



**Lambeth**

**Updating and Screening Assessment of Air Quality  
for  
The Lambeth Council**

**March 2004**

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## Executive Summary

The role of the local authority review and assessment process is to identify the areas where it is considered that the government's air quality objectives will be exceeded. The Council has previously undertaken the first round of review and assessment (R&A) of local air quality management and earlier this year the Council completed its further assessment ("Stage 4 report"). This included remodelling the whole borough with the revised vehicle emission factors. The Stage 4 report confirmed earlier findings that certain AQS objectives will be exceeded. However the area where the annual mean nitrogen dioxide objective is predicted to exceed was much larger. Following the Stage 4 the Council designated the whole borough an AQMA.

This report concerns the Updating and Screening Assessment under the second round of review and assessment (R&A). Local authorities are now required to review and assess air quality against the objectives in the Air Quality Regulations 2000 and the amendment regulations. The air quality objectives to be assessed are for the following seven pollutants: carbon monoxide, benzene, 1,3-butadiene, lead, nitrogen dioxide, sulphur dioxide and particles (PM<sub>10</sub>). This report provides a new assessment to identify those matters that have changed since the last review and assessment, and which might lead to a risk of the objective being exceeded.

The report follows the latest prescribed guidance given in technical guidance LAQM. TG (03), which replaced that produced for the previous round of R&A. It gives guidance on the use of background pollutant concentrations, monitoring results, industrial sources, and road traffic. It also requires both a phased approach and that local authorities only undertake a level of assessment that is commensurate with the risk of an air quality objective being exceeded.

The report identifies that the risk of the objectives being exceeded:

- For carbon monoxide, benzene, 1,3-butadiene, lead, and sulphur dioxide PM<sub>10</sub> is not significant in the Council's area. The Council need not progress beyond the updating and screening assessment for these pollutants.
- For nitrogen dioxide, there is a risk of the annual mean objective being exceeded across the borough. This is consistent with the Council's existing AQMA.
- For particles PM<sub>10</sub> (for 2004 and 2010) there is a risk of the objectives being exceeded across parts of the borough. The Council however is not required to undertake actions at this time in respect of the finding for 2010, other than to note it for longer term planning purposes.

For all pollutants not requiring detailed assessments the LAQM guidance requires the production of annual air quality progress reports by the end of April 2005, prior to undertaking the next updating and screening assessment by the end of April 2006.

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## **Progress with Local Air Quality Management (1997-2002)**

As part of its Local Air Quality Management (LAQM) responsibilities, Lambeth Council (“the Council”) has completed the first round review and assessment (R&A) of air quality (see the individual reports prepared between 1999 and 2003). These reports present a staged approach whereby the seven air pollutants in the Government’s Air Quality Strategy related to LAQM, were first assessed and screened as to their relative importance to air quality within the Council’s area.

Benzene, 1,3 butadiene, carbon monoxide and lead were considered at the earliest stage of the first round of review and assessment; these were not found likely to lead to the air quality objectives being exceeded at this stage and therefore no further action was required.

The Stage 3 report assessed air quality across the whole of the Council’s area in accordance with DEFRA guidance. The Stage 3 report considered nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>10</sub>) and sulphur dioxide (SO<sub>2</sub>). Areas were predicted to exceed the NO<sub>2</sub> annual mean and daily mean particulate matter (PM<sub>10</sub>) objectives. As a consequence an Air Quality Management Area (AQMA) was designated in 2001 for the northern part of the borough as far south as Kennington Park, a large area covering central Brixton, a number of roads and fronting properties in Tulse Hill and a number of sections of main road (and fronting properties) including the A202 Camberwell New Road, A3036 Wandsworth Road, A203 South Lambeth Road, A3, A2217 Clapham Park Road and A23.

The Stage 4 report subsequently remodelled the whole borough with the revised vehicle emission factors. The Stage 4 modelling predictions confirm the Stage 3 findings that certain AQS objectives will be exceeded. However the area where the annual mean NO<sub>2</sub> objective is predicted to exceed was much larger. Following the Stage 4 the Council designated the whole borough an AQMA.

## **Introduction to Updating Screening and Assessment**

The government’s Air Quality Strategy (AQS) establishes the framework for air quality improvements, including international and national improvements. However it is recognised that despite these improvements, areas of poor air quality will remain and that these are best dealt with using local measures implemented through the LAQM regime. The role of the local authority review and assessment process is to identify the areas where it is considered that the objectives will be exceeded. Experience has shown that such areas may range from single residential properties to whole town centres.

This report concerns the second round of LAQM review and assessment (R&A) and is part of a three yearly cycle for review and assessment that ends in 2010. It follows the latest prescribed guidance given in Technical Guidance LAQM. TG (03), which replaced the guidance produced for the previous round of R&A. TG03 is designed to help local authorities undertake their duties under the Environment Act 1995 to review and assess air quality in their area from time to time.

The most important changes since the last round of review and assessment relates to the changes in air quality objectives. Local authorities are now required to review and assess air quality against the objectives in the Air Quality Regulations 2000 and the 2002 amendment regulations. In addition the EU has set limit values for NO<sub>2</sub> and benzene and indicative limit

values for PM<sub>10</sub> for 2010. In the case of NO<sub>2</sub> the 2010 limit values are the same as the 2005 objectives, hence meeting the latter automatically means that the former are met. The guidance confirms that local authorities are not statutorily required to assess air quality against the EU limit values, but it advises that they may find it helpful to do so, to assist with longer term development planning.

Tables 1 and 2 below provide details of the objectives for the purposes of this round of R&A.

The guidance requires a phased approach, as with the previous guidance. This requires local authorities to undertake a level of assessment that is commensurate with the risk of an air quality objective being exceeded. It is considered that not every authority will need to proceed beyond the first step of the second round of review and assessment.

The first step is the Updating and Screening Assessment (USA), which all local authorities are required to undertake. TG03 gives guidance on the use of background pollutant concentrations, monitoring results, industrial sources, road traffic, as well as the specific AQS pollutants to be examined for both the USA and the subsequent step, i.e. the Detailed Assessment.

**Table 1** Air quality objectives (from Air Quality Regulations 2000 and Amendment Regulations 2002)

Pollutant	Objective		Date to be achieved by
	Concentration	Measured as	
<b>Benzene</b>	16.25 µg/m <sup>3</sup> (5 ppb)	Running Annual Mean	31 Dec 2003
	5 µg/m <sup>3</sup>	Annual Mean	31 Dec 2010
<b>1, 3 Butadiene</b>	2.25 µg/m <sup>3</sup> (1 ppb)	Running Annual Mean	31 Dec 2003
<b>Carbon Monoxide</b>	10 mg/m <sup>3</sup>	Daily Maximum Running 8 hour mean	31 Dec 2003
<b>Lead</b>	0.5 µg/m <sup>3</sup>	Annual Mean	31 Dec 2003
	0.25 µg/m <sup>3</sup>	Annual Mean	31 Dec 2008
<b>Nitrogen Dioxide (provisional)</b>	200 µg/m <sup>3</sup> (105 ppb) not to be exceeded more than 18 times a year	1 hour mean	31 Dec 2005
	40 µg/m <sup>3</sup> (21 ppb)	Annual Mean	31 Dec 2005
<b>Particles (PM<sub>10</sub>)</b>	50 µg/m <sup>3</sup> not to be exceeded more than 35 times a year	24 hour mean	31 Dec 2004
	40 µg/m <sup>3</sup>	Annual Mean	31 Dec 2004
<b>Sulphur Dioxide</b>	350 µg/m <sup>3</sup> (132 ppb) not to be exceeded more than 24 times a year	1 hour mean	31 Dec 2004
	125 µg/m <sup>3</sup> (47 ppb) not to be exceeded more than 3 times a year	24 hour mean	31 Dec 2004
	266 µg/m <sup>3</sup> (100 ppb) not to be exceeded more than 35 times a year	15 minute mean	31 Dec 2005

**Table 2** Proposed new particle objectives (from Air Quality Strategy Addendum (2003))

Pollutant	Objective		Date to be achieved by
	Concentration	Measured as	
<b>Particles (PM<sub>10</sub>)</b> <b>(NB the objective for London is given in brackets)</b>	50 µg/m <sup>3</sup> not to be exceeded more than 7 (10) times a year	24 hour mean	31 Dec 2010
	20 (23) µg/m <sup>3</sup>	Annual Mean	31 Dec 2010

### London Atmospheric Emissions Inventory

The Greater London Authority (GLA) has required London Boroughs to use the London Atmospheric Emission Inventory (LAEI). The latest version of which released during November 2003, incorporates the latest updates and changes relating to atmospheric emissions across the Greater London area. The total area covered by the LAEI is 2,466 km<sup>2</sup>, covering all 32 London boroughs and the City of London and parts of 19 districts that lie between the M25 and GLA boundary. The LAEI incorporates all major and minor sources, including roads.

The development of the revised road traffic part of the LAEI for 2001 has followed closely the methodology laid out in the 1999 version. However a number of key areas have been enhanced, these include

- A revised road network and complete update of vehicle flow, which includes roads up to and including the M25;
- Use has been made of a new version (b 2.1) LTS model;
- Recalculation of the minor road vehicle km totals;
- Updated speed estimates on all roads;
- Revision and use of the most recent speed related emissions estimates;
- Estimates of the performance of the national vehicle stock model compared to on-road vehicle stock using 2002 VED data;
- Use of GPS positioning in estimating taxi flows on roads around Heathrow;
- Improvements made to the taxi and bus stock in London using specific data from the Public Carriage Office (PCO) and TfL Buses.

The vast majority of the road network is identical to the previous 1999 inventory. The most significant change is that the road links now include those up to and including the M25. The total number of links has increased from 18201 (1999 LAEI) to 21944.

The traffic flows have been updated using approximately 1700 manual count flows obtained from TfL, TfL automatic traffic count data, and counts supplied by the London Boroughs. Full details are given in the LAEI 2001 methodology.

## Background Pollutant Concentrations

Background concentrations provide an understanding of the prevailing pollution in the absence of specific local emission sources. Future background concentrations have been modelled on a 40m-grid square using the LAEI for NO<sub>2</sub>, NO<sub>x</sub> and PM<sub>10</sub> (for 2004), for details of the methodology used (see [www.london.gov.uk/approot/mayor/air\\_quality/model.jsp](http://www.london.gov.uk/approot/mayor/air_quality/model.jsp)).

The National Atmospheric Emission Inventory (NAEI) has been used to provide an understanding of future concentrations of benzene (based on 2010), 1,3-butadiene (based on 2003) and PM<sub>10</sub> (based on 2010). These are produced on a 1x1km grid square for the U.K (see [www.airquality.co.uk/archive/laqm/tools.php](http://www.airquality.co.uk/archive/laqm/tools.php)). It is important to note that the NAEI (incorporates all major sources, including roads) within each grid square.

## Monitoring Data

The monitoring of air quality in a local authority's area provides an important source of information for understanding air quality in its area and Lambeth has been monitoring air pollution throughout the borough since 1993. This benefit can be further enhanced if the monitoring is undertaken as part of a wider e.g. regional network. It is however important to ensure that there is confidence in the data being produced and used. Hence QA/QC issues need to have been considered and the data produced also need to be properly validated and preferably ratified.

The Council carries out continuous monitoring of CO, NO<sub>2</sub>, SO<sub>2</sub> and PM<sub>10</sub> (plus ozone, which is classed as a regional pollutant and has not been included within the LAQM process) at five sites, although not all of these pollutants are measured at every site. The sites are listed below and include the jointly owned Crystal Palace site close to the southern tip of the borough. All of the sites are affiliated to the London Air Quality Network (LAQN). This network provides a regional focus and the standards of QA/QC adopted meet those stipulated in TG03 guidance. The Council also undertakes diffusion tube monitoring of NO<sub>2</sub> and benzene at 15 locations.

- Lambeth 1 (LB1) is a roadside site on Christchurch Road/ Palace Road SW2;
- Lambeth 2 (LB2) is a roadside site at Vauxhall Cross, SW8 (this site closed temporarily on the 1<sup>st</sup> July 2003 due to extensive roadworks);
- Lambeth 3 (LB3) is an urban background site at Loughborough Junction/ Wanless Road SE24;
- Lambeth 4 (LB4) is a roadside site on Brixton Road. Monitoring at this site commenced in late 2003, hence the results are not reported in this report;
- Crystal Palace 1 (CY1) is the jointly operated roadside site located on Crystal Palace Parade, SE19.

## Industrial Sources

Both the Environment Agency and the Council regulate industrial sources under the Pollution Prevention and Control Act 1999 and Environmental Protection Act 1990. The Environment

Agency is responsible for the largest industrial processes (IPPC/ Part A processes), whilst the Council is responsible for smaller Part B processes. There are no Part A processes, or Part A2 processes (which are regulated by local authorities) within the borough. Those small industrial processes that fall outside of Part B Process control are also of interest to LAQM. The TG03 guidance requires details of boilers with a thermal rating of greater than 5 MW that burn coal or fuel oil (e.g. in universities, hospitals, etc) to be obtained and examined.

Updated lists of Part B and other processes of potential concern in Council's area are given in Appendix 3.

### **Road Traffic**

To estimate the air quality impact of those roads that need examining in this latest step of the review and assessment process it is necessary to use the DMRB screening methodology produced by the Highways Agency. The version used (i.e. version 1.01) was released in February 2003 and incorporates the most recent emission factors. It is intended to provide conservative estimates, however in some instances it can under predict concentrations. In these specific instances factors can be applied, as advised in TG03.

