

**Environmental
Services**



**Melton
Borough
Council**

Revocation of the Air Quality Management Area

January 2005

Executive Summary

The Environment Act 1995 makes a requirement for local authorities to monitor air quality. Objectives for levels of certain pollutants have been specified. If the levels within the borough exceed, or are predicted to exceed the objectives then an air quality management area (AQMA) must be declared.

In 2001 an AQMA was declared surrounding Melton Mowbray town centre. Modelling of air quality for nitrogen dioxide (NO₂) had demonstrated that the objective was not likely to be met. The modelling was based on meteorological data from Leicester and traffic data.

Melton Borough Council routinely monitors for NO₂. Following analysis of new data from 2003, in conjunction with revised traffic flows specifically for Melton Mowbray, the predicted levels of NO₂ are substantially less than previously thought. The NO₂ objective is now likely to be met and it is proposed that the AQMA is revoked.

CONTENTS

SECTION	CONTENTS	PAGE
	EXECUTIVE SUMMARY	2
1	INTRODUCTION	4
2	PURPOSE OF THE REPORT	6
3	NEW MONITORING RESULTS	8
4	NEW MODELLING	11
5	NEW LOCAL DEVELOPMENTS	12
6	ADDITIONAL INFORMATION	12
7	CONCLUSIONS	13

Revocation of the Air Quality Management Area

Section 1 : Introduction

- 1.1 The local air quality management (LAQM) system was introduced in the Environment Act 1995 and subsequent Regulations. Local authorities have to review the present quality of air and the likely future quality of air and assess whether the nationally prescribed objectives are likely to be achieved. Progress reports are required to be undertaken in the years when the authority is not carrying out Updating and Screening Assessments or a Detailed Assessment of air quality.
- 1.2 The air quality objectives in Table 1, provide the statutory basis for the system of Local Air Quality Management.

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.5 µg/m ³	Running annual mean	31.12.2003
	5 µg/m ³	Annual mean	31.12.2010
1,3 Butadiene	2.25 µg/m ³	Running annual mean	31.12.2003
Carbon monoxide	10.0 µg/m ³	Maximum daily running 8-hour mean	31.12.2003
Lead	0.5 µg/m ³	Annual mean	31.12.2004
	0.25 µg/m ³	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m ³ not to be exceeded more than 18 times a year	1 hour mean	31.12.2005
	40 µg/m ³	Annual mean	31.12.2005
Particles (PM ₁₀)	50 µg/m ³ not to be exceeded more than 35 times a year	24 hour mean	31.12.2004
	40 µg/m ³	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m ³ not to be exceeded more than 24 times a year	1 hour mean	31.12.2004
	125 µg/m ³ not to be exceeded more than 3 times a year	24 hour mean	31.12.2004
	266 µg/m ³ not to be exceeded more than 35 times a year	15 minute mean	31.12.2005

TABLE 1: EXTRACT FROM THE AIR QUALITY REGULATIONS

- 1.3 Previous reports have indicated that the Government's objectives are being, or will be, achieved in Melton Mowbray for all the pollutants of concern, except nitrogen dioxide (NO₂), by the due dates. National measures to reduce emissions by road vehicles appear to be having the desired effect of reducing air pollution and ensuring compliance with the Governments objectives.

- 1.4 This report supplements previous reports by providing additional details about the subsequent monitoring and modelling carried out in 2003.
- 1.5 Figure 1 is provided to indicate the location of Melton Borough in Leicestershire, as well as the location of the town, two largest villages and the major road links.



FIGURE 1: MAP OF MELTON BOROUGH AND POSITION IN LEICESTERSHIRE

Section 2 : Purpose of the Report

2.1 To demonstrate why the air quality Management area (AQMA) was declared and provide detailed subsequent monitoring and modelling data to enable its revocation.

