



DIRECTORATE OF HOUSING & HEALTH

ENVIRONMENTAL PROTECTION SECTION  
SOUTHFIELDS OFFICES  
SOUTHFIELDS ROAD  
LOUGHBOROUGH  
LEICESTERSHIRE  
LE11 2TX



## Executive Summary

As part of the duties under the Environment Act 1995 local authorities are recommended to produce annual air quality progress reports in years when they are not undertaking review and assessments of air quality. This report provides both an up to date report on air quality in Charnwood and actions being taken to address air quality problems. It also provides a summary of further evidence obtained from air quality monitoring near to the Great Central Railway.

Charnwood has three Air Quality Management Areas (AQMAs), which were declared because of predicted breaches of national air quality objectives at residential properties in the borough. The causes of these predicted breaches were emissions from local traffic and commercial sources.

In 2004, monitoring of nitrogen dioxide at twenty-seven locations in Charnwood demonstrated a breach of UK air quality objectives at nine of these. Seven of these are within the Loughborough Air Quality Management Area, with one in Shepshed and one in Rearsby. The overall statistical trend in nitrogen dioxide levels is that they are on the increase. However air quality was particularly bad in 2003 and if the results for this year are excluded then the trend shows that the situation is generally stable. The Epinal Way Extension appears to have led to a tangible decrease in nitrogen dioxide exposure at some locations without causing a noticeable effect at locations past which traffic has been diverted.

Sulphur dioxide emissions from the Great Central Railway engine sheds are causing occasional breaches of short-term air quality objectives. Results indicate that the existing Air Quality Management Area around the sheds should be retained, although recent monitoring suggests that the extent of the problem is not as great as was originally feared.

Progress with the implementation of the Charnwood Air Quality Action Plan has been satisfactory. Many of the transport related actions have been absorbed into the provisional Local Transport Plan which means that they are much more likely to be achieved. Of those remaining actions falling within the Borough Councils remit a PID has been established to try to ensure that they are accounted for in the future business planning process of the Council.

# Contents

## Executive Summary

1. [Background to air quality management](#)
2. [The UK Air Quality Strategy](#)
3. [Air quality in Charnwood](#)
4. [Aims and Objectives of the Air Quality Progress Report](#)
5. [Air quality work programme](#)
6. Monitoring Results
  - [Real time monitoring](#)
    - Background
    - [Quarry PM10](#)
    - [Steam locomotive sulphur dioxide](#)
  - [Non real time monitoring](#)
  - [Commentary on results](#)
7. [New developments, which may affect air quality](#)
8. [Air quality action planning](#)
  - Work to date
  - Current status
  - Future progress management

## [Action Plan Implementation Report](#)

## **I. Background to Air Quality Management**

Good air quality is essential for our health, quality of life and the environment. Over the years the Government have introduced controls through legislation to improve air quality. However, the previous simple solutions applied to preventing the heavy smog type image prevalent in urban areas in the 50's are no longer applicable and any solution to current air quality problems requires a coherent national strategy applied flexibly at a local level.

Government experts have estimated that up to 24,000 people die prematurely each year in the United Kingdom as a result of poor air quality. We therefore, as all stakeholders in our air quality and improvements will require the participation of all members of the community as well as the specialist input from scientific and professional groups and the support of government locally, nationally and internationally.

In the early 90's the Expert Panel on Air Quality Standards (EPAQS) was set up by the Secretary of State for the Environment following the publication of the white paper 'Our Common Inheritance'. The remit of the panel was to advise on the establishment and application of Air Quality Standards based on the effects of pollutants on human health and the wider environment.

In 1995 the Environment Act introduced initiatives for the protection of air quality in the UK. Section 80 of this Act required the Secretary of State for the Environment to publish a National Air Quality Strategy. The first National Air Quality Strategy (NAQS) was published in 1997 then revised and re-issued in early 2000. This strategy brought about a change in the way local air quality is managed. All local councils are required to review and assess air quality in their areas through a process known as Local Air Quality Management (LAQM).

The Air Quality Regulations 2000 and the Air Quality (England) (Amendment) Regulations 2002 prescribe pollutant specific air quality objectives to be achieved by certain dates specific to each pollutant, ranging from 2003 to 2010. A summary of the objectives is included below. Local authorities have to consider the present and likely future quality of the air up to these dates, and to assess whether these objectives will be met.

If, as the result of the review process, it appears that the air quality objectives are not, or are unlikely to be achieved in any area within the boundary of the local authority – then the local authority shall by order designate it as an 'Air Quality Management Area' (AQMA). Once such an area has been designated, a more detailed assessment of the air quality in each of these areas must be conducted. Based on the findings of the detailed assessments, air quality action plans (AQAP) to reduce air pollution to acceptable levels should then be developed, either as independent plans or, where it is linked to transport emissions, as part of the relevant Local Transport Plan.

## 2. The UK Air Quality Strategy

The National Air Quality Strategy (NAQS) sets objectives to limit exposure to key pollutants to levels at which even the most vulnerable members of the community are not thought to suffer ill health. These are based on the advice of the Expert Panel on Air Quality Standards (EPAQS), and on the requirements of the EC Air Quality Daughter Directive (AQDD). Assessments of the appropriate health-based standards are translated into Objectives by adding target dates for compliance and allowing for a small number of unavoidable exceedences for certain pollutants. These standards and associated specific objectives are shown in Table I.

The Environment Act also requires local authorities to carry out a periodic Review and Assessment of air quality in relation to these Objectives. The aims of this are:

- To identify areas of the district where national measures will not achieve the Air Quality Objectives by themselves, so local action is needed.
- To provide a basis for integrated local policy on air quality, in matters such as land use planning and traffic management.

**Table I: Air Quality Objectives in the Air Quality Regulations (2000) for the purpose of Local Air Quality Management**

Pollutant	Concentration Limits		Averaging Period	Objective
	µg m <sup>3</sup>	ppb		Date for objective
<b>Benzene</b>	16.25	5	Running annual mean	December 31 <sup>st</sup> 2003
<b>1/3-Butadiene</b>	2.25	1	Running annual mean	December 31 <sup>st</sup> 2003
<b>Carbon monoxide</b>	11.6	10	Running 8 hour mean	December 31 <sup>st</sup> 2003
<b>Lead</b>	0.5	-	Annual mean	December 31 <sup>st</sup> 2004
	0.25	-	Annual mean	December 31 <sup>st</sup> 2008
<b>Nitrogen dioxide</b>	200	105	1 hour mean not to be exceeded more than 18 times a year	December 31 <sup>st</sup> 2005
	40	21	Annual mean	December 31 <sup>st</sup> 2005
<b>Particles (PM10)</b>	50	-	24 hour mean not to be exceeded more than 35 times a year	December 31 <sup>st</sup> 2004
	40	-	Annual mean	December 31 <sup>st</sup> 2004
<b>Sulphur dioxide</b>	266	100	15 minute average mean not to be exceeded more than 35 times a year	December 31 <sup>st</sup> 2004
	350	132	1 hour mean not to be exceeded more than 24 times a year	December 31 <sup>st</sup> 2004
	125	47	24 hour mean not to be exceeded more than 3 times a year	December 31 <sup>st</sup> 2005

Notes: Conversions of ppb and ppm to (µg m<sup>3</sup>) correct at 20°C and 1013mb

### 3. Air Quality In Charnwood

In 2001 a first review and assessment of air quality for Charnwood was published. This concluded that;

- 1) ***There is no indication to suggest that levels of pollution of benzene, 1,3 butadiene, lead, or carbon monoxide are having or are likely to have an impact on human health within the Borough of Charnwood.***
- 2) ***There is evidence to suggest that levels of nitrogen dioxide will not generally breach the air quality objectives other than in close vicinity (within 10 to 20 metres) of roadside locations along the following road lengths;***
  - ***The A6 corridor through Loughborough and Birstall.***
  - ***The M1 corridor through the borough.***
  - ***Ashby Road, Alan Moss Road and the Epinal Way in Loughborough.***
  - ***Newark Road in Thurmaston***
  - ***Melton Road in Syston***
- 3) ***There is no current evidence that the objectives for sulphur dioxide are being breached. However, the authority remains concerned that the as yet unquantified emissions from the Great Central Railway may have a significant impact on air quality in its immediate vicinity.***
- 4) ***There is no current evidence that the objectives for PM<sub>10</sub> will be breached. However, Charnwood Borough Council remains concerned that traffic derived PM<sub>10</sub> will impact on the same areas as is predicted for traffic derived nitrogen dioxide.***

Three Air Quality Management Areas were declared in 2001 on the basis of this report. A full copy of the 2001 Round 1, Stage 3 Review and Assessment is at <http://www.charnwood.gov.uk/environment/2309.html> along with maps of the AQMAs and a list of the properties within them.