### **Relevant exposure**

The objectives relate to public exposure to the pollutants. More specifically any areas that may exceed them should relate to "the quality of air at locations which are situated outside of buildings or other man made structures above or below ground, and where members of the public are regularly present" (from the Air Quality Regulations). TG03 advises further that the assessment should focus on those locations where members of the public are likely to be regularly present and are likely to be exposed over the period of the objective.

## Carbon Monoxide

*The air quality objective for carbon monoxide (CO) has been tightened and is now 10mg/m<sup>3</sup> as a maximum daily running 8-hour concentration to be achieved by the end of 2003, which is in line with second Air Quality Daughter Directive limit value.*

### Perspective

The main source of CO remains road transport (nationally about 67% based on 2000), although annual emissions are declining mainly as a result of uptake of abatement technologies.

Current monitoring indicates that none of the UK national network sites exceeded the objective during the period between 1999 and 2001, with kerbside/roadside sites having higher concentrations than urban background sites (see TG03). Despite this the guidance highlights that under certain meteorological conditions the objective was approached within 2mg/m<sup>3</sup> at four urban background sites in 2001.

Current projections are that emissions will reduce by a further 42% between 2000 and 2005. National modelling has further indicated that at the end of 2003, major roads will not exceed the objective.

No AQMAs were declared in the first round based on the previous objective of 11.6mg/m<sup>3</sup>.

Based on TG03, it is considered highly unlikely that any authority will be required to proceed beyond the updating and screening assessment.

### Methodology Overview

Full details of the methodology employed can be found in TG03. The following represents a summary of the methods used. To undertake this it is necessary to draw on the first stage report of the first round of review and assessment. Only monitoring data and very busy roads need be considered. (The TG03 guidance does not require the screening of industrial sources).

A checklist approach is used, based on 1) monitoring data and 2) traffic data relating to very busy roads.

1. For monitoring data only, roadside data are required where there is public exposure. The data will be assumed to be applicable to 2003 and if the data indicate that the maximum daily running 8-hour concentration exceeds the objective then the Council will be required to proceed to the Detailed Assessment stage.
2. This relates to annual average daily traffic flows exceeding stated flows (which are dependent on the type of road) for areas where the 2003 annual mean background is expected to be greater than 1mg/m<sup>3</sup>. If there is relevant exposure within 10m of the kerb then it will be necessary to obtain additional traffic information relating to average speeds and the HGV/LGV split. The DMRB screening model can be used to predict 2003 concentrations. (Note if junctions occur along any of the roads then the flows from the

roads should be added together). If the predicted annual mean concentration is greater than  $2\text{mg}/\text{m}^3$  then it is necessary to proceed to the Detailed Assessment stage.

### Updating and Screening Assessment of Carbon Monoxide for Lambeth Council

The Council considered the following sources during the previous round of R&A: major roads in the Council's area, industrial processes, a combination of low level combustion sources and roads, and planned sources. Based on this CO was found not likely to exceed the AQS objective where there might be exposure and hence no further action was undertaken.

#### 1. Monitoring

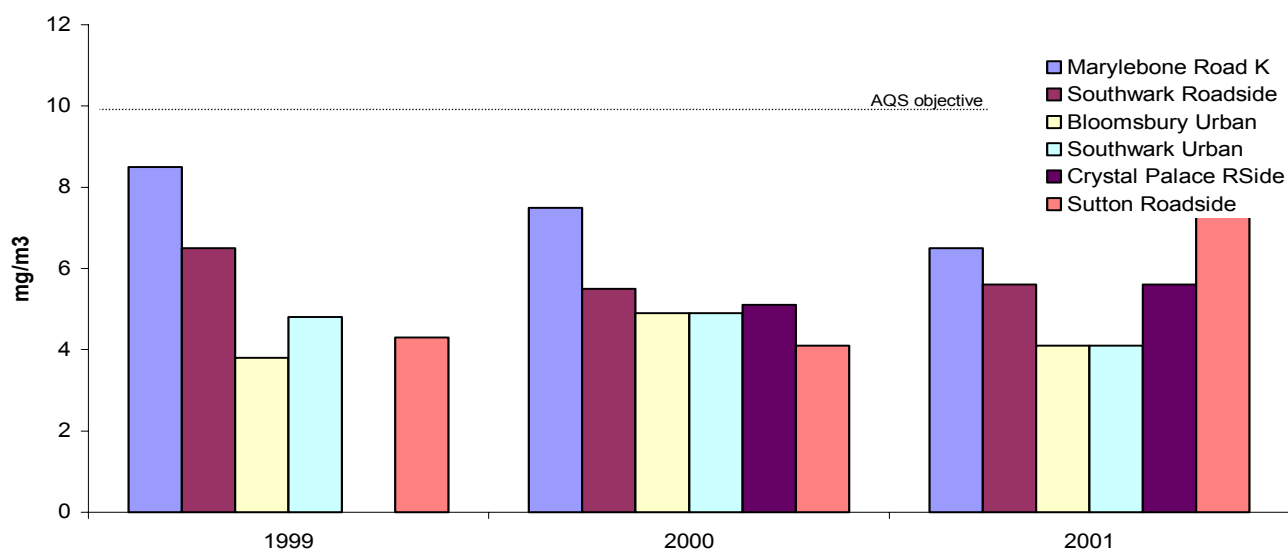
The Council undertakes CO continuous monitoring at its roadside site at Crystal Palace (which is jointly run and owned in conjunction the neighbouring London Boroughs of Bromley, Croydon and Southwark). The site is located at very southern tip of the borough. The results at this location confirm that the objective was not exceeded for the period 1999 to 2002.

**Table 3** Maximum daily running 8 hour mean CO for Crystal Palace site ( $\text{mg}/\text{m}^3$ )

Crystal Palace (CY1)	1999	2000	2001	2002
Max daily running 8hour mean	5.8	5.1	5.6	3.5
Data capture (%)	24	97	96	96

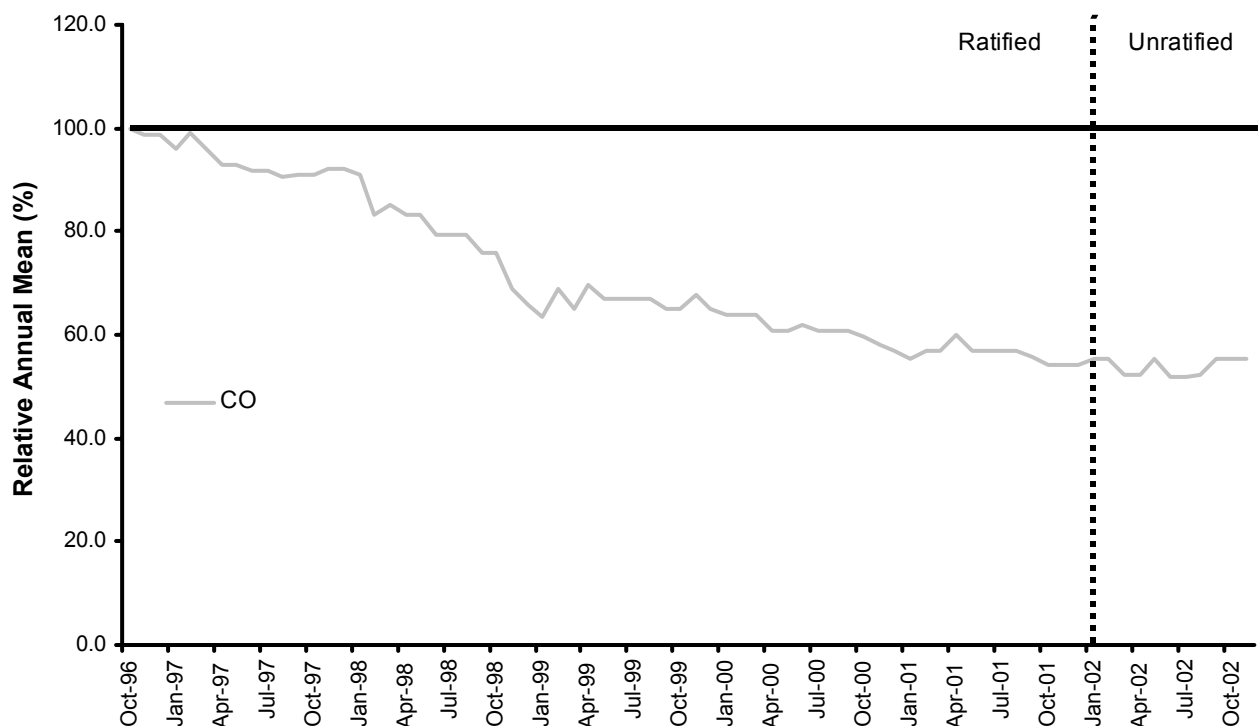
Monitoring of CO is also undertaken at London Air Quality Network sites across London, including the busy kerbside site at Marylebone Road in central London. The results for these sites for the period between 1999 and 2001 (including the Crystal Palace (CY1)) are given in Figure 1 below. These results confirm that the objective was not exceeded at any site. The data capture rates were greater than 90% and the data have been scaled and ratified.

**Figure 1** Maximum daily running 8 hour mean CO for selected London sites (1999-2001)



An analysis of annual mean concentrations since 1996 for LAQN sites is given above in Figure 2. This indicates a downward trend over time, although it is important to appreciate that the AQS objective for CO is averaged over shorter time periods, which are not necessarily represented by annual mean concentrations.

**Figure 2** Relative annual mean for CO from LAQN sites



These results of monitoring by the Council and elsewhere in London are considered representative of the Council's area. These indicate that the objective is being met and therefore a Detailed Assessment of CO based on monitoring is not required.

## 2. *Very busy roads/junctions in built up areas*

Traffic flows in the area are given in Appendix 2 and this indicates 'very busy' roads with single carriageways exceeding 80,000 vehicles per day (vpd) and dual carriageway exceeding 120,000vpd are not found in the Council's area (as classified by TG03). There are similarly no junctions of the busiest roads where these traffic flows are exceeded in the Council's area.

Based on the results from the urban background sites in the LAQN, the background in the Council's area can reasonably be assumed at approximately  $0.4 \text{ mg/m}^3$  (from the 2001 results). Using the factor in TG03 the estimated 2003 annual mean concentration can be determined as  $0.35 \text{ mg/m}^3$ , which is thus less than the  $1 \text{ mg/m}^3$  concentration where further action is deemed necessary by TG03. This indicates that the objective is being met and therefore a Detailed Assessment of CO based on very busy roads and junctions is not required.

## Conclusion

The updating and screening assessment for carbon monoxide has not identified a risk of the new 2003 objective being exceeded in the Council's area. The Council therefore need not proceed beyond this updating and screening assessment for carbon monoxide for this round of review and assessment.

## Summary of findings for carbon monoxide

Screening checklist for CO	Outcome
Monitoring data	No further action required
Busy roads, junctions	No further action required

## Benzene

*The air quality objective for benzene is  $16.25\mu\text{g}/\text{m}^3$  as a running annual mean to be achieved by the end of 2003, this has been added to with an additional objective of  $5\mu\text{g}/\text{m}^3$  as an annual mean concentration to be achieved by the end of 2010. This is in line with second Air Quality Daughter Directive limit value.*

### Perspective

Petrol engine vehicles, petrol refining and the uncontrolled emissions from petrol filling stations without vapour recovery systems are the main sources of benzene.

Current monitoring indicates that all of the UK national network sites were significantly below the 2003 objective during the period between 1999 and 2001 (from TG03). Since 2001 the concentrations were also below the 2010 objective, with kerbside/roadside sites having higher concentrations than urban background sites.

National mapping has indicated that for most areas the 2003 objective will not be exceeded. However for 2010 there is the possibility that some areas will exceed.

No AQMAs were declared in the first round of R&A. Therefore traffic emissions need not be considered for the 2003 objective. It is also considered that only those local authorities with relevant locations close to major industrial processes involving benzene will be required to proceed beyond the updating and screening assessment for the 2003 objective.

For the 2010 objective however it is necessary to consider both petrochemical processes and busy roads, as monitoring from the first round indicates that this objective has recently been exceeded.

### Methodology Overview

Full details of the methodology employed can be found in TG03. The following represents a summary of the methods used. To undertake this it is necessary to draw on the first stage report of the previous round of review and assessment.

A checklist approach is used, based on 1) monitoring data 2) data relating to very busy roads 3) industrial sources/ petrol stations/ major fuel storage depots.

1. For monitoring the data should be prioritised, based on locations near busy roads and the results at building facades. Where monitoring relating to industrial and other sources is undertaken then monitoring down wind from the site is recommended. If monitoring is undertaken by diffusion tube, suitable QA/QC procedures should be used and the tubes validated and bias corrected. The results will need to be corrected to 2003/2010. If the data indicate that the objective is exceeded then the local authority will be required to proceed to the Detailed Assessment stage.
2. This relates to 2010 only, where the 2010 annual mean background exceeds  $2\mu\text{g}/\text{m}^3$  and the annual average daily traffic flows exceed the stated flows (which are dependent on the type of road). If there is relevant exposure within 10m of the kerb then it will be

necessary to obtain additional traffic information relating to average speeds and the HGV/LGV split. The DMRB screening model can be used to predict 2010 concentrations. (Note if junctions occur along any of the roads then the flows from the roads should be added together). If the predicted concentration is greater than  $5\mu\text{g}/\text{m}^3$  then it is necessary to proceed to the Detailed Assessment stage.

