2009 Air Quality Updating and Screening Assessment for *London Borough of Hillingdon*

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

May 2009

Title	2009 Air Quality Updating and Screening Assessment for London Borough of Hillingdon
Customer	London Borough of Hillingdon
Customer reference	
Confidentiality, copyright and reproduction	Copyright AEA Technology plc All rights reserved Enquiries about copyright and reproduction should be addresses to the Commercial Manager, AEA Technology plc.
File reference	AEAT/ENV/R/2809
Reference number	ED45585127

AEA Energy & Environment
The Gemini Building
Fermi Avenue
Harwell International Business Centre
Didcot
OX11 0QR

t: 0870 190 3859
f: 0870 190 6138

AEA Energy & Environment is a business name of
AEA Technology plc

AEA Energy & Environment is certificated to ISO9001
and ISO14001

Author	Name	Agnieszka Griffin
Approved by	Name	Dr Marios Valiantis
	Signature	
	Date	29-05-09

Local Authority Officer	Val Beale

Department	Environmental Protection Unit
Address	3W/01 Civic Centre, High Street, Uxbridge, Middlesex, UB8 1UW
Telephone	01895 277454
e-mail	envhealth-epu@hillingdon.gov.uk, VBeale@hillingdon.gov.uk

Report Reference number	AEAT/ENV/R/2809
Date	29-05-09

Executive Summary

This Air Quality Updating and Screening Report has been prepared for London Borough of Hillingdon as part of the Local Air Quality Management (LAQM) system introduced in Part IV of the Environment Act 1995. The Local Air Quality Management Technical Guidance LAQM.TG (09) has been closely followed in the preparation of this report.

After completing the Third round of air quality review and assessments, London Borough of Hillingdon is now required to proceed to the Fourth round. The Fourth round will reassess sources of emissions to air to identify whether the situation has changed since the third round, and if so, what impact this may have on predicted exceedences of the air quality objectives.

On the basis of this assessment, no further action is required in respect to pollutants:

- PM_{10};
- $PM_{2.5}$;
- Carbon Monoxide (CO);
- Benzene.

Analysis of the 2008 Nitrogen Dioxide monitoring data concluded that no further action is required. This is consistent with previous review and assessments and it supports the need for the existing AQMA.

Bias corrected diffusion tube data from the survey have continued to show exceedences during 2008. However, all the exceedances occurred within the existing AQMA, therefore it is suggested to continue NO_2 diffusion tube monitoring. No further action is required.

The Updating and Screening Assessment concluded that no further action was required for the following sources within London Borough of Hillingdon:

- Busy streets where people may spend 1-hour or more close to traffic;
- Roads with a high flow of buses and/or HGVs;
- Junctions;
- New roads constructed or proposed since the last round of review and assessment;
- Roads with significantly changed traffic flows and;
- Bus and coach stations;
- Airports;
- Ports (shipping).

Under the screening criteria set out within the Local Air Quality Management Technical Guidance LAQM.TG (09), the London Borough of Hillingdon has identified the need for a Detailed Assessment to be carried out for nitrogen dioxide along the railway lines with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

It is recommended that monitoring of nitrogen dioxide is commenced at the locations with relevant exposure along the railway line. If NO_2 exceedances found, the London Borough of Hillingdon will be required to proceed to a Detailed Assessment.

Table of contents

1 Introduction 4

1.1 Description of Local Authority Area 4

1.2 Purpose of Report 4

1.3 Air Quality Objectives 4

1.4 Summary of Previous Review and Assessments 6

2 New Monitoring Data 8

2.1 Summary of Monitoring Undertaken 8

2.2 Comparison of Monitoring Results with AQ Objectives 16

2.3 Results for other pollutants 25

3 Road Traffic Sources 28

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb 28

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic 28

3.3 Roads with a High Flow of Buses and/or HGVs. 28

3.4 Junctions 28

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment 29

3.6 Roads with Significantly Changed Traffic Flows 29

3.7 Bus and Coach Stations 29

4 Other Transport Sources 30

4.1 Airports 30

4.2 Railways (Diesel and Steam Trains) 30

4.3 Ports (Shipping) 30

5 Industrial Sources 32

5.1 Industrial Installations 32

5.2 Major Fuel (Petrol) Storage Depots 33

5.3 Petrol Stations 33

5.4 Poultry Farms 33

6 Commercial and Domestic Sources 34

6.1 Biomass Combustion – Individual Installations 34

6.2 Biomass Combustion – Combined Impacts 34

6.3 Domestic Solid-Fuel Burning 34

7 Fugitive or Uncontrolled Sources 35

8 New Developments 36

8.1 Residential, Commercial and Public Developments 36

9 Air Quality Plans and Policies 37

9.1 AQMA Action Plan 37

9.2 Local Transport Plan 37

10 Conclusions and Proposed Actions 38

10.1 Conclusions from New Monitoring Data 38

10.2 Conclusions from Assessment of Sources 39

10.3 Proposed Actions 39

11 References 40

Appendices

Appendix A QA/QC Data / Bias Adjustment Calculations

Appendix B Pollutant Data

Appendix C Part-B processes

Appendix D Air Quality Monitoring Reports

Appendix E Scaled Traffic Data

1 Introduction

1.1 Description of Local Authority Area

Hillingdon is the second largest local authority area in London in size. It has approximately 250,000 residents. It is more prosperous than neighbouring Ealing and Hounslow, but less so than Harrow. The borough to the north of the A40 is semi-rural, with Ruislip as its district centre. The south of the borough is more densely populated, urban in character, and contains the metropolitan centre of Uxbridge and towns of Hayes and West Drayton. London Borough of Hillingdon is a green borough, with a strong economy and excellent transport links to London, the west of England and the world, Hillingdon is a place of many contrasts.

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 micrograms per cubic metre $\mu g/m^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 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 $\mu g/m^3$	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 London Borough of Hillingdon has completed the following review and assessments of air quality to date:

- Stage 1: The report recommended that further examination was required for nitrogen dioxide, PM_{10}, sulphur dioxide and carbon monoxide.
- Stage 2: Further assessment of nitrogen dioxide, PM_{10}, sulphur dioxide and carbon monoxide were carried out as recommended in the Stage 1 Review and Assessment. The report concluded that the air quality objectives for NO_2, PM_{10}, CO and SO_2 would not be met in Hillingdon and that a stage 3 assessment was required.
- Stage 3: Detailed modelling of nitrogen dioxide, PM_{10}, carbon monoxide and sulphur dioxide were carried out. The report concluded that the annual mean nitrogen dioxide and 24 hour mean PM_{10} objectives would not be met in the borough and that an air quality management area should be declared.
- Stage 4: Further modelling and source apportionment were undertaken in the form of a stage 4 assessment.

As a result, the London Borough of Hillingdon has declared an air quality management area (AQMA) and developed an action plan.

2003 Review and Assessment:

- The report concluded the strategy objectives for nitrogen dioxide are not likely to be achieved by 2005. There was a need to progress to a detailed review and assessment for this pollutant as an AQMA had already been declared for this area during the previous round of Assessment. However DEFRA and the Greater London Authority (GLA) advised that a full Detailed assessment was not required at this stage. The main area of difference from previous review and assessment work was the release of a new Heathrow Emission Inventory by BAA Heathrow. Given the release of the Aviation White Paper and its recommendations to refine air quality modelling around Heathrow, the London Borough of Hillingdon decided to wait to use the recommendations from this process before proceeding with modelling.
- It was concluded that the strategy objectives for PM_{10} as a result of road transport emission are not likely to be achieved by 2004 or 2010. However, modelling around the major road corridors showed that the exceedences were confined to the major road corridors and there was no relevant public exposure.

2005 Progress Report:

- During 2004, the annual mean standard for NO_2 was exceeded at both roadside and background sites within the Borough.
- These results supported the earlier decision to declare an AQMA across the southern half of the Borough, and to adopt the AQAP based on the exposure of parts of the Hillingdon population to these levels of NO_2.

2006 Updating and Screening:

- The report concluded that for all pollutants apart from NO_2 the air quality objectives were predicted to be met within the London Borough of Hillingdon.
- All locations exceeding the NO_2 objective are within the already existing AQMA, thus there was no need to progress to detailed review and assessment for this pollutant.

2007 Progress Report:

From the monitoring data presented in the progress report it was concluded that:

- During 2007, the annual mean standard for NO_2 was exceeded at roadside, suburban and background sites within the Borough and its neighbouring local authorities. These include sites monitored continuously in the National and London networks as well as those within the Hillingdon diffusion tube survey.

- There was no progress towards achieving the NO_2 standard discernible in the 2007 data when taken as a whole with other data showing the results and trends over several years, going back to the mid 1990s.
- These results supported the decision to declare and continue with the AQMA and to adopt the AQAP based on exposure of the Hillingdon population to NO_2.
- Other monitoring results indicated that the standards for other air quality strategy pollutants were achieved during 2007, supporting the decision not to declare the AQMA on the basis of exposure to these other pollutants, though continued monitoring, especially of fine particles, remains desirable.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

New monitoring data for 2008 has become available since the 2008 Progress Report for:

- Nitrogen Dioxide (NO_2);
- PM_{10};
- $PM_{2.5}$;
- Carbon Monoxide (CO);
- Ozone (O_3);
- Benzene;

The London Borough of Hillingdon has carried out automatic monitoring for NO_2, PM_{10}, $PM_{2.5}$, CO, and O_3 during 2008. From April 2008 monitoring of NO_2 and PM_{10} commenced at Hillingdon Hayes monitoring station.

