2009 Air Quality Updating and Screening Assessment for London Borough of Camden

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

August 2009

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Executive Summary

The Updating and Screening Assessment has shown that Camden continues to breach the annual mean NO_2 air quality objective. The use of the VCM model has resulted in a reduction in daily mean PM_{10} exceedences, as such the Council now complies with the daily mean PM10 objective. Continuous and diffusion tube NO_2 monitoring have revealed that the short term NO_2 objective has failed to be achieved at a number of roadside locations over the past few years. The Council will process to detailed assessment to determine the extent to which the hourly NO_2 objective is breached across the borough.

There have been no new or significantly changes emission sources have been identified which have the potential to negative impact any of the air quality objectives.

The Council will proceed to Detailed Assessment and submit an action plan Progress Report in due course.

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1 Introduction

1.1 Description of Local Authority Area

Camden is approximately 22km^2 in size and is situated north of the River Thames. Camden experiences some of the poorest air quality London, especially towards the south of the borough where traffic and congestion is severe. The north of the borough in contrast is less congested, and there are more open spaces and parks, of which particular areas have been designated as Sites of Special Scientific Interest (SSSI). Air pollution in these areas is generally lower resulting in improved air quality..

1.2 Purpose of 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.

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 μg/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 Local Air Quality Management in England.

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene			
	16.25 $\mu g/m^3$	Running annual mean	31.12.2003
	5.00 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Stages 1 and 2 the review and assessment process were completed in June 1998. Stage 3 was finalised in 2000 and concluded that there were likely to be exceedences of the fine particle and nitrogen dioxide objectives. On this basis, the Council declared the whole borough an Air Quality Management Area (AQMA) and carried out a Stage IV further assessment of air quality.

The Council produced its first Air Quality Action Plan in September 2002 which has been revised and updated in July 2009.

The second and third round of review and assessment was carried out in 2003 and 2006, and respectively identified no significant changes in air pollution levels or new emissions sources, as a result detailed assessment was not required.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Changes to monitoring equipment

A Filter Dynamics Measurement System (FDMS), used to measure particulate matter, has been installed at London Bloomsbury (Nov 2008) and Swiss Cottage (Feb 2009). The new FDMS monitors have replaced the TEOMs at both sites and now measure $PM_{2.5}$ as well as PM_{10}. The TEOMs were replaced with the FDMS to ensure monitoring is fully equivalent with the European Gravimetric Standard Method. There have been no changes to the monitoring equipment at Shaftesbury Avenue.

PM_{10} data recorded before 2004 has been corrected using the 1.3 factor, after this the Volatile Correction Model (VCM) has been used to correct the data.