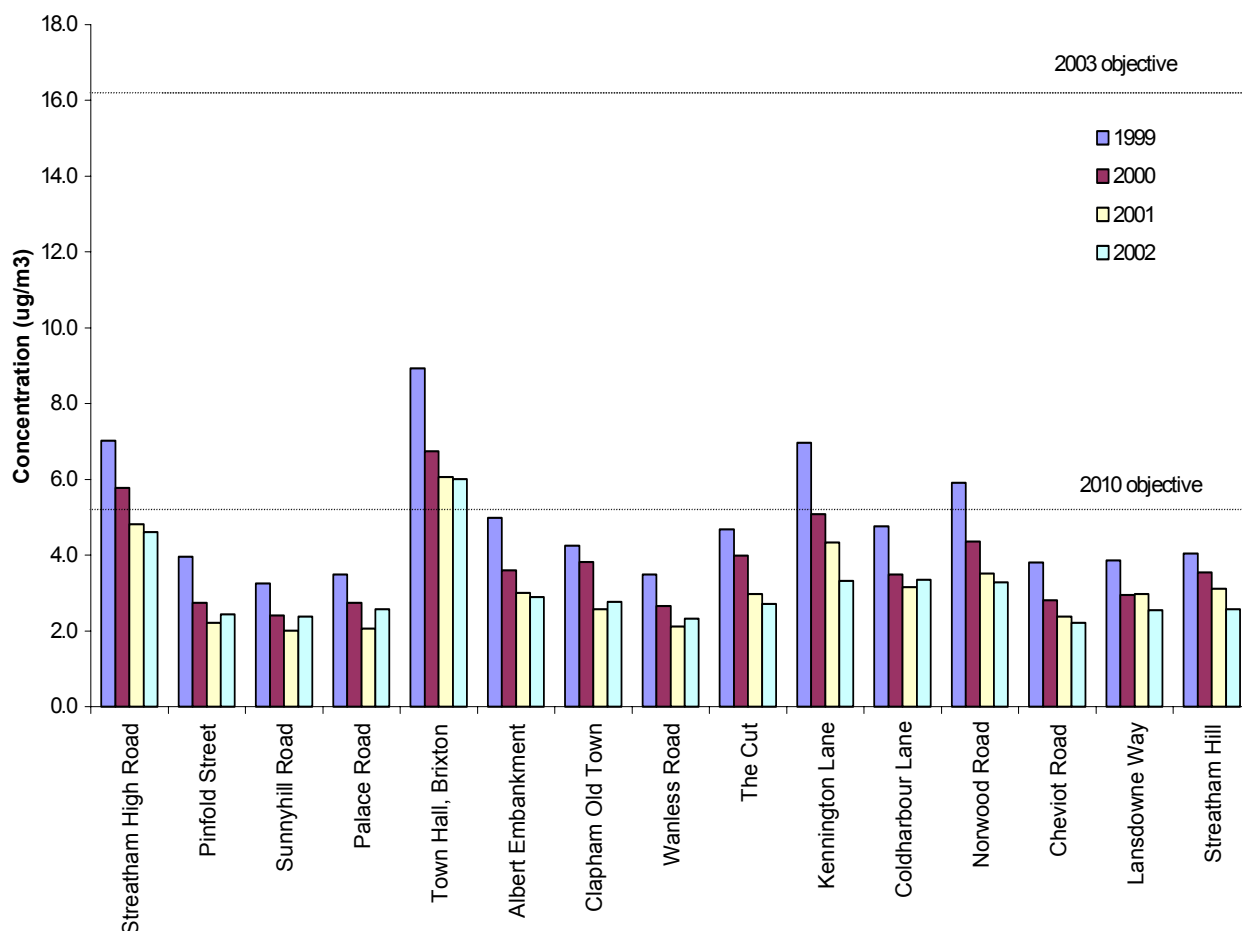
3. a) For new industrial and other sources listed in TG03 it is likely that an air quality assessment will have been undertaken as part of planning or authorisation process. The results from this should be cited. Authorities are also asked to check information from the first round of R&A if there were doubts about their validity. Where it is necessary to check industrial sources then the annual emission of benzene is needed along with the height of discharge to calculate whether the relevant threshold in the guidance has been exceeded.
- b) For petrol stations it is necessary to identify petrol stations with a throughput of more than  $2,000\text{m}^3$ , and with a road with more than 30,000 vehicles per day nearby. If there is relevant exposure within 10m of the pumps it is necessary to proceed to a Detailed Assessment.
- c) For major petrol storage depots it is necessary to identify relevant exposure and annual emissions to calculate whether the relevant threshold in the guidance has been exceeded.
- d) For combined sources the 2010 objective need only be considered. The methodology relies on an assessment based on the establishment of emission rates for the industrial/fugitive source combined with DMRB for busy roads.

### **Updating and Screening Assessment of Benzene for Lambeth Council**

Sources were screened during the previous round of R&A and found to pose a negligible risk in localities where there might be exposure, hence progression beyond Stage 2 R&A was not undertaken.

#### *1. Monitoring*

The Council uses diffusion tubes for monitoring benzene at 15 locations across the borough (for details see appendix 1). The analysis is undertaken by Lambeth Scientific Services. The Council does not undertake continuous monitoring, hence a co-location study has not been undertaken and the results are not adjusted. The results for the period 1999 to 2002 are given below.

**Figure 3** Annual mean results of benzene in the Council's area (1999 to 2002 inclusive)

The results indicate that the 2003 annual mean objective has not been exceeded at any sites during the period assessed. Furthermore the results indicate a year on year drop in concentrations for the period from 1999 to 2001 as a consequence of national measures to reduce benzene emissions. Concentrations are further reduced in 2002 for the majority of locations.

The 2010 annual mean objective is also not exceeded at the locations monitored, with the exception of one site, i.e. the Town Hall in Brixton. The result for this site was  $6 \mu\text{g}/\text{m}^3$ , which just exceeds the  $5 \mu\text{g}/\text{m}^3$  mean standard. An estimated concentration for 2010 can be derived from this result using TG03 guidance. Based on the correction factor to estimate future concentrations from measured roadside data, the estimated concentration at the Town Hall location is  $4.2 \mu\text{g}/\text{m}^3$ , which is below the 2010 objective.

Continuous monitoring of benzene is also undertaken in other areas of London including a suburban site at London Eltham (this site was part of the government's AURN until monitoring stopped in 2000). The annual mean results for the site in 1999 and 2000 were  $2.81$  and  $2.52 \mu\text{g}/\text{m}^3$  respectively, i.e. below both 2003 and the more stringent 2010 objectives.

In addition the annual mean results for the busy kerbside site at London Marylebone Road for the period 1999 to 2001 was  $12.8$ ,  $10.8$  and  $6.29 \mu\text{g}/\text{m}^3$ . To consider the results for 2010 it is

necessary to correct the results. Based on the 2001 data, the predicted concentration for this site is  $4.06 \mu\text{g}/\text{m}^3$ , which is below the 2010 objective.

These monitoring results are considered representative of the Council's area. They indicate that the concentrations will not exceed the benzene objectives for 2003 and 2010 and therefore a Detailed Assessment based on monitoring is not required.

## 2. *Very busy roads/ junctions in built up areas*

Traffic flows in the area are given in Appendix 2; from this no roads in the Council's area need be identified as a 'very busy road' using the TG03 definition. Furthermore the [www.airquality.co.uk/archive/laqm/tools.php](http://www.airquality.co.uk/archive/laqm/tools.php) site gives the 2010 background for the Council's area and from this the estimated background predictions vary between  $0.79$  and  $1.2 \mu\text{g}/\text{m}^3$ . This is less than the  $2 \mu\text{g}/\text{m}^3$  referred to in the TG03 guidance for further assessment. Based on these findings there is no need to carry out a Detailed Assessment for roads.

### 3a. *Part A processes*

There were no industrial processes that were found in or near to the Council's area to emit significant quantities of benzene during the previous R&A. Since then no significant new industrial sources of benzene or existing ones with increased emissions have been identified either in the Council's area or in neighbouring local authority areas.

### 3b. *Petrol stations*

The list of authorised petrol stations is attached in Appendix 3. A petrol station is only considered important for 2010 objective, if the throughput is greater than  $2000\text{m}^3$  and if it is close to a busy road with more than 30,000vpd. Full details on the throughput are not available, although all petrol stations are known to have a throughput of greater than  $1000\text{m}^3$ . Using an assumption that each has an annual throughput greater than  $2000\text{m}^3$ , those petrol stations in the Council's area that are close to busy roads (as defined by TG03) do not have relevant exposure within 10m of the petrol pumps. Thus a Detailed Assessment based on petrol stations is not required.

### 3c. *Major fuel storage depots*

There are no major fuel storage depots within the Council's area (as listed in TG03).

## **Conclusion**

The updating and screening assessment for benzene has not identified a risk of the 2003 and 2010 objectives being exceeded in the Council's area. The Council need not therefore proceed beyond this updating and screening assessment for benzene.

**Summary of findings for benzene**

<b>Screening checklist for benzene</b>	<b>Outcome</b>
Monitoring data	No further action required
Busy roads, junctions	No further action required
Petrol stations	No further action required
Industrial sources	No further action required
Major petrol storage depots	No further action required

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## 1,3-Butadiene

*The air quality objective for 1,3-butadiene remains  $2.25\mu\text{g}/\text{m}^3$  as a maximum running annual mean concentration to be achieved by the end of 2003.*

### Perspective

Emissions from road vehicle exhausts and a small number of industrial sites handling bulk quantities are the main sources of 1,3-butadiene.

Current monitoring indicates that all of the UK national network sites were significantly below the 2003 objective during the period between 1999 and 2001 (from TG03) apart from the Marylebone Road site in London in 1999. This site is a very busy kerbside site and concentrations at this site appear to have tailed off since. Reductions in emissions from road vehicles is continuing as a result of the uptake of abatement technology hence only locations close to industrial sites are expected to proceed beyond the updating and screening assessment for this objective.

National mapping has indicated that for all areas the 2003 objective will not be exceeded. No AQMAs were declared in the first round of R&A.

### 1,3-Butadiene - Methodology Overview

Full details of the methodology employed can be found in TG03. The following represents a summary of the methods used. To undertake this it is necessary to draw on the first stage report of the first round of review and assessment.

A checklist approach is used, based on 1) monitoring data 2) new industrial sources or existing industrial sources with significantly increased emissions.

1. For monitoring the data should be prioritised and for locations near industrial sites monitoring down wind from the site is recommended. If the data indicate that the objective is exceeded then the local authority will be required to proceed to the Detailed Assessment stage (as there is no need to correct it for future years).
2. For new industrial processes listed in the guidance it is likely that an air quality assessment will have been undertaken as part of planning or authorisation process. The results from this should be cited. Authorities are also asked to check information from the first round of R&A if there were doubts about their validity. Where it is necessary to check industrial sources then annual emission of 1,3-butadiene is needed along with the height of discharge to calculate whether the relevant threshold emissions rate in the guidance has been exceeded.

A substantial increase in emissions is one where the increase is greater than 30%.

### Updating and Screening Assessment of 1,3-Butadiene for Lambeth Council

No significant sources were screened during the previous round of R&A and so relevant exposure was considered unlikely. As a result progression beyond Stage 2 R&A was not undertaken.

### 1. *Monitoring*

The Council has not undertaken specific monitoring of 1,3-butadiene since the last round of review and assessment. Continuous monitoring is undertaken nearby in other parts of London. The annual mean results at the national network roadside site at London UCL (in central London) and the suburban site at Eltham for 1999 and 2000 (when monitoring stopped) are approximate to 0.5 and 0.4  $\mu\text{g}/\text{m}^3$  respectively for both years. These results are both less than the 2003 objective and are considered representative of the Council's area. They indicate that the concentrations will not exceed the 1,3-butadiene objective for 2003 and therefore a detailed assessment is not required.

The 2003 background from the [www.airquality.co.uk/archive/laqm/tools.php](http://www.airquality.co.uk/archive/laqm/tools.php) site also confirms that 2003 background is less than 1  $\mu\text{g}/\text{m}^3$ . The estimated background predictions vary between 0.31 and 0.52  $\mu\text{g}/\text{m}^3$  across the Council's area.

### 2. *Industrial sources*

As for benzene, there are no new Part A or B processes or existing processes with substantially increased emissions of 1,3-butadiene within the Council's area since the last round of review and assessment. Similarly the Council has not identified significant new industrial sources or existing ones with increased emissions in neighbouring local authority areas.

## Conclusion

The updating and screening assessment for 1,3-butadiene has not identified a risk of the 2003 objective being exceeded in the Council's area. The Council need not therefore proceed beyond this updating and screening assessment for 1,3-butadiene.

## Summary of findings for 1,3 butadiene

Screening checklist for 1,3 butadiene	Outcome
Monitoring data	No further action required
Industrial sources	No further action required

## Lead

*The current air quality objective for lead is  $0.5\mu\text{g}/\text{m}^3$  as an annual mean concentration to be achieved by the end of 2004, with a lower air quality objective of  $0.25\mu\text{g}/\text{m}^3$  as an annual mean concentration to be achieved by the end of 2008.*

### Perspective

Emissions of lead are now restricted to a small number of industrial processes, including battery manufacture, pigments in paint, alloys, radiation shielding tank lining and piping.

Current monitoring indicates that lead in air at all background and kerbside UK national network sites was significantly below the 2004 and 2008 objectives during the period between 1999 and 2001 (from TG03).

Further assessments however have been undertaken nationally at specific sites near industrial processes. For one industrial site in 2000 the result exceeded the  $0.5\mu\text{g}/\text{m}^3$  objective, followed in 2001 by an exceedence of the  $0.25\mu\text{g}/\text{m}^3$  objective. For the other site the result was exceeded at 2 locations in 1999, one of the  $0.5\mu\text{g}/\text{m}^3$  objective and one of  $0.25\mu\text{g}/\text{m}^3$  objective. Concentrations at this site however since have dropped markedly. Thus the monitoring results indicated generally no exceedences of the 2004/ 2008 objectives although locations in proximity to non-ferrous metal production and foundry processes were deemed to be at risk.