In 2003 the findings of this report were reviewed and published as a 2003 Round 2 Updating and Screening Report.

In 2004 two further detailed assessments were published. One provided a detailed review and assessment of traffic related air quality – the Round 1, Stage 4 Review and Assessment. The other provided a detailed review and assessment of air quality around two industrial locations – the Round 2 Detailed Assessment.

All reports are available on the Charnwood Borough Council website on the web page above.

## 4. Aims & Objectives of the Progress Report

Progress Reports have been introduced into the Local Air Quality Management (LAQM) system following a detailed evaluation of the first round of local authority review and assessments.

A need was identified to develop a longer-term vision for both LAQM and the review and assessment process. The process was seen to be too 'stop-start', with some local authorities completing their first round of review and assessment and then doing little for several years until the next round. This did not encourage the integration of LAQM into the routine work of local authorities.

The overall aims of the Progress Report should be to:

- Report progress on implementing local air quality management.
- Report progress in achieving, or in many cases maintaining, concentrations below the air quality objectives.

It is considered these aims can be best achieved by addressing two matters as a minimum requirement namely:

- New monitoring results.
- New local developments that might affect local air quality.

And by providing any information on additional elements including

- Progress on implementation of action plans;
- An assessment of the monitoring data in relation to likely exceedences of the objectives;
- Progress on local air quality strategies;
- A list of planning applications that have the potential to affect local air quality;
- Progress on implementing those elements of the local transport plan that might affect air quality
- Any relevant updates on planning policies that relate specifically to air quality.
- Other areas of local interest that the authority also wishes to incorporate into its Progress Report.

This report also contains specific information relating to a further assessment of emissions from the Great Central Railway following the completion of the detailed assessment of this site in 2004 and the subsequent declaration of an Air Quality Management Area.

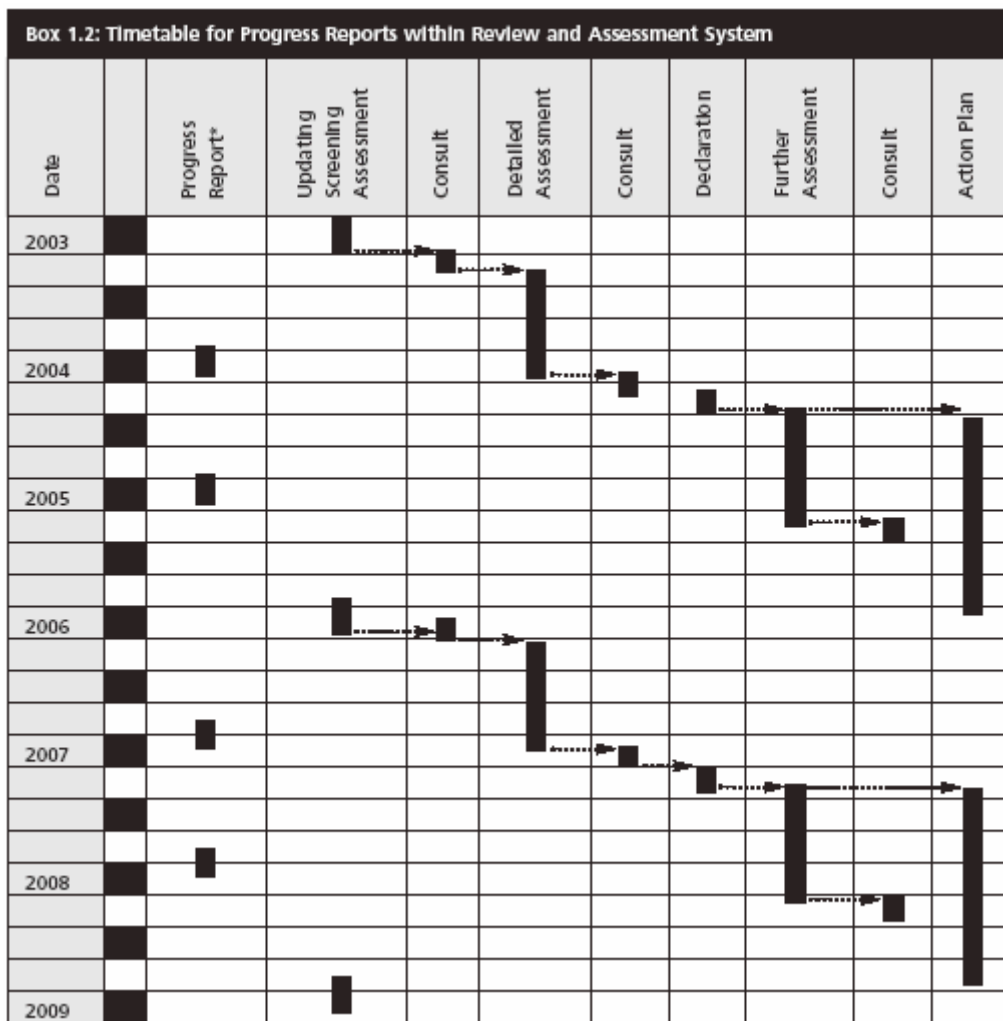
## 5. Air Quality Management Work Programme

As part of the strategy of ensuring that air quality management is current and aligned with other key policies, a rolling long-term programme has been developed to ensure that the work is continually being revised.

All authorities are required to carry out a thorough review of air quality every three years. This commences with an **Updating and Screening Assessment**, which requires all of the knowledge, assumptions and data that informed previous assessments to be reviewed and revised based on a prescribed methodology.

Where any significant 'new' material comes to light then this prompts the need for a **Detailed Assessment** of those pollutants and specific locations identified.

In any year where no assessment work is being carried out. Local authorities are still expected to produce annual progress reports.





## 6. Monitoring Results

Since 2000 Charnwood has continued to expand and rationalise its air quality monitoring network. Results of recent and historical data are published bi-monthly on the Councils website at <http://www.charnwood.gov.uk/environment/2415.html>

### 6.1 Real time monitoring

#### 6.1.1 Background

A chemiluminescent nitrogen oxide monitor, a TEOM PM10 monitor and a UV fluorescence sulphur dioxide monitor have been operating for a number of years within a Council owned residential area on Durham Road in Loughborough ('Site 11 on map 6.2.1 below). The site is located approximately 20 metres from the kerbside of the A6 former trunk road and was chosen as a suitable monitoring location for possible human receptors of traffic pollution in the area. The monitor is actually located just outside what was eventually designated as the Loughborough air quality management area. It has however proved a valuable tool in allowing validation of modelling data in scenarios beyond 10 metres from road kerbsides and as a source of bias correction factors for our network of diffusion tubes.

#### 6.1.2 Quarry Derived PM10

We also have two light scatter type portable PM10 monitors which have been used both as part of complaint investigation work and as part of monitoring for LAQM purposes. Most recently these have been deployed near the Mountsorrel quarry to allow further study of possible PM10 emissions from this source.

