

# Worcestershire Regulatory Services

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## 2011 Air Quality Progress Report for *Malvern Hills District Council*

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

Date April 2011

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## **Executive Summary**

The current and any proposed sources of air quality objective pollutants have been reviewed together with the results of the only pollutant measured, namely nitrogen dioxide.

Nitrogen dioxide continues to be below the objective level albeit that the results for 2010 were marginally above those for the previous two years, probably a reflection of the cold weather in November and December 2010.

Based on the results of the diffusion tubes for Nitrogen Dioxide it is not necessary to declare an air quality management area.

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## **Appendices**

- Appendix 1 Plan showing location of diffusion tubes in Malvern
- Appendix 2 Plan showing location of diffusion tubes in Kempsey

# 1 Introduction

## 1.1 Description of Local Authority Area

Lying on the western edge of Worcestershire and south of the West Midlands region, Malvern Hills district covers 577 square kms. The area is dominated by the Malvern Hills, designated as an area of outstanding natural beauty, which coupled with the rivers Severn and Teme which flow through the district provide a quality natural environment attracting over a million visits every year.

The district is mainly rural with three main centres of population. Malvern, in the centre of the district, is the main town and contains majority of the district's industry. Tenbury Wells in the North West grows hops, apples and soft fruits; Upton upon Seven in the South East of the district is a tourist and marina town.

In terms of employment approximately 72% of employed residents are within the services sector. There are no major industrial sources of the pollutants indicated in Table 1. Road traffic is a major source of pollutants with nitrogen dioxide being the most significant and to a lesser extent particulates (PM 10). Whilst there are two motorways within the district, the M5 and the M50, there are no relevant exposures nearby such as residential properties. The principal sources of relevant exposure are all within Malvern itself and indicated in 1.4 of this report.

## 1.2 Purpose of Progress Report

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

## 1.3 Air Quality Objectives

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

Table 1.1. includes the number of permitted exceedences in any given year (where applicable).

Table 1.1

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	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 $\text{mg}/\text{m}^3$	Maximum daily 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 ( $\text{PM}_{10}$ ) (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

The Council has been reviewing a quality since 1998 and producing annual Progress Reports or Updating and Screening Assessments.

The principal source of air pollutants within this area is from vehicular traffic and in connection with this the only pollutant which has been measured is Nitrogen Dioxide. This has been measured non-automatically using diffusion tubes since 2001 at locations where, primarily, there is queuing or slow-moving traffic combined with proximity of premises where there is relevant exposure for example residential properties. (See Appendices that end of this Report for location of these sites).

Since 2001 there have been no significant alterations to road layouts or traffic flows which has necessitated a change to these locations.

It can be seen in Table 2.1 that the annual average results since 2001 have all been below 40mg/m<sup>3</sup>

**Table 2.1 showing microgrammes/m<sup>3</sup> of NO<sub>2</sub> at 5 locations for years 2002 - 2009**

	2002	2003	2004	2005	2006	2007	2008	2009	Tube to kerb distance
Graham Road	29.6	34.07	34.85	33.8	33.9	28.4	31.6	30.0	1.9m
Richmond Road	27.45	31.39	30.34	29.4	28.9	25.7	30.1	30.1	4.5m
Kempsey M5	23.1	25.66	24.96	24.2	23.1	19.4	Incomplete	21.24	68m
Barnards Green			28.7*	24.3	22.3	22.9	25.1	23.9	3.2m
Worcester Road			26.3*	21.5	19.6	15.9	Incomplete	18.45	5.4m

## 2 New Monitoring Data

### 2.1 Summary of Monitoring Undertaken

Automatic Monitoring Sites: None

#### 2.1.1 Non-Automatic Monitoring Sites

**Table 2.2 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?
Teme Avenue M3N	Urban Background	X37971 Y24563	NO <sub>2</sub>	N	7m	1.0m	N
Westward Road M4N	Urban Background	X37732 Y24869	NO <sub>2</sub>	N	8m	1.5m	N
Richmond Road M5N	Traffic light controlled road junction	X37852 Y24775	NO <sub>2</sub>	N	0.5m	4.5m	Y
Graham Road M6N	Traffic light controlled road junction	X37774 Y24599	NO <sub>2</sub>	N	0.5m	1.9m	Y
Barnards Green M8N	Busy road	X37882 Y24563	NO <sub>2</sub>	N	0.3m	3.2m	Y
M5 Kempsey MHK	Rural	X38632 Y24833	NO <sub>2</sub>	N	68M	68M	N
Worcester Road	Busy Road	X37884 Y24806	NO <sub>2</sub>	N	1M	5.4M	Y