2.2 Air Quality Management Area (AQMA)

Figure 2 shows the AQMA marked in blue. In March 2001, the Council passed the following resolution:

“That there is a ‘probability’ the annual average air quality objective for NO₂ will not be met at 31 December 2005, the Council decided that the most appropriate action was to declare an **Air Quality Management Area (AQMA)** for that part of the Melton Town where there are ground floor habitable dwelling within 10 metres of the highway”.

An **Order** was made on 21 March 2001 to come into force on 21 April 2001.

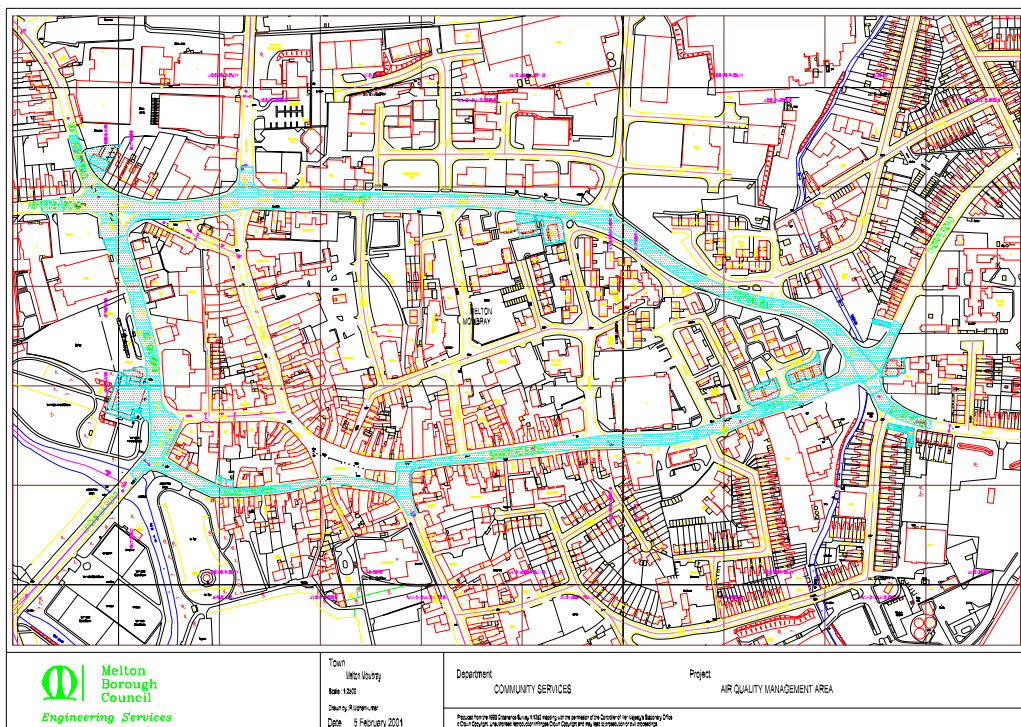


FIGURE 2 - MAP OF THE AQMA

2.3 Modelling

The information from the monitoring exercise provided the initial result in Figure 3, on which the air quality management was declared.

