



Lewisham



**Fourth Round Updating and Screening
Assessment
for
London Borough of Lewisham**

KING'S
College
LONDON

June 2009

Acknowledgements

The assistance of colleagues from the Lewisham Council is gratefully acknowledged in the production of this report.

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Executive Summary

The Council are required to review and assess air quality against the objectives in the Air Quality Regulations 2000 and the amendment regulations as part of a rolling three-year cycle ending in 2017. 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).

The role of the local authority Review and Assessment process is to identify any relevant areas where it is considered that the government's air quality objectives for the above air pollutants will be exceeded. The London Borough of Lewisham has previously undertaken the earlier rounds of Review and Assessment of local air quality management and identified areas where some of the objectives are exceeded and where there is relevant public exposure.

This report concerns the fourth round Updating and Screening Assessment and is the 2009 Updating and Screening Assessment of air quality in the London Borough of Lewisham area. It has re-examined pollution sources in its area in accordance with Defra LAQM guidance (released February 2009).

The report identifies that:

For carbon monoxide, benzene, 1,3-butadiene, lead and sulphur dioxide there is not a significant risk of the objectives being exceeded in the Council's area.

For nitrogen dioxide and particles PM₁₀ the Council has previously designated AQMAs across the northern part of the Borough and along main roads in the southern part. The findings from this report indicate that the AQMAs should be maintained.

For three roads outside of the AQMAs, which fit the new congested roads criteria for nitrogen dioxide, the Council will undertake a Detailed Assessment based on a diffusion tube survey.

The Council is also planning to install a PM₁₀ analyser in Mercury Way (within AQMA 1) to assess for additional fugitive and uncontrolled PM₁₀ sources not previously considered. The results from this will be reported in future Council Air Quality Progress reports and a Further Assessment will be undertaken if appropriate.

In view of the findings from the report the Council will undertake the following actions:

1. Undertake consultation with the statutory and other consultees as required.
2. Maintain the existing and proposed monitoring and further extend the diffusion monitoring survey of those roads newly identified as being at risk.
3. Continue with the implementation of its Air Quality Action Plan in pursuit of the AQS objectives.
4. Prepare for the submission of a Detailed Assessment of Brockley Rise in Forest Hill and those narrow congested streets roads identified in the report as at risk of exceeding the annual mean nitrogen dioxide objective.

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1. Introduction

1.1 Brief description of the Lewisham Council area

The London Borough of Lewisham is situated in southeast London. It is an inner London Borough comprising a densely populated area with a population of approximately 255,700 (mid 2006). The Borough is mostly residential with areas of employment around the main commercial centres of Lewisham, New Cross, Catford, Hither Green, Lee and Sydenham. The Borough has a broad socio-economic range between generally affluent Blackheath and less affluent Deptford. The main roads that run through the Borough include A2, A20 and A21 and A200. The main sources of air pollutants are the busy and congested roads. There are about 75 minor industrial processes that are regulated by the Council and one Part A installation regulated by the Environment Agency.

1.2 Purpose of report

This report is the 2009 Updating and Screening Assessment of air quality for the London Borough of Lewisham. The purpose of the report is to fulfil the Council's initial obligation under the fourth round review and assessment of air quality. In so doing it will determine whether or not there is a risk that an air quality objective will be exceeded in the Borough and therefore whether or not the Council needs to undertake a Detailed Assessment of air quality.

Part IV of the Environment Act 1995 introduced new responsibilities to both national and local government throughout the UK. These responsibilities included the requirement upon the national government and devolved administrations to develop an Air Quality Strategy (AQS) for England, Wales, Scotland and Northern Ireland. The overall purpose of the AQS is to seek improvements in air quality for the benefit of public health. The most recent AQS was produced in 2007.

Local air quality management (LAQM) was also introduced by the Environment Act 1995. Under this local authorities are required to periodically review and assess air quality across their areas. The AQS confirms that LAQM provides a major component of the government's plan for air quality improvement across the UK.

Air quality objectives have been set for those air pollutants deemed to be of most concern and relevance by the AQS. Seven of these pollutants are included under the LAQM regime and regulations for these were introduced. The applicable air quality objectives for the relevant pollutants are given in Table 1. Additional objectives have been set for ozone, polyaromatic hydrocarbons (PAHs) and PM_{2.5}, although these have been deemed the responsibility of national government and therefore not applicable to the LAQM process.

The objectives are all based on health-based standards using current scientific advice taking into account the likely cost and benefits, as well as feasibility and practicality in meeting the objectives. The objectives are mostly in line with limit values prescribed by EU Directive, although additional objectives (including bringing forward the date for compliance) were included for some pollutants.

1.3 Air Quality objectives

The air quality objectives applicable to LAQM in England are set out in the Air Quality (England) Regulations 2000 (SI 928) and The Air Quality (England) (Amendment) Regulations 2002 (SI 3043) (see Table 1). This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g m}^{-3}$ (and milligrammes per cubic metre, mg m^{-3} for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1 Air quality objectives (from Air Quality Regulations 2000 and Amendment Regulations 2002) applicable to the London Borough of Lewisham area

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g m}^{-3}$	Running annual mean	31.12.2003
	5.00 $\mu\text{g m}^{-3}$	Annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g/m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg m^{-3}	Maximum daily running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g m}^{-3}$	Annual mean	31.12.2004
	0.25 $\mu\text{g m}^{-3}$	Annual mean	31.12.2008
Nitrogen dioxide (NO ₂)	200 $\mu\text{g m}^{-3}$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g m}^{-3}$	Annual mean	31.12.2005
Particles (gravimetric)	50 $\mu\text{g m}^{-3}$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g m}^{-3}$	Annual mean	31.12.2004
Sulphur dioxide (SO ₂)	350 $\mu\text{g m}^{-3}$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g m}^{-3}$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g m}^{-3}$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

(Note – the provisional PM₁₀ objectives outlined on the third round USA report were not adopted in England as part of the revised 2007 AQS).

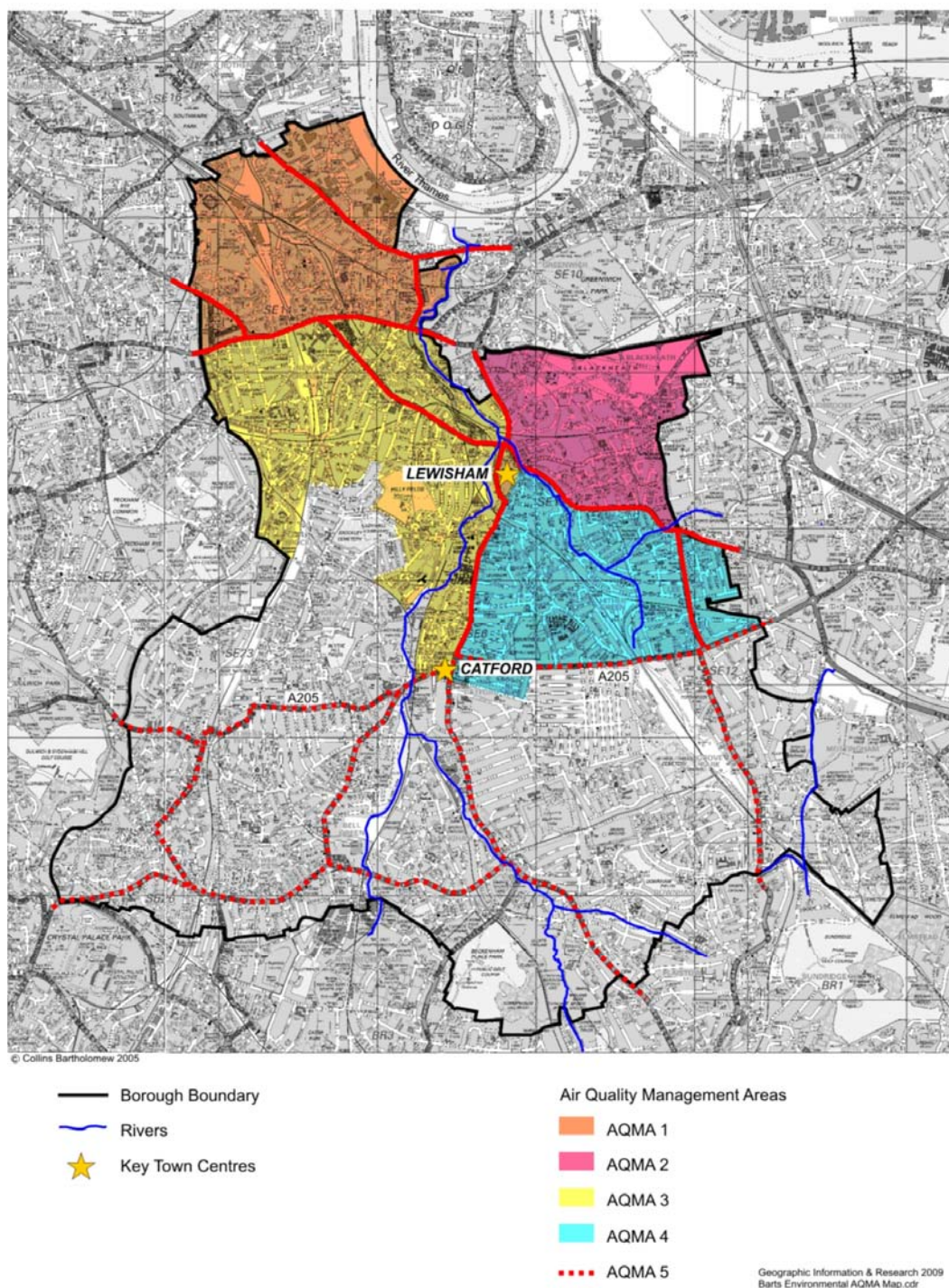
1.4 Summary of previous R&A in Lewisham B.C

The Council undertook previous rounds of review and assessment of air quality. The main issue following the first round with respect to local air quality was found to be emissions (NO₂ and PM₁₀) emanating from road vehicles. As a result the Council designated Air Quality Management Areas in parts of the Borough. These are shown in Figure 1 and consist of four large AQMAs and a series of ribbon roads (called AQMA 5).