No AQMAs were declared in the first round of R&A.

### Methodology Overview

Full details of the methodology employed can be found in TG03. The following represents a summary of the methods used. To undertake this it is necessary to draw on the first stage report of the first round of review and assessment.

A checklist approach is used, based on 1) monitoring data 2) new industrial sources and existing industrial sources with significantly increased emissions.

1. For monitoring the data should be prioritised and for locations near industrial sites monitoring down wind from the site at the nearest residential property is recommended. If the data indicate that the objective is exceeded then the local authority will be required to proceed to the Detailed Assessment stage (as there is no need to correct it for future years).
2. For new industrial processes listed in the guidance it is likely that an air quality assessment will have been undertaken as part of planning or authorisation process. The results from this should be cited. Authorities are also asked to check information from the first round of R&A if there were doubts about their validity. Where it is necessary to check industrial sources then the annual emission of lead is needed along with the height of discharge to calculate whether the relevant threshold in the guidance has been exceeded.

A substantial increase in emissions is one where the increase is greater than 30%.

## Updating and Screening Assessment of Lead for Lambeth Council

The sources identified in the first round of R&A in the Council's area, were found to pose a negligible risk in localities where there might be exposure and hence progress beyond the Stage 1 R&A was not needed.

### 1. *Monitoring*

The Council has not identified a need to undertake the specific monitoring of lead anywhere in its area since the last round of review and assessment. The results from the national network in London (between 1999 and 2001) have confirmed that concentrations do not exceed the objectives for 2003 and 2008. The highest annual mean concentration was 0.068  $\mu\text{g}/\text{m}^3$  at the kerbside site at Cromwell Road in West London in 1999, although concentrations at the London sites have since reduced markedly.

These monitoring results are considered representative of the Council's area. The results indicate that the concentrations will not exceed the lead objectives for 2004 and 2008 and therefore a detailed assessment is not required.

### 2. *Industrial sources*

There are no new Part A or B processes or existing processes with substantially increased emissions of lead within the Council's area since the last round of review and assessment. Similarly the Council has not identified significant new industrial sources or existing ones with increased emissions of lead in neighbouring local authority areas.

## Conclusion

The updating and screening assessment for lead has not identified a risk of the 2004 and 2008 objectives being exceeded in the Council's area. The Council therefore need not proceed beyond this updating and screening assessment for lead for this round of review and assessment.

## Summary of findings for lead

Screening checklist for lead	Outcome
Monitoring data	No further action required
Industrial sources	No further action required

## Nitrogen Dioxide

*The current air quality objectives for nitrogen dioxide are 40  $\mu\text{g}/\text{m}^3$  as an annual mean concentration and a one hour mean concentration of 200  $\mu\text{g}/\text{m}^3$  not be exceeded more than 18 times per year. The objectives are to be achieved by the end of 2005.*

### Perspective

Nitrogen dioxide ( $\text{NO}_2$ ) and nitric oxide ( $\text{NO}$ ) are both oxides of nitrogen, and are collectively referred to as nitrogen oxides ( $\text{NO}_x$ ). All combustion processes produce  $\text{NO}_x$  emissions, largely in the form of nitric oxide, which is then converted to nitrogen dioxide, mainly as a result of reaction with ozone in the atmosphere. It is nitrogen dioxide that is associated with adverse effects upon human health.

The principal source of nitrogen oxides emissions is road transport, which accounted for about 49% of total UK emissions in 2000 (from TG03). Major roads carrying large volumes of high-speed traffic are a predominant source, as are conurbations and city centres with congested traffic. The contribution of road transport to nitrogen oxides emissions has declined significantly in recent years as a result of various policy measures. At a national level, urban traffic nitrogen oxides emissions are estimated to fall by about 20% between 2000 and 2005, and by 46% between 2000 and 2010 (Stedman et al, 2001).

Other significant sources of nitrogen oxides emissions include the electricity supply industry and other industrial and commercial sectors. Emissions from both sources have also declined dramatically, due to the fitting of low nitrogen oxides burners, and the increased use of natural gas. Industrial sources make only a very small contribution to annual mean nitrogen dioxide levels.

More than 100 AQMAs were declared in the first round of R&A across the country, the vast majority of which related specifically to road transport emissions, where the attainment of the annual mean objective is considered unlikely. The annual mean objective is more demanding than the one-hour mean objective and areas predicted to exceed include parts of major conurbations, town centres with congested traffic and dual carriageways and motorways.

### Methodology Overview

Full details of the methodology employed can be found in TG03. The following represents a summary of the methods used. To undertake this it is necessary to draw on the first stage report of the first round of review and assessment.

A checklist approach is used for the updating and screening assessment, based on 1) monitoring data 2) roads including narrow congested streets and junctions 3) bus stations 4) new industrial sources and existing ones with significantly increased emissions 5) aircraft.

1. Monitoring data are to be considered both outside an AQMA and within an AQMA. The data will be corrected to 2005 using factors in TG03 and if the data indicate that the concentration exceeds the objective then the local authority will be required to proceed to the Detailed Assessment stage.

2. The section on roads focuses on specific examples that may not have been fully considered in the first round of review and assessment, these include: narrow congested streets; junctions; busy streets where people may spend an hour or more close to traffic; roads with high flows of buses or HGVs; new roads; and roads close to the objective during the first round of review and assessment. The assessment relates to annual average daily traffic flows exceeding stated flows (which are dependent on the type of road) for different locations. If the indications arising from these assessments are greater than  $40 \mu\text{g}/\text{m}^3$  in 2005 then a detailed assessment is necessary. For any new roads a specific assessment is required based on the DMRB screening model. Similarly roads close to the objective at the last review and assessment or roads with significantly changed flows should be re-assessed.
3. Bus stations should be assessed specifically based on the numbers of bus movements and the proximity of relevant exposure (in this instance it should be judged against the 1 hour criteria). If the bus station meets or exceeds these stated levels of activity then DMRB is to be used to obtain a predicted annual mean. If the predicted concentration is greater than  $40 \mu\text{g}/\text{m}^3$  in 2005 then it is necessary to proceed to the Detailed Assessment stage.
4. For new industrial sources (as listed in TG03) it is likely that an air quality assessment will have been undertaken as part of planning or authorisation process. The results from this should be cited. If no assessment was undertaken then TG03 provides nomograms for an assessment. The same approach is required where there has been a substantial increase in emissions (i.e. one greater than 30%).
5. Aircraft emissions are important if there is relevant exposure within 1000m of the airport boundary and the equivalent passenger numbers are predicted to exceed 5 million passengers per annum.

### **Updating and Screening Assessment of Nitrogen Dioxide for Lambeth Council**

The main sources examined in the Council's area during the previous round of R&A were road transport sources. The Council undertook a Stage 3 R&A in the previous round of review and assessment and identified the sections of roads in its area with relevant exposure where the annual mean objective would be exceeded. Consequently the Council declared an AQMA in the north of the borough and along main roads running through the borough.

A further review was undertaken using the updated emissions inventory for London. This differed from that used for the Stage 3 review in 2000 and incorporated the new vehicle emission factors. The results showed that future vehicle emissions will not reduce as much as previously estimated; the outcome from this was that the annual mean objective was likely to be breached along most of the main roads in the borough. As a result the Council extended its AQMA to cover the whole borough.

#### *1. Monitoring*

##### *Monitoring in the Lambeth Council area*

The Council undertakes continuous monitoring of  $\text{NO}_2$  within its area at five continuous sites:

- Lambeth 1 (LB1) is a roadside site on Christchurch Road;
- Lambeth 2 (LB2) is a roadside site at Vauxhall Cross (this site closed on the 1<sup>st</sup> July 2003);
- Lambeth 3 (LB3) is an urban background site at Loughborough Junction;
- Lambeth 4 (LB4) is a roadside site on Brixton Road. Monitoring at this site commenced in late 2003, hence the results are not given below;
- Crystal Palace 1 (CY1) is the jointly operated roadside site located on Crystal Palace Parade.

The sites are all part of the LAQN and the standards of QA/QC applied meet the requirements of the LAQN. The above sites are all representative of relevant exposure.

The results of the monitoring at the sites are given in Table 4 below and this indicates that the annual mean objective was achieved only in 2002 for the Lambeth 3 background site. All other sites exceeded the annual mean objective. The data capture for the sites is given in the appendices.

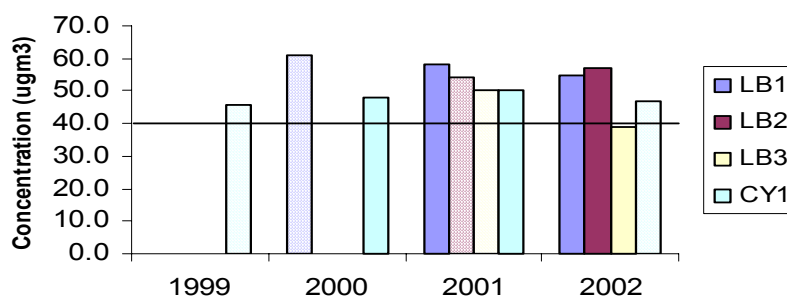
**Table 4** NO<sub>2</sub> continuous monitoring in Lambeth Council area (1999 – 2002) (µg/m<sup>3</sup>)

LAQN site	1999	2000	2001	2002
Lambeth 1 – roadside	no	<i>61.1</i>	<b>58.0</b>	<b>55.0</b>
Lambeth 2 – roadside	no	no	<b>54.0</b>	<b>57.0</b>
Lambeth 3 - background	no	no	<b>50.0</b>	39.0
Crystal Palace 1 - roadside	<i>45.8</i>	<b>47.8</b>	<b>50.0</b>	<i>47.0</i>

(Note - no indicates site not in operation, italics represents < 90% data capture)

There was however only one hour where the hourly standard was exceeded at the sites during the period 1999 to 2002. This was at the roadside site at Lambeth 2 during 2002. Figure 4 shows the results in graphical form.

**Figure 4** NO<sub>2</sub> continuous monitoring in Lambeth Council area (1999 – 2002) (µg/m<sup>3</sup>)

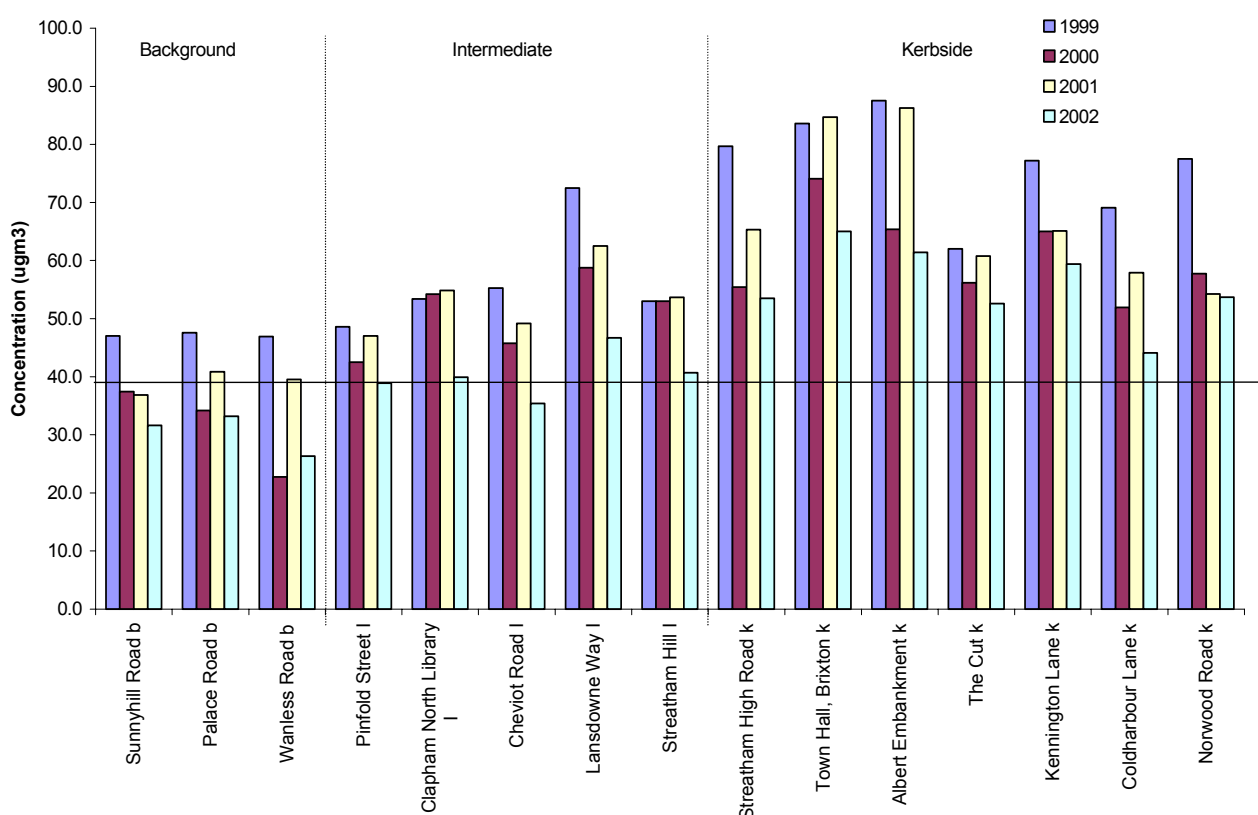


(Note – the above graph only shows those sites with > 80% data capture)

The results of diffusion tube monitoring for the most recent years (i.e. from 1999 to 2002) of the 15 sites monitored in the borough are given in Table 5 below (note – the results given are the original unbiased results). The sites represent locations relevant for public exposure.

