

Review And Assessment of Air Quality In The London Borough of Lewisham

Updating and Screening Assessment

February 2004

Updating and Screening Assessment conducted by Environmental Research Group,
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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 Borough of Lewisham has previously undertaken the first round of review and assessment (R&A) of local air quality management. Following this report the Council designated five Air Quality Management Areas (AQMAs) across the Borough for both nitrogen dioxide and particles (PM₁₀).

The Borough of Lewisham has subsequently 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 the Air Quality Strategy (AQS) objectives will be exceeded. However, the area where the annual mean nitrogen dioxide objective is predicted to exceed was larger.

This report concerns the Updating and Screening Assessment under the second round of review and assessment. 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 (PM₁₀). This report provides a new assessment to identify those matters that have changed since the last review and assessment and might lead to a risk of the objectives being exceeded.

The report follows the latest prescribed guidance given in technical guidance LAQM. TG (03), which replace the guidance produced for the previous round of review and assessment. It gives guidance on the use of background pollutant concentrations, monitoring results, industrial sources and road traffic. In addition, the guidance requires a phased approach and states that local authorities should 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 is: -
Not significant in the Council's area. Therefore, 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 many parts of the Borough. This is consistent with the Council's existing AQMAs.

- For particles PM₁₀ (for 2004 only): -
There is a risk of the annual mean objective being exceeded across parts of the Borough close to busy roads.
- For PM₁₀ (for 2010 only): -
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 this finding, 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.

The Council has already declared five Air Quality Management Areas in respect of NO₂ and PM₁₀ and the findings of this assessment are consistent with this action. In addition and as a result of the above findings the Council will also undertake Detailed Assessments for NO₂ and PM₁₀ for the additional sources identified.

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1. Local Air Quality Management – Summary

1.1 Introduction

The Environment Act 1995 provides the framework for local air quality management across England and Wales. The provisions in Part IV of the 1995 Act are largely enabling and give local authorities the flexibility to take forward local policies to suit local needs.

The Government set out the regime for the review and assessment process: -

The duties imposed upon the Council include:

Reviewing and assessing air quality, against the standards and objectives of the Air Quality Regulations 1997, the Air Quality Regulations (England) (Wales) 2000 and the Air Quality (Amendment) Regulations 2002, within the local authority's geographical area for both 1995 and 2005 and

Designating Air Quality Management Areas (AQMAs) where the Air Quality Strategy (AQS) objectives are unlikely to be met by 2005 and preparing a written action plan for such areas.

The Local Air Quality Management (LAQM) process is designed to ensure that the London Borough of Lewisham (LBL) and other local authorities contribute to the Governments' air quality objectives as identified in the AQS. The purpose of the review and assessment, which forms part of the overall process, is to:

- **review current air quality across Lewisham's geographical area**
- **assess the current air quality in Lewisham against the AQS objectives and**
- **predict the future air quality in Lewisham (a timescale is set by Government in regulations) against the AQS objectives.**

Review and Assessment – Old and New

The 'review and assessment' of air quality is the first step in the LAQM process. Part IV of the Environment Act requires each local authority to review air quality 'from time to time'. The Borough of Lewisham carried out the previous or 'first' round of reviews and assessments from 1999 to 2003 to determine the need for designation of AQMAs in the Borough.

In September 2001, the Department of Food, Environment and Rural Affairs (DEFRA) and the Devolved Administrations commissioned a detailed evaluation of the previous round of air quality reviews and assessments by local authorities under Part IV of the Environment Act 1995. The aim of the evaluation was to look at aspects of the LAQM process that had worked well and aspects that could usefully be improved in order to help inform the next round of reviews and assessments.

An evaluation report was published in March 2002 and led recommendations for future rounds of reviews and assessments.

The Previous Four Stage Approach (1998 to 2003)

The previous review and assessment was composed of four stages, although it was only Stage one that all local authorities were obliged to undertake. The next stage was to be undertaken only if Stage one indicated the potential for elevated levels of air pollution. Similarly Stage three was only to be undertaken when required as a result of Stage two.

If the results of the assessment were such that the objectives were unlikely to be met by the year 2004/5, the local authority was then required to designate an Air Quality Management Area (AQMA) and prepare a written action plan.

Stage One

The Council followed the phased approach required by the Government and undertook the first, second, third and fourth stages of the review and assessment process.

The Stage one report concluded that there were four main pollutants of concern in Lewisham: -

Carbon Monoxide
Particulates
Nitrogen Dioxide
Sulphur Dioxide

On the basis of these findings, the London Borough of Lewisham was required to progress to Stage two of the review process.

Lead, benzene and 1,3-butadiene were filtered out at Stage one as levels met the current and projected objectives in Lewisham.

Stage Two

The Stage two report for the London Borough of Lewisham took the findings of the Stage one report and provided a further screening of those pollutants, which were deemed to be most significant in terms of air quality in the Borough.

On the basis of the conclusions reached in the Stage one report, the Council undertook Stage two of the process for the four remaining pollutants only and concluded, after further screening, that no further action needed to be taken for the following pollutant: -

Carbon Monoxide

The Stage two report concluded that the London Borough of Lewisham should proceed to a Stage three review and assessment for the remaining pollutants:

Nitrogen Dioxide

Particulates

Sulphur Dioxide

Stage Three

In the third stage of the review and assessment the Council was required to undertake sophisticated modelling to ensure that an accurate and detailed review and assessment of current and future air quality was carried out.

The Stage three report assessed air quality across the whole of the Borough in accordance with DEFRA guidance. The detailed assessment predicted that there would be areas in the Borough that would exceed the NO₂ annual mean and 24 hour mean PM₁₀ objectives.

As a consequence five Air Quality Management Areas (AQMAs) were designated across the Borough. The Stage three report also included sulphur dioxide (SO₂). However, following acceptance of the Environment Agency's report on Air Quality in the East Thames Corridor (2000), no further action was deemed necessary for this pollutant.

Stage Four

The Stage four report subsequently remodelled the whole Borough using revised vehicle emission factors. The Stage four modelling predictions confirmed the Stage three findings that the annual mean NO₂ and 24 hour mean PM₁₀ AQS objectives would be exceeded. The area where the annual mean NO₂ objective was predicted to exceed was much larger than that for PM₁₀.

Action Plan

The Environment Act 1995 (Section 84) states that where an AQMA is designated, a local authority shall prepare an Action Plan to demonstrate how the authority intends to pursue the achievement of air quality standards and objectives in the AQMA, using any powers exercisable by the authority

The key aims of the Action Plan were to bring about change across a number of areas to ensure emissions are reduced from the main sources of pollution in a cost-effective and proportionate way.

1.2 Review and Assessment (2003 to 2010) - The new challenge

In September 2001, Defra and the Devolved Administrations commissioned a detailed evaluation of the previous or 'first' round of air quality reviews and assessments. The aim of the evaluation was to look at aspects of the LAQM process that had worked well and aspects that could be improved in order to help inform the next round of reviews and assessments.

An evaluation report was published in March 2002 and led recommendations for future rounds of reviews and assessments. DEFRA, the Mayor of London and the National Assembly for Wales accepted that the next and subsequent rounds of reviews and assessments up to 2010 should be carried out in two steps: -

Updating and Screening Assessment (USA) - identifies those aspects that have changed since the first round of reviews and assessments. The Updating and Screening Assessment should include an explanation of the conclusion reached as to whether the local authority should proceed to a Detailed Assessment or not; and

Detailed Assessment (DA) - Identifies those pollutants and specific locations that require further work, that is where members of the public are likely to be exposed over the averaging period of the Air Quality Objective

The Government and the National Assembly for Wales expect local authorities that have designated AQMAs to complete their second round of reviews and assessments by April 2004. The Mayor of London has advised London local authorities that have designated AQMAs, to complete the next round by the end of 2004.

Local authorities are expected to submit their Updating and Screening Assessments to Defra, the National Assembly for Wales and to other statutory consultees by end of May 2003. London local authorities with AQMAs are expected to submit their Updating and Screening Assessments by December 2003.

2. Updating and Screening Assessment

2.1 Introduction

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 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 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 review and assessment. TG (03) 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 relate 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 NO₂ and benzene and indicative limit values for PM₁₀ for 2010. In the case of NO₂ 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.

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. TG (03) gives guidance on the use of background pollutant concentrations, monitoring results, industrial sources and road traffic, as well as the specific AQS pollutants to be examined for both the USA and the subsequent step, that is the Detailed Assessment.

Tables 1 and 2 provide details of the objectives for the purposes of the current round of review and assessment.

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

Pollutant	Objective Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu\text{g}/\text{m}^3$ (5 ppb)	Running Annual Mean	31 Dec 2003
	5 $\mu\text{g}/\text{m}^3$	Annual Mean	31 Dec 2010
1, 3 Butadiene	2.25 $\mu\text{g}/\text{m}^3$ (1 ppb)	Running Annual Mean	31 Dec 2003
Carbon Monoxide	10 mg/m^3	Daily Maximum Running 8 hour mean	31 Dec 2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual Mean	31 Dec 2003
	0.25 $\mu\text{g}/\text{m}^3$	Annual Mean	31 Dec 2008
Nitrogen Dioxide (provisional)	200 $\mu\text{g}/\text{m}^3$ (105 ppb) not to be exceeded more than 18 times a year	1 hour mean	31 Dec 2005
	40 $\mu\text{g}/\text{m}^3$ (21 ppb)	Annual Mean	31 Dec 2005
Particles (PM₁₀)	50 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 35 times a year	24 hour mean	31 Dec 2004
	40 $\mu\text{g}/\text{m}^3$	Annual Mean	31 Dec 2004
Sulphur Dioxide	350 $\mu\text{g}/\text{m}^3$ (132 ppb) not to be exceeded more than 24 times a year	1 hour mean	31 Dec 2004
	125 $\mu\text{g}/\text{m}^3$ (47 ppb) not to be exceeded more than 3 times a year	24 hour mean	31 Dec 2004
	266 $\mu\text{g}/\text{m}^3$ (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	
Particles (PM₁₀) (NB the objective for London is given in brackets)	50 µg/m ³ not to be exceeded more than 7 (10) times a year	24 hour mean	31 Dec 2010
	20 (23) µg/m ³	Annual Mean	31 Dec 2010

2.2 London Atmospheric Emissions Inventory

The Greater London Authority (GLA) requires all London boroughs to use the London Atmospheric Emission Inventory (LAEI). The latest version of which was released during November 2003 and incorporates the updates and changes relating to atmospheric emissions across the Greater London area. The total area covered by the LAEI is 2,466 km², covering all 32 London Boroughs, 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, including: -

- 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 of the London Transportation Studies (LTS) model;
- Recalculation of the minor road vehicle totals (km);
- Updated speed estimates on all roads;
- Revision and use of the most recent speed related emission estimates;
- Estimates of the performance of the national vehicle stock model compared to on-road vehicle stock using 2002 Vehicle Excise Duty (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 Transport for London (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, automatic traffic count data (TfL) and counts supplied by the London boroughs.