2.1.1 Automatic Monitoring Sites

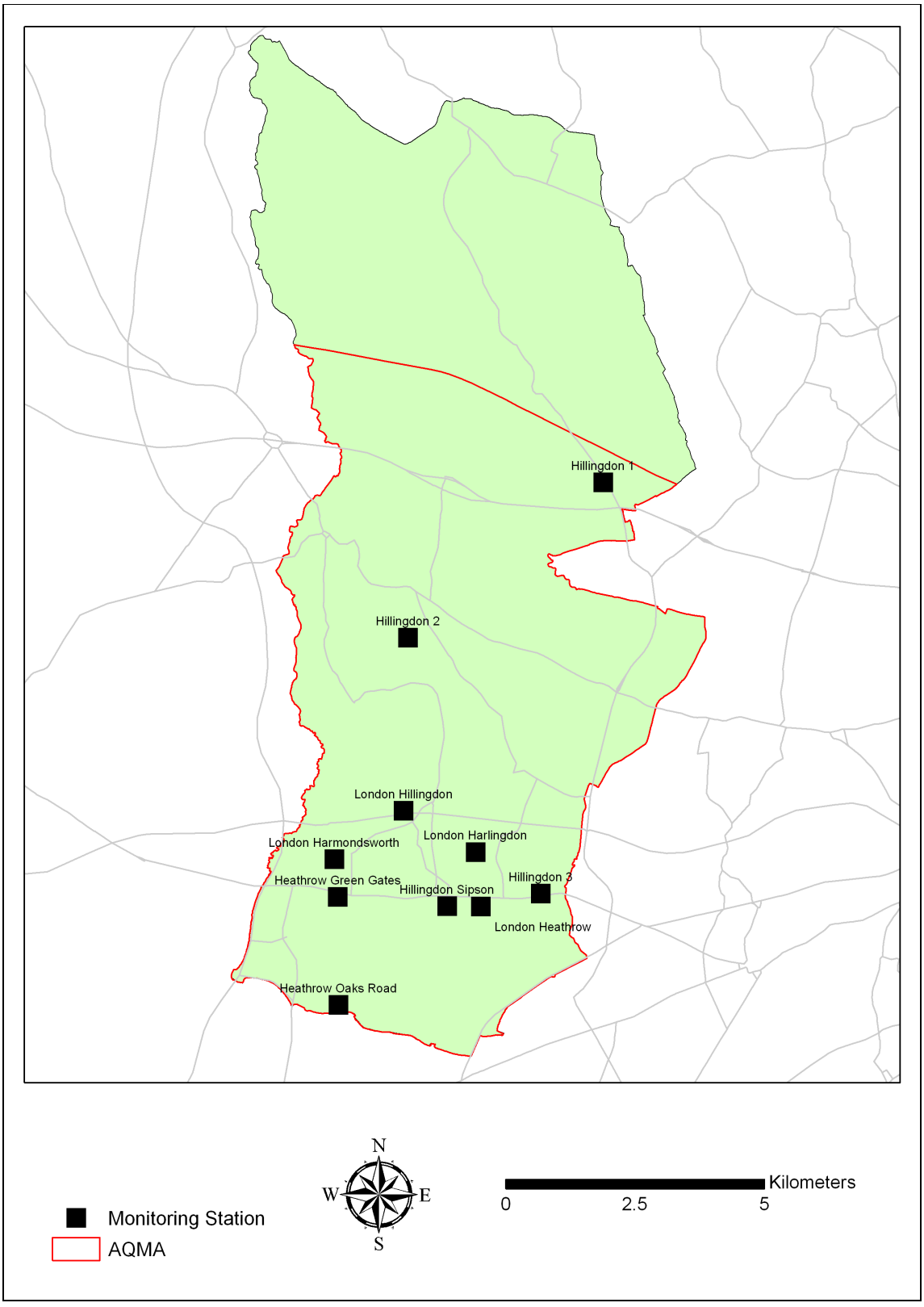
There are 11 automatic continuous monitoring sites located in the London Borough of Hillingdon. The details of these monitoring sites are provided in Table 2.1. Hillingdon Hayes is the only new site that stared monitoring since the last Progress Report. No site has closed down since the previous report. However, carbon monoxide monitoring was discontinued at London Harlington from March 2008 and also from London Hillingdon, the DEFRA owned site. London Hillingdon and London Harlington form part of the National Urban Network. Hillingdon 1, Hillingdon 2 and Hillingdon 3 are part of the London Network; London Heathrow, Heathrow Oaks Road and Heathrow Green Gates are part of the Heathrow airport monitoring; London Sipson, Hillingdon Hayes and London Harmondsworth are part of the local network. The locations of the automatic continuous monitoring sites are shown in Figure 2.1.

Details of QA/QC of the monitoring stations can be found in Appendix A.

Table 2.1 Details of 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 ?
London Heathrow LHR2	Airport	X 508399 Y 176746	NO_2, PM_{10} (TEOM)	Yes	No	N/A (inside the airport)	No
London Hillington	Suburban	X 506900 Y 178600	NO_2, O_3	Yes	Yes	3m (30m from M4)	Yes
Hillingdon 1	Roadside	X 510770 Y 184960	NO_2, PM_{10} (TEOM)	Yes	Yes (14m from residential housing façade)	2.5m from nearest road (busy)	Representative of exposure on this road
Hillingdon 2	Roadside	X 506991 Y 181951	NO_2, PM_{10} (TEOM)	Yes	Yes (7m from residential housing façade)	2m	By residential and also opposite hospital
Hillingdon 3	Roadside	X 509557 Y 176994	NO_2, PM_{10} (TEOM)	Yes	Yes (in line with residential façade)	18m from busy main road	Yes (for emissions from Bath Rd and Airport)
London Harlington	Airport	X 508300 Y 177800	CO, NO_2, O_3, PM_{10} $PM_{2.5}$ (TEOM)	Yes	No	8m	Background
Hillingdon Sipson	Urban background	X 507750 Y 176750	NO_2	Yes	Yes	9m from nearest residential facade	Yes
London Harmondsworth	Airport	X 505561 Y 177661	NO_2, PM_{10} (BAM)	Yes	20m (from nearest residential façade)	1m	Yes
Heathrow Green Gates	Airport	X 505630 Y 176930	NO_2, PM_{10}, $PM_{2.5}$ (TEOM)	Yes	No (although ls inline with residential property in Longford village)	N/A (background for the airport) 62m from airport boundary)	No (Background location)
Heathrow Oaks Road	Airport	X 505714 Y 174503	NO_2, PM_{10}, $PM_{2.5}$ (TEOM)	Yes	No	5m	No
Hillingdon Hayes	Roadside	X 510283 Y 178905	NO_2, PM_{10} (BAM)	Yes	Residential property within 15m	5m	Yes

Figure 2-1: Locations of the mo monitoring stations in London Borough of Hillingdon



2.1.2 Non-Automatic Monitoring

Diffusion tubes measurements for nitrogen dioxide were taken at 38 locations throughout the borough. Diffusion tubes are a common quantitative method for sampling at a large number of sites due to their low cost and ease of deployment. They provide a cost-effective means of measuring spatial distributions of nitrogen dioxide. The diffusion tube is a passive sampler and as such measures a mean concentration over the period for which it is exposed, in this case one month. Due to concerns about railway emissions two tubes HD79 and HD80 were added, one near to the railway, the other at the nearest residential location. The London Borough of Hillingdon is also taking part in the national survey organised on behalf of the highways Agency. Two sites are included in this survey, one roadside site and one residential. Hillingdon also monitors benzene concentrations via diffusion tubes at 5 locations HD31, HD46, HD48, HD50 and HD58.

Table 2.2 Details of Non- Automatic Monitoring Sites

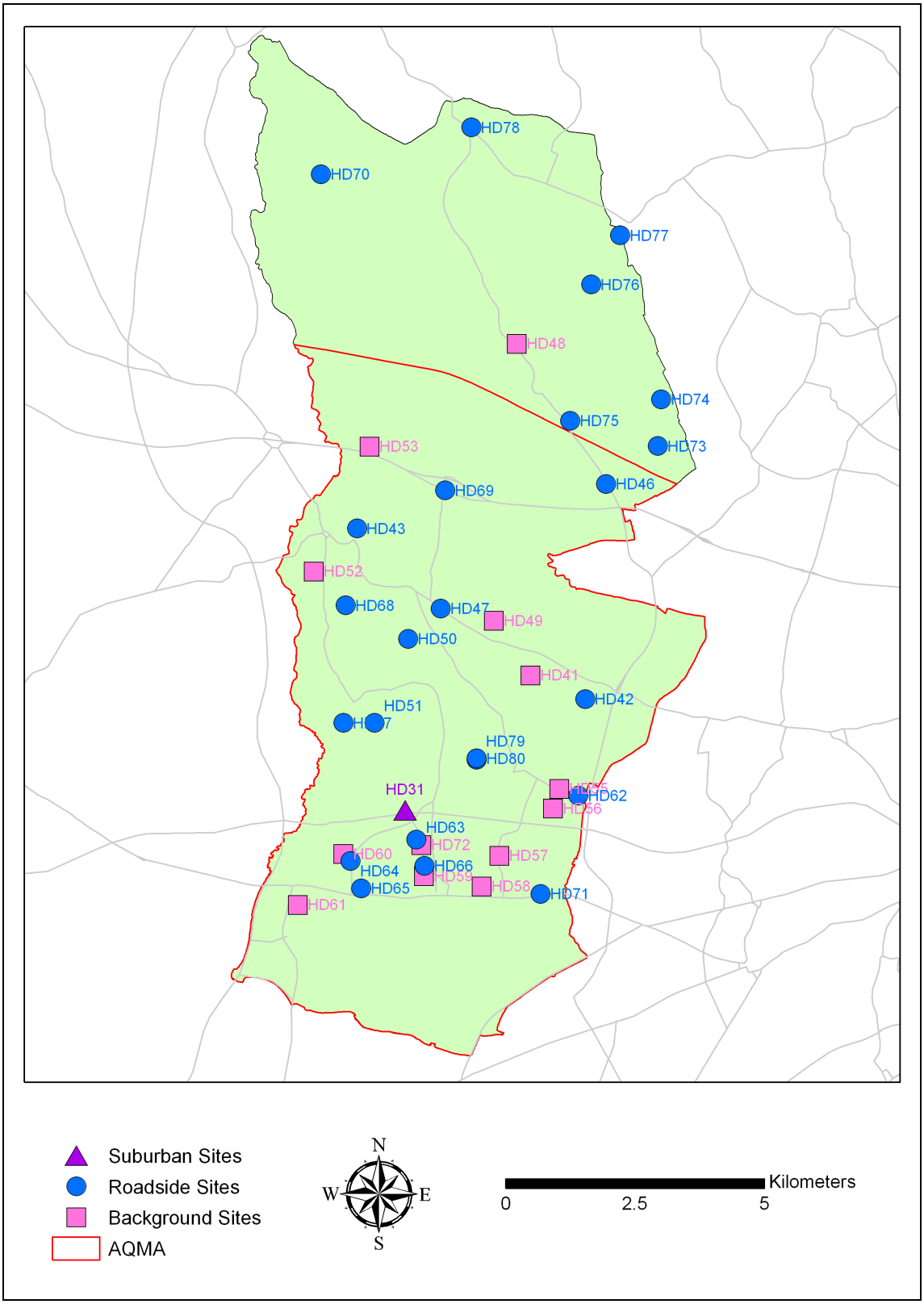
Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location?
HD31	Suburban	X 506940 Y 178601	NO_2/Benzene	Yes	station in-line with residential housing façade	30m from M4	Co-location site
HD41	Background	X 509358 Y 181215	NO_2	Yes	10m from residential housing façade	2m	Representative of a street
HD42	Roadside	X 510417 Y 180752	NO_2	Yes	4m from residential housing façade	2m	Representative of a road
HD43	Roadside	X 505996 Y 184058	NO_2	Yes	Fence of Children's nursery	4m	Yes
HD46	Suburban	X 506940 Y 178601	NO_2/Benzene	Yes	14m from residential housing façade	2.5m	Representative of a road
HD47	Roadside	X 507617 Y 182506	NO_2	Yes	Fence of school	5m	Representative of a road
HD48	Background	X 509094 Y 187645	NO_2/Benzene	No	No	7m	No
HD49	Background	X 508651 Y 182274	NO_2	Yes	Residential housing façade	7m	No - background
HD50	Roadside	X 510821 Y 184923	NO_2/Benzene	Yes	7m from residential housing façade	2m	Representative of a street
HD51	Roadside	X 506333 Y 180294	NO_2	Yes	in-line with residential housing façade	4m	Yes- Nearest residential to busy road
HD52	Background	X 505159 Y 183232	NO_2	Yes	5m from residential façade	1m	Representative of a road
HD53	Background	X 506243 Y 185653	NO_2	Yes	Lamp-post in-line with residential façade	23m	Yes - nearest residential to busy road
HD55	Background	X 509918 Y 179015	NO_2	Yes	4m from residential façade	30m	Yes - nearest residential to busy road

