



Air Quality Updating and Screening Assessment 2009



In fulfillment of Part IV of the Environment Act 1995
Local Air Quality Management

April 2009

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Executive Summary

The only pollutant which has been determined to be of significance in the Borough of Melton throughout the air quality review and assessment process since the year 2000 is **nitrogen dioxide**.

As the result of modelling in 2001 an air quality management area (AQMA) was declared. However the monitoring that has been carried out since that date has demonstrated that the model had over predicted.

In 2005 the AQMA was revoked.

Nitrogen dioxide continues to be monitored by the use of diffusion tubes and the results continue to be within the annual mean concentrations. None of the pollutants require a detailed assessment.

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1 Introduction

1.1 Description of Local Authority Area



Figure 1: Location of Melton Borough Council

GEOGRAPHIC MAKE UP OF DISTRICT

Melton is a rural district in Leicestershire with an area of approximately 48,000 hectares. The population is about 48,300 of which just over 25,000 live in the town of Melton Mowbray. Melton Mowbray is 18 miles from Nottingham, 15 miles from Leicester and approximately 20 miles from East Midlands Airport. There are more than 60 villages and 25 parish councils.

POLLUTION SOURCES

The main source of concern within the Borough of Melton is traffic.

No new industrial processes (A1, A2 or B) commenced operation or changed significantly during the period 1 January 2008 to 31 December 2008, and one Waste Oil Burner has ceased use.

There is one A1 process; the Mars-Pedigree Factory in Melton Mowbray. There is one A2 process; the Saint Gobain foundry at Asfordby which does not cause any significant problems.

There are 20 Part B processes, of which there are 5 petrol vapour recovery (PVR) and 4 waste oil burners (WOB).

LeFarge Quarry at Brooksby. The quarry commenced operation for gravel extraction and grading in October 2006. Melton Borough Council is now working in partnership with our neighbour Charnwood Borough Council (CBC) as they have a quarry in their district operated by the same company. The quarry in Charnwood is larger and includes blasting and granite crushing operations.

PREDOMINANT WIND DIRECTION

Wind direction has a major influence on the pollutants which originate elsewhere and which may ultimately affect the Borough. Below is a wind rose indicating the predominant direction as being south-westerly and westerly.

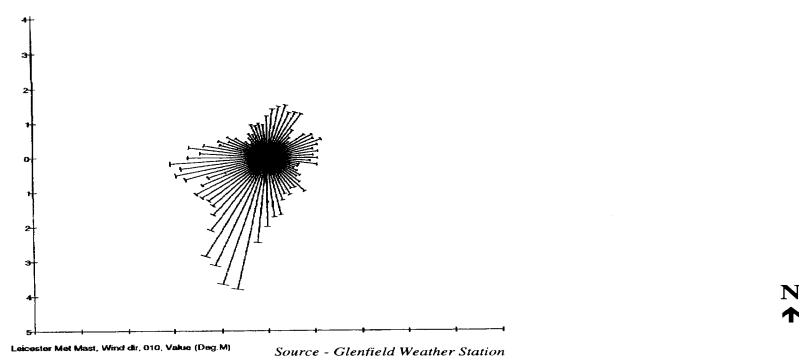


Figure 2: Wind rose for Melton District

1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles (PM₁₀) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Since 2000 the review of air quality has been completed to the satisfaction of DEFRA. Many of the reports can be viewed from the following link;

http://www.melton.gov.uk/environment_and_planning/environmental_health/pollution/air_pollution/air_quality_review.aspx

- 2000 – Review & Assessment
- 2001 – **AQMA declared**
- 2002 – Stage 4 Assessment
- 2003 – Updating & Screening Assessment
- 2004 – Progress Report
- 2005 – Progress Report - **revoking AQMA**
- 2006 - Updating & Screening Assessment
- 2007 - Progress Report
- 2008 - Progress Report

The only pollutant of interest to date has been NO₂. In 2001 an air quality management area (AQMA) was declared in and around the town centre (marked in mauve on Figure 3 below).