2.3 Background Pollutant Concentration

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 NO₂, NO_x and PM₁₀ (for 2004).

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 PM₁₀ (based on 2010). These are produced on a 1x1km grid square for the UK. It is important to note that the NAEI incorporates all major sources, including roads, within each grid square.

Details of the modelling methodology used for background concentrations can be found at the London.gov.uk website.

2.4 Monitoring Data

The monitoring of air quality in a local authority's area provides an important source of information for understanding air quality within that area. This benefit can be further enhanced if the monitoring is undertaken as part of a wider, that is, 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 needs to be properly validated and preferably ratified. The Council carries out continuous monitoring of NO₂, SO₂ and PM₁₀. Ozone, which is classed as a regional pollutant and has not been included within the LAQM process, is also monitored. There are two monitoring sites in the Borough: -

Lewisham 1 - An urban background site at Catford monitoring NO₂, SO₂ and ozone;

Lewisham 2 – A roadside site at New Cross monitoring NO₂, SO₂ and PM₁₀ (using a Tapered Element Oscillating Microbalance (TEOM)).

Both 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 TG (03) guidance.

2.5 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. The Council has no Part A2 processes, which are also regulated by local authorities. Those small industrial processes that fall outside of Part B Process control are also of interest to the LAQM process.

The TG (03) guidance requires details of boilers with a thermal rating of greater than 5 MW that burn coal or fuel oil such as those in universities and hospitals to be obtained and examined.

A list of Part B and other processes of potential concern in Lewisham are given in Appendix 3. The only Part A process in the Borough is the incineration process operated by South East London Combined Heat and Power Ltd (SELCHP) in the north of the Borough near South Bermondsey. Emissions data for this process has been examined from the Environment Agency web site and the most significant emission for this assessment is sulphur dioxide.

2.6 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, that is, 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 TG (03).

2.7 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). TG (03) 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.

3. Updating and Screening Assessment – Results

3.1 Carbon Monoxide

3.1.1 Objective

The air quality objective for carbon monoxide (CO) has been tightened and is now 10mg/m³ as a maximum daily running 8-hour concentration to be achieved by the end of 2003, which is in line with the second Air Quality Daughter Directive limit value.

3.1.2 Pollutant Overview

The main source of CO in Lewisham remains road transport (nationally about 67% based on 2000), although annual emissions are declining mainly as a result of uptake of abatement technologies. Current projections are that emissions will reduce by 42% between 2000 and 2005

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 DEFRA Technical guidance LAQM.TG (03)). Despite this, the guidance states a cautious approach as certain meteorological conditions meant that the objective was nearly exceeded at four urban background sites in 2001 (levels came within 2mg/m³ of the objective).

Based on TG (03), it is considered highly unlikely that any authority will be required to proceed beyond the updating and screening assessment.

No AQMAs were declared in Lewisham or anywhere else as a result of the first round of review and assessments, based on the previous objective of 11.6mg/m³.

3.1.3 Methodology Overview

Full details of the methodology employed can be found in TG (03). The following represents a summary of the methods used. To undertake this it was necessary to draw on the first stage report of the first round of review and assessment. Only monitoring data and very busy roads were considered. (The TG (03) guidance does not require the screening of industrial sources).

A checklist approach was used, based on: -

- **Monitoring data.** For monitoring data only, roadside data was required where there is public exposure. The data is assumed to be applicable to 2003 and if it indicates that the maximum daily running 8-hour concentration exceeds the objective, the Council will then be required to proceed to the Detailed Assessment stage.
- **Traffic data relating to very busy roads.** 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 $1\text{mg}/\text{m}^3$. 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 Heavy Goods Vehicle/Long Goods Vehicle (HGV/LGV) split. The Design Manual for Roads and Bridges (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.

3.1.4 Assessment Results

The Council considered the following sources during the previous round of review and assessment: 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 unlikely to exceed the AQS objective where there might be exposure and hence no further action was undertaken.

Monitoring

The Council does not undertake continuous monitoring for CO within the borough. However, monitoring is undertaken to the southwest corner of the Borough at the roadside site at Crystal Palace (which is a London Air Quality Network (LAQN) site jointly run and owned by the London Boroughs of Bromley, Croydon, Lambeth and Southwark). The results at this location confirm that the objective was not exceeded for the period 1999 to 2002.

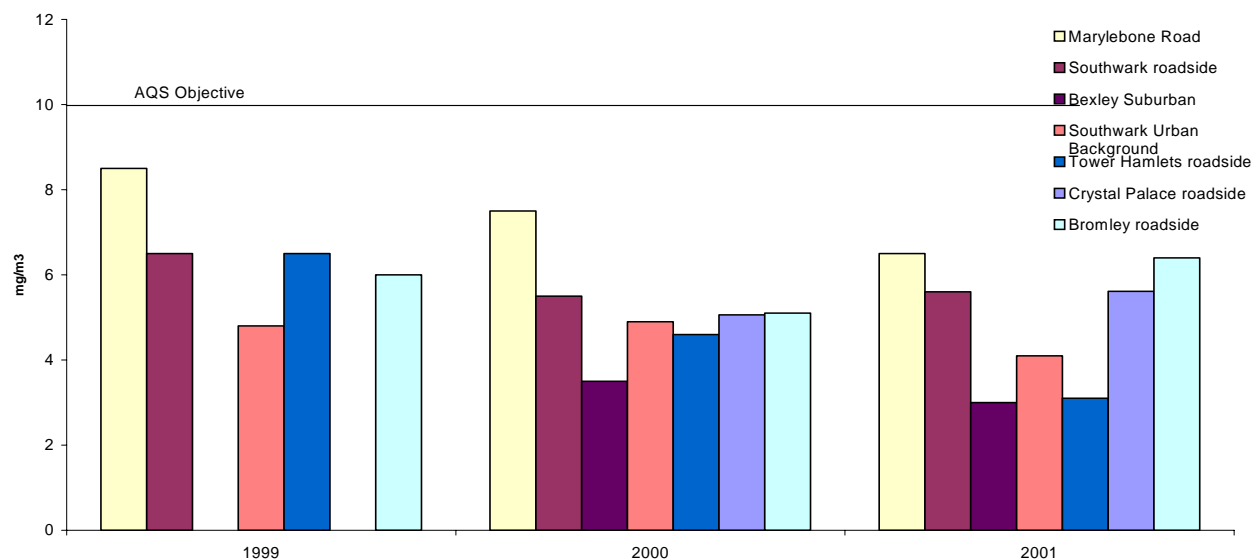
Table 3 - Maximum daily running 8 hour mean CO for nearby Crystal Palace site (mg/m^3)

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 other LAQN 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 site, are given in Figure 1.

These results confirm that the objective was not exceeded at any site. The data capture rates were greater than 90% and the data has 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 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.

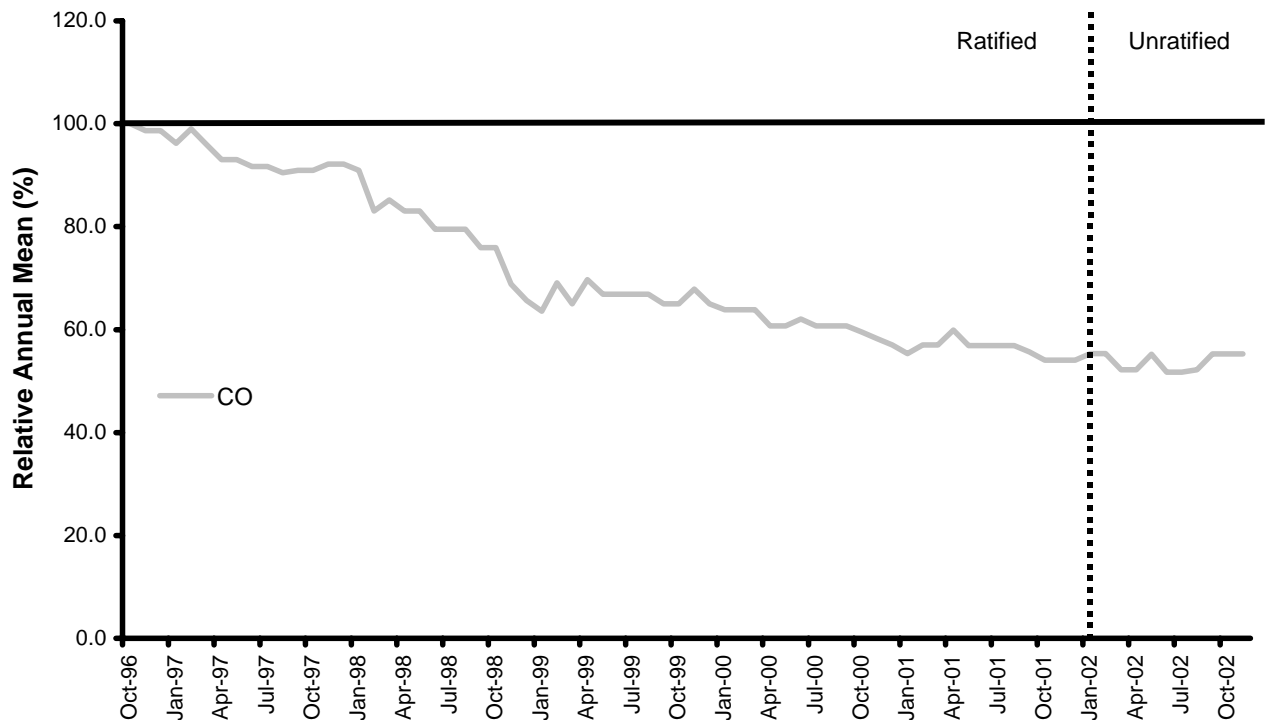


Figure 2 - Relative annual mean for CO from LAQN sites

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

Very busy roads/ junctions in built up areas

Traffic flows in the area are given in Appendix 2 and indicate that 'very busy' roads with single carriageways exceeding 80,000 vehicles per day (vpd) and dual carriageway exceeding 120,000vpd are not found in the Borough (as classified by TG (03)). Similarly there are no junctions of the busiest roads where the above traffic flows are exceeded.

Based on the results from the urban background sites in the LAQN, the background in the Borough can reasonably be assumed at approximately 0.4 mg/m^3 (from the 2001 results). Using the factor in TG (03) the estimated 2003 annual mean concentration can be determined as 0.35 mg/m^3 , which is less than the 1 mg/m^3 concentration, the point at which further action is deemed necessary by TG (03). 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.