The Council's diffusion tubes are prepared and analysed by Lambeth Scientific Services. The method of preparation used is 50% TEA in acetone. The diffusion tube locations comprise 7 kerbside sites, 5 intermediate sites and 3 background sites across the borough. The details of the sites are given in appendix 1, with Figure 5 below showing the results for all sites for the monitoring period between 1999 and 2002. It should be noted that the results presented in this figure have not been bias adjusted.

**Figure 5** NO<sub>2</sub> diffusion tube results across the Council's area (1999 – 2002)



The results indicate generally that concentrations have decreased between 1999 and 2002, with the most recent concentrations at the three background sites meeting the annual mean objective. Three of the intermediate sites also met the objective (Pinfold Street, Clapham North Library and Cheviot Road) for 2002 only. Each kerbside site however exceeded the 40  $\mu\text{g}/\text{m}^3$  objective for all years monitored.

**Table 5** NO<sub>2</sub> diffusion tube monitoring in Lambeth (1999 – 2002) (µg/m<sup>3</sup>)**(NB these results are not bias corrected)**

Sites	Type	1999	2000	2001	2002
Sunnyhill Road	b	47.0	37.4	36.8	31.6
Palace Road	b	47.6	34.2	40.8	33.2
Wanless Road	b	46.9	22.8	39.5	26.3
Pinfold Street	i	48.6	42.5	47.0	38.9
Clapham North Library	i	53.4	54.2	54.8	39.9
Cheviot Road	i	55.3	45.8	49.2	35.4
Lansdowne Way	i	72.5	58.8	62.5	46.7
Streatham Hill	i	53.0	53.0	53.7	40.7
Streatham High Road	k	79.7	55.4	65.3	53.5
Town Hall, Brixton	k	83.6	74.1	84.7	65.0
Albert Embankment	k	87.5	65.4	86.3	61.4
The Cut	k	62.0	56.2	60.8	52.6
Kennington Lane	k	77.2	65.0	65.1	59.4
Coldharbour Lane	k	69.1	51.9	57.9	44.1
Norwood Road	k	77.5	57.7	54.3	53.7

The results of diffusion tube monitoring for 2001 of the sites monitored in the borough are given below. These results are biased adjusted, based on the results from co-location studies with the Lambeth 1 monitoring site. The bias adjustment is undertaken to try to correct for a systematic laboratory bias arising.

The bias adjustment was obtained (in accordance with TG03) as follows:

Bias adjustment factor (based on roadside site 2001 annual mean)

$$\begin{aligned}
 &= \text{Lambeth 1 monitoring result} / \text{Co-located diffusion tube} \\
 &= 58 / 40.8 \\
 &= 1.42
 \end{aligned}$$

(Note - the data capture for the continuous site exceeds 90% and 12 months of diffusion tube monitoring was undertaken)

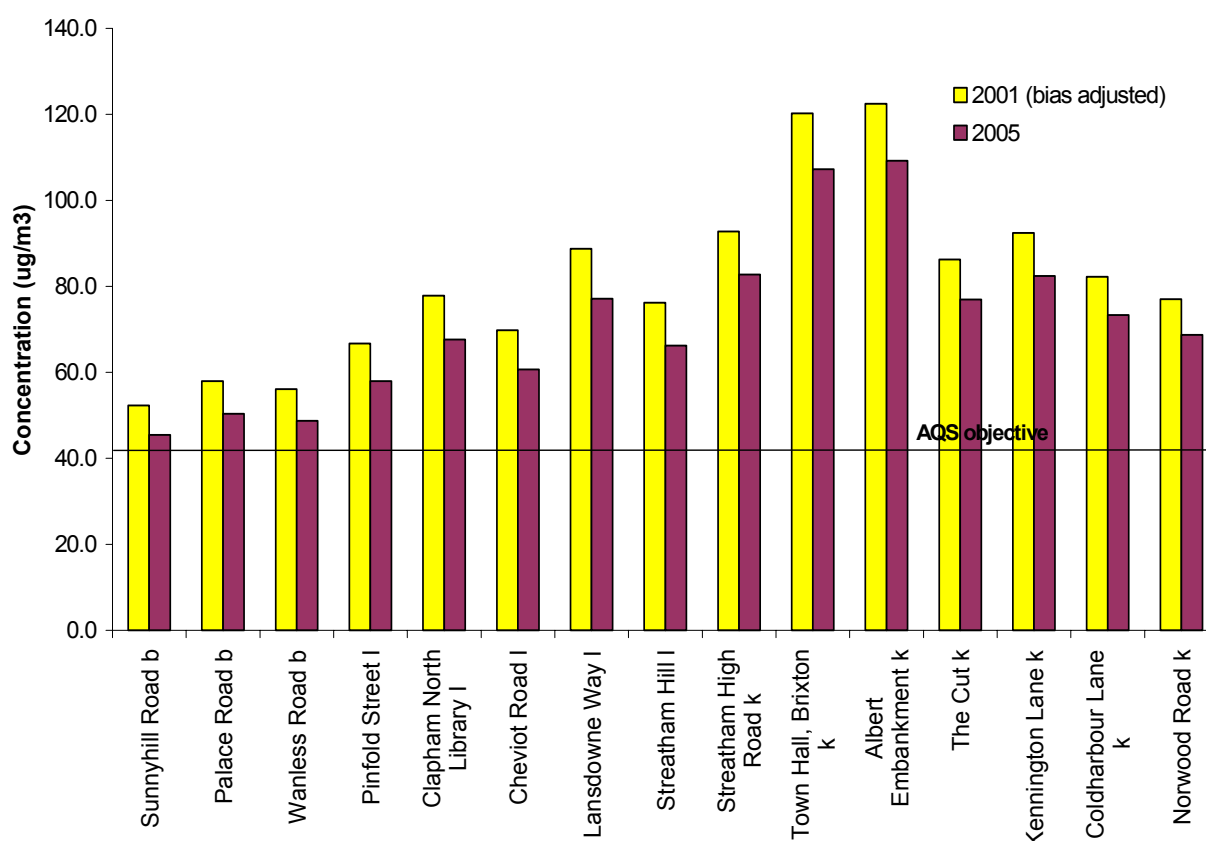
It should be noted that the bias adjusted results indicate that all 15 sites exceeded the annual mean objective in 2001.

#### *Future estimates based on Lambeth monitoring*

The TG03 guidance also includes correction factors for future years for roadside measurements and using this estimated concentrations for the sites with measured exceedences have been derived. The results are given below in Table 6.

**Table 6** Predicted NO<sub>2</sub> using corrected diffusion tube results across the borough (2001 and estimated 2005) (µg/m<sup>3</sup>)

Site	Type	Bias adjusted	
		2001	2005
Sunnyhill Road	b	52.3	45.5
Palace Road	b	58.0	50.4
Wanless Road	b	56.1	48.7
Pinfold Street	l	66.7	58.0
Clapham North Library	i	77.9	67.7
Cheviot Road	i	69.8	60.7
Lansdowne Way	i	88.8	77.1
Streatham Hill	i	76.2	66.2
Streatham High Road	k	92.8	82.8
Town Hall, Brixton	k	120.2	107.2
Albert Embankment	k	122.5	109.2
The Cut	k	86.3	76.9
Kennington Lane	k	92.4	82.4
Coldharbour Lane	k	82.2	73.3
Norwood Road	k	77.0	68.7

**Figure 6** Predicted NO<sub>2</sub> using corrected diffusion tube results across the borough (2001 and estimated 2005) (µg/m<sup>3</sup>)

The results indicate that all sites in the borough exceeded the 40 µg/m<sup>3</sup> objective for 2001 and are also estimated to exceed the objective in 2005.

#### *Monitoring in nearby London areas*

It is helpful to consider the borough as part of the wider London conurbation and the most recent results from the continuous sites in nearby authorities in the LAQN (including the Marylebone Road site in central London, which is a kerbside with high pollution concentrations) are given in Table 7 below. Full details of the data capture rate are given in Appendix 1.

**Table 7** Results of NO<sub>2</sub> monitoring from nearby LAQN sites (1999-2002)

LAQN site	Type	1999	2000	2001	2002
Marylebone Rd	K	<b>89.8</b>	<b>91.7</b>	<b>84.0</b>	<b>80.0</b>
Croydon 2	R	38.2	34.4	<b>45.0</b>	<b>46.0</b>
Croydon 4	R	<i>40.1</i>	<b>51.6</b>	<i>56.0</i>	<b>50.0</b>
Croydon 5	R	no	<b>55.4</b>	<i>69.0</i>	<b>65.0</b>
Croydon 6	S	no	no	<i>39.0</i>	35.0
Southwark 1	U	<b>55.4</b>	<b>51.6</b>	<b>54.0</b>	<i>46.0</i>
Southwark 2	R	<i>74.5</i>	<i>63.0</i>	<i>65.0</i>	<i>58.0</i>
Wandsworth 2	U	<b>51.6</b>	<b>49.7</b>	<b>52.0</b>	<b>52.0</b>
Wandsworth 4	R	<i>49.7</i>	45.8	53.0	<b>44.0</b>
Westminster	U	no	no	<i>44.0</i>	<b>43.0</b>

(Note – K: kerbside, R: roadside, S: suburban, U: urban background; italics indicates <90% data capture and bold indicates > objective)

The results confirm that the kerbside site at Marylebone Road and all other roadside sites failed to meet the 40 µg/m<sup>3</sup> standard. The urban background sites also, apart from those in outer London, all exceeded the standard, thereby suggesting that background concentrations across the Council's area are not likely to meet the standard. The findings for these LAQN sites are considered indicative of the findings for the Council's area, that is that high concentrations of NO<sub>2</sub> arise close to the busiest roads across the borough and at the background towards central London.

The assessment of NO<sub>2</sub> based on monitoring confirms that there are areas across the borough where the annual mean objective will be exceeded. A Detailed Assessment to revoke the Council's AQMA is not therefore required.

- Roads including narrow streets/ junctions/ busy streets/ high flows of HGVs and buses/ new roads/ roads close to the objective in first round of R & A/ roads with significantly changed flows.*

The Stage 3 report for the previous round of R&A provided modelling of the main roads in Lambeth. The Stage 4 updated the earlier predictions and incorporated the revised emission factors and addressed the following issues:

- Narrow congested roads, including street canyons
- Junctions
- High flows of HGVs and buses
- Roads close to the objective in first round of R & A

As a result none of the above issues have been re-examined in this report. The Stage 4 report also used the latest version of the London Atmospheric Emissions Inventory (LAEI) referred to in the introductory chapter to the report, this incorporates the latest traffic flows in the borough. There are no roads with significantly changed flows since the Stage 4 report.

### *Busy streets*

Busy streets have been identified using GIS techniques (note – this enables streets to be identified that meet the relevant distance criteria in TG03 but clearly does not confirm the presence of street cafes, etc. Thus additional streets are included in the selection). The purpose of examining busy streets is to determine whether or not there is the potential for exposure arising, which will exceed the one-hour objective. Monitoring undertaken across the borough has clearly indicated that the objective is not exceeded, however the monitoring is not always possible in every location where such exposure might arise.

To predict concentrations close to roads an understanding of the future predicted background concentrations of both NO<sub>x</sub> and NO<sub>2</sub> for 2005 is required. These details have also been derived from the LAEI as explained earlier.

Busy streets with more than 10,000vpd, where people may regularly spend more than one hour within 5m of the kerb, have been identified in the borough and a DMRB assessment undertaken of these, based on relevant exposure arising at 5m from the kerb. The DMRB results for the busiest streets are given in Table 8 below. Details of the traffic flows used for this updating and screening assessment are given in Appendix 2 (see Table 20).