Please note: the red stars indicate the positions of a number of NO_x tubes.
Figure 3: Former Air Quality Management Area in the Borough of Melton

The AQMA was declared based on modelling of predicted NO₂, however the monitoring proved that the modelling had over predicted and the AQMA was revoked in 2005. As this report will go on to demonstrate, the NO₂ levels remain within the air quality objectives.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Melton Borough Council does not have any automatic monitoring sites

2.1.2 Details of Non- Automatic Monitoring Sites

The following table provides details of each monitoring site in the Borough of Melton

Table 2.1 Details of Non- Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location ?
			NO ₂	N	Y (1m)	3m	Y
Wilton Road	Urban background	X 475029 Y 319164	NO ₂	N	15M	2M	Y
Leicester Road	Urban background	X 474290 Y 318404	NO ₂	N	50M	1.5M	Y
Thorpe End	Urban background	X 475637 Y 319167	NO ₂	N	1M	1.5M	Y
Thorpe Road	Urban background	X 475843 Y 319401	NO ₂	N	3M	2M	Y
Norman Way	Urban background	X 475583 Y 319310	NO ₂	N	14M	2M	Y
Burton Road	Urban background	X 475782 Y 317922	NO ₂	N	19M	2M	Y
Nottingham Road	Urban background	X 474621 Y 320330	NO ₂	N	18M	2M	Y
Dalby Road	Urban background	X 475138 Y 318299	NO ₂	N	20M	1.5M	Y
Melton Road, Asfordby Hill	Rural	X 472471 Y 319224	NO ₂	N	6M	2M	Y
Leicester Road, Kirby Bellars	Rural	X 471477 Y 317669	NO ₂	N	25M	2M	Y
Main Road, Croxton Kerrial	Rural	X 483590 Y 329125	NO ₂	N	11M	3M	Y
Dalby Rd/Wilton Road	Urban background	X 474901 Y 318949	NO ₂	N	50M	2M	Y
Leicester Street	Urban background	X 475048 Y 319109	NO ₂	N	16M	1M	Y

2.1.3 Quality Assurance/Quality Control for Diffusion Tubes

- The laboratory supplying and analysing the tubes is Bureau Veritas.
- The preparation method used in 2008 was 10% TEA (triethanolamine) in water
- Since January 2009, Bureau Veritas has used 20% TEA in water preparation method to fit in with the DEFRA harmonised methods.
- There has not been a co-location study.

- The bias adjustment factor being applied to the annual means from the diffusion tubes is 0.83. This came from the Review and Assessment website
<http://www.uwe.ac.uk/aqm/review/R&Asupport/diffusiontube310309.xls>
- Bureau Veritas had good results of laboratory precision and the z scores of < 1 for the WASP scheme analysis, equates to category 1 (good).

2.2 Comparison of Monitoring Results with AQ Objectives

This section provides additional details of the pollutants monitored in the Borough of Melton and an assessment is made of whether a detailed assessment is required.

2.2.1 NITROGEN DIOXIDE

The measured annual mean concentration was not greater than 40 µg/m³ at any site analysed in the Borough of Melton. The monitoring site locations are representative of relevant public exposure.

Diffusion Tube Monitoring Data

The following tables demonstrate the 2008 annual mean concentrations for each of the sites monitored, the adjusted results for the past 3 years and trend analysis over 6 years.

Table 2.2a Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations
				2008 (µg/m ³) Adjusted for bias
				Bias Adjustment 0.83
1	Wilton Road	N	91.66	30
2	Leicester Road	N	100	28
3	Sherrard St	N	100	34
4	Thorpe Road	N	100	38
5	Norman Way	N	75	31* (3 tubes disappeared)
6	Burton Road	N	91.66	23
7	Nottingham Road	N	100	25
8	Dalby Road	N	100	23
9	Asfordby Hill	N	100	31
10	Kirby Bellars	N	100	21
11	Croxton Kerrial	N	100	22
12	Dalby Road	N	100	29
13	Leicester Street	N	100	32

The figure in red represents where the period of valid data is less than 90% of a full year

Table 2.2b Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA?	Annual mean concentrations ($\mu\text{g}/\text{m}^3$) Adjusted for bias		
			2006 *	2007 *	2008
1	Wilton Road	N	34	33	30
2	Leicester Road	N	31	27	28
3	Sherrard St	N	38	40	34
4	Thorpe Road	N	38	33	38
5	Norman Way	N	31	33	31*
6	Burton Road	N	27	23	23
7	Nottingham Road	N	29	32	25
8	Dalby Road	N	27	27	23
9	Asfordby Hill	N	32	33	31
10	Kirby Bellars	N	25	22	21
11	Croxtan Kerrial	N	25	22	22
12	Dalby Road	N	34	29	29
13	Leicester Street	N	25	33	32

The figures in red represent where the period of valid data is less than 90% of a full year

As can be seen from the table above and corresponding chart below the annual average for all sites remains below $40\mu\text{g}/\text{m}^3$. The slight rise in 2007 can mainly be attributed to major roadworks in Melton Mowbray for much of the year. The rise in 2008 for Thorpe Road is as a result of follow up roadworks on the Thorpe Road and Thorpe End junction. It is expected to reduce again next year.