Melton Town Centre

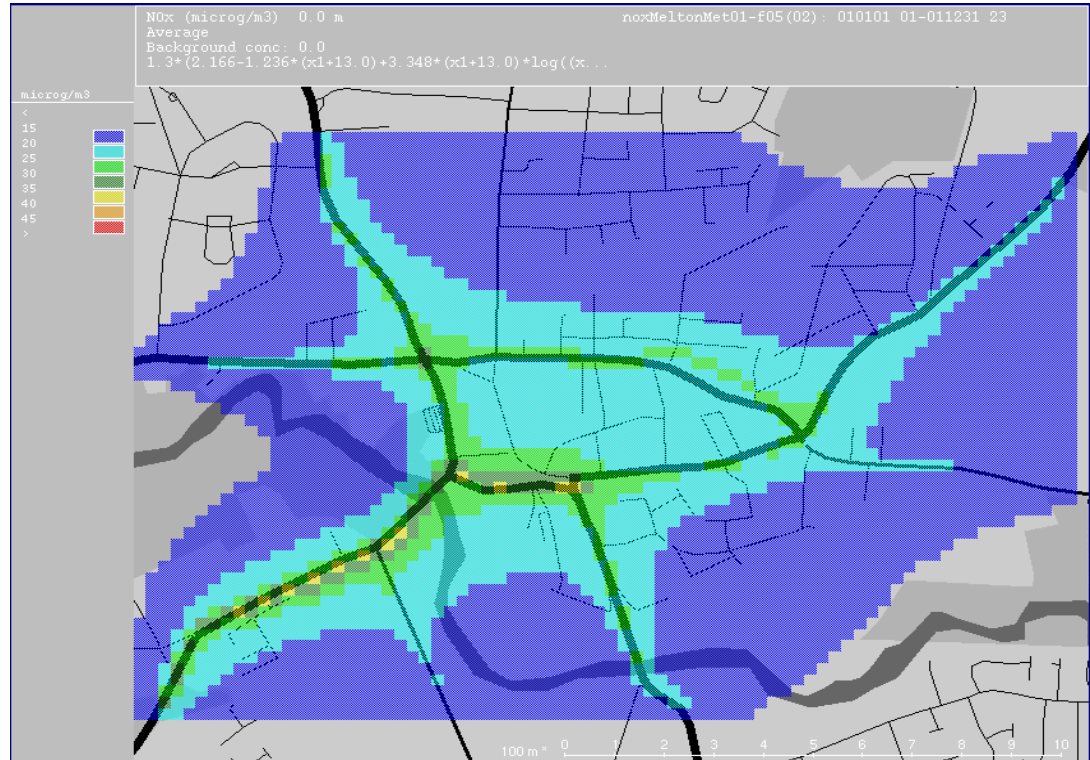


FIGURE 3: ANNUAL AVERAGE NO₂, MET YEAR 2001, 2005 DATABASE (EMISSION FACTORS RELEASED 2002). INCLUDES BACKGROUND AND CORRECTION FACTOR

2.4 Modelling assumptions:

- i) It was assumed that the meteorological conditions in 2005 would be the same as in 2001, the met year used for the model dispersion calculations.
- ii) Meteorological data for all model runs was from the Leicester met mast located at the junction of Groby Road, New Parks Boulevard, and Glenfrith Way, Leicester (O.S. ref 55830638)
- iii) Validation was by comparison with Leicester monitoring stations. It was assumed that the weather and pollution levels in Melton during 2001 (the year used for validation) were the same as those in the city. The validation methodology was taken from "Air Quality Management Areas: Turning Reviews Into Action", published by the National Society for Clean Air and Environmental Protection. Using this methodology, a correction factor of 1.3 was calculated.
- iv) Vehicle emission factors for 2005 and 2001 (for validation) were those supplied by NETCEN Stanger in 2002, the most up to date figures available.
- v) The background concentration of NO_x was taken from the rural air quality monitoring site at Ladybower, Derbyshire. The background NO_x was added to predicted values of NO_x and the overall value of NO₂ was calculated using the Derwent-Middleton equation.

2.5 Conclusion to this Modelling

It was assessed from this that the solutions to the problem were all traffic related. Due to the road configuration, with Melton Mowbray being at the cross of several major routes the rerouting of traffic may not be practicable due to the lack of suitable alternative roads. The provision of a new bypass around all or part of the town would resolve the problem.

Section 3 : New Monitoring Results

- 3.1 **Diffusion Tubes:** The Council monitors oxides of nitrogen at eleven diffusion tube sites throughout the Borough. There are three town centre sites, five main roads in the town of Melton Mowbray and three main roads out of the town, see Figure 4 below.