The conclusions of the Council's subsequent Review and Assessment reports from 2003 to 2008 (see references) were that the designation of AQMAs should remain. These were primarily for exceedences of the annual mean objective for NO₂; but also for the daily mean objective for PM₁₀ where there was a smaller area that exceeds. The reports also identified that the proposed redevelopment of Lewisham could result in increased concentrations and that fugitive emissions from industrial sources in the north of the borough required monitoring.

Figure 1 London Borough of Lewisham AQMAs

Environmental Management



1.5 Fourth Round Review and Assessment

This report concerns the fourth round of LAQM review and assessment (R&A), which is part of a three yearly cycle for review and assessment ending in 2017. It follows the new prescribed guidance given in Technical Guidance LAQM. TG (09) (Defra, 2009a), supported where necessary by new LAQM Tools. The guidance 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.

It is recognised that most of the original TG03 guidance is still relevant, although some parts required revision to reflect the most up-to-date understanding, and to draw upon experience gained during the third round of Review and Assessment.

Updated guidance has been prepared to cover the following issues:

Background pollution concentrations and future year adjustments
New emission tools

Monitoring of PM₁₀ and use of the volatile correction model

Emissions from narrow roads, railways, poultry farms, biomass combustion

Data ratification procedures

NO_x: NO₂ relationships

In addition, the Updating and Screening Assessment (USA) checklists provided in TG09 have been revised and re-issued to take account of all necessary changes.

The guidance requires a phased approach, as with the previous guidance and is undertaken source by source rather than using pollutant specific assessment. This however still 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 fourth round of review and assessment.

The findings from the USA determine the need for the Council to undertake the next steps of local air quality management i.e. a Detailed Assessment and then potentially progressing to the declaration of an air quality management area (AQMA) with a need for an air quality action plan (AQAP).

1.6 Updating Screening and Assessment – important considerations

As with the previous USAs, relevant considerations and sources of data include the following:

Monitoring Data

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

Background Pollutant Concentrations

These are produced nationally for all local authorities in the UK and provide the estimated background annual mean air pollutant concentrations at a 1 km x 1 km grid resolution for NO_x, NO₂, PM₁₀ and PM_{2.5} for the 2006 base year with projections for all years to 2020. The data are available from <http://www.airquality.co.uk/archive/laqm/tools.php>

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 (Part A processes), whilst the Council is responsible for smaller Part B and A2 processes. Those small industrial processes that fall outside of Part B/A2 Process control can also be of interest to LAQM. Details of the processes and installations are available from the Council's Public Register (see tables in the Appendix). There is one Part A1 process in the Borough; the incineration process operated by South East London Combined Heat and Power Ltd (SELCHP) in the north of the Borough. Since the previous USA, two Part B operations

(small waste oil burner and a vehicle re-sprayer) have closed, with a waste incineration installation, concrete batching plant and concrete crusher opening. In addition, over 50 permits for dry cleaners have been issued. None of these changes however are considered to be important for the purposes of this USA.

Road Traffic

Updated details of road traffic movements across the Borough have been made available from the London Atmospheric Emissions Inventory (2006) and the Council itself to check for significant changes from the previous USA.

1.7 Relevant exposure

The objectives relate to public exposure to the pollutants. More specifically any areas that may exceed the objectives should relate to “the quality of air at locations which are situated outside of buildings or other manmade structures above or below ground, and where members of the public are regularly present” (from the Air Quality regulations). TG09 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.

2. New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic monitoring

The Council undertakes continuous monitoring at three fixed long-term sites:

- Lewisham 1 – an urban background site located in Catford (in the centre of the Borough). This monitoring site started operating in 1996 and is operated to London Air Quality Network (LAQN) standards, which are similar to those of the AURN. The data produced have traceability to national standards and operational procedures defined for the LAQN and are therefore similar to AURN. **Nitrogen dioxide, sulphur dioxide** and ozone are monitored at the site.
(See http://www.londonair.org.uk/london/asp/publicdetails.asp?region=0&site=LW1&details=location&mapview=all&a_id=23&network=All)
- Lewisham 2 – a site located 6m from the roadside in New Cross, which is located in the north of the Borough closer to central London. This monitoring site opened in 2002 and is also operated to London Air Quality Network (LAQN) standards. The site monitors **nitrogen dioxide, particles (PM₁₀)** by TEOM and **sulphur dioxide**. The site represents relevant exposure.
(See http://www.londonair.org.uk/london/asp/publicdetails.asp?region=0&site=LW2&details=location&mapview=all&a_id=23&network=All)
- Crystal Palace 1 – a roadside site located 4m from the kerb in the south west of the Borough on the border of three other neighbouring London boroughs (Southwark, Croydon and Bromley). The site opened in 1999 and is operated to LAQN standards and is jointly owned between four Boroughs). The site monitors **nitrogen dioxide, carbon monoxide, particles (PM₁₀)** by TEOM and **sulphur dioxide**.
(See http://www.londonair.org.uk/london/asp/publicdetails.asp?region=0&site=CY1&details=location&mapview=all&a_id=23&network=All)

2.1.2 Non automatic monitoring

A monitoring survey of nitrogen dioxide, using passive diffusion tubes, started in 2008. The survey started with nine sites, with one additional triplicate site co-located with the Lewisham 2 continuous site. One of the sites (LWS01) was affected by construction works and did not provide any data. A further site (LWS12) was discontinued after collecting data for 12 months. The tubes have been relocated to two new sites (LWS17 and LWS18 respectively). A further three sites have been added in recent months (LWS014 to LWS016), although the monitoring results are limited and therefore are not included within this report.

The details of the sites are given in Table 2. The background locations chosen are all close to residential facades on minor roads, hence the distance to kerb is marked N/A and worst-case location noted as N (i.e. no). The worst-case locations indicated as Y (i.e. yes) and are sited on lampposts close to kerbsides. In all cases the diffusion tubes are mounted using spacers and sited 2.5 to 3m above ground level.

Table 2 Details of NO₂ diffusion tube sites

Site Name	Site Type	Easting	Northing	In AQMA	Relevant exposure (Y/N with distance (m) to relevant exposure)	Distance to kerb (m) of nearest road (N/A if not applicable)	Worst-case location
LWS001	Roadside	540317	174100	Y	Y	10	N
LWS002	Background	538475	175785	Y	Y	N/A	N
LWS003	Roadside	538220	176100	Y	Y	10	N
LWS004	Roadside	537740	175920	Y	N	1.5	Y
LWS005-007	Roadside	535290	177295	Y	Y	6	Y
LWS008	Roadside	535830	176830	Y	Y	15	Y
LWS009	Roadside	536130	173337	Y	Y	3	Y
LWS010	Background	538055	173810	Y	Y	N/A	N
LWS011	Roadside	537180	173370	Y	N	0.5	Y
LWS012	Background	538640	172730	N	Y	N/A	N
LWS013	Used as control						
LWS014	Background	535536	173192	N	Y	N/A	N
LWS015	Roadside	536523	175925	Y	Y	0.5	Y
LWS016	Roadside	539640	175934	Y	Y	0.5	Y
LWS017	Roadside	540037	173748	N	Y	0.5	Y
LWS018	Background	538960	172740	N	Y	2	Y

The diffusion tubes used were analysed by Gradko International using a preparation method of 50% TEA in water. In the most recent round of Annual Performance Criteria for NO₂ Diffusion Tubes used in LAQM (Defra, 2009b), the laboratory demonstrated good performance in a QA/QC scheme for analysis of NO₂ diffusion tubes. Gradko International participates in the Workplace Analysis Scheme for Proficiency (WASP), which is an independent analytical performance testing scheme. The scheme is an important QA/QC exercise for laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM). The Health and Safety Laboratory (HSL) operate the WASP scheme independently and the cost of operation is borne by the laboratories, which pay an annual fee to HSL.