3.1.5 Conclusions

The Updating and Screening Assessment for carbon monoxide has not identified a risk of the new objective being exceeded by the end of 2003 in the Borough.

The findings of the Updating and Screening assessment have shown that it will NOT be necessary to undertake a Detailed Assessment of carbon monoxide for this round of review and assessment.

3.2 Benzene

3.2.1 Objective

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

3.2.2 Pollutant Overview

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 TG (03)). Since 2001 the concentrations have also been 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 review and assessment. 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.

3.2.3 Methodology Overview

Full details of the methodology employed can be found in TG (03). 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: -

- **Monitoring data.** 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, monitoring down wind from the site is recommended. If monitoring is undertaken by diffusion tube, suitable Quality Assurance/Control (QA/QC) procedures should be used with the tubes validated and bias corrected. Correction factors will need to be applied to estimate concentrations for future years (2003 and 2010). If the data indicates that the objective is exceeded the local authority will then be required to proceed to the Detailed Assessment stage.
- **Traffic data relating to very busy roads.** 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.
- **Industrial sources/petrol stations/major fuel storage depots.**
 - ❖ For new industrial and other sources listed in TG (03) 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 review and assessments 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.
 - ❖ 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.
 - ❖ 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.
 - ❖ 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.

3.2.4 Assessment Results

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

Monitoring

The Council does not undertake benzene monitoring and in the previous review and assessment it was considered that annual mean concentrations would not exceed the previous objective in the Council's area.

Continuous monitoring of benzene is undertaken in other areas of London and the nearest site to the Borough boundary is a suburban site known as 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, that is 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 were 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 2001 data using factors from TG (03). The factors used are based on the continuing reductions in emissions arising from petrol and its use. Based on the 2001 data, the predicted concentration for this site was 4.06 $\mu\text{g}/\text{m}^3$, which is below the 2010 objective.

These monitoring results are considered representative of the Borough. 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.

Very busy roads/ junctions in built up areas

Traffic flows in the area are given in Appendix 2. From this data, there were no roads in the Borough identified as 'very busy roads' using the TG (03) definition.

The airquality.co.uk website gives the estimated 2010 background concentrations for the Borough and from this the estimated background predictions vary between 0.58 and 0.84 $\mu\text{g}/\text{m}^3$. These figures are less than the 2 $\mu\text{g}/\text{m}^3$ referred to in the TG (03) guidance for further assessment. Based on these findings, there is no need to carry out a Detailed Assessment in connection with very busy roads.

Part A processes

There were no industrial processes that were in or near to the Borough, that could emit significant quantities of benzene during the previous review and assessment. Since then, no significant new industrial sources of benzene or existing ones with increased emissions have been identified either in Lewisham or in neighbouring local authority areas.

Petrol stations

The list of authorised petrol stations is attached in Appendix 4. A petrol station is only considered important for 2010 objective, if the throughput is greater than 2000m³ and if it is close to a busy road with more than 30,000vpd. All petrol stations are known to have a throughput greater than 1000m³. Those petrol stations in the Borough close to busy roads (as defined by TG (03)), do not have relevant exposure within 10m of the petrol pumps. Thus a Detailed Assessment based on petrol stations is not required.

Major fuel storage depots

There are no major fuel storage depots within the Borough (as listed in TG (03)).

3.2.5 Conclusions

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 findings of the Updating and Screening Assessment have shown that it will NOT be necessary to undertake a Detailed Assessment of benzene for this round of review and assessment

3.3 1,3-Butadiene

3.3.1 Objective

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.

3.3.2 Pollutant Overview

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 TG (03)), 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 are 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 review and assessment.

3.3.3 Methodology Overview

Full details of the methodology employed can be found in TG (03). 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: -

- **Monitoring data.** For monitoring the data should be prioritised and for locations near industrial sites monitoring down wind from the site is recommended. If the data indicates that the objective is exceeded the local authority will then be required to proceed to the Detailed Assessment stage (as there is no need to correct it for future years).

- **New industrial sources or existing industrial sources with significantly increased emissions.** 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 review and assessment if there were doubts about their validity.

Where it is necessary to check industrial sources, annual emissions of 1,3-butadiene are 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%.

3.3.4 Assessment Results

No significant sources were screened during the previous round of review and assessment and so relevant exposure was considered unlikely. As a result progression beyond the second round of the previous review and assessment was not undertaken.

Monitoring

The Council has not undertaken specific monitoring of 1,3-butadiene. Continuous monitoring is undertaken in other parts of London. The annual mean results at the national network sites at the roadside site at London UCL (in central London) and the suburban site at Eltham for 1999 and 2000 (when monitoring stopped) were approximately 0.5 and 0.4 $\mu\text{g}/\text{m}^3$ respectively. These results are both less than the 2003 objective.

These monitoring results are considered representative of the Borough. 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 concentrations from the airquality.co.uk website also confirm that the 2003 background level was less than 1 $\mu\text{g}/\text{m}^3$. The estimated background predictions varied between 0.27 and 0.39 $\mu\text{g}/\text{m}^3$ across the Borough.

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 Borough 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.

3.3.5 Conclusions

The Updating and Screening Assessment for 1,3-butadiene has not identified a risk of the 2003 objective being exceeded in the Borough.

The findings of the Updating and Screening Assessment have shown that it will NOT be necessary to undertake a Detailed Assessment of 1,3-butadiene for this round of review and assessment

3.4 Lead

3.4.1 Objective

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

3.4.2 Pollutant Overview

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 TG (03)).

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 have since 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 review and assessment.

3.4.3 Methodology Overview

Full details of the methodology employed can be found in TG (03). The following represents a summary of the methods used. To undertake this it is necessary to draw on the Stage One report from the previous round of review and assessment.

A checklist approach is used, based on: -

- **Monitoring data.** 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 indicates 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).

- **New industrial sources and existing industrial sources with significantly increased emissions.** 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 previous round of review and assessment 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%.

3.4.4 Assessment Results

The sources identified in the previous round of review and assessment in the Borough, were found to pose a negligible risk in localities where there might be exposure and hence progress beyond the first round of review and assessment was not needed.

Monitoring

The Council has not identified a need to undertake the specific monitoring of lead anywhere in its area since the previous 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 Borough and indicate that the concentrations will not exceed the lead objectives for 2004 and 2008. Therefore, a detailed assessment is not required.

Industrial sources

There are no new Part A or B processes or existing processes with substantially increased emissions of lead within the Borough since the previous 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.

3.4.5 Conclusions

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 findings of the Updating and Screening Assessment have shown that it will NOT be necessary to undertake a Detailed Assessment of lead for this round of review and assessment

3.5 Nitrogen Dioxide

3.5.1 Objective

The current air quality objectives for nitrogen dioxide are 40 $\mu\text{g}/\text{m}^3$ as an annual mean concentration to be achieved by the end of 2005, 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

3.5.2 Pollutant Overview

Nitrogen dioxide (NO_2) and nitric oxide (NO) are both oxides of nitrogen, and are collectively referred to as nitrogen oxides (NO_x). All combustion processes produce 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 TG (03)). 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 a hundred AQMAs were declared in the first round of review and assessment 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 the objective include parts of major conurbations, town centres with congested traffic, dual carriageways and motorways.

3.5.3 Methodology Overview

Full details of the methodology employed can be found in TG (03). 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:

-

- **Monitoring data.** Monitoring data is to be considered both outside an AQMA and within an AQMA. The data will be corrected to 2005 using factors in TG (03) 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.
- **Roads including narrow congested streets and junctions.** 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 with levels close to the objective during the previous 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 that the level will be 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 with levels close to the objective at the previous round of review and assessment or roads with significantly changed flows should be re-assessed.

- **Bus stations.** Bus station assessments should be 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.
- **New industrial sources and existing ones with significantly increased emissions.** For new industrial sources (as listed in TG (03)) 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 TG (03) provides nomograms for an assessment. The same approach is required where there has been a substantial increase in emissions, that is, one greater than 30%.
- **Aircraft.** 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.

3.5.4 Assessment Results

The main sources examined in the Borough during the previous round of review and assessment were road transport sources. The Council undertook a Stage three 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 five separate AQMAs.

A further review was undertaken using an updated emissions inventory for London (1999 version). This differed from that used for the third Stage review and assessment in 2000 and incorporated the new vehicle emission factors. The results showed that future vehicle emissions will not reduce as much as previously estimated and as a result the Council has maintained its AQMAs across the whole Borough.

Monitoring

Monitoring in the Borough of Lewisham

The Council undertakes continuous monitoring of NO₂ within its area at two locations:

- Lewisham 1 (LW1) which is an urban background site in the Catford Town Hall, Catford;
- Lewisham 2 (LW2) which is a roadside site on New Cross Road.

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

The results of the monitoring undertaken in the Borough are given in Table 4 and these figures indicate that the annual mean objective was exceeded at the Lewisham 1 site for all years and at the Lewisham 2 site for 2002. There were also no hours where the hourly standard was exceeded at either site during the period 1999 to 2002. The percentages for data capture for the sites are also given in Table 4.

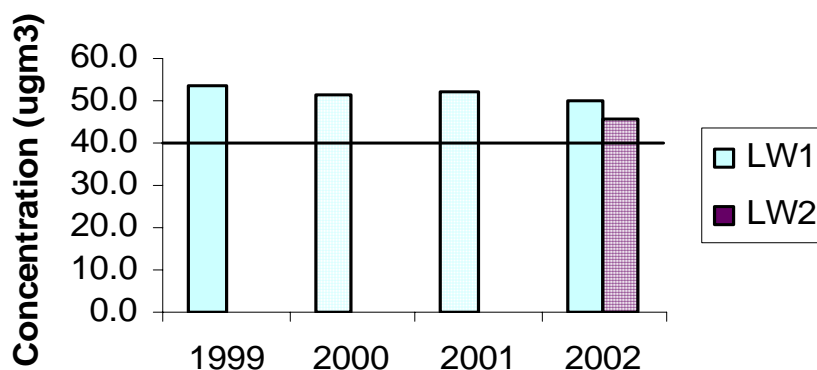
Table 4 - NO₂ continuous monitoring in Lewisham Borough (1999 – 2002) (µg/m³)

	1999	2000	2001	2002
Lewisham 1	53.5	51.6	52.0	50.0
Data capture %	95	43	45	93
Lewisham 2	no	No	No	46.0
Data capture %				75

(Note – 'no' indicates site not in operation. Lewisham 1 was not in operation for part of 2000/2001 due to extensive construction works being carried out in the immediate vicinity. Italics represents data capture < 90%)

Figure 3 shows the results in graphical form.