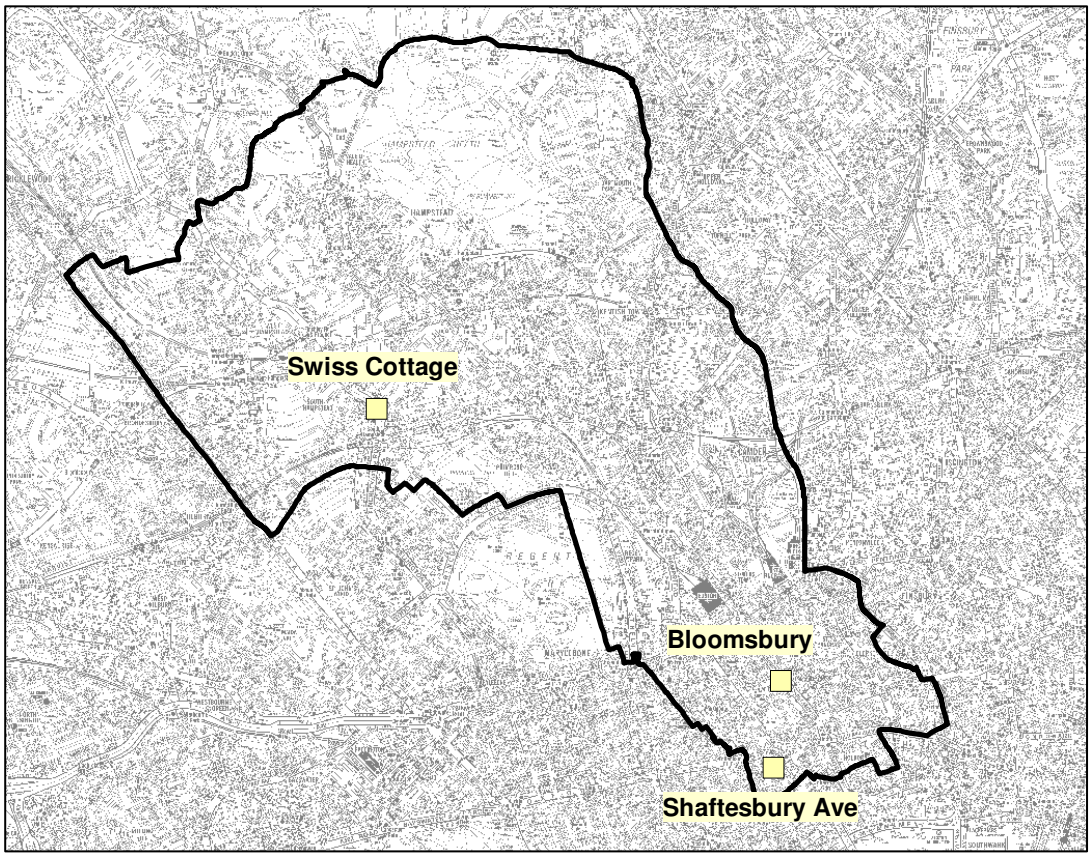
Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location ?
London Bloomsbury	Urban background	X 530120 Y 182034	NO_2, PM_{10}, $PM_{2.5}$, SO_2, CO, O_3, Benzene	Y	Y (40m)	27m	N/A
Swiss Cottage (Finchley Rd)	Kerbside	X 526633 Y 184392	NO_2, PM_{10}, $PM_{2.5}$	Y	Y (7m)	<1m	Y
Shaftesbury Avenue	Roadside	X 530060 Y 181290	NO_2, PM_{10}, $PM_{2.5}$	Y	Y (1m)	3m	Y

Monitoring stations are calibrated every fortnight at Swiss Cottage and Shaftesbury Avenue by Camden staff. The London Bloomsbury monitoring station is calibrated by Bureau Veritas as part of the AURN.

All site audits are carried out by the National Physics Laboratory and all monitors are covered by a service contract with SupportingU. Data validation and ratification for all of Camden's automatic monitoring sites is carried out by King's College ERG.

Figure 2.1: Map of automatic monitoring locations



2.1.2 Non-Automatic Monitoring

Diffusion tubes are deployed across the borough to monitor nitrogen dioxide concentrations. The 2008 programme consisted of twenty-two sites; there locations can be shown in Table 2.2. Three new sites were set up in 2008 (Camden Road, Bloomsbury Street and Goodge Street) and one site was discontinued - Lincoln's Inn Field.

The diffusion tube results have been bias corrected on the basis of triplicate tubes co-located with a chemi-luminescent analyser at Swiss Cottage. The bias adjustment factor was calculated in accordance with the methodology stated in TG09.

Gradko Environmental supplies, prepares (50% TEA and acetone method) and analyses Camden's diffusion tubes. This laboratory participates in the UK National Diffusion Tube Network and the Workplace Analysis Scheme for Efficiency. Gradko currently holds UKAS accreditation for analysis of diffusion tubes and participates in the Health and Safety Laboratory's Workplace Analysis Scheme for Proficiency (WASP).