#### 6.1.3 Steam Locomotive Derived SO2

We also deployed a UV fluorescence sulphur dioxide monitor within the Great Central Railway AQMA between December 2004 and April 2005 in order to get some type tested air quality data for the area

### 6.2.1 Summary of background air quality results

#### Nitrogen Dioxide

Annual average Nitrogen Dioxide in microgrammes/cubic meter per monitoring year				NAQS for 2005	Trend
2001	2002	2003	2004		
31.2	32.6	34.9	29.7	40	Reducing

#### Sulphur Dioxide

	Monitoring Year				NAQS for 2004	Trend
	2001	2002	2003	2004		
15 min	1 breaches	0 breaches	0 breaches	0 breaches	35	Reducing
24 hour	0 breaches	0 breaches	0 breaches	0 breaches	3	Static
Annual	7.4	5.7	5.4	3.7	none	Reducing

## Particles (PM10)

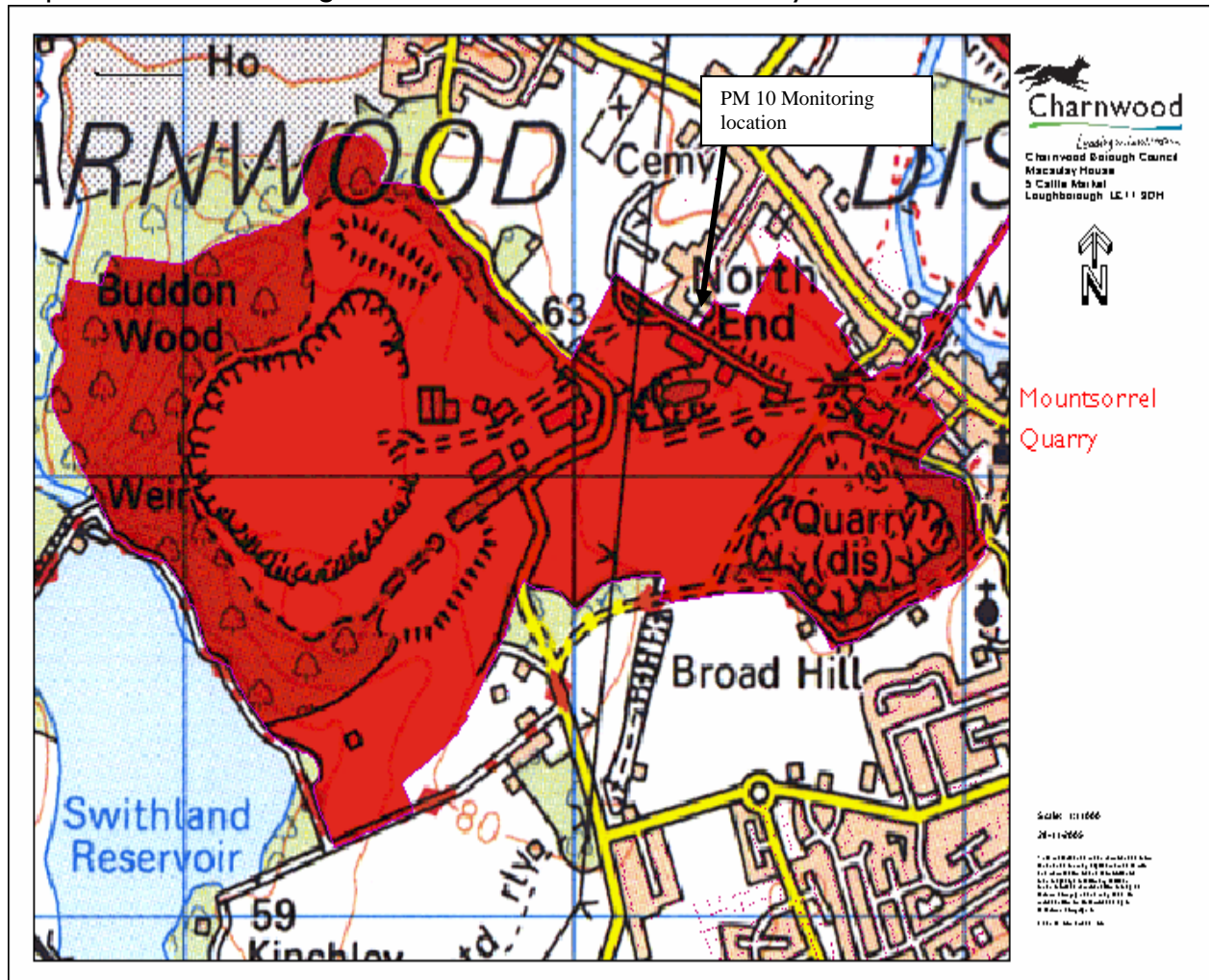
	Monitoring Year				NAQS for	Trend
	2001	2002	2003	2004		
24 hour	7 breaches	5 breaches	20 breaches	2 breaches	35 breaches	Static
annual	22.6	22.5	24.4	20.4	40	Reducing

Data capture for all years is >95%

### 6.2.2 Quarry Dust Monitoring

A PM10 monitor was installed in one of the nearest receptor locations to the quarry in Mountsorrel in November 2004 (map 6.1). At the same time a condition was placed on the quarry as part of their permit under the Pollution Prevention and Control Act to undertake a similar exercise within their own site boundary. It will be necessary to gather a years worth of monitoring data before any conclusions can be reached. The outcomes of this study will be published in next years Updating and Screening Report.

