City of Westminster

2015 Air Quality Report

Updating and Screening Assessment & Air Quality Action Plan Progress Report

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

April 2015

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This report will be available on the Westminster City Council web site at:
www.westminster.gov.uk/airquality

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1 Introduction

This report fulfils the following statutory reporting duties:

- 2015 Air Quality Update and Screening Assessment
- 2015 Air Quality Progress Report

1.1 Description of Local Authority Area

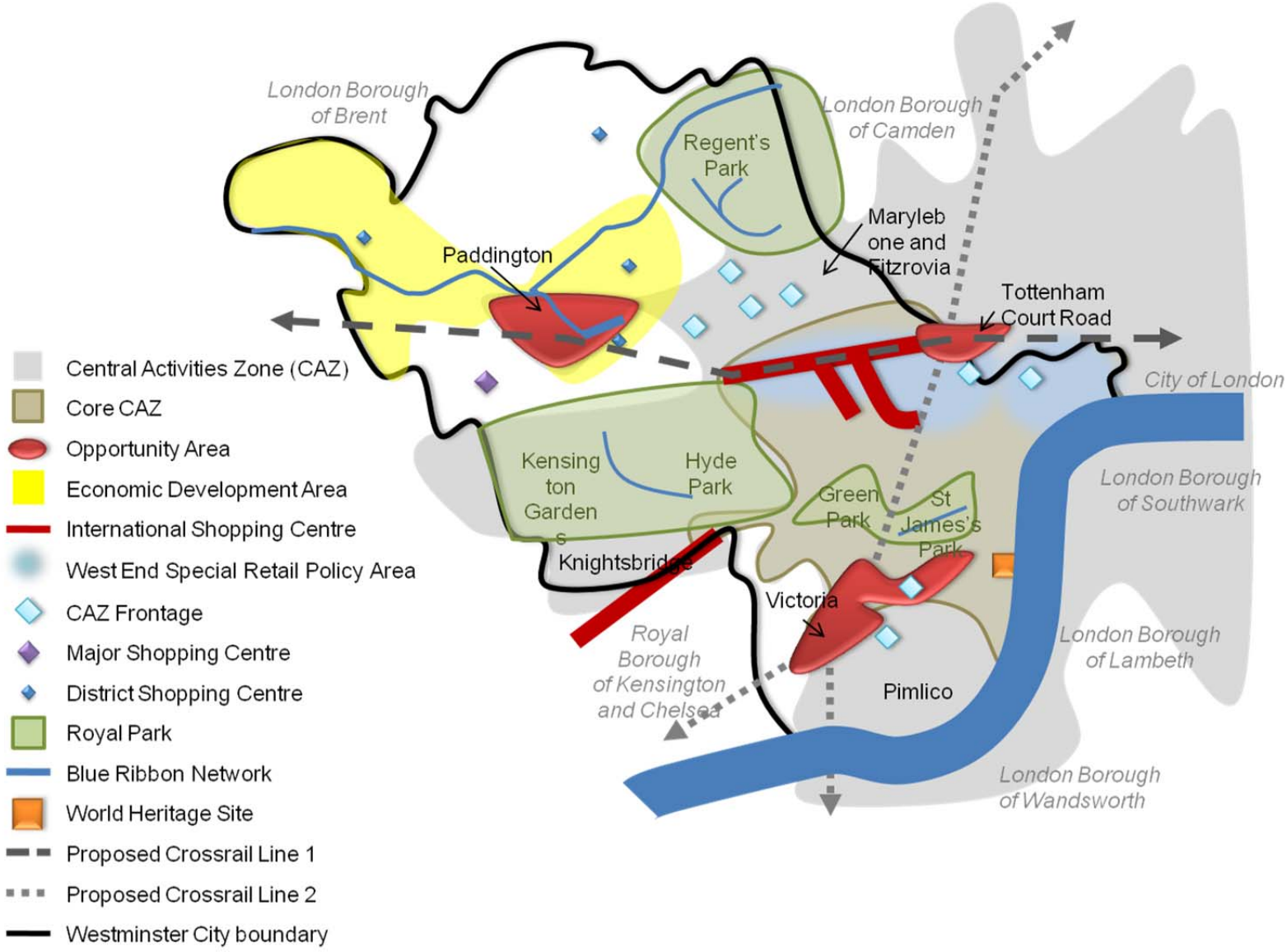
Westminster is home to a growing resident population which is expected to rise from 228,000 in 2014 to 254,600 in 2030. The population also swells to more than 1 million during the day with the influx of workers and visitors. Westminster has approximately 673,000 employees (expected to rise to 750,000 by 2036) – the most of any other London borough by some distance, representing 13% of London's workforce and nearly twice the amount when compared to the second highest London borough, which is the City of London.