**Table 8** Predicted annual mean NO<sub>2</sub> at busy streets for 2005 in Lambeth area (µg/m<sup>3</sup>)

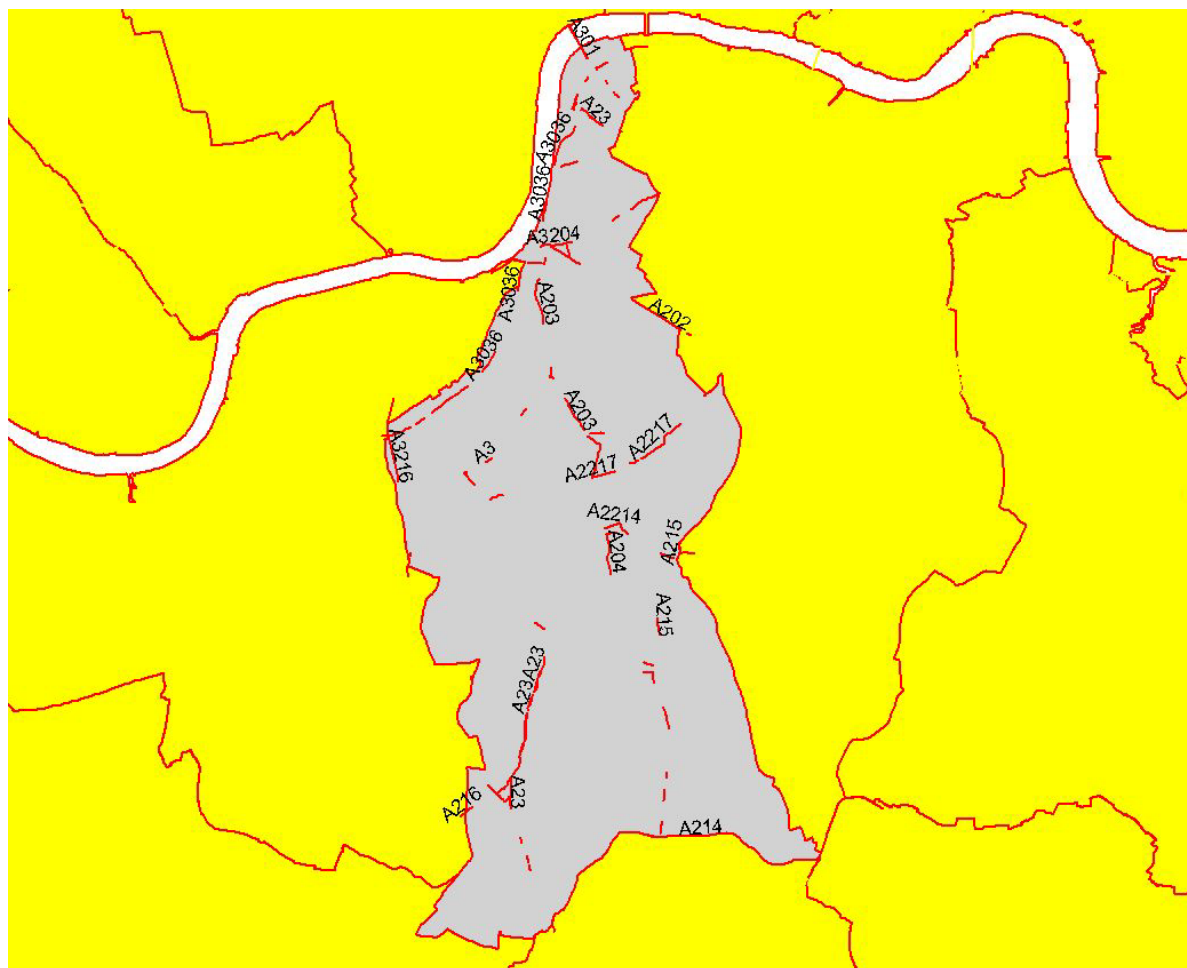
road name	Road number	NO <sub>2</sub>	NO <sub>2</sub> canyon
CROWN DALE	A214	35.5	40.0
KNIGHT'S HILL	A215	36.0	40.8
CROWN LANE	A214	36.0	40.3
CROXTED ROAD	A2199	37.4	41.1
STREATHAM HIGH ROAD	A23	38.2	44.0
NORWOOD ROAD	A215	38.5	44.1
GLENEAGLE ROAD	A214	38.7	43.2
TULSE HILL	A205	38.9	44.1
MITCHAM LANE	A216	39.7	44.6
TULSE HILL	A204	39.8	44.4
TULSE HILL	A205	39.8	45.0
MORVAL ROAD	A2214	39.9	44.4
AMBLESIDE AVENUE	A214	39.9	44.9
HERNE HILL	A215	39.9	44.4
CHAMPION PARK	A2216	41.6	46.9
MITCHAM LANE	A216	41.6	48.0

THE AVENUE	A205	42.0	46.9
STREATHAM HILL	A23	42.4	49.4
STREATHAM PLACE	A205	42.5	48.5
BALHAM HILL	A24	42.8	48.0
COLDHARBOUR LANE	A2217	43.1	48.4
QUEENSTOWN ROAD	A3216	43.2	48.3
STREATHAM HIGH ROAD	A23	43.9	52.0
DENMARK HILL	A215	44.0	50.5
CHRISTCHURCH ROAD	A205	44.3	52.6
CEDARS ROAD	A3216	44.5	50.7
STOCKWELL ROAD	A203	44.5	49.7
CLAPHAM PARK ROAD	A2217	44.7	50.8
CLAPHAM ROAD	A3	44.7	50.4
STOCKWELL ROAD	A203	45.7	52.4
STREATHAM HIGH ROAD	A23	45.9	54.8
KENNINGTON LANE	A3204	46.1	51.2
SOUTH LAMBETH ROAD	A203	46.1	51.2
LAVENDER HILL	A3036	46.1	53.6
CAMBERWELL NEW ROAD	A202	46.5	53.3
HARLEYFORD ROAD	A202	46.6	52.4
WANDSWORTH ROAD	A3036	46.7	52.7
KENNINGTON LANE	A3204	47.1	52.8
DURHAM STREET	A3204	48.2	54.6
BRIXTON ROAD	A23	48.3	56.8
STAMFORD STREET	A3200	48.6	54.1
NINE ELMS LANE	A3205	49.3	56.1
	A301	49.6	55.6
LAMBETH PALACE ROAD	A3036	49.7	55.6
STAMFORD STREET	A3200	49.8	56.2
LAMBETH ROAD	A3203	50.0	56.3
ALBERT EMBANKMENT	A3036	50.7	57.6
WESTMINSTER BRIDGE ROAD	A23	50.8	57.3
KENNINGTON PARK ROAD	A3	50.9	59.5
ST GEORGE'S ROAD	A302	51.0	58.0
KENNINGTON LANE	A3204	51.5	59.6
STOCKWELL PARK WALK	A203	51.8	61.8
WATERLOO ROAD	A301	52.4	60.1
KENNINGTON LANE	A203	52.6	61.3
PARRY STREET	A3205	52.6	61.5
KENNINGTON LANE	A3204	53.7	63.2
HARLEYFORD ROAD	A202	54.4	64.2
YORK ROAD	A3200	54.7	63.6
WESTMINSTER STREET	A23	56.8	66.9

The above results are given with streets being treated as both non-street canyons and street canyons (using the TG03 methodology). The results for non-street canyons indicate that the majority of roads exceed the  $40 \mu\text{g}/\text{m}^3$  annual mean objective for the roads tested, thus indicating that there is a potential for more than 18 hours above  $200 \mu\text{g}/\text{m}^3$ . If the same roads are considered as street canyons then all the streets tested exceed the annual mean objective.

The roads identified are shown in Figure 7 below.

**Figure 7** Roads identified as bust streets using GIS methods in the Lambeth Council area



No new roads with traffic flows greater than 10,000vpd have been built in the Council's area since the first round of R&A where there is relevant exposure arising.

### 3. *Bus stations*

There is several open bus station in the Council's area: at Streatham Hill, Stockwell and West Norwood where there is relevant exposure. The estimated numbers of buses using each station is less than 1000 buses per day (from timetabled information). On this basis and using TG03 guidance no further assessment need be made.

### 4. *Industrial sources*

There are no new Part A or B processes or existing processes with substantially increased emissions of nitrogen oxides within or close to the Council's area since the last round of review and assessment.

## 5. *Aircraft*

There is not an airport within the Council's area and therefore no assessment need be made.

### **Conclusion**

The updating and screening assessment for nitrogen dioxide has identified a risk that the 2005 annual mean objective will be exceeded in the Council's area. This is consistent with the Council's previous local air quality management findings and actions. The Council therefore need not undertake a Detailed Assessment in respect of nitrogen dioxide with a view to revoking its AQMA.

### **Summary of findings for nitrogen dioxide**

<b>Screening checklist for NO<sub>2</sub></b>	<b>Outcome</b>
Monitoring data	No further action required
Roads	No further action required
Bus stations	No further action required
Industrial sources	No further action required
Air craft	No further action required

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## Sulphur Dioxide

*The current air quality objectives for sulphur dioxide are a 15 mean concentration of 266  $\mu\text{g}/\text{m}^3$  not be exceeded more than 35 times per year, to be achieved by the end of 2005. Additional objectives include a one hour mean concentration of 350  $\mu\text{g}/\text{m}^3$  not be exceeded more than 24 times per year and a 24 hour mean concentration of 125  $\mu\text{g}/\text{m}^3$  not be exceeded more than 3 times per year. These latter objectives, equivalent to the EU limit values, are all to be achieved by the end of 2004.*

### Perspective

The main source of sulphur dioxide in the UK is power stations, which accounted for more than 71% of emissions in 2000. There are also significant emissions from other industrial combustion sources. Domestic sources now only account for 4% of emissions, but can be locally much more significant. Road transport currently accounts for less than 1% of emissions.

Measurements from the national monitoring network indicate that concentrations have fallen in recent years, with the objectives only being exceeded in Belfast (from TG03). This is associated with widespread domestic coal burning. The 15-minute objective is the most stringent for  $\text{SO}_2$ . A small number of AQMAs were declared during the first round of review and assessment. These relate to a number of coal-fired boilers, domestic coal burning and at a major port.

### Methodology Overview

Full details of the methodology employed can be found in TG03. The following represents a summary of the methods used. To undertake this it is necessary to draw on the first stage report of the first round of review and assessment.

A checklist approach is used, based on 1) monitoring data 2) new industrial sources and existing ones with significantly increased emissions 3) areas of domestic coal burning 4) boilers burning coal or oil 5) railway locomotives.

1. Monitoring data are to be considered both outside an AQMA and within an AQMA. The data will be assumed to relate to the relevant objective year and if the data indicate that the concentration exceeds the objective then the local authority will be required to proceed to the Detailed Assessment stage.
2. For new industrial sources listed in TG03 it is likely that an air quality assessment will have been undertaken as part of planning or authorisation process. The results from this should be cited. If no assessment was undertaken then TG03 provides nomograms for an assessment. The same approach is required where there has been a substantial increase in emissions (i.e. one greater than 30%).
3. For domestic sources there is the need to identify small areas (500 x 500m) where significant coal burning still takes place. If the density of coal burning premises exceeds 100 per 500 x 500m then a detailed assessment is required.

4. For boiler plant it is necessary to identify all plant >5MW(thermal) that burn coal or fuel oil and establish whether there is relevant exposure within 500m. If such boilers are found then TG03 provides nomograms for an assessment.
5. Both diesel and coal fired locomotives emit SO<sub>2</sub> and this is most relevant where the locomotives are stationary for periods of 15 minutes or more. It is also necessary to establish whether or not there is relevant exposure within 15m of the source. If there are more than 2 occasions when locomotives are stationary with engines running then it is necessary to go to a detailed assessment.

### Updating and Screening Assessment of Sulphur Dioxide for the Lambeth Council

The main sources examined during the previous round were Part A or B processes. No boilers greater than 5MW (thermal) were identified as a significant emission source of SO<sub>2</sub> in the Council's area. The assessment of SO<sub>2</sub> therefore ended at the Stage 3 R&A following the Council's acceptance of the Environment Agency's report assessing air quality in London and the East Thames corridor (2000).

#### 1. Monitoring

The Council undertakes SO<sub>2</sub> continuous monitoring at all of its sites including Crystal Palace (CY1). The results for the period 1999 to 2002 based on ratified data indicate that the 15-minute mean standard was exceeded once at the Lambeth 1 during 2001 only; similarly there were no periods when the one-hour and 24 hour mean standards were exceeded. Details of the maximum 15-minute mean measurements for the Council's continuous sites are given in the following table:

**Table 9** Maximum 15-minute mean measurement at Lambeth continuous sites (1999-2002)

$\mu\text{g}/\text{m}^3$	1999	2000	2001	2002
LB1	no	<i>107.3</i>	314.0	125.4
LB2	no	no	<i>45.9</i>	174.0
LB3	no	no	<i>43.4</i>	<i>208.2</i>
CY1	<i>260.7</i>	<i>151.1</i>	<i>256.2</i>	<i>164.5</i>

(Note – no indicates not in operation; italics indicates <90% data capture)

Monitoring is also undertaken in nearby local authorities in the LAQN. The monitoring results relating to the 15-minute mean objective and relevant data capture for these sites are given in Table 10 below for 2001. As with the Lambeth site there have been no instances where the one-hour or 24 hour mean objectives have been exceeded. The 15-minute mean standard of 266  $\mu\text{g}/\text{m}^3$  has been exceeded at Wandsworth 3 in 1999. However this was not for more than the objective of 35 occurrences in one year.

**Table 10** Maximum 15 minute mean SO<sub>2</sub> from LAQN in neighbouring areas (1999 - 2002)

<b>µg/m<sup>3</sup></b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>
Lewisham 1	169.2	<i>58.5</i>	<i>56.1</i>	258.0
Lewisham 2	no	no	no	<i>189.9</i>
Southwark 1	182.7	172.9	181.7	154.3
Southwark 2	<i>200.0</i>	115.4	149.2	74.5
Wandsworth 2	131.4	<i>153.0</i>	230.4	104.3
Wandsworth 33	282.2	<i>120.2</i>	no	no
Westminster	no	no	<i>77.1</i>	151.6

(Note – no indicates not in operation; italics indicates <90% data capture)

The results for all the above sites confirm that the SO<sub>2</sub> objectives were achieved. This is considered representative of the Council's area and therefore no further assessment based on monitoring data is required.

## 2. *Industrial sources*

There are no new Part A or B processes within the Council's area or nearby in neighbouring authorities since the last round of review and assessment. There are also no existing relevant Part A or B processes within the Council's area or nearby in neighbouring authorities where there have been substantially increased emissions

## 3. *Domestic sources*

Local knowledge and professional judgement indicates that significant domestic coal burning is not undertaken across the Council's area.

## 4. *Boilers*

No specific new boilers have been identified in the Council's area since the last round of R&A.

## 5. *Railway locomotives*

An assessment has been made of railway activity at sites where locomotives are known to operate in the Council's area. From this it has been established that there is no relevant exposure within 15m of the sites where locomotives are stationary with engines running for two periods of more than 15 minutes per day.

## **Conclusion**

The updating and screening assessment for sulphur dioxide has not identified a risk of the 2004 and 2005 objectives being exceeded in the Council's area. The Council need not therefore proceed beyond this updating and screening assessment for sulphur dioxide for this round of review and assessment.