Figure 3 - NO₂ continuous monitoring in Lewisham Borough (1999 – 2002) (µg/m³)



(Note – hatched bars indicate < 90% data capture)

The Council does not undertake diffusion tube monitoring of NO₂.

Future estimates based on Lewisham monitoring

The TG (03) guidance also includes correction factors for future years at roadside and background locations and using this, estimated concentrations for the sites with measured exceedences have been derived. The results are given below in Table 5.

Table 5 - Predicted NO₂ using corrected results for the Council's monitoring sites (µg/m³)

SITE CODE	LW1	LW2
2005 (based on 2002)	48.7	41

The estimations for the above sites indicate that both will exceed the 2005 annual mean objective.

Monitoring in nearby London areas

It is helpful to consider the Borough as part of the wider London conurbation and the most recent results for 2001 from the continuous sites in nearby authorities in the LAQN and from the Marylebone Road site in central London, which is a kerbside with high pollution concentrations, are given in Table 6. This table gives the annual mean concentration at the sites and indicates whether or not the data capture rate exceeded 90%.

Table 6 - Results of NO₂ monitoring from nearby LAQN sites (1999 - 2002)

LAQN site	Type	1999	2000	2001	2002
Marylebone Rd	K	89.8	91.7	84.0	80.0
Bromley 7	R	64.9	<i>63.0</i>	<i>61.0</i>	41.0
Crystal Palace 1	R	<i>45.8</i>	47.8	50.0	<i>47.0</i>
Greenwich 4	U	34.4	32.5	33.0	29.0
Greenwich 5	R	<i>51.6</i>	49.7	55.0	54.0
Greenwich 7	R	no	No	no	<i>50.0</i>
Greenwich Bexley 6	R	no	<i>42</i>	50	49
Southwark 1	U	55.4	51.6	54.0	<i>46.0</i>
Southwark 2	R	<i>74.5</i>	<i>63.0</i>	65.0	<i>58.0</i>
Tower Hamlets 1	U	45.8	<i>43.9</i>	45.0	40.0
Tower Hamlets 2	R	64.9	64.9	<i>72.0</i>	61.0
Tower Hamlets 3	U	<i>43.9</i>	42.0	47.0	43.0

(Note – K: kerbside, R: roadside and U: urban background. Italics indicates < 90% data capture and 'no' indicates site not in operation. Bold indicates an exceedence of the objective)

The above results represent those sites in neighbouring Boroughs with at least 70% data capture plus the very busy kerbside site at Marylebone Road in central London for comparison purposes. The kerbside and roadside sites all failed to meet the 40 µg/m³ standard. The urban background site in Greenwich, did meet the standard, thereby suggesting that background concentrations in Lewisham are likely to meet the standard. The findings for these LAQN sites are considered indicative of the findings for Lewisham, these being that high concentrations of NO₂ arise close to the busiest roads across the Borough.

The assessment of NO₂ based on monitoring confirms that there are locations across the Borough where the annual mean objective will be exceeded.

Roads including narrow streets/ junctions/ busy streets/ high flows of HGVs and buses/ new roads/ roads close to the objective in first round of review and assessment/ roads with significantly changed flows.

The Third Stage report for the previous round of review and assessment provided modelling of the main roads in Lewisham. The Fourth Stage report updated the earlier predictions, incorporated the revised emission factors and addressed the following issues:

- Junctions
- High flows of HGVs and buses
- Roads close to the objective in the first round of review and assessment

As a result, none of the above issues have been re-examined in this report.

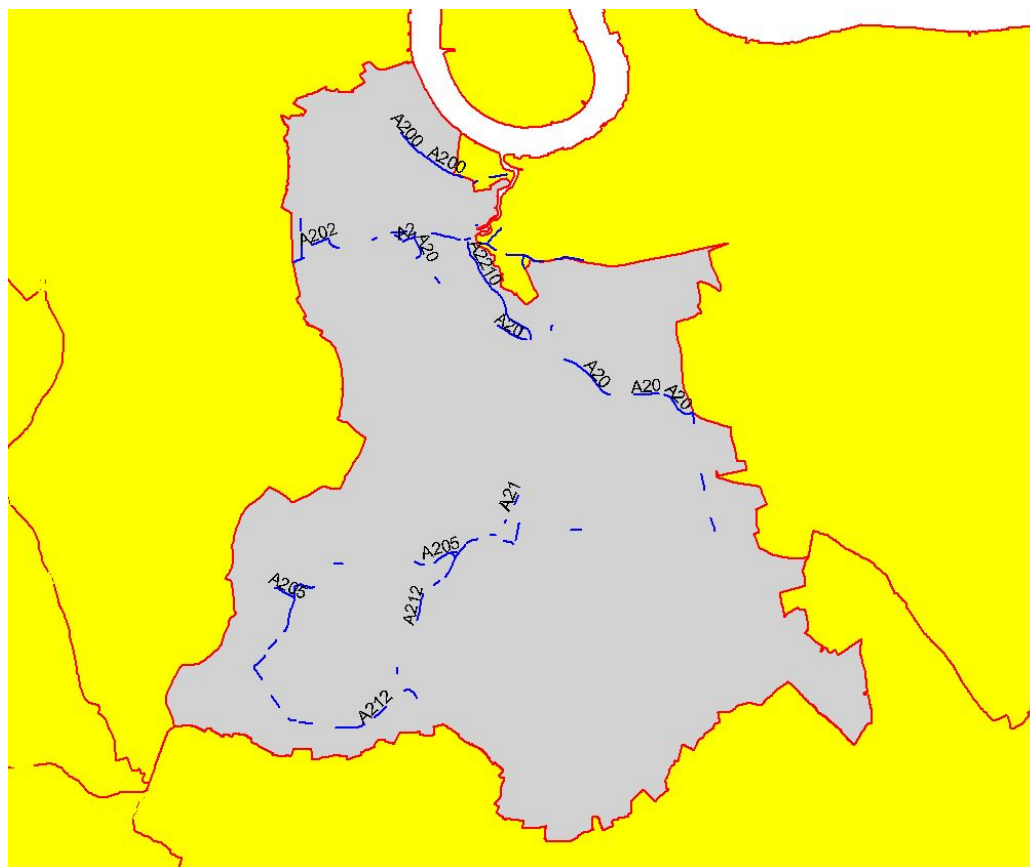
The rest of this section focuses on narrow congested streets, these being defined as busy streets and roads with significantly changed flows. These routes have been identified from local knowledge, whereas the changed flows have been identified from the new London Atmospheric Emissions Inventory (LAEI).

To predict concentrations close to roads an understanding of the predicted background concentrations of both NO_x and NO₂ for 2005 is required. These details have also been derived from the LAEI.

Narrow congested streets

Narrow congested streets with more than 10,000vpd have been identified in the Borough and a DMRB assessment undertaken of these, based on relevant exposure arising at 5m from the kerb. These are indicated in Figure 4.

These streets have been examined as both street canyons (as defined using TG (03)) and non-street canyons. For street canyons the road component has been doubled. The predictions for these streets are given in Table 7.

Figure 4 – Roads in the Borough of Lewisham identified as narrow congested streets**Table 7 - Predicted annual mean NO₂ at narrow congested streets for 2005 in road sections within the Borough of Lewisham (µg/m³)**

Road name	Road number	NO ₂	NO ₂ canyon
DEPTFORD BROADWAY	A2	44.5	53.4
NEW CROSS ROAD	A2	44.5	53.4
LEWISHAM WAY	A20	41.2	47.2
LOAMPIT HILL	A20	41.2	47.2
LOAMPIT VALE	A20	41.2	47.2
LONDON ROAD	A205	41.4	48.4
SYDENHAM ROAD	A212	37.9	42.7
BROOKMILL ROAD	A2210	42.0	48.6
JERRARD STREET	A2210	42.0	48.6
THURSTON ROAD	A2210	42.0	48.6
LEWISHAM ROAD	A2211	39.8	45.1
PARKFIELD ROAD	A2	46.1	55.9
BROWNHILL ROAD	A205	46.3	56.0
DEPTFORD BROADWAY	A2209	41.7	48.2
DEPTFORD CHURCH STREET	A2209	41.2	48.3
LEE HIGH ROAD	A20	40.4	46.8

BROWNHILL ROAD	A205	40.4	47.2
DARTMOUTH ROAD	A2216	38.9	44.2
KIRKDALE	A2216	38.9	44.2
SOUTHEND LANE	A2218	36.3	41.0
AMERSHAM ROAD	A2	44.0	52.7
EVELYN STREET	A200	40.2	46.6
QUEEN'S ROAD	A202	43.7	52.1
DARTMOUTH ROAD	A205	41.0	47.1
STANSTEAD ROAD	A205	41.0	47.1
WALDRAM CRESCENT	A205	41.0	47.1
WALDRAM PARK ROAD	A205	41.0	47.1
SYDENHAM ROAD	A212	38.7	44.2
BARING ROAD	A2212	32.6	37.2
LEWISHAM WAY	A2	42.3	50.1
NEW CROSS ROAD	A2	41.1	48.2
RUSHEY GREEN	A21	41.5	48.6
AMERSHAM ROAD	A20	39.0	44.5
PLASSY ROAD	A205	44.3	52.9
SANGLEY ROAD	A205	44.3	52.9
CATFORD ROAD	A205	41.9	49.0
CATFORD HILL	A205	39.1	44.8
CATFORD HILL	A212	39.1	44.8
PERRY HILL	A212	39.1	44.8
BURNT ASH HILL	A2212	35.9	40.4
BURNT ASH ROAD	A2212	35.9	40.4
NEW CROSS ROAD	A2	42.9	51.3
NEW CROSS ROAD	A2	43.5	52.2
NEW CROSS ROAD	A2	39.5	45.8
QUEEN'S ROAD	A202	39.7	45.9
KENDER STREET	A202	37.4	42.0
BESSON STREET	A202	38.5	43.9
EVELYN STREET	A200	42.5	50.4
KENDER STREET	A202	42.3	50.1

The above table indicates that the majority of roads investigated will exceed the annual mean objective whether they are treated as street canyons or otherwise. The roads indicated as meeting the objective are those in the south of the Borough, with lower levels of traffic.

Busy streets

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 indicated that the objective is not exceeded. However, the monitoring is not always possible in every location where such exposure might arise.

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 using GIS techniques and a DMRB assessment undertaken of these, based on relevant exposure arising at 5m from the kerb. The streets are shown in Figure 5 and the DMRB results are given in Table 8. Details of the traffic flows used for this Updating and Screening Assessment are given in Appendix 2.