Commercial activities can be found throughout the City but are concentrated in the Central Activities Zone and in the Paddington, Victoria and Tottenham Court Road Opportunity Areas. To the north and west of the Central Activities Zone and to its south as far as the River Thames, housing, in a wide variety of built forms, is the principal land use. Westminster has some of the most expensive housing in the country in places such as Belgravia, Knightsbridge and St. John's Wood but also has some of the worst deprivation in areas such as Church Street, Harrow Road and Queen's Park.

All or most of five Royal Parks are within Westminster, as are 21 historic squares and gardens, over 11,000 listed buildings and conservation areas which cover 75% of the Borough's area. The River Thames forms the southern boundary of the Borough. Westminster has four of London's main line railway termini with two, Paddington and Victoria, having direct connections to airports and ten out of twelve London Underground lines, including the network's busiest underground station at Victoria.

In common with many other urban areas, Westminster suffers from poor air quality. This is a result of the millions of vehicles that travel through the area and the dense network of roads and buildings which not only emit pollution, but also prevent pollution from dispersing. In addition to pollution from transport, domestic and commercial sources such as heating contribute greatly to the overall levels of pollution. Background pollution generated elsewhere also contributes to the concentrations that are measured in Westminster. Sources can be both man-made and natural, and are closely linked to weather systems and the geography of the area.

Figure 1.1 Westminster's Key Diagram

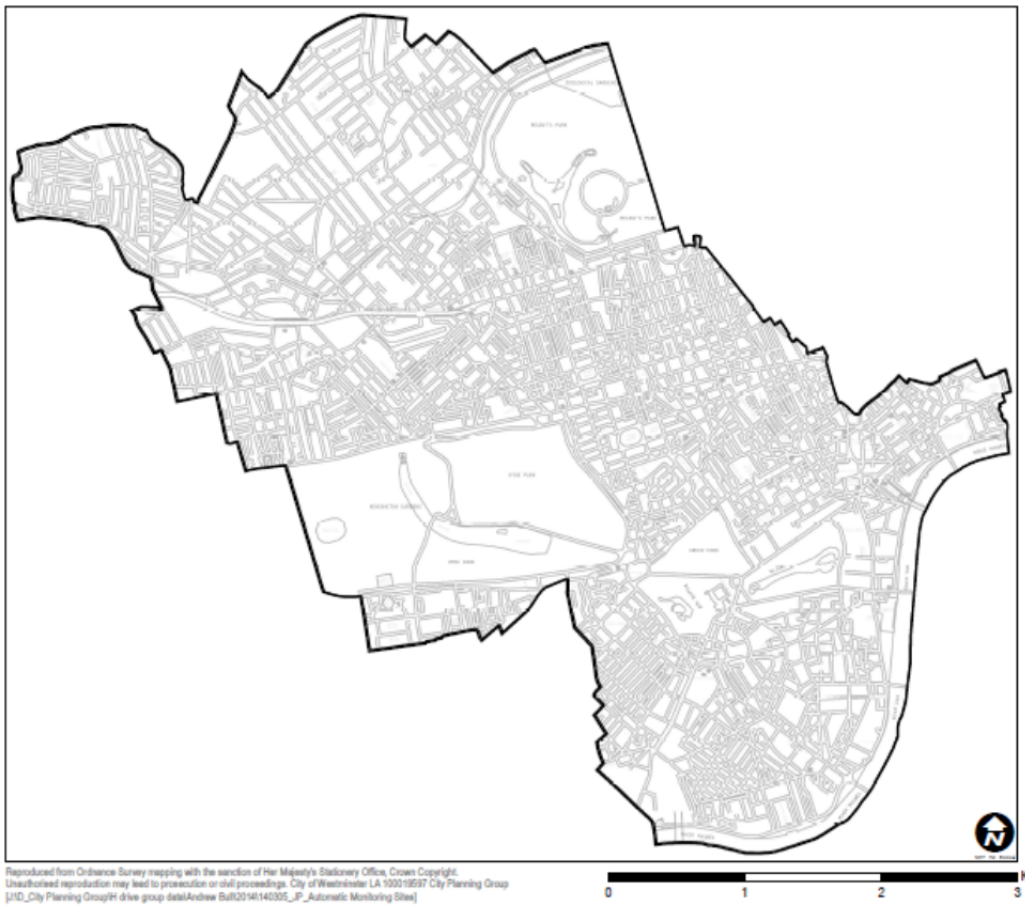


1.2 Purpose of Progress Report

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.