**Summary of findings for sulphur dioxide**

<b>Screening checklist for SO<sub>2</sub></b>	<b>Outcome</b>
Monitoring data	No further action required
Industrial sources	No further action required
Domestic sources	No further action required
Boilers	No further action required
Railway locomotives	No further action required

## Particles (PM<sub>10</sub>)

*The current air quality objectives for PM<sub>10</sub> are an annual mean concentration of 40 µg/m<sup>3</sup> and a 24 hour mean concentration of 50 µg/m<sup>3</sup> not to be exceeded more than 35 times per year. Both objectives are to be achieved by the end of 2004 and are based upon measurements by the European gravimetric transfer reference sampler or equivalent.*

*The EU has also set indicative limits (Stage 2 limit values) to be achieved by beginning of 2010. These limit values are more stringent than the existing objectives. The government has adopted these as provisional objectives for England, Wales and Northern Ireland (excluding London), although it has not brought them into regulation for the purposes of LAQM. Specific objectives have been included for London; these are an annual mean concentration of 23 µg/m<sup>3</sup> and a 24 hour mean concentration of 50 µg/m<sup>3</sup> not be exceeded more than 10 times per year. The TG03 guidance suggests that local authorities consider them as part of this second round of review and assessment as the findings will provide valuable information, particularly when assessing future local development proposals.*

### Perspective

There is a wide range of emission sources that contribute to PM<sub>10</sub> concentrations in the UK. Research studies have confirmed that these sources can be divided into 3 main categories (APEG, 1999): (i) Primary particle emissions are derived directly from combustion sources, including road traffic, power generation, industrial processes etc. (ii) Secondary particles are formed by chemical reactions in the atmosphere, and comprise principally sulphates and nitrates. (iii) Coarse particles comprise emissions from a wide range of sources, including resuspended dusts from road traffic, construction works, mineral extraction processes, wind-blown dusts and soils, sea salt and biological particles.

The expected reduction in national particle emissions in future years is different for each source type. For example, emissions from road transport will be governed by new legislation on vehicle emission standards; emissions of secondary particles will be largely governed by controls on power generation, industrial and transport SO<sub>2</sub> and NO<sub>x</sub> emissions, both in the UK and in Europe; emissions of coarse particles are largely uncontrolled, and in general are not expected to decline in future years.

Measurements from the national monitoring network indicate that concentrations are generally below the current annual mean objective (TG03). The 24-hour mean objective however has been exceeded at a small number of sites, principally close to busy roads or close to industrial activities. The 2010 annual mean and 24 hour mean objectives are widely exceeded across the network.

An analysis of PM<sub>10</sub> projections for the AQS indicated that exceedences of the 2004 objectives might be found in areas adjacent to busy roads, particularly in urban areas, areas with significant emissions from domestic solid fuel burning, and areas in the vicinity of industrial plant or which have significant uncontrolled or fugitive emissions.

An analysis for 2010 indicates that, dependant on meteorological conditions; exceedences of annual mean concentrations at background locations are only likely to occur in the southeast

of England. In addition exceedences of the annual mean objectives are still expected at some busy roadsides throughout the UK.

Approximately half of the AQMAs declared during the first round of review and assessment were for the 24-hour mean PM<sub>10</sub> objective. The majority of these are in combination with nitrogen dioxide and are associated with road transport sources. Other AQMAs have declared in relation to industrial activities and fugitive sources around a quarry and from port handling activities.

### **Methodology Overview**

Full details of the methodology employed can be found in TG03. The following represents a summary of the methods used. To undertake this it is necessary to draw on the first stage report of the first round of review and assessment.

A checklist approach is used, based on 1) monitoring data 2) roads including junctions and new roads 3) new industrial sources and existing ones with significantly increased emissions 4) areas of domestic coal burning 5) quarries, landfill sites, opencast coal, handling of dusty cargoes at ports, etc and 6) aircraft.

1. Monitoring data are to be considered both outside an AQMA and within an AQMA. The data will be corrected to 2004 and 2010 using factors in TG03 and if the data indicate that the concentration exceeds the 24-hour objective then the local authority will be required to proceed to the Detailed Assessment stage.
2. The section on roads focuses on specific examples that may not have been fully considered in the first round of review and assessment including: junctions; roads with high flows of buses or HGVs; new roads; and roads close to the objective during the first round of review and assessments. These relate to busy roads with annual average daily traffic flows exceeding 10,000vpd. Any relevant exposure within 10m of the kerb needs to be determined. Then using DMRB screening model to predict the number of 24-hour exceedences more than 50 µg/m<sup>3</sup> in 2004. If the number is greater than 35 then a detailed assessment is necessary. Similar assessments are required for roads with high numbers of HGVs and/or buses, i.e. where the proportion of this type of vehicle exceeds 20% and the HGV/ bus flow exceeds 2000vpd. For any new roads a specific assessment is required based on the DMRB screening model. Similarly roads close to the objective at the last review and assessment or roads with significantly changed flows should be re-assessed.
3. For new industrial sources listed in the guidance it is likely that an air quality assessment will have been undertaken as part of planning or authorisation process. The results from this should be cited. If no assessment was undertaken then TG03 provides nomograms for an assessment. The same approach is required where there has been a substantial increase in emissions (i.e. one greater than 30%).
4. For domestic sources there is the need to identify small areas (500 x 500m) where significant solid fuel burning still takes place. If the density of such premises exceeds 50 per 500 x 500m then the nomogram in TG03 is used to determine whether or not a detailed assessment is required.

5. For quarries, landfill sites and ports where dusty cargoes are handled then it is necessary to identify whether there is relevant exposure near to any unpaved haul road, processing plant and materials handling facility. The proximity relates to distance, which is dependant on the annual mean background. For sites identified there is a need to use professional judgement based on complaints received and concerns with the facility.
6. Aircraft emissions are important if there is relevant exposure within 500m of the airport boundary and the equivalent passenger numbers are predicted to exceed 10 million passengers per annum.

### **Updating and Screening Assessment of PM<sub>10</sub> for the Lambeth Council**

Detailed modelling of all sources across the Council's area was undertaken in the Stage 3 for the 2004 objectives. This showed exceedences of the 24 hour mean objective for PM<sub>10</sub>. As a result an AQMA was declared for the northern part of the borough and major roads in the borough.

A Stage 4 further assessment was subsequently undertaken using the new emission factors. This also indicated exceedences of the 24-hour mean objective for PM<sub>10</sub> close to major roads in the borough.

#### *1. Monitoring*

The Council undertakes continuous monitoring of PM<sub>10</sub> in the borough at:

- Lambeth 1 (LB1) is a roadside site on Christchurch Road/ Palace Road, SW2;
- Lambeth 2 (LB2) is a roadside site at Vauxhall Cross, SW8 (this site closed on the 1<sup>st</sup> July 2003);
- Lambeth 3 (LB3) is an urban background site at Loughborough Junction/ Wanless Road, SE24;
- Lambeth 4 (LB4) is a roadside site on Brixton Road. Monitoring at this site commenced in late 2003, hence the results are not given below;
- Crystal Palace 1 (CY1) is the jointly operated site at Crystal Palace, SE19 (close to the northern boundary of the borough). It is also a roadside site located on Crystal Palace Parade (it has high volumes of traffic and is in a non-residential area, close to a petrol station, with the Crystal Palace park to rear).

The Lambeth sites all use BAM instruments for monitoring PM<sub>10</sub>, the only exception to this being the Crystal Palace site which has a TEOM instrument; the results for the latter are therefore presented as a gravimetric equivalent, i.e. TEOM times 1.3. The BAM results are unadjusted. The data capture rates are given in Appendix 1.

The following table presents the results for the period 1999 – 2002 for the four sites (i.e. excluding LB4). It confirms that there were days where the 24-hour mean standard of 50 µg/m<sup>3</sup> was exceeded at all sites for all years (including part years apart from 1999 for Crystal

Palace 1. During 2002 the number of such days was 35 or more for all sites other than Crystal Palace.

**Table 11** PM<sub>10</sub> monitoring (Number of days > 50 µg/m<sup>3</sup>) at Lambeth sites (1999 – 2002)

LAQN site	Type	Instrument	1999	2000	2001	2002
Lambeth 1	R	B	no	<i>6</i>	<b>52</b>	<b>57</b>
Lambeth 2	R	B	no	no	<i>1</i>	<b>65</b>
Lambeth 3	U	B	no	no	<i>1</i>	<b>35</b>
Crystal Palace 1	R	T	<i>0</i>	17	24	6

(Note - italics represent < 90% data capture; bold indicates exceedence)

The annual mean results for the same period are given in Table 12 below:

**Table 12** PM<sub>10</sub> monitoring (Annual mean µg/m<sup>3</sup>) at Lambeth sites (1999 – 2002)

LAQN site	Type	Instrument	1999	2000	2001	2002
Lambeth 1	R	B	no	<i>42.9</i>	37	38
Lambeth 2	R	B	no	no	36	38
Lambeth 3	U	B	no	no	30	31
Crystal Palace 1	R	T	29	29.9	31	28

(Note - italics represent < 90% data capture)

The annual mean results confirm that the 2004 objective of 40 µg/m<sup>3</sup> is being met for those years where the data capture exceeds 90%.

The TG03 guidance also includes correction factors to use with measurement results to estimate future levels. These have been used with the 2001 measurements and the results are given in the following tables for Lambeth 1 and Crystal Palace 1 (i.e. those sites with >90% data capture). (The secondary background PM<sub>10</sub> concentrations also used with the methodology have been obtained from following website [www.airquality.co.uk/archive/laqm/tools.php](http://www.airquality.co.uk/archive/laqm/tools.php)).

**Table 13** Estimated PM<sub>10</sub> results at Lambeth sites for 2004 (using TG03)

2004	Annual mean µg/m <sup>3</sup>	No. of days > 50µg/m <sup>3</sup>
Lambeth 1	35.2	<b>50.4</b>
Crystal Palace 1	29.7	26.2

The above results indicate an exceedence of the 2004 24-hour mean objective at the LB1 monitoring site in the borough. The annual mean results meet the 2004 objective at both sites.

The details of the estimated annual mean PM<sub>10</sub> concentrations in 2010 using a similar methodology are given in the following table:

**Table 14** Estimated PM<sub>10</sub> results at Lambeth sites for 2010 (using TG03 methodology)

2010	Annual mean $\mu\text{g}/\text{m}^3$	No. of days > 50 $\mu\text{g}/\text{m}^3$
Lambeth 1	31.9	35.2
Crystal Palace 1	27.6	19.4

Despite the predicted reduction resulting from future emission changes the estimates for the above sites indicate that the 2010 annual mean of 23  $\mu\text{g}/\text{m}^3$  and 24 hour mean objective of 50  $\mu\text{g}/\text{m}^3$  (not be exceeded more than 10 times per year for London) will be exceeded in the Council's area.

It is helpful to consider the borough as part of the wider London conurbation and the most recent results from the continuous sites in nearby authorities in the LAQN are given in Table 15 and Table 16 below. These results highlight that the busy roadside at Marylebone Road exceeds both PM<sub>10</sub> objectives for all years. The only site that exceeded the daily mean objective was the roadside site at Croydon 4 in 2000. The roadside sites all as expected indicate higher concentrations than the urban background sites.

**Table 15** PM<sub>10</sub> monitoring (number of days >50  $\mu\text{g}/\text{m}^3$ ) in neighbouring local authorities (1999 - 2002)

LAQN site	Type	Type	1999	2000	2001	2002
Marylebone Rd	K	T	111	157	106	111
Marylebone Rd	K	G -Partisol	no	no	no	65
Marylebone Rd	K	G- KFG	no	no	no	51
Croydon 3	U	T	8	5	11	5
Croydon 4	R	T	0	38	25	18
Southwark 1	U	T	no	no	no	1
Southwark 2	R	T	no	no	7	25
Wandsworth 4	R	T	17	19	28	17

(For Instrument: T represents TEOM and B – BAM; no indicates not in operation)

**Table 16** PM<sub>10</sub> monitoring (annual mean  $\mu\text{g}/\text{m}^3$ ) in neighbouring local authorities (1999 - 2002)

LAQN site	Type	1999	2000	2001	2002
Marylebone Rd	K	46	48.1	43	44
Marylebone Rd	K	no	no	no	44
Marylebone Rd	K	no	no	no	37
Croydon 3	U	25	22.1	24	23
Croydon 4	R	25	29.9	30	29
Southwark 1	U	no	no	no	26
Southwark 2	R	no	no	31	33
Wandsworth 4	R	26	27.3	28	27

The findings for these LAQN sites are considered indicative of the likely findings across the borough.

The assessment of PM<sub>10</sub> based on monitoring confirms that there are likely to be areas across the borough where the 2004 objectives will be exceeded. Estimations based on monitoring results in the borough indicate that the 2010 objectives will also be exceeded in the borough. However the Council is not required at the present to progress to a Detailed Assessment for the 2010 objectives.

## 2. *Roads*

The Stage 3 report for the previous round of R&A provided modelling of the main roads in Lambeth and addressed the following issues: junctions and high flows of HGVs and buses. Hence no further examination of these will be undertaken in this report.

The TG03 guidance also requires an assessment of roads close to the objective during the first round of R&A further and this was undertaken in the Stage 4 report. The Stage 4 report used the 2002 LAEI and hence it used the most up to date traffic flows in the area. Since the Stage 4 report there are no roads with significantly changed flows.

No new roads with traffic flows greater than 10,000vpd have been built in the Council's area since the first round of R&A where there is relevant exposure arising.

## 3. *Industrial sources*

No new relevant processes have started in or close to the Council's area since the last round of review and assessment. An examination of the Environment Agency's Pollution Inventory and the Part B processes on the Council's Public Register has identified that there are no existing processes with substantially increased emissions of PM<sub>10</sub> within the Council's or neighbouring local authority areas since the last round of review and assessment.

## 4. *Domestic sources*

From local knowledge and professional judgement, significant domestic burning of solid fuels is not undertaken across the Council's area. There is therefore no need for further assessment.

## 5. *Quarries/ landfill sites/ handling of dusty cargoes, etc*

The Council has received no dust complaints from fugitive sources and there are no other potential sources e.g. licensed landfill sites or quarries within the Council's area. There is therefore no need for further assessment.