Table 2.1.2: Details of Non- Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA ?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location ?
CA1	Roadside	X 530210 Y 182762	NO_2	Y	Y (1m)	10m	Y
CA2	Roadside	X 529133 Y 182695	NO_2	Y	Y (m)	15m	Y
CA3	Roadside	X 528215 Y 185637	NO_2	Y	Y (2m)	5m	Y
CA4	Roadside	X 530110 Y 182795	NO_2	Y	Y (1m)	5m	Y
CA5	Roadside	X 529395 Y 182567	NO_2	Y	Y (4m)	1m	Y
CA6	Urban background	X 530430 Y 182430	NO_2	Y	Y (18m)	30m	Y
CA7	Urban background	X 526213 Y 185519	NO_2	Y	Y (6m)	30m	Y
CA8	Urban background	X 528588 Y 186249	NO_2	Y	Y (m)	25m	Y
CA9	Roadside	X 529671 Y 181970	NO_2	Y	Y (4m)	2m	Y
CA10	Urban background	X 529880 Y 182334	NO_2	Y	Y (35m)	25m	Y
CA11	Kerbside	X 529568 Y 181728	NO_2	Y	Y (4m)	<1m	Y
CA13	Urban background	X 529977 Y 182809	NO_2	Y	Y (3m)	20m	Y
CA14	Urban background	X 530120 Y 182034	NO_2	Y	Y (40m)	20m	Y
CA15	Kerbside	X 526633 Y 184392	NO_2	Y	Y (7m)	<1m	Y
CA16	Roadside	X 529013 Y 185102	NO_2	Y	Y (1m)	1m	Y
CA17	Roadside	X 526547 Y 185125	NO_2	Y	Y (5m)	5m	Y
CA18	Kerbside	X 528672 Y 183642	NO_2	Y	Y (4.5m)	<1m	Y
CA19	Roadside	X 528815 Y 183909	NO_2	Y	Y (4m)	15m	Y
CA20	Roadside	X 529914 Y 183147	NO_2	Y	Y (9m)	<5m	Y
CA21	Roadside	X 529962 Y 181620	NO_2	Y	Y (4m)	<1m	Y
CA22	Roadside	X 529488 Y 181719	NO_2	Y	Y (4m)	<1m	Y
CA23	Roadside	X 529173 Y 184129	NO_2	Y	Y (5m)	<1m	Y

2.2 Comparison of Monitoring Results with AQ Objectives

PM_{10} Measurements

The annual mean air quality standard for PM_{10} was met at all three automatic monitoring sites in 2008. There has only been one exceedence of the annual mean since monitoring began, which occurred at Swiss Cottage in 1997. Shaftesbury Avenue has the next highest annual mean of 40µg/m^3 in 2007. There are two other borderline cases one being at London Bloomsbury in 1996, and then at Shaftesbury Avenue in 1997, both of which recorded annual means of 39µg/m^3. London Bloomsbury has the lowest annual means overall which is mainly due to its background location.

The majority of breaches of the 24hr objective occurred at London Bloomsbury during 1993 – 1997. There were 51 days over the 24hr limit at Swiss Cottage in 1997. This was the highest number of exceedences recorded at any sites. There were breaches in 2001 at Shaftesbury Avenue and again in 2003, with exceedences also occurring at Swiss Cottage during this year.

All the exceedences occurred in years when monitoring took place on a TEOM with the 1.3 correction factor applied. The data from 2004 onwards has been corrected using the VCM and no breaches have arise during this time.

All the identified exceedences have occurred within the AQMA.

Table 2.2a: PM_{10} Automatic Monitoring Measurements taken on TEOM corrected with 1.3 factor

	London Bloomsbury			Swiss Cottage			Shaftesbury Avenue		
Year	Data Capture	Annual Mean	Days > 50µg/m3	Data Capture	Annual Mean	Days > 50µg/m3	Data Capture	Annual Mean	Days > 50µg/m3
1993	97	37	**29**	-	-	-	-	-	-
1994	98	35	**21**	-	-	-	-	-	-
1995	93	37	**22**	-	-	-	-	-	-
1996	92	39	**30**	-	-	-	-	-	-
1997	96	35	**8**	99	**42**	**51**	-	-	-
1998	94	30	0	82	32	0	-	-	-
1999	96	28	0	94	34	0	-	-	-
2000	97	28	0	98	33	0	-	-	-
2001	97	29	0	99	33	0	98	36	**6**
2002	36	37	0	99	31	0	98	34	0
2003	58*	30*	0*	99*	35*	**13***	97*	39*	**34***

* Data not fully ratified

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Table 2.2b: PM_{10} Automatic Monitoring Measurements taken on TEOM corrected on VCM

	London Bloomsbury			Swiss Cottage			Shaftesbury Avenue		
Year	Data Capture	Annual Mean	Days > 50µg/m3	Data Capture	Annual Mean	Days > 50µg/m3	Data Capture	Annual Mean	Days > 50µg/m3
2004	66	19	0	63	23	0	67	24	0
2005	71	20	0	75	26	0	67	24	0
2006	95	20	0	85	25	0	76	25	0
2007	87	21	0	98	24	0	90	26	0
2008	84*	19*	0*	92*	23*	0*	99*	24*	0*

