



Stage I Air Quality Review and Assessment Wealden District Council

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Environment Act 1995 Part IV

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1. Introduction

Wealden District Council is commencing a review of local air quality in order to fulfil its obligations under the Environment Act 1995 Part IV. The Act requires all Local Authorities to review the sources of pollution in their own and neighbouring areas, and to assess likely future concentrations of a number of pollutants.

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This work began in April 1998 and is required to be completed by the end of 1999.

There are two main objectives of a review and assessment of air quality:

- to identify those areas at a local level where national policies and measures appear unlikely to deliver the air quality objectives by the year 2005
- to ensure that air quality considerations are integrated into a local authorities decision making process

1.1 National Targets

In its National Air Quality Strategy (1997), the Government set a series of targets for concentrations of harmful pollutants in air, these are listed below:

Pollutant	Standard		Specific Objective
	Concentration	Measured as	To be achieved by 2005
Benzene	5 ppb	Running annual mean	5 ppb
1-3 Butadiene	1 ppb	Running annual mean	1 ppb
Carbon Monoxide	10 ppm	Running 8hr mean	10 ppm
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	0.5 $\mu\text{g}/\text{m}^3$
Nitrogen Dioxide	150 ppb	1 hour mean	150 ppb
Nitrogen Dioxide	21 ppb	Annual mean	21 ppb
Ozone	50 ppb	Running 8 hour mean	50 ppb as the 97 th percentile
PM ₁₀	50 $\mu\text{g}/\text{m}^3$	Running 24hr mean	50 $\mu\text{g}/\text{m}^3$ as the 99 th percentile
SO ₂	100 ppb	15 minute mean	100 ppb as the 99.9th percentile

Note:

A running annual mean is a mean which is calculated on an hourly basis, yielding 1 running annual mean per hour. The running annual mean for a particular substance at a particular location for a particular hour is the mean of the hourly levels for that substance at that location for that hour and the preceding 8759 hours. (A similar process is used to calculate the running 8 and 24 hour means).

The 90th or 99th percentile is calculated for a calendar year, yielding one result per calendar year, as demonstrated by the following example:

The 99th percentile of 24 hour running means for the PM₁₀ objective means that the 50 µg/m³ objective may be exceeded on no more than four days of the year.

The Air Quality Regulations (1997) made a statutory duty on local authorities to ensure that by the year 2005 air pollutant concentrations both in Wealden District and nationally comply with the specific objectives.

Ozone was not included in the list of pollutants for local authority control, and is not therefore covered in the Air Quality Regulations. Due to the nature of ozone pollution, action at the local authority level will not be effective in tackling high concentrations. Action is therefore being taken by the National Government at International level to combat high concentrations of ozone.

The review and assessment has regard to the air quality objectives as laid down in the Regulations rather than the air quality standards. The recommended air quality **standards** from the Strategy are set purely with regard to scientific and medical evidence of the effects of that particular pollutant on health. As such, they represent minimum or no significant risk levels. The draft air quality **objectives** however, represent the Government's present judgement of achievable air quality by the year 2005 on the evidence of costs and benefits and technical feasibility.

1.2 Review and Assessment Process

In order to determine compliance with these objectives, a process of air quality review and assessment has been recommended. To ensure that there is some consistency between local authorities, the Government has issued Guidance on how local authorities should carry out their reviews and assessments. The guidance notes issued are as follows:

General Guidance

- Framework for Review and Assessment of Air Quality
- Developing Local Air Quality Strategies and Action Plans: The Principal Considerations
- Air Quality and Traffic Management
- Air Quality and Land Use Planning

Technical Guidance

- Monitoring for Air Quality Reviews and Assessments
- Preparation and Use of Atmospheric Emission Inventories
- Selection and Use of Dispersion Models
- Review and Assessment: Pollutant Specific Guidance

This document has been prepared with regard to these guidance notes, most notably the Review and Assessment: Pollutant Specific Guidance.

This Guidance note breaks the process down into three stages:

- **Stage I** – gather information about current and likely future sources of air pollution. This includes levels of traffic on the road, industrial processes (large and small) and an examination of current air pollution monitoring data for the area. The sources of pollution are then examined to determine whether the general public are likely to be exposed to any pollution over the timescales of the air quality objectives, and to determine if either the operation (road or industry) will close before 2005, or whether new operations are planned. If significant sources of any of the pollutants named in the Table above are identified then the authority must progress to Stage II.
- **Stage II** – This Stage involves the application of screening techniques to determine both current and future levels of air pollution. A further examination of any current monitoring data should be carried out. If air quality in 2005 is predicted to be above any of the objectives above then a Stage III assessment will be required.
- **Stage III** – In Stage III more complex techniques (dispersion modelling, real-time monitoring and emission inventories) are required, in order to determine the nature and size of any areas where the objectives are exceeded.

If at the end of Stage III air pollutant concentrations are predicted to be above any of the specific objectives (see above table) then an Air Quality Management Area must be declared, and wider consultation is then required. Flowing from this, an Air Quality Action Plan should then be prepared, detailing how the local authority proposes to introduce measures to reduce the concentrations of air pollutants in line with the Government objectives.

This report covers Stage I of this review and assessment process, and gives details of all those sources of pollution which are of concern in Wealden. Further work will be carried out and separate reports produced on the second and third stages.

2. The Main Pollutants

Benzene

National Air Quality Strategy Objective: 5 parts per billion (ppb) running annual mean.

