



2013 Air Quality Progress Report for City of London Corporation

In fulfillment of Part IV of the
Environment Act 1995
Local Air Quality Management

April 2013

Local Authority Officers	Kelly Wilson Ruth Calderwood
Department	Markets and Consumer Protection
Address	City of London, Guildhall, PO Box 270, London EC2P 2EJ
Telephone	020 7332 1162
e-mail	Kelly.wilson@cityoflondon.gov.uk Ruth.calderwood@cityoflondon.gov.uk
Report Reference number	COL/ PR/ 2013
Date	April 2013

Executive Summary

Pollution levels in the City of London during 2012 were broadly similar to 2011; however, this is the first year the 24-hour average PM₁₀ objective was breached at Beech Street.

Nitrogen dioxide levels continue to be high in the City. Particularly high levels were seen at Walbrook Wharf roadside and roof and Beech Street. Walbrook Wharf is beside Upper Thames Street, which has a high volume of traffic and low dispersion due to street canyon effects. Beech Street is a roadside site within a tunnel, which also has low dispersion.

The annual objective for PM₁₀ was met at all sites; however the 24-hour mean objective was exceeded at both Beech Street and Upper Thames Street (roadside sites). In 2011, only the Upper Thames Street site exceeded this objective. The City of London is investigating why this may be the case and initial investigations indicate an increase in traffic in the Beech Street Tunnel as a result of road closures associated with Crossrail may be the cause. There were a number of air pollution episodes in London during 2012, summarised in Appendix B, which may also be a contributory factor.

Based on the results presented here, a report submitted to Defra has concluded that detailed assessment is not required for any pollutants. This means that it is not appropriate to revise the "Air Quality Management Area" status of the City of London.

The City of London continues to work to improve air quality, by implementing the actions in its Air Quality Strategy 2011-2015, and by continuing to work closely with stakeholders such as the Greater London Authority, Department for the Environment Food and Rural Affairs, King's College London, and other Central London Local Authorities.

Table of Contents

1	Introduction	5
1.1	Description of Local Authority Area	5
1.2	Purpose of Progress Report	5
1.3	Air Quality Objectives	6
1.4	Summary of Previous Review and Assessments	8
2	New Monitoring Data	10
2.1	Summary of Monitoring Undertaken	10
2.2	Comparison of Monitoring Results with Air Quality Objectives	14
3	New Local Developments	31
4	Local / Regional Air Quality Strategy	32
5	Air Quality Planning Policies	33
6	Local Transport Plans and Strategies	34
7	Climate Change Strategies	35
8	Implementation of Action Plans	36
9	Conclusions and Proposed Actions	52
9.1	Conclusions from New Monitoring Data	52
9.2	Proposed Actions	52
10	References	53

List of Tables

- Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England
- Table 2.2 Details of Non- Automatic Monitoring Sites
- Table 2.3 Results of Automatic Monitoring for NO₂: Comparison with Annual Mean Objective
- Table 2.4 Results of Automatic Monitoring for NO₂: Comparison with 1-hour Mean Objective
- Table 2.5 Results of NO₂ Diffusion Tubes 2012
- Table 2.6 Results of NO₂ Diffusion Tubes (2008 to 2012)
- Table 2.7 Results of Automatic Monitoring for PM₁₀: Comparison with Annual Mean Objective
- Table 2.8 Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour Mean Objective
- Table 2.9 Results of Automatic Monitoring for SO₂: Comparison with Objectives
- Table 2.10 Results of Automatic Monitoring of PM_{2.5} – Annual mean
- Table 2.11 Results of Automatic Monitoring of Ozone – Annual mean

List of Figures

- Figure 1.1 Map of AQMA Boundary
- Figure 2.1 Map of Automatic Monitoring Sites
- Figure 2.2 Map of Non-Automatic Monitoring Sites
- Figure 2.3 Trends in Annual Mean NO₂ Concentrations at Automatic Monitoring Sites
- Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites
- Figure 2.5 Trends in Annual Mean PM₁₀ Concentrations
- Figure 2.6 Trends in 24-hour Average PM₁₀ Concentrations
- Figure 2.7 Trends in SO₂ Concentrations

Appendices

Appendix A - QA:QC Data

Appendix B – Pollution Episodes in London during 2012

1 Introduction

1.1 Description of Local Authority Area

City of London is the financial and commercial heart of Britain, also known as the “square mile”. It is a densely developed urban area in the centre of Greater London, and is approximately 2.9km² in area. It is the historic heart of London, and has been inhabited since Roman times.

The City experiences some of the worst air quality in the UK, primarily to the density of development and its geographical location. Road traffic is the main source of pollution in the City, supplemented by commercial and domestic heating. Construction and Deconstruction activities are also a significant source. There are no industrial sources of pollution in the City.

Due to its location in the heart of London, the City is heavily influenced by pollution generated in neighbouring authorities, and across London as a whole. As with other areas in the southeast of England, the City is also affected by pollutants (notably fine particulates) thought to originate from continental Europe.

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m ³	Running annual mean	31.12.2003
	5.00 µg/m ³	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m ³	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m ³	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m ³	Annual mean	31.12.2004
	0.25 µg/m ³	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM ₁₀) (gravimetric)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m ³	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

The City of London 'Stage 1 and 2 Review and Assessment' was published in September 1998. The review identified three pollutants with potential to exceed the air quality objectives: nitrogen dioxide; fine particulates and sulphur dioxide. Further work for Stage 3 of the Review and Assessment process concluded that just nitrogen dioxide and fine particulates were likely to exceed the objectives. The whole of the City was consequently declared an Air Quality Management Area in January 2001 for these two pollutants. The need for an Air Quality Management Area was confirmed in the Stage 4 Review and Assessment published in June 2002. The City consequently published an Action Plan in May 2003 detailing the measures that would be taken in the City to improve air quality. The 2006 and 2009 Updating and Screening Assessments both concluded that there was no requirement for a Detailed Assessment for any of the specified pollutants, and that it was pertinent to maintain the Air Quality Management Area for the whole of the City of London, for both NO₂ and PM₁₀.

In the spring of 2011, the City of London Air Quality Strategy received committee approval. The strategy outlines how air quality policy at the City will be developed from 2011 to 2015, and sets out 32 actions to achieve this.

Although a lot of work has been undertaken since 1998 with a view to improving air quality in the City, levels of nitrogen dioxide and fine particulates continue to be a problem, and the AQMA remains appropriate for the whole of the City of London (Figure 1.1).

A number of the documents discussed here can be viewed on the City of London website: www.cityoflondon.gov.uk/air

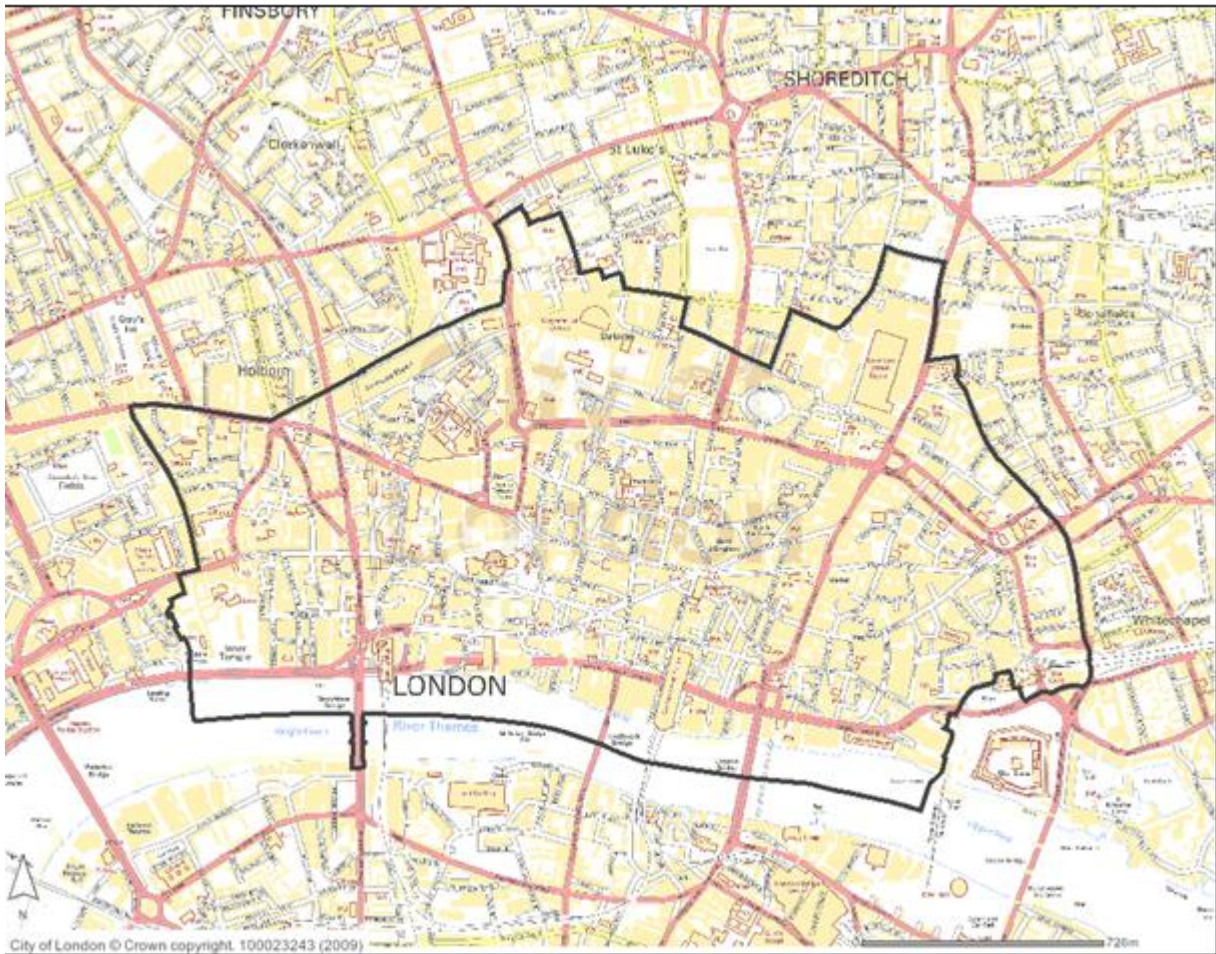


Figure 1.1 Map of AQMA Boundary

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

The locations and details of all automatic monitoring sites are shown in Figure 2.1 and Table 2.1.