* Data not fully ratified

Table 2.2.1: NO_2 Automatic Monitoring Measurements

	London Bloomsbury			Swiss Cottage			Shaftesbury Avenue		
Year	Data Capture	Annual Mean	Hours > 200µg/m3	Data Capture	Annual Mean	Hours > 200µg/m3	Data Capture	Annual Mean	Hours > 200µg/m3
1993	94	**65**	0	-	-	-	-	-	-
1994	96	**65**	0	-	-	-	-	-	-
1995	93	**68**	**8**	-	-	-	-	-	-
1996	96	**69**	0	-	-	-	-	-	-
1997	96	**70**	**6**	95	**74**	**51**	-	-	-
1998	95	**65**	0	97	**63**	0	-	-	-
1999	92	**67**	0	97	**65**	0	-	-	-
2000	96	**59**	0	96	**63**	0	-	-	-
2001	97	**51**	0	99	**66**	0	97	**74**	0
2002	9	**42**	0	8	**64**	0	99	**68**	0
2003	68	**56**	0	44	**65**	-	97	**70**	0
2004	98	**58**	0	39	**70**	-	95	**72**	0
2005	94	**57**	0	85	**76**	0	82	**75**	0
2006	93	**57**	0	97	**71**	**21**	76	**72**	0
2007	78	**61**	0	97	**77**	**95**	93	**75**	**6**
2008	99*	**54***	0*	94*	**75***	**56***	98*	**78***	0*

* Data not fully ratified

The annual NO_2 mean objective has been exceeded at all sites for all years that monitoring has taken place. London Bloomsbury displays the lowest annual means due to its background location. Swiss Cottage and Shaftesbury Avenue both follow a similar trend from 2005 onwards. However in 2008, levels rose slightly at Shaftesbury Avenue but decreased at Swiss Cottage. Concentrations at London Bloomsbury decreased between 1999 and 2002. After a steep rise in 2003, levels plateau with a decrease occurring in 2008.

The hourly objective has been exceeded for the last the years at Swiss Cottage, with a very high number of hours over the limit recorded in 2007. Shaftesbury Avenue has only had one breach which occurred in 2007. Two exceedences of the objective limit at London Bloomsbury were recorded in 1995 and 1997. All the identified exceedences have occurred within the AQMA.

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

The annual mean objective for nitrogen dioxide was exceeded at all sites. The hourly objective was only breached at Swiss Cottage in 2008.

Table 2.3a Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 (%)	Annual mean concentrations (µg/m^3)
				2008
BLO	London Bloomsbury	Y	99	**54**
CD1	Swiss Cottage	Y	94	**75**
CD3	Shaftesbury Avenue	Y	98	**78**

Table 2.3b Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 (%)	Number of Exceedences of hourly mean (200 µg/m^3)
				2008
BLO	London Bloomsbury	Y	99	0
CD1	Swiss Cottage	Y	94	**56**
CD3	Shaftesbury Avenue	Y	98	0

Diffusion Tube Monitoring Data

The annual mean objective was exceeded at all but three sites in 2008; these were Wakefield Gardens, Frognal Way and Croftdown Road. These are all urban background sites. The highest diffusion tube NO_2 concentrations were measured at the roadside sites of the Euston Road (93.21 µg/m^3) and Tottenham Court Road (84.21µg/m^3). NO_2 concentrations observed from long term diffusion tube locations show no clear upward or down trend between 2006 and 2008. Between 2007 and 2008 the majority of diffusion tube sites reveal a minor reduction in annual mean NO_2 concentration.

Table 2.4a Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations
				2008 (µg/m^3) Adjusted for bias *
CA1	Argyle School, Tonbridge St	Y	100	**51.9**
CA2	Robert St	Y	100	**48.2**
CA3	Mansfield Rd	Y	100	**42.8**
CA4	Euston Rd	Y	100	**93.3**
CA5	Drummond St/Cobourg St	Y	92	**46.1**
CA6	Wakefied Gds	Y	100	37.8
CA7	Frognal Way	Y	100	30.4
CA8	Croftdown Rd	Y	92	36.3
CA9	63 Gower St	Y	100	**73.0**
CA10	Tavistock Gardens	Y	92	**46.7**

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CA11	Tottenham Court Road	Y	100	**84.2**
CA13	British Library	Y	100	**48.6**
CA14	Russel Square Gardens	Y	100	**43.6**
CA15	Finchley Rd	Y	97 (triplicate tube)	**68.1**
CA16	Kentish Town Road	Y	100	**61.8**
CA17	47 Fitzjohn's Ave	Y	100	**55.5**
CA18	Corner Gloucester Ave/Parkway	Y	100	**56.7**
CA19	Inverness St	Y	92	**41.5**
CA20	Brill Place	Y	75	**48.9**
CA21	Bloomsbury St	Y	75	**76.5**
CA22	Goodge St	Y	75	**56.8**
CA23	Camden Road	Y	75	**66.5**