Concerns: Benzene is a known human carcinogen (cancer causing substance), and also contributes to the formation of ozone (summer smog).

Sources: The major source of benzene is motor vehicle emissions, which nationally account for 64% of emissions (the majority arising from petrol vehicles), with the other major source being certain industrial processes accounting for 15% of emissions. (LAQM.TG4).

Monitoring: Benzene is monitored at a number of sites in Sussex, both at the roadside and in background locations, using passive diffusion tube monitors.

Concentrations: National benzene monitoring data shows that recorded concentrations are all below the 5 ppb annual objective, even at the roadside in central London. (Broughton et al 1998). Monitoring data from London measured using benzene diffusion tubes shows that concentrations in excess of the 5 ppb objective were recorded close to certain roadside locations, and values of 5 ppb were recorded in the vicinity of petrol filling stations. (Stanger Science 1996).

Controls and Trends: Benzene monitoring data from London have shown declining concentrations over the past few years, and work by Imperial College London suggests that concentrations have been declining since the 1970's.

Since 1993 it has been effectively mandatory to fit three-way catalytic converters onto petrol fuelled vehicles under European Legislation. As more catalyst fitted vehicles come into the fleet on the road (due to the replacement of old vehicles) concentrations will continue to decline.

Controls are also being implemented at petrol filling stations to recover some of the evaporating vapour during refilling of storage tanks at the station. Further controls on individual vehicle refuelling are currently under discussion.

These reductions should mean that by the year 2005 there should be no or very few areas in excess of the 5 ppb objective.

1,3-butadiene

National Air Quality Strategy Objective: 1 part per billion (ppb) running annual mean.

Concerns: 1,3-butadiene is a probable human carcinogen, and as with benzene, no absolutely safe level can be defined.

Sources: The major source of 1,3-butadiene nationally is motor vehicle emissions, which account for 67% of emissions (from petrol vehicles), with other major sources being industrial processes (13% of the national total). (LAQM.TG4).

Monitoring: No local monitoring of 1,3-butadiene is currently being carried out.

Concentrations: National 1,3-butadiene monitoring data shows that recorded concentrations are all below the 1 ppb annual average objective, even at the roadside in central London. (Broughton et al 1998). Monitoring of 1,3-butadiene has only been carried out on a systematic basis since 1992.

Controls and Trends: As with benzene, the fitting of catalytic converters to petrol vehicles reduces their emissions of 1,3-butadiene. Concentrations of 1,3-butadiene in the atmosphere are also heavily dependent on the chemical composition of petrol. Controls on the loading of petrol at petrol stations will also have an effect on 1,3-butadiene concentrations, with planned future controls on the refuelling of individual vehicles adding to this reduction.

These controls mean that by 2005 there should be no or very few areas in excess of the 1ppb annual average objective.

Lead

National Air Quality Strategy Objective: 0.5 microgrammes per cubic metre ($\mu\text{g}/\text{m}^3$) annual mean.

Concerns: Lead has been identified as causing acute and chronic damage to the nervous system, effects on the kidneys, joints and reproductive system. At extremely high concentrations lead is toxic.

Sources: The major source of lead is motor vehicle emissions, which nationally account for 65% of emissions, with other major sources being metal industries (18%) and power generation (5%). (LAQM.TG4).

Monitoring: There is currently no local monitoring of lead. Historically, lead was more widely monitored, but concentrations declined dramatically in the late 1980's, early 1990's due to the introduction of unleaded petrol and the introduction of the catalytic converter.

Concentrations: National lead monitoring data shows that recorded concentrations are below the $0.5 \mu\text{g}/\text{m}^3$ annual objective, except in the vicinity of very large lead smelters, such as those in Walsall which fall under Part A process control. (LAQM.TG4). The EC requires that monitoring be carried out in the vicinity of such large sources of lead, to determine whether the EC Directive lead levels are being breached.

Controls and Trends: The fitting of catalytic converters to vehicles has meant that less four star leaded petrol has been sold. Catalytic converters are "poisoned" by the lead in petrol, and must therefore use unleaded fuel. There are also restrictions across the European community to limit the lead levels present in petrol.

Carbon Monoxide

National Air Quality Strategy Objective: 10 parts per million (ppm) running 8 hour mean.

Concerns: Carbon monoxide affects the body by restricting the uptake of oxygen by carboxyhaemoglobin. At ambient levels, carbon monoxide may affect concentration, with higher levels leading to more serious nervous system effects.

Sources: The major source of carbon monoxide is motor vehicle emissions, which nationally account for 71% of emissions, although this figure will be higher in most urban areas. (LAQM.TG4).

Monitoring: Some local assessment of carbon monoxide concentrations has been made when new road schemes are under assessment.

Concentrations: National carbon monoxide monitoring data shows that recorded concentrations have exceeded the 10 ppm objective, especially in the vicinity of major roads in large urban areas. (LAQM.TG4). The numbers of exceedences have declined greatly since the 1970's due to improvements in vehicle technology.

Controls and Trends: Improvements in vehicle technology and the fitting of catalytic converters has meant that concentrations of carbon monoxide have declined over recent years. These decreases are expected to continue, giving rise to very few carbon monoxide air quality management areas.

Sulphur Dioxide

National Air Quality Strategy Objective: 100 parts per billion (ppb) as a 15 minute mean. 99.9th percentile compliance to be achieved by 2005.