The 2008 unbiased results of the diffusion tube monitoring in the Borough are given in the Appendix (see Table 8). The monitoring was undertaken for the period from the beginning of February 2008 until December 2008 inclusive. Thus the monitoring did not quite match the calendar year.

Monitoring using diffusion tubes has advantages over continuous monitoring in that it is far cheaper and therefore more sites can be established and assessed. The main disadvantage is that the method is less precise and accurate than continuous monitoring. The recommended methods to reduce these errors include the use of good QA/QC practices and bias adjustment factors that are derived from co-location studies between continuous analysers and diffusion tubes.

The bias adjustment factors are specific to each year, analysing laboratory, method of analysis and location. The factors are therefore also limited to the data supplied. The Review and Assessment website advises that "in many cases, using an overall correction factor derived from as many co-location studies as possible will provide the 'best estimate' of the 'true' annual mean concentration, it is important to recognise that there will still be uncertainty associated with this bias adjusted annual mean. One analysis has shown that the uncertainty for tubes bias adjusted in this way is $\pm 20\%$ (at 95% confidence level). This compares with a typical value of $\pm 10\%$ for chemiluminescence monitors subject to appropriate QA/QC procedures."

A default bias adjustment factor for 2008 has been obtained from the government's Review and Assessment website (based on the March 2009 spreadsheet). The default factor is based on statistical analyses of reported data provided by other local authorities. The factor for 2008, based on 4 studies, indicates that the monitored results slightly under estimate continuously monitored concentrations.

From the default spreadsheet, the precision for the 2008 studies indicates good performance. The term “precision” indicates how well the diffusion tubes produce similar results from the duplicate and triplicate studies undertaken. The criterion is somewhat arbitrary and it reflects both the laboratory’s performance in preparing and analysing the tubes, plus the handling of the tubes in the field. The precision is based on an assessment of the coefficient of variation. “Good” precision is defined as achieving a coefficient of variation less than 20% for eight or more periods in a year and the average is less than 10%.

The local co-location study using triplicate tubes was undertaken over 11 months at the Lewisham 2 roadside site in New Cross. The diffusion tubes were located within 0.5m of the inlet sampler of the chemiluminescent analyser at the continuous site. The study compared equivalent exposure periods, although the continuous results are provisional. The results from the study indicate that there was good precision and also good data capture for the continuous analyser. The local bias adjustment factor indicates that the results slightly over estimate continuously monitored concentrations.

2008	Bias adjustment factor
Local	0.96
Default	1.05

The results of a nation-wide survey of nitrogen dioxide diffusion tube co-location studies were further used to improve current understanding of diffusion tube bias (AQC, 2006). The data suggested that tubes close to a road were more likely to underestimate concentrations, once they have been adjusted for laboratory bias, and conversely tubes further away from roads were more likely to overestimate concentrations. (Note this is the opposite of the local findings reported here).

Further analysis of the results suggested that it was not the distance from roads that mattered; rather it was the different concentrations of nitric oxide, nitrogen dioxide and ozone in the atmosphere. The different concentrations influenced the chemistry taking place within the diffusion tube, in particular the formation of additional nitrogen dioxide from a reaction of ozone with nitric oxide.

A relationship was identified between diffusion tube bias and the measured annual mean nitrogen dioxide concentration that can be used to further adjust the diffusion tube result. The effect of this ‘tube-chemistry’ adjustment depends on the measured concentration: thus a laboratory bias adjusted result of 20.0 would become 18.1 $\mu\text{g m}^{-3}$ after adjustment for bias due to tube chemistry. A value of 40.0 $\mu\text{g m}^{-3}$ would remain at 40.0 $\mu\text{g m}^{-3}$ and 60.0 $\mu\text{g m}^{-3}$ would become 65.1 $\mu\text{g m}^{-3}$. As shown the effect of this adjustment is minimal at concentrations close to the objective of 40.0 $\mu\text{g m}^{-3}$ and so it will not have a material effect on exceedences of the objective identified using diffusion tubes. Although adjusting for tube chemistry can reduce the uncertainty of diffusion tube results, it was not however recommended that this adjustment be applied routinely for the reporting of results.

The choice of which bias factor to use is not straightforward; hence the two factors (local and default) are reported above to provide context. Box 3.3 of the TG 09 guidance provides some suggestions as to which factor might be the most appropriate. In this instance there are reasons for using either. Since this Updating and Screening Assessment provides a more precautionary approach to assessing the risk of an air quality objective being exceeded the default factor (rather than the local factor) is applied below in the results section.

2.2 Comparison of Monitoring Results with AQ Objectives

2.2.1 Nitrogen Dioxide

The results for the three continuous sites operated by the Borough of Lewisham are shown in Table 3 (for the years 2003 to 2008 inclusive). The results include details relating to the annual mean and daily mean objectives, as well as data capture. All the data reported are fully ratified apart from 2008, part of which is still provisional. Data capture exceeded 80% for all years reported at all three sites.

Table 3 NO₂ continuous monitoring in Lewisham (2003 – 2008)

LAQN site		2003	2004	2005	2006	2007	2008
Lewisham 1 (Urban background - AQMA3)	Annual mean	55	49	51	54	53	51
	No of hours >200 µg m ⁻³	1	1	3	0	8	2
	Data capture %	99	97	97	91	91	94
Lewisham 2 (Roadside- AQMA3)	Annual mean	64	68	55	68	60	63
	No of hours >200 µg m ⁻³	5	4	4	27	11	5
	Data capture %	99	100	90	<i>80</i>	92	94
Crystal Palace (Roadside – just outside of Borough)	Annual mean	49	48	51	46	50	49
	No of hours >200 µg m ⁻³	2	<i>0</i>	<i>0</i>	<i>0</i>	0	0
	Data capture %	96	<i>85</i>	<i>87</i>	<i>84</i>	93	93

(Note – italics indicates < 90% data capture)

The results indicate that the annual mean objective was easily exceeded at the three sites for all years monitored. Previously it was noted that there were high concentrations of NO₂ in 2003. At the background site at Lewisham 1 in Catford, 2003 remains the year with highest concentrations, although this level was approached in both 2006 and 2007. For the other sites higher concentrations than 2003 were measured in other years; 2004 and 2006 for Lewisham 2 and 2005 and 2007 for the Crystal Palace site.

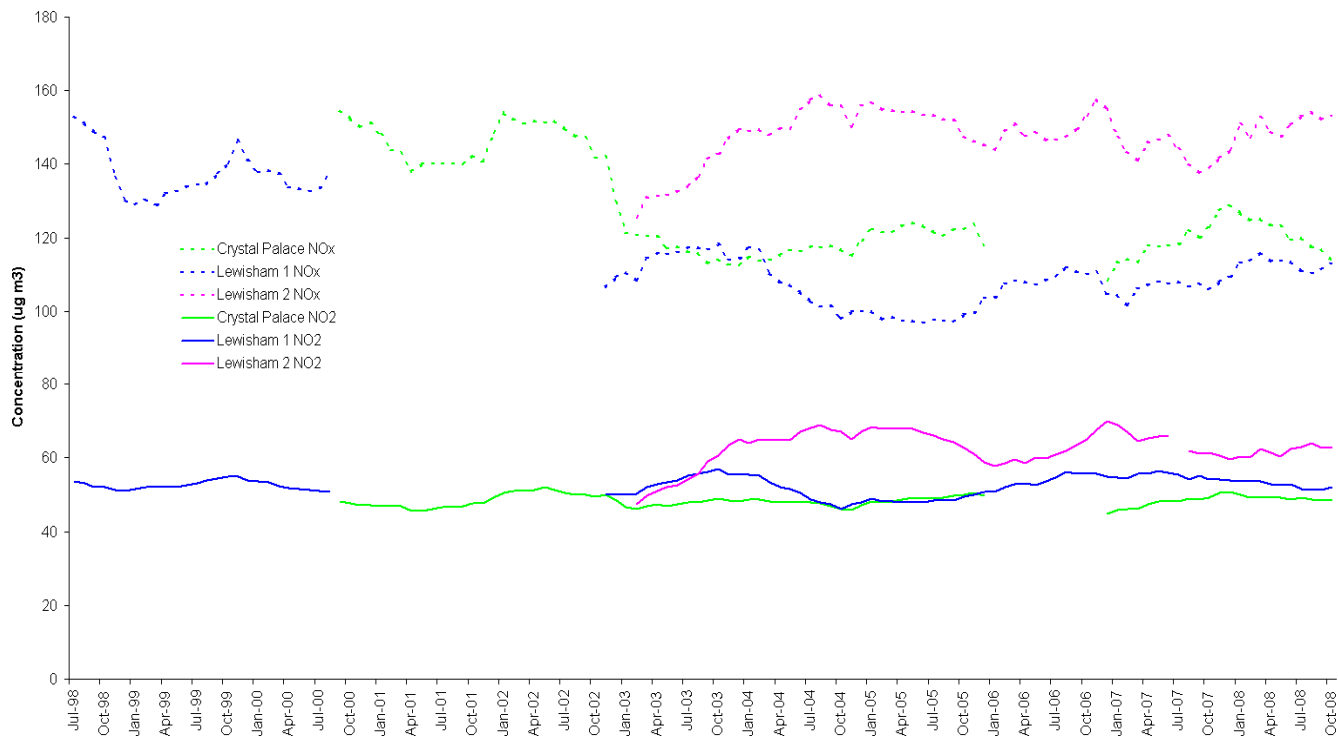
The hourly objective was however not exceeded at any of the sites, apart from the Lewisham 2 site in 2006. There were also more than 10 periods that exceeded the hourly standard of 200 µg m⁻³ in 2007, plus 8 periods that exceeded the standard at the background site in Catford. For other years the standard has mostly been exceeded only for single figure periods. The standard has not been exceeded at the Crystal Palace site since 2003. The results provide some evidence to confirm that emissions of NO₂ directly emitted from road vehicles have increased (Carslaw D.C and Beevers, S. D, 2005 and AQEG, 2007).