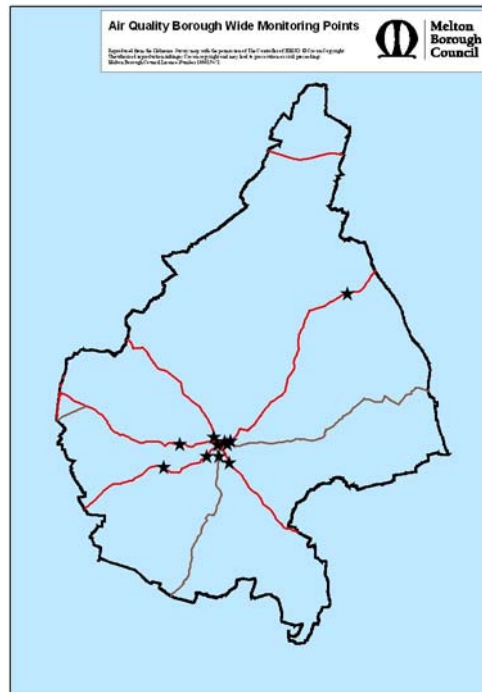


FIGURE 4: DIFFUSION TUBE SITE LOCATIONS

- 3.2 **Nitrogen Dioxide**

OBJECTIVE: 200 micrograms per cubic metre or less, when expressed as an hourly mean, not to be exceeded more than 18 times a year to be achieved by 31 December 2005 or 40 micrograms per cubic metre or less, when expressed as an annual mean, to be achieved by 31 December 2005.

- 3.3 Diffusion tubes are provided and analysed by Casella Group Ltd using 10% TEA (triethanolamine) in water and are typically exposed for one-month periods. Results have been corrected by 0.92, for laboratory bias using the recommended default factors evaluated by 'netcen', a division of AEA Technology plc. In table 2 below, the unadjusted results from 2003 are shown, along with the NETCEN bias corrected value and the projected results for 2005 and 2010.

LOCATION	ANNUAL MEAN (unadjusted) 2003 µg/m ³	NETCEN CORRECTED VALUE (0.92) 2003 µg/m ³	CORRECTION FOR 2005 (Value x.892/.941) from TG(03) Box 6.6	CORRECTION FOR 2010 (Value x .734/.941) from TG(03) Box 6.6
Norman Way, Melton Mowbray	36	33	31	26
Sherrard Street, Melton Mowbray	36	33	31	26
Wilton Road, Melton Mowbray	31	29	27	23
Nottingham Road, Melton Mowbray	27	25	24	20
32 Thorpe Road, Melton	34	31	29	24
Burton Road, Melton	29	27	26	21
Dalby Road, Melton Mowbray	25	23	22	18
Leicester Road, Melton Mowbray	27	25	24	20
LOCATION	ANNUAL MEAN (unadjusted) 2003 µg/m ³	NETCEN CORRECTED VALUE (0.92) 2003 µg/m ³	CORRECTION FOR 2005 (Value x.892/.941) from TG(03) Box 6.6	CORRECTION FOR 2010 (Value x .734/.941) from TG(03) Box 6.6
Leicester Road, Kirby Bellars	23	21	20	16
Melton Road, Asfordby Hill	31	29	27	23
Main Road, Croxton Kerrial	23	21	20	16

TABLE 2 – CORRECTED DIFFUSION TUBE DATA FOR 2003 AND PROJECTED FOR 2005 AND 2010

3.4 As can be seen from the data in Table 2, the NO₂ diffusion tube monitoring demonstrates that the highest corrected annual mean for 2003 was 33µg/m³ and when this is projected for the years 2005 and 2010 the results indicate levels of 31µg/m³ and 26µg/m³ respectively. To fail to achieve the air quality objective for NO₂ the traffic levels would have to increase substantially and this will not be the case. Figure 5 below shows the locations of the above town centre tubes. The first three are clockwise from the top on the lilac ring, indicating the AQMA and the next five are clockwise from the top of the map. The last three monitoring points can be seen as the outer stars on Figure 4 from left to right.