Quality assurance and quality control details for all automatic monitoring sites in the City are provided in Appendix A. All results reported here may be subject to slight change, depending on the results of equipment audits in Spring 2013.

Figure 2.1 Map of Automatic Monitoring Sites

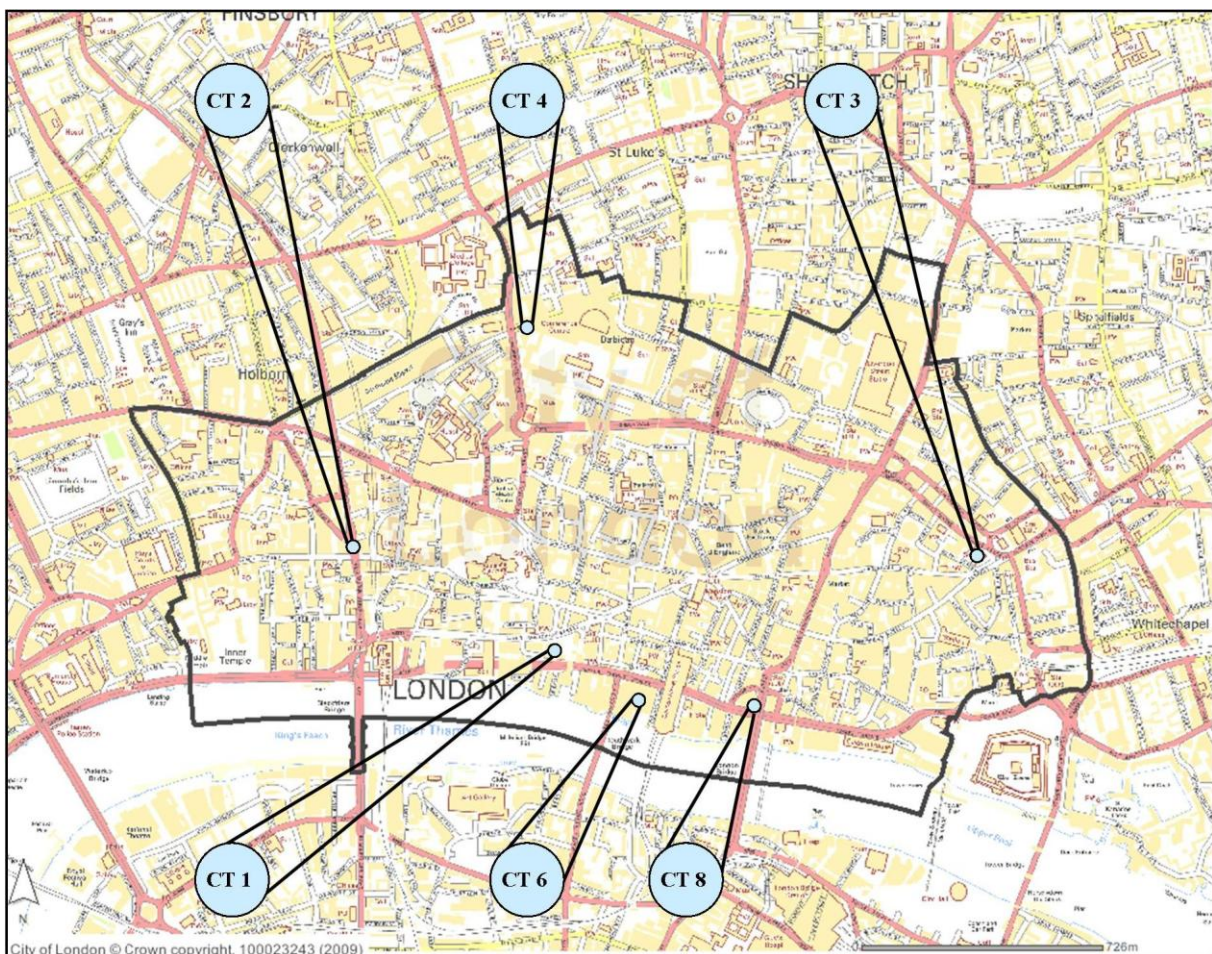


Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS GridRef	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
CT 1 - Senator House	Urban Background	532234	180894	SO ₂	Y	Flourescence	Yes (on top of a building)	N/A	N/A
CT 1 - Senator House	Urban Background	532234	180894	O ₃	Y	Photometric	Yes (on top of a building)	N/A	N/A
CT 1 - Senator House	Urban Background	532234	180894	NO ₂	Y	Chemolumine scence	Yes (on top of a building)	N/A	N/A
CT 2 – Farringdon Street	Kerbside	531625	181201	PM _{2.5}	Y	BAM	Yes (4m)	1m	Y
CT 3 - John Cass School	Urban Background	533475	181179	PM ₁₀	Y	BAM	Yes (in school playground)	N/A	N/A
CT 3 - John Cass School	Urban Background	533475	181179	NO ₂	Y	Chemolumine scence	Yes (in school playground)	N/A	N/A
CT 4 - Beech Street	Roadside	532141	181861	PM ₁₀	Y	TEOM	Yes (5m)	1m	Y
CT 4 - Beech Street	Roadside	532176	181862	NO ₂	Y	Chemolumine scence	Yes (5m)	1m	Y
CT 6a - Walbrook Wharf Foyer	Roadside	532528	180784	NO ₂	Y	Chemolumine scence	Yes (3m)	1m	Y
CT6b - Walbrook Wharf Roof	Urban Background	532528	180784	NO ₂	Y	Chemolumine scence	Yes (on top of a building)	N/A	N/A
CT 8 - Upper Thames Street	Roadside	532834	180691	PM ₁₀	Y	TEOM	Yes (3m)	2m	Y

2.1.2 Non-Automatic Monitoring Sites

Diffusion tubes were used in 2011 to monitor nitrogen dioxide. The tubes used are managed by Bureau Veritas as part of the London-Wide Environment Programme (LWEP). All diffusion tubes employed in the LWEP programme are prepared and analysed by UKAS accredited Gradko International Ltd.

Diffusion tubes are prepared using the 50% v/v triethanolamine with acetone method and analysed using UV spectrometry. The diffusion tubes are labelled, and kept refrigerated in plastic bags prior to and after exposure. The City did not conduct its own co-location study, and laboratory bias adjustment factor is supplied by Bureau Veritas. For 2011 the factor was 1.02. Further QA/QC data is included in Appendix A. Figure 2.2 shows a map of nitrogen dioxide diffusion tube sites in the City of London and table 2.2 provides details of all sites.