In addition a widespread primary pollution episode arose in December 2007. At this time weather conditions were cold and calm, with very light winds. An initial analysis suggests that this was the most significant nitrogen dioxide incident for 10 years, when NO₂ was elevated across the region, The hourly mean AQS of not more than 18 hours per year above 200 µg m⁻³ was breached at 9 other sites across London, and equalled at 2 sites, on the basis of measurements during this episode alone. The west and central areas of London saw the most elevated levels. The highest hourly concentrations at the Lewisham sites in 2007 arose during episodes in November/ December and also February and April/ May.

Rolling annual mean plots can be used to indicate changing annual concentrations over time. The use of rolling annual mean concentrations, based on averaged hourly means, largely removes any seasonal influences and provides a guide to changing trends. NO₂ is a mainly secondary pollutant formed by chemical reactions in the atmosphere from NO_x emissions produced by combustion sources. These reactions also involve ozone, which is scavenged by NO. The relationship between NO_x and NO₂ however is non linear and it is also further complicated by direct emissions of NO₂ from some road vehicles.

The rolling annual mean plots of both NO_x and NO₂ concentrations of the Lewisham sites are shown in Figure 2. This analysis is for the period from 1998 through to 2008 (including some provisional data for the latter period). There were also interruptions in data capture over the period shown.

Figure 2 Rolling annual mean NO_x/ NO₂ trends for Lewisham sites (1998 to 2008)



The rolling annual mean concentrations of NO_x indicate a reduction in concentrations at the Lewisham 1 and Crystal Palace roadsides site over time in line with the expected reductions in emissions, although since 2003 concentrations have remained almost constant. An equivalent trend for NO₂ is less clear for the sites, with both sets remaining almost constant over the whole period of monitoring. The downward trend for NO_x (approximately 40 µg m⁻³) as the primary emission is pronounced, whereas that for NO₂ is negligible (approximately 1 µg m⁻³) at Lewisham 1. At the Crystal Palace site, NO₂ has remained constant between the beginning and end of the data reported. This illustrates the difference between pollutants and the difficulty in reducing NO₂, which is mostly a secondary pollutant that is largely determined by the oxidising capacity of the atmosphere. In addition it again highlights the recent research, which indicates that direct NO₂ emissions may also be increasing.

The Lewisham 2 roadside site does show not any similar reductions; instead both NO_x and NO₂ have increased between the start and end periods, albeit with some inter annual variation. This increase may be a reflection of the shorter period of monitoring and the direct NO₂ contribution referred to above.

For 2008 diffusion tube survey, the data capture for the sites exceeded 80% at all sites, apart from one, which recorded 75% data capture. Small adjustments were made to represent a full year where there was less than 12 months diffusion tube data. This adjustment was made using a ratio of annual mean to period mean using continuously monitored data derived from three nearby LAQN background sites in Lewisham, Greenwich and Tower Hamlets. All three of these sites had greater than 90% data capture for 2008 and the adjustments made are small less than 2%. The details of the adjustments are provided in the Appendix. (Note the results for the co-located site are not included in the table).

Table 4 Bias adjusted annual mean NO₂ concentrations ($\mu\text{g m}^{-3}$) for Lewisham (2008)

Site	Location	Type	Annual mean
LWS02	AQMA 2	Background	35.2
LWS03	AQMA 2	Roadside	45.8
LWS04	AQMA 3	Roadside	58.5
LWS08	AQMA 3	Roadside	40.9
LWS09	Outside AQMAs	Roadside	56.3
LWS10	AQMA 4	Background	35.1
LWS11	AQMA 5	Roadside	50.1
LWS12	Outside AQMAs	Background	20.9

The bias adjusted annual concentrations for 2008 indicate that the government's air quality objective of $40 \mu\text{g m}^{-3}$ was met at all three background monitoring locations in the Borough; although at two sites LWS02 and LWS10 the annual mean objective was approached. The monitoring at all the roadside sites however all exceeded the annual mean objective and all apart from the LWS08 site had an annual mean of more than $45 \mu\text{g m}^{-3}$. The results confirm that the annual mean air quality objective is widely exceeded at roadsides in the Borough, including the LWS09 site, which is located outside of the AQMAs at a site with relevant exposure.

2.2.2 Carbon monoxide

Carbon monoxide was monitored at the roadside Crystal Palace site, close to the southwest corner of the Borough. The site opened in 1999 and details of recent monitoring from 2003 to 2008, plus data capture, are given in Table 5 based on scaled and ratified data (apart from 2008 which are still provisional).

There were no periods exceeding the CO objective at the site over the period 2003 to 2008, in common with findings from other sites in the U.K. Details of annual mean and maximum one-hour concentrations are also provided for information purposes. The annual mean concentrations are low in comparison with the objective.

Table 5 CO concentrations (mg m^{-3}) for Lewisham (2003 – 2008)

	2003	2004	2005	2006	2007	2008
Max 8 Hour	3.5	2.5	2.1	2.5	1.9	1.6
Annual mean	0.6	0.6	0.5	0.5	0.5	0.4
Max 1 Hour	5.1	3.3	2.9	3.2	3.1	3
Data capture %	96	85	74	85	92	86

The results from the monitoring site are considered representative of busy roadsides in the Council's area. These indicate that the objective is being met and therefore a Detailed Assessment of CO based on monitoring is not required. The results also indicate a fall in concentrations over time as outlined in the Council's previous updating and screening assessment.

2.2.3 Sulphur dioxide

The Council monitors SO₂ at its sites; Lewisham 1 an urban background site in Catford which opened in 1996 (sited in the middle of the Borough) and Lewisham 2 a roadside site in New Cross towards the north of the Borough and which opened in 2002. Sulphur dioxide is also monitored at the Crystal Palace roadside site close to the southwest of the Borough.

The maximum 15-minute concentrations for each year at the sites are given in Table 6, along with details of data capture. In all cases the data are fully ratified, apart from the 2008, which include some provisional data.

These results indicate that the 15-minute standard of $266 \mu\text{g m}^{-3}$ was exceeded at all three sites during 2003 only. In addition, the standard was exceeded at the Crystal Palace site in 2006 and 2008 (although the latter includes provisional data). In 2003 at the Lewisham 1 site there were 2 periods that exceeded, whilst at the other sites there was one 15-minute period only that exceeded per year. There was also one period exceeding in 2006 and four in 2008 at Crystal Palace. These episodes may be due to emissions from large point sources (possibly elsewhere in London).

Table 6 SO₂ monitoring in Lewisham (2003 to 2008)

Site	Data reported	2003	2004	2005	2006	2007	2008
Lewisham 1	Maximum 15 minute $\mu\text{g m}^{-3}$	285.7	194.9	109.5	149.5	154.9	150.7
(AQMA 3)	Data capture %	99	98	97	97	97	97
Lewisham 2	Maximum 15 minute $\mu\text{g m}^{-3}$	267.8	169.7	129.2	170.3	140.9	128.3
(AQMA 3)	Data capture %	96	100	99	83	93	91
Crystal Palace	Maximum 15 minute $\mu\text{g m}^{-3}$	266.2	130.6	108	280.7	140.9	1585.5
(just outside of Borough)	Data capture %	77	85	74	85	86	86

Despite these periods where the standard was exceeded, the 15-minute objective of more than 35 such periods was not exceeded. The stricter hourly and daily standards were also not exceeded in any year. Hence these results also confirm that the hourly and daily SO₂ objectives also were not exceeded over this period of monitoring. These results are considered representative of all the Lewisham Council area.