3.5 New Traffic Monitoring Data

Melton Borough Council contributed £15,000 funding to Leicestershire County Council to undertake monitoring of traffic flows, primarily in the town centre. The results are very detailed and amount to numerous pages of an Excel spreadsheet. These can be made available upon request.

Table 3 shows a summary detail of average annual daily totals for the major roads of Melton Town Centre. It can be seen that of the nine results for 2003 eight demonstrate a reduction in average daily totals. The noticeable increase is for Norman Way inbound on

a Sunday. Further work could be done to try and establish the reason for this, if proven to be significant. These are an indication of the revised results contributing to the updated modelling.

There are Annual Average Daily Totals (AADTs) going back several years. The figures for the last three years are as follows:				
		2001	2002	2003
92611 (Leicester Rd, Outbound),	Mon-Fri	12409	12854	11595
92611 (Leicester Rd, Outbound),	Sat	10893	11189	10169
92611 (Leicester Rd, Outbound),	Sun	9291	9573	8860
92631 (Norman Way, Outbound)	Mon-Fri	13691	13798	12597
92631 (Norman Way, Outbound)	Sat	12418	12277	11177
92631 (Norman Way, Outbound)	Sun	9476	9504	8885
92632 (Norman Way, Inbound)	Mon-Fri	7293	7342	7262
92632 (Norman Way, Inbound)	Sat	6158	6143	6098
92632 (Norman Way, Inbound)	Sun	4567	4630	4701