Figure 5 - Roads identified as busy streets in the Borough of Lewisham

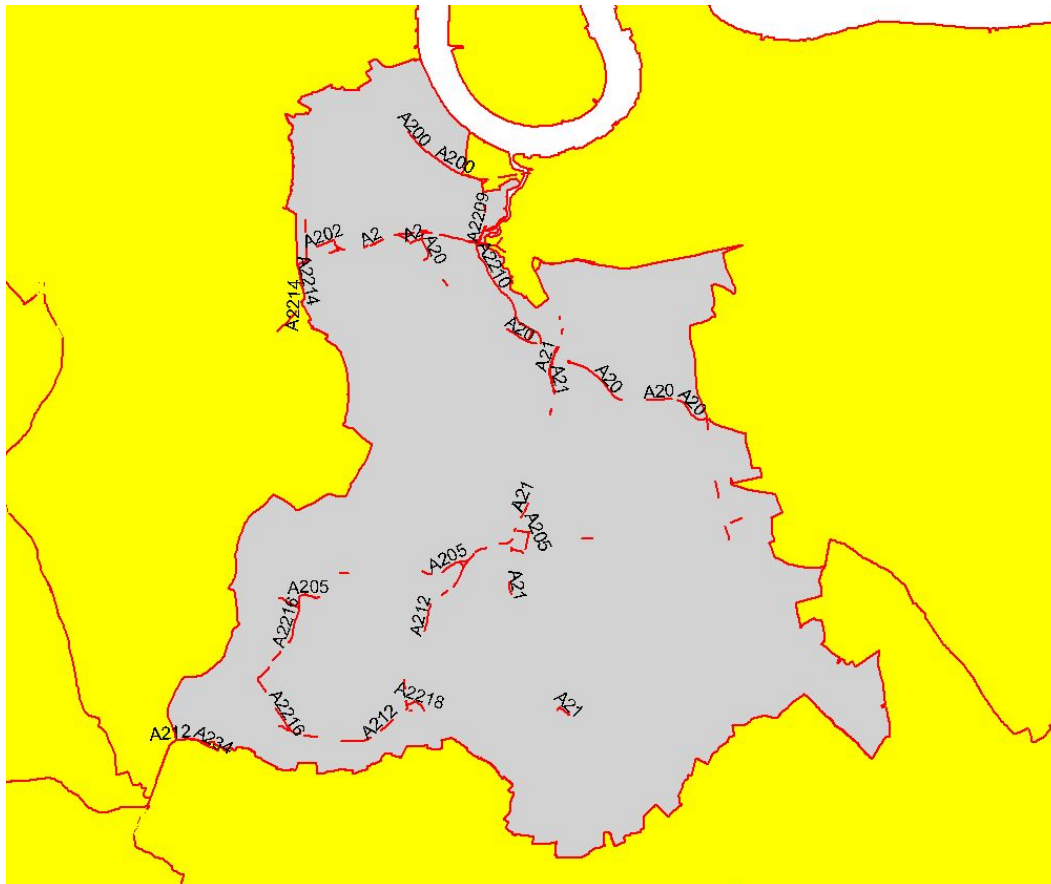


Table 8 - Predicted annual mean NO₂ at busy streets for 2005 in road sections within the Borough of Lewisham (µg/m³)

Road name	Road number	NO ₂	NO ₂ canyon
DEPTFORD BROADWAY	A2	44.5	53.4
NEW CROSS ROAD	A2	44.5	53.4
LEWISHAM WAY	A20	41.2	47.2
LOAMPIT HILL	A20	41.2	47.2
LOAMPIT VALE	A20	41.2	47.2
BROMLEY ROAD	A21	38.0	43.8
LONDON ROAD	A205	41.4	48.4
SYDENHAM ROAD	A212	37.9	42.7
BROOKMILL ROAD	A2210	42.0	48.6

JERRARD STREET	A2210	42.0	48.6
THURSTON ROAD	A2210	42.0	48.6
LEWISHAM ROAD	A2211	39.8	45.1
PARKFIELD ROAD	A2	46.1	55.9
BROWNHILL ROAD	A205	46.3	56.0
DEPTFORD BROADWAY	A2209	41.7	48.2
DEPTFORD CHURCH STREET	A2209	41.2	48.3
DEPTFORD BRIDGE	A2	44.4	53.1
LEE HIGH ROAD	A20	40.4	46.8
BROWNHILL ROAD	A205	40.4	47.2
WESTWOOD HILL	A212	38.7	44.6
DARTMOUTH ROAD	A2216	38.9	44.2
KIRKDALE	A2216	38.9	44.2
SOUTHEND LANE	A2218	36.3	41.0
STANTON WAY	A2218	36.3	41.0
AMERSHAM ROAD	A2	44.0	52.7
NEW CROSS ROAD	A2	44.0	52.7
EVELYN STREET	A200	40.2	46.6
KENDER STREET	A202	43.7	52.1
QUEEN'S ROAD	A202	43.7	52.1
DARTMOUTH ROAD	A205	41.0	47.1
STANSTEAD ROAD	A205	41.0	47.1
WALDRAM CRESCENT	A205	41.0	47.1
WALDRAM PARK ROAD	A205	41.0	47.1
BELL GREEN	A212	38.7	44.2
SYDENHAM ROAD	A212	38.7	44.2
BARING ROAD	A2212	32.6	37.2
LEWISHAM WAY	A2	42.3	50.1
NEW CROSS ROAD	A2	41.1	48.2
LEWISHAM HIGH STREET	A21	41.5	48.6
MOLESWORTH STREET	A21	41.5	48.6
RUSHEY GREEN	A21	41.5	48.6
BROMLEY ROAD	A21	38.1	44.3
WESTHORNE AVENUE	A205	39.4	46.3
WESTWOOD HILL	A212	37.6	42.1
CRYSTAL PALACE PARK ROAD	A234	37.0	41.5
EVELINA ROAD	A2214	39.5	44.7
LAUSANNE ROAD	A2214	39.5	44.7
AMERSHAM ROAD	A20	39.0	44.5
PLASSY ROAD	A205	44.3	52.9
SANGLEY ROAD	A205	44.3	52.9
LEE HIGH ROAD	A20	47.9	58.0
CATFORD ROAD	A205	41.9	49.0
STANSTEAD ROAD	A205	41.9	49.0
BELL GREEN	A212	39.1	44.8
CATFORD HILL	A205	39.1	44.8
CATFORD HILL	A212	39.1	44.8
PERRY HILL	A212	39.1	44.8
BURNT ASH HILL	A2212	35.9	40.4

BURNT ASH ROAD	A2212	35.9	40.4
NEW CROSS ROAD	A2	42.9	51.3
OLD KENT ROAD	A2	40.8	47.7
LEWISHAM WAY	A2	43.5	52.2
NEW CROSS ROAD	A2	43.5	52.2
NEW CROSS ROAD	A2	39.5	45.8
KENDER STREET	A202	39.7	45.9
QUEEN'S ROAD	A2	39.7	45.9
QUEEN'S ROAD	A202	39.7	45.9
KENDER STREET	A202	37.4	42.0
BESSON STREET	A202	38.5	43.9
EVELYN STREET	A200	42.5	50.4
KENDER STREET	A202	42.3	50.1

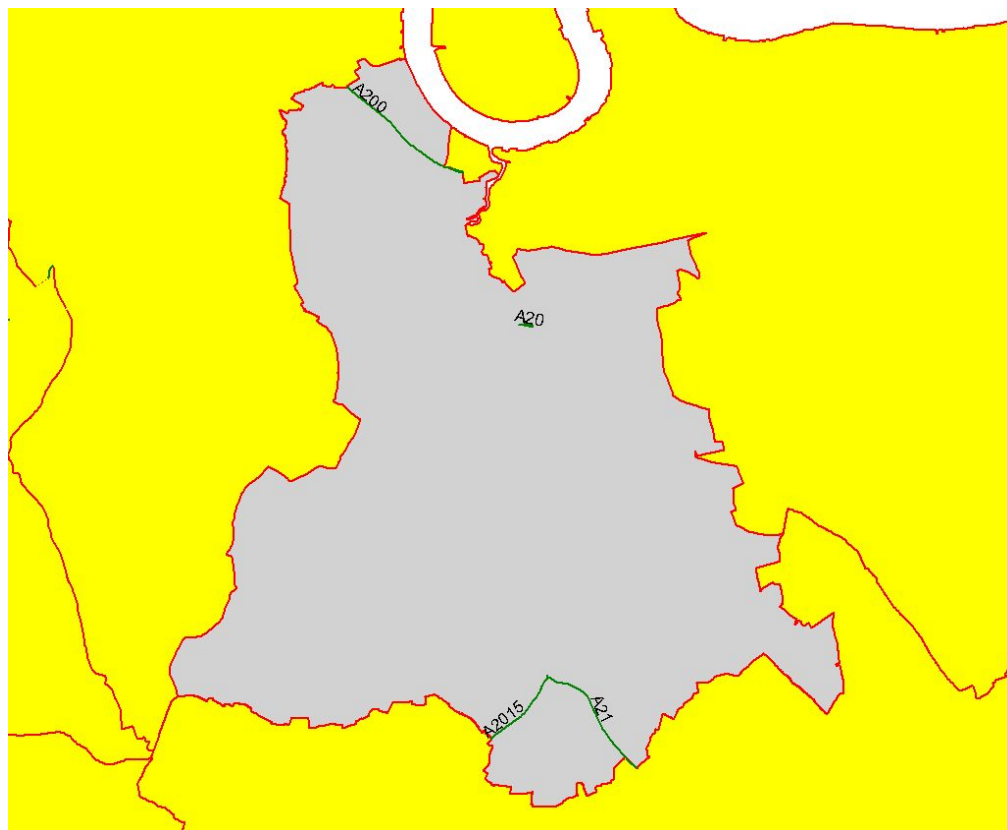
The above results indicate that the majority of roads exceed the 40 $\mu\text{g}/\text{m}^3$ annual mean objective for all the roads tested, thus indicating that there may be more than 18 hours above 200 $\mu\text{g}/\text{m}^3$.

Significantly changed flows

No roads have been identified where the actual flows have increased significantly. However, there are a number of roads with significantly changed flows since the previous round of review and assessment. These have arisen due to a revision of traffic link information in the emission inventory. To identify these roads a comparison has been undertaken between the supplied 1999 and 2001 LAEI traffic data where the traffic flow has increased by more than 25%.

The following roads have been identified and are shown in Figure 6.