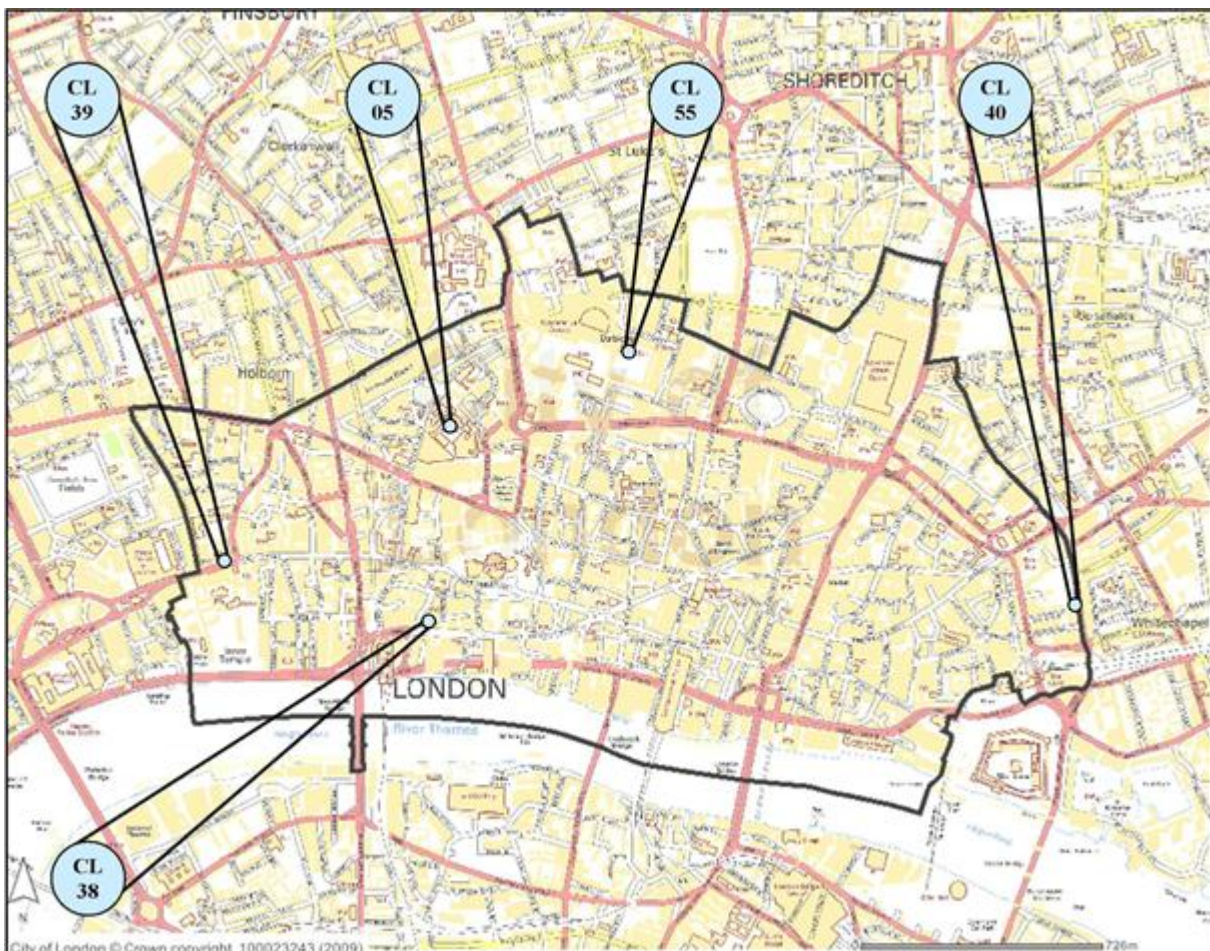


Figure 2.2 Map of Non-Automatic Monitoring Sites

Table 2.2 Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
CL5	St. Bartholomew's Hospital courtyard	Urban Centre	531901	181571	2	NO ₂	Y	N	Y	N/A	N/A
CL38	St. Andrew's Church, Queen Victoria Street	Roadside	531851	180962	3	NO ₂	Y	N	Y (4m)	2m	N
CL39	St. Dunstan's Church, Fleet Street	Roadside	531235	181155	2	NO ₂	Y	N	Y (4m)	2m	Y
CL40	Guinness Trust Estate, Mansell Street.	Roadside	533791	181027	2.5	NO ₂	Y	N	Y (3m)	3m	N
CL55	CL 55 Speed House, Barbican Centre	Urban Background	532482	181799	1	NO ₂	Y	N	Y	N/A	N/A

2.2 Comparison of Monitoring Results with Air Quality Objectives

All of the City's monitoring sites are located within the existing AQMA.

Nitrogen Dioxide

- The NO₂ annual mean objective was achieved at Speed House, Barbican (an urban background, diffusion tube site) and was exceeded at all other sites in the City of London.
- The NO₂ hourly mean objective was exceeded at Beech Street (CT4) and Walbrook Wharf (CT6a) roadside sites and Walbrook Roof (CT6b). It was met at all other sites.

PM10

- The PM₁₀ daily mean objective was exceeded at the Beech Street (CT4) and Upper Thames Street (CT8) roadside sites.
- The PM₁₀ annual mean objective was achieved at all sites.

SO2

- The SO₂ 15 minute, 1-hour and 24-hour mean objectives were all achieved at Senator House (CT1).

Other Monitoring

All monitoring results (including PM_{2.5} and O₃), for which there is no obligation on local authorities to meet the objectives) are discussed in greater detail in the following sections.

2.2.1 Nitrogen Dioxide (NO₂)

In the City, nitrogen dioxide (NO₂) is monitored using both (automatic) continuous analysers and (non-automatic) diffusion tubes. Continuous monitoring data is used to measure against both an hourly average objective and an annual average objective value. Diffusion tubes are used to measure against the annual average objective only.

There are five continuous monitors in the City. Two are roadside sites (Beech Street - CT4 and Walbrook Wharf Foyer – CT6a), and three are urban background sites (Senator House – CT1, Sir John Cass School – CT3 and Walbrook Wharf Roof CT6b).

There are five diffusion tube sites in the City. One is an urban centre site (St. Bartholomew's Hospital). Three are roadside/kerbside sites (St. Andrew's by the Wardrobe, Queen Victoria Street; St. Dunstan's in the West, Fleet Street and The Guinness Trust Estate, Mansell Street). One is an urban background site (Speed House, The Barbican).

Automatic Monitoring Data

In 2012 the annual objective was not achieved at any automatic site and the hourly average objective was not achieved at three sites:

- Beech Street (CT4)
- Walbrook Wharf (CT6a)
- Walbrook Wharf Roof (CT6b)

Data capture at Senator House (CT1) was low due to a significant problem which arose with the third party electricity supply which affected the reliability of logged data. The annual value has been “annualised” as detailed.

Tables 2.3 and 2.4 show the results of automatic monitoring in 2012. Figure 2.3 shows trends in annual mean concentrations since 1999.

Table 2.3 Results of Automatic Monitoring for NO₂: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2012 %	Annual Mean Concentration (µg/m ³)				
				2008	2009	2010	2011	2012 ^c
CT1 (Senator)	Urban Background	Y	72	49	48	51	52	52^c
CT3 (John Cass)	Urban Background	Y	97	58	56	55	48	46
CT4 (Beech St)	Roadside	Y	100	85	90	81	67	79
CT 6a (WW Foyer)	Roadside	Y	96	126	131	117	101	114
CT6b (WW Roof)	Urban Background	Y	100	93	91	93	95	92

In bold, exceedence of the NO₂ annual mean AQS objective of 40µg/m³

^c Data “annualised” as in Box 3.2 of TG(09) (<http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38>), as valid data capture less than 75%. un-annualised mean 50(µg/m³), ratio used 1.045 derived from data as follows:

AURN Site	Annual Mean (Am)	Period Mean (Pm)	Ratio (Am/Pm)
Kensington - North	35.9	33.7	1.065
Camden - Bloomsbury	50.8	49.9	1.018
		Average Ratio	1.045

Figure 2.3 Trends in Annual Mean NO₂ Concentrations Measured at Automatic Monitoring Sites

A trend chart providing NO₂ annual mean results over the past 14 years. All sites continue to be above the annual mean objective.

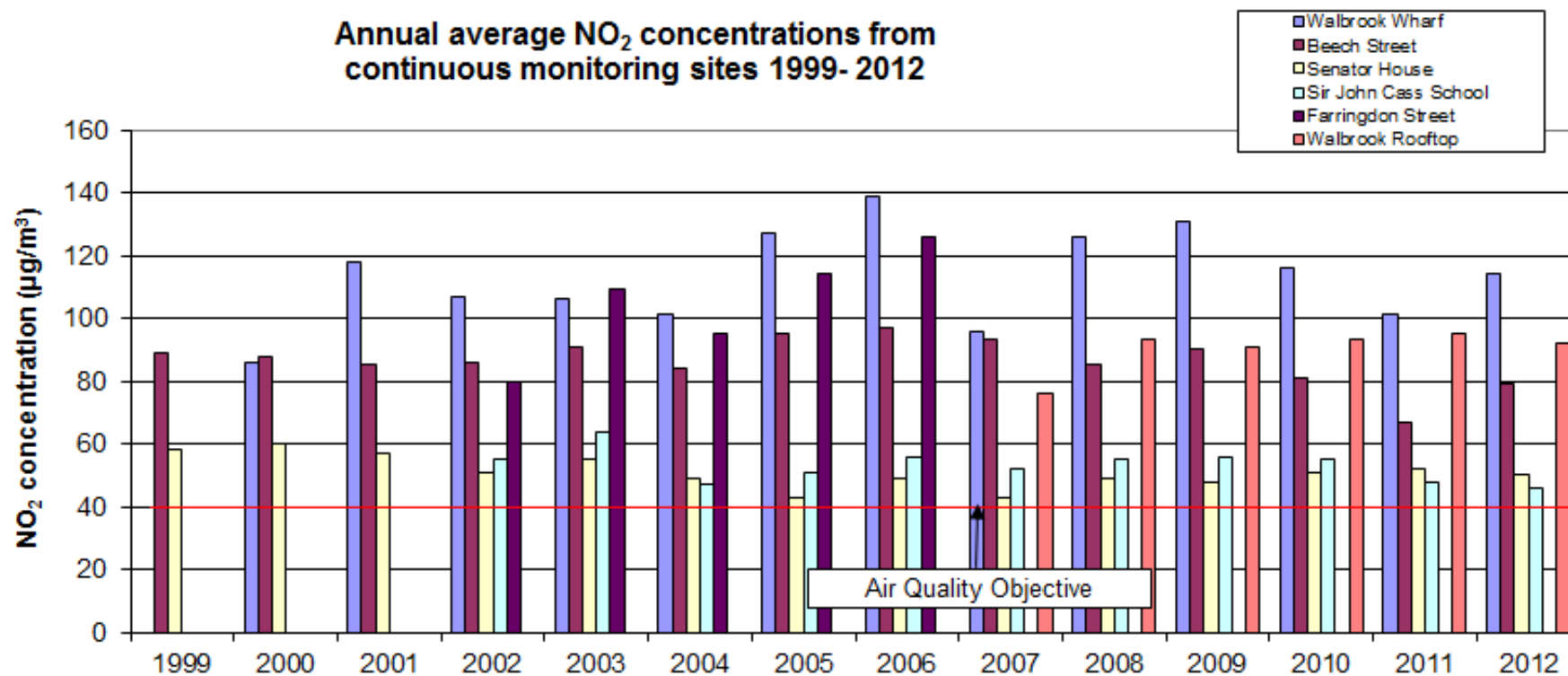


Table 2.4 Results of Automatic Monitoring for NO₂: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2012 % ^b	Number of Hourly Means > 200µg/m ³				
				2008 ^c	2009 ^c	2010 ^c	2011 ^c	2012 ^c
CT1 (Senator)	Urban Background	Y	72	0	0	2	0	2(154.8 µg/m ³)
CT3 (John Cass)	Urban Background	Y	97	0	2	3	0	0
CT4 (Beech St)	Roadside	Y	100	106	189	139	42	176
CT 6a (WW Foyer)	Roadside	Y	96	810	955	646	231***	450
CT6b (WW Roof)	Urban Background	Y	98	13	4	40	118	63

*** there were 231 exceedences at CT6a, but 2011 data capture was too low for this figure to be reliable

In bold, exceedence of the NO₂ hourly mean AQS objective (200µg/m³ – not to be exceeded more than 18 times per year)

^c If the data capture for full calendar year is less than 90%, include the 99.8th percentile of hourly means in brackets

Diffusion Tube Monitoring Data

Annual concentrations are summarised in table 2.5. Table 2.6 and Figure 2.4 show trends in Annual mean NO₂ concentrations measured at diffusion tube sites since 2001. In 2012, the annual objective was achieved at one site, Speed House, Barbican Centre. None of the sites are collocated with continuous analysers, and there were no triplicate tubes exposed in 2012.