Figure 1.2 Map of AQMA Boundary



1.3 Air Quality Objectives

The air quality objectives, as set out in the Air Quality (England) Regulations 2000 (SI 928) and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043), are shown in the following table.

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

Table 1.2 Summary of Previous Air Quality Reports

Report	Date Published
First round Review and Assessment	1998
Declaration of borough-wide AQMA for NO_2 and PM_{10}	Mar 1999
Air Quality Strategy and Action Plan (AQSAP)	Jan 2001
Further Assessment (Stage 4b)	Jan 2003
Update and Screening Assessment (USA) 2003	Dec 2003
Progress Report 2004	Apr 2004
Detailed Assessment (SO_2 at Paddington Station)	Apr 2005
Progress Report 2005	Jul 2005
Progress Report 2006	Apr 2006
Review of Monitoring (AEA Technology)	Mar 2007
Progress Report 2007	May 2007
Progress Report 2008	Apr 2008
Modelling and Source Apportionment	Aug 2008
Developing a new AQSAP - Consultation	Aug 2008
Update and Screening Assessment 2009	Aug 2009
Air Quality Action Plan Progress Report 2009	Aug 2009
Progress Report 2010	Aug 2010
Progress Report 2011	April 2012
Air Quality Action Plan 2013 - 2018	April 2013
Update and Screening Assessment (USA) 2012	June 2013
Air Quality Action Plan Progress Report 2012	June 2013
Ten Year Air Quality Monitoring Summary 2004 to 2013 & 2013 and 2014 Air Quality Progress Report	April 2014

2 Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

In 2014 we monitored air quality at four monitoring sites, as detailed in Table 2.1. Two are Defra managed 'Automatic Urban and Rural Air Quality Network' (AURN) sites: one located on Marylebone Road, adjacent to the University of Westminster, the other near Horseferry Road, adjacent to the Westminster Mortuary and Coroner's Court.

Two additional sites are operated by the Council: one situated in Oxford Street and one in the Victoria Palace Theatre in Victoria Street. Both sites form part of the London Air Quality Network (LAQN) and the QA/QC standards are similar to those of the AURN. Regular calibrations are carried out and data ratification is undertaken by King's College London.

2.1.1 Non-Automatic Monitoring Sites

There are no non-automatic monitoring sites in Westminster.

Figure 2.1 Map of Current Automatic Monitoring Sites.