EVELYN STREET	A200
LOAMPIT VALE	A20
CREEK ROAD	A200
DEPTFORD CHURCH STREET	A200
EVELYN STREET	A200
BROMLEY HILL	A21
BROMLEY ROAD	A21
BECKENHAM HILL ROAD	A2015

Figure 6 - Roads with substantial changes in the Borough of Lewisham

A DMRB assessment has been made of these roads assuming relevant exposure arises at 5m from the kerb. The results of the assessment are given in Table 9 below.

Table 9 - Predicted annual mean NO₂ of roads with substantial changes for 2005 in Lewisham area (µg/m³)

Road Name	Road	NO ₂
EVELYN STREET	A200	40.2
LOAMPIT VALE	A20	46.6
CREEK ROAD	A200	42.5
DEPTFORD CHURCH STREET	A200	42.5
EVELYN STREET	A200	42.5
BROMLEY HILL	A21	23.0
BROMLEY ROAD	A21	23.0
BECKENHAM HILL ROAD	A2015	23.1

The above results indicate that the roads at the southern boundary with substantial changes in traffic flows do not exceed the 40 µg/m³ annual mean objective. The busier A20 and A200 in the north of the Borough are predicted to exceed that level.

New roads

No new roads with traffic flows greater than 10,000vpd have been built in the Borough since the first round of review and assessment where there is relevant exposure arising.

Bus stations

Lewisham Bus Station is the only open bus station in the Borough, where there is relevant exposure. Thirty four bus routes operate from this station and the estimated numbers of buses using the station is over 1,100 buses per day (from timetabled information). A DMRB assessment has been undertaken, which assumes that the distance from receptor to centre of the road is 4m and that buses pass through once. The result of the assessment is that the annual mean objective exceeds 40 $\mu\text{g}/\text{m}^3$. On this basis and using TG (03) guidance a further assessment is required.

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 this Borough since the last round of review and assessment.

Aircraft

There is no airport within the Council's area so no assessment needs to be carried out.

3.5.5 Conclusions

The Updating and Screening Assessment for nitrogen dioxide has identified a risk that the 2005 annual mean objective will be exceeded in Lewisham. This is consistent with the Council's previous local air quality management findings and actions. The Council need not, therefore, undertake a Detailed Assessment in respect of nitrogen dioxide with a view to revoking its AQMAs. However, the assessment has identified that Lewisham bus station is at risk of exceeding the 2005 hourly mean objective and a Detailed Assessment will be required due to this source.

The findings of the Updating and Screening Assessment have shown that it will be necessary to undertake a Detailed Assessment of nitrogen dioxide for this round of review and assessment

3.6 Sulphur Dioxide

3.6.1 Objective

The current air quality objectives for sulphur dioxide are a 15 min 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

3.6.2 Pollutant Overview

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 TG (03)). This is associated with widespread domestic coal burning. The 15-minute objective is the most stringent for SO_2 . A small number of AQMAs were declared during the first round of review and assessment. These related to a number of coal-fired boilers, domestic coal burning and a major port.

3.6.3 Methodology Overview

Full details of the methodology employed can be found in TG (03). 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:-

- **Monitoring data.** Monitoring data is 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 indicates that the concentration exceeds the objective then the local authority will be required to proceed to the Detailed Assessment stage.

- **New industrial sources and existing ones with significantly increased emissions.** For new industrial sources listed in TG (03) 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 TG (03) provides nomograms for an assessment. The same approach is required where there has been a substantial increase in emissions, that is one greater than 30%.
- **Areas of domestic coal burning.** For domestic sources there is a 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.
- **Boilers burning coal or oil.** 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 TG (03) provides nomograms for an assessment.
- **Railway locomotives.** Both diesel and coal fired locomotives emit SO₂ and this is most relevant where the locomotives are stationary for periods of 15 minutes or more. It is necessary to establish whether or not there is relevant exposure within 15m of the source. If there are more than two occasions when locomotives are stationary with engines running then it is necessary to go to a detailed assessment.

3.6.4 Assessment Results

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 SO₂ in the Borough. The assessment of SO₂, therefore, ended at the previous third round of review and assessment following the Council's acceptance of an Environment Agency's report assessing air quality in London and the East Thames corridor (2000).

Monitoring

The Council undertakes SO₂ continuous monitoring at the urban background site at the Town Hall, Catford (LW1) and the roadside at New Cross (LW2). The results for the period 1999 to 2002, based on ratified data, indicate that the 15-minute mean standard was not exceeded. Similarly there were no periods when the one-hour and 24 hour mean standards were exceeded. Table 10 shows the maximum 15 minute mean monitored.

Table 10:- Maximum 15 minute mean ($\mu\text{g}/\text{m}^3$) for Lewisham sites (1999 –2002)

LAQN Site	1999	2000	2001	2002
LW1	168.5	58.5	56.2	258.0
LW2	no	no	no	189.8

(Note – ‘no’ indicates site not in operation)

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 11 for the period 1999 – 2002 (the relevant data capture rates are given in Appendix 1). As with the Lewisham sites there have been no instances where the one-hour or 24 hour mean objectives have been exceeded.

Table 11 - SO₂ monitoring from LAQN in neighbouring areas (number of 15-minute means > 266 $\mu\text{g}/\text{m}^3$)(1999-2002)

LAQN site	Type	1999	2000	2001	2002
Bexley 1	S	10	0	4	0
Bexley 5	S	1	0	0	0
Crystal Palace 1	R	0	0	0	0
Greenwich 4	U	1	0	0	0
Lewisham 1	U	0	0	0	0
Lewisham 2	R	no	No	no	0
Lambeth 1	R	no	0	1	0
Lambeth 2	R	no	No	0	0
Lambeth 3	U	no	No	0	0
Southwark 1	U	0	0	0	0
Southwark 2	R	0	0	0	0
Tower Hamlets 1	U	1	0	0	0
Tower Hamlets 3	U	0	0	10	0

(Note – K: kerbside, R: roadside, U: urban background, italics indicates < 90% data capture and ‘no’ indicates site not in operation)

The results for all the above sites confirm that the SO₂ objectives were achieved.

Industrial sources

There are no new Part A or B processes within the Borough or in neighbouring authorities since the previous round of review and assessment.

The Environment Agency’s Pollution Inventory indicates that SO₂ emissions from the SELCHP increased by more than 30% between 2001 and 2002. The stack parameter details and total annual emission rate from the Pollution Inventory were used with the nomogram in TG (03) and the actual emission rate for 2002 is less than that indicated for which a Detailed Assessment is required.

There are also no existing relevant Part A or B processes within the Borough or nearby in neighbouring authorities where there have been substantially increased emissions

Domestic sources

Local knowledge and professional judgement indicates that significant domestic coal burning is not undertaken across the Borough.

Boilers

No specific new boilers have been identified in the Borough since the previous round of review and assessment.

Railway locomotives

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

3.6.5 Conclusions

The Updating and Screening Assessment for sulphur dioxide has not identified a risk of the objectives being exceeded by 2004 and 2005 in the Council's area.

The findings of the Updating and Screening Assessment have shown that it will NOT be necessary to undertake a Detailed Assessment of sulphur dioxide for this round of review and assessment.

3.7 Particulates

3.7.1 Objective

The current air quality objectives for PM₁₀ are an annual mean concentration of 40 µg/m³ and a 24 hour mean concentration of 50 µg/m³ 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 the 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/m³ and a 24 hour mean concentration of 50 µg/m³ not to be exceeded more than 10 times per year. The TG (03) 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

3.7.2 Pollutant Overview

There are a wide range of emission sources that contribute to PM₁₀ concentrations in the UK. Research studies have confirmed that these sources can be divided into three main categories:-

- Primary particle emissions are derived directly from combustion sources, including road traffic, power generation and industrial processes.
- Secondary particles are formed by chemical reactions in the atmosphere and comprise principally sulphates and nitrates.
- Coarse particles comprise emissions from a wide range of sources, including re-suspended 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 SO₂ and NO_x 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 (TG (03)). 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 PM₁₀ projections for the AQS indicated that exceedences of the 2004 objectives might be found in areas adjacent to busy roads, particularly in urban areas, in 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, dependent 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 AQMA's declared during the first round of review and assessment were for the 24-hour mean PM₁₀ objective. The majority of these are in combination with nitrogen dioxide and are associated with road transport sources. Other AQMA's have been declared in relation to industrial activities and fugitive sources around a quarry and from port handling activities.

3.7.3 Methodology Overview

Full details of the methodology employed can be found in TG (03). 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:-

- **Monitoring data.** Monitoring data is to be considered both outside an AQMA and within an AQMA. The data will be corrected to 2004 using factors in TG (03) and if the data indicates that the concentration exceeds the 24-hour objective then the local authority will be required to proceed to the Detailed Assessment stage.
- **Roads including junctions and new roads.** 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 previous round of review and assessment. 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, using the DMRB screening model to predict the number of 24-hour exceedences more than 50 µg/m³ 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, that is 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.

- **New industrial sources and existing ones with significantly increased emissions.** 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 TG (03) provides nomograms for an assessment. The same approach is required where there has been a substantial increase in emissions, that is one greater than 30%.
- **Areas of domestic coal burning.** For domestic sources there is a 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 TG (03) is used to determine whether or not a detailed assessment is required.
- **Quarries, landfill sites, opencast coal, handling of dusty cargoes at ports.** For quarries, landfill sites and ports where dusty cargoes are handled 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.
- **Aircraft.** Aircraft emissions are important if there is relevant exposure within 500m of an airport boundary and the equivalent passenger numbers are predicted to exceed 10 million passengers per annum.

3.7.4 Assessment Results

Detailed modelling of all sources across the Borough was undertaken in the third stage of the previous round of review and assessment for the 2004 objectives. This showed exceedences of the 24-hour mean objective for PM₁₀ close to major roads in the Borough. As a result the Council declared five AQMAs across the Borough.

Subsequent modelling was undertaken in the fourth stage of the previous round of review and assessment using the then new emissions information and revised emission factors based on 1996 meteorology data. This also indicated exceedences of the 24-hour mean objective for PM₁₀ close to major roads in the Borough.

Monitoring

The Council undertakes continuous monitoring of PM₁₀ in the Borough at its Lewisham 2 (LW2) roadside site in New Cross. The site uses a TEOM instrument for monitoring PM₁₀ and the results are presented in the report as a gravimetric equivalent, that is TEOM times 1.3.

The following table presents the results for 2002 when the site commenced operation. The results indicate that the 2004 annual mean objective of 40 $\mu\text{g}/\text{m}^3$ is being met and confirms that there were days where the 24-hour mean standard of 50 $\mu\text{g}/\text{m}^3$ was exceeded, however the number of such days did not exceed 35.