Map 6.1 PM10 Monitoring location near to Mountsorrel Quarry

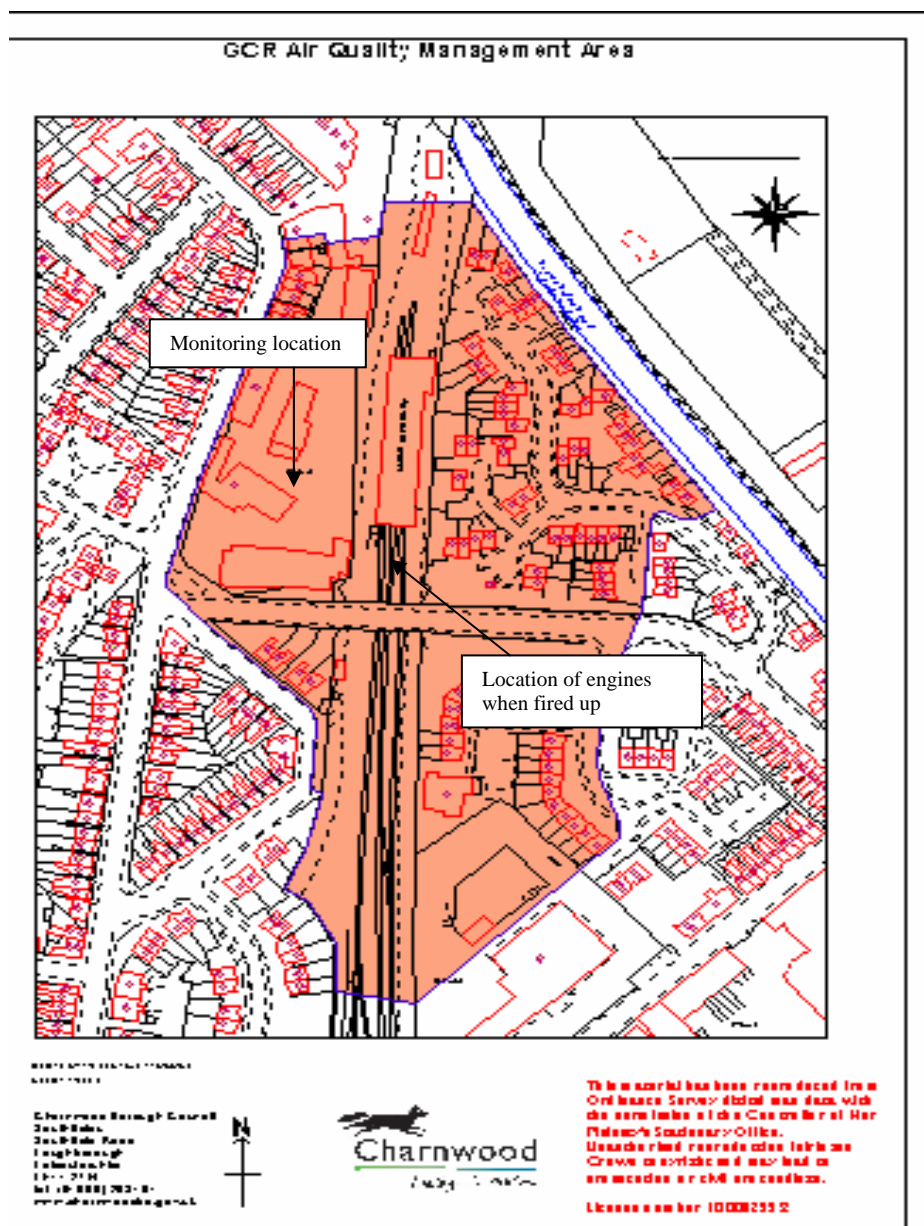


### 6.2.3 Steam Locomotive SO2 Monitoring

A real time analyser was placed 50 metres away from the location at which steam locomotives are brought “into steam” at the Great Central Railway engine sheds (map 6.2). This is a similar distance to that of 6 receptor locations on the other side of the sheds. The monitor was calibrated bi-weekly and data downloaded and ratified daily. All QA/QC was in accordance with LAQM.TG(03).

The data obtained was analysed both in terms of how it compared to data from the Durham Road sulphur dioxide analyser over the same period and against the NAQS 15 minute mean objective.

Map 6.2 Real time SO2 monitoring location near to the Great Central Railway



### Results Summary

	At GCR	At Durham Road (background)
Monitoring period	15 Dec 04 – 18 Apr 05	15 Dec 04 – 18 Apr 05
Data capture	99.5%	72.6%
Mean	10 µg/m <sup>3</sup>	1.4 µg/m <sup>3</sup>
99.7 %ile	133.3 µg/m <sup>3</sup>	
99.9 %ile	225.4 µg/m <sup>3</sup>	
Maximum 15 min average	428.7 µg/m <sup>3</sup>	36 µg/m <sup>3</sup>
No of 15min readings > 100ppb	3	0

Initial analysis of the data suggests that there is a clear elevation of SO<sub>2</sub> at the monitoring location compared with a nearby background site. Some further calculations can be applied to account for other influencing factors including wind direction, seasonal use of the railway and coal type

#### Wind Direction

In order for emissions from the railway to be impacting at the monitoring location, GIS mapping suggested that the wind direction would need to be in the range 100 to 180° (roughly from the south or east). In order to impact on residential receptor locations within 50 metres of the emission point the wind would need to be blowing in the 200 to 290° range (roughly from the south west or the north west).

Of the 11888, 15 minute monitoring data sets obtained during the exercise 1938 (16%) indicate that the wind was coming from the 100-180° sector. Therefore emissions from the GCR engine sheds would have been impacting on the monitoring location for a maximum of 16% of the monitoring duration.

Meteorological monitoring at the background site on Durham Road demonstrates that wind is in the 202-292° sector for 60% of the time based on wind direction data from the last two years. Therefore those 6 properties identified as being within 50 metres of the GCR sheds are downwind of it for 60% of the time.

Extrapolating out to cover a year using the monitoring results;

1. Number of breaches of the 15-minute mean objective at monitoring location over monitoring period  
3
2. Proportion of a year covered by the monitoring exercise  
2972/8760 hours = 34%
3. Predicted number of breaches at the monitoring location over one year  
3(100/34) = 8.8, rounded to 9 days

If a location 50 metres from the source experiences 9 breaches per year with the wind coming from the direction of the source for 16% of the time, then residential receptors downwind of the source for 60% of the time may expect the following number of breaches

$$9(60/16) = 33.75, \text{ rounded to } 34$$

The NAQS prescribes that the objective is being breached where more than 35 exceedences of the 15 minute mean occur.

### *Other Meteorological Impacts*

Clearly the weather conditions and in particular atmospheric conditions such as inversions will play a large role in determining how well emissions from the locos are dispersed. Not enough is known about the local meteorological conditions around the sheds to allow a meaningful insight into whether the conditions during the monitoring period were representative of normal conditions. No further analysis of the results based on met factors has been undertaken.

### *Variations In Activity*

Activities at the GCR are based on timetabled services, which follow some degree of seasonal trend, and non-timetabled events (such as charters for photographs or footplate experiences for customers) which are less seasonal. Given that the majority of loco activity is based on timetabled events it is considered that the annual timetable provides a reasonable insight into the relative intensity of use of the engine sheds during the monitoring period.

Immediately prior to Christmas is a busy time for the railway with numerous special events and Santa Specials. Locos would therefore have been in steam at the sheds daily for all of the period between 15 December and 3 January with the exception of Christmas Day. For the rest of the monitoring period daily services would only have been provided on weekends and school holidays.

Based on the timetable, of the 124 days when monitoring was undertaken, 65 (52%) would have seen one or more locos being brought into steam at the engine sheds. Across the whole calendar year of 2005 a service is programmed for 58% of days.

The monitoring data was therefore obtained during a period which slightly underestimates, but is broadly representative of the actual frequency of use of the engine sheds.

### *Coal Usage*

Obtaining coal with which to fire the steam locos is a substantial business overhead for the GCR. More over obtaining good quality fuel which will not damage the locos is also a key part of the purchasing policy. Finding a cost effective, reliable and good quality supply has been a continual problem for GCR over the last few years. Coal

sulphur content varies significantly and so the coal type in use at any given point in time plays a major factor in the likelihood of breaches of air quality objectives.

Analysis of the sulphur content of coal was carried out as part of the modelling which informed the detailed review and assessment of emissions from the GCR in 2004. In this assessment the impact of emissions from locos at the engine shed was based on computer predictions of coal containing high (8.2%) and low (1.56%) sulphur based on the fuels used at the time. In both scenarios the modelling predicted breaches of the 15 minute and 1 hour objectives for sulphur dioxide at surrounding receptors although the magnitude and geographical extent of the breaches differed substantially.

During December 2004 to April 2005 the coal in use was derived from the Rossington pit although some use was also made of coal from Daw Mill and trials were held using Killock coal. Coal is not a homogenous material and the sulphur content will vary from seam to seam and even within seams. Never the less it is possible to derive average sulphur content for coal from given collieries.

The average sulphur content of various coals used by the GCR over recent years is summarised below:

Source of Coal / Name of Coal	Sulphur content (% of total mass)
Rossington	1.24
Daw Mill	1.56
Killock	0.82
Brunel	2.7
Old Glory	8.2

The coals used during the monitoring period were relatively low in sulphur content compared to other coals used. The emissions from the railway locomotives during the monitoring period will therefore have been less than during periods when higher sulphur coals have been in use. The monitoring data will therefore under represent the impact of emissions from the locos when higher sulphur content coals are used.

