup> 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%)

<sup>c</sup> Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2016 % <sup>b</sup>	Monthly NO <sub>2</sub>													Annual mean – raw data <sup>c</sup>	Annual mean – bias adjusted <sup>c</sup>
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec			
SJC1**	n/a	100	<b>45.2</b>	35.4	28.1	31.9	33.2	33.1	30.0	34.2	<b>41.7</b>	<b>41.6</b>	<b>47.6</b>	<b>52.2</b>	37.9	39.0	
SJC2	n/a	92	30.4	28.5	27.8	31.1	32.2	30.3	28.1		31.8	31.5	33.0	36.2	31.0	31.9	
SJC3	n/a	100	<b>48.0</b>	37.3	38.5	36.8	40.0	36.6	39.9	<b>40.8</b>	<b>47.1</b>	<b>48.7</b>	<b>53.5</b>	<b>58.3</b>	<b>43.8</b>	<b>45.1</b>	
SJC4	n/a	92	<b>47.1</b>	33.0	32.2	33.3	<b>42.7</b>	39.4	38.6	39.2	<b>44.9</b>	<b>49.2</b>	<b>55.9</b>		<b>41.4</b>	<b>42.6</b>	
SJC5	n/a	100	<b>55.0</b>	37.4	39.1	33.9	<b>47.6</b>	<b>46.5</b>	<b>48.2</b>	<b>52.6</b>	<b>53.9</b>	<b>58.4</b>	<b>69.6</b>	<b>62.2</b>	<b>50.4</b>	<b>51.9</b>	
SJC6**	n/a	100	<b>44.9</b>	34.6	34.8	33.9	33.2	31.4	29.8	33.3	39.7	<b>40.7</b>	<b>51.4</b>	<b>53.3</b>	38.4	39.6	
SJC7	n/a	100	<b>48.2</b>	<b>40.2</b>	37.1	33.8	40.4	35.3	36.2	39.9	<b>41.6</b>	<b>45.0</b>	<b>55.8</b>	<b>59.7</b>	<b>42.8</b>	<b>44.0</b>	
SJC8**	n/a	92	39.5	36.5	30.6		33.3	34.9	32.1	32.0	38.6	38.8	<b>50.3</b>	<b>55.1</b>	<b>38.3</b>	<b>39.5</b>	

Exceedance of the NO<sub>2</sub> annual mean AQO of 40 µgm<sup>-3</sup> are shown in **bold**.

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

<sup>b</sup> 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%)

<sup>c</sup> Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

\*\* co-location

Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2016 % <sup>b</sup>	Monthly NO <sub>2</sub>														
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data <sup>c</sup>	Annualised result	Annual mean – bias adjusted <sup>c</sup>
BANK 1	n/a	92	65.6	58.6	78.9	97.5	67.7		59.3	64.1	92.9	82.8	81.7	84.9	75.8		78.1
BANK 2	n/a	92	59.4		51.6	60.7	70.9	67.0	58.3	74.0	87.3	67.5	74.0	92.9	69.4		71.5
BANK 3	n/a	83	47.2	44.5	45.4	39.6	51.9			41.3	54.8	48.0	59.6	70.8	50.3		51.8
BANK 4	n/a	83	61.3	59.4	58.6		68.3			62.4	79.5	67.7	83.5	81.5	69.1		71.2
BANK 5	n/a	92	62.4	59.2	55.4	57.7	70.5	57.5	47.1	58.8	75.8		76.9	79.9	63.7		65.6
BANK 6	n/a	92	68.9	65.1	66.7	76.8	71.8		69.3	68.4	83.7	84.9	74.6	80.5	73.7		75.9
BANK 7	n/a	92	39.7	43.9	54.9	54.4	64.9	66.2	46.0	44.6	63.2	65.1		69.1	55.6		57.3
BANK 8	n/a	92	59.0	49.7	46.6	49.4	51.7	60.0	51.0		62.5	59.3	73.3	72.1	57.7		59.4
BANK 9	n/a	100	64.0	63.2	54.3	60.3	68.7	61.1	65.2	64.6	77.0	68.9	63.6	76.2	65.6		67.6
BANK 10	n/a	75	81.1		55.7	59.7		61.8	56.3	67.4	84.9	68.6		86.6	69.1		71.2
BANK 11	n/a	100	59.2	54.3	44.2	45.6	60.1	62.5	54.0	42.5	71.9	67.8	72.7	73.8	59.1		60.8
BANK 12	n/a	75	66.8	83.3	69.0		81.4	86.0	75.1			85.4	93.4	103.3	82.6		85.1
BANK 13	n/a	83	52.7	56.9	50.7	68.1		45.0	36.9	55.3		59.9	65.1	79.1	57.0		58.7
BANK 14	n/a	100	61.7	53.2	49.1	71.3	61.4	56.8	50.5	62.8	75.0	62.5	67.0	78.6	62.5		64.4
BANK 15	n/a	100	54.0	54.6	55.2	61.7	64.2	68.2	58.3	49.0	70.7	67.6	69.9	68.9	61.8		63.7
BANK 16	n/a	100	52.1	51.2	56.2	62.6	59.0	65.2	46.0	47.5	62.5	59.3	70.3	70.6	58.5		60.3
BANK 17	n/a	83	62.7		59.2	75.4	77.3	69.6	60.4	49.0	72.3	74.5	67.7		66.8		68.8
BANK 18	n/a	100	46.7	59.4	45.0	42.4	51.9	46.8	44.0	42.0	58.7	51.9	63.2	64.6	51.4		52.9
BANK 19	n/a	67	43.5	36.8	44.9			45.2	34.0		49.3		52.4	59.6	45.7	43.7	45.0
BANK 20	n/a	75	72.7	84.6		77.1	75.9	65.6	77.1	72.8		71.2		81.6	75.4		77.7