Table 12 - PM₁₀ monitoring at the Lewisham site (2002) ($\mu\text{g}/\text{m}^3$)

Site	Days > 50 $\mu\text{g}/\text{m}^3$	Annual mean $\mu\text{g}/\text{m}^3$
Lewisham 2	17	31

(Note - data capture rate was 54%)

The TG (03) guidance provides a method to estimate the annual mean from short term monitoring data and this method has been employed based on monitoring at the nearby background sites in Bexley (BX1), Greenwich (GR4) and Tower Hamlets (TH1). These sites all have more than 90% data capture for both 2001 and 2002. Based on the average of the ratio of annual mean and period means for these sites, the estimated 2001 annual mean for the Lewisham (LW2) site is 30 $\mu\text{g}/\text{m}^3$ (TEOM).

The TG (03) guidance also includes correction factors to use with measurement results to estimate future levels and this has been undertaken using the above estimated 2001 annual mean for LW2. These levels have been used with the 2001 measurements and the results are given in tables 13 and 14. The secondary background PM₁₀ concentrations also used with the methodology have been obtained from the airquality.co.uk website.

Table 13 - Estimated PM₁₀ results at Lewisham sites for 2004 (using TG (03))

2004	Annual mean ($\mu\text{g}/\text{m}^3$)	No. of days > 50 $\mu\text{g}/\text{m}^3$
LW2	28.7	23

The above results do not indicate an exceedence of the 2004 annual mean and 24-hour mean objectives at the monitoring site in the Borough.

The details of the estimated annual mean PM₁₀ concentrations in 2010 using a similar methodology are given in the following table.

Table 14 - Estimated PM₁₀ results at Lewisham sites for 2010 (using TG (03) methodology)

2010	Annual mean ($\mu\text{g}/\text{m}^3$)	No. of days > 50 $\mu\text{g}/\text{m}^3$
LW2	26.2	16

Despite the predicted reduction resulting from future emission changes the estimates for the LW2 roadside site indicates 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 Borough.

It is helpful to consider the Borough as part of the wider London conurbation and the most recent results for the period 1999 to 2001 from the continuous sites in nearby authorities in the LAQN are given in Table 15 for the 24 hour mean objective and Table 16 for the annual mean objective. The results also include the busy and polluted kerbside site at Marylebone road for comparison purposes. It should be noted that sites all have greater than 70% data capture, apart from the Marylebone Road measurement that had 68% data capture.

These results highlight that the 24 mean objective for 2004 of more than 35 days with a mean more than $50 \mu\text{g}/\text{m}^3$ was exceeded at Marylebone Road and Bexley 4 for all years. As mentioned above, the Marylebone Road is a kerbside site on a very busy road in central London and the Bexley 4 site is located in an industrial area with specific transport issues. The roadside sites all indicate higher concentrations than the background sites, with the Bromley 7 site (in 1999) and Greenwich 7 (in 2002) also exceeding the objective. The results from all other sites indicate that the objective was achieved.

Table 15 - Number of days PM_{10} 24 hour mean exceeds $50 \mu\text{g}/\text{m}^3$ in neighbouring local authorities (1999-2002)

LAQN site	Type	Instrument	1999	2000	2001	2002
Marylebone Rd	K	G-KFG	no	no	no	51
Marylebone Rd	K	G-Partisol	no	no	no	65
Marylebone Rd	K	T	111	157	<i>106</i>	111
Bexley 1	S	T	17	10	18	11
Bexley 2	S	T	17	10	24	14
Bexley 3	S	T	13	10	14	15
Bexley 4	R	T	77	78	100	98
Bromley 7	R	B	59	16	21	15
Crystal Palace 1	R	T	0	17	24	6
Greenwich 4	U	T	5	2	11	5
Greenwich 5	R	T	8	12	18	13
Greenwich 7	R	T	no	no	no	43
Greenwich Bexley 6	R	T	no	2	30	19
Southwark 2	R	T	no	no	7	25
Tower Hamlets 1	U	T	21	5	15	10
Tower Hamlets 3	U	T	0	2	10	13

(For Instrument: T represents TEOM; B – BAM; G – gravimetric. K: kerbside, R: roadside and U: urban background. Italics indicates < 90% data capture, 'no' indicates site not in operation and bold indicates an exceedence of the objective)

Table 16 - PM₁₀ annual mean (µg/m³) in neighbouring local authorities (1999-2002)

LAQN site	Type	1999	2000)	2001	2002
Marylebone Rd	K	no	no	no	37
Marylebone Rd	K	no	no	no	44
Marylebone Rd	K	46	48.1	43	44
Bexley 1	S	25	23.4	24	25
Bexley 2	S	23	23.4	25	24
Bexley 3	S	23	23.4	25	25
Bexley 4	R	47	35.1	40	42
Bromley 7	R	38	32.5	28	27
Crystal Palace 1	R	29	29.9	31	28
Greenwich 4	U	22	19.5	23	23
Greenwich 5	R	26	26	28	27
Greenwich 7	R	no	no	no	35
Greenwich Bexley 6	R	no	23.4	29	28
Southwark 2	R	no	no	31	33
Tower Hamlets 1	U	27	23.4	24	25
Tower Hamlets 3	U	17	19.5	21	26

(For Instrument: T represents TEOM; B – BAM; G – gravimetric. K: kerbside, R: roadside and U: urban background. Italics indicates < 90% data capture, 'no' indicates site not in operation and bold indicates an exceedence of the objective)

The annual mean results for the sites all indicate that the objective has been met except at the Marylebone Road and Bexley 4 sites. The results also indicate that the kerbside and roadside results recorded higher concentrations than those at background sites.

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

The assessment of PM₁₀ based on monitoring confirms that the only areas where the 2004 objectives are likely to be exceeded across the Borough are close to busy roads. Based on these findings a Detailed Assessment is not required.

Estimations based on monitoring results in the Borough indicate that the 2010 objectives will be exceeded in parts of the Borough. However, the Council is not required at the present to progress to a Detailed Assessment for these objectives in this round of review and assessment.

Roads

The third and fourth stage reports for the previous round of review and assessment provided modelling of the main roads in Lewisham and addressed the issues of junctions and high flows of HGVs and buses. The TG (03) guidance also requires an assessment of roads close to the objective during the first round of review and assessment and this was undertaken in the Council's Stage 4 report. Hence no further examination of these roads will be undertaken in this report.

The rest of this section focuses on roads with significantly changed flows although no roads have been identified where the actual flows have recently increased significantly.

However, there are a number of roads with significantly changed flows since the start of the previous round of review and assessments. These have arisen due to a revision of traffic link information in the emission inventory. To identify these roads a comparison was undertaken between the supplied 1999 and 2001 LAEI data where the traffic flow has increased by more than 25%.

The traffic data for these roads is given in Appendix 2. The results of the DMRB assessment are given in Table 17. The receptor positions are assumed at 5m from the kerb.

Table 17 - Predicted number of 24 hour means of PM₁₀ exceeding 50 µg/m³ for 2004 for roads with substantial changes in Lewisham area

road name	Road number	No. of days > 50 µg/m³
EVELYN STREET	A200	15
LOAMPIT VALE	A20	18
CREEK ROAD	A200	19
DEPTFORD CHURCH STREET	A200	19
EVELYN STREET	A200	19
BROMLEY HILL	A21	9
BROMLEY ROAD	A21	9
BECKENHAM HILL ROAD	A2015	9

The estimates for the roads with substantial changes indicate that the 2004 objective will not be exceeded.

No new roads with traffic flows greater than 10,000vpd have been built in the Borough since the previous round of review and assessments where there is relevant exposure arising.

Industrial sources

No new relevant processes have started in or close to the Borough since the previous round of review and assessments. 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 PM₁₀ within the Borough or neighbouring local authority areas since the previous round of review and assessments.

Domestic sources

From local knowledge and professional judgement, significant domestic burning of solid fuels is not undertaken across the Borough so there is no need for further assessment.

Quarries/ landfill sites/ handling of dusty cargoes

There are no quarries, landfill sites or areas where dusty cargoes are handled within the Borough. There are, however, numerous dust complaints, which possibly include a PM₁₀ fraction, from fugitive sources close to Mercury Way, SE14 and Bolina Road, SE16. Examination of the areas indicates that the potential sources include metal recycling plants and various waste transfer stations. The nearest relevant exposure to the sources are within 200m and the estimated annual mean background concentration for 2004 is less than 26µg/m³. As a result and using TG (03) guidance, further Detailed Assessment is required.

Aircraft

As stated earlier in the section for nitrogen dioxide there is no airport in the Borough and assessment is not required.

3.7.5 Conclusions

The Updating and Screening Assessment for PM₁₀ has identified a risk that the 2004 objectives will be exceeded in the Borough. 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 PM₁₀ with a view to revoking its five AQMAs. The Updating and Screening Assessment for PM₁₀ has identified an additional risk of the objectives being exceeded by 2004 from fugitive sources in the north of the Borough and that there is a risk that the 2010 objectives will be exceeded across several parts of Lewisham.

The findings of the Updating and Screening Assessment have shown that it will be necessary to undertake a Detailed Assessment of particulates for this round of review and assessment

4. Conclusions and Recommendations – Further Actions

4.1 Introduction

This report follows the technical guidance (TG (03)) produced for the Updating and Screening Assessment of the second round of review and assessment and it 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 Borough. The Council need not therefore proceed beyond the Updating and Screening Assessment for these pollutants.

The Council has identified the following:-

- **For the nitrogen dioxide annual mean and hourly objectives** - there is a risk that these objectives will be exceeded at locations with relevant public exposure. The Council has previously designated five separate AQMAs for nitrogen dioxide. The findings of the Updating and Screening Assessment are consistent with this action. The assessment has also indicated that there is a risk that the hourly objective will be exceeded at Lewisham bus station.
- **For the PM₁₀ 2004 daily objective** - there is a risk that the objective will be exceeded at locations with relevant public exposure. For the 2004 objective the Council has previously designated five separate AQMAs for PM₁₀. The findings of the Updating and Screening Assessment are consistent with this action. An additional risk in relation to fugitive emission sources in the Borough has been identified.
- **For the PM₁₀ 2010 objectives** - there is a risk that these objectives will be exceeded at locations with relevant public exposure. The Council is not required to undertake a Detailed Assessment for these PM₁₀ objectives at this stage. The findings for PM₁₀ have been noted for longer term planning.

For 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.

4.2 Detailed Assessment – Further Action

The TG (03) guidance advises that a Detailed Assessment is required to determine with reasonable certainty whether or not there is a likelihood of the objectives not being achieved. Therefore, the Council has decided to take the following action:-

- Undertake consultation on the findings arising from this report with the statutory and other consultees as required.
- Undertake a Detailed Assessment for the 2005 nitrogen dioxide hourly objective in relation to Lewisham bus station.
- Undertake a Detailed Assessment for the 2004 PM₁₀ daily objective in relation to the identified fugitive emission sources in the Borough.