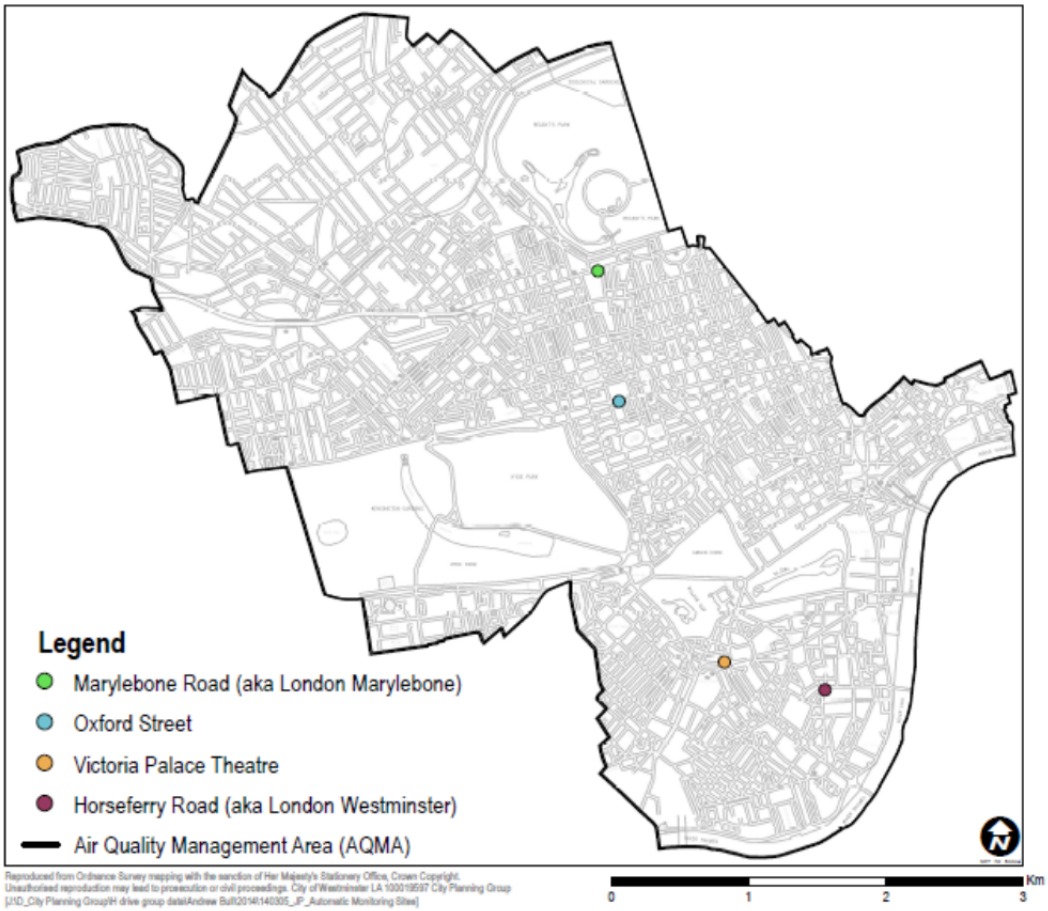


Table 2.1 Details of Automatic Monitoring Sites

Site Location	Site Type	X/Y OS Grid Reference	Inlet Height (m)	Pollutants Monitored/ Monitoring Technique	In AQMA?	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?
Marylebone Road	Kerbside	528121 182015	2.5m	NO_2, $PM_{10,}$ $PM_{2.5}$	Y	Y (0m)	1.5m	Y
Horseferry Road	Urban Background	529778 178960	3m	NO_2, $PM_{2.5}$	Y	Y (0m)	N/A	N
Oxford Street	Kerbside	528276 181065	1.5m	NO_2	Y	Y (0m)	1m	Y
Victoria Palace Theatre	Urban Background	529045 179163	7m	NO_2	Y	Y (12m)	12	N

All sites are within the AQMA boundary and representative of public exposure.

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

Automatic Monitoring Data

- During 2014 NO_2 was automatically monitored at a total of four sites in Westminster.

- The NO_2 annual mean objective was exceeded at Marylebone Road, Oxford Street and Victoria Street and met at Horseferry Road with a borderline concentration of 39 $\mu g/m^3$.

- The NO_2 hourly mean objective was exceeded at Marylebone Road and Oxford Street and was met Horseferry Road and Victoria Street. Levels of NO_2 in Oxford Street were over three times the annual objective and over 80 times the hourly objective.

- All NO_2 monitoring sites are representative of public exposure. Westminster has a borough-wide AQMA so all sites fall within its boundary.

- The instrument used is a chemiluminescent analyser designed to measure the concentration of nitric oxide (NO), total oxides of nitrogen (NO_X) and, by calculation, nitrogen dioxide (NO_2).

- Data which is not fully ratified is presented in italics. Data which exceeds the objectives is presented in bold.

Table 2.2 Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2013 %	Annual Mean Concentration (µg/m^3)
Marylebone Road	Kerbside	Y	*>90*	***79***
Horseferry Road	Urban Background	Y	*>90*	*39*
Oxford Street	Kerbside	Y	*73**	***141***
Victoria Street	Urban Background	Y	*>90*	***55***

* Where data capture was below 90%, this is due to periodic maintenance issues, not a monitoring period of less than a full year; therefore, annual means have not been annualised.

Table 2.3 Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2013 %	Number of Hourly Means > 200µg/m^3
Marylebone Road	Kerbside	Y	*>90*	*12*
Horseferry Road	Urban Background	Y	*>90*	*0*
Oxford Street	Kerbside	Y	*73**	***1503(393)***
Victoria Street	Urban Background	Y	*>90*	*3*

99.8th percentile of hourly mean in brackets where data capture is less than 90%.

Trends in Annual Mean NO_2 Concentrations Measured at Automatic Monitoring Sites

The table below shows the NO_2 annual means over the last decade. As can be seen, at both the Marylebone Road kerbside site and the Horseferry Road urban background site there is an apparent decreasing NO_2 annual mean concentration trend. At the Horseferry Road site, concentration levels are borderline and on some years the objective is met, albeit by a small margin. At Oxford Street and Marylebone Road, concentrations are still significantly higher than the objective level, although the downward trend at Marylebone Road is encouraging.

Table 2.4 2004 – 2014 Summary Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Marylebone Road	**109**	**112**	**110**	**102**	**115**	**107**	**98**	**97**	**94**	**80**	***79***
Horseferry Road	**46**	**48**	**50**	37	**40**	**44**	**49**	**41**	39	**46**	*39*
Oxford Street	-	-	-	-	-	-	-	-	-	**126**	***141***
Victoria Street	-	-	-	-	-	-	-	-	-	-	***55***

Particulate Matter (PM_{10})

- During 2014, PM_{10} was monitored at two sites: Marylebone Road and Horseferry Road.
- The PM_{10} annual mean objective and 24 hour mean objective were met at all monitoring sites.
- All sites are representative of public exposure. Westminster has a borough wide AQMA so all sites fall within its boundary.
- Data which is not fully ratified is presented in italics. Data which exceeds the objectives is presented in bold.