Council Name - England

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?
HD56	Background	X 509798 Y 178634	NO_2	Yes	7m from residential façade/school	1.5m	Representative of a road
HD57	Background	X 508758 Y 177718	NO_2	Yes	7m from residential façade	1m	Yes - nearest residential to busy road
HD58	Background	X 508414 Y 177125	NO_2/Benzene	Yes	in-line with residential façade	1m	Representative of a road
HD59	Background	X 507296 Y 177323	NO_2	Yes	8m from residential façade	1m	Representative of a road
HD60	Background	X 505736 Y 177752	NO_2	Yes	boundary of Children's nursery	1m	Representative of a street
HD61	Background	X 504851 Y 176770	NO_2	Yes	in-line with residential façade	2m	Representative of a street
HD62	Roadside	X 510285 Y 178880	NO_2	Yes	Residential housing façade	7m	Yes
HD63	Roadside	X 507148 Y 178030	NO_2	Yes	Residential hosing façade	12m	Representative of a street
HD64	Roadside	X 505873 Y 177613	NO_2	Yes	Residential housing façade	17m	Representative of a street
HD65	Roadside	X 506079 Y 177081	NO_2	Yes	Residential housing façade	4m	Representative of a street
HD66	Roadside	X 507305 Y 177520	NO_2	Yes	Residential housing façade	12m	Representative of a street
HD67	Roadside	X 505731 Y 180288	NO_2	Yes	3m from residential façade	1m	Representative of a street
HD68	Roadside	X 505776 Y 182567	NO_2	Yes	in-line with residential façade	1m	Yes - nearest residential to road
HD69	Roadside	X 507703 Y 184795	NO_2	Yes	Health centre façade	2m	Yes
HD70	Roadside	X 505299 Y 190923	NO_2	No	hospital entrance	5m	Representative of a street
HD71	Roadside	X 509556 Y 176974	NO_2	Yes	in line with residential façade	18m	Yes

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?
HD72	Background	X 507245 Y 177929	NO_2	Yes	Residential façade	9m	Represent ative of a street
HD73	Roadside	X 511825 Y 185655	NO_2	No	outside school	1m	Represent ative of a street
HD74	Roadside	X 511889 Y 186563	NO_2	No	8m from building façade,	1m	Yes
HD75	Roadside	X 510125 Y 186144	NO_2	No	Children's nursery, 4m from façade	2m	Yes - nearest receptor to busy road
HD76	Roadside	X 510531 Y 188785	NO_2	No	4m from residential façade,	1m	Yes - nearest residential to busy road
HD77	Roadside	X 511094 Y 189738	NO_2	No	12m from residential building façade	1m	Represent ative of a street
HD78	Roadside	X 508210 Y 191830	NO_2	No	24m from residential façade,	1m	Represent ative of a street
HD 79	Roadside	X 508310 Y 179577	NO_2	Yes	Residential façade	36m (from railway)	South of railway so not worse-case. North would be worse-case due to prevailing wind
HD80	Roadside	X 508316 Y 179600	NO_2	Yes	24m from residentialf acade	12m (from railway)	South of railway so not worse-case. North would be worse-case due to prevailing wind

Figure 2-2: Locations of the diffusion tubes in London Borough of Hillingdon



2.2 Comparison of Monitoring Results with AQ Objectives

2.2.1 Nitrogen Dioxide

The principal source of NO_x emissions is road transport, which accounted for about 32% of total UK emissions in 2006. Major roads carrying large volumes of high-speed traffic (such as motorways and other primary routes) are a predominant source, as are conurbations and city centres with congested traffic. Within most urban areas, the contribution of road transport to local emissions will be much greater than for the national picture.

2.2.2 Automatic Monitoring Data

Table 2.3a presents the annual mean concentrations for nitrogen dioxide for 2006, 2007 and 2008. The 2008 results illustrate that the air quality objective was exceeded at London Heathrow (53 µg/m^3) London Hillingdon (51µg/m^3), Hillingdon 1 (46µg/m^3), Hillingdon 3 (42µg/m^3) and Hillingdon Hayes (50µg/m^3). The exceedances at London Heathrow LHR2 are likely due to airport activities, Hillingdon 1, Hillingdon 3 and Hillingdon Hayes are roadside sites. However London Hillingdon is a suburban site which is representative of residential areas of the Borough close to the airport and major roads. All of the sites with measured NO_2 exceedances are located within AQMA.

There were no exceedances at Hillingdon 2, London Harlington, Hillingdon Sipson, London Harmondsworth, Heathrow Green Gates and Heathrow Oaks Road.

Table 2.3a Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 %	Annual mean concentrations (µg/m^3)		
				2006	2007	2008
London Heathrow LHR2	Airport	Yes	99	52	54	**53**
London Hillingdon	Suburban	Yes	83	50	45	**51**
Hillingdon 1	Roadside	Yes	100	43	49	**46**
Hillingdon 2	Roadside	Yes	99	38	44	35
Hillingdon 3	Roadside	Yes	93	45	43	**42**
London Harlington	Airport	Yes	98	37	37	35
Hillingdon Sipson	Urban background	Yes	99	45	40	38
London Harmondsworth	Airport	Yes	93	-	35	32
Heathrow Green Gates	Airport	Yes	85	37	38	38
Hillingdon Hayes	Roadside	Yes	60	-	-	**50**
Heathrow Oaks Road	Airport	Yes	95	33	38	35

Data capture 60% for Hillingdon Hayes – site in operation from 21/04/2008
Hillingdon 1 2007 data capture – 77%
Hillingdon 2 2007 data capture 27% - due to instrument failure
Hillingdon Sipson – 2006 data capture 31% - site in operation since September 2006.

Council Name - England

Figure 2-3 shows the trends observed in the data recorded at the automating monitoring sites. It shows that nitrogen dioxide concentrations have been above the air quality objective at LHR2, Hillingdon 1, London Hillingdon and Hillingdon 3 since monitoring commenced (Appendix B). The very hot weather in 2003 is likely responsible for the peak observed in that year, and the poor weather of 2002 for the dip in levels then. Although there had been some evidence of reduction in concentrations during the second part of the 1990s, there is no evidence of improvement since that time. There was a small reduction in annual mean concentrations in 2008 at most of the monitoring sites in London Borough of Hillingdon.

The analysis of the trend data suggests that it is unlikely that the annual mean NO_2 objective will be reached at LHR2, London Hillingdon, Hillingdon 1, Hillingdon 3 and Hillingdon Hayes in the coming years as judged from these local monitoring data alone.

NO_2 monitoring data recorded at all the monitoring stations for previous years can be found in Appendix B.