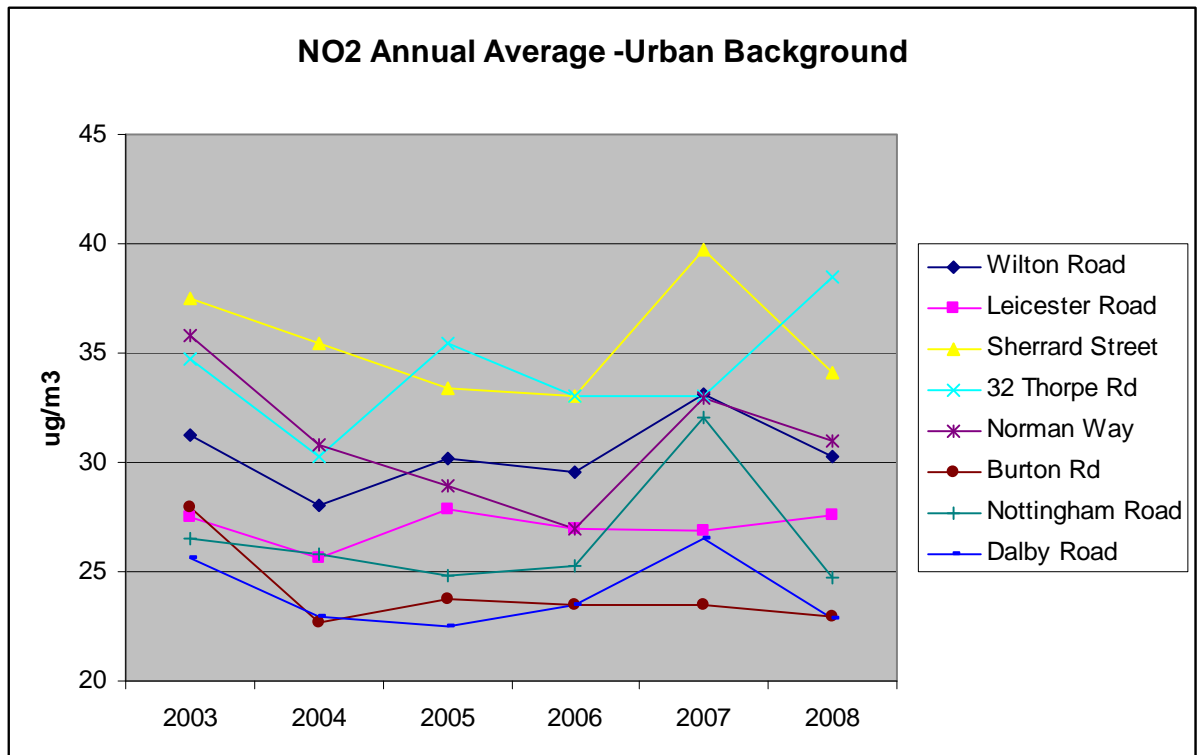


Figure 4: Nitrogen Dioxide monitoring results in the town of Melton Mowbray since 2003

The table below continues to show that NO₂ annual mean concentrations in the rural area of the Borough are satisfactory.