#### *Presence of other sources*

No other known sources of sulphur dioxide are known to exist in the near vicinity

## 6.2 Non real time Monitoring

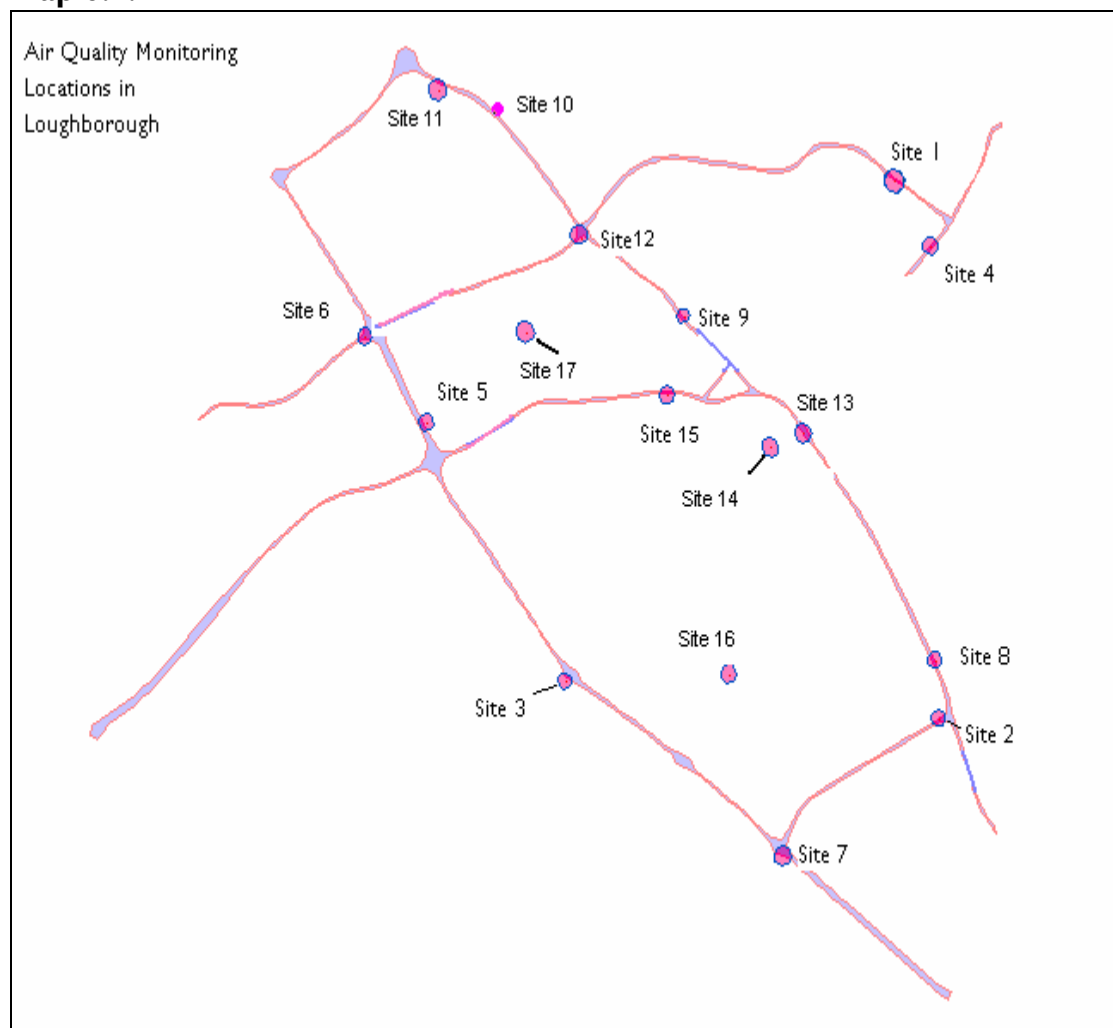
Since the completion of the first review and assessment of air quality we have sought to continuously update and improve our monitoring network. As of November 2005 we have

- 26 Nitrogen dioxide diffusion tube monitoring locations
- 5 benzene diffusion tube monitoring locations
- 5 ozone diffusion tube monitoring locations

Of the nitrogen dioxide monitoring locations 12 are within one of our two AQMAs, located as close as practicable to receptor locations – usually on the facades of residential properties.

### 6.2.1 Nitrogen Dioxide results in Loughborough

**Map 6.2.1**



N.B site 8 (Leicester Road) was moved in Jan 2005 from the location shown here to a more northerly point on the A6 corridor

Annual average results at locations within the designated Loughborough AQMA expressed as microgrammes of nitrogen dioxide per cubic metre:

Location	Year				Compliant	Trend
	2001	2002	2003	2004	2004	
Ratcliffe Road, site 1	37.9	43.7	48.1	41.3	X	Up
Haydon Road, site 5	28.3*	35.9	45.1	38.0	☑	Up
Leicester Road, site 8	43.0*	45.9	44.8	40.1	X	Down
High Street, site 13	53.7	63.0	74.7	67.7	X	Up
Derby Road, site 9	41.2*	46.0	48.8	43.7*	X	Up
Briscoe Avenue, site 10						New site
Ashby Road, site 15	40.4*	43.0*	53.7	42.8	X	Up
Epinal Way / Ling Road, site 7			42.1	36.5	☑	Down
Alan Moss Road / A6, site 12	38.3*	45.7	51.5	45.7	X	Up

Data capture >90% other than data marked with \*

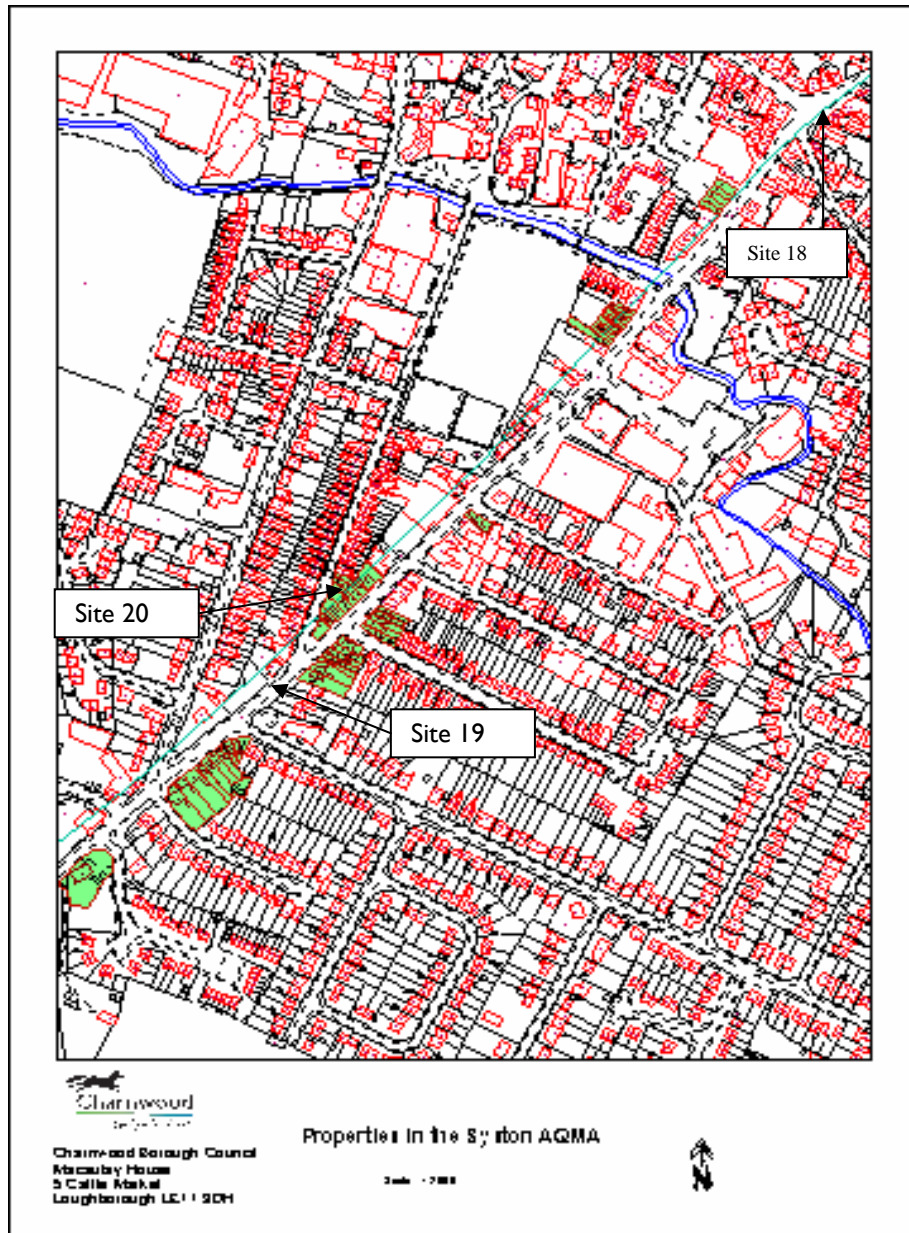
Further monitoring locations in Loughborough which are outside the AQMA:

Location	Year				Compliant	Trend
	2001	2002	2003	2004	2004	
Shelthorpe Road, site 2	43.2	43.0	42.6	30.0	☑	Down
Forest Road, site 3	33.2	32.7	43.6	33.6	☑	Up
Nottingham Road, site 4	33.7	40.3	43	36.0	☑	Up
Alan Moss Rd / Epinal Way, site 6	32.8*	38.6	44.2	36.0	☑	Up
Durham Road, site 11	26.9*	30.3	32.8	25.0	☑	Down
Market Place, site 14	29.6	31.9	35.2	29.4	☑	Up
Beacon Road, site 16	23.7	23.5	25.9	25.1	☑	Up
Rosebury Street, site 17	23.7	25.0	28.5	24.4	☑	Up



## 6.2.2 Nitrogen Dioxide results in Syston

**Map 6.2.2**



### Results at locations within the Syston AQMA

Location	Year	2001	2002	2003	2004	Compliant 2004	Trend
Melton Road, site 18		31.5	34.9	40.6	30.7	<input checked="" type="checkbox"/>	Up
Melton Road Adj St Peters Road, site 19		34.3*	40.9	45.5	37.0	<input checked="" type="checkbox"/>	Up
Melton Road 3, site 20							New Site

### 6.2.3 Nitrogen Dioxide results at other locations in Charnwood

Location	Year				Compliant	Trend
	2001	2002	2003	2004		
Loughborough Road, Birstall, site 21	32.7	33.3	43.9	33.0	<input checked="" type="checkbox"/>	Up
Birstall A6, site 22	37.3*	38.8	48.1	38.5	kerbside	Up
Humberstone Lane Thurmaston, site 23	38.7	41.3	48.7	42.1	kerbside	Up
The Nook, Anstey, site 24	30.9*	36.1*	48.3	38.9	<input checked="" type="checkbox"/>	Up
Melton Road, Rearsby, site 25	33.0	36.4	41.7	44.5	<input checked="" type="checkbox"/>	Up
Ashby Road Central, Shepshed, site 26	34.0*	39.6	46.4	40.6	kerbside	Up
Loughborough Road, Hathern, site 27	38.5	38.8	47	37.7	kerbside	Up

#### QA/QC of diffusion tube data

Since 2001 we have co-located a diffusion tubes immediately adjacent to the inlet to the chemiluminescent analyser at Durham Road (site 11) in order for us to evaluate the accuracy of the results we received from our diffusion tube analytical lab. Using the method outlined in LAQM TG (03) box 6.4 we have been able to develop local bias correction factors to apply to diffusion tube data from the rest of the borough. More recently we have augmented this with the additional bias correction data that has been made available on the Local Air Quality Management web resource site <http://www.uwe.ac.uk/aqm/review>. This indicated that our own bias correction factors were within a high degree of accuracy relative to those derived from other local authorities diffusion tube studies. This gives us a lot of confidence with the accuracy of the historical results we have obtained since 2000. In applying bias correction factors to our data for the purposes of this report we have used national factors and only included local factors where no or limited national data exists.

#### Correction factors obtained for diffusion tubes exposed in Charnwood

Year	Correction Factor
2004	1.1315 (+13.15%)
2003	1.029 (+2.9%)
2002	1 (no correction required)
2001	1.015 (+1.5%)

### 6.3 Commentary on Results

Of nine monitoring locations in the Loughborough AQMA, seven continued to exceed air quality objectives in 2004 while two complied. None of the monitoring locations outside the AQMA breached the objective. This does suggest that the AQMA is about right in its size and coverage.

Twelve sites in Loughborough have experienced increased levels of nitrogen dioxide over the past 4 years, whilst four have seen decreases. Three of these four sites are at locations which have experienced reduced traffic flows following the construction of the Epinal Way Extension. Surprisingly, the sites near to locations where increased

traffic flows are assumed as a consequence of the road do not seem to have experienced an increase in pollution above the norm. This may be due to the better flow / reduced congestion and because of the better dispersion characteristics of these sites.

Generally the 4 year trend shows increasing levels of nitrogen dioxide. However if the data for 2003 (a particularly bad year for air quality) is taken out then the trend is more stable and generally suggests that levels are remaining approximately the same. There were breaches of the nitrogen dioxide objective at locations in Rearsby and Shepshed. The Rearsby site is expected to experience a major reduction in 2005 following the construction of the Rearsby by pass. However the results from Shepshed will need to be looked at in more detail as part of future review and assessments. The two monitoring locations in the Syston AQMA met the objective in 2004.

Type tested monitoring of sulphur dioxide emissions from the Great Central Railway demonstrate that it is causing occasional breaches of the 15 minute concentration limit for the air quality objective. By extrapolating the results from the four month monitoring exercise there is good evidence that there may well be more than 35 instances where the 15 minute SO<sub>2</sub> objective is exceeded at nearby receptor locations. This suggests that the declaration of the AQMA around the sheds was appropriate.

The monitoring suggests that the modelling results which led to the original declaration of the GCR AQMA are probably overly pessimistic and that the magnitude and range of the breach is not as great as was first feared.

## 7. New Developments which may affect air quality

Much like the rest of the country the face of Charnwood is constantly evolving as human developments reshape the urban environment.

This section of the report highlights some of the significant developments in the built environment that have and are likely to have an impact on the future of air quality in the Borough.

The Stage 2 Updating and Screening Report published in 2003 picked out the major developments, based on guidance in LAQM.TG(03) that may have an air quality impact. These were:

Development	Likely Impact
Hallam Fields, Birstall	Increase in traffic along the A6 corridor in Birstall (an AQMA which was revoked in 2004)
Epinal Way Extension, Loughborough	Impact on general traffic flows around Loughborough (an existing AQMA)
Meadow Lane Link road, Loughborough	Diversion of traffic away from Ratcliffe Road in Loughborough (an existing AQMA)
Barkby Road development, Syston	Increase in traffic along Barkby Lane (not an AQMA) and Melton Road (an existing AQMA)

The **Hallam Fields** development has received full planning consent and is in the early stages of construction. An environmental impact assessment in relation to the development suggested that it would not impact on road traffic until late in the decade. Following the completion of a Stage 4 review and assessment of air quality in Birstall, Charnwood Borough Council took the decision to revoke the Air Quality Management Area. Monitoring will continue to keep this situation under review.