Concerns: Sulphur dioxide is an acute respiratory irritant, hence the short averaging time for the standard. Sulphur dioxide may also be converted through chemical reactions in the atmosphere to secondary sulphate particulate matter.

Sources: Nationally, the major source of sulphur dioxide is power stations, which account for 65% of emissions, with other major sources being industrial emissions (24%) and commercial and domestic heating (6%). (LAQM.TG4).

Monitoring: Some monitoring of sulphur dioxide is undertaken in Sussex as part of the national survey of smoke and sulphur dioxide. This method uses wet chemical techniques, and is only capable of giving daily average sulphur dioxide concentrations.

Concentrations: National sulphur dioxide monitoring data shows that recorded concentrations have exceeded the 100 ppb objective, especially in the vicinity of large point sources of sulphur dioxide, such as power stations. Exceedences have also been recorded in domestic coal burning areas of the north-east, and in the East Thames Gateway. (Broughton et al 1998).

Controls and Trends: Discussions at a European level on measures to combat acid rain will influence future sulphur dioxide concentrations, as will the introduction of low sulphur diesel and its derivatives. Many large point sources are regulated by the Environment Agency, who review emission limits for industrial plant on a four yearly basis.

Nitrogen Dioxide

National Air Quality Strategy Objective: 2 Standards: 1 Hour mean of 150 parts per billion (ppb) and an annual mean of 21 ppb.

Concerns: Nitrogen dioxide is a respiratory irritant, and is also thought to be a sensitiser, which may worsen other conditions such as hayfever. There are a number of oxides of nitrogen present in the atmosphere, but it is nitrogen dioxide which gives rise to health concerns.

Sources: The major source of nitrogen dioxide is the motor vehicle, which nationally accounts for 47% of emissions, with other major sources being power generation (22%) and domestic sources (4%). In urban areas the contribution of traffic sources is likely to be higher. (LAQM.TG4).

Monitoring: Nitrogen dioxide is the pollutant for which there is the most local monitoring. This is because cheap and relatively simple monitoring equipment is available to monitor nitrogen dioxide. Most districts have at least four sites, which participate in a national survey of nitrogen dioxide which has been running for a number of years. More sophisticated monitoring equipment is also in use, giving hourly readings of nitrogen dioxide concentration.

Concentrations: Results from within Sussex show that at certain kerbside (within 1 metre of the road) locations the annual average (21 ppb) objective is being breached, as well as at a small number of intermediate sites (1-30 m of the road). (Bush et al 1998). Data from the DETR run Lullington Heath site (between Litlington and Jevington) and in Brighton and Hove suggest that the hourly maximum standard (150 ppb) is not currently exceeded in Sussex. (Broughton et al 1998).

Controls and Trends: The introduction of catalytic converters into the vehicle fleet will lead to further reductions in nitrogen dioxide concentrations, although the exact size of this reduction will depend on the effectiveness of these control measures in urban areas. During short journeys, catalysts do not reach their effective operating temperatures, giving high levels of emissions.

Particulate Matter (PM₁₀)

National Air Quality Strategy Objective: 50 microgrammes per cubic metre ($\mu\text{g}/\text{m}^3$).

Concerns: Particulate matter is of major concern, as it has been linked with both increased morbidity and premature mortality, estimates have placed the figure as high as 10,000 excess premature deaths per year for the whole of the UK.

Sources: The major source of particulate matter is the motor vehicle, which nationally accounts for 24% of emissions, with other major sources being industrial emissions (38%), power stations (16%) and domestic and other low power combustion (17%). (LAQM.TG4). These are only the primary PM₁₀ emissions, and additional contributions in the atmosphere arise from secondary particles (formed through chemical reactions involving nitrogen dioxide and sulphur dioxide in the atmosphere), and particles such as sea salt, pollen, road dust and wind blown soil.

Monitoring: Monitoring of PM₁₀ has only been carried out nationally since 1992, and there is little local monitoring.

Concentrations: PM₁₀ is the major pollutant of concern as far as the National Air Quality Strategy is concerned, as monitoring data from the national networks show that the objective is currently exceeded at the vast majority of monitoring sites throughout the UK. These include both central urban sites and more remote monitoring in rural areas. (Broughton et al 1998).

Controls and Trends: Controls on PM₁₀ are expected to deliver reductions, but these may not reduce concentrations sufficiently to meet the NAQS standard by 2005. Low sulphur diesel fuels and controls on industrial emissions will reduce PM₁₀ concentrations, but the natural sources provide a background level which is always present onto which the vehicle emissions are added. Analysis of concentrations and meteorological data have suggested that long-range intercontinental transport may also provide a significant source of particles.

3. Information About Wealden District Council

The Wealden District is a predominantly rural area covering 322 square miles, within the County of East Sussex, making it one of the largest Districts in the country. The District borders on to East Grinstead and Tunbridge Wells in the north and extends southwards to the sea on either side of Eastbourne.

The highly attractive yet diverse landscape incorporates the South Downs with their dramatic chalk cliffs, the Pevensey Levels, which are designated a wetland habitat of International Importance, the Ashdown Forest heathland, with its links to Winnie The Pooh, and the High Weald, a patchwork of well-wooded ridges and valleys. Nearly two thirds of Wealden is designated as Areas of Outstanding Natural Beauty and there are 29 Sites of Special Scientific Interest.

The total population exceeds 138,000, half of whom live in the main towns of Crowborough, Hailsham, Polegate, Willingdon, Uckfield and Heathfield. The majority of the remainder live in the many smaller villages interspersed within the rural area. Hence the population density is low at 1.6 persons per hectare.

