



2011 Air Quality Progress Report for *Dacorum Borough Council*

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

June 2011

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Executive Summary

A Progress Report covering the 2010 period has been produced following relevant guidance outlined in LAQM.TG(09). This is the latest LAQM review and assessment report to be submitted to DEFRA by Dacorum Borough Council since the 2010 Progress Report (covering the 2009 period) was issued in April 2010.

Diffusion tube monitoring data for 2010 indicate that annual mean nitrogen dioxide (NO₂) concentrations continue to exceed the relevant air quality objective at three 'hot spot' areas in the borough, namely Lawn Lane, Hemel Hempstead; London Road, Apsley and the High Street area of Northchurch.

Formal declaration of three Air Quality Management Areas (AQMAs) in relation to the annual mean air quality objective for NO₂ at these three locations is anticipated in October 2011, following a Dacorum Borough Council cabinet meeting in July 2011 and a subsequent 3-month consultation period.

Annual mean NO₂ concentrations at other diffusion tube monitoring sites representative of relevant exposure did not exceed the relevant air quality objective in 2010, and therefore it was not considered necessary to proceed to a detailed assessment. No other pollutants were monitored in the borough in 2010.

The diffusion tube monitoring network presented/discussed in the 2009 Progress Report was augmented in December 2010 with a further 10 roadside diffusion tube monitoring sites (mostly in the to be declared AQMAs in Hemel Hempstead and Apsley). A further 10 roadside diffusion tube monitoring sites will also be deployed in Hemel Hempstead in 2011. Associated monitoring results will be presented in future LAQM review and assessment reports.

A number of fuel storage companies are now beginning to start operations at the Buncefield depot following the explosion in December 2005. This conglomerate of emission sources will be considered in the next Updating and Screening Assessment.

A waste transfer station in an industrial area of Hemel Hempstead has been identified in this Progress Report. Emissions from this site will also be considered in the next Updating and Screening Assessment. No other new local developments were identified.

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1 Introduction

1.1 Description of Local Authority Area

Dacorum borough comprises a mix of urban and rural land uses situated on the western edge of Hertfordshire. Located approximately 30 miles northwest of central London, the borough has a population of approximately 140,000¹, which is predominantly centred on the towns of Berkhamsted, Hemel Hempstead and Tring.

Major roads within the area include the M1, which crosses the eastern side of the borough, the M25, which is located near the southern boundary of the borough, and the A41, which closely bypasses Berkhamsted, Hemel Hempstead and Tring, linking Aylesbury to the west with Watford to the east. The area is well connected to London and the midlands via a major rail link that traverses the borough and terminates at London Euston.

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, mg/m^3). Table 1.1. includes the number of permitted exceedences in any given year (where applicable).

¹ Population at 2001 census according to Dacorum Borough Council website: www.dacorum.gov.uk

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 $\mu\text{g}/\text{m}^3$	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 mg/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 (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

Dacorum Borough has undertaken and completed the following rounds of LAQM review and assessment:

1. Air Quality Progress Report (issued in April 2005 covering the period 2003 to 2004),
2. Updating and Screening Assessment (issued in April 2006 covering the 2005 period);
3. Detailed Assessment of Local Air Quality (issued in October 2007 covering the 2006 period);
4. Updating and Screening Assessment (issued in July 2009 covering the 2006 to 2008 period); and,
5. Air Quality Progress Report (issued in April 2010 covering the 2009 period).

The 2009 Updating and Screening Assessment (USA) indicated that annual mean nitrogen dioxide (NO₂) concentrations continued to exceed the relevant air quality objective at three previously identified AQMAs (at Lawn Lane, Hemel Hempstead; London Road, Apsley and Northchurch High Street)². It was not considered necessary to proceed to a detailed assessment for any other pollutants or to consider the declaration of additional AQMAs at other locations within the borough.

In addition to the 2009 USA, Dacorum Borough Council commissioned the RSK Group in 2009 to undertake a detailed dispersion modelling assessment of PM₁₀ emissions in the three identified (to be declared) AQMAs. Although not repeated in this Progress Report, the results of the modelling study indicate that both long- and short-term concentrations of PM₁₀ are anticipated to meet relevant air quality objectives in the study areas assessed.