Figure 2-3: Long-term annual mean NO_2 concentration in London Borough of Hillingdon. Results from automatic monitoring stations

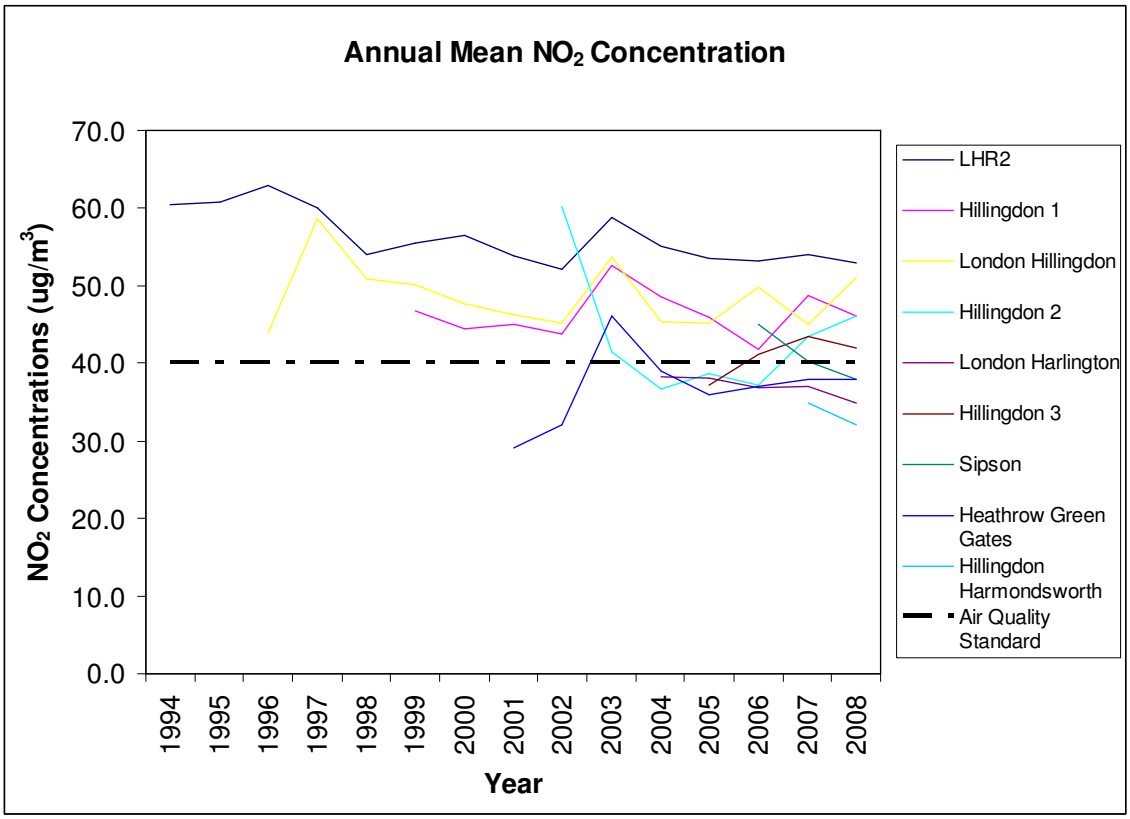


Table 2.3b presents information on all 1-hourly mean NO_2 objective at the continuous automatic monitoring sites (see also Appendix B). The 2008 results show that the objective was achieved at all the sites in the Borough. The exceedances of hourly NO_2 objective in 2008 were recorded at London Hillingdon and Hillingdon Hayes, one day and two days respectively.

Table 2.3b Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 %	Number of Exceedences of hourly mean (200 µg/m^3) *If the period of valid data is less than 90% of a full year, include the 99.8th %ile of hourly means in brackets.*		
				2006	2007	2008
London Heathrow LHR2	Airport	Yes	99	0	12	0
London Hillingdon	Suburban	Yes	83	0	8	1 (159)
Hillingdon 1	Roadside	Yes	100	1	21	5
Hillingdon 2	Roadside	Yes	99	0	0	0
Hillingdon 3	Roadside	Yes	93	0	5	1
London Harlington	Airport	Yes	98	2	4	0
Hillingdon Sipson	Urban background	Yes	99	0	0	2
London Harmondsworth	Airport	Yes	93	-	0	0
Heathrow Green Gates	Airport	Yes	85	0	1	0 (141)
Hillingdon Hayes	Roadside	Yes	60	-	-	2 (168)
Heathrow Oaks Road	Airport	Yes	95	0	1	0

Data capture 60% for Hillingdon Hayes – site in operation from 21/04/2008
Hillingdon 1 2007 data capture – 77%
Hillingdon 2 2007 data capture 27% - due to instrument failure
Hillingdon Sipson – 2006 data capture 31% - site in operation since September 2006.

Council Name - England

Diffusion Tube Monitoring Data

In spite of the convenience and ease of use, diffusion tubes have limitations. They do not offer the same accuracy and precision as more sophisticated continuous methods, and are therefore only considered to be an "indicative" monitoring technique.

The accuracy of diffusion tubes may be affected by a number of sources of interference – both during exposure and at the analysis stage – which can cause them to exhibit so-called 'bias' i.e. under-read or (more commonly) over-read relative to a continuous analyser. For this reason the accuracy of any diffusion tube survey should be quantified by means of a co-location study, in which diffusion tubes are exposed at the same site as a continuous analyser throughout the duration of the survey. The ratio of the continuous analyser to the diffusion tube result is used as a "bias adjustment factor" and applied to the annual means measured by the diffusion tubes at all of the sites.

Table 2.4a Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 %	Annual mean concentrations (µg/m^3) Adjusted for bias
				2008
HD31	AURN Monitoring Station	Yes	92	**45.0**
HD41	Barra Hall	Yes	75	30.7
HD42	Uxbridge Technical College	Yes	83	35.8
HD43	Uxbridge Day Nursery	Yes	92	**45.0**
HD46	South Ruislip Monitoring Station	Yes	92	**47.3**
HD47	Hillingdon Primary School	Yes	92	32.2
HD48	Citizens Advice Bureau	No	92	30.7
HD49	83 Hayes End Drive, Hayes End, Middlesex (on drain pipe)	Yes	92	27.0
HD50	Hillingdon Hospital Monitoring Station	Yes	92	**40.2**
HD51	4 Colham Avenue	Yes	83	36.2
HD52	101 Cowley Mill Road	Yes	92	38.4
HD53	Warren Road	Yes	92	**45.5**
HD55	Harold Avenue	Yes	92	**41.7**
HD56	15 Phelps Way	Yes	92	38.5
HD57	25 Cranford Lane	Yes	92	38.3
HD58	Brendan Close	Yes	92	**41.6**
HD59	7 Bomber Close	Yes	92	36.0
HD60	Harmonsworth Green	Yes	83	32.9
HD61	Heathrow Close	Yes	92	36.7
HD62	1 North Hyde Gardens, Hayes (rear of residents property - open access)	Yes	92	37.6
HD63	370 Sipson Road, Sipson, Middlesex (on drainpipe)	Yes	92	34.6

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 %	Annual mean concentrations (μg/m^3) Adjusted for bias
				2008
HD65	28 Pinglestone Close, Sipson, Middlsex (on drainpipe)	Yes	92	31.8
HD66	486 Sipson Road, Sipson, Middlesex (on drainpipe)	Yes	92	34.1
HD67	31 Tavistock Road (on lamp-post outside house)	Yes	92	31.8
HD68	Ratcliffe Close, Uxbridge (1st lamp-post on the left)	Yes	92	29.0
HD69	Hillingdon Health Centre, Freezeland Way (on drain-pipe)	Yes	92	35.4
HD70	Harefield Hospital, Hill End Road (lamp-post outside entrance)	No	83	26.0
HD71	Oxford Avenue, Cranford (1st lamp-post on left)	Yes	92	**40.9**
HD72	2 Vineries Close (drainpipe rear of house)	Yes	92	30.5
HD73	Queensmead School, South Ruislip. (lamppost opposite Jubilee Drive)	No	75	31.1
HD74	Field End Road/Field End School, S.Ruislip. 3rd Lamp-post south of school entrance	No	92	32.3
HD75	Sidmouth Drive, South Ruislip. Lamp-post outside Nursery, 2nd lamp-post from West E Rd	No	83	29.3

Council Name - England

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 %	Annual mean concentrations (μg/m^3) Adjusted for bias
				2008
HD77	Chamberlain Wy, Eastcote. 1st lamppost left in Chamberlain Wy. Monitoring Cuckoo Hill	No	92	26.3
HD78	Gateway Close, Northwood. 1st lamp-post on left of Gateway Close. Monitoring Rickmansworth Road	No	92	32.5
HD 79	Rear Garden of 86 Stormount Drive, Hayes, UB3 1RH. Attached to building, rear of property	Yes	75	33.4
HD80	Rear of 86 Stormount Drive, UB3 1RH. Attached to fenceline that borders the railway	Yes	75	32.0

It is necessary to determine a bias adjustment factor appropriate for the particular diffusion tubes used in the London Borough of Hillingdon. The methodology for determining the appropriate bias adjustment factor is outlined in the Technical Guidance (09) and several online tools are also available to assist with this process.

The Bias Correction used for Hillingdon can either be locally calculated using sites collocated with a chemiluminescence analyser or derived using the national database co-location studies.

The London Borough of Hillingdon has 3 co-located sites that can be used to calculate the local bias adjustment factor. The bias adjustment factor for each individual location was calculated using the "LAQM Tool" described in section A1.191 of the Technical Guidance (09). Calculations can be seen in Appendix A.

The factors derived from the co-location studies were as follows:

- London Hillingdon (AURN) -1.05;
- Hillingdon1 – 0.91;
- Hillingdon 2 - 0.83.

The bias adjustment factor of 0.93 was calculated as an average of these three factors.

The average bias adjustment factor calculated from three co-location studies was used in all previous review and assessment, therefore for the consistency and comparison of the diffusion tube data from the previous years, the decision was taken to carry on with this approach.

This bias adjustment factor was, therefore, applied to the annual average concentration recorded at each site.

When the bias adjustment factor was applied to the 2008 annual mean NO_2 concentrations, 8 of the diffusion tube sites exceeded the NO_2 air quality objective of 40 $\mu g/m^3$.

These diffusion tubes locations are as follows:

- AURN Monitoring Station (in-line with residential housing façades);
- Uxbridge Day Nursery (fence of children nursery);
- South Ruislip Monitoring Station (14 meters from residential housing façade);
- Hillingdon Hospital Monitoring Station (7 meters from residential housing façade);
- Warren Road (Lamp-post in-line with residential façade);
- Harold Avenue (Lamp-post 4 meters from residential façade);
- Brendan Close (Lamp-post in-line with residential façade);
- Oxford Avenue, Cranford (Lamp-post in-line with residential façade).

All of these diffusion tubes are located within the existing AQMA, and therefore it is no required to proceed to detailed assessment for these locations.

Mapped data from the diffusion tube network presented in Figures: 2-4 and 2-5 show a similar pattern, with exceedances at a number of locations in 2005, 2006, 2007 and 2008. There is no evidence of overall improvement in NO_2 concentrations from the diffusion tubes data.