## 6. *Aircraft*

As stated earlier in the section for nitrogen dioxide there is not an airport in the Council's area and no assessment is needed.

## **Conclusion**

The updating and screening assessment for PM<sub>10</sub> has not identified any additional risk of the objectives being exceeded by 2004. The same assessment has also identified that there is a risk that the 2010 objectives will be exceeded across parts of the Council's area.

**Summary of findings for PM<sub>10</sub>**

<b>Screening checklist for PM<sub>10</sub></b>	<b>Outcome</b>
Monitoring data	No further action required other than to note that there is a risk that the 2010 objectives will be exceeded
Roads	No further action required
Industrial sources	No further action required
Domestic sources	No further action required
Quarries, landfill sites, etc	No further action required
Air craft	No further action required

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## Conclusion and Recommendations

This report follows the technical guidance (TG03) produced for the updating and screening assessment of the second round of review and assessment and it therefore fulfils this part of the continuing LAQM process.

The results, from following this methodology, are that the Council has not identified a risk of the air quality objectives for carbon monoxide, benzene, 1,3-butadiene, lead, and sulphur dioxide being exceeded by the relevant years anywhere in the Council's area. Thus the Council need not therefore proceed beyond the updating and screening assessment for these pollutants.

The Council has identified a risk that the air quality objectives for nitrogen dioxide and particles PM<sub>10</sub> (for 2004 and 2010) will be exceeded at locations with relevant public exposure. The Council has previously designated the whole of the borough an AQMA and the findings of the updating and screening assessment is consistent with this action. The findings for PM<sub>10</sub> for 2010 however should be noted for longer term planning.

For those pollutants not requiring detailed assessments the LAQM guidance requires the production of annual air quality progress reports by the end of April 2005, prior to undertaking the next updating and screening assessment by the end of April 2006.

The Council is therefore recommended to undertake the following action:

1. Undertake consultation on the findings arising from this report with the statutory and other consultees as required.

## References

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## Glossary

AADT	Annual Average Daily Traffic (vehicles per day)
APEG	Airborne Particles Expert Group
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
AURN	Automatic Urban and Rural Network
CO	Carbon monoxide
COMEAP	Committee on the Medical Effects of Air Pollutants
DA	Detailed Assessment
DEFRA	Department for Environment Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges Screening Model
HGV	Heavy Goods Vehicles
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
mg/m <sup>3</sup>	Milligrams of the pollutant per cubic metre of air
µg/m <sup>3</sup>	Micrograms of the pollutant per cubic metre of air
ppb	Parts per billion
ppm	Parts per million
NO	Nitric oxide
NO <sub>2</sub>	Nitrogen dioxide
PM <sub>10</sub>	Particles with diameter less than 10µm
QA/QC	Quality Assurance / Quality Control
R&A	Review and Assessment
SO <sub>2</sub>	Sulphur dioxide
TEOM	Tapered Element Oscillating Microbalance

## Appendix 1

**Table 17** Data capture rates (%) for the NO<sub>2</sub> continuous monitoring sites (1999-2002)

LAQN site	Type	1999	2000	2001	2002
Lambeth 1	R	no	26	96	99
Lambeth 2	R	no	no	3	99
Lambeth 3	U	no	no	3	99
Crystal Palace 1	R	11	96	96	82
Marylebone Rd	K	92	96	94	98
Croydon 2	R	94	94	99	98
Croydon 4	R	10	95	75	92
Croydon 5	R	no	23	87	97
Croydon 6	S	no	no	79	99
Southwark 1	U	93	96	97	84
Southwark 2	R	49	89	92	86
Wandsworth 2	U	96	97	99	98
Wandsworth 4	R	87	99	96	97
Westminster	U	no	no	35	97

(no means not in operation)

**Table 18** Diffusion tube sites (for both NO<sub>2</sub> and benzene)

Site	Type
Sunnyhill Road	b
Palace Road	b
Wanless Road	b
Pinfold Street	I
Clapham North Library	i
Cheviot Road	i
Lansdowne Way	i
Streatham Hill	i
Streatham High Road	k
Town Hall, Brixton	k
Albert Embankment	k
The Cut	k
Kennington Lane	k
Coldharbour Lane	k
Norwood Road	k

**Table 19** Data capture rates (%) for the PM<sub>10</sub> continuous monitoring sites (1999-2002)

<b>LAQN site</b>	<b>Type</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>
Marylebone Rd	K	94	98	89	98
Marylebone Rd	K	no	no	no	68
Marylebone Rd	K	no	no	no	90
Lambeth 1	R	no	24	95	96
Lambeth 2	R	no	no	3	94
Lambeth 3	U	no	no	3	97
Crystal Palace 1	R	23	96	98	99
Croydon 3	U	95	96	96	95
Croydon 4	R	15	96	90	98
Southwark 1	U	no	no	no	16
Southwark 2	R	no	no	38	71
Wandsworth 4	R	98	99	99	97

**Appendix 2****Table 20** Estimated 2005 traffic count data for Lambeth Council's roads

<b>Road name</b>	<b>Road number</b>	<b>Total vehicles</b>	<b>Percent HGVs</b>
CROWN DALE	A214	17485	4.0
KNIGHT'S HILL	A215	17268	4.9
CROWN LANE	A214	20121	3.3
CROXTED ROAD	A2199	12536	4.2
STREATHAM HIGH ROAD	A23	24090	5.7
NORWOOD ROAD	A215	20623	8.1
GLENEAGLE ROAD	A214	17190	3.8
TULSE HILL	A205	29666	4.5
MITCHAM LANE	A216	17158	6.7
TULSE HILL	A204	17190	6.1
TULSE HILL	A205	19341	7.0
MORVAL ROAD	A2214	13627	6.7
AMBLESIDE AVENUE	A214	13717	4.8
HERNE HILL	A215	16803	5.1
CHAMPION PARK	A2216	18719	6.0
MITCHAM LANE	A216	14041	10.1
THE AVENUE	A205	29799	3.2
STREATHAM HILL	A23	32127	8.8
STREATHAM PLACE	A205	31214	6.1
BALHAM HILL	A24	21532	5.6
COLDHARBOUR LANE	A2217	15688	6.4
QUEENSTOWN ROAD	A3216	15331	6.9
STREATHAM HIGH ROAD	A23	41433	8.9
DENMARK HILL	A215	31441	7.3
CHRISTCHURCH ROAD	A205	29406	16.4
CEDARS ROAD	A3216	12400	12.0
STOCKWELL ROAD	A203	18754	6.9
CLAPHAM PARK ROAD	A2217	21275	7.2
CLAPHAM ROAD	A3	37402	4.7
STOCKWELL ROAD	A203	16175	11.0
STREATHAM HIGH ROAD	A23	27048	11.5
KENNINGTON LANE	A3204	21415	7.1
SOUTH LAMBETH ROAD	A203	24238	5.0
LAVENDER HILL	A3036	23971	9.7
CAMBERWELL NEW ROAD	A202	22946	7.3
HARLEYFORD ROAD	A202	33115	6.1
WANDSWORTH ROAD	A3036	29086	5.7
KENNINGTON LANE	A3204	16845	6.4
DURHAM STREET	A3204	22018	8.6
BRIXTON ROAD	A23	44215	8.7
STAMFORD STREET	A3200	21493	6.0
NINE ELMS LANE	A3205	41997	6.7
	A301	53788	6.7
LAMBETH PALACE ROAD	A3036	31489	7.0

STAMFORD STREET	A3200	22257	8.9
LAMBETH ROAD	A3203	20361	8.0
ALBERT EMBANKMENT	A3036	43018	4.7
WESTMINSTER BRIDGE ROAD	A23	42792	5.9
KENNINGTON PARK ROAD	A3	36777	16.2
ST GEORGE'S ROAD	A302	26781	10.3
KENNINGTON LANE	A3204	41984	9.9
STOCKWELL PARK WALK	A203	13405	19.7
WATERLOO ROAD	A301	25052	10.1
KENNINGTON LANE	A203	43888	7.7
PARRY STREET	A3205	39499	12.4
KENNINGTON LANE	A3204	26896	21.1
HARLEYFORD ROAD	A202	29497	18.5
YORK ROAD	A3200	32746	10.1
WESTMINSTER STREET	A23	27467	9.9

(From LAEI supplied by the GLA)

### Appendix 3

**Table 21** Part B processes in the Lambeth Council area (excluding petrol stations)

Name	PG Guidance Ref:	Type of Process	Date of First Authorisation
<i>Displaycraft Limited - 1- 31 Morrish Rd SW 4ES</i>	<i>PG 6/ 16 (97)</i>	<i>Printworks</i>	<i>1997 Revoked 2001</i>
<i>Concrete Aggregate Supplies Limited 63 Shrubbery Road SW16 2AS</i>	<i>PG 3/ 16 (96)</i>	<i>Mobile Plant - Crushing of Bricks, Tile and Concrete</i>	<i>1997 Revoked Feb 2000 – Company Ceased Trading Revoked 25/02/99</i>
Winn & Coales Limited. Chapel Road SE27 0TR	PG6 / 42 (94)	Bitumen Coating Process	1997 Upgrade completed 2001
<i>Kings College Hospital Denmark Hill SE5 9RS</i>	<i>PG5 / 1(95)</i>	<i>Clinical Incinerator</i>	<i>1994 – Revoked July 1999 (Use discontinued by operator)</i>
John Myland Limited 80 Norwood High Street SE27 9NW	PG6/10/ (97)	Manufacturer of Coatings and Varnishes	1995 – Upgrade in progress 2002
W.Norwood Crematorium Norwood Road SE27 9JU	PG5/ 2 (95)	Crematorium	1994 Revised 2000
<i>Pinewood Motor Company Limited 237 Brixton Hill SW2 1NR</i>	<i>PG 6 / 34 / (97)</i>	<i>Vehicle Respraying</i>	<i>1996 Revoked 2000</i>
<i>Cannons MSA Limited 33 Macaulay Road SW4 0QP</i>	<i>PG 3/13 (95)</i>	<i>Asbestos Process-relining automotive clutches and brake linings</i>	<i>1993 –Revoked 2001 – process discontinued</i>
T.Brewer and Co Limited-Timbermill Way Gauden Road SW4 6LY	PG 6/ 2 (95)	Timber Process	1992 – Under further review 2002/3
Acre Lane Mouldings Limited 47-49 Acre Lane SW2 5TN	PG6 / 2 (95)	Timber Process	1992 – Under further review 2002/3
<i>Emerald Cams Ltd. Unit 2 Hardness Street SE24 0HN</i>	<i>PG 1/ 1 (95)</i>	<i>Waste Oil Burner &lt; 0.4MW</i>	<i>Revoked 1998</i>
<i>Lithotech Winchester House Cranmer Rd. SW9 6EJ</i>	<i>PG 6/ 16 (97)</i>	<i>Printworks</i>	<i>1998 Revoked 2002</i>
Primagrang Limited 2 - 22 Padfield Road SE5 9AA	PG 3/ 16 (96)	Mobile Plant - Crushing of Bricks, Tile and Concrete	2003

**Table 22** Authorised petrol stations in the Lambeth Council area

Name	Date of First Authorisation
BP as agents for Mr & Mrs Krishna T/A Avenue Park Filling Station 17 Thurlow Park Road SE21 8JB	1998
Q8 Petroleum GB 120 Leigham Court Rd SW16 2RW	1998
Texaco Ltd, 1 Western Circus E.4 - as agents Mr S. Pairnaban 321-331 Coldharbour Lane Brixton SW9 8RX	1998 (June 2001 change of operator)
Sainsbury's Nine Elms Wandsworth Rd SW8 2 LF	1998
372 Clapham Rd - Jet Filling Station Conoco SW9 9BT	1998
Tesco 330 Brixton Road - Filling Station SW 9 7BZ	1998
Conoco Ltd. 2 -22 Streatham Place SW2 4QY	1998
Cheriton Court Service Station – Esso 109 Tulse Hill Sw2 2QB	1998
Star Service Station 275 Streatham High Road SW16 3NN (Texaco)	1999
Star Service Station 300 Norwood Road London SE27 9AF (Texaco)	1998
Star Service Station 38-46 Albert Embankment London SE1 7TJ (Texaco)	1998
Star Service Station 212 – 214 Kennington Road London SE1 6PR (Texaco)	1998
St. Lukes Service Station, 65c Clapham High Street London SW4 7TG – Yarl Petroleum Co. Ltd (Texaco)	1998
Ingarfields Service Station 243 Brixton Road London SW9 6LJ	1999
<i>Kennington Park Service Station, 190 - 198A Kennington Park Road London SE11 4BT</i>	<i>1999 - Revoked 2002 – Site no longer operating</i>
Save Service Station, 42-52 Hinton Road SE24 0HJ	1999
Norbury Service Station 401 Streatham High Road SW16 3PF (BP)	1999
<i>Silverthorne Service Station 635 Wandsworth Rd SW8 3JD</i>	<i>2000 - Revoked 2002 – site no longer operating</i>
Elf Service Station Clapham 66 – 86 Clapham Road London SW9 0JJ	2000
Elf Service Station Brixton 124/128 Brixton Hill SW2 1RS	2000

Murco Service Station 63/ 69 Sternhold Avenue London SW2 4PB	2000
Knights Hill Filling Station 260 Knights Hill London SE27 0QP	2000
Star Service Station (Malthouse Heathbrook) SW8 3LT	2000
BP Herne Hill Service Station 128 Herne Hill SE24 9QH	2000
BP Service Station 47-51 Acre Lane SW2 5TN	2001
BP Express Shopping Ltd 238 Kennington Lane SE11 5RD	2001