The 2010 Progress Report again identified that annual mean NO₂ concentrations continued to exceed the relevant air quality objective at the three previously identified (to be declared) AQMAs. It was not considered necessary to proceed to a detailed assessment for any other pollutants or to consider the declaration of additional AQMAs at other locations within the borough.

Formal declaration of the three previously identified AQMAs in relation to the annual mean air quality objective for NO₂ is anticipated in October 2011, following a Dacorum Borough Council cabinet meeting in July 2011 and a subsequent 3-month consultation period.

² The three potential AQMAs were identified in the Detailed Assessment report of October 2007. At the time of writing the AQMAs have not yet been declared by Dacorum Borough Council i.e. the AQMAs referenced in this report are 'to be declared'.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

No automatic monitoring was undertaken within Dacorum Borough in 2010. An automatic nitrogen oxides (NO_x) roadside monitoring station has been installed at the Northchurch High Street (to be declared) AQMA, and this monitoring site is expected to be commissioned in the summer of 2011.

2.1.2 Non-Automatic Monitoring Sites

Dacorum Borough Council measured ambient NO₂ concentrations using passive diffusion tubes at 22 different locations across the local authority area in 2010. The monitoring sites/locations for 2010 are listed below in **Table 2.1**.

With the exception of the Sawyers Way monitoring site in Hemel Hempstead, which was not reported in the 2009 Progress Report due to ongoing vandalism at this site, the monitoring locations in 2010 were unchanged from those reported in the 2009 Progress Report.

Ten roadside diffusion tube monitoring sites (mostly in the to be declared AQMAs in Hemel Hempstead and Apsley) were installed in December 2010 and a further 10 roadside diffusion tube monitoring sites will also be deployed in Hemel Hempstead in 2011. Associated monitoring results will be presented in future LAQM review and assessment reports.

All the NO₂ diffusion tubes used by Dacorum Borough Council are supplied and analysed by Harwell Scientifics, Didcot, Oxfordshire, and are prepared using the 50:50 (TEA:acetone) method. Harwell Scientifics follow the procedures set out in the Practical Guidance document and, according to the QAQC Framework webpage of the DEFRA website³, have achieved 'good' scores in the last five quarterly rounds of the Workplace Analysis Scheme for Proficiency (WASP).

No local authority co-location studies were undertaken within Dacorum borough in 2010, and therefore a locally derived bias adjustment factor has not been generated for the presented reporting period. Annual average NO₂ concentrations presented in this report have been bias adjusted by a factor of 0.85, which was obtained from the latest (April 2011) version of the national bias adjustment spreadsheet available from DEFRA⁴.

³ <http://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>

⁴ <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

Table 2.1 Details of Non-Automatic Monitoring Sites (*within to be declared AQMA)

