2010 Air Quality Progress Report for *Redditch Borough Council*

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

March 2010

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Executive Summary

This report is the latest Progress Report on the assessment of air quality in Redditch This is a continuation of a process to assess and review local air quality that began in 1999, with the last updating and screening assessment (USA) completed in 2009.

A detailed assessment was undertaken along Other Road based on concerns of high NO2 levels identified on the previous USA. The detailed assessment concluded that there is no requirement to proceed to an AQMA for Other Road.

There have also been no exceedences of the objective in other areas around the district so there will be no requirement for a detailed assessment.

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1. Introduction

1.1 Description of Local Authority Area

The Borough of Redditch is situated in the north east of the County of Worcestershire. It is bounded by three other local authorities, Bromsgrove District Council, Stratford District Council and Wychavon District Council. It lies 21 kilometres south of Birmingham within the green belt and covers an area of approximately 5435 hectares. The Borough is comprised of Redditch town, being an urban area and a rural area of roughly equal size containing the villages of Astwood Bank and Feckenham. Since the town was designated as a 'new town' in 1964 extensive development has taken place and the population has more than doubled to its present level of around 80,000.

Within the Borough there are 6 Part 'A' processes and 28 Part 'B' processes, all of which are regulated under the Environmental Protection Act 1990 and the Environmental Permitting Regulations 2007.

There are no busy roads in the borough.

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 micrograms per cubic metre $\mu g/m^3$ (for carbon monoxide the units used are milligrammes per cubic metre, mg/m^3). Table 1.1. includes the number of permitted exceedences in any given year (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu g/m^3$	Running annual mean	31.12.2003
	5.00 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, 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 purpose of the first, second, third and fourth round of review and assessments was to identify areas where it is possible that the air quality objectives may not have been met by the due date. The results of the review are summarised below.

Table 1.2 Summary of Previous R&A's

Pollutant	1st Round – Declare AQMA?	2nd Round – Declare AQMA?	3rd Round – Declare AQMA?	4th Round – Declare AQMA
Carbon Monoxide	No	No	No	No
Benzene	No	No	No	No
1,3 Butadiene	No	No	No	No
Lead	No	No	No	No
Nitrogen Dioxide	No	No	No	*No – Detailed Assessment Undertaken*
Fine Particulates	No	No	No	No
Sulphur Dioxide	No	No	No	No

The area affected by high Nitrogen Dioxide levels is part of Other Road in the town centre area. Since the last round of review and assessment, more emphasis has been placed on monitoring the air quality in this location. The results of the monitoring in 2007 gave an annual mean of 39.8µg/m3 [bias adjusted]. In 2008, this has risen to 45.4µg/m3. This site is located close to a roundabout with idling traffic being of significance. There are also relevant exposure points i.e. façade of residential properties close to the road.

In 2008, two further diffusion tubes were installed along Other Road to gain a more comprehensive idea of the nitrogen dioxide levels in the air. The results of the monitoring have confirmed that Other Road is a location which will require further investigation. 26N – 14 Other Road is a relatively new site which gave an annual mean of 39.5µg/m3, which can be classed as borderline. 27N – 26 Other Road is another new site which gave an annual mean of 35.8µg/m3.

Chapter two details the monitoring results obtained for 2009.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

There are no automatic monitoring sites in Redditch.

2.1.2 Non-Automatic Monitoring

The Council has no automatic monitoring sites but undertakes Nitrogen Dioxide monitoring using diffusion tubes. The current objective is 40µg/m^3. Recently, the diffusion tube network has been extended to monitor more areas of relevant exposure in the borough. A plan of the sites can be found at appendix 1.