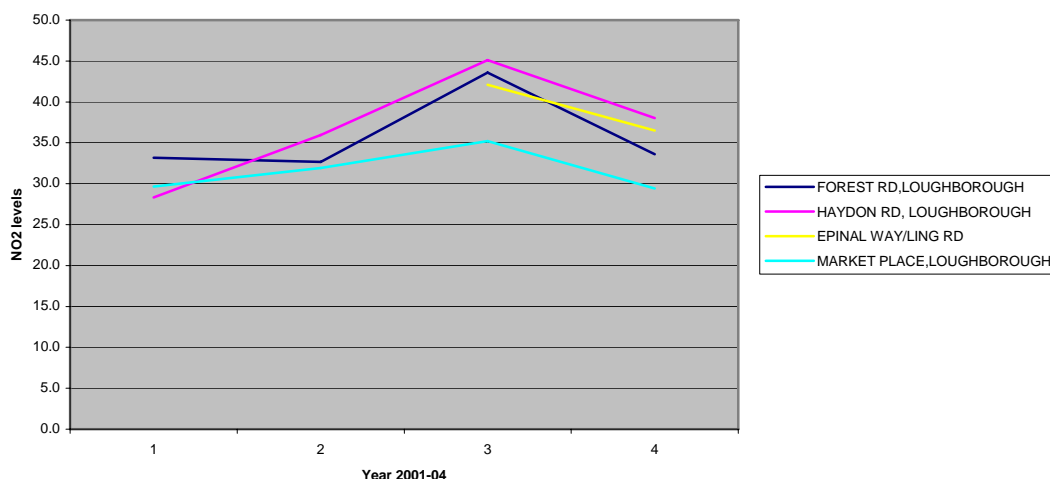
The **Epinal Way Extension** was opened in 2003. It has resulted in a significant diversion of traffic off the southern part of the A6 corridor in Loughborough which has mainly been diverted onto the western A6004 ring road.

Since the road was opened a stage 4 review and assessment of air quality has taken place. The diverted traffic has resulted in properties on the A6 south of the Shelthorpe Road junction being taken out of the Loughborough Air Quality Management Area.

It does seem to have made a significant difference to air quality in the southern part of the A6 corridor. Diffusion tube monitoring sites number 2 (Shelthorpe Road) and 8 (Leicester Road) are virtually the only ones showing a downward trend over the last 4 years. Leicester Road is now close to achieving the air quality objective and Shelthorpe Road meets it - see section 4 above.

Monitoring continues at sites which traffic diverted from the A6 can reasonably be assumed to be passing at greater volumes. Sites number 3 (Forest Road), 5 (Haydon Road) and 7 (Alan Moss Road) all show upward trends in nitrogen dioxide levels. However the extent of these increases do not seem to be out of proportion with trends at background sites over the same period.

**NO2 trends following the construction of the Epinal Way Extension, Epinal Way sites against background site (Market Place)**



The **Meadow Lane Link Road** is still an aspiration of the Borough Council to implement. During the summer of 2005 a consultation exercise is being held with local residents and other stakeholders to decide on the preferred design of three submitted by local developers.

The **Barkby Road** development in Syston has been granted full planning consent. An air quality assessment of the development has indicated that the impact of the development will lead to a very slight increase in nitrogen dioxide levels of between 0.1 and 0.24  $\mu\text{g}/\text{m}^3$  nitrogen dioxide on Melton Road. Currently a Section 106 agreement is being consulted upon which is focused on making environmental improvements to Syston. Some of the current proposals may have a small impact in leading to reduced travel flows on the Melton Road. The Highways Agency are also in the process of making changes to the nearby junction of the A46 which should be complete by the spring of 2006. It is suggested that highway improvements here may eventually result in up to a 10% reduction in peak hour traffic in Syston. Traffic modelling of the area is currently being revised by Leicestershire County Council from which further air quality modelling is expected to be carried out to improve predictions in the Syston AQMA.

The developments detailed above are those identified from the government's technical guidance as those likely to have a significant impact on local air quality. This does not mean that other developments will not impact on local air quality. The Environmental Protection Team have an active input into the development control process in that the weekly list of planning applications are monitored and any proposals with a likely air quality impact are requested for consultation.

From January 2004 to June 2005, 492 planning applications have been inspected and commented upon by the Environmental Protection Team in relation to their potential environmental impact. During this period there have been no new installations applied for or constructed under the Pollution Prevention and Control Act which may impact on air quality. There have been no new mineral or landfill applications or constructions and no new roads other than the Epinal Way Extension.

Some of the applications which have been commented upon in respect of their potential impact on air quality objective breaches include;

Application	Application description
04/1796	Construction of flats in an AQMA
04/2840	Construction of new flats adjacent to A512
04/2890	Construction of residential properties within 400m of granite quarry
04/3534	Phased development of student accommodation around Loughborough
05/1099	Retail store in AQMA
05/1640	Residential estate development around the A6
05/0656	Residential estate development adjacent to the A6 AQMA
05/0776	Conversion of commercial building to flats in an AQMA
05/0964	Construction of flats adjacent to steam railway station

## 8. Air Quality Action Planning

### 8.1 Work to date

Following the declaration of an Air Quality Management Area local authorities are tasked with carrying out a detailed review and assessment of air quality in the AQMA within 4 months of the declaration, and within 12 months to have produced and consulted on an Air Quality Action Plan. DEFRA have issued guidance on the contents of Action Plans and how they can be integrated with other key policy documents such as the Local Transport Plan.

Over the last year Charnwood's response to the emerging air quality issues in the borough has steadily evolved:

March 2004	Interim Stage 4 Review and Assessment of air quality published focusing on road traffic emissions but lacking detail about source apportionment of emissions from vehicle classes
April 2004	Consultant appointed to draft a first version Air Quality Action Plan
July 2004	Draft Air Quality Action Plan endorsed for public consultation by Cabinet
August 2004	Detailed Review and Assessment of air quality published focusing on air quality around two non traffic sources
October 2004	Final Stage 4 Review and Assessment published including source apportionment details
November 2004	Endorsement from Regulatory Committee for the declaration of three Air Quality Management Areas in the locations identified by the Final Stage 4 and Detailed Assessment reports
January 2005	Publication for consultation of a final draft Air Quality Action Plan following technical amendments arising from the Final Stage 4 and Detailed Assessment reports
January – March 2005	Air Quality Action Plan consultation
May 2005	Publication of the first draft of the Local Transport Plan (LTP2) including an appraisal of all transport actions in the draft Action Plan
Nov 2005	CBC response to provisional LTP

### 8.2 Current Status

The draft Air Quality Action Plan contains 13 *Options* and 20 *Measures* for addressing the air quality issues identified. The *Options* are hard, engineering solutions for which reasonable quantified estimates can be made in terms of their air quality impacts. The *Measures* are softer, educational and policy based actions which it is much more difficult to quantify the impacts of.

Air quality is one of the four key areas which guidance requires the current Local Transport Plan to concentrate on. Having consulted with Leicestershire County Council throughout the drafting of the Action Plan it was pleasing that all of the transport *options* identified and prioritised in the AQAP have been picked up in the provisional LTP2. County Council have carried out further cost benefit analysis of

these actions and there has been some amendments of their prioritisation of the work. Most of the *measures* have also been picked up and a number of other actions besides. This approach fits in with current DEFRA guidance on AQAP / LTP integration which states:

*“For those local authorities that have designated AQMAs where road transport is identified as the primary source, it is recommended that they should integrate their AQAP into the LTP.”* LAQM.PGA(04) para.13

Consultation and fine tuning will continue with County Council as the LTP2 continues through its development process.

The only area where the AQAP and LTP are not in parallel is in relation to air quality in Syston. Leicestershire County Council have made the point that long term monitoring has demonstrated an objective breach here on one occasion in 2003, which was shown to be a poor year for air quality around the borough with the annual average NO<sub>2</sub> concentration up 24% on average across the borough. They have also expressed concern that whilst modelling of this road suggests that there will be a breach of the objective, this is primarily because of the application of a validation factor of 1.6 to the model. This validation factor has been derived from comparisons of model and monitoring data from monitoring locations within 10 meters of kerbside in Leicester city. An absence of real time roadside data in Charnwood means that no more local validation factors can yet be applied to the Syston or Loughborough models.