There are around 57,000 residents in or seeking work in the Wealden District. Some 43,000 are in employment, whilst a further 12,000 are self-employed. Approximately 57% of the resident workforce are employed in Wealden with the remainder commuting out, principally to Eastbourne, Tunbridge Wells, Crawley, East Grinstead and London.

Each of the principal Wealden towns has its own industrial estate, catering in the main for light industrial activities, and there are also smaller industrial areas in Forest Row and Westham. Despite the rural nature of the area, agriculture provides for only a small percentage of the employment base.

Wealden has one of the largest and most active tourism industries in the South East region. It has the highest concentration of visitor attractions with over twenty top Sussex attractions in the District. As a result, tourism and recreation make a significant contribution to the rural economy and provide for numerous employment opportunities both in and out of season.

4. Road Traffic

Details of road traffic movements in Wealden are collected by East Sussex County Council who are the Highway Authority. Traffic flows are obtained from undertaking a series of Manual Classified Turning Counts at key junctions across the County each year. There are nearly 200 of these junctions, referred to as the Regular Base Monitoring Programme junctions. The surveys take place each year during “neutral months”.

Over 100 permanent Automatic Traffic Counters also monitor throughout the year. These automatic counters (inductive loops in the road) record traffic flow 24 hours per day, 365 days per year. Data collected from the Manual Classified Turning Counts are then factored up (from 12 hour flows on a specific day) using nearby Automatic Traffic Count data to produce the overall County Flow Plot. In total the County Flow Plot gives annual average data for some 500 links covering East Sussex.

Annual Average Daily Traffic flow (AADT) Data for 1996 are shown on the attached map.

The pollution specific guidance note (LAQM.TG4) specifically requires details of:

- Roads with more than 50,000 vehicles per day (a possible significant source of carbon monoxide)
- Roads with more than 25,000 vehicles per day (a possible significant source of PM₁₀)
- Roads with more than 20,000 vehicles per day (a possible significant source of nitrogen dioxide).

Those road sections within Wealden which fall into these categories are listed below, and are highlighted on the map.

Road with more than 20,000 vehicles per day 2005 is equivalent to a traffic flow of 16,764 in 1996, based on high traffic growth estimate predictions from DETR (low growth 6.8% - high growth 19.3% 1996-2005 traffic growth).

Road with more than 20,000 vpd (2005) –

High Street Uckfield (Station end)

A267 – from B2102 to the A265 Junction west of Heathfield

B2104 - Hailsham Road, from border with Eastbourne north to the junction with Glynleigh Road

A259 – Junction of A259/A27 north to junction of A259/B2095

Two sections of the A22 –

Uckfield bypass – from Maresfield bypass south to junction of A22/A26

From Eastbourne border north to Golden Cross A22/B2124 junction

Roads with more than 25,000 vehicles per day (2005)

A22 from Eastbourne border north to South Road, Hailsham junction (A295)

5. Industrial Sources

Industrial sources are currently controlled under the Environmental Protection Act 1990, and are classified into either Part A (large industries such as power stations and chemical works) or Part B processes (such as concrete batching plant and vehicle respraying facilities) for guidance and control. Part A processes fall under the jurisdiction of the Environment Agency, whilst control of Part B processes is a duty carried out by local authorities.

The continuing operation of the Local Authority Air Pollution Control authorisation process (for Part B processes) is the subject of a report issued by the Department of the Environment. This report refers specifically to the role of local authorities in local air quality management. It is stated that local exceedences of air quality standards and objectives caused by a Part B process may be grounds for the imposition of stricter conditions in an authorisation than would normally be the case. However, it will have to be clear that the industry alone is responsible for the exceedence, and not a combination of factors. Changes in air quality due to changing Part B process authorisations will therefore be imposed and felt at a local level, rather than an estimate which could be made across the whole region.

A list of Part B processes in Wealden together with their potentially significant emissions are given on the attached sheet. There are currently no Part A processes within the District.

The list shows that there are currently no authorised industrial processes in Wealden District which are considered to emit significant enough quantities of pollution to cause a breach of any of the air quality objectives. This situation will be reviewed in the light of any future industrial process applications. It should be noted that petrol filling stations are currently in the process of Part B authorisation. These have not been included in the list of potentially significant emitters as the DETR is currently investigating the ambient levels of benzene in the vicinity of such locations.

Certain other small industrial processes that fall outside of Part B Process control are also of concern. The pollutant specific review and assessment guidance requires details of boiler plant with a thermal rating of greater than 5MW where solid fuel or fuel oil is the power source. There are no such combustion systems in Wealden.