- 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 or a co-location study.
- The bias adjustment currently being applied is 0.86.
  [http://www.uwe.ac.uk/aqm/review/R&Asupport/diffusiontube]
- 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]
- 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. [http://www.airquality.co.uk/archive/reports/cat05/0802141004_NO2_WG_PracticalGuidance_Issue1a.pdf]

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?
24N Linton Mews	Roadside	X 407860 Y 266767	NO_2	N	N	15m	Y
11N Astwood Bank Park	Kerbside	X 404367 Y 262449	NO_2	N	N	0.5m	Y
12N 287 Birmingham Rd	Intermediate	X 403983 Y 268815	NO_2	N	Y(0m)	20m	Y
17N Other Road	Kerbside Relevant	X 404625 Y 267479	NO_2	N	N	0.5m	Y
18N Windsor Road	Kerbside	X 403743 Y 268408	NO_2	N	N	1m	Y
19N Headless Cross Drive	Roadside	X 403785 Y 266071	NO_2	N	N	3m	Y
1N Arrow Valley Park	Urban Background	X 406600 Y 267700	NO_2	N	N	N/A	N
20N 2 Eadie Mews	Intermediate Relevant	X 403598 Y 266379	NO_2	N	Y(0m)	16m	Y
21N 9 Lydham Close	Intermediate Relevant	X 404439 Y 268315	NO_2	N	Y(0m)	16m	Y
26N 14 Other Road	Roadside Relevant	X 404620 Y 267495	NO_2	N	Y(0m)	3m	Y
23N 354 Evesham Road	Roadside Relevant	X 403940 Y 265053	NO_2	N	Y(0m)	1.5m	Y
25N 41 The Slough	Roadside Relevant	X 404415 Y 264384	NO_2	N	Y(0m)	2m	Y
27N 26 Other Road	Roadside Relevant	X 404610 Y 267522	NO_2	N	Y(0m)	3m	Y
2N 44 Feckenham High Street	Roadside Relevant	X 400700 Y 261400	NO_2	N	Y(0m)	1m	Y
3N Rough Hill Drive Roundabout	Roadside	X 404312 Y 264419	NO_2	N	N	2m	Y
5N Alvechurch Highway	Roadside	X 404400 Y 266200	NO_2	N	N	1.6m	Y
9N o/s 287 Birmingham Rd	Kerbside	X 403998 Y 268824	NO_2	N	N	1m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

The table below details the relevant key statistics for the diffusion tube results in Redditch. A full dataset of diffusion tube results can be found at Appendix B.

Table 2.2 Key Statistics

Site ID	*Location*	*Data Capture Year 2009 %*	*Data Capture period 2009%*	*Annual Mean Concentrations 2009 (µg/m^3)* Adjusted for bias *(0.86)*	*Exceedence of Annual Mean*	*Exceedence of 1 hour mean*
1N	Arrow Valley Park	*92*	*100*	*13.9*	*NO*	*Not measured*
2N	44 Feckenham High St	*92*	*100*	*18.5*	*NO*	*Not measured*
3N	Rough Hill Drive R-about	*83*	*100*	*36.2*	*NO*	*Not measured*
9N	o/s 287 Birmingham Rd	*92*	*100*	*37.3*	*NO*	*Not measured*
11N	Astwood Bank Park	*83*	*100*	*26.0*	*NO*	*Not measured*
12N	287 Birmingham Rd	*92*	*100*	*20.5*	*NO*	*Not measured*
17N	Other Road	*83*	*100*	*37.4*	*NO*	*Not measured*
18N	Windsor Road	*92*	*100*	*25.1*	*NO*	*Not measured*
19N	Headless Cross Drive	*92*	*100*	*37.0*	*NO*	*Not measured*
20N	2 Eadie Mews	*92*	*100*	*16.5*	*NO*	*Not measured*
21N	9 Lydham Close	*92*	*100*	*20.6*	*NO*	*Not measured*
23N	354 Evesham Rd	*92*	*100*	*21.7*	*NO*	*Not measured*
24N	Linton Mews	*92*	*100*	*23.1*	*NO*	*Not measured*
25N	41 The Slough	*92*	*100*	*25.6*	*NO*	*Not measured*
26N	14 Other Road	*92*	*100*	*32.8*	*NO*	*Not measured*
27N	26 Other Road	*83*	*100*	*26.4*	*NO*	*Not measured*

In 2008 the annual mean nitrogen dioxide objective was exceeded at the Other Road monitoring site (17N) and concentrations were approaching the objective at the 14 Other Road site (26N). However, in 2009 the annual mean nitrogen dioxide objective was met at all locations. The Other road diffusion tube is located on sign post at the rear of the kerb and does not represent relevant exposure. All other tubes are located on drainpipes of properties located further away from the road and therefore expected to experience lower concentrations.