Given that the transport related options and measures are now actively being considered by the transport authority, the role and need for an AQAP in Charnwood has been re-evaluated. The key remaining issues are to ensure that,

- Those options and measures prioritised in the draft Air Quality Action Plan that are not within the County Councils power to deliver via the LTP are retained as a corporate commitment by other responsible bodies (principally Charnwood Borough Council).
- Non road transport related air quality actions are retained within a much smaller revised AQAP. This revised AQAP will require Cabinet endorsement
- Attention is paid to closely monitor air quality trends in Syston and influence the LTP in future years if more robust evidence of air quality objective exceedences emerge.
- Any major transport engineering schemes, such as the Loughborough Inner Relief Road, are subject to air quality appraisals to determine their net impact, to inform the decision to progress and to assist in the design process.

### **8.3 Future Progress Management for Air Quality Actions**

In July 2005 Cabinet agreed to a revised approach to the production of the draft AQAP. The transport related actions in the existing AQAP are proposed to be



removed and a smaller AQAP produced which will relate only to emissions from the Great Central Railway engine sheds. The annual progress reports, of which this is the first, will continue to monitor and report on progress with all transport related aspects of the draft AQAP. Any underperformance, lack of progress or new evidence identified can then be picked up and dealt with either through the annual LTP review or incorporated into the annual Service Development Plan process of Charnwood BC. Reports are proposed to be produced and fed through Regulatory Committee around August in good time for the drafting of service plans for the next financial year.

A Project Initiation Document (PID) has been written and a project board created to manage air quality management over the next two years. The milestones contained within the PID are reported to and monitored by the Councils Senior Management Team and the Performance and Audit Committee.

## Action Plan Implementation Report, Nov 2005

Many of the original actions proposed in the draft AQAP produced in 2004 have now been adopted or incorporated into other strategy or policy commitments, either by Charnwood or other lead agencies. The following table outlines **all** of the actions originally identified in the AQAP. It outlines where in other strategy or policy documents a commitment relevant to the original action has been included, or if no such commitment has been made indicates what, if any, progress has been made.

### High Priority

Option /Measure	Original Timescale	Progress	Outcome	Comments
Loughborough Inner Relief Road	2010	Major bid scheme to DfT proposed in 2006		(Ref draft LTP p.149
Improved traffic flow on Epinal Way	2010	Excluded from major bid scheme until the LDF is better developed		(Ref draft LTP p.151)
Nottingham Road – Bridge Street Link	2007-8	Part of Eastern Gateway project. Consultation on preferred scheme currently underway		ref Community Strategy aim 4 action 1
Action Plan / LTP2 integration	2005	COMPLETE	AQAP incorporated into draft LTP	Annual AQ progress reports programmed to coincide with LTP annual reports. Two air quality targets in the draft LTP2 p.120
LDF policies for access to Dishley Industrial Area and the Meadow Lane-Station area.	2006	LDF currently under production		
All new developments and schemes are encouraged to provide facilities for cyclists and pedestrians	2005	COMPLETE		Similar policies will need to be carried forward into the LDF Ref Local Plan Policy ST/2 & ST/3, H/16
Ensure that air quality is taken into account in the planning process	2005	COMPLETE	Air quality is a material planning constraint. All new planning applications are referred to and commented on by EHOs.	Ref EH 05/06 SDP
Improve sustainable transport through work with developers	2005	Policies to be continued through the LDF		ref Local Plan policy E/1

Option /Measure	Original Timescale	Progress	Outcome	Comments
Improve local air quality monitoring	2006	Proposed increase in air quality monitoring network by April 06		SCE(R) funding obtained in 2005 for two new real time NO2 analysers ref EH 05/06 SDP
Relocation of GCR engine sheds	2008	New buildings acquired by GCR. Suitable land being sought		ref Air Quality Action Plan
Abate or improve dispersion of smoke from GCR	2008	The relocation option is being pursued as a first choice		ref Air Quality Action Plan

\* the draft LTP referred to is that published in July 2005

### Medium Priority

Option /Measure	Original Timescale	Progress	Outcome	Comments
Pedestrian preference to Loughborough town centre	2010	Major bid scheme to DfT proposed in 2006		Ref draft LTP2 p149
Low Emission Zone	None	None	Not included in this LTP2 round. Cost / benefit analysis rejected this option	Ref draft LTP2 appendix D
Traffic flow improvements on the Melton Road, Syston	None	Not included in this LTP2 round		Ref draft LTP2p120.
Improve fuel quality at the GCR	2007	The relocation option is being pursued as a first choice		ref Air Quality Action Plan
Implement the Council's Staff Travel Plan	2006	Original Plan implemented in 2000. Staff Travel Group has been reconvened & Plan in the process of being revised		ref Climate Change Strategy T1
Reduce the amount of travel and distances travelled between home and work	2007	Relevant policies to be developed through the LDF		
Develop supplementary planning guidance to assist with air quality assessments	None	Rejected following consultation on the draft AQAP		SPG considered unnecessary given the perceived adequacy of the existing planning consultation arrangements
Develop local Climate Change Strategy	2005	COMPLETE	Adopted in July 2005	Action Plan to be updated annually

Option /Measure	Original Timescale	Progress	Outcome	Comments
Publish annual progress reports	2005	COMPLETE	First report (this) published Aug 05	Reports to be published annually each August
Encourage fleet operators and members of the public to properly maintain their vehicles	None	5 vehicle emission testing days programmed for 2006/7		Draft 06/07 Health & Housing SDP
CBC to initiate vehicle emissions testing	None	Draft submission in Service Development Plan (SDP) for 2006/7		
CBC will continue to promote energy awareness throughout the Borough	2005	COMPLETE		Included in 2005/6 SDP
CBC to promote the use of low emission vehicles in the Borough Council's own fleet of municipal and general purpose vehicles	2010	Low emission target & effective maintenance target adopted in Climate Change Strategy		Ref Climate Change Strategy T3 & T4

### Low Priority

Option /Measure	Original Timescale	Progress	Outcome	Comments
Parking Control Policies	2006	COMPLETE	Review of off street parking complete	On street parking policies to be considered as part of decriminalised parking for CBC
Bus/rail interchange at Loughborough Station	2007-8	Part of Eastern Gateway project. Consultation on preferred scheme currently underway		
Evaluate bypass schemes for Loughborough and Syston	None	Not included in this LTP2 round		
Development of travel plans for new sites	2005	COMPLETE		ref Local Plan TR/6
Encourage the uptake of Employer and School Travel Plans within Charnwood	2010	School travel targets in draft LTP2 Workplace travel plans target in LTP2		Ref draft LTP2 p193. CBC urged particular focus on Syston in response to the provisional LTP
Review and improve the facilities for cycling		Cycling targets in draft LTP2		Ref draft LTP2 p193

Option /Measure	Original Timescale	Progress	Outcome	Comments
CBC will run one promotional event a year to raise the profile of air quality in Charnwood		5 vehicle emission testing days programmed for 2006/7		Draft 06/07 Health & Housing SDP
Improved bus services and facilities	Target for increased use of buses in draft LTP2			Ref draft LTP2 p192
Park and ride scheme for Loughborough		Rejected in this LTP2 round on cost / benefit grounds		Ref draft LTP2 appendix D
Congestion charging		Rejected in this LTP2 round on cost / benefit grounds		Ref draft LTP2 appendix D

#### Other Proposals from LTP

Option /Measure	Original Timescale	Progress	Outcome	Comments
Work through Quality Bus Partnership to reduce bus emissions		LTP targets for % of older buses in the fleet		Ref draft LTP2 p197
Reduce the number of older, more polluting vehicles on the network	None	LTP targets for % of older HGV vehicles in the fleet in Loughborough		Ref draft LTP2 p197