TABLE 3: MELTON TOWN CENTRE TRAFFIC COUNT SUMMARIES

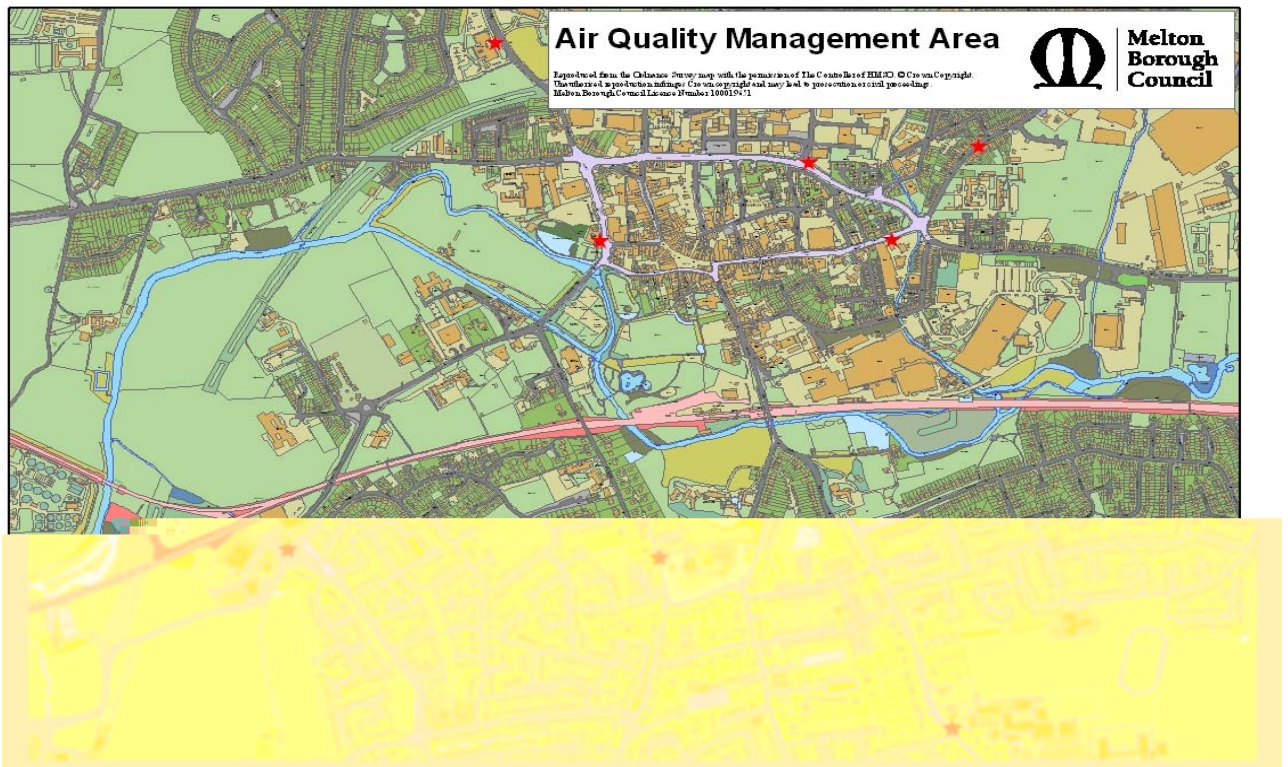


FIGURE 5: MAP OF THE TOWN CENTRE WITH DIFFUSION TUBES LOCATIONS IDENTIFIED

Section 4 : New Modelling

- 4.1 This additional data for diffusion tube measured results for 2003 and specific traffic flow data for 2003 enabled new modelling to be undertaken. The results of the monitoring were then compared to the model results. The modelled results were assessed to have been too high. They included a correction figure of 1.6 based on Leicester data for meteorology. Using the NSCA methodology the correction figure was amended to 1.3 for the Melton model. The result is shown below in Figure 6.

Annual average NO₂ for Melton Town Centre

Met year: 2003. Database: Melt0406. Emission factors for 2003, released 2002.

Includes background NO_x (converted to NO₂) of 25 µg/m³, source Harwell.

Correction factor: 1.3. Uncertainty: +/- 3 µg/m³, (2 standard deviations)