Table 2.5 Results of NO₂ Diffusion Tubes 2012

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (Number of Months or %)	2012 Annual Mean Concentration (µg/m ³) - Bias Adjustment factor = 1.04
CL5	St. Bartholomew's Hospital courtyard	Urban Centre	Y	N	12	42.8
CL38	St. Andrew's Church, Queen Victoria Street	Roadside	Y	N	11	57.5
CL39	St. Dunstan's Church, Fleet Street	Roadside	Y	N	12	<u>92.9</u>
CL40	Guinness Trust Estate, Mansell Street.	Roadside	Y	N	10	<u>60.4</u>
CL55	CL 55 Speed House, Barbican Centre	Urban Background	Y	N	12	36.9

In bold, exceedence of the NO₂ annual mean AQS objective of 40µg/m³

Underlined, annual mean > 60µg/m³, indicating a potential exceedence of the NO₂ hourly mean AQS objective

Table 2.6 Results of NO₂ Diffusion Tubes (2008 to 2012)

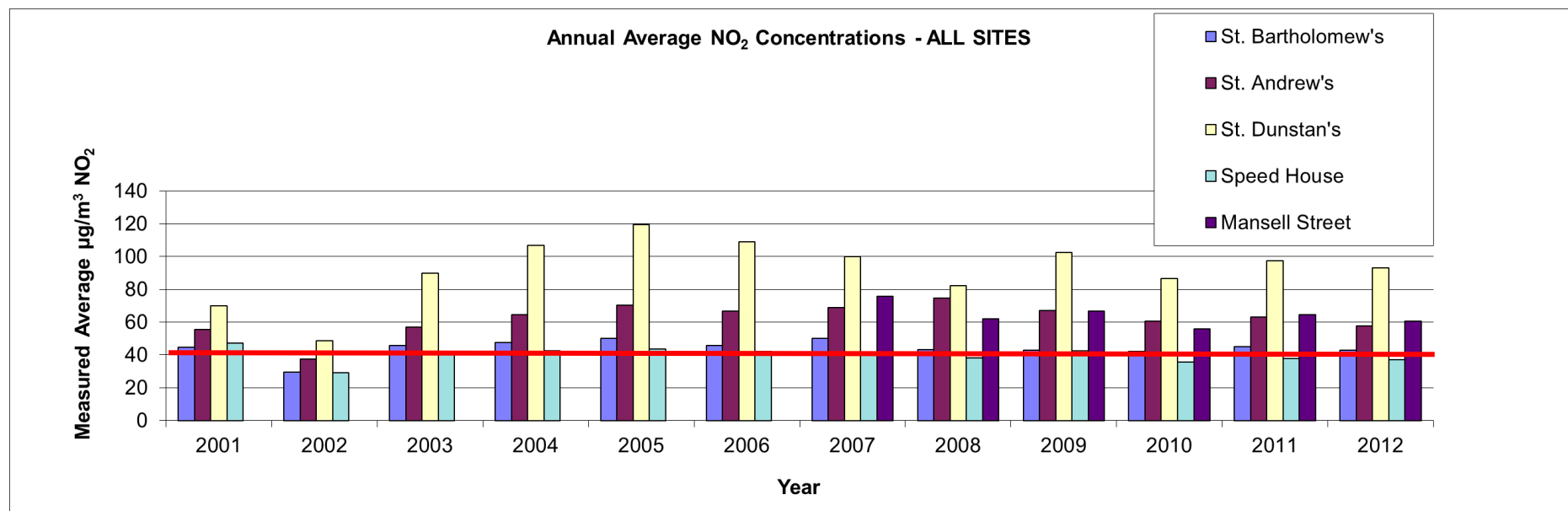
Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m ³) - Adjusted for Bias				
			2008 (Bias Adjustment Factor = 0.93)	2009 (Bias Adjustment Factor = 1)	2010 (Bias Adjustment Factor = 0.99)	2011 (Bias Adjustment Factor = 1.02)	2012 (Bias Adjustment Factor = 1.04)
CL5 (St. Barts)	Urban Centre	Y	43.3	42.7	42.1	45.0	42.8
CL38 (St. Andrews)	Roadside	Y	<u>74.7</u>	<u>66.9</u>	<u>60.7</u>	<u>63.1</u>	57.5
CL39 (Fleet St)	Roadside	Y	<u>82.4</u>	<u>102.3</u>	<u>86.7</u>	<u>97.5</u>	<u>92.9</u>
CL40 (Mansell St)	Roadside	Y	<u>61.9</u>	<u>66.8</u>	54.6	<u>64.5</u>	<u>60.4</u>
CL55 (S/H)	Urban Background	Y	40.5	42.6	37.3	37.8	36.9

In bold, exceedence of the NO₂ annual mean AQS objective of 40µg/m³

Underlined, annual mean > 60µg/m³, indicating a potential exceedence of the NO₂ hourly mean AQS objective

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

A trend chart providing NO₂ annual mean results over the past twelve years. All sites except Speed house have exceeded the objective for the past five years.



2.2.2 Particulate Matter (PM₁₀)

In the City, the majority (85%) of PM₁₀ is emitted outside the City boundary. The rest is believed to come from road vehicles travelling within the City (10%) and other local sources, such as construction works, domestic heaters and industrial boilers (5%). This means that the capacity to manage overall PM₁₀ concentrations at a local level is limited. Overall, levels in the City have been consistently high over the last decade. TEOM measurements at Beech Street and Upper Thames Street have had the Volatile Correction Model (VCM) applied. Results appear lower from 2007 onwards, but this is likely to be due in part to the application of the VCM.

In 2012, the annual mean objective was achieved at all sites. The daily average objective was not achieved at Upper Thames Street or Beech Street. There were eight PM₁₀ episodes in London during 2012. One in January, one in February, three in March, one in May, one in October and November. The high number of pollution incidents in the first part of the year can be seen reflected in the results obtained.

The Beech Street site experienced 25 exceedences of the daily mean during the first three months of the year. It monitored a 'very high day' day and four 'high days' in March and three 'high days' in February. It also measured seventeen moderate days in the first three months of the year.

The Upper Thames Street Site experienced 29 exceedences of the daily mean during the first three months of the year, with 25 moderate days, and four high days.

The City of London is investigating why Beech Street has now exceeded the daily mean and initial investigations indicate an increased traffic flow in the Beech Street Tunnel as a result of road closures associated with Crossrail may be the cause.

Table 2.7 shows annual mean concentrations at all sites, and table 2.8 shows the number of times the 24-hour mean was exceeded. Figure 2.5 shows the trend in annual mean concentrations at City of London sites since 1999, and the influence of the VCM.

Table 2.7 Results of Automatic Monitoring for PM₁₀: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2012 % ^b	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m ³)				
					2008 ^c	2009 ^c	2010 ^c	2011 ^c	2012 ^c
CT3 (John Cass)	Urban Background	Y	94	Y	26	27	26 (90 th percentile 52.5 µg/m ³)	28	26
CT4 (Beech St)	Roadside	Y	99	Y	26	28	30	28.6	28
CT8 (UTS)	Roadside	Y	92	Y	34	36	37	37	39

In bold, exceedence of the PM₁₀ annual mean AQS objective of 40µg/m³

Figure 2.5 Trends in Annual Mean PM₁₀ Concentrations

A trend chart providing PM₁₀ annual mean results over the past 14 years. All sites have been below the objective for the past five years.