*** Bias Adjustment = 0.91**

Table 2.4b Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA?	Annual mean concentrations (µg/m^3) Adjusted for bias		
			2006	2007	2008
CA1	Argyle School, Tonbridge St	Y		**50.2**	**51.9**
CA2	Robert St	Y		**48.2**	**48.2**
CA3	Mansfield Rd	Y		40.4	**42.8**
CA4	Euston Rd	Y	**90.6**	**91.2**	**93.3**
CA5	Drummond St/Cobourg St	Y		**48.1**	**46.1**
CA6	Wakefied Gds	Y	**48.5**	**49.6**	37.8
CA7	Frognal Way	Y	**41.7**	28.7	30.4
CA8	Croftdown Rd	Y		31.4	36.3
CA9	63 Gower St	Y		**94.9**	**73.0**
CA10	Tavistock Gardens	Y		**46.3**	**46.7**
CA11	Tottenham Court Road	Y		**101.1**	**84.1**
CA13	British Library	Y		**46.6**	**48.6**
CA14	Russel Square Gardens	Y		**54.5**	**43.6**
CA15	Finchley Rd	Y	**54.6**	**44.3**	**68.1**
CA16	Kentish Town Road	Y	**84.3**	**81.5**	**61.8**
CA17	47 Fitzjohn's Ave	Y	**69.0**	**66.6**	**55.5**
CA18	Corner Gloucester Ave/Parkway	Y		**63.6**	**56.7**
CA19	Inverness St	Y		**53.6**	**41.5**
CA20	Brill Place	Y		**52.6**	**48.9**
CA21	Bloomsbury St	Y	**51.3**	**51.5**	**76.5**
CA22	Goodge St	Y			**56.8**
CA23	Camden Road	Y			**66.5**

2.2.2 PM_{10}

The annual mean and 24hr PM10 objectives have not been exceeded at any automatic monitoring sites in 2008.

Table 2.5a Results of PM_{10} Automatic Monitoring: Comparison with Annual Mean Objective (Annual means corrected on VCM)

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations (µg/m^3)
				2008*
BLO	London Bloomsbury	Y	84	19
CD1	Swiss Cottage	Y	92	23
CD3	Shaftesbury Avenue	Y	99	24

*unratified data

Table 2.5b Results of PM_{10} Automatic Monitoring: Comparison with 24-hour Mean Objective

Site ID	Location	Within AQMA?	Data Capture 2008 %	Number of Exceedences of hourly mean (50 µg/m^3)
				2008*
BLO	London Bloomsbury	Y	84	**0**
CD1	Swiss Cottage	Y	92	0
CD3	Shaftesbury Avenue	Y	99	0

*unratified data

2.2.3 Sulphur Dioxide

Sulphur dioxide is only monitored at London Bloomsbury. There have been no exceedences of any of the SO_2 objectives over past twelve years.

Table 2.2.3: Annual SO_2 monitoring data

Year	Data Capture (%)	Exceedences of the 15 minute mean*	Exceedences of the 1hr mean*	Exceedences of the 24hr mean*	Annual mean
1997	94	0	0	0	21
1998	96	0	0	0	19
1999	96	0	0	1	19
2000	97	0	0	0	10
2001	92	0	0	0	11
2002	90	0	0	0	11
2003	94	0	0	0	8
2004	98	0	0	0	15
2005	94	0	0	0	5
2006	95	0	0	0	5
2007	82	0	0	0	5
2008	99	0*	0*	0*	4*

*unratified data

2.2.4 Benzene

Benzene is not currently monitored in the Borough as historic monitoring has reveal benzene levels to be well below the air quality objective for this pollutant.

2.2.5 Other pollutants monitored

Ozone

Ozone levels are only monitored at London Bloomsbury. Concentrations have been gradually rising since monitoring began in 1997. The highest annual mean ozone levels were measured in 2006 and 2008. The hourly objective has been exceeded twice, once in 2003 and then again in 2006. These two years where associated with very sunny and hot weather conditions promoting the formation of ozone.