2.2.4 PM₁₀

There are continuous PM₁₀ analysers at the Lewisham 2 and Crystal Palace monitoring sites. The Lewisham 2 site opened in 2002 and is located at the roadside in New Cross. The Crystal Palace site opened in 1999 and is also located at the roadside on the southwest of the Borough. The sites are part of the London Air Quality Network and therefore the standards of QA/QC are similar to those of the government's AURN sites, with subsequent data ratification undertaken by the ERG at King's College London. In all cases the data are fully ratified, apart from the 2008, which include provisional data. Monitoring undertaken at the neighbouring LAQN site at Blackheath (Greenwich 7) is also included. This site is located very close to Lewisham's area.

All three sites used TEOM instruments and the results have been factored to a gravimetric equivalent ($\times 1.3$) for the period up to 2007. It should be noted however that for 2008 the correction was undertaken using the VCM (Volatile Correction Model), based on TG09 guidance.

The TG09 guidance highlights that the TEOM instruments cannot be strictly used to measure PM₁₀ concentrations for comparison with the air quality objectives, as the instrument was not found to conform to the equivalence criteria relating to the gravimetric European reference method. Previously a correction using a factor of 1.3 was accepted; now however the VCM has been adopted. This method is based on the assumption that the volatile component of PM₁₀ lost during the heated sampling of PM with the standard TEOM is consistent across a defined geographical area. The model uses the Filter Dynamics Measurement System (FDMS) purge measurement as an indicator of this volatile component. FDMS instruments have met the equivalence criteria and thus the VCM correction is also considered equivalent to the European reference method.

Table 7 PM₁₀ monitoring in Lewisham and nearby (2003 to 2008)

Site		2003 ^a	2004 ^a	2005 ^a	2006 ^a	2007 ^a	2008 ^b
Lewisham 2 (AQMA 3)	Annual mean	37	31	30	30	30	26
	No of days > 50 µg m ⁻³	47	19	24	<i>21</i>	26	18
	Data capture	<i>82</i>	99	99	<i>80</i>	93	93
Crystal Palace (just outside of Borough)	Annual mean	27	26	28	28	29	25
	No of days > 50 µg m ⁻³	17	4	7	<i>14</i>	17	6
	Data capture	93	91	91	<i>89</i>	90	86
Greenwich 7 (just outside of Borough)	Annual mean	35	31	30	32	30	29
	No of days > 50 µg m ⁻³	55	25	22	30	24	6
	Data capture	99	92	90	99	99	60

(Note – bold indicates objective exceeded; italics < 90% data capture; ^a indicates TEOM x1.3; ^b indicates TEOM_{VCM})

The results for the site indicate that the 2004 daily mean objective of more than 50 µg m⁻³ was exceeded in 2003 at the Lewisham 2 and Greenwich 7 roadside sites. The annual mean objective however was not exceeded, although the highest annual mean concentration also arose during 2003. It should be noted that 2003 was a year with high pollutant concentrations in many areas of the UK, due to the long periods of high pressure that arose during the hot summer months. Such periods are conducive to secondary particle formation over wide areas. In 2007 there were also episodes with high concentrations in both March and December leading to higher daily concentrations during the year. The monitoring results for the most recent year, 2008, did not exceed the objectives.

An analysis of rolling annual mean PM₁₀ concentrations and daily mean PM₁₀ exceedences is provided for the Lewisham and other nearby monitoring sites to indicate any trend over time. The analysis is for the period from 2000 through to 2008.

Figure 3 illustrates changing concentrations over time, based on changing rolling annual mean PM₁₀ concentrations and Figure 4 the rolling daily mean PM₁₀ exceedences. The use of rolling data in this way largely removes seasonal influences and thus provides a guide to changing trends over time. (Note – the annual mean results are not factored).

The rolling annual mean trend for the Crystal Palace site provides the longest dataset. The site shows a slight downward trend from 2000 to 2008, of approximately 4 µg m⁻³ over this period. The data for the Lewisham 2 and Greenwich 7 sites show a similar pattern of little change to that of the Crystal Palace site for the period which the sites overlap. For the Greenwich 7 site, concentrations increased during 2003 and then dropped off in 2004 to a lower concentration, which has not changed for the rest of the period shown. The reduction between the start in 2003 and end of 2008 is approximately 2 µg m⁻³. The value for the Lewisham 2 site is slightly more around 6 µg m⁻³ however the graph starts around the peak of the 2003 episodes. For all sites the trend is not always downward as inter annual variations during some years show increases in concentrations (e.g. during 2006).

The use of trends in this way highlights that although concentrations dropped in 2004, this was mainly as a result of the pollution incidents in 2003 not being repeated in 2004. Levels have dropped just below pre 2003 levels and do not appear to be further reducing; indeed for some sites in London there may be a slight increase, possibly as a result of increasing primary PM₁₀ emissions (ERG, 2008) rather than the predicted decrease in emissions.

Figure 3 Rolling annual mean PM₁₀ trends for Lewisham and nearby sites (2000 to 2008)

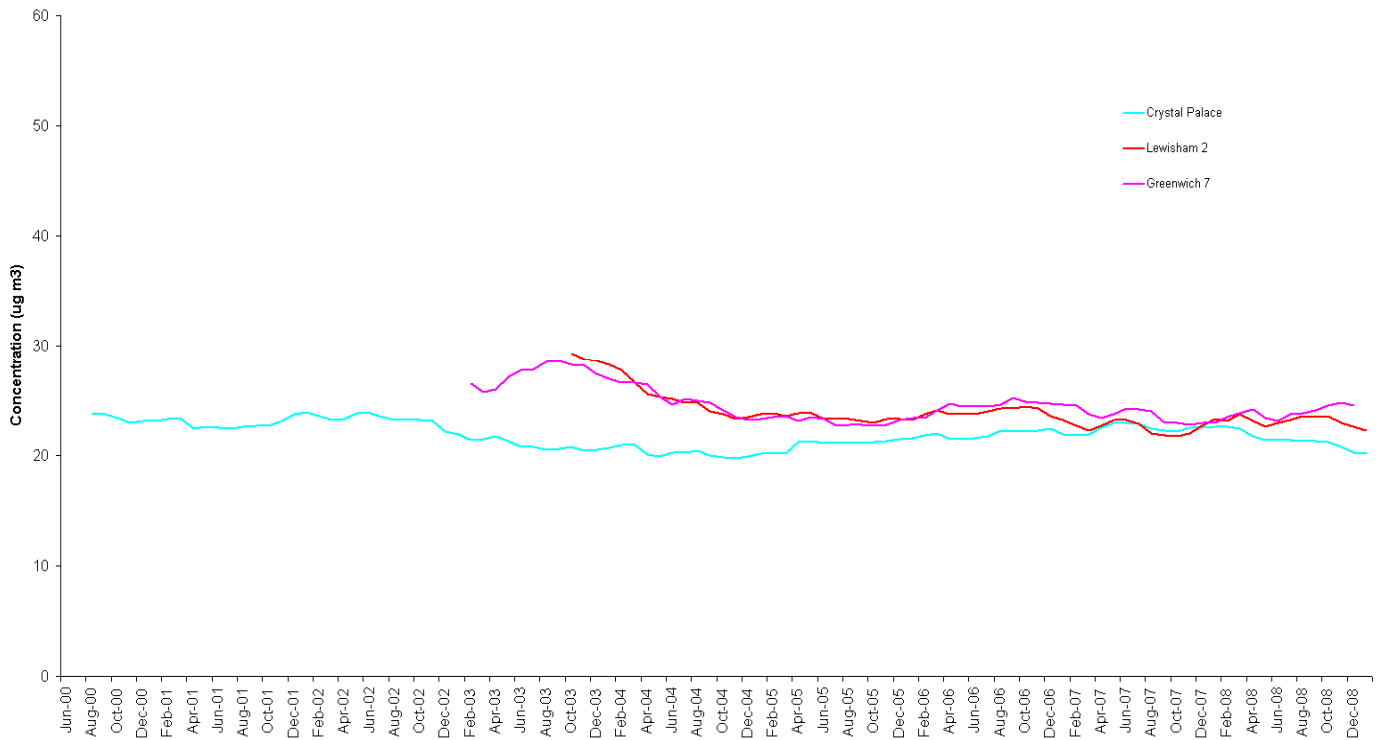
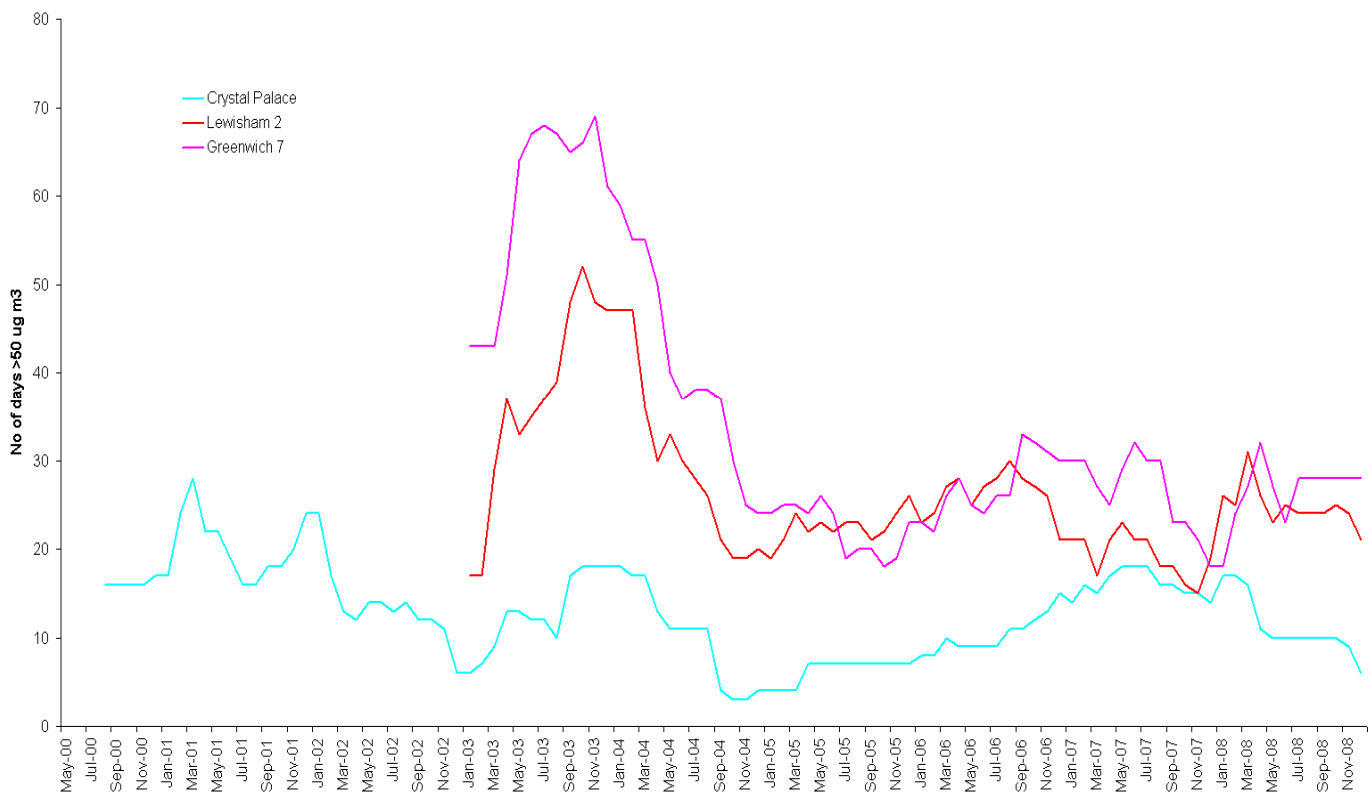