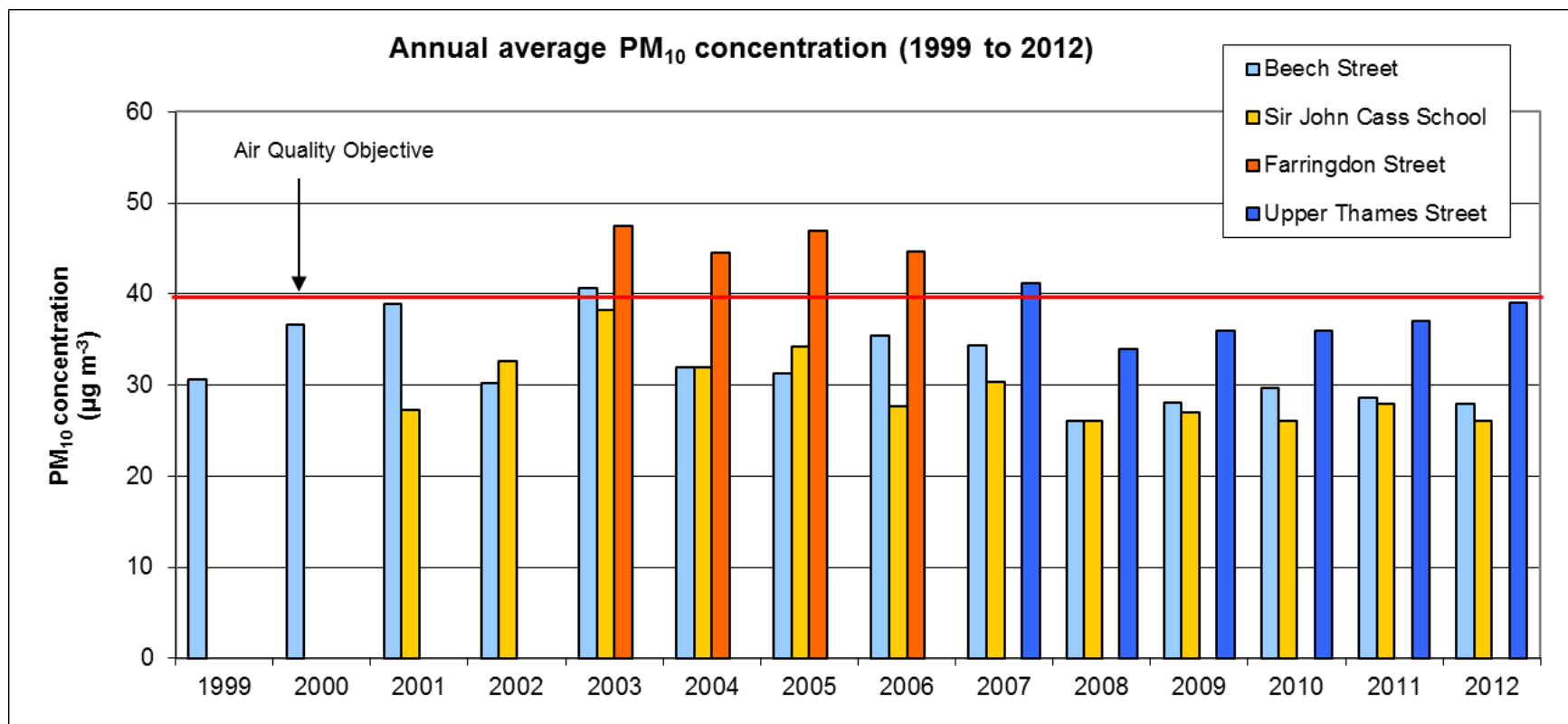


Table 2.8 Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour Mean Objective

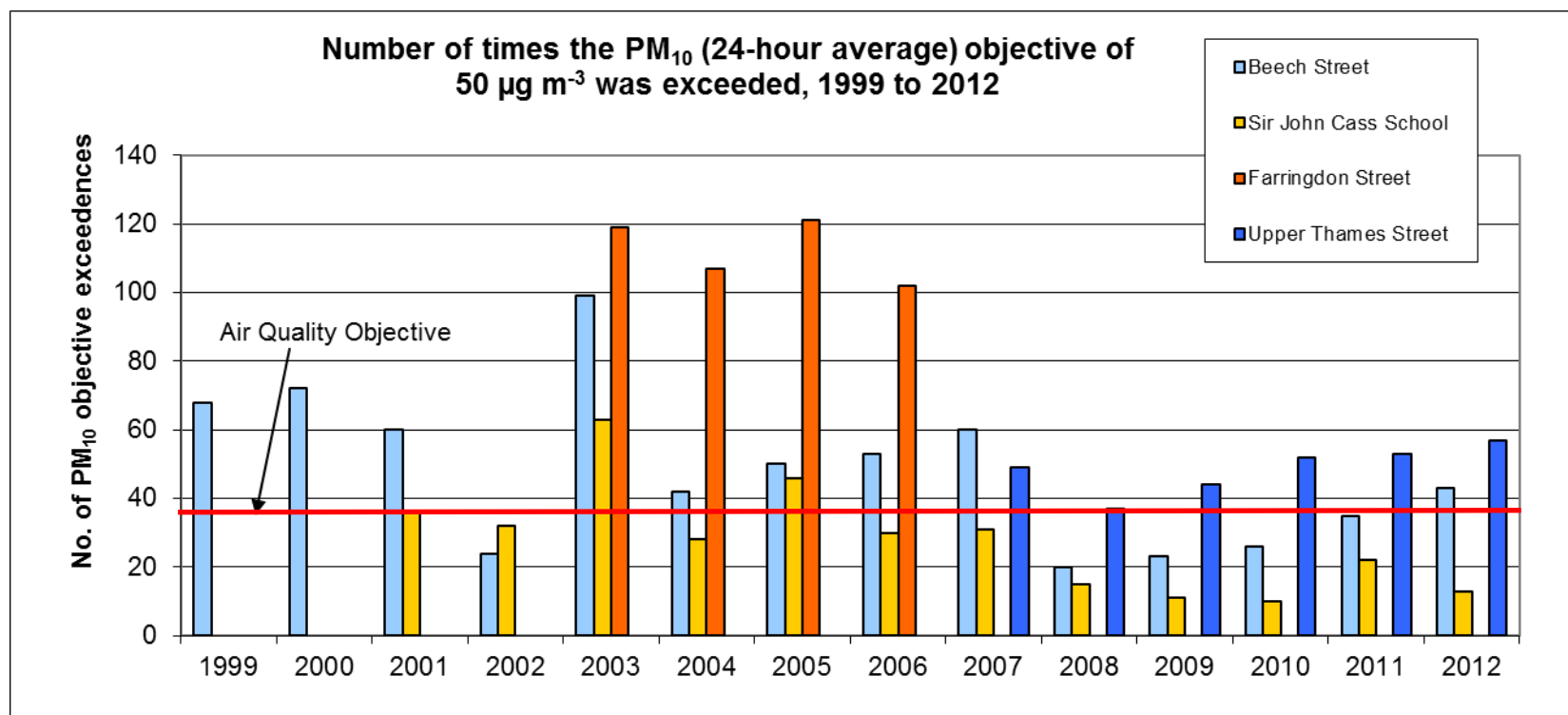
Site ID	Site Type	Within AQMA?	Valid Data Capture 2012 %	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m ³				
					2008 ^c	2009 ^c	2010 ^c	2011 ^c	2012 ^c
CT3 (John Cass)	Urban Background	Y	94	Y	15	11	10 (90 th percentile 52.5 µg/m ³)	22	13
CT4 (Beech St)	Roadside	Y	99	Y	20	23	26	35	43
CT8 (UTS)	Roadside	Y	92	Y	37	44	57	53	57

In bold, exceedence of the PM₁₀ daily mean AQS objective (50µg/m³ – not to be exceeded more than 35 times per year)

^c if data capture for full calendar year is less than 90%, include the 90.4th percentile of 24-hour means in brackets

Figure 2.6 Trends in 24-hour Average PM₁₀ Concentrations

A trend chart providing PM₁₀ 24-hour average results over the past 14 years. After 4 years of Beech Street meeting the objective, this road-side site now exceeds along with Upper Thames Street, which could be attributable to increased traffic flow as a result of road closures.



2.2.3 Sulphur Dioxide (SO₂)

The City of London typically sees very low levels of SO₂. Local concentrations are predominantly influenced by distant industrial point sources. Easterly winds occasionally give rise to increased concentrations by bringing SO₂ from power stations along the Thames corridor. Even with this contribution, concentrations are found to be very low.

In 2012, all three objectives were met. Table 2.9 shows the results of SO₂ monitoring in 2012, and Figure 2.6 shows that annual average concentrations have remained low since 2002. The higher than expected result for 2012 is discussed below. None of the objectives have been exceeded in this time.

Table 2.9 Results of Automatic Monitoring for SO₂: Comparison with Objectives

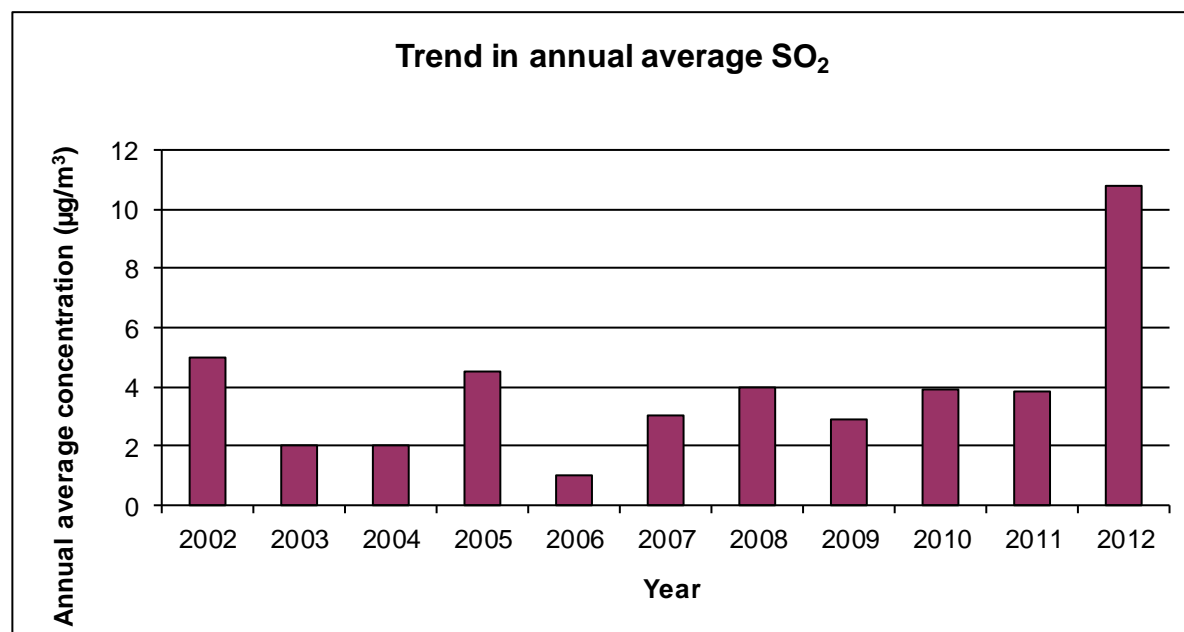
Site ID	Site Type	Within AQMA?	Valid Data Capture 2012 % ^b	Number of: ^c		
				15-minute Means > 266µg/m ³	1-hour Means > 350µg/m ³	24-hour Means > 125µg/m ³
CT1 (Senator)	Urban Background	Y	69	0 (46.4)	0 (35.5)	0 (25.8)

In bold, exceedence of the relevant AQS objective (15-min mean = 35 allowed/year; 1-hour mean = 24 allowed/year; 24-hour mean = 3 allowed/year)

^c The data capture for full calendar year is less than 90%, so the relevant percentile is given in the bracket (in µg/m³): 15-min mean = 99.9th; 1-hour mean = 99.7th; 24-hour mean = 99.2th percentile. The data capture was low at this site due to a problem with the power supply, which affected the reliability of the logger and its data. The data is currently un-ratified and may change due to the problems identified with the logger.