Figure 2.2.5a: Annual mean ozone monitoring data

Year	Data Capture (%)	Annual Mean	Exceedences of the 8hr mean
1993	96	18	0
1994	96	22	0
1995	93	20	0
1996	98	18	0
1997	96	20	0
1998	96	20	0
1999	98	24	0
2000	97	22	0
2001	97	24	0
2002	89	22	0
2003	82	30	6
2004	97	24	0
2005	91	23	0
2006	96	29	5
2007	85	24	0
2008	98*	28*	0*

*unratified data

Carbon Monoxide

Carbon monoxide is only monitored at London Bloomsbury. The air quality objective for carbon monoxide has been achieved since monitoring began in 1993.

Figure 2.2.5b: Annual Carbon Monoxide monitoring data

Year	Data Capture (%)	Annual Mean	Exceedences of the rolling 8hr mean
1993	82	0.6	0
1994	97	0.6	0
1995	90	0.7	0
1996	94	0.7	0
1997	96	0.7	0
1998	96	0.7	0
1999	85	0.6	0
2000	95	0.6	0

2001	94	0.6	0
2002	88	0.3	0
2003	93	0.4	0
2004	97	0.3	0
2005	92	0.5	0
2006	95	0.4	0
2007	84	0.3	0
2008	99*	0.3*	0*

*unratified data

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

The London Borough of Camden confirms that there are no 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 More Close to Traffic

The London Borough of Camden confirms that there are no 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.

The London Borough of Camden confirms that there are no newly identified roads with high flows of buses or HDVs.

3.4 Junctions

The London Borough of Camden confirms that there are no newly identified busy junctions or busy roads.

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

The London Borough of Camden confirms that there are no new or proposed roads since the last round of review and assessment.

3.6 Roads with Significantly Changed Traffic Flows

The London Borough of Camden confirms that there are no newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

There are several bus termini in Camden, such as South End Green where up to six buses may stand at one time, but there is only one bus station at Euston train station. This is managed by London buses, who keep records of planned movements of buses entering and leaving the station. During a 24-hour period there are approximately 5,000 buses moving in and out of the bus station (*personal comm. TfL)*, which is above the criteria of 2,500 movements in the USA checklist. However, it is very unlikely that people will be exposed to bus emissions over a one-hour period at this station. This is because the nearest offices and green spaces are further away than the recommended exposure threshold of 20 metres from the bus stands. Therefore, it can be concluded that as this will not lead to relevant air quality exceedences, a detailed assessment is not required for this specific source.

The London Borough of Camden confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

The London Borough of Camden confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

Camden has three major national rail stations; Euston, Kings Cross and St Pancras. The stations are under covered and therefore “outdoor”. This subsequently dismisses the inclusion of railways in this assessment.

4.2.1 Stationary Trains

The London Borough of Camden confirms that there are no 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

The London Borough of Camden confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

The London Borough of Camden 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

Camden has no power stations. The nearest power station to Camden is in the neighbouring borough of the City of London. The contribution of emissions from this power station has no impact on the PM10, SO_2 NO_2 air quality objectives in Camden.

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been carried out

The London Borough of Camden 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

The London Borough of Camden 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

The London Borough of Camden 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

The London Borough of Camden confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry Farms

The London Borough of Camden confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Camden has received nine planning applications which include biomass boilers, see Table 6.1. The biomass screening tool has been used to determine the impacts of the emissions from these biomass boilers on the short and long terms PM_{10} objectives. The threshold value was not exceeded as such detailed assessment is not required.

The screening tool could not be used to determine the impact of biomass boiler emissions on the long and short term NO_2 objectives. The reason being that Camden's background NO_2 concentrations are above 40 $\mu g/m^3$. Camden has raised this matter with the Review and Assessment Helpdesk (*15.6.09 – Tim C*). The Council where advised not to carry out any further screening assessment as it would deemed unnecessary due to the borough already being declared an AQAM, and the unusual situation that exists with NO_2 background concentrations that exceed the annual mean air quality objective.

Table 6.1 Details of planning application including biomass boilers

Application Name	Size (kw)
Central Saint Giles	100
100 Park Village East	150
Great Ormond Street Hospital	2 x 35
220 Arlington Road	150
64-78 Kingsway	150
7-15 Whitfield St	100
Former Elizabeth GA Hospital	2 x 55
158-164 Royal College Street	67
2-12 Harmond Street	150

Camden is maintaining an inventory of all biomass boilers installed in the borough through the planning process. The Council is requiring developers to undertake air quality assessment to determine the impact of PM_{10} and NOx emissions on local air quality.