Figure 4 Rolling number of days PM₁₀ > 50 µg m⁻³ for Lewisham and nearby sites (2000 to 2008)



The rolling trend of PM₁₀ exceedences highlights the effect of the pollution episodes in 2003 for the Lewisham 2 and Greenwich 7 sites. The effect for the Crystal Palace site is less pronounced. This site has been operating for longer and it shows that, despite fluctuating, levels appear not to have decreased markedly over the period of time since 2001.

Averages based on selected London sites for the period from 1995 to 2000 show a downward trend from around 50 days above 50 µg m⁻³ to 10 days in 2002. This is similar to the Crystal Palace site. By the end of 2004 the number of days exceeding the standard at background sites was comparable to that measured at the start of 2001, whereas inner London roadside sites had a higher number of days exceeding in 2004 than 2001. This did not change during 2005 and levels increased during 2006. In 2006 mainly roadside sites were affected it has been suggested that it has been due to an increase in PM₁₀ from primary sources (ERG, 2008).

3. Road Traffic Sources

The focus of attention for road traffic sources is on those relevant locations close to busy roads, especially in congested areas and near to junctions, where traffic emissions are higher, and in built up areas where the road is canyon like and buildings restrict the dispersion and dilution of pollutants. Only those locations, which have not been assessed during the earlier rounds or where there has been a change or new development, are assessed.

As reported earlier the Council previously designated the northern half of the Borough into 4 large AQMAs, with the main roads only designated as an AQMA in the south.

3.1 Narrow congested streets with residential properties close to the kerb

Concentrations are often higher where traffic is slow moving, with stop/start driving, and where buildings on either side reduce dispersion. Screening models so far have not proved helpful at identifying potential exceedences, which have only been identified by monitoring. This assessment is for NO₂ only.

The following roads with relevant exposure, outside of the Lewisham AQMAs, have been identified as having more than 5,000 vehicles per day (based on recent Borough traffic counts): Perry Vale, Mayow Road and Brockley Road. All have sections that are congested with average speeds less than 25kph, and are built up with residential properties on both sides of the road and include some within 2m of the kerb on one side. Some of these roads already have diffusion tube surveys underway and the sites will be checked for relevance to this section.

London Borough of Lewisham have identified three roads outside of its AQMAs that fit the new criteria for congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb. The Council will proceed to Detailed Assessment, based on a diffusion tube survey along the most relevant sections of these roads.

3.2 Busy streets where people may spend 1 hour or more close to traffic

These include some street locations where individuals may regularly spend 1-hour or more, for example, streets with many shops and streets with outdoor cafes and bars, close to road traffic where there may be high concentrations of NO₂. (Note – that those people that are occupationally exposed in such locations are not included, as they are not covered by the regulations). This assessment is for NO₂ only.

Busy streets where people may spend an hour or more close to traffic were examined in the second round USA. There has been no change to the previous findings since then and no new roads have been constructed with traffic flows greater than 10,000vpd in the Council's area since the first round of R&A where there is relevant exposure arising.

London Borough of Lewisham confirms that there are no new or newly identified busy streets where people may spend 1 hour or more close to traffic in the Borough.

3.3 Roads with high flow of buses and/or HGVs

These include street locations in the Borough where traffic flows are not necessarily high (i.e. fewer than 20,000 vehicles per day) but where there are an unusually high proportion of buses and/or HGVs. The assessment is for both NO₂ and PM₁₀ and is dependent on the proximity of relevant exposure within 10m of the kerbside.

Those roads within the Borough with high flows of heavy duty vehicles were previously identified by the Council in earlier Review and Assessments. No new roads relevant to this section have been built in the Borough.

London Borough of Lewisham confirms that there are no new or newly identified roads with high flows of buses or HGVs in the Borough that have not been adequately considered in previous rounds of Review and Assessment.

3.4 Junctions

Concentrations are usually higher close to junctions, due to the combined impact of traffic emissions on roads forming the junction, and to the higher emissions due to stop start driving. The assessment is for both NO₂ and PM₁₀ and is dependent on the proximity of relevant exposure within 10m of the kerbside.

There is no change to the previously reported situation concerning junctions and no new or newly identified junctions with relevant exposure within 10m.

London Borough of Lewisham confirms that there are no new or newly identified busy junctions in the Borough that have not been adequately considered in previous rounds of Review and Assessment.

3.5 New roads constructed or proposed since the last round of review and assessment

The approach to considering new roads depends on whether or not an assessment was carried out in advance of building the new road. The assessment is for both NO₂ and PM₁₀ and is dependent on the proximity of relevant exposure within 10m of the kerbside.

There have been no new or proposed roads in the Borough where an air quality assessment was required.

London Borough of Lewisham confirms that there are no relevant new or proposed roads in the Borough.

3.6 All roads with significantly changed traffic flows

Only roads with significantly changed traffic flows that have not already been considered above were investigated. The assessment is for both NO₂ and PM₁₀.

A comparison of traffic flows from the latest version of the London Atmospheric Emissions Inventory confirms that there are no new roads with significantly changed traffic flows.

London Borough of Lewisham confirms that there are no new or newly identified roads not considered previously with significantly changed traffic flows in the Borough.

3.7 Bus and coach stations

This section only applies to bus stations or sections of bus stations that are not enclosed, and where there is relevant exposure, including at nearby residential properties. The assessment is for both the annual mean and the 1-hour NO₂ objectives. (Note - the term "bus" in this instance is used to signify both buses and coaches). Lewisham bus station was examined in previous USAs and there has been no change to the previous position for this USA.

London Borough of Lewisham confirms that the bus station in Lewisham was assessed in previous rounds of review and assessment. These found that there are no relevant bus stations in the Borough.

4. Other Transport Sources

4.1 Airports

Aircraft are potentially significant sources of nitrogen oxides (NO_x) emissions, especially during takeoff. The revised guidance has used new information, which has resulted in the criteria to trigger a Detailed Assessment being relaxed, while the requirement to assess PM₁₀ has been removed. Thus this section only applies to NO₂. (Note – any road traffic using airports was considered in the previous section.)

In the Council's previous rounds of Review and Assessment it was confirmed that the nearest airport, London City airport is outside the Borough and sufficiently distant as not to be relevant. This situation has not changed.

London Borough of Lewisham confirms that there are no relevant airports in the Borough.