Site Name	Site Type	OS Grid Ref (X)	OS Grid Ref (Y)	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?
Sawyers Way Hemel Hempstead	Background	X 506780	Y 207180	NO ₂	N	N (5 m)	2 m	N
Wood Lane End Hemel Hempstead	Background	X 508177	Y 207934	NO ₂	N	Y (12 m)	1 m	N
Roman Way, Markyate	Background	X 506197	Y 216506	NO ₂	N	N (10 m)	58 m	N
High Street Bovingdon	Kerbside	X 501541	Y 203659	NO ₂	N	Y (13 m)	N/A	N
High Street Berkhamsted	Kerbside	X 499365	Y 207724	NO ₂	N	N (20 m)	N/A	N
Prince Edward Street, Berkhamsted	Background	X 499207	Y 207754	NO ₂	N	N (12 m)	35 m	N
High Street, Northchurch	Kerbside	X 497346	Y 208835	NO ₂	N*	Y (1 m)	N/A	Y
Brook Street, Tring	Kerbside	X 492552	Y 211824	NO ₂	N	Y (8 m)	N/A	N
High Street, Tring	Kerbside	X 492335	Y 211386	NO ₂	N	N (30 m)	N/A	N
Charles Street, Tring	Background	X 492195	Y 211159	NO ₂	N	N (2 m)	50 m	N
Watford Road, Kings Langley	Kerbside	X 507606	Y 201624	NO ₂	N	N (34 m)	N/A	N
High Street, Kings Langley	Kerbside	X 507184	Y 202690	NO ₂	N	N (15 m)	N/A	N
Lawn Lane 1, Hemel Hempstead	Kerbside	X 505923	Y 205761	NO ₂	N*	Y (2 m)	N/A	N
Gammons Lane, Hemel Hempstead	Background	X 507058	Y 206727	NO ₂	N	N (6 m)	22 m	N
Wadley Close, Hemel Hempstead	Background	X 506981	Y 206829	NO ₂	N	N (10 m)	11 m	N
Field Road, Hemel Hempstead	Background	X 507483	Y 206898	NO ₂	N	Y (1 m)	17 m	N
St Agnells Lane, Hemel Hempstead	Roadside	X 507121	Y 209252	NO ₂	N	Y (10 m)	1 m	N
New Road, Northchurch	Kerbside	X 497335	Y 208860	NO ₂	N*	Y (1 m)	N/A	Y
Darrs Lane, Northchurch	Roadside	X 497264	Y 208927	NO ₂	N*	Y (5 m)	1 m	N
Lawn Lane 2, Hemel Hempstead	Roadside	X 505969	Y 205726	NO ₂	N*	Y (8 m)	1 m	N
Lawn Lane 3, Hemel Hempstead	Roadside	X 505930	Y 205740	NO ₂	N*	Y (1 m)	1 m	Y
London Road, Apsley	Roadside	X 505674	Y 205514	NO ₂	N*	Y (1 m)	1 m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

The following section compares NO₂ diffusion tube monitoring results with relevant air quality objectives. **Only annual average NO₂ data are presented**, as no other parameters/averaging periods were monitored/assessed in Dacorum borough in 2010.

2.2.1 Nitrogen Dioxide

Diffusion Tube Monitoring Data

Table 2.2 below presents annual average NO₂ concentrations as measured at the 22 diffusion monitoring sites in 2010. Annual average concentrations for 2010 have been bias adjusted by applying the factor of 0.85 referenced above in Section 2.1.2.

Due to the low data capture (<90%) apparent at each monitoring site for the 2010 calendar year, the bias adjusted NO₂ concentrations were annualised by following the methodology outlined in Box 3.2 of LAQM.TG(09). Specifically, average annual mean/period mean ratios were derived from 2010 measurement data from four automatic monitoring stations within 50 miles of the diffusion tube sites and were applied to the measured, bias adjusted NO₂ concentrations.

The diffusion tube measurement data for 2010 indicate that the annual mean air quality objective for NO₂ was exceeded at five monitoring sites situated within the (to be declared) AQMAs. Specifically, that is the monitoring sites at New Road and the High Street, Northchurch (DC62 and DC50), Lawn Lane, Hemel Hempstead (DC57 and DC65) and London Road, Apsley (DC66).

Exceedances were also observed outside of the (to be declared) AQMAs at two diffusion tube sites, namely the High Street, Berkhamsted (DC47) and Watford Road, Kings Langley (DC54). However, as identified in **Table 2.1**, no relevant exposure is apparent at these two sites.

Following the guidance/calculation outlined in Box 2.3 of LAQM.TG(09), annual average NO₂ concentrations at the nearest receptors/sites of relevant exposure to the DC47 and DC54 monitoring sites are estimated to be 37 µg/m³ and 38 µg/m³ respectively, and therefore below the relevant air quality objective.

No exceedance of the annual mean air quality objective for NO₂ was observed at the other diffusion tube monitoring stations in 2010. An annual mean NO₂ concentration of 38 µg/m³ (i.e. approaching the relevant air quality objective) was recorded at Lawn Lane 2, Hemel Hempstead (DC64). However, as identified in **Table 2.1**, this monitoring site is located within the (to be declared) Lawn Lane AQMA.

Section 2.34 of LAQM.TG(09) indicates that if annual mean NO₂ concentrations are 60 µg/m³ or above, then it is likely that exceedances of the 1-hour mean air quality objective for NO₂ will occur.