Figure 2.7 Trends in SO₂ Concentrations

SO₂ levels have historically been low. As stated, the data for 2012 is un-ratified and is expected to change significantly due to the problems stated with data capture.



2.2.4 Benzene

No benzene monitoring carried out during 2012.

2.2.5 Other Pollutants Monitored

PM_{2.5}

There are two new PM_{2.5} standards, one relating to an annual mean concentration (25µg/m³ by 2020), and the other a 10% net reduction in concentrations at urban background locations, measured as a 3-year mean.

The site at Farringdon Street is a kerbside site, and so the only relevant standard is the annual mean concentration. The proposed standard is for an annual mean concentration of 25µg/m³ to be achieved by 2020. Table 2.10 shows the annual mean result in 2011 and 2012. Raw data has been scaled by dividing by a factor of 1.21.

Table 2.10 – Results of Automatic Monitoring of PM_{2.5} – Annual mean

Site ID	Site Type	Within AQMA	Valid data capture 2012 %	Annual Mean Concentration (µg/m ³)	
				2011	2012
CT2 (Farringdon)	Kerbside	Y	83.4	24	25

Ozone

Local objectives for improving ground level ozone are not included in the Air Quality Regulations 2000. The UK Air Quality Strategy suggests a running 8-hour average of 50ppb (100µg/m³) should not be exceeded more than 10 times per year. In 2012 there were 9 days when the running 8 hour average exceeded this level at Senator House (CT1). There were three O₃ episodes in London during 2012; one in May, July and August. There was also high ozone on the 24th July. The annual average ozone concentrations are shown in table 2.11 below:

Table 2.11 – Results of Automatic Monitoring of Ozone – Annual Mean

Site ID	Site Type	Within AQMA	Valid data capture 2012 %	Annual Mean Concentration (µg/m ³)	
				2011	2012
CT1 (Senator)	Urban Background	Y	65	31.2	36.1

Summary of Compliance with AQS Objectives

The City of London Corporation has examined the results from monitoring in the City of London.

Concentrations within the AQMA still exceed the 1 hour mean objective for Nitrogen Dioxide at the following locations and the AQMA should remain:

- CT4 – Beech Street
- CT6a – Walbrook Wharf Foyer
- CT6b – Walbrook Wharf Roof

Concentrations within the AQMA still exceed the annual mean for Nitrogen Dioxide at all locations, except Speed House and the AQMA should remain.

Concentrations within the AQMA still exceed the 24hour mean objective for PM₁₀ at the following locations and the AQMA should remain:

- CT4 – Beech Street
- CT8 – Upper Thames Street

Concentrations within the AQMA meet the annual mean objective for PM₁₀ at all locations.

The SO₂ concentrations within the AQMA for 15 minute, 1-hour and 24-hour mean objectives were all achieved at Senator House (CT1).

3 New Local Developments

The City of London is in a constant state of redevelopment. New developments are either commercial or residential in nature, there are no industrial developments. Any air quality assessments undertaken always indicate negligible impact on local air quality. This is due to the high background levels of pollution, energy efficient designs and low NOx boilers installed. Very few developments include spaces for car parking, and where they do, it is for a small number of vehicles, <5. Emissions associated with the demolition and construction phase are controlled through our own code of practice which is updated annually to reflect best practice.

The City of London Corporation confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

The City of London confirms that all the following have been considered:

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

4 Local / Regional Air Quality Strategy

The City of London published its Air Quality Strategy in 2011. It runs from 2011 to 2015 when it will be reviewed. It is available at www.cityoflondon.gov.uk/air
It contains a range of actions, progress with each action is detailed in section 8.

5 Air Quality Planning Policies

The City of London Core Strategy requires development to “positively address ... local air quality, particularly nitrogen dioxide and particulates PM₁₀ (the City’s Air Quality Management Area pollutants).”

Actions in the City of London Air Quality Strategy 2011-2015 relate specifically to planning:

Action 17	Air quality will be a consideration in all development and the City of London will require developers to undertake detailed air quality impact assessments of major developments adjacent to sensitive premises, such as residential properties, schools and St Bartholomew’s Hospital. This will form part of the Environmental Impact Assessment (EIA).
Action 18	Major developments will be encouraged to obtain maximum points for the pollution section of the BREEAM assessment relating to NOx emissions i.e. to meet a dry NOx emission rating of <40 mg/kWh for boilers (this is equivalent to a NOx rating >5).
Action 20	Developers will be encouraged to install non-combustion renewable energy technology to work towards energy security and carbon reduction targets.
Action 21	A detailed air quality impact assessment will be required for any development where biofuel or biomass is proposed for on-site energy generation.
Action 23	Where appropriate, the City of London will secure air quality improvements through the S106 process.

6 Local Transport Plans and Strategies

The City of London Local Implementation Plan 2011 has the following key policies relating to air quality:

LIP 2011.1: To reduce the pollution of air, water and soils and excessive noise and vibration caused by transport in the City.

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.

7 Climate Change Strategies

The City of London has produced a Climate Change Mitigation Strategy, which sets out how the City plans to encourage action to reduce greenhouse gas emissions in the Square Mile. The Air Quality Strategy forms part of the delivery mechanism for the Climate Change Mitigation Strategy.

The City of London obtained funding to commission a best practice guidance document Air Quality and Climate Change: Integrating Policy in Local Authorities. It outlines how local authorities can integrate air quality and climate change policy and the importance of integrating both policy areas into other plans and strategies that guide local authority functions. This document informs policy development at the City, and the following action in the Air Quality Strategy:

Action 2	The City of London will ensure that, if possible, policies introduced to improve air quality will also have a positive benefit on reducing greenhouse gas emissions and policies introduced to reduce greenhouse gas emissions will have a positive benefit on air quality.
----------	---

8 Implementation of Action Plans

Table 9.1 Action Plan Progress

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
1	The City of London will continue to monitor air pollutants to ensure that air quality objectives and Limit Values are being met, and to assess the effectiveness of national, regional and local policies to reduce levels of pollution.	The City has been monitoring nitrogen dioxide, PM ₁₀ , PM _{2.5} , ozone and sulphur dioxide. Air quality data from Senator House, Sir John Cass School, Upper Thames Street and Walbrook Wharf has been made available on the London Air Quality Network www.londonair.org.uk	A review of the monitoring needs of the City was undertaken at the end of 2012. The Senator House background site was closed as sulphur dioxide is not now a problem and the NO _x / NO ₂ readings are the same as Sir John Cass School background site. Beech Street PM ₁₀ data was added to the London Air web site. An annual report for 2012 data has been produced and will be made available on the City of London web site.	On going
2	The City of London will ensure that, if possible, policies introduced to improve air quality will also have a positive benefit on reducing greenhouse gas emissions, and policies introduced to reduce greenhouse gas emissions will have a positive benefit on air quality.	Using Defra air quality grant, the City of London Corporation commissioned Environmental Protection UK to produce a document to advise local authorities on integrating air quality and climate change policy. This document has been used to guide policy development at the City e.g. in the production of planning guidance for combined heat and power plant. The document is called Air Quality and Climate Change: Integrating Policy in Local Authorities 2011.	The City of London continues to encourage non-combustion renewable energy sources in new developments and to ensure that carbon reduction policies do not have a negative impact on local air quality.	On going

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
3	Options for managing traffic in the City to improve air quality locally will be considered during 2011. Air quality impact assessments will be undertaken for transport schemes that involve significant changes to traffic type and movement on City roads.	<p>Potential changes to the road network associated with the removal of the Aldgate gyratory system were modelled for their impact on local air quality, particularly at Sir John Cass School. The local air quality impact was taken into account when designing the final scheme.</p> <p>Air quality improvement is now a key part of the City of London Local Implementation Plan and has been written into the following key polices:</p> <ul style="list-style-type: none"> • LIP 2011.1: To reduce the pollution of air, water and soils and excessive noise and vibration caused by transport in the City. • 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>The City has secured funding to look at potential ways to reduce emissions associated with taxi running in the City. Surveys were conducted to assess passenger and taxi cab use at ranks across the city and this was rolled out to neighbouring Boroughs.</p> <p>Funding was secured via Defra air quality grants, the GLA and City Local Implementation Plan spending to reduce the impact of traffic emissions on the children at Sir John Cass School.</p> <p>The City of London, via the Central London Sub Regional Transport Partnership, commissioned research to look at the potential impact on air quality of 20mph zones.</p>	On going
4	The City of London will model the air quality impact of further controls over taxi emissions, the use of low emission buses on routes through the City and a central and inner London Low Emission Zone.	An assessment of the air quality impact of a range of traffic management scenarios has been undertaken. The scenarios considered were different options for a central and inner London Low Emission Zone, a reduction in boiler emissions and the impact of reducing emissions from taxis. This information was used to lobby Transport for London for low emission buses in the City and further action to reduce emissions from taxis.	As a result of the taxi emission modelling, the City has secured funding for a project to look at reducing emissions associated with taxi running in the Square Mile.	2014