There have been no exceedences of the objective in 2009 although previous years data indicated that further investigation may be required. A detailed assessment has been carried out using a combination of monitoring data and modelled concentrations. Neither methods identified any exceedences of the nitrogen dioxide objectives in 2009 therefore an Air Quality Management Area is not required.

There have also been no exceedences of the objective in other areas around the district so there will be no requirement for a detailed assessment.

The table below shows the data trends from previous years.

Table 2.3 Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Diffusion Tube Monitoring Sites

Site ID	***Location***	***Annual Mean Concentrations ($\mu g/m^3$) Adjusted for bias***				
		2005	***2006***	***2007***	***2008***	***2009***
1N	Arrow Valley Park	*17.1*	*14.84*	*16.6*	*15.2*	*13.9*
2N	44 Feckenham High St	*23.3*	*16.48*	*20.0*	*19.3*	*18.5*
3N	Rough Hill Drive R-about	*39.7*	*39.8*	***40.1***	*39.0*	*36.2*
9N	o/s 287 Birmingham Rd	***53.2***	***46.5***	***50.7***	***45.7***	*37.3*
11N	Astwood Bank Park	*23.7*	*29.6*	*31.1*	*31.0*	*26.0*
12N	287 Birmingham Rd	*33.9*	*25.7*	*26.7*	*22.6*	*20.5*
17N	Other Road	***52.5***	*33.2*	***39.8***	***45.4***	*37.4*
18N	Windsor Road	*29.3*	*26.5*	*26.7*	*30.8*	*25.1*

19N	Headless Cross Drive	*34.7*	*25.48*	*26.7*	*38.7*	*37.0*
20N	2 Eadie Mews	*26.5*	*19.2*	*23.1*	*21.4*	*16.5*
21N	9 Lydham Close	*26.6*	*24.9*	*26.3*	*24.8*	*20.6*
23N	354 Evesham Road		*28.9*	*32.3*	*27.0*	*21.7*
24N	Linton Mews		*23.96*	*25.6*	*26.9*	*23.1*
25N	41 The Slough				*25.3*	*25.6*
26N	14 Other Road				*39.5*	*32.8*
27N	26 Other Road				*35.8*	*26.4*

The bias adjustment figures for the previous years are as follows:

- 2009 – 0.86
- 2008 – 0.92
- 2007 – 0.91
- 2006 – 0.98
- 2005 – 1.03

2.2.2 Summary of Compliance with AQS Objectives

Redditch Borough Council has examined the results for monitoring in the Borough. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

Redditch Borough 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.

4 Local / Regional Air Quality Strategy

Whilst fulfilling statutory responsibilities and obligations to identify local air quality hot spots, the local authorities have recognised a need to develop a more holistic and unified approach to managing local air quality across the two Counties. Herefordshire and Worcestershire Pollution Group, consisting of environmental health professionals, have thereby initiated the preparation of a cross-County Herefordshire and Worcestershire Air Quality Strategy and Planning Protocol. The improvement of air quality requires input from a wide range of planning and other professions. Therefore this Strategy identifies broad actions, particularly for communication and co-operation within and between local authorities and wider bodies and the community.

The Strategy provides a unified approach to Air Quality, which is clearly a cross boundary issue. The strategy assists in the implementation of the statutory requirement to assess air quality within the Borough.

The strategy is a 'live' document and is be available online and will be reviewed annually.

5 Local Transport Plans and Strategies

The Worcestershire LTP 2006-2011 acknowledges that it must be intrinsically linked to the county wide air strategy and to strategies to combat congestion. The LTP lists 2 policies that are relevant:

Policy AQ1: Implement measures that will enable the removal of Air Quality Management Area designation from the existing sites identified.

Policy AQ2: Ensure that no new AQMA's are declared during the LTP2 period as a result of increasing traffic levels.

6 Climate Change Strategies

A draft joint Climate Change Strategy for Bromsgrove and Redditch action plan is currently being written.