6.2 Biomass Combustion – Combined Impacts

Camden has assessed the combined impacts of biomass combustion plant, and concluded that it will not be necessary to proceed to a detailed assessment.

6.3 Domestic Solid-Fuel Burning

Information in the LAEI 2006 states that there are no particulate matter emissions from domestic coal burning in Camden, which is likely to be because the whole of the borough is a smoke free zone. Smokeless fuel burning is not included as a source in the LAEI, but there may be a few households burning smokeless fuels on open fireplaces (as a secondary source of heating). However, this does not occur on the significant scale as classed in the guidance, posing no risk to exceeding the PM_{10} objectives.

7 Fugitive or Uncontrolled Sources

The London Borough of Camden confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

It would not be appropriate to revoke the AQMA because the monitoring results show that the annual mean air quality objective for NO_2 continues to be exceeded. Recent measurements reveal that the hourly NO_2 objective is being breached at a number of roadside locations, automatic and diffusion tube. Following the introduction of the VCM model, Camden no longer breaches the daily mean PM_{10} objective.

8.2 Conclusions from Assessment of Sources

There have been no new or significantly changed sources which have the potential to impact on the air quality objectives. The Council is carefully monitoring the number of biomass boilers in the borough and assessing the impact of NOx and PM_{10} emissions to avoid any potential negative impacts on air quality.

The Council are of the opinion that gas Combined Heat and Power plant should be included as a new combustion source in the next updating and screening assessment. Camden has noticed from the results of air quality assessments that the contribute NOx emissions from CHP can increase in the annual mean NO_2 concentration at receptor locations. In order to curtail any negative impacts on air quality the Council is requesting that CHP which give rise to >1 $\mu g/m^3$ increase in annual NO_2 concentration undertake mitigation measures such as increasing stack height and efflux velocity or fitting NOx arrestment notably selective catalytic reduction equipment.

8.3 Proposed Actions

The Updating and Screening Assessment has shown that a Detailed Assessment is required for the short-term NO_2 objective.

The Updating and Screening Assessment has not identified any need for additional monitoring or changes to the existing monitoring programme.

There are no changes required to the existing AQMA. However the Council may need to include the short term NO_2 objective in the AQMA.

The Council's next actions are to carry out a Detailed Assessment for the short term NO_2 objective, and submit an air quality action plan Progress Report.

9 References

Local Air Quality Management: Technical Guidance Note, LAQM, TG(09)

Appendix A: QA:QC Data

Factor from Local Co-location Studies (if available)

Site ID	Site Type	2000	2001	2002	2003	2004	2005	2006	2007	2008
CA1	R	-	-	-	-	-	-	-	50.2	51.93
CA2	R	-	-	-	-	-	-	-	48.2	48.23
CA3	R	-	-	-	-	-	-	-	40.4	42.88
CA4	R	53.76	71.82	59.28	65.1	75.48	88.33	90.6	91.2	93.31
CA5	R	-	-	-	-	-	-	-	48.1	46.15
CA6	B	44.64	48.3	36.96	41.0	49.8	41.25	48.5	49.6	37.80
CA7	B	33	39.2	34.08	42.4	41.28	33.22	41.7	28.7	30.46
CA8	B	-	-	-	-	-	-	-	31.4	36.36
CA9	R	-	-	-	-	-	-	-	94.9	73.01
CA10	B	-	-	-	-	-	-	-	46.3	46.75
CA11	K	-	-	-	-	-	-	-	101.1	84.21
CA12	B	-	-	-	-	-	-	-	46.6	-
CA13	B	-	-	-	-	-	-	-	54.5	48.69
CA14	B	50.16	57.12	37.68	51.2	59.28	55.11	54.6	44.3	43.64
CA15	K	49.08	-	-	58.9	78.6	77.88	84.3	81.5	68.14
CA16	R	55.8	66.64	48.84	58.0	62.88	65.34	69.0	66.6	61.82
CA17	R	-	-	-	-	-	-	-	63.6	55.59
CA18	K	-	-	-	-	-	-	-	53.6	56.73
CA19	R	-	-	-	-	-	-	-	52.6	41.55
CA20	R	-	-	39.84	50.0	50.16	50.93	51.3	51.5	48.99
CA21	R	-	-	-	-	-	-	-	-	76.55
CA22	R	-	-	-	-	-	-	-	-	56.84
CA23	R	-	-	-	-	-	-	-	-	66.54
Bias Adjustment Factor		***1.2***	***1.4***	***1.2***	***1.03***	***1.2***	***1.1***	***1.09***	***0.936***	***0.91***

Discussion of Choice of Factor to Use

UWE Default is 0.91 which is the same as Camden's co-located factor.