City of London Corporation

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
5	The City of London will investigate further options for using parking policy to promote the use of low emission vehicles in the Square Mile	No progress made to date as parking policy review was planned for 2013	Parking policy is being reviewed in 2013. This will incorporate options for using the policy to promote the use of low emission vehicles in the Square Mile.	2014
6	The City of London will continue to manage its vehicle fleet to reduce emissions of NO _x , PM ₁₀ and CO ₂ year on year.	The City of London started to manage and reduce emissions from its own fleet, and that of its contractors, in the financial year 2008/9. By 2009/10, a reduction in NO _x from vehicles of 33% had been achieved from the 2008/9 baseline, together with a reduction in PM ₁₀ of 45%. 2010/11 saw a further reduction in PM ₁₀ of 9% with NO _x levels remaining the same. The City of London has been awarded Gold member status for Transport for London's Freight Operator Recognition Scheme, which recognises good practice in freight management including the environmental impact of the fleet	The City achieved a further 7 % reduction in PM10 and 3% reduction in NO _x from its fleet.	On-going

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
7	The City of London will continue to trial alternatively fuelled vehicles and increase the number of low emission vehicles in the fleet, where appropriate.	The City of London considers the emissions profile of every new vehicle purchased. The City has been conducting a trial of Ashwoods Ecodrive+ on two vehicles. The Ecodrive+ is a device that monitors and manages driving style with a view to improving driving habits and is estimated to lead to a reduction in fuel consumption of up to 25%.	Weekly reports are received for the Ecodrive have led to an improvement in driver behaviour and a reduction in overall fuel consumption. The City trialled a stop-start petrol hybrid vehicle, two types of electric vehicle and has reduced the overall fleet number by a further two vehicles. The City also purchased an additional electric van. The City has been benchmarking its fleet management to make further efficiency savings and won Public Sector Fleet of the year for under 250 vehicles in the Green Fleet Awards 2012. The fleet manager was highly commended in the award scheme.	On-going

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
8	The City will continue to encourage its contractors to use low emission vehicles.	At the City of London, air quality is now a key component of tender questionnaires for major contracts. The City's new refuse collection contractor uses 6 plug in electric hybrid refuse collection vehicles which should lead to a 20% fuel saving. They also employ electric manual road sweepers, so the City is expecting a big reduction in emissions of NOx and PM ₁₀ going forward. The contractor has set a target reduction in carbon emissions of 35% in the first year.	<p>The Cleansing contractor has purchased a range of hybrid diesel vans and is looking at options for introducing hydrogen technology. The Cleansing contractor is working with the City Police to increase fleet efficiency and reduce fuel consumption.</p> <p>The highways contractor is working to reduce emissions associate with their fleet year on year. Their fleet comprises 10% petrol hybrid vehicles, 35% diesel hybrid and 22% of diesel vehicles with Adblu. Monthly fuel use data is submitted to the City to assist in the management and reduction of emissions.</p> <p>The air quality impact of transport is a key component of the draft parking enforcement policy document.</p>	On-going

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
9	The City of London will work with public and private bodies to develop low emission procurement guidance.	The document available at www.lowemissionstrategies.org/les_procurement_guidance.html	The City worked with Investec to produce a procurement guide for City businesses as part of the CityAir campaign. This is available on the City of London web site :www.cityoflondon.gov.uk/cityair The City published a 'low and zero emission procurement directory' for services and goods procured by the City of London. This has been made available to other local authorities and City businesses on request and is being further developed by the Central London Sub Regional Transport Partnership.	Complete

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
11	The City of London will continue with its efforts to establish effective ways to prevent drivers from leaving vehicle engines idling unnecessarily in the City	From January 2012, the City of London made a commitment to issue Fixed Penalty Notices to drivers who refuse to turn their vehicle engines off when asked to do so by authorised officers. The City undertook a widespread publicity campaign to reduce the amount of vehicle idling and has produced a set of posters aimed at specific vehicle types. Letters have been written to coach companies, taxi operators and key delivery companies to outline the requirement to turn vehicle engines off when parked. The City of London Police is supporting the City of London Corporation on this initiative.	The City has been working closely with construction sites to ensure drivers do not leave engines running. Construction sites display City of London 'no idling' posters and give leaflets out to drivers. Areas that have a problem with delivery vehicles leaving engines on have been targeted by delivering letters by hand to all businesses in the area asking them to ensure drivers of delivery vehicles turn their engines off. Other drivers are approached as officers see them as they walk around the City. The City's cleansing contractor is introducing toolbox talks to ensure drivers don't leave engines idling unnecessarily. No engine idling is also promoted through the CityAir campaign.	On-going
12	The City of London will work with the Mayor of London to designate the whole of London a no-idling zone.	The Mayor of London has not implemented this action, so the City of London has undertaken the action detailed above	No further progress	2012

City of London Corporation

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
13	The City of London will work with Transport for London to trial a method of dust suppression along the route from Victoria Embankment through to Tower Hill.	The City of London supported TfL in its trial of dust suppression along the route from Victoria Embankment through to Tower Hill. The trial ended in March 2012.	A final report was released indicating that dust suppression is most effective where there is a lot of re suspended dust e.g. at waste transfer sites, some construction sites and in tunnels.	2012
14	If dust suppression is shown to be effective at reducing PM ₁₀ concentrations, the City will consider rolling it out to other areas of concern in the Square Mile and encourage Transport for London to apply it on other roads in the City that they are responsible for, particularly Mansell Street and Farringdon Street.	The City of London worked with TfL to find a demolition site in the City to conduct a trial of dust suppression. Unfortunately the trial couldn't go ahead as the substance used for dust suppression reacts with bentonite, which is found on demolition sites.	TfL applied dust suppression to roads in the City during the Olympics. This was supported by the City of London. The City of London has undertaken a trial of targeted water suppression to reduce re suspended dust in Beech Street tunnel. Depending upon the results, the City will consider the application of CMA in the tunnel	2014
15	The City of London will continue to explore and implement energy efficiency measures to reduce emissions of carbon, NOx and PM ₁₀ from its buildings.	The City of London began to manage and reduce emissions from its buildings in the financial year 2008/9. By 2009/10, a reduction in NOx from buildings 7% had been achieved and a reduction in PM ₁₀ of 9%. 2010/11 saw a further reduction in NOx of 9 % and PM ₁₀ of 11%.	Further reduction in NOx and PM10 emissions have been made leading to an overall reduction in emissions of 15% PM10 and 14.5% NOx since the 2008/9 baseline year	On-going

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
16	The City of London will engage with City businesses to gain their support for improving air quality in the Square Mile.	The City of London has used Defra air quality grant funding to implement its CityAir project to engage local businesses in emission reduction. The work has been very successful with a range of guidance being produced. This year the concept was rolled out to the City of Westminster and Royal Borough of Kensington and Chelsea. Businesses have been very supportive with 20 organisations undertaking CityAir walking campaigns to date. CityAir has a twitter account @_Cityair. For further information see www.cityoflondon.gov.uk/cityair	The CityAir model is now being replicated by the London Borough of Wandsworth, London Borough of Camden, London Borough of Islington, City of Westminster and Royal Borough of Kensington and Chelsea. In the City over 50 premises have been engaged which represents over 40,000 employees. CityAir employee walking campaigns continue to be very popular.	2015
17	Air quality will be a consideration in all development and the City of London will require developers to undertake detailed air quality impact assessments of major developments adjacent to sensitive premises, such as residential properties, schools and St Bartholomew's Hospital. This will form part of the Environmental Impact Assessment (EIA).	This action is on-going and actively implemented	3 Environmental Impact Assessments were submitted as part of the planning application process. All show a negligible impact on air quality due to the high background levels.	On-going

City of London Corporation

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
18	Major developments will be encouraged to obtain maximum points for the pollution section of the BREEAM assessment relating to NOx emissions i.e. to meet a dry NOx emission rating of <40 mg/kWh for boilers (this is equivalent to a NOx rating >5).	This action has been very successful with all major developments now installing low NOx boilers automatically.	All new developments include proposals for a low NOx boiler, often below 40 mg/kWh	On-going
19	The City of London will develop local best practice guidance for controlling emissions from gas Combined Heat and Power plant.	This action is complete and the document will be made available on the City of London web site	Documents available and will be updated to reflect best practice	Complete
20	Developers will be encouraged to install non-combustion renewable energy technology to work towards energy security and carbon reduction targets.	This is written in to planning informatives and has become the norm for all new major developments	This is now in the City of London Core Strategy	On-going

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
21	A detailed air quality impact assessment will be required for any development where biofuel or biomass is proposed for on-site energy generation.	No such proposals were made, so no impact assessments required.	One proposal for a liquid biofuel CCHP plant was made. A detailed air quality impact assessment was requested which has still to be submitted.	On-going
22	The City of London will consider cost effective ways of minimising emissions from back up generators by the end of 2011.	This action is complete and the document will be made available on the City of London web site.	Action complete	Complete
23	Where appropriate, the City of London will secure air quality improvements through the S106 process.	This action is on-going. Where uplift from developments is likely to lead to an increase in local emissions, a contribution is sought through the Section 106 process to assist in reducing emissions locally	The City has secured £176,000 for air quality projects associated with a number of developments	On-going
24	The City of London will continue to establish best practice for minimising emissions from construction, demolition and street works and update the City of London Code of Practice for Demolition and Construction Sites to reflect this.	The City of London Code of Practice was updated in 2011 to reflect current best practice.	The Code of Practice was updated in 2013, again to reflect best practice	On-going