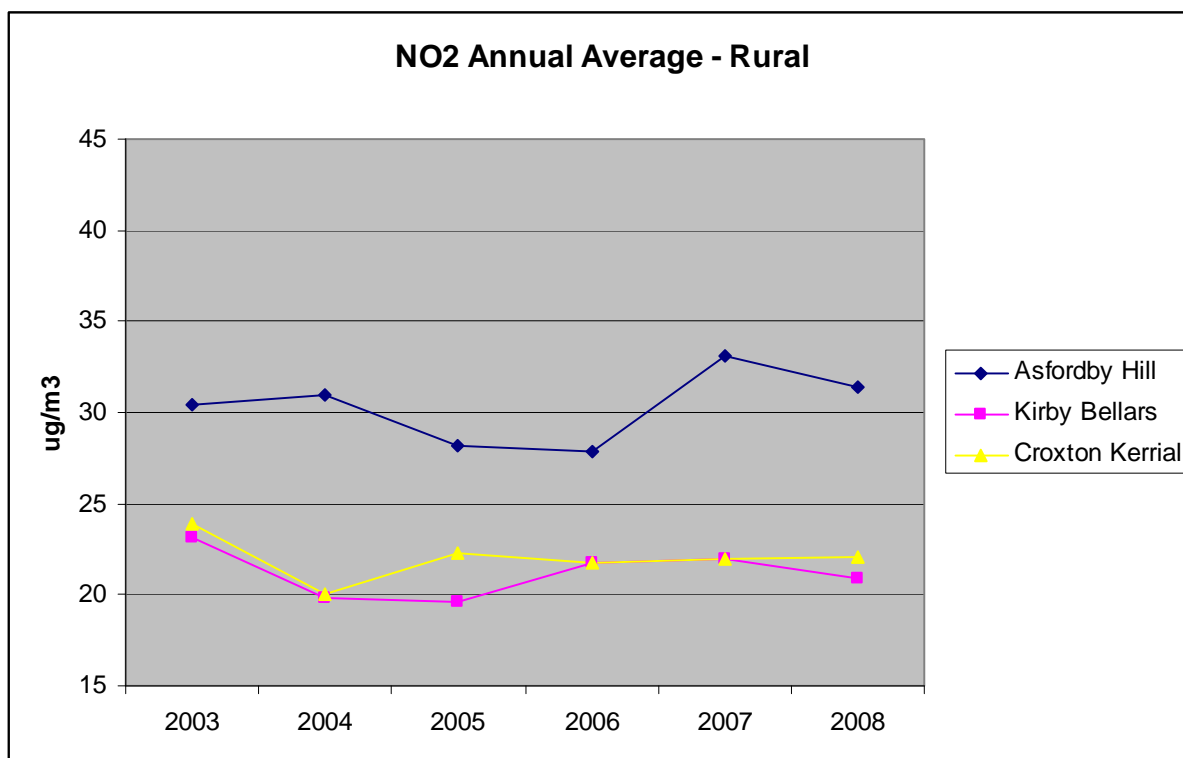


Figure 5: Nitrogen Dioxide monitoring results in the rural Borough of Melton since 2003

Melton Borough Council will continue to monitor nitrogen dioxide by using diffusion tubes in 2009. It is hoped that the major roadworks over the last two years will have assisted in keeping traffic moving and this in turn will contribute to a downward trend in future years.

2.2.2 PM₁₀

This authority is not currently monitoring PM₁₀.

There have been no significant changes with regard to PM₁₀ emissions in this authority and as such **a Detailed Assessment will not be required**

2.2.3 SULPHUR DIOXIDE

This authority is not currently monitoring SO₂.

There are no new industrial processes of relevance for SO₂ in the authority. There have been no significant changes with regards to SO₂ emissions in this authority and as such **a Detailed Assessment will not be required.**

2.2.4 BENZENE

This authority is not currently monitoring benzene.

There have been no significant changes with regards to benzene emissions in this authority and as such **a Detailed Assessment will not be required.**

2.2.5 OTHER POLLUTANTS MONITORED

There are no other pollutants monitored in the Borough of Melton.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Melton Borough Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

Melton Borough Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

Melton Borough Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

3.4 Junctions

Melton Borough Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

Melton Borough Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

Melton Borough Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

Melton Borough Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

Melton Borough Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

Melton Borough Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

Melton Borough Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

Melton Borough Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

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

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

Melton Borough Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

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

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within Melton Borough Council area.

5.3 Petrol Stations

Melton Borough Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

Melton Borough Council confirms that there are no poultry farms meeting the specified criteria.

Shoby Poultry of Lodge Farm, Six Hills Lane, Old Dalby LE14 3NB is about to be permitted by the Environment Agency for 181,000 birds with mechanical ventilation. It is not a turkey unit.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Melton Borough Council confirms that there are no biomass combustion plants in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

Melton Borough Council confirms that there are no biomass combustion plants in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

Melton Borough Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Melton Borough Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

The monitoring of nitrogen dioxide that has been carried out over the 2007 and 2008 has demonstrated that major roadworks had a temporary impact on air quality in Melton Mowbray.

In 2007 there were junction improvements on the Wilton Road, Asfordby Road, Nottingham Road & Norman Way crossroads. The impact was stationary traffic around the town. The only areas not affected where monitoring is carried out were Burton Road and Thorpe Road. This can be seen in figure 4 (page 10 above) with peaks in 2007 which have since reduced when traffic flows improved.