4.2 Railways (diesel and steam trains)

Stationary locomotives, both diesel and coal fired, can give rise to high levels of sulphur dioxide (SO₂) close to the point of emission. Recent evidence also suggests that moving diesel locomotives, in sufficient numbers, can also give rise to high NO₂ concentrations close to the track where, along busy lines, emissions can be equivalent to those from a busy road.

Although diesel locomotives use rail lines through Lewisham, these are not included on the list in Table 5.1 of TG09 of lines, which identify those lines with a "high" usage of diesel locomotives. Previous rounds of Review and Assessment also found that there are no areas within the Borough where diesel or steam locomotives are stationary for periods of 15 minutes or more and within 15m of where regular outdoor exposure arises. This situation has not changed.

4.2.1 Stationary Trains

London Borough of Lewisham confirms that there are no locations where relevant exposure to emissions from steam or diesel trains arises within the Borough.

4.2.2 Moving Trains

London Borough of Lewisham confirms that there are no locations where there are large movements of diesel locomotives and potential long-term relevant exposure within 30m.

4.3 Ports (shipping)

The assessment for shipping needs to consider SO₂ only. A very small part of the Borough at its northern end fronts the river Thames and although there are small ship movements in this area they are not sufficient to require further investigation based on the TG09 guidance.

London Borough of Lewisham confirms that there is no port or any shipping that meet the specified criteria within the Borough.

5. Industrial sources

The Council and Environment Agency (EA) control industrial sources within the Borough under the Pollution Prevention and Control Act 1999. The Council also has control over smaller industrial and commercial sources, largely through the Clean Air Act, with its associated control of the stack heights. As a result of these controls, there are relatively few sources that may be relevant under the Local Air Quality Management (LAQM) regime. Many of these sources were also addressed during previous rounds of Review and Assessment. The focus is thus on new installations and those with significantly changed emissions.

5.1 New or Proposed Industrial Processes

Industrial sources are considered unlikely to make a significant local contribution to annual mean concentrations, but could be significant in terms of the short-term objectives in the Borough. Sources in neighbouring authorities and the combined impact of several sources are considered. The approach used is based on use of the planning and permitting processes. The assessment considers all the LAQM pollutants, including those most at risk of requiring further work (SO₂, NO₂, PM₁₀ and benzene).

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

Since the last round of Review and Assessment three non-reduced fee applications have been received for new sources (for mobile concrete crushing, concrete batching and waste incineration). In addition, the Solvent Emissions Directive Regulations introduced limits on solvent usage and emissions from activities not previously regulated under the EP Regulations including dry cleaning.

This means that dry cleaning processes / installations are now prescribed for LAPPC control under Section 7 of Schedule 1 of the EP Regulations 2007. There are fifty one dry cleaners currently operating within the Borough. None of the above processes has, however, required an air quality assessment.

London Borough of Lewisham confirms that there are no relevant new or proposed industrial processes for which planning approval has been granted.

5.1.2 Existing Processes where emissions have increased substantially or new relevant exposure has been introduced

The lists of existing Part B processes that are regulated under the Environmental Permitting regime are provided in the Appendix. There is one Part A1 process in the Borough; the incineration process operated by South East London Combined Heat and Power Ltd (SELCHP) in the north of the Borough. Environment Agency data have been checked and these confirm that emissions of LAQM pollutants have not increased and no new relevant exposure has been introduced nearby. In addition none of the other existing Part B installations have increased emissions by greater than 30% and no new relevant exposure has been introduced nearby.

London Borough of Lewisham confirms that there are no existing processes with substantially increased emissions or new relevant exposure.

5.1.3 New or significantly changed processes with no previous Air Quality Assessment

Since the last round of Review and Assessment no applications have been received for new or proposed sources where it has been determined that the installation is likely to give rise to significant pollutant emissions.

London Borough of Lewisham confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major fuel (petrol) storage depots

This was previously assessed in earlier rounds of Review and Assessment and it was found that there are no major petrol storage depots in the Borough. This situation has not changed.

There are no major fuel (petrol) storage depots within the London Borough of Lewisham.

5.3 Petrol stations

There is some evidence that petrol stations could emit sufficient benzene to put the 2010 objective at risk of being exceeded, especially if combined with higher levels from nearby busy roads.

The previous round of Review and Assessment assessed all petrol stations with a throughput of more than 2000 m³ of petrol, and with a busy road nearby. None were found to have relevant exposure within 10m of the pumps and therefore it was not necessary to go to a Detailed Assessment. There has been no change in this situation for this round.

London Borough of Lewisham confirms that there are no petrol stations meeting the specified criteria in the Borough.

5.4 Poultry farms

Some local authorities in England have identified potential exceedences of the PM₁₀ objectives associated with emissions from poultry farms (defined as chickens (laying hens and broilers), turkeys, ducks and guinea fowl). These relate to large farms (> 100,000 birds) that are regulated by the EA. None however exist within the Council's area.

London Borough of Lewisham confirms that there are no poultry farms meeting the specified criteria in the Borough.

6. Commercial and Domestic Sources

6.1 Biomass combustion – Individual Installations

Biomass burning can lead to an increase in PM₁₀ emissions, from the combustion process itself and also by aerosol formation from the volatile materials distilled from the wood. Compared to conventional gas burning, biomass burning can also result in an increase in NO_x emissions due to the fuel-derived portion that is not present in gas combustion.

6.1.1 Individual installations

The Council has assessed for individual combustion plant burning biomass ranging from 20 MW down to 50 kW units. No biomass combustion plant within this range was found in the Borough, although one smaller biomass boiler (less than 50kW) was found. Three other boilers are in the planning application stages.

London Borough of Lewisham confirms that there is no relevant biomass combustion plant in the Borough.

6.1.2 Combined impacts

There is the potential that many small biomass combustion installations (including domestic solid-fuel burning), whilst individually acceptable, could in combination lead to unacceptably high PM₁₀ concentrations, particularly in areas where PM₁₀ concentrations are close to or above the objectives. The impact of domestic biomass combustion in most areas is thought to be small at the time of writing, but could become more important in future. However as reported above there is currently no relevant biomass combustion plant in the Borough.

London Borough of Lewisham confirms that there is no relevant biomass combustion plant in the Borough.

6.2 Domestic Solid-Fuel Burning

The previous rounds of Review and Assessment identified areas where domestic solid fuel burning gives rise to exceedences of the objective for SO₂. PM₁₀ from domestic solid fuel burning was also covered above (6.1.2 Biomass combustion – combined impacts).

The whole of the Borough has been designated a Smoke Control Area and there are no areas of significant domestic solid fuel use in the Borough. This position has not changed from the previous USA in 2006, which confirmed that no areas of significant domestic solid fuel burning were identified. Gas is widely available across the Borough and it remains the predominant fuel used for domestic water and space heating.

Where enquiries are made to the Council about burning solid fuels, the details are logged with the aim of identifying areas where there may be significant future domestic solid fuel use.

London Borough of Lewisham confirms that there are no areas of significant domestic solid fuel use in the Borough.

7. Fugitive or Uncontrolled Sources

Dust emissions from uncontrolled and fugitive sources can give rise to elevated PM₁₀ concentrations. These sources can include, but are not limited to the following sites: quarrying and mineral extraction sites, landfill sites, coal and material stockyards, or materials handling, major construction works and waste management sites. Dust can arise from the passage of vehicles over unpaved ground and along public roads that have been affected by dust and dirt tracked out from dusty sites. Other sources of dust are from the handling of dusty materials, the cutting of concrete, etc and wind-blown dust from stockpiles and dusty surfaces.

The Council have noted dust deposits on the road along Mercury Way, towards the northeast of the Borough and within the Council's existing AQMA 1. To further investigate PM₁₀ concentrations the Council has purchased a continuous analyser that meets the European equivalence standard and is looking for an appropriate site in the area in which to install it. This will enable the Council to fully assess the level and extent of pollution. The area is mainly industrial with some relevant exposure towards the periphery.

London Borough of Lewisham is investigating fugitive and uncontrolled particulate matter emissions near Mercury Way. It will install a continuous analyser in the area to determine the need for further action. The monitoring results will be reported in subsequent Council Air Quality Progress reports and recommendations for a Further Assessment and any amendments to the Council's Action Plan will be made accordingly.

8. Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Monitoring within the Borough confirmed that the annual mean nitrogen dioxide objective has been exceeded at roadside and background locations. Many of the sites monitored represent relevant exposure. Three other background sites in the Borough monitored for nitrogen dioxide meet the relevant annual mean objectives (based on 2008 results).

Based on these findings the Council does not need to undertake a Detailed Assessment, other than for Brockley Rise, which as a result of the findings of the LWS09 diffusion tube site was found to exceed the annual mean NO₂ objective at a relevant location in 2008. No other new potential or actual exceedences at relevant locations were established.

An analysis of trends from continuous monitoring sites in and near to Lewisham indicates that there have been no other significant reductions to NO₂ concentrations in the Borough since the previous round of Review and Assessment.