City of London Corporation

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
25	The City of London will pay particular attention to controlling emissions of PM ₁₀ from construction, demolition and street works in and around the route from Victoria Embankment through to Tower Hill. This is to assist the Government to achieve the PM ₁₀ Limit Value.	Demolition sites along this route have been requested to use on site machinery that conforms to Euro IIIA emission standards and consider the routes that construction vehicles take. This will be reinforced through the new Construction Logistics Plans.	This is an on going action that is applied to new sites as they are set up.	On-going
26	The City of London will assist the Mayor of London to update the Greater London Authority and London Councils' Best Practice Guide for Controlling Dust and Emissions from Construction and Demolition.	The City of London was part of a review group in 2011 that was established to update the guidance	No further action during 2012, awaiting consultation draft	2013

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
27	The City of London will encourage the use of green walls and green roofs in new and existing buildings, particularly in close proximity to the priority location Victoria Embankment, Upper and Lower Thames Street through to Tower Hill.	The City is implementing this action through the development control process	Four planning applications were approved with green roofs in the last 12 months	On-going
28	The City of London will continue to increase public understanding of poor air quality through initiatives such as pollution alert systems and its work with City businesses.	<p>The City of London continues to be a member of airTEXT which provides air pollution alerts for vulnerable people. The City used Defra air quality grant funding to support the production of an air quality video by Kings College London and the alterations to their web site following the change in the air quality banding system.</p> <p>www.londonair.org.uk/london/asp/news.asp?NewsId=AQIndexfilm&StartIndex=1</p> <p>The City of London held a stakeholder event at the Guildhall to mark World Environmental Health Day, the theme of which was air quality.</p> <p>The City has also used Defra air quality grant funding to embark on an air quality publicity campaign to persuade the public that we can all take action to improve air quality</p>	158 people have signed up to Airtex alerts for the Square Mile and 3560 for the central London area. Alert information is also available via Londonair smart phone apps and Google chrome. The City of London is developing its own Smartphone App to provide advice and information on air quality in the Square Mile.	On-going

City of London Corporation

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
29	The City of London will continue to promote, reward and disseminate best practice for tackling poor air quality through the Sustainable City Awards and the Considerate Contractor Scheme Environment Award.	The Sustainable City Award for Air Quality and Considerate Contractors Environment Award are both run on an annual basis	The 2012 winner of the SCA for Air Quality was the greater London Authority and Transport for London for their work on the Clean Air Fund 1. The runner up was Close the Door Campaign. The 2012 winner of the CCS Environment Award will be announced in May 2013, it was delayed due to the Olympics. CityAir information was made available to businesses at the Clean City Awards event and there will be a specific air quality award for 2013 to mark European Year of Air.	On-going
30	The City will continue to work in partnership with key organisations to develop local, regional and national air quality policy.	The City of London continues to be an active member of the central London air quality cluster group, is a member of the Environmental Protection UK air quality committee was a member of the Health Protection Agency Group for air quality during the Olympics.	The City is an active member of the Central London Sub Regional Transport Partnership and has been working on joint air quality projects. The City also worked with other London Boroughs and the University of Newcastle and Kings College London on a research project to look at vehicle emissions in urban areas.	On-going

City of London Corporation

No.	Action	Progress to Date	Progress in Last 12 Months	Estimated Completion Date
31	The City of London will continue to lobby the Mayor of London and the Government to ensure that the Limit Values for PM ₁₀ and nitrogen dioxide are met in the Square Mile.	The City of London wrote to the Mayor of London in 2012 to register concern over taxi emissions. The City also hosted a breakfast meeting in March 2012 for City of London, London Borough of Camden and City of Westminster officers and politicians to advance closer working between the authorities and develop an improved dialogue with the Greater London Authority and Transport for London.	The City wrote to the Mayor about taxi emissions, which is a key area of concern. Representatives from the City attended a further meeting with London Borough of Camden, City of Westminster and GLA/ TfL representatives and has signed up to a joint letter to be sent to Defra from all London Boroughs	On-going

9 Conclusions and Proposed Actions

9.1 Conclusions from New Monitoring Data

Nitrogen dioxide was monitored at ten sites in the City, and the annual mean objective was exceeded at nine out of ten sites. This was similar to results in previous years. The hourly mean objective for NO₂ was exceeded at three of the four continuous monitoring sites; Beech Street, Walbrook Wharf roof and roadside sites. This has occurred in previous years.

PM₁₀ was monitored at three sites in the City. The annual mean objective was not exceeded at any site, and the 24-hour mean objective was exceeded at Upper Thames Street and Beech Street. This is the first year the Beech Street Site has exceeded the 24hour mean. This exceedence at Beech Street may be attributable to an increase in traffic flow as a result of road closures associated with Crossrail construction works and this will be investigated during 2013. PM₁₀ levels were higher prior to 2008, when the new volatile correction model (VCM) was first used.

A detailed assessment is not required and it is not appropriate to revoke the AQMA.

9.2 Proposed Actions

The new monitoring data from 2012 has not identified the need to proceed to a detailed assessment for any pollutant. The data has not identified a need for any additional monitoring. There are no changes required for any existing AQMAs.

The next course of action will be to continue to implement the actions set out in the City of London Air Quality Strategy 2011-2015, and to submit another progress report in early 2013, which will discuss the monitoring data collected during 201.

The City of London will investigate the potential reasons behind the exceedence of the PM10 daily mean at Beech Street.

10 References

London Air Quality Network. 2012. Statistics.

www.londonair.org.uk

City of London air quality management documentation, including the City of London Air Quality Strategy 2011-2015

www.cityoflondon.gov.uk/air

The Volatile Correction Model

www.volatile-correction-model.info

Diffusion tube inter-comparison exercise

<http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

Laboratory WASP Results

<http://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>

Appendices

Appendix A: Quality Assurance / Quality Control (QA/QC) Data

- Diffusion Tubes:
 - Diffusion Tube Bias Adjustment Factors
 - Factor from Local Co-location Studies (if available)
 - Discussion of Choice of Factor to Use
- PM Monitoring Adjustment
- Short-term to Long-term Data adjustment
- QA/QC of Automatic Monitoring
- QA/QC of Diffusion Tube Monitoring

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

Tubes supplied by:	Bureau Veritas
Analysed by:	Gradko International Ltd.
Method:	50% TEA v/v in Acetone / analysed using U.V. Spectrophotometry.
adjustment:	The 2012 LWEP Bias Adjustment factor was used, supplied by Bureau Veritas.

Factor from Local Co-location Studies (if available)

There were no co-location studies conducted in 2012.

Discussion of Choice of Factor to Use

The LWEP bias adjustment factor was used as it is the most appropriate factor to use for London sites (Bias factor of 1.04); the National factor available is 1.01 and is more conservative. The results would have been slightly lower using the National factor so the use of the LWEP factor provides a worse case scenario; however, the sites exceeding the annual average would still have exceeded using the National factor.

PM Monitoring Adjustment

PM₁₀ data from the two TEOM sites (CT4 Beech Street and CT8 Upper Thames Street) has been adjusted using the Volatile Correction Model (VCM). PM_{2.5} data from the BAM at Farringdon Street has been divided by a factor of 1.21, in accordance with guidance.

Short-term to Long-term Data adjustment

The NO₂ annual mean value at CT1 was “annualised” as in Box 3.2 of TG(09) (<http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38>), as valid data was capture less than 75%. The un-annualised mean was 50(µg/m³) and the ratio used was 1.045 derived from data as follows:

AURN Site	Annual Mean (Am)	Period Mean (Pm)	Ratio (Am/Pm)
Kensington - North	35.9	33.7	1.065
Camden - Bloomsbury	50.8	49.9	1.018
		Average Ratio	1.045

QA/QC of Automatic Monitoring

Site	Data Management:	Site Serviced and repaired by:	Site audited by:	CoL Calibration / Maintenance
CT1 (Senator)	Kings College	SupportingU (every 6 months)	National Physics Laboratory (every 6 months)	Every 2 weeks
CT2 (Farringdon)	City of London	Enviro-technology (every 6 months)	--	Filter change every 8 weeks
CT3 (SJC)	Kings College	SupportingU (every 6 months)	National Physics Laboratory (every 6 months)	Every 2 weeks and BAM filter change every 8 weeks
CT4 (Beech St NOx)	City of London	SupportingU (every 6 months)	--	Every 2 weeks
CT4 (Beech St PM10)	Kings College	SupportingU (every 6 months)	--	Filter change
CT6a (Walbrook Foyer)	Kings College	SupportingU (every 6 months)	National Physics Laboratory (every 6 months)	Every two weeks
CT6b (Walbrook Roof)	City of London	SupportingU (every 6 months)	--	Every two weeks
CT8 (UTS)	Kings College	SupportingU (every 6 months)	National Physics Laboratory (every 6 months)	Filter change

QA/QC of Diffusion Tube Monitoring

Gradko International is a UKAS accredited laboratory and participates in the Workplace Analysis Scheme for Proficiency (WASP) for NO₂ diffusion tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance. In the latest available WASP results, rounds January to December 2012) Gradko International Ltd have scored have scored 100% (ref: <http://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>). The percentage score reflects the results deemed to be satisfactory based upon the z-score of < ± 2. The tube precision for the NO₂ Annual Field Inter-comparison at Marylebone Road was rated as 'good'.

(ref: <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>)

Appendix B: Pollution Episodes in London during 2012

Pollution Episode	Date
Winter Smog	Mid-January
PM _{10 / 2.5}	Late January Early February Early March Mid-march Late March
PM ₁₀ / Ozone	Mid-May
High Ozone	24 th July 2012
Ozone	24 th July Early August
PM _{10/2.5}	Late October Mid-November
Wintertime Smog	Mid-December