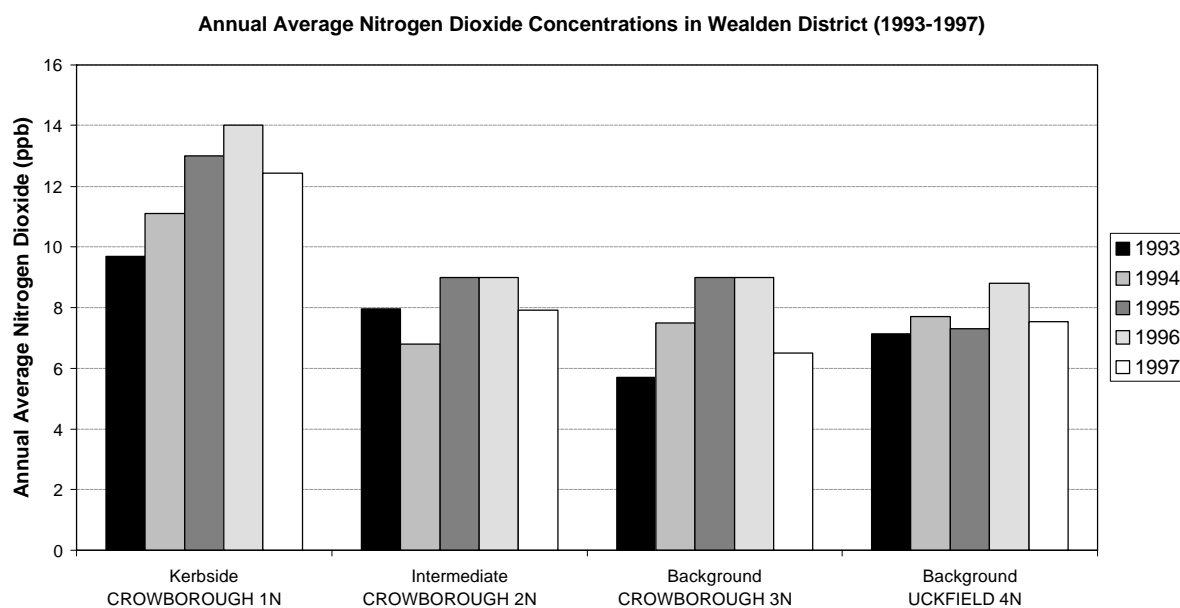
6. Air Pollution Monitoring

Air quality monitoring takes place at a number of locations in Wealden using passive diffusion tubes and automated monitoring techniques.

6.1 Nitrogen Dioxide

Nitrogen dioxide is the pollutant for which the most monitoring has been carried out in Wealden, through participation in the national nitrogen dioxide diffusion tube survey. This survey has provided results over a number of years.

The diffusion tube sampler consists of an acrylic tube, 7cm long with a 1cm internal diameter. Triethanolamine, an extremely effective absorbent of NO₂ is used to coat a stainless steel grid fixed at one end of the tube by an airtight cap. The tube is then fixed vertically with the capped end uppermost. NO₂ diffuses up the tube and is trapped by the absorbent coating. By measuring the total amount of NO₂ absorbed, and knowing the exposure time of the tube and the rate at which the gas diffuses up the tube, the mean concentration of NO₂ in the air over the exposed period can be determined. The tubes are generally exposed for 3-4 weeks (and shorter periods in urban areas where nitrogen dioxide concentrations tend to be higher). Thus they only provide an estimate of long-term concentrations, and cannot measure short-term (e.g. daily) peaks in concentration.



Analysis of nitrogen dioxide diffusion tube data from 1996 in Wealden shows that concentrations are all currently below the 21 ppb air quality objective, even at the kerbside. This has been the case throughout the whole of the 5 year monitoring period. The DETR has predicted (in LAQM.TG4) that those sites where concentrations are currently 30 ppb or below as an annual average will decline to below 21 ppb by the year 2005. On this basis, there is no need to investigate these sites further.

Monitoring of nitrogen dioxide is also carried out at the DETR funded automatic monitoring station at Lullington Heath. The site is classified as a rural site, and

annual mean and hourly maximum nitrogen dioxide levels over the past few years are given in the Table below:

Year	Annual Mean	Hourly Maximum
1991	8.2	53.7
1992	7.4	89.9
1993	9.1	53.3
1994	8.5	64.2
1995	7.5	42.9
1996	8.4	45.5
1997	7.1	48

These show that annual mean levels are currently well below the nitrogen dioxide air quality objective. As Lullington Heath monitors continuously it can also be seen that the hourly maximum concentrations are below the 150 ppb air quality objective.

6.2 Sulphur Dioxide

The Lullington Heath station is one of very few locations in Sussex where sulphur dioxide is monitored continuously. These data can be used to compare against the sulphur dioxide objective (99.9th percentile of 15 minute means less than 100 ppb). Results from recent years are shown below:

Year	99.9th Percentile 15 Minute Means
1993	26.7
1994	21.9
1995	22.4
1996	29.5
1997	19.6

These show that the sulphur dioxide air quality objective is currently not being breached at this site.

7. Other Sources of Information

There are particular requirements within the pollution specific guidance note to review and assess a number of other sources of information against targets. These include limits on background concentrations of PM₁₀ and emissions of PM₁₀ and sulphur dioxide. The nature of this assessment is outlined below.

7.1 National Pollution Mapping Work

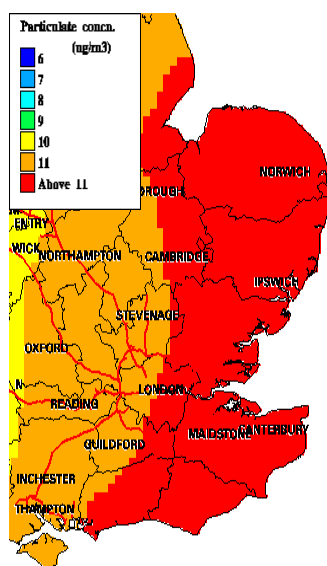
The DETR has commissioned a series of maps showing how background concentrations of the various pollutants vary across the country. These are shown below and on the following sheet for all pollutants for which they have been prepared. The maps provide estimates, and are designed to give an indication of pollutant levels in areas where there is no monitoring. The maps provide an estimate of the annual mean of the pollutant on a 1km grid across the UK. The maps currently show 1996 data. (Further details of the mapping methodology are given in Stedman 1998).