PM Monitoring Adjustment

Particulate matter monitoring has taken place on a TEOM and the 1.3 correction factor has been used for data recorded pre 2004. Since 2004 all TEOM data has been corrected through the VCM.

QA/QC of automatic monitoring

Monitoring stations are calibrated every fortnight at Swiss Cottage and Shaftesbury Avenue by Camden. London Bloomsbury monitoring station is calibrated by Bureau Veritas as part of the AURN.

All Site audits are carried out by the National Physics Laboratory and all monitors are covered by a service contract with Casella. Data validation and ratification is carried out by ERG for all automatic monitoring sites.

QA/QC of diffusion tube monitoring

Gradko performed very well in the WASP scheme January 2008 - January 2009 gaining the highest score of good, on both the performance of the RPI old criteria and RPI new criteria.

Appendix 2: Monthly mean nitrogen dioxide diffusion tubes values, 2008

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CA1	66.76	74.05	40.87	55.15	60.51	47.13	48.49	47.22	54.34	68.83	63.30	58.14
CA2	61.10	59.06	38.27	49.37	92.27	42.50	45.58	42.54	46.77	50.58	53.35	54.59
CA3	53.45	52.06	41.11	45.53	45.06	43.52	43.98	37.84	47.98	50.35	53.60	50.99
CA4	98.52	96.87	78.45	106.16	121.76	95.10	114.15	87.98	95.00	102.98	151.51	81.94
CA5	53.25	65.90	40.29	54.19	54.06	43.05	46.98	-	40.44	52.70	52.51	54.45
CA6	50.29	54.28	39.87	34.87	39.58	33.76	35.82	35.46	37.14	45.56	47.01	44.83
CA7	39.43	52.12	27.67	36.31	27.16	22.70	26.58	25.37	28.56	37.64	34.55	43.53
CA8	46.10	49.29	29.74	36.81	56.95	-	29.47	27.69	34.89	39.59	45.81	43.17
CA9	89.78	93.38	69.08	95.78	35.03	78.10	84.21	78.47	69.06	98.31	91.83	79.80
CA10	59.21	58.40	41.43	46.92	72.15	-	44.98	40.40	48.64	55.02	58.24	46.57
CA11	107.96	94.15	78.57	103.71	50.49	94.32	86.28	92.64	71.76	111.64	104.44	87.02
CA11	117.88	97.41	82.71	84.97	79.93	93.68	89.49	92.82	82.98	111.85	98.66	88.43
CA11	107.61	100.78	77.29	102.47	74.11	97.37	90.83	89.28	84.58	108.87	109.51	84.97
CA13	62.28	62.53	43.74	55.15	61.32	39.54	47.80	43.01	48.80	54.79	60.36	62.80
CA14	48.88	54.16	44.19	49.72	58.30	47.14	44.42	25.67	44.58	50.60	57.70	50.07
CA15	70.54	81.35	68.68	80.83	86.37	89.36	71.71	61.00	73.69	80.70	85.23	73.71
CA15	67.24	78.64	65.65	78.13	73.71	84.92	71.79	64.73	76.71	85.15	98.36	77.98
CA15	65.94	78.85	64.63	13.10	91.56	83.38	79.24	57.57	-	83.97	77.50	78.47
CA16	63.58	82.33	48.15	67.11	108.49	65.18	59.40	49.25	71.66	64.68	71.45	63.91
CA17	67.23	66.03	51.47	62.50	68.68	56.48	60.53	46.80	56.85	66.78	72.90	56.87
CA18	62.28	81.13	52.89	67.92	67.21	58.76	60.95	56.54	52.03	69.36	59.32	59.76
CA19	-	56.46	33.90	40.79	52.15	39.65	43.29	35.46	41.55	48.99	51.01	54.13
CA20	-	-	-	51.95	92.04	44.46	42.30	36.79	53.66	50.59	56.16	56.54
CA21	-	-	-	62.07	144.22	94.65	83.33	59.44	79.04	74.22	91.76	68.34
CA22	-	-	-	62.54	69.19	58.21	61.03	54.91	61.48	74.10	61.39	59.28
CA23	-	-	-	76.42	79.34	77.18	73.54	64.28	66.96	74.98	77.28	68.07