Figure 2-4: Map illustrating the 2008 annual mean NO_2 concentrations (ug/m^3) in the London Borough of Hillingdon

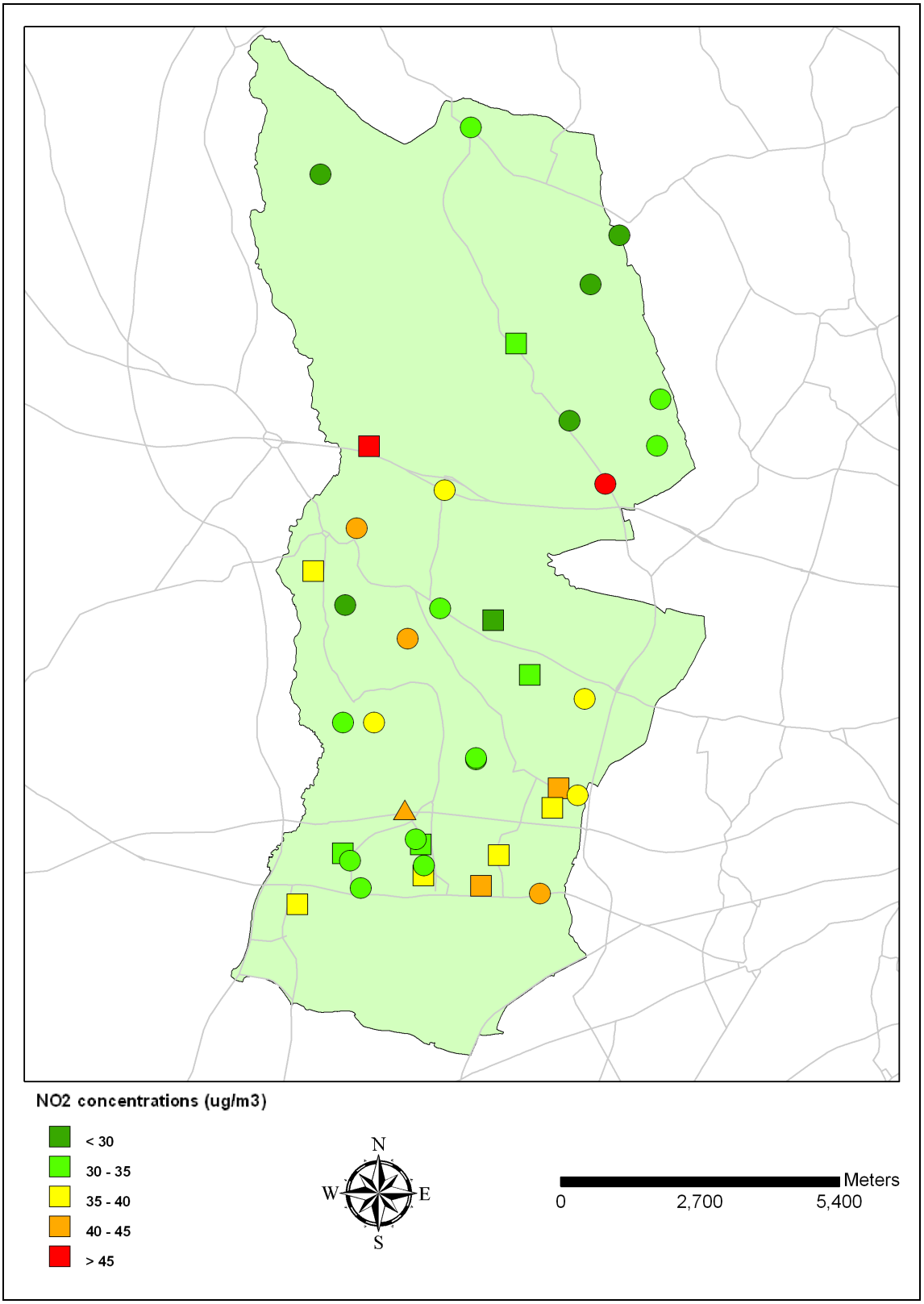
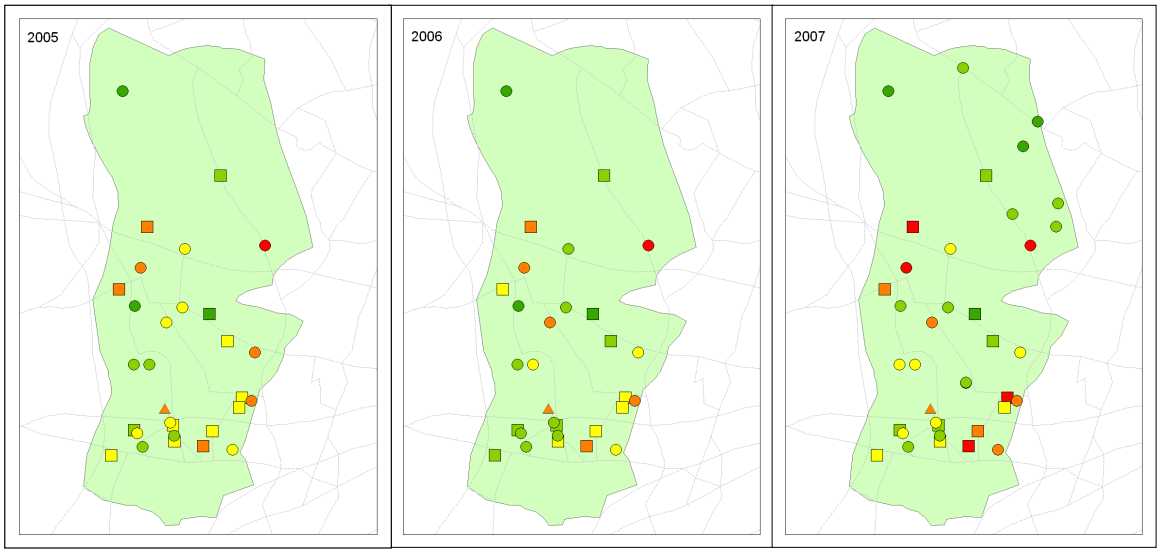


Figure 2-5: Maps of the London Borough of Hillingdon the 2005, 2006 and 2007 annual mean NO_2 concentration (μgm^{-3}). These maps were taken from the London Borough of Hillingdon Air Quality Action Plan Progress Report 2008



Council Name - England

Summary for Nitrogen Dioxide

The 2008 monitoring of NO_2 shows that the exceedances occurred at roadside, suburban and background sites. This includes continuous monitoring sites from the National and London Networks and also diffusion tubes.

The analysis of the trend data shows no clear upward or downward trends and there is no progress towards achieving the air quality objective.

Annual mean concentrations however continue to be high in Hillingdon which is consistent with the previous review and assessments and support the need for the AQMA and also to continue with the AQAP based on the exposure of the Hillingdon population to NO_2.

2.3 Results for other pollutants

2.3.1 PM_{10}

Tables 2.5a presents the PM_{10} data recorded at the continuous automatic monitoring sites in 2006, 2007 and 2008. The 2008 results compared to the air quality objective show that the objective was achieved at all the monitoring sites. Measured PM_{10} data using TEOMs monitors for 2006, 2007 and 2008 was corrected by using the Volatile Correction Model (VCM) in agreement with the Technical Guidance. PM_{10} data measured by using BAM monitors were corrected with the factor 0.8333.

Table 2.5a Results of PM_{10} Automatic Monitoring: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 %	Annual mean concentrations (µg/m^3)		
				2006	2007	2008
LHR2	Airport	Yes	98	27.0	25.1	23.4
Hillingdon 1	Roadside	Yes	99	25.0	24.9	22.9
Hillingdon 2	Roadside	Yes	93	28.5	28.5	20.8
Hillingdon 3	Roadside	Yes	94	23.2	21.5	21.4
London Harlington	Airport	Yes	87	23.2	21.5	20.9
London Harmondsworth	Airport	Yes	85	-	21.5	29.7
Heathrow Green Gates	Airport	Yes	95	23.3	22.1	17.2
Hillingdon Hayes	Roadside	Yes	58	-	-	21.6
Heathrow Oakes Road	Airport	Yes	98	22.3	21.7	19.8

2007 Hillingdon 2 – data capture 28.7%
2007 London Harlington – data capture 48%

Table 2.5b presents information on 24-hour mean PM_{10} objective at the continuous automatic monitoring sites. The 2008 results show that the objective was achieved at all the sites in the Borough. However, the exceedances of the 24-hour mean PM_{10} objective occurred at all the monitoring sites in 2008, with the highest number of days of 33 with exceedances at London Harmondsworth and the lowest number of days of 2 with exceedances at Heathrow Green Gates and London Hayes.

Table 2.5b Results of PM_{10} Automatic Monitoring: Comparison with 24-hour Mean Objective

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 %	Number of Exceedences of 24 hour mean (50 µg/m³) *If data capture < 90%, include the 90th %ile of 24 hour means in brackets.*		
				2006	2007	2008
LHR2	Airport	Yes	98	23	20	15
Hillingdon 1	Roadside	Yes	99	18	22	12
Hillingdon 2	Roadside	Yes	93	9	11 (49.5)	6
Hillingdon 3	Roadside	Yes	94	31	30	10
London Harlington	Airport	Yes	87	12	16	10 (35.8)
London Harmondsworth	Airport	Yes	85	-	2 (35)	33 (51)
Heathrow Green Gates	Airport	Yes	95	10	16	2
Hillingdon Hayes	Roadside	Yes	59	-	-	2 (35.8)
Heathrow Oakes Road	Roadside	Yes	98	14	21	9

2007 Hillingdon 2 – data capture 28.7%
2007 London Harlington – data capture 48%

2.3.2 Benzene

Concentrations of benzene in the London Borough of Hillingdon are monitored through the diffusion tube survey. There is no co-location study carried out in the borough to allow bias correction calculation. Unadjusted results are presented in Table 2.6. The recorded concentration in 2008 ranged from 1.77 µg/m³ to 2.43 µg/m³ which are below of the benzene standard of 5 µg/m³. As in previous years, annual mean benzene levels for the 12-month period January 2008 to January 2009, were below the air quality objective. The ambient benzene concentrations do not appear to be increasing.

Table 2.6 presents annual mean concentrations for benzene in 2007 and 2008. The monitoring data shows that the air quality objective for benzene was achieved.