Values only apply to areas within 10m of kerb

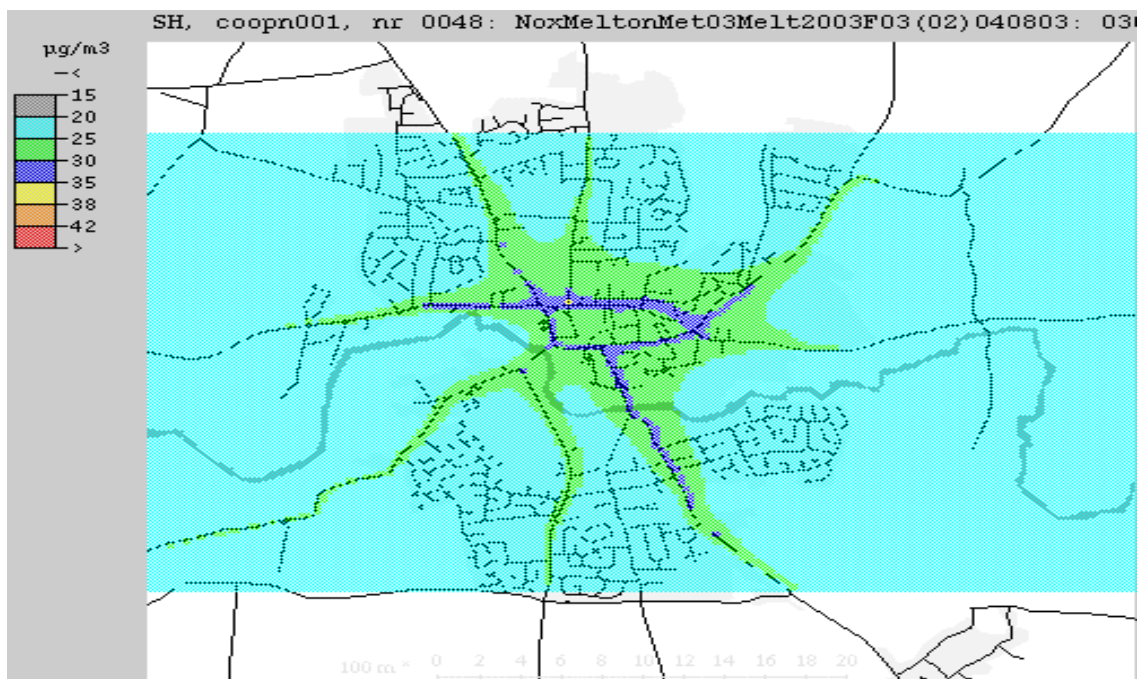


FIGURE 6: MODELLING BASED ON 2003 DATA

- 4.2 The vast majority of the result falls in the 30-35µg/m³ band (shown in purple). The single area marked yellow has a modelled result of 35µg/m³. This demonstrates that it is at the lower end of that scale banding. The results as a whole further suggest that the air quality objective for NO₂ is not likely to be exceeded at 31st December 2005.

Section 5 : New Local Developments

- 5.1 No new industrial processes (A1, A2 or B) commenced operation or changed significantly during the period 1 January 2003 to 30 November 2004. Existing processes are being permitted as A1 and A2 under the appropriate regulations.
- 5.2 There have been no new developments with impact on air quality, e.g. which have resulted in significantly increased traffic flows. On the contrary, research by Leicestershire County Council has concluded that Melton needs a bypass. If this were to become a reality in the future it would impact by significantly reducing traffic flows in the town centre.
- 5.3 A new quarry has been granted planning permission about 5 miles out of Melton Town. This will be taken into account when assessing future results.

Section 6 : Additional Information

- 6.1 The Council does not monitor ozone, polycyclic aromatic hydrocarbons (PAHs) or any other air pollutant. During 2003 there were no complaints regarding odour and dust emission from regulated industrial sources.
- 6.2 £15,000 of the planning delivery grant has been used to develop the link with air quality, transport and planning. It has contributed to monitoring traffic flows, travel speeds and carrying out a census to provide valuable data. There is a multi departmental team of officers from Melton Borough Council and Leicestershire County Council who are working together to progress these issues.
- 6.3 An aim of the Leicestershire County Council Local Transport Plan is to achieve improvement of the air quality. The action plan relates to transport in Melton Mowbray. It addresses congestion in the town centre. A traffic model has been developed that takes forward the work previously carried out. This is being used to test alternative solutions to traffic problems. By the end of 2004, a consultation paper will be published to explore the issues and consider possible solutions. The outcome of this consultation will frame policies for the new transport plan for Leicestershire in 2005.
- 6.4 Melton Borough Council Local Development Framework will link with this consultation and the outcomes. It is acknowledged that more land in the Borough will be required for new housing and employment land. It is intended that this will contribute to the solution for transport. The Local Development Framework is due for publication in 2007.

Section 7 : Conclusions

- 7.1 Air quality in Melton currently meets national standards for carbon monoxide, benzene, 1,3-butadiene, lead, sulphur dioxide and particulates.
- 7.2 It is apparent from the updated monitoring and modelling that the air quality objective annual mean of 40µg/m³ of NO₂ is now likely to be met.
- 7.3 Melton Borough Council will continue to monitor the eleven diffusion tube sites in the Borough and will analyse the results for trends. If it becomes apparent that the air quality objectives for NO₂ are not being met, this Authority will take appropriate steps.
- 7.4 The interdepartmental links into the Leicestershire Transport Plan will continue, as transport is the major contributor to air quality in Melton Mowbray. It is perceived that this will be the most effective method to bring about further improvement to the air quality issues in the town.
- 7.5 Further information concerning this report may be obtained from Victoria Clarke, Principal Environmental Health Officer on 01664 502408 or e-mail vclarke@melton.gov.uk.

VC – Revocation of AQMA Report 2004