Although the annual mean NO₂ concentration at Lawn Lane 3, Hemel Hempstead (DC65) in 2010 was 62 µg/m³, this is considered to be a marginal exceedance of the 'guideline value' and therefore well within the typical diffusion tube measurement uncertainty of 25% referenced in Section A1.40 of LAQM.TG(09). Annual mean NO₂ concentrations at all other monitoring sites were below 60 µg/m³ in 2010.

Also presented in **Table 2.2** are annual mean NO₂ concentrations for 2008 and 2009. The annualisation and bias adjustment procedures/calculations for these previously reported data are detailed in the 2009 Updating and Screening Assessment and 2010 Progress Report.

Appendix A presents, for 2010, monthly NO₂ measurement data for each diffusion tube site and the annual mean/period mean ratios that were used to calculate the annualised annual mean NO₂ concentrations presented in **Table 2.2**.

Table 2.2 Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA?	Relevant Exposure? Y/N	Data Capture for monitoring period %	Data Capture for full calendar year 2010 %	Annual mean NO ₂ concentrations (µg/m ³)		
						2008	2009	2010
DC40	Sawyers Way Hemel Hempstead	N	N	50 [^]	50	22	No Data	24
DC42	Wood Lane End HH	N	Y	75 ^{^^^}	75	26	27	28
DC43	Roman Way, Markyate	N	N	67 ^{^^}	67	19	20	21
DC46	High Street Bovingdon	N	Y	75 ^{^^^}	75	24	24	25
DC47	High Street Berkhamsted	N	N	83 ^{^^^^}	83	39	40	43
DC48	Prince Edward Street, Berkhamsted	N	N	83 ^{^^^^}	83	19	21	23
DC50	High Street, Northchurch	N*	Y	83 ^{^^^^}	83	42	42	45
DC51	Brook Street, Tring	N	Y	83 ^{^^^^}	83	29	29	31
DC52	High Street, Tring	N	N	83 ^{^^^^}	83	34	32	36
DC53	Charles Street, Tring	N	N	83 ^{^^^^}	83	16	18	17
DC54	Watford Road, Kings Langley	N	N	75 ^{^^^}	75	49	48	52
DC55	High Street, Kings Langley	N	N	67 ^{^^}	67	32	32	36
DC57	Lawn Lane 1, Hemel Hempstead	N*	Y	75 ^{^^^}	75	56	60	59
DC58	Gammons Lane, Hemel Hempstead	N	N	83 ^{^^^^}	83	30	29	31
DC59	Wadley Close, Hemel Hempstead	N	N	83 ^{^^^^}	83	30	34	35
DC60	Field Road, Hemel Hempstead	N	Y	75 ^{^^^}	75	25	25	25

DC61	St Agnells Lane, Hemel Hempstead	N	Y	83 ^{^^^}	83	32	30	29
DC62	New Road, Northchurch	N*	Y	83 ^{^^^}	83	38	42	42
DC63	Darrs Lane, Northchurch	N*	Y	83 ^{^^^}	83	29	33	33
DC64	Lawn Lane 2, Hemel Hempstead	N*	Y	83 ^{^^^}	83	38	40	38
DC65	Lawn Lane 3, Hemel Hempstead	N*	Y	83 ^{^^^}	83	54	56	62
DC66	London Road, Apsley	N*	Y	50 [^]	50	56	57	54

Note: *within to be declared AQMA; Source for 2010 data: Hertfordshire and Bedfordshire Air Quality Network (www.hertsbedsair.org.uk); Source for 2008 and 2009 data: Dacorum Borough Council Updating and Screening Assessment (2009) and Progress Report (2010); 2010 data bias adjusted by a factor of 0.85 and annualised by the annual mean/period mean ratios presented in Appendix A; [^]6 months of monitoring; ^{^^}8 months of monitoring; ^{^^^}9 months of monitoring; ^{^^^}10 months of monitoring.

2.2.2 Summary of Compliance with AQS Objectives

Dacorum Borough Council has examined the results from monitoring in the borough. Concentrations outside of the (to be declared) AQMA's are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

3.1 Road Traffic Sources

Dacorum Borough Council has not identified any new road traffic sources since the 2009 Updating and Screening Assessment.