Table 2.6 Results of the annual mean concentrations for benzene

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations (µg/m³)	
				2007	2008
HD31	AURN Monitoring Station	Yes	75	1.78	2.43
HD46	South Ruislip Monitoring Station	Yes	75	2.20	1.77
HD48	Citizens Advice Bureau	Yes	75	2.13	2.04
HD50	Hillingdon Hospital Monitoring Station	Yes	67	2.07	2.00
HD58	Brendan Close	Yes	75	1.85	2.36

2.3.3 $PM_{2.5}$

The UK Government and the Devolved Administrations have set new national air quality objective for particulate matter smaller that 2.5µg diameter. However this objective has not been incorporated into LAQM Regulations and Local Authority has no statutory obligation to review and assess air quality against it. The air quality objective for $PM_{2.5}$ is 25 µg/m³ and to be achieved by 2020. Table 2.7 presents the $PM_{2.5}$ data recorded at the continuous automatic monitoring sites in 2008. The 2008

results show that $PM_{2.5}$ recorded at the monitoring sites were in the range of 10µg/m^3 to 12 µg/m^3. Measured results were well below the objective for $PM_{2.5}$.

Table 2.7: Results of the annual mean concentrations for $PM_{2.5}$ (µg/m^3)

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 %	Annual mean concentrations (µg/m^3)
				2008
London Harlington	Airport	**Yes**	11.5*	10
Heathrow Green Gates	Airport	**Yes**	99	11
Heathrow Oaks Road	Airport	**Yes**	95	12

**London Harlington data capture 11.5% site in operation from 16th September 2008*

2.3.4 Ozone

Tables 2.8 presents the ozone data recorded at the continuous automatic monitoring sites in 2008. The 2008 results show that ozone concentrations recorded at the monitoring sites were in the range of 31µg/m^3 to 35 µg/m^3.

Table 2.8: Results of the annual mean concentrations for ozone (µg/m^3)

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 %	Annual mean concentrations (µg/m^3)
				2008
London Hillingdon	Airport	**Yes**	99	31
Heathrow Harlington	Airport	**Yes**	98	35

2.3.5 Carbon Monoxide

Table 2.9 illustrate the CO data recorded at the London Harlington continuous monitoring site in 2008. The air quality objective was achieved. Monitoring of carbon monoxide was discontinued at London Harlington site in March 2008.

Table 2.9: Results of the annual mean concentrations for CO

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 %	Annual mean concentrations (mg/m^3)		
				2006	2007	2008
Heathrow Harlington	Airport	**Yes**	17	1.9	0.3	0.4

Data capture 17% in 2008 – monitoring discontinued in March 2008

CO data for previous years for LHR2, London Hillingdon and London Harlington can be found in Appendix 2.

3 Road Traffic Sources

All roads included in the 2006 LAEI were assessed in the previous USA, these covered most of the main roads within the London Borough of Hillingdon and also narrow congested streets with residential properties close to the kerb, busy streets where people spend an hour or more close to traffic, roads with high proportion of HGVs and buses, roads where the concentration were close to the air quality objective and those with significant change in traffic flows. The traffic data from the 2006 LAEI were scaled up using the Regional Traffic Forecast (RTF) factor to 2008. These data can be found in Appendix E.

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

London Borough of Hillingdon 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

London Borough of Hillingdon 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.

The roads with high flows of buses and/or HGVs were considered in the previous round of review and assessment. According to the latest LAEI 2006 traffic data, there are 4 roads outside the AQMA with HDVs percentage greater than 20. These roads are: Northwood Way, Park Lane, Field End Road, and Green Lane. However, the total number of HDVs is less than 2500 and therefore there is no need to proceed to a Detailed Assessment.

London Borough of Hillingdon confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

Busy junctions in the London Borough of Hillingdon were in the last round of review and assessment.

London Borough of Hillingdon 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

London Borough of Hillingdon confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

London Borough of Hillingdon confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

There are two buses/coaches stations within the London Borough of Hillingdon: one at Heathrow and one at Hatton Cross. Both were assessed in the previous round of review and assessment.

According to the Technical Guidance (09), if there are more than 2,500 daily movements at the bus/coach station then further action is required. Both stations don't exceed this threshold, and therefore no action is required.

London Borough of Hillingdon confirms that there are no new/newly identified bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

Heathrow airport lies within the London Borough of Hillingdon. The Heathrow airport has been assessed in the previous round of review and assessment. There is relevant exposure within 1000 meters of the airport boundary and there were a total of 67,054,745 passengers per annum in 2008*. The 2008 Air Pollution Report - Heathrow LHR2 - showed that the annual average NO_2 concentration was 53 $\mu g/m^3$.

A new terminal, terminal 5, was operational since March 2008. The London Borough of Hillingdon will work with neighboring boroughs to model the NO_2 concentrations using the LEAI 2006. The model predictions for 2010 will include the operation of Terminal 5 using details from the Heathrow Emission Inventory. The London Borough of Hillingdon has confirmed that plans for modeling the NO_2 concentrations from this new terminal are already in place.

London Borough of Hillingdon confirms that there are no new/newly identified airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

The Great Western mainline runs through the London Borough of Hillingdon and stops at Hayes and Harlington and West Drayton stations.

London Borough of Hillingdon 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

The Great Western mainline runs through the London Borough of Hillingdon. There is nearby residential housing alongside the railway. During 2008 there was NO_2 monitoring undertaken at two locations near the railway line. The measured concentrations were below the air quality objective.

London Borough of Hillingdon has identified locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m, and **will need to proceed to a Detailed Assessment for nitrogen dioxide.**

4.3 Ports (Shipping)

London Borough of Hillingdon confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

Council Name - England

** BAA website information*

5 Industrial Sources

5.1 Industrial Installations

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

During 2008 three new permits were issued for Part B installations.
These were:

- 1st choice – Dry Cleaning;
- Premier dry Cleaners – Dry Cleaning;
- Impact Bodyshop Ltd – Re-spraying of Road vehicles.

The key emissions from Dry cleaners and surface cleaning processes/activities are those consisting of volatile organic compounds (VOC), due to solvent use in these processes. Part B processes require an LAPPC permit which is a legal permit allowing an 'operator' to emit air pollution. Local councils 'permit' operators to carry out 'activities' at 'installations' within their area. The permit sets out conditions, which the operators must abide by and sets emission limits which take into account National Air Quality Standards. The installations are regularly inspected by Officers from the council to ensure they are complying with their air quality limits and meeting the conditions of their permit. Therefore emissions from these new Part B processes on objectives of local air quality management should be insignificant.

A list of Part B processes is presented in Appendix C.

London Borough of Hillingdon 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

London Borough of Hillingdon 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

London Borough of Hillingdon 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 the Local Authority area.

5.3 Petrol Stations

The petrol stations in the London Borough of Hillingdon are registered as Part B processes. The guidance requires that petrol stations have to be considered only if there are near busy roads i.e. roads with more than 30,000 vehicles per day, a throughput greater than 2 million petrol litres per annum and a relevant exposure within 10 m of the pump. A list of petrol stations in the London Borough of Hillingdon is displayed in **Appendix C.**

London Borough of Hillingdon confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry Farms

There are no poultry farms meeting the criteria to be registered under the Integrated Pollution and Prevention (IPPC) and there is no relevant exposure including residential properties that form part of the harm itself.

London Borough of Hillingdon confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

London Borough of Hillingdon confirms that there are no biomass combustion plants in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

London Borough of Hillingdon confirms that there are no biomass combustion plants in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

No new sources of domestic solid-fuel burning have been identified since the previous round of Review and Assessment, which stated that the use of solid fuel continue to decline through out the area and that there were no areas with 50 or more houses using these fuels in a 500 m square.

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

7 Fugitive or Uncontrolled Sources

There are no new or newly identified quarries, opencast mines, landfills, handling of dust cargo, industrial sites with unpaved roads, processing plants or materials handling.

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

8 New Developments

8.1 Residential, Commercial and Public Developments

The following developments with potentially significant air quality impacts have been granted approval since the last round of Review and Assessment:

Porters Way Development - 575 residential unit development in West Drayton, south of the borough, within the AQMA;

Hayes Station Goods Yard Re-development – 600 residential plus 120 bed hotel, not all yet fully let, south of the borough, within the AQMA;

RAF Northolt Additional Development – 50,000m2 development site including 800 residential, parcels sorting office, at the northern boundary of the AQMA;

RAF Eastcote – addition of 350 residential units, outside of AQMA boundary;

Honeywell Site Re-development – 350 residential units, south of borough, within the AQMA;

Sidmouth Drive School – new secondary school, 900 maximum, up to 3rd year of intake, high levels of sustainability included, just north of AQMA boundary;

Stockley Academy – school re-development, 1,000 maximum intake, in south of borough, within AQMA.

9 Air Quality Plans and Policies

9.1 AQMA Action Plan

The London Borough of Hillingdon declared the AQMA in 2005 and therefore an Air Quality Action Plan is currently in place.

9.2 Local Transport Plan

London Borough of Hillingdon has a Local Transport Plan in place. This plan will spearhead actions aimed at ensuring good air quality is maintained in respect of the national air quality objectives and introducing more integrated transport solutions to tackle any identified air quality hotspots.

10 Conclusions and Proposed Actions

This Updating and Screening report has followed the guidance set in Part IV of the Environment Act 1995 Local Air Quality Management Technical Guidance LAQM. TG(09) to ensure continuity in the LAQM process. The following conclusions arise from the findings in this report:

10.1 Conclusions from New Monitoring Data

The London Borough of Hillingdon undertakes extensive automatic and diffusion tube air quality monitoring throughout its areas. This monitoring is carried out to the high standard required for these data to be considered with the review and assessment process.

Nitrogen Dioxide

Monitoring of nitrogen dioxide at the eleven automatic sites in London Borough of Hillingdon showed that concentrations at Hillingdon 2, London Harlington, Hillingdon Sipson, London Harmondworth, Heathrow Green Gates and Heathrow Oaks Road were below the annual mean objective. Annual mean concentrations however continued to exceed at London Heathrow, London Hillingdon, Hillingdon 1, Hillingdon 3 and Hillingdon Hayes. This is consistent with previous review and assessments and it supports the need for the AQMA.

Bias corrected diffusion tube data from the survey have continued to show exceedences during 2008. However, all the exceedances occurred within the existing AQMA, therefore it is suggested to continue NO_2 diffusion tube monitoring. No further action is required.