Results from dispersion or other models can be used to estimate the impact of individual sources on local air quality. Ambient air quality near to sources, such as at the edge of a busy road or near to an industrial chimney, can be estimated by calculating the sum of this individual source impact plus the background concentration given by the maps.

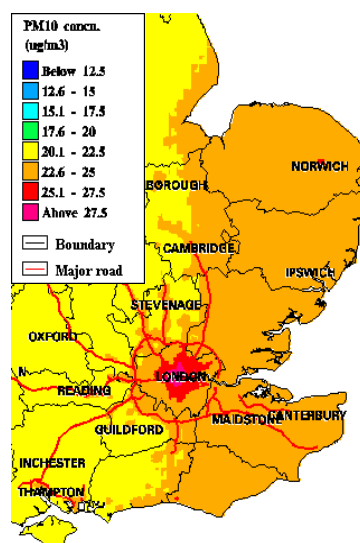
These national maps will be used more extensively in Stages II and III of review and assessment, but should be used in Stage I to screen PM₁₀ concentrations.

- The DETR pollutant specific guidance requires that in Stage I an assessment is made of whether in urban areas annual mean levels of secondary particulate currently exceed 8 µg/m³

At the present time there is no rural background monitoring of PM₁₀ in Sussex. The national maps for both total and secondary PM₁₀ are shown below. These maps indicate that for all authorities in both East and West Sussex a second stage review and assessment will be required for PM₁₀, as annual mean levels of secondary particulate currently exceed this 8 µg/m³ limit.



Estimated Annual Mean
Secondary PM₁₀ Concentration



Estimated Annual Mean
Background PM₁₀ Concentration

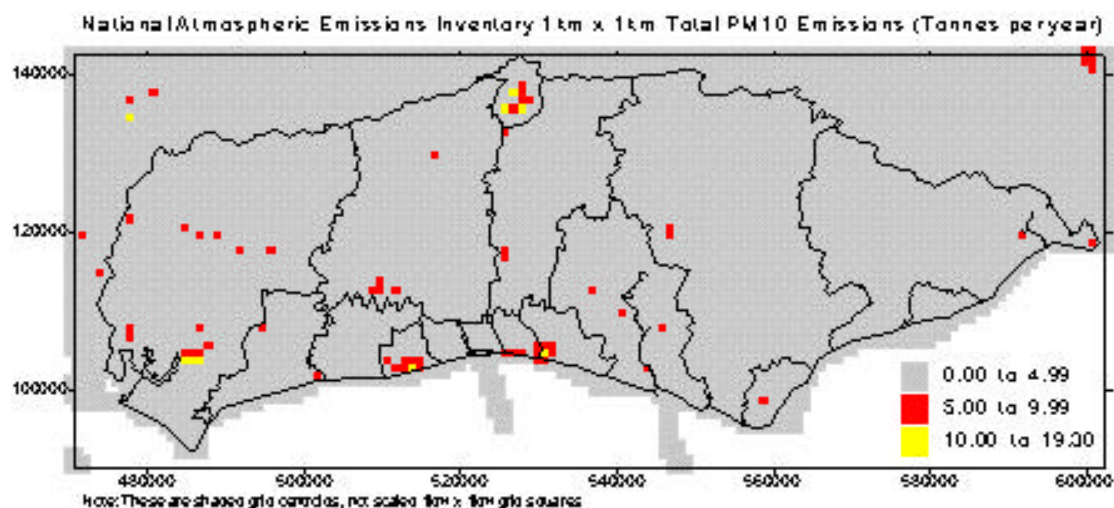
7.2 National Atmospheric Emissions Inventory

In addition to the above maps of estimated *concentration*, there are also national maps of pollutant *emissions* on a 1km by 1km grid square basis (also produced using data from AEA/Netcen).

In Stage I of review and assessment this information is required to be used to screen levels of emissions of sulphur dioxide and PM₁₀:

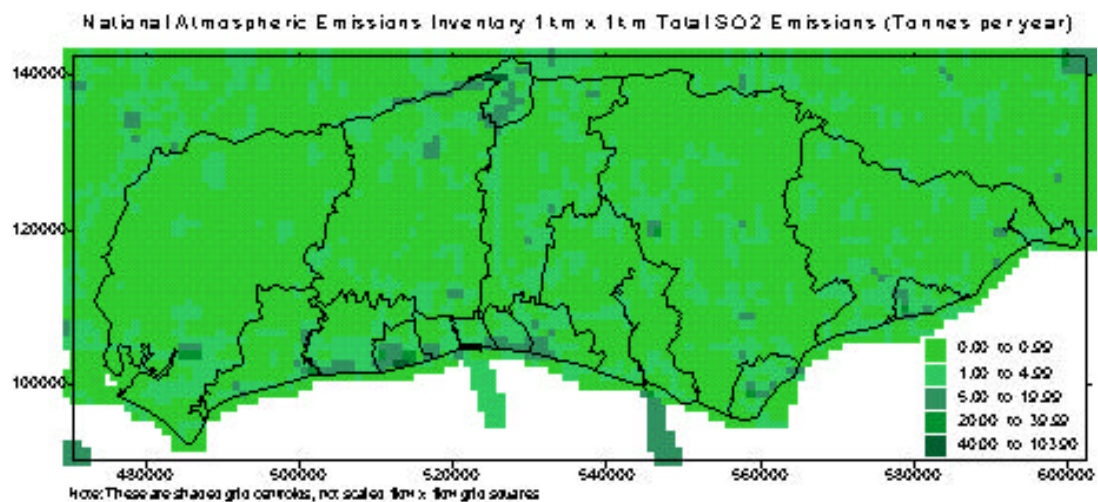
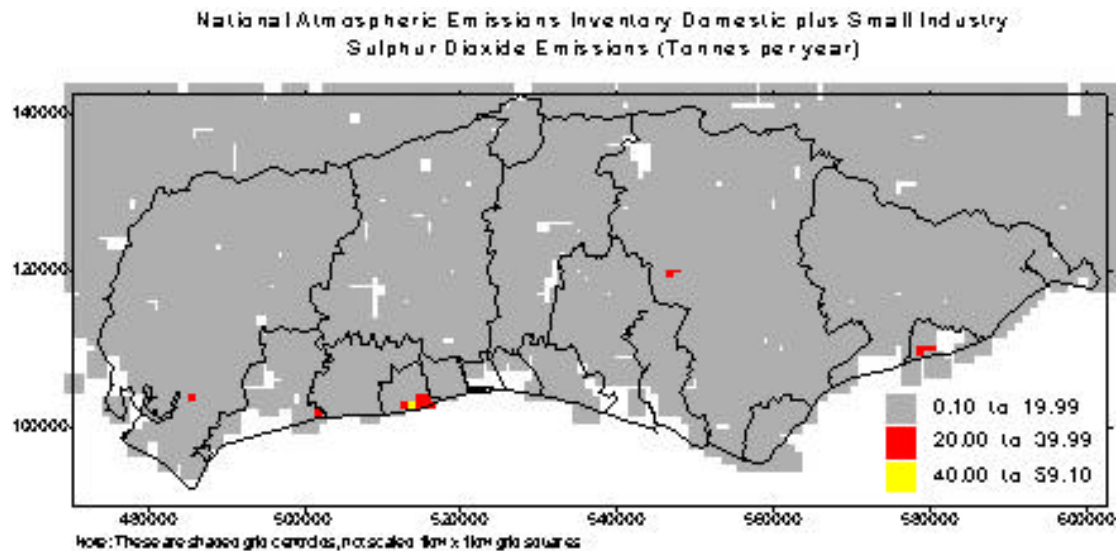
- The DETR pollutant specific guidance requires that in Stage I an assessment is made of any 1km by 1km grid squares within a local authority area with PM₁₀ emissions from low level dispersed sources of greater than 10 tonnes in any 1 km x 1km grid square, or emissions greater than 5 tonnes in several adjacent squares.

The map below shows that the Uckfield area is indicated as having two adjacent grid squares with PM₁₀ emissions of greater than 5 tonnes. This area will therefore need to be investigated further during the second stage of review and assessment.



- The DETR pollutant specific guidance also requires in Stage I that details are given of any 1km x 1km grid squares in the authority's area for which maximum low-level (ie domestic combustion and other short stack) emissions are greater than 25 kg per hour or 40 tonnes per year. Where domestic emissions are the main source of concern, this can be assumed to approximate to 300 houses burning coal in a 1km x 1km grid square.

The map below shows that there are no areas in Wealden District where the emissions limit of 40 tonnes per year from domestic combustion and other short stack emissions is exceeded. This remains the case even if total emissions are considered (see the second map below).



7.3 Details of any significant sources in neighbouring areas which could impact significantly within the authority's area

Once Stage I reviews have been completed, full datasets will be swapped between neighbouring local authorities. In the meantime, it is estimated that the following sources in neighbouring areas may be of concern and will be investigated further in Stage II:

The Part A industrial process at Pebsham (Rother District Council) – a possible source of PM₁₀.

8. Review and Assessment

8.1 Source Screening

For all existing *and* proposed activities identified, those which have the potential, singly or together to emit significant quantities of pollution and:

- are expected to be in operation by the end of 2005;
- and for which there is a potential for exposure of individuals in relevant locations;

should then be identified.

8.2 Exposure

A key concept in review and assessment is that of exposure, with the DETR stating that:

"For the purposes of determining the focus of review and assessment local authorities should have regard to locations where individuals are likely to be exposed over the averaging time of the objective."

It is therefore recommended that:

- For objectives with short averaging times (e.g. sulphur dioxide and the hourly nitrogen dioxide objective) reviews and assessments should be focused on any non-occupational, near ground level outdoor location given that exposures over such short averaging times are potentially likely.
- For objectives with longer averaging times (from the carbon monoxide rolling 8 hour objective upwards), reviews and assessments should be focused on the following non-occupational, near ground level outdoor locations; background locations; roadside locations; and other areas of elevated pollutant concentrations where a person might reasonably be expected to be exposed (e.g. in the vicinity of housing, schools or hospitals etc) over the relevant averaging time of the objective.

All sources identified as significant emitters in the sections above will be investigated further in Stage II of review and assessment.

9. Sources of Concern for Stage II

If no sources identified above are present for any of the pollutants occurring in a locality which could lead to exposure of the public over the averaging periods of the appropriate objective, then the risk of exceeding the air quality objective should be considered negligible, and the authority should proceed no further.