3.2 Other Transport Sources

Dacorum Borough Council has not identified any other new transport sources since the 2009 Updating and Screening Assessment.

3.3 Industrial Sources

Following the widely publicised explosion at the Buncefield oil/fuel storage depot in December 2005, a number of different companies are now beginning to operate again at the Buncefield site. Relevant emissions from this conglomeration of operators will be assessed as required in the 2012 Updating and Screening Assessment.

Dacorum Borough Council has not identified any other new industrial sources since the 2009 Updating and Screening Assessment.

3.4 Commercial and Domestic Sources

Dacorum Borough Council has not identified any new commercial or domestic sources since the 2009 Updating and Screening Assessment.

3.5 New Developments with Fugitive or Uncontrolled Sources

A waste transfer station located on Maxted Close in an industrial area of Hemel Hempstead has been identified since the 2009 Updating and Screening Assessment. Relevant emissions from this site will be assessed as required in the 2012 Updating and Screening Assessment.

Dacorum Borough Council has identified the following new or previously unidentified local developments which may impact on air quality in the Local Authority area.

Buncefield fuel storage depot, Hemel Hempstead Waste transfer station, Hemel Hempstead

These will be taken into consideration in the next Updating and Screening Assessment, scheduled for 2012.

4 Air Quality Planning Policies

Policy 11 of Dacorum Borough Council's Adopted Local Plan makes specific reference to the potential impact of development proposals on air quality. Specifically, criterion (j) of policy 11 states the following:

Development will not be permitted unless it avoids harm arising from pollution in all its forms, including air, water, noise and light pollution. In particular there should be no detrimental effect on air quality in sensitive areas (especially where traffic related pollution problems arise).

Although Dacorum Borough Council's Local Plan policies are currently being reviewed as a Local Development Framework (LDF) for the borough is progressed, the emerging Core Strategy of the LDF will include policies relating to the control/reduction of air pollution and carbon emissions through planning/development control mechanisms.

5 Local Transport Plans and Strategies

Hertfordshire County Council's *Local Transport Plan (LTP) 2006/07 – 2010/11* recognises the importance of addressing local air quality issues through transport planning, particularly where AQMAs have been, or will be, declared. Consultation with district and borough councils within the Hertfordshire area, including Dacorum Borough Council, is identified as being a key mechanism by which local air quality concerns can be addressed at the county council level through transport planning initiatives such as area plans, cycling strategies and other initiatives to promote non-polluting modes of transport.

6 Implementation of Action Plans

As discussed in Section 1.4, it is anticipated that formal AQMA declarations for the three previously identified areas of exceedance of the annual mean objective for NO₂ in London Road, Apsley; Lawn Lane, Hemel Hempstead and Northchurch High Street will take place in October 2011.

Following the AQMA declarations, a Further Assessment of each AQMA will be completed and an Action Plan(s) developed. Progress on the implementation of any future Action Plan(s) will therefore be detailed in subsequent LAQM review and assessment reports.

7 Conclusions and Proposed Actions

7.1 Conclusions from New Monitoring Data

The diffusion tube monitoring results for 2010 indicate that the annual mean air quality objective for NO₂ continues to be exceeded at Lawn Lane, Hemel Hempstead; London Road, Apsley and the High Street area of Northchurch. Exceedances of the long-term air quality objective for NO₂ have occurred at each of these sites over the previous three years, and it is therefore recognised that AQMAs for these locations must be declared without delay in 2011.

Measured annual mean NO₂ concentrations were, with the exception of Watford Road, Kings Langley and the High Street, Berkhamsted, below the relevant air quality objective at all other diffusion tube monitoring sites in 2010. Although annual mean NO₂ concentrations are observed to be near to, or above the relevant air quality objective in 2008, 2009 and 2010 at the Watford Road and Berkhamsted High Street monitoring sites, there is no relevant exposure at these locations, and therefore it is not deemed necessary to proceed to a detailed assessment.