Particulate Matter (PM_{10})

Particulate Matter (PM_{10}) is monitored at London Heathrow, Hillingdon 1, Hillingdon 2, Hillingdon 3, London Harlington, London Harmondsworth, Heathrow Green Gates, Hillingdon Hayes and Heathrow Oakes Road. The 2008 measured concentrations show that the annual mean objective was achieved. The 24-hour mean concentration was exceeded at all the sites, however the objective of 35 days a year was achieved.

Benzene

Results of the ongoing air quality monitoring study in the London Borough of Hillingdon indicate that ambient concentrations of benzene in Hillingdon during 2008 met the Air Quality Strategy Objective. There are no new industrial processes, roads, petrol stations or other developments that require detailed assessment for this pollutant. Hence, new information in 2008 confirms the conclusion of previous reports that a Detailed Assessment is not required for benzene.

Carbon Monoxide

The monitoring of carbon monoxide was discontinued in London Borough of Hillingdon. However the short-term monitoring undertaken in 2008 indicates that the Air Quality Strategy Objectives for CO are likely to be met. There are no new industrial processes, roads or other developments that require detailed assessment with respect to this pollutant. Hence, new information in 2008 confirms the conclusion of previous reports that a Detailed Assessment is not required for CO.

Particulate Matter ($PM_{2.5}$)

Particulate Matter ($PM_{2.5}$) is monitored at London Harlington, Heathrow Green Gates, and Heathrow Oakes Road. The 2008 measured concentrations show that the annual mean objective was achieved.

Ozone

Ozone data measured at the continuous automatic monitoring sites in 2008 show that ozone concentrations recorded at the monitoring sites were in the range of 31$\mu g/m^3$ to 35 $\mu g/m^3$.

10.2 Conclusions from Assessment of Sources

There is no requirement to proceed to a detailed Assessment for the following sources:

- Busy Streets where People May Spend 1-hour or More Close to Traffic;
- Roads with a High Flow of Buses and/or HGVs;
- Junctions;
- New Roads Constructed or Proposed since the Last round of Review and Assessment;
- Roads with Significantly changed Traffic Flows and;
- Bus and Coach Stations.

10.2.1 Other Transport Sources

There is a requirement for a Detailed Assessment for the railways sources as London Borough of Hillingdon has identified locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

It is recommended that monitoring of nitrogen dioxide is commenced at the locations with relevant exposure along the railway line. If NO_2 exceedances found, the London Borough of Hillingdon will be required to proceed to detailed assessment.

There is no requirement to proceed to a Detailed Assessment for the following sources

- Airports;
- Ports (shipping).

10.2.2 Industrial Sources

There is no requirement to proceed to a Detailed Assessment for the following sources:

- Industrial Installations;
- New or Significantly changed installations with no Previous Air Quality Assessment;
- Major Fuel (Petrol) Storage Depots and;
- Petrol Stations.

10.2.3 Commercial and Domestic Sources

There is no requirement to proceed to a Detailed Assessment for the following sources:

- Biomass combustion –individual installations
- Biomass combustion – combined impacts
- Domestic solid-fuel burning

10.3 Proposed Actions

London Borough of Hillingdon has identified the need for a Detailed Assessment to be carried out for nitrogen dioxide for railways sources – moving trains.

Detailed Assessments should be completed within 12 months of the date they are initiated however in some locations a minimum of 6 months monitoring data will be required before it can be prepared. The next part of London Borough of Hillingdon air quality review and assessment process will be the 2010 Progress Report, to be finished for the end of April.

11 References

1. Part IV of the Environment Act 1995. Local Air Quality Management, Revised Policy Guidance LAQM.PG(09), February 2009 www.defra.gov.uk/environment/airquality/local/guidance/pdf/laqm-policy-guidance-part4.pdf

2. Part IV of the Environment Act 1995. Local Air Quality Management. Technical Guidance LAQM.TG(09) February 2009. www.defra.gov.uk/environment/airquality/local/guidance/pdf/tech-guidance-laqm-tg-09.pdf

3. Air Quality Updating and Screening Assessment for London Borough of Hillingdon Council 2003.

4. Air Quality Review and Assessment Progress Report for London Borough of Hillingdon 2005.

5. Air Quality Updating and Screening Assessment for London Borough of Hillingdon Council – 2006.

6. Air Quality Review and Assessment Progress Report for London Borough of Hillingdon, 2007.

7. Air Quality Action Plan for London Borough of Hillingdon 2008.

8. Air Quality Review and Assessment Help desk: http://www.uwe.ac.uk/aqm/review/index.html

9. UK Air Quality Archive: http://www.airquality.co.uk/archive/index.php

10. The London wide environment programme, Benzene diffusion tube survey annual report, 2008, Bureau Veritas

11. Volatile Correction Model www.volatile-correction-model.info/Default.aspx

Appendices

Appendix A: QA/QC Data / Bias adjustment calculations

Appendix B: Pollutant Data

Appendix C: B-Processes

Appendix D: Air Quality Monitoring Reports

Appendix E: Scaled Traffic Data

Appendix A: QA:QC Data

NO_2 Diffusion Tube Bias Adjustment Factors

Supplier: Gradko International Ltd
preparation method: 50% TEA Acetone
Factor from the UWE for year 2008: 0.85

QA/QC of diffusion tube monitoring

1. Gradko International Ltd confirms that the laboratory complies with the procedures detailed in the Defra Harmonisation Practical Guidance

2. Gradko International Ltd WASP results for 01.08 to 01.09 were as follows :

Jan 08 Round 100:
Ref Value: 1.36ugNO2 Measured Value: 1.34 ugNO2 Z score -0.1 Satisfactory
Ref Value: 1.47ugNO2 Measured Value: 1.50 ugNO2 Z score 0.2 Satisfactory

March 08 Round 101:
Ref Value: 0.92ug NO2 Measured Value: 0.95ugNO2 Z Score 0.2 Satisfactory
Ref Value: 1.86ugNO2 Measured Value: 1.85ugNO2 Z Score 0 Satisfactory

July 08 Round 102:
Ref Value: 1.37ugNO2 Measured Value: 1.42ugNO2 Z Score 0.3 Satisfactory
Ref Value: 2.28ugNO2 Measured Value: 2.21ugNO2 Z score -0.2 Satisfactory

Jan 09 Round 104:
Ref Value: 2.02ugNO2 Measured Value: 1.85ugNO2 Z Score -0.7 Satisfactory
Ref Value: 1.22ug NO2 Measured Value: 1.21ugNO2 Z Score - 0.1 Satisfactory

Factor from Local Co-location Studies (if available)

Figure 11-1 Bias adjustment factor calculation – London Hillingdon

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	03/01/2008	31/01/2008	55.46	51.50	54.66	54	2.1	4	5.2
2	31/01/2008	29/02/2008	53.55	53.60	52.39	53	0.7	1	1.7
3	29/02/2008	03/04/2008	39.12	42.84	40.98	41	1.9	5	4.6
4	03/04/2008	01/05/2008	46.51	45.35	44.22	45	1.1	3	2.8
5	01/05/2008	29/05/2008	48.41	52.06	47.49	49	2.4	5	6.0
6	29/05/2008	03/07/2008	40.08	37.91	40.32	39	1.3	3	3.3
7	03/07/2008	07/08/2008	51.82	52.31	51.22	52	0.5	1	1.4
8	07/08/2008	04/09/2008	50.07	43.90	54.74	50	5.4	11	13.5
9	03/10/2008	30/10/2008	52.25	53.36	56.72	54	2.3	4	5.8
10	30/10/2008	05/12/2008	47.03	44.19	45.15	45	1.4	3	3.6
11	05/12/2008	09/01/2009	48.68	50.15	49.55	49	0.7	1	1.8
12									
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
55	99.1	Good	Good
68	96	Good	Good
41	99.8	Good	Good
55	98.1	Good	Good
-	0	Good	or Data Capture
53	30.6	Good	or Data Capture
48	89.9	Good	Good
46	89.6	Good	Good
55	99.5	Good	Good
46	96.9	Good	Good
53	99.5	Good	Good
Overall survey -->		Good precision	Poor Overall DC

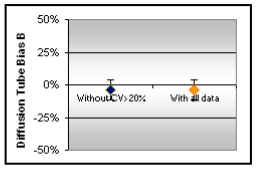
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision: 11 out of 11 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%
Bias calculated using 9 periods of data
Bias factor A: 1.05 (0.97 - 1.15)
Bias B: -5% (-13% - 3%)
Diffusion Tubes Mean: 49 μgm^{-3}
Mean CV (Precision): 4
Automatic Mean: 52 μgm^{-3}
Data Capture for periods used: 96%
Adjusted Tubes Mean: 52 (48 - 57) μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA
Bias calculated using 9 periods of data
Bias factor A: 1.05 (0.97 - 1.15)
Bias B: -5% (-13% - 3%)
Diffusion Tubes Mean: 49 μgm^{-3}
Mean CV (Precision): 4
Automatic Mean: 52 μgm^{-3}
Data Capture for periods used: 96%
Adjusted Tubes Mean: 52 (48 - 57) μgm^{-3}



Jaume Targa
jaume.targa@aeat.co.uk
Version 03 - November 2006

Figure 11-2 Bias adjustment factor calculation – Hillingdon 1

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	03/01/2008	31/01/2008	51.03	49.82	58.49	53	4.7	9	11.7
2	31/01/2008	29/02/2008	60.25	58.16	62.01	60	1.9	3	4.8
3	29/02/2008	03/04/2008	45.54	44.14	45.72	45	0.9	2	2.1
4	03/04/2008	01/05/2008	49.94	48.86	46.40	48	1.8	4	4.5
5	01/05/2008	29/05/2008	60.84	64.33	66.61	64	2.9	5	7.2
6	29/05/2008	03/07/2008	42.43	40.85	41.33	42	0.8	2	2.0
7	03/07/2008	07/08/2008	47.16	48.40	47.47	48	0.6	1	1.6
8	07/08/2008	04/09/2008	40.22	36.57	28.39	35	6.1	17	15.0
9	03/10/2008	30/10/2008	57.20	59.44	59.21	59	1.2	2	3.1
10	30/10/2008	05/12/2008	50.89	51.95	52.71	52	0.9	2	2.3
11	05/12/2008	09/01/2009	52.50	53.33	57.72	55	2.8	5	7.0
12									
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
46.6	100	Good	Good
66	100	Good	Good
40.5	100	Good	Good
52.5	100	Good	Good
52.5	99	Good	Good
36.7	100	Good	Good
33.8	100	Good	Good
33.3	100	Good	Good
45.2	100	Good	Good
46.5	100	Good	Good
57.5	100	Good	Good
Overall survey -->		Good precision	Good Overall DC