6.1 Local CO2 information

In 2008, Redditch Borough Council's carbon footprint as a result of running our services and organisation was 3'637 tonnes. We intend to reduce this by 2% year on year in the future. In 2006, Redditch Borough's carbon footprint was 622'000 tonnes – thats a footprint of 7.9 tonnes for each person who lives here. We want to try and reduce this by 9% over the next 3 years.
Redditch Borough Council are signatories to the Nottingham Declaration on Climate Change and the Worcestershire Climate Change Pledge. We are also a partner within the Worcestershire Partnership Climate Change Strategy (2005-2011)

7 Conclusions and Proposed Actions

7.1 Conclusions from New Monitoring Data

The monitoring results indicate that there are no exceedences of the objective for NO2 within the Borough. The one area of concern in the Borough was Other Road. A detailed assessment was undertaken and it concluded that an AQMA is not required.

7.2 Proposed Actions

The Other Road area will continue to be closely monitored.

8 References

Part IV of the Environment Act 1995

- Local Air Quality Management, Technical Guidance LAQM.TG(09), February 2009
- Local Air Quality Management, Policy Guidance (PG09), February 2009
- http://www.uwe.ac.uk/aqm/review/
- http://www.airquality.co.uk/archive/actionplan.php
- http://www.laqmsupport.org.uk/

• Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

- The diffusion tubes are supplied and analysed by Gradko International Ltd, St. Martins House, 77 Wales Street, Hampshire, SO23 0RH. The laboratory uses a 20% Triethanolamine / Deionised Water preparation method.

- The bias adjustment currently being applied is 0.86.
  [http://www.uwe.ac.uk/aqm/review/R&Asupport/diffusiontube]

- 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]

- 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. [http://www.airquality.co.uk/archive/reports/cat05/0802141004_NO2_WG_PracticalGuidance_Issue1a.pdf]

Appendix B – Diffusion Tube Results – Full Dataset

Tube Number	January	February	March	April	May	June	July	August	September	October	November	December	Mean	**Bias Adj Mean**
1N	24.44	21.28	16.48	15.28	10.32		8.68	9.06	15.33	17.51	15.34	23.65	16.12	**13.90**
2N	32.71	19.44	18.94	23.49	18.30		14.94	14.07	19.13	24.98	21.13	29.61	21.52	**18.50**
3N	58.00		37.75	50.65	40.73		32.35	24.05	39.49	45.80	34.56	57.73	42.11	**36.20**
9N	64.93	40.34	44.76	49.98	37.78		34.63	29.65	38.41	39.00	46.32	51.88	43.43	**37.30**
11N	35.14	32.36	31.79	28.82			27.00	22.18	27.92	34.61	30.70	31.96	30.25	**26.00**
12N	36.79	18.72	26.33	26.57	17.61		17.39	14.61	20.96	25.63	22.24	35.86	23.88	**20.50**
17N	51.57	33.85	40.70	48.99	46.21		35.89		37.82	50.94	42.32	46.78	43.51	**37.40**
18N	35.65	24.83	33.34	30.60	24.14		23.05	21.46	27.20	33.07	32.30	36.43	29.28	**25.20**
19N	53.61	27.80	45.33	44.44	42.88		39.82	36.17	43.49	48.60	40.94	50.39	43.04	**37.00**
20N	25.67	12.90	18.47	25.50	19.20		11.60	8.71	21.13	22.33	16.94	28.26	19.16	**16.50**
21N	35.08	26.91	27.73	24.71	16.07		16.45	15.84	20.81	26.14	25.15	28.29	23.93	**20.60**
23N	33.10	29.85	27.09	25.03	19.02		15.78	16.43	23.04	28.48	25.54	34.57	25.27	**21.70**
24N	34.75	23.86	23.42	32.86	22.38		23.22	20.97	20.26	31.97	28.70	33.22	26.87	**25.60**
25N	37.25	29.68	29.75	27.08	22.03		25.70	22.74	26.46	33.15	28.01	45.98	29.80	**25.60**
26N	52.25	10.77	36.14	49.94	37.01		32.62	29.5	32.97	43.96	41.57	52.34	38.10	**32.80**
27N	45.28	28.32	31.62		27.47		27.37	23.98	17.11	36.59	32.72	37.03	30.75	**26.40**
28N							31.53		30.47	42.36		45.4	37.44	**32.20**
29N							30.25		29.77	41.46		43.63	36.28	**31.20**

* Graph on graph tab below **31.15**

17N	Top of Other Road
26N	14 Other Road
27N	26 Other Road