5. References

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6. Glossary of Terms

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
LAQN	London Air Quality Network
mg/m ³	Milligrams of the pollutant per cubic metre of air
µg/m ³	Micrograms of the pollutant per cubic metre of air
ppb	Parts per billion
ppm	Parts per million
NO	Nitric oxide
NO ₂	Nitrogen dioxide
PM ₁₀	Particles with diameter less than 10µm
QA/QC	Quality Assurance / Quality Control
SO ₂	Sulphur dioxide
TEOM	Tapered Element Oscillating Microbalance

7. Appendices

Appendix 1

Table 18:- Data capture rates (%) for the NO₂ continuous monitoring sites (1999-2002)

LAQN site	Type	1999	2000	2001	2002
Lewisham 1	U	95	43	45	93
Lewisham 2	R				75
Marylebone Rd	K			94	98
Bromley 7	R	94	82	88	97
Crystal Palace 1	R	11	96	96	82
Greenwich 4	U	96	97	97	98
Greenwich 5	R	26	98	96	99
Greenwich 7	R				71
Southwark 1	U	93	96	97	84
Southwark 2	R	49	89	92	86
Tower Hamlets 1	U	93	84	96	97
Tower Hamlets 2	R	97	91	87	98
Tower Hamlets 3	U	17	94	95	91

(Note - K: kerbside, R: roadside and U: urban background and a gap indicates site not in operation)

Table 19:- Data capture rates (%) for the PM₁₀ continuous monitoring sites (1999-2002)

LAQN site	Type	Type	1999	2000	2001	2002
Marylebone Rd	K	T		98	89	98
Marylebone Rd	K	G -Partisol				67
Marylebone Rd	K	G- KFG				90
Bexley 1	S	T	96	97	96	98
Bexley 2	S	T	95	97	99	82
Bexley 3	S	T	77	93	96	98
Bexley 4	R	T	62	97	98	95
Bromley 7	R	B	90	86	88	92
Crystal Palace 1	R	T	23	96	98	99
Greenwich 4	U	T	98	92	97	94
Greenwich 5	R	T	45	97	98	95
Greenwich 7	R	T				81
Southwark 1	U	T				16
Southwark 2	R	T			38	71
Tower Hamlets 1	U	T	97	97	98	96
Tower Hamlets 3	U	T	13	94	94	90

(Note - for Instrument: T represents TEOM; B – BAM; G – gravimetric. K: kerbside, R: roadside and U: urban background and a gap indicates site not in operation)

Appendix 2

Table 19:- Estimated 2005 traffic count data for Lewisham Council's roads

Road name	Road number	Total vehicles	Total HGV's	Percent HGVs
DEPTFORD BROADWAY	A2	27787	3796	13.7
NEW CROSS ROAD	A2	27787	3796	13.7
LEWISHAM WAY	A20	28434	1837	6.5
LOAMPIT HILL	A20	28434	1837	6.5
LOAMPIT VALE	A20	28434	1837	6.5
BROMLEY ROAD	A21	27875	2067	7.4
LONDON ROAD	A205	31890	2501	7.8
SYDENHAM ROAD	A212	32331	1037	3.2
BROOKMILL ROAD	A2210	12704	2022	15.9
JERRARD STREET	A2210	12704	2022	15.9
THURSTON ROAD	A2210	12704	2022	15.9
LEWISHAM ROAD	A2211	17266	1259	7.3
PARKFIELD ROAD	A2	14655	1982	13.5
BROWNHILL ROAD	A205	29920	2959	9.9
DEPTFORD BROADWAY	A2209	27549	1338	4.9
DEPTFORD CHURCH STREET	A2209	29699	1911	6.4
DEPTFORD BRIDGE	A2	45817	4937	10.8
LEE HIGH ROAD	A20	24818	1745	7.0
BROWNHILL ROAD	A205	25325	1971	7.8
WESTWOOD HILL	A212	32522	2003	6.2
DARTMOUTH ROAD	A2216	20931	1234	5.9
KIRKDALE	A2216	20931	1234	5.9
SOUTHEND LANE	A2218	29995	862	2.9
STANTON WAY	A2218	29995	862	2.9
AMERSHAM ROAD	A2	19885	4046	20.3
NEW CROSS ROAD	A2	19885	4046	20.3
EVELYN STREET	A200	34866	2426	7.0
KENDER STREET	A202	23231	2545	11.0
QUEEN'S ROAD	A202	23231	2545	11.0
DARTMOUTH ROAD	A205	25392	1586	6.2
STANSTEAD ROAD	A205	25392	1586	6.2
WALDRAM CRESCENT	A205	25392	1586	6.2
WALDRAM PARK ROAD	A205	25392	1586	6.2
BELL GREEN	A212	21939	1226	5.6
SYDENHAM ROAD	A212	21939	1226	5.6
BARING ROAD	A2212	18253	796	4.4
LEWISHAM WAY	A2	23710	2469	10.4
NEW CROSS ROAD	A2	27660	2774	10.0
LEWISHAM HIGH STREET	A21	34789	2849	8.2
MOLESWORTH STREET	A21	34789	2849	8.2
RUSHEY GREEN	A21	34789	2849	8.2

BROMLEY ROAD	A21	39329	1808	4.6
WESTHORNE AVENUE	A205	46209	2417	5.2
WESTWOOD HILL	A212	20739	963	4.6
CRYSTAL PALACE PARK ROAD	A234	22063	935	4.2
EVELINA ROAD	A2214	15619	803	5.1
LAUSANNE ROAD	A2214	15619	803	5.1
AMERSHAM ROAD	A20	12097	1160	9.6
PLASSY ROAD	A205	27458	2606	9.5
SANGLEY ROAD	A205	27458	2606	9.5
LEE HIGH ROAD	A20	28088	4355	15.5
CATFORD ROAD	A205	45377	2800	6.2
STANSTEAD ROAD	A205	45377	2800	6.2
BELL GREEN	A212	28019	1478	5.3
CATFORD HILL	A205	28019	1478	5.3
CATFORD HILL	A212	28019	1478	5.3
PERRY HILL	A212	28019	1478	5.3
BURNT ASH HILL	A2212	21237	714	3.4
BURNT ASH ROAD	A2212	21237	714	3.4
NEW CROSS ROAD	A2	17044	2295	13.5
OLD KENT ROAD	A2	39637	2743	6.9
LEWISHAM WAY	A2	50167	5069	10.1
NEW CROSS ROAD	A2	50167	5069	10.1
NEW CROSS ROAD	A2	20813	1622	7.8
KENDER STREET	A202	28054	2074	7.4
QUEEN'S ROAD	A2	28054	2074	7.4
QUEEN'S ROAD	A202	28054	2074	7.4
KENDER STREET	A202	16650	857	5.1
BESSON STREET	A202	11153	1368	12.3
EVELYN STREET	A200	39096	3949	10.1
KENDER STREET	A202	29682	3625	12.2

(from LAEI supplied by the GLA)

Appendix 3

Table 20:-Part B processes in the Lewisham Council area (excluding petrol stations)

PROCESS	NAME	ADDRESS	Comment
COATING RESPRAYING	Penfold Motors Limited	36 Old Road, Lewisham, London, SE13 5SR	
CREMATORIUM	London Borough of Lewisham – Crematorium	Verdant Lane, London, SE6 1JX	
COATING RESPRAYING	S G Smith (Motors) Sydenham Limited	140-149 Mayow Road, London, SE26 4HZ	Revoked 2002
WASTE OIL BURNER	Volkespares Limited	104 Newlands Park, Sydenham, London, SE26	
COATING RESPRAYING	Sheltex Limited, trading as Holts Accident Repair Centre	105 Stanstead Road, London, SE23 1HH	New application 2002

Appendix 4

Table 21:- Authorised petrol stations in the Lewisham Council area

	PETROL STN	PROCESS ADDRESS	OS MAP REF
1	BP/Safeway	415 Bromley Road, BR1 4PJ	TQ3871NE
2	Lee S/Service	BP Harmony Lee, 193-205 Lee High Road, SE13 5PQ	TQ3975SE
3	BP	BP Oil Limited, 31 Burnt Ash Road, SE12 8RG	CLOSED
4	Motorcrown	Perry Hill Service Station, 87 Perry Hill, SE6 4LT	CLOSED
5	Esso	Loampit S/ Station, 55-60 Loampit Vale, SE13 7SX	CLOSED
6	Esso	Foxberry S/ Station, 242-246 Brockley Road, SE4 2SU	TQ3675SE
7	Esso/ Tesco	Grove Park Express, 340 Baring Road, SE12 0DU	TQ4072SE
8	Esso/ Tesco	Forril S/ Station, 86 London Road, SE23 3PE	TQ3573SW
9	Q8	93-97 Ladywell Road, SE13 7JA	CLOSED
10	Q8	Q8 – Catford, 43 Rushey Green, SE6 4AS	CLOSED
11	Sainsbury	236 New Cross Road, SE14 5UL	TQ3676NW
12	Sainsbury	Savacentre, Southend Lane, Sydenham, SE26 4PU	TQ3771NE
13	Shell	357-361 Lewisham High Street, SE13 6NZ	TQ3874NW
14	Shell	163-165 Stanstead Road, SE23 1HP	TQ3673SW
15	Shell	Shell UK Limited, 101 Evelyn Street, SE8 5RJ	TQ3678SW
16	Shell	Shell Burnt Ash Hill, 155 Burnt Ash Hill, SE12 0AP	CLOSED
17	Shell	Hillbrow, 96A Bromley Hill, BR1 4JU	TQ3970SW
18	Star	Lewisham S/ Station, 169 Lewisham Road, SE13 7PY	TQ3875NW
19	Star	315 Southend Lane, SE6 3WD	TQ3771NE
20	Sydenham Motors	Sydenham Service Station, 277 Kirkdale, SE26 4QD	TQ3571NW
21	Tesco	290 Lewisham Road, SE13 7PA	TQ3876SW
22	Tesco	97-99 Loampit Vale, SE13 7TG	TQ3875NW
23	Texaco	Star S/ Station, Catford, Brownhill Road, SE6 1AD	TQ3873NW
24	TotalFina	Total Oil (GB) Limited, 246 Bromley Road, SE6 2SY	CLOSED
25	TotalFina	Carholme, 224-226 Stanstead Road, SE23 1DD	TQ3673SW
26	TotalFina	Verdant Lane/ Whitefoot Lane, SE6 1TP	TQ3972SE
27	Leeside	170 Lee High Road, SE13 5PP	CLOSED