The Council's most recent PM₁₀ monitoring indicates that the daily and annual mean objectives have been met. An analysis of trends however confirms that concentrations do not appear to be reducing and there is also evidence indicating that, close to roadsides, PM₁₀ from primary sources may be increasing.

The 2008 monitoring of carbon monoxide and sulphur dioxide confirms that the objectives for these pollutants have been met.

8.2 Conclusions from Assessment of Sources

The Council has assessed the likely impacts of local developments, road transport, other transport, industrial processes, commercial/domestic, fugitive emissions, residential and commercial sources. These findings indicate that there are roads outside of the AQMAs that fit the new criteria for congested roads. The Council will therefore undertake a Detailed Assessment of these roads, based on an extension of its diffusion tube survey.

The Council has previously noted that there is the potential for fugitive and uncontrolled PM₁₀ emissions in the Mercury Way area. Monitoring of the area is currently being arranged.

There are no other findings that have indicated that there are new changes that require the Council to undertake a Detailed Assessment for the other LAQM pollutants.

8.3 Proposed Actions

This report follows the technical guidance (TG09) produced for this part of the third round of Review and Assessment. It therefore fulfils this part of the continuing LAQM process.

The results, from following this methodology, are that the Council has not identified an additional risk of the air quality objectives for the LAQM pollutants: carbon monoxide, benzene, 1,3-butadiene, lead and sulphur dioxide, being exceeded anywhere in the Council's area. Thus the Council need not proceed beyond the updating and screening assessment for these pollutants. For nitrogen dioxide and particles (PM₁₀) the Council has previously designated parts of the Borough as AQMAs. The findings from this report indicate that the AQMAs should be maintained, with further investigation required for both pollutants.

The Council will therefore undertake the following actions:

1. Undertake consultation on the findings arising from this report with the statutory and other consultees as required.
2. Maintain the existing and proposed monitoring. It will also further extend the diffusion monitoring survey of those roads newly identified as being at risk.

3. Continue with the implementation of its Air Quality Action Plan in pursuit of the AQS objectives.
4. Prepare for the submission of a Detailed Assessment of Brockley Rise in Forest Hill and those narrow congested streets (Perry Vale, Mayow Road and Brockley Road) identified as at risk of exceeding the annual mean NO₂ objective.

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Appendices

Table 8 2008 Unadjusted NO₂ diffusion tube results for Lewisham

	LWS02	LWS03	LWS04	LWS05	LWS06	LWS07	LWS08	LWS09	LWS10	LWS11	LWS12
Feb-08	48.7	52.75	57.16	74.26	65.33	67.95	58.74	67.67	50.61	67.96	39.03
Mar-08	29.86	34.24	44.02	59.87	62.57	51.42		50.07	30.52	41.72	
Apr-08	31.57	45.89	62.85	54.87	60.86	58.01	48.53	59	32.66	56.45	8.67
May-08	31.13	58.47	100.86	89.31	88.97	91.64	72.1	51.22	41.62	78.31	26.28
Jun-08	34.4	51.8	65.25	74	73.31	69.15	57.99	66.19	30.33	58.86	5.75
Jul-08	31.71	51.25	50.17	58.75	60.02	61.37	48.74	64.88	31.1	57.93	20.25
Aug-08	28.28	40.61	47.72			63.37	37.28	50.8	26.25	43.75	17.64
Sep-08	27.87	33.12	49.64	49.9	51.34	57.05	44.23	44.95	28.54	47.27	23.23
Oct-08	42.97	51.45	59.24	60.81	76.94	71.8	45.37	65.62	38.61	58.1	27.43
Nov-08	49.26	53.76	64.98	85.85	80.05	77.61		58.79	44.15		35.91
Dec-08	47.68	51.97	69.2	88.24	82.89	80.07	58.15	66.78	48.14	60.61	37.37

(Note LWS05/06 and 07 are the triplicate tubes co-located with the Lewisham 2 continuous site)

Table 9 List of permitted petrol stations in the Council's area

Ref.	Name
EPA/PG1/14/82495/CE	Shell Deptford
EPA/PG1/14/82486/CE	Shell Forest Hill
EPA/PG1/14/82507/CE	Star (Crown Auto Point)
EPA/PG1/14/82488/CE	Lee Self-Service Station
EPA/PG1/14/82181/CE	Sainsbury's New Cross Road
EPA/PG1/14/82489/CE	Foxberry Service Station
EPA/PG1/14/82496/CE	Sydenham Service Centre
EPA/PG1/14/81885/CE	Tesco Lewisham Road
EPA/PG1/14/82490/CE	Star Service Station Southend Lane
EPA/PG1/14/82505/CE	Tesco Grove Park Express
EPA/PG1/14/80028/CE	Shell Lewisham
EPA/PG1/14/82501/CE	BP/Safeway Bromley Road
EPA/PG1/14/82503/CE	Forest Hill Express
EPA/PG1/14/82506/CE	Shell Bromley Hill
EPA/PG1/14/82279/CE	Tesco Loampit Vale
EPA/PG1/14/81933/CE	Star Service Station Catford
EPA/PG1/14/82185/CE	Sainsbury's Sydenham
EPA/PG1/14/82253/CE	Total Whitfoot Lane

Table 10 Part B installations in the Council's area

Ref.	Name	Type of Process
EPA/PG3/01/07790	F.M. Conway	Cement batcher
EPA/I/1	Lewisham Crematorium	Crematorium
PPC/PG6/34/001	Ascott Cab & Co Sales Ltd	Vehicle Resprayer
EPA/PG1/12/001	London Wood Reclaim Ltd	Waste Incineration
EPA/PG3/16(04)/10692	H. Sivyer (Transport) Ltd.	Concrete Crusher

Table 11 Part B dry cleaners in the Council's area

Name	Reference
Whistle and Flute	EPA/PG6/46/14463
Tuxedo Dry Cleaners	EPA/PG6/46/12312
One Step Ahead	EPA/PG6/46/08220
Manor Lane Dry Cleaners	EPA/PG6/46/08214
Suits U Bespoke Dry Cleaners	EPA/PG6/46/09031
Horizon Dry Cleaners	EPA/PG6/46/12147
High Road Dry Cleaners	EPA/PG6/46/07515
Lewisham Dry Cleaners	EPA/PG6/46/10050
2001 Dry Cleaners	EPA/PG6/46/07524
Busy Bees	EPA/PG6/46/11466
BrookBank Dry Cleaners	EPA/PG6/46/07171
Kirkdale Express Dry Cleaners	EPA/PG6/46/10793
Turbo Dry Cleaners	EPA/PG6/46/23526
Cleartone Dry Cleaners	EPA/PG6/46/10060
Speedway Dry Cleaners	EPA/PG6/46/10794
Michigan Laundrette Ltd	EPA/PG6/46/12144
Forbs Dry Cleaners	EPA/PG6/46/10774
Trend Dry Cleaners	EPA/PG6/46/10071
Asik Dry Cleaners	EPA/PG6/46/10070
Finesse Dry Cleaners	EPA/PG6/46/12148
Brownhill Road Dry Cleaners	EPA/PG6/46/26520
Swallow Express	EPA/PG6/46/08219
Starlite Dry Cleaners	EPA/PG6/46/07358
Ace Cleaners (Actontex Ltd)	EPA/PG6/46/01523
Crofton Dry Cleaners	EPA/PG6/46/07168
Streakers Dry Cleaners	EPA/PG6/46/10074
Strides Drycleaners	EPA/PG6/46/12325
Downham Express Dry Cleaners	EPA/PG6/46/10067
Hydra Dry Cleaners	EPA/PG6/46/10056
Clean World	EPA/PG6/46/02290
Sam's Dry Cleaners	EPA/PG6/46/23046
Five Star Dry Cleaners	EPA/PG6/46/07158
Carlton Drycleaners	EPA/PG6/46/10063
Ladywell Junction Express Cleaners	EPA/PG6/46/08215

Quality Dry Cleaners	EPA/PG6/46/08223
Pel's Dry Cleaners	EPA/PG6/46/10061
Palace Cleaners	EPA/PG6/46/08213
Blackheath Dry Cleaners	EPA/PG6/46/10064
Starbright Dry Cleaners	EPA/PG6/46/10073
Three Square Express Dry Cleaners	EPA/PG6/46/08188
M & S Dry Cleaners	EPA/PG6/46/08190
Master Drycleaner	EPA/PG6/46/08179
Starshine Dry Cleaners	EPA/PG6/46/08226
Friendly Dry Cleaners	EPA/PG6/46/11501
Honor Oak Cleaners	EPA/PG6/46/10044
The Cleaning Touch Dry Cleaners	EPA/PG6/46/08186
Perry Cleaners Ltd	EPA/PG6/46/10068
Bellingham Cleaners	EPA/PG6/46/08221
Catford Dry Cleaners	EPA/PG6/46/10065
Jubilee Cleaners	EPA/PG6/46/08348
Aplanda Dry Cleaners	EPA/PG6/46/08227