If the first stage review and assessment indicates that the risk of exceedence is not negligible then the authority should carry out a second and/or third stage review and assessment, with a view to determining the risk of exceedence more precisely.

Those sources which are of concern, and will need to be considered in a Stage II review and assessment are listed below:

Part A Processes **NONE**

Part B Processes **NONE**

Large Boiler Plant **NONE**

Road Sections

Roads with more than 20,000 vpd (2005) – a significant nitrogen dioxide source

High Street Uckfield (Station end)

A267 – from B2102 to the A265 Junction west of Heathfield

B2104 - Hailsham Road, from border with Eastbourne north to the junction with Glynleigh Road

A259 – Junction of A259/A27 north to junction of A259/B2095

Two sections of the A22 –

Uckfield bypass – from Maresfield bypass south to junction of A22/A26

From Eastbourne border north to Golden Cross A22/B2124 junction

Roads with more than 25,000 vehicles per day (2005) – a significant PM₁₀ source

A22 from Eastbourne border north to South Road, Hailsham junction (A295)

Nitrogen Dioxide Monitoring Sites above 30 ppb **NONE**

PM₁₀ Emissions of more than 5 tonnes in adjacent 1km areas **YES**

Background Secondary PM₁₀ concentration of more than 8 mg/m³ **YES**

This means that Stage II assessments will be undertaken for at least one source for the following pollutants:

PM₁₀
Nitrogen Dioxide

10. Consultation

10.1 Statutory Consultees

Under the Environment Act, all local authorities are required to consult on their air quality review and assessment with the Environment Agency and their Highways Authority. Through the Sussex Air Quality Steering Group both of these bodies have been involved since the early stages of the air quality management process, and will be made fully aware of all of Wealden District Council's air quality review and assessment.

The Sussex Air Quality Steering Group is also working to ensure a free flow of information between neighbouring local authorities, including those which border Sussex but which are located in Kent, Surrey and Hampshire.

10.2 Public Consultation

Copies of this document have been circulated to libraries and public reception points. In addition the proprietors of the more significant Part B processes have also been sent a consultation copy.

Further information concerning air quality management is available from the District Council. There is also a Department of the Environment, Transport and the Regions produced video which you may wish to see, as well as technical guidance on air quality management for local authority officers.

11. The Way Forward

Work will now commence on the second stage of review and assessment, and a similar, separate report will be produced detailing the outcome of the second stage and the need to progress to Stage III or otherwise.

There are a number of specialist cases where information gathered in Stage I and the tools available for Stage II would not be sufficient to give an accurate air quality assessment. In these cases, the authority should proceed directly to Stage III:

- **Benzene** – Where an authority needs to review and assess the impact of a planned rather than existing, industrial site the authority should undertake a third stage review and assessment.
- **1,3-Butadiene** – Where the first stage review indicates a risk of exceedence of an annual mean of 1 ppb at the end of 2005, the authority should carry out a third stage review and assessment of 1,3-butadiene.
- **Lead** – Where there are significant fugitive emissions of lead or significant emissions from sites or parts of sites that do not come under the control of either Part A or Part B of the Environment Act 1990, the authority may complete a second stage review and assessment but should also carry out a third stage review and assessment.
- **PM₁₀** – If low-level combustion sources other than road transport are significant (i.e. a 1km x 1km grid area for which the emission of PM₁₀ is more than 10 tonnes) the authority may wish to undertake a second stage review and assessment but should also complete a third stage review and assessment.
- **PM₁₀** – If an industrial source emits significant quantities of PM₁₀ from sources other than regulated stacks, the authority should similarly complete a third stage review.
- **Sulphur Dioxide** – If dispersed low-level sources (a 1km x 1km grid square exists in the authority's area for which annual low-level emissions are greater than 40 tonnes) the authority may carry out a second stage review and assessment but should also carry out a third stage review and assessment.

A local authority may also decide of its own accord to skip Stage II and proceed directly to Stage III.

Wealden District Council has decided that a second stage review and assessment will now be undertaken for those pollutants listed in Section 9.

References

Broughton GFJ, Bower JS, Clark H and Willis PG (1998) *Air Pollution in the UK: 1996*, AEA Technology, AEAT 2238.

Bush T, Mooney D and Stevenson K (1998) *UK Nitrogen Dioxide Survey 1996*, AEA Technology, AEAT-2779

Department of the Environment (1996) *Local Air Pollution Control in England and Wales: Five Year Report 1991-1996*. Department of the Environment, London.

DETR (1997) *The United Kingdom National Air Quality Strategy*, The Stationery Office

Environment Act 1995

SI (1997) No 3043, Environment Protection, *The Air Quality Regulations 1997*.

Stanger Science (1996) *London Wide Benzene Monitoring Programme Annual Report 1995*.

The following are all published by the Stationery Office:

- LAQM.G1 Framework for Review and Assessment of Air Quality
- LAQM.G2 Developing Local Air Quality Strategies and Action Plans: The Principal Considerations
- LAQM.G3 Air Quality and Traffic Management
- LAQM.G4 Air Quality and Land Use Planning
- LAQM.TG1 Monitoring for Air Quality Reviews and Assessments
- LAQM.TG2 Preparation and Use of Atmospheric Emission Inventories
- LAQM.TG3 Selection and Use of Dispersion Models
- LAQM.TG4 Review and Assessment: Pollutant Specific Guidance

Stedman (1998) *Revised High Resolution Maps of Background Air Pollutant Concentrations in the UK: 1996*, AEA Technology, AEAT-3133.