Exceedance of the NO<sub>2</sub> annual mean AQO of 40 µg m<sup>-3</sup> are shown in **bold**.

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

<sup>b</sup> 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%)

<sup>c</sup> Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% - **BANK 19 WAS ANNUALISED**



Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2016 % <sup>b</sup>	Monthly NO <sub>2</sub>														
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data <sup>c</sup>	Annualised	Annual mean – bias adjusted <sup>c</sup>
CH1	n/a	75	<b>67.1</b>	<b>58.0</b>	<b>52.2</b>	<b>79.7</b>	<b>64.2</b>	<b>71.2</b>	<b>49.0</b>	<b>55.2</b>	<b>72.8</b>				<b>63.3</b>		<b>65.2</b>
CH2	n/a	67	<b>58.2</b>	<b>50.1</b>	<b>53.2</b>	<b>66.1</b>			<b>47.1</b>	<b>63.7</b>	<b>72.4</b>			<b>62.0</b>	<b>59.1</b>	<b>60.8</b>	<b>62.6</b>
CH3	n/a	75	<b>45.5</b>	<b>44.2</b>	<b>44.8</b>	<b>49.2</b>	<b>49.0</b>		<b>44.3</b>	<b>49.8</b>	<b>51.8</b>			<b>54.6</b>	<b>48.1</b>		<b>49.6</b>
CH4	n/a	83	<b>59.6</b>	<b>62.9</b>	<b>63.7</b>	<b>73.4</b>	<b>77.9</b>	<b>66.3</b>	<b>66.2</b>	<b>73.2</b>	<b>75.2</b>			<b>70.9</b>	<b>68.9</b>		<b>71.0</b>
CH5	n/a	25		<b>59.2</b>					<b>52.0</b>	<b>58.9</b>				<b>56.7</b>	<b>63.9</b>		<b>65.8</b>
CH6	n/a	75	<b>51.3</b>	<b>53.9</b>	<b>54.3</b>	<b>54.3</b>	<b>70.3</b>		<b>45.3</b>	<b>54.5</b>	<b>65.7</b>			<b>61.8</b>	<b>56.8</b>		<b>58.5</b>
CH7	n/a	50		<b>58.6</b>	<b>61.6</b>	<b>60.1</b>				<b>64.5</b>	<b>70.2</b>			<b>73.2</b>	<b>64.7</b>	<b>59.9</b>	<b>61.7</b>
CH8	n/a	75	<b>44.6</b>	<b>42.4</b>	<b>40.9</b>	<b>42.3</b>	<b>70.0</b>	<b>36.3</b>		<b>40.5</b>	<b>42.2</b>			<b>58.0</b>	<b>46.4</b>		<b>47.8</b>
CH9	n/a	67	<b>51.3</b>	<b>54.4</b>	<b>50.8</b>	<b>62.9</b>	<b>67.5</b>		<b>40.8</b>	<b>51.5</b>				<b>58.4</b>	<b>54.7</b>	<b>53.3</b>	<b>54.9</b>
CH10	n/a	67		<b>69.4</b>	<b>54.5</b>		<b>57.2</b>	<b>74.3</b>	<b>62.9</b>	<b>70.8</b>	<b>63.1</b>			<b>67.4</b>	<b>64.9</b>	<b>68.0</b>	<b>70.0</b>

Exceedance of the NO<sub>2</sub> annual mean AQO of 40 µg m<sup>-3</sup> are shown in **bold**.

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

<sup>b</sup> 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%)

<sup>c</sup> Means should be “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% **CH 2,7,8,9 WERE ANNUALISED**