Although the annual mean NO₂ concentration at Lawn Lane, Hemel Hempstead has been measured at, or marginally above, 60 µg/m³ in 2009 and 2010, these are considered to be marginal exceedances of the 'guideline value' (for potential breaches of the short-term air quality objective for NO₂) and well within the typical diffusion tube measurement uncertainty range. Annual mean NO₂ concentrations at all other monitoring sites were below 60 µg/m³ in 2008, 2009 and 2010.

7.2 Conclusions relating to New Local Developments

Dacorum Borough Council has identified that a number of different fuel storage companies are now beginning to start operations at the Buncefield depot following the explosion in December 2005. A new waste transfer station located in Hemel Hempstead has also been identified.

It is not considered necessary at this stage to proceed to a detailed assessment for either of these sources. However, these will be considered in the next Updating and Screening Assessment, scheduled for 2012.

7.3 Proposed Actions

The 2010 monitoring data has not identified the need to proceed to a detailed assessment for any pollutants at any locations within Dacorum borough. However, it is recognised that the declaration of the three AQMAs at Lawn Lane, Hemel Hempstead; London Road, Apsley and Northchurch High Street must be declared in October 2011 as currently planned.

Following the AQMA declarations, Dacorum Borough Council will undertake a Further Assessment of each AQMA and develop an air quality action plan(s) that will contain a number of measures aimed at reducing emissions to air and improving local air quality in the designated AQMAs. In line with the review and assessment timetable

referenced in Box 1.3 of LAQM.TG(09), an Updating and Screening Assessment will be produced in 2012.

As detailed in Sections 2.1.1 and 2.1.2, the automatic NO_x analyser currently installed within the (to be declared) Northchurch High Street AQMA will be commissioned in the summer of 2011. Ten roadside diffusion tube monitoring sites will also be deployed in Hemel Hempstead in 2011. Associated monitoring results will be presented in future LAQM review and assessment reports.

8 References

- Dacorum Borough Council (2009). 2009 Air Quality Updating and Screening Assessment for Dacorum Borough Council
- Dacorum Borough Council (2010). 2010 Air Quality Progress Report for Dacorum Borough Council
- Dacorum Borough Council website: www.dacorum.gov.uk
- DEFRA (2009). Part IV of the Environment Act 1995 Environment (Northern Ireland) Order 2002 Part III Local Air Quality Management Technical Guidance LAQM.TG(09)
- DEFRA UK Air Information Resource website: <http://uk-air.defra.gov.uk>
- Hertfordshire and Bedfordshire Air Quality network: www.hertsbedsair.org.uk
- Hertfordshire County Council (2005). Local Transport Plan 2006/07 – 2010/11
- RSK Group (2009): Detailed Air Dispersion Modelling Assessment of PM₁₀ Road Traffic Emissions in Dacorum Borough

Appendices

Appendix A: Monthly Diffusion Tube Data and Annual Mean/Period Mean Ratios

The table below presents monthly mean NO₂ concentrations as measured at the 22 diffusion tube monitoring sites in 2010. The presented data have not been bias adjusted or annualised.

Code	Address	NO ₂ ug/m ³											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
DC40	Sawyers Way HH				26	21	17		20	24			46
DC42	Wood Lane End HH	46	45	31	34		27	19	23	29			46
DC43	Roman Way Markyate	35	35		21	17	15		15	22			40
DC46	High Street Bovington		38	28	27	26	21	18	20	27			48
DC47	High Street Berkhamsted	54	57	51	51	43	65	37	35	46			63
DC48	Prince Edward Street Berkhamsted	41	40	28	23	20	19	12	19	25			42
DC50	High Street Northchurch	72	69	59	45	45	43	49	31	45			67
DC51	Brook Street Tring	51	43	37	37	32	27	23	27	31			55
DC52	High Street Tring	52	48	41	40	34	37	34	31	39			54
DC53	Charles Street Tring	32	33	20	18	10	12	11	12	17			36
DC54	Watford Road Kings Langley	73	68	63	56	50	50	45	47	60			
DC55	High Street Kings Langley		54	44	42	35	27	27	29	40			
DC57	Lawn Lane 1 HH	59	89	64	71	51	67	54	55	69			
DC58	Gammons Lane HH	51	59	28	37	33	23	24	27	34			46
DC59	Wadley Close HH	52	51	43	41	36	31	32	30	40			46
DC60	Field Road HH	33	39	31	33	24	22	19	21				47
DC61	St Agnells Lane HH	30	47	37	27	31	23	25	26	36			50
DC62	New Road Northchurch	60	69	47	55	34	44	32	47	50			52
DC63	Darrs Lane Northchurch	48	44	38	36	33	33	30	28	38			52
DC64	Lawn Lane 2 HH	53	51	44	47	34	33	35	35	49			61
DC65	Lawn Lane 3 HH	81	75	75	68	62	58	74	59	77			89
DC66	London Road Apsley	82	78	74	66	62							83