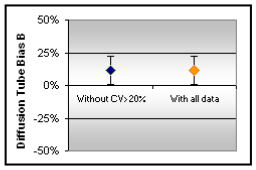
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision: 11 out of 11 periods have a CV smaller than 20%

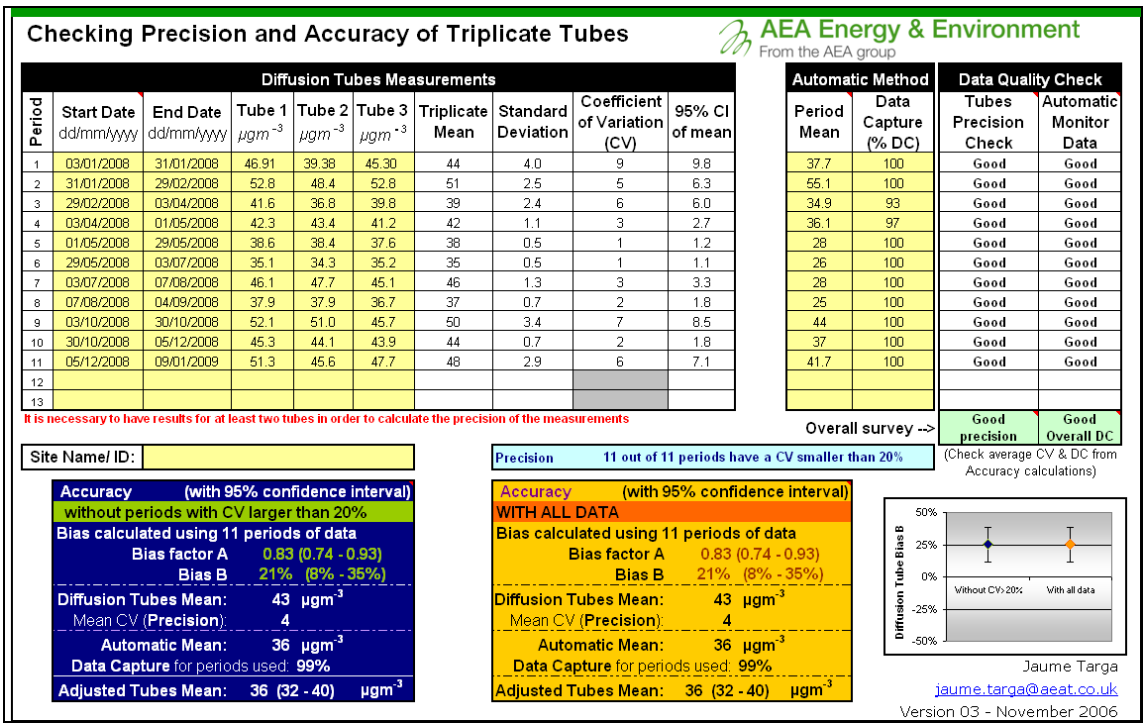
Accuracy (with 95% confidence interval) without periods with CV larger than 20%
Bias calculated using 11 periods of data
Bias factor A: 0.91 (0.83 - 1.01)
Bias B: 10% (-1% - 20%)
Diffusion Tubes Mean: 51 μgm^{-3}
Mean CV (Precision): 5
Automatic Mean: 46 μgm^{-3}
Data Capture for periods used: 100%
Adjusted Tubes Mean: 46 (42 - 51) μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA
Bias calculated using 11 periods of data
Bias factor A: 0.91 (0.83 - 1.01)
Bias B: 10% (-1% - 20%)
Diffusion Tubes Mean: 51 μgm^{-3}
Mean CV (Precision): 5
Automatic Mean: 46 μgm^{-3}
Data Capture for periods used: 100%
Adjusted Tubes Mean: 46 (42 - 51) μgm^{-3}



Jaume Targa
jaume.targa@aeat.co.uk
Version 03 - November 2006

Figure 11-3 Bias adjustment factor calculation – Hillingdon 2



Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	03/01/2008	31/01/2008	46.91	39.38	45.30	44	4.0	9	9.8
2	31/01/2008	29/02/2008	52.8	48.4	52.8	51	2.5	5	6.3
3	29/02/2008	03/04/2008	41.6	36.8	39.8	39	2.4	6	6.0
4	03/04/2008	01/05/2008	42.3	43.4	41.2	42	1.1	3	2.7
5	01/05/2008	29/05/2008	38.6	38.4	37.6	38	0.5	1	1.2
6	29/05/2008	03/07/2008	35.1	34.3	35.2	35	0.5	1	1.1
7	03/07/2008	07/08/2008	46.1	47.7	45.1	46	1.3	3	3.3
8	07/08/2008	04/09/2008	37.9	37.9	36.7	37	0.7	2	1.8
9	03/10/2008	30/10/2008	52.1	51.0	45.7	50	3.4	7	8.5
10	30/10/2008	05/12/2008	45.3	44.1	43.9	44	0.7	2	1.8
11	05/12/2008	09/01/2009	51.3	45.6	47.7	48	2.9	6	7.1
12									
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
37.7	100	Good	Good
55.1	100	Good	Good
34.9	93	Good	Good
36.1	97	Good	Good
28	100	Good	Good
26	100	Good	Good
28	100	Good	Good
25	100	Good	Good
44	100	Good	Good
37	100	Good	Good
41.7	100	Good	Good
Overall survey -->		Good precision	Good Overall DC

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision 11 out of 11 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 11 periods of data
Bias factor A 0.83 (0.74 - 0.93)
Bias B 21% (8% - 35%)
Diffusion Tubes Mean: 43 µgm^{-3}
Mean CV (Precision): 4
Automatic Mean: 36 µgm^{-3}
Data Capture for periods used: 99%
Adjusted Tubes Mean: 36 (32 - 40) µgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 11 periods of data
Bias factor A 0.83 (0.74 - 0.93)
Bias B 21% (8% - 35%)
Diffusion Tubes Mean: 43 µgm^{-3}
Mean CV (Precision): 4
Automatic Mean: 36 µgm^{-3}
Data Capture for periods used: 99%
Adjusted Tubes Mean: 36 (32 - 40) µgm^{-3}

Jaume Targa
jaume.targa@aeat.co.uk
Version 03 - November 2006

Table 11-1 Details of overall bias calculations

Co-location site	Site Type	Site Bias 2005	Site Bias 2006	Site Bias 2007	Site Bias 2008
London Hillingdon	**S**	1.07	1.18	1.05	1.05
Hillingdon 1	**R**	0.93	0.89	0.99	0.91
Hillingdon 2	**R**	0.89	0.89	-	0.83
Average		**0.96**	**0.99**	**1.02**	**0.93**
Gradko Bias		1.10	1.04	0.86	0.85

Discussion of Choice of Factor to Use

There were three local co-location studies between nitrogen dioxide diffusion tubes and continuous monitoring carried out within the borough. Therefore, the bias adjustment factor has been undertaken using these data. The bias adjustment factor of 0.93 was calculated as an average of the three factors calculated from:

- London Hillingdon (AURN) -1.05;
- Hillingdon1 – 0.91;
- Hillingdon 0.83.

For this USA the average bias adjustment factor is being applied due to the following factors:

- Using the average factor derived from the three co-location study is consistent with the previous review and assessment;
- It is more conservative of the two bias adjustment factors (average bias adjustment vs national bias adjustment factor).

PM Monitoring Adjustment

TEOM
The PM_{10} monitoring data recoded by TEOMs monitors were corrected with Volatile Correction Model (VCM). The Volatile Correction Model (VCM) web portal allows you to correct TEOM measurements for the loss of volatile components of particulate matter that occur due to the high sampling temperatures employed by this instrument. The resulting corrected measurements have been demonstrated as equivalent to the gravimetric reference equivalent.
Method:

The following data are required as inputs to the VCM:

- Daily average temperatures
- Daily average pressures
- Daily average TEOM concentrations (□gm^{-3})
- Daily average FDMS (Filter Dynamic Measurement System) purge measurements (μgm^{-3})

The VCM can also use hourly average inputs, however, it was found that the model has difficulty in coping with hourly data and therefore daily average data was used.

The VCM works by using the volatile particulate matter measurements provided by nearby FDMS instruments (within 130 km) to assess the loss of PM_{10} from the TEOM; this value is then added back onto the TEOM measurements.
The correction generated by the VCM is geographically specific, an exact location of your TEOM instrument is therefore required.
The VCM can be accessed through http://www.volatile-correction-model.info
BAM
The data recorded by BAM monitors were corrected by the factor 0.83333.

QA/QC of automatic monitoring

QA/QC for Hillingdon1, Hillingdon 2 and Hillingdon 3 are provided by ERG King's College London.

Hillingdon 1,Hillingdon 2 and Hillingdon 3 are calibrated fortnightly by LSOs, the audits are every 6 months.
Calibrations are carried out by LA. Audits are carried out by NPL. Audits are UKAS accredited

Data validation and ratification procedures

A final measurement data set was produced by King's following retrospective ratification of the measurements using procedures, which exceed the requirements detailed in LAQM TG09 (DEFRA, 2009). During ratification information from regular calibrations, audits and daily manual validation were used to establish an operational and calibration history of the instruments and the pollution measurements were corrected to establish traceability to National Metrological Standards. Details of the monitoring site and the final dataset can be found at www.londonair.org.uk.

The sites AEA look after include Sipson, Hayes, Hillingdon AURN, Harlington AURN and the 3 other BAA sites located around Heathrow Airport which include Green Gates, LHR2, Oakes Road.

Routine Calibrations are carried out by AEA every 3 to 4 weeks in line with the R&A requirements. The QA/QC audits are carried out by AEA at 6 monthly intervals.

The Data Validation and Ratification phrase used is