Table 2.5 Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Monitor	Valid Data Capture 2014 %	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m^3)
Marylebone Road	Kerbside	Y	TEOM+FDMS	*>90*	Y	26
Horseferry Road	Urban Background	Y	TEOM+FDMS	*>90*	Y	18

Table 2.6 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Monitor	Valid Data Capture 2014 %	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m^3
Marylebone Road	Kerbside	Y	TEOM+FDMS	*>90*	Y	14
Horseferry Road	Urban Background	Y	TEOM+FDMS	*>90*	Y	5

Trends in Annual Mean PM_{10} Concentrations Measured

- The table below shows the PM_{10} annual mean concentrations over the last decade. As can be seen, at the Marylebone Road kerbside site and the Horseferry Road urban background site there is an apparent decreasing PM_{10} annual mean concentration trend, to the point that the annual objective of 40 µg/m^3 is consistently achieved. This continued downward trend is likely to be largely due to improving vehicle engine standards and is very encouraging.

Table 2.7 2004 – 2014 Summary Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site	Monitor	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Marylebone Road	TEOM+FDMS	33	33	33	41	35	34	32	38	31	*29*	*26*
Horseferry Road	Gravimetric (2004-2008), TEOM+FDMS (2008-2013)	25	28	28	28	22	15*	21*	19	18	*18*	*18*

2.2.2 Other Pollutants Monitored

Historic monitoring of the following pollutants has shown that concentration levels in Westminster consistently achieve the required objectives. These are not pollutants of concern within Westminster and, therefore, the Council no longer reports on them.

- Sulphur Dioxide
- Benzene
- 1,3 Butadiene
- Lead in air
- Carbon Monoxide

2.2.3 Summary of Compliance with AQS Objectives

Westminster City Council has examined the results from monitoring in the City of Westminster.

Concentrations within the AQMA still exceed the annual and hourly means for nitrogen dioxide and the AQMA should remain. Concentrations within the AQMA largely achieve the annual and daily means for PM_{10}.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Westminster City Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

Westminster City Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

Westminster City Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

Westminster City Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

Westminster City Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

Westminster City Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

Westminster City Council confirms that there are no new relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

Westminster City Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

Westminster City Council confirms that there are no new locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

Westminster City Council confirms that there are no new locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

Westminster City Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

Westminster City Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

Westminster City Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

Westminster City Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

Westminster City Council confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry Farms

Westminster City Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Westminster City Council confirms that there are no biomass combustion plant in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

Westminster City Council confirms that there are no biomass combustion plant in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

Westminster City Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Westminster City Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Implementation of Air Quality Action Plan

8.1 Background

The Council has committed to take action to improve air quality for over a decade, adopting its first Air Quality Action Plan in 2001. In April 2013, the Council adopted its revised Air Quality Action Plan which aims to deliver real improvements in air quality and build on our successes to better equip ourselves for a sustainable future. The Action Plan can be viewed at www.westminster.gov.uk/airquaity/aqap

A summary of progress to date is given in Appendix B.

9 Conclusions and Proposed Actions

9.1 Conclusions from New Monitoring Data

- Concentrations within the AQMA still exceed the annual and hourly means for NO_2 and the AQMA should remain.

- Concentrations within the AQMA achieve the annual and daily means for PM_{10} and the Council will be considering data with a view to undertaking a Detailed Assessment for revocation of the AQMA for PM_{10} in due course.

- No further Detailed Assessment is required at this time.

9.2 Conclusions relating to New Local Developments

- The assessment of new local sources and developments has not identified any significant impacts on air quality**. It is concluded that it will not be necessary to proceed to Detailed Assessment.**

9.3 Proposed Actions

- Because no amendments to the AQAM and no new local sources have been identified, **no Detailed Assessment is required for any pollutant**.

- The next formal course of action will be the completion of the 2016 report.

Appendix A: QA:QC Data

Horseferry Road and Marylebone Road monitoring sites are AURN sites and therefore have AURN QA/QC procedures.

For all other sites, monitoring data is collected, validated and ratified by ERG, King's College London. QA/QC procedures are similar to those of the AURN network. Calibrations are carried out by a Local Site Operator from City of Westminster on a fortnightly schedule.