In 2008 there were junction improvement on the Thorpe Road, Thorpe End and Norman Way crossroads. This had a direct impact on the monitoring result at Thorpe Road as can be seen in figure 4 (page 10 above). It is anticipated that the monitoring in 2009 will demonstrate a reduction.

The monitoring in rural areas continues to remain well below the threshold level, even though there has been an apparent increase at Asfordby Hill.

8.2 Conclusions from Assessment of Sources

New Source - Since the last USA the LeFarge Quarry at Brooksby commenced operation for gravel extraction and grading in October 2006. Melton Borough Council is now working in partnership with our neighbour Charnwood Borough Council (CBC) as they have a quarry in their district operated by the same company. The quarry in Charnwood is larger and includes blasting and granite crushing operations. PM10 monitoring at the Charnwood site is in early stages. Should this monitoring produce anything significant which may translate to potential problems at Melton, PM10 monitoring at the Brooksby site may be undertaken.

Existing Sources - There have been no significant changes to any other sources since the last round of USA.

The only other potential source of significance in this round could have been Shoby Poultry. However the numbers of birds housed is lower than the threshold for assessment in the USA.

8.3 Proposed Actions

As the air quality objectives identified nationally have not been exceeded in the district since 2003, Melton Borough Council will continue to monitor air quality arising from vehicular transport. This will focus on the continued assessment of nitrogen dioxide using diffusion tubes in and around Melton Mowbray. There will be continue to be liaison with colleagues at Leicestershire County Council for traffic data to supplement the report as necessary.

Other potential sources and installations where 'no previous air quality assessment has been required' will be sought.

In 2010 Melton Borough Council will submit a Progress Report.

9 Reference

DEFRA Technical Guidance (TG09)

Appendices

Appendix A1: Full dataset of monthly average diffusion tube concentrations

f	SITE	JAN '08	FEB '08	MAR '08	APRIL '08	MAY '08	JUNE '08	JULY '08	AUG '08	SEPT '08	OCT '08	NOV '08	DEC '08	TOTAL	AV	RUNNING AV	Convert to ug/m3 (x 1.91)	Bias 0.83	% Capture
1	Wilton Road	17	19	20	15	19	12	18	<1	29	18	21	22	210	19	16	36	30	91.66
2	Leicester Road	17	26	15	17	10	14	15	13	24	16	19	23	209	17	15	33	28	100
3	Sherrard Street	18	25	19	19	19	19	23	18	27	21	24	26	258	22	20	41	34	100
4	32 Thorpe Rd	22	30	23	21	19	19	24	20	35	25	25	28	291	24	19	46	38	100
5	Norman Way	20	A	A	19	13	15	21	A	20	18	28	22	176	20	19	37	31	75
6	Burton Rd	12	18	14	12	13	10	13	C	17	13	18	19	159	14	14	28	23	91.66
7	Nottingham Road	14	17	15	17	11	9	17	12	17	15	22	21	187	16	15	30	25	100
8	Dalby Road	14	20	14	13	8	12	13	9	17	13	20	20	173	14	14	28	23	100
9	Asfordby Hill	20	24	20	16	12	17	23	18	21	18	25	24	238	20	19	38	31	100
10	Kirby Bellars	11	15	11	11	13	10	13	8	18	13	16	19	158	13	14	25	21	100
11	Croxton Kerrial	8	18	16	13	10	11	13	10	18	13	18	19	167	14	14	27	22	100
12	Dalby Road	20	24	22	15	7	16	19	14	18	18	23	25	221	18	18	35	29	100
13	Leicester Street	20	25	21	18	15	18	18	14	21	21	24	25	240	20	13	38	32	100
	ppb	213	161	133	206	169	182	230	136	282	222	283	293	2687	18		34		96.52

Appendix A2: QA:QC Data

Quality Assurance/Quality Control for Diffusion Tubes

- The laboratory supplying and analysing the tubes is Bureau Veritas.
- The preparation method used in 2008 was 10% TEA (triethanolamine) in water
- Since January 2009, Bureau Veritas has used 20% TEA in water preparation method to fit in with the DEFRA harmonised methods.
- There has not been a co-location study.
- The bias adjustment factor being applied to the annual means from the diffusion tubes is 0.83. This came from the Review and Assessment website
- <http://www.uwe.ac.uk/aqm/review/R&Asupport/diffusiontube310309.xls>
- Bureau Veritas had good results of laboratory precision and the z scores of < 1 for the WASP scheme analysis, equates to category 1 (good).

Discussion of Choice of Factor to Use

There was no local bias adjustment factor available so the national figure was used.