- The diffusion tubes are supplied and analysed by Gradko International Ltd, St. Martins House, 77 Wales Street, Hampshire, SO23 0RH
- Diffusion tubes are small plastic tubes containing a media, which upon exposure to pollutants passively absorbs them.
- Once returned to a laboratory for analysis, a calculation can be made of the mean pollutant concentration in the location of the tube from the duration of exposure and amount of pollutants absorbed. The laboratory uses a 20% Triethanolamine / Deionised Water preparation method.
- The Authority has not compared the diffusion tubes with a reference method at a co-location study.
- The bias adjustment currently being applied is 0.95.(<http://www.uwe.ac.uk/aqm/review/R&Asupport/diffusiontube.xls>)
- Results from the WASP scheme show that Gradko Laboratories demonstrated good performance. ([http://www.laqmsupport.org.uk/Summary of laboratory Performance in WASP R98-102.pdf](http://www.laqmsupport.org.uk/Summary%20of%20laboratory%20Performance%20in%20WASP%20R98-102.pdf))



Gradko is also part of the Working Group on harmonisation of preparation and analysis methods and follows the procedures set out in the Harmonisation Practical Guidance.

## 2.2 Comparison of Monitoring Results with Air Quality Objectives

### 2.2.1 Nitrogen dioxide

From Table 2.3 it can be seen that no site had an annual mean of above 40 mg/m<sup>3</sup>. The background sites (M3N & M4N) are on housing estates whilst M5N, M6N & M7N are on shop facades above which there are residential properties. M7N is located at a residential property close to a road & to traffic lights whilst MHK is in a rural location near a motorway. Triplicate tubes are provided at all sites, apart from background sites where one tube is provided.

**Table 2.3 Results of Nitrogen Dioxide Diffusion Tubes for 2010**

			Capture 2009 % *	
M3N	Teme Avenue	N	100	15.66
M4N	Westward Road	N	100	15.3
M5N	Richmond Road	N	100	31.341
M6N	Graham Road	N	100	34.8
M8N	Barnards Green	N	83.3	30.1
M7N	Worcester Road	N	100	21.26
MHK	Kempsey	N	100	26.1

### 2.2.2 Summary of Compliance with AQS Objectives

Malvern Hills DC has examined the results from monitoring in the district. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

### **3. New local developments & those with Fugitive or Uncontrolled Sources**

Malvern Hills District Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Malvern Hills District Council confirms that all the following have been considered –

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

## **4 Local / Regional Air Quality Strategy**

An Air Quality Strategy and planning protocol has been drawn up collectively for all the district councils in Worcestershire together with Herefordshire Council. This Strategy came into effect in November 2009.

The Strategy provides for a unified approach to air-quality and in the Malvern Hills area has resulted in improved communication between the planning Department and environmental health concerning applications where air-quality is of significance. From June 2011 environmental health departments of the six districts councils in Worcestershire will come together as Worcestershire Regulatory Services and air quality will be dealt with on a countywide basis.

## **5 Planning Applications**

The large-scale planning application for a residential development of 3950 dwellings referred to in last year's Progress Report has been withdrawn. There are no known proposed developments at the present time likely to have an effect on air quality.

## **6 Local Transport Plans and Strategies**

The Worcestershire LTP 2006 – 2011 acknowledges that it must be intrinsically linked to the County wide air quality strategy and to strategies to combat congestion. The principal aim of the LTP is to try and ensure that no new air quality management areas are declared as a result of increasing traffic levels and also to implement measures that will enable the removal of AQMA designation from sites already declared.

Worcestershire County Council is represented on the Herefordshire and Worcestershire Pollution Group which assists in making informed decisions when considering transport and other developments which may have an impact on air quality.

## 7 Climate Change Strategies

The Council and its partners have committed to a plan of action to bring about a significant reduction in the district's dependence on fossil fuels by identifying practical actions that will reduce carbon emissions and build greater resilience and self-reliance in key fields such as food and energy supply. A group of local people under the initiative of "Transition Malvern" are working together on this project and more information can be obtained from [www.transitionmalvern hills.org.uk](http://www.transitionmalvern hills.org.uk)

## **8 Conclusions and Proposed Actions**

### **8.1 Conclusion**

Whilst there has been a significant variation in data since monitoring for nitrogen dioxide commenced the annual mean continues to be well below the objective. It is proposed that within this district council area monitoring of nitrogen dioxide using diffusion tubes will continue under the new Worcestershire Regulatory Service

### **8.2 Proposed Action**

To continue monitoring the nitrogen dioxide at existing locations and to review the results together with any developments which may affect air quality in the 2012 Updating and Screening Assessment. It is envisaged that this will be done on a countywide basis

## 9 References

Part IV of the Environment Act 1995:

Local Air Quality Management, Technical Guidance LAQM.TG(09) 2009

Local Air Quality Management, Policy Guidance (PG09) 2009

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