The tables below present, for 2010, monthly and annual mean NO₂ concentrations as measured at four urban background automatic monitoring stations located within 50 miles of the diffusion tube monitoring sites in Dacorum borough. Also presented are the average annual mean (AM)/period mean (PM) ratios that have been derived from the automatic monitoring data and subsequently applied to the (period mean) diffusion tube measurement data.

Automatic Monitoring Site	Data Capture for 2010 (%)	Site Type	2010 Monthly Mean NO ₂ (ug/m ³)												2010 Annual Mean NO ₂ (ug/m ³)
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Hertsmere – Borehamwood	98	Urban Background	35.9	31.2	25.1	25.7	21.0	21.5	16.4	12.7	20.0	22.4	29.8	34.8	24.7
Luton – Challney College	88	Urban Background	42.0	40.6	35.0	33.8	23.4	26.7	25.2	26.0	29.2	29.1	49.7	45.9	33.9
St Albans – Fleetville	99	Urban Background	32.7	32.0	25.6	24.7	16.5	14.1	15.5	13.1	20.4	23.9	29.4	35.9	23.7
Three Rivers – Rickmansworth	89	Urban Background	57.9	53.4	45.7	45.3	32.8	34.8	22.1	20.6	32.6	38.7	45.4	62.7	41.0

Source: Hertfordshire and Bedfordshire Air Quality Network (www.hertsbedsair.org.uk)

Automatic Monitoring Site	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio
	Sawyers Way HH	Wood Lane End HH	Roman Way Markyate	High Street Bovingdon	High Street Berkhamsted	Prince Edward Street Berkhamsted	High Street Northchurch	Brook Street Tring	High Street Tring	Charles Street Tring	Watford Road Kings Langley	High Street Kings Langley
Hertsmere – Borehamwood	1.092	0.996	0.975	1.067	1.011	1.011	1.011	1.011	1.011	1.011	1.061	1.138
Luton – Challney College	1.099	1.002	1.013	1.067	1.034	1.034	1.034	1.034	1.034	1.034	1.082	1.130
St Albans – Fleetville	1.138	0.994	0.999	1.076	1.026	1.026	1.026	1.026	1.026	1.026	1.093	1.168
Three Rivers – Rickmansworth	1.075	0.984	0.964	1.054	1.005	1.005	1.005	1.005	1.005	1.005	1.069	1.141
Average AM/PM Ratio	1.101	0.994	0.988	1.066	1.019	1.019	1.019	1.019	1.019	1.019	1.076	1.145

Automatic Monitoring Site	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio	AM/PM Ratio
	Lawn Lane 1 HH	Gammons Lane HH	Wadley Close HH	Field Road HH	St Agnells Lane HH	New Road Northchurch	Darrs Lane Northchurch	Lawn Lane 2 HH	Lawn Lane 3 HH	London Road Apsley
Hertsmere – Borehamwood	1.061	1.011	1.011	0.992	1.011	1.011	1.011	1.011	1.011	0.854
Luton – Challney College	1.082	1.034	1.034	1.021	1.034	1.034	1.034	1.034	1.034	0.921
St Albans – Fleetville	1.093	1.026	1.026	1.013	1.026	1.026	1.026	1.026	1.026	0.848
Three Rivers – Rickmansworth	1.069	1.005	1.005	0.983	1.005	1.005	1.005	1.005	1.005	0.826
Average AM/PM Ratio	1.076	1.019	1.019	1.002	1.019	1.019	1.019	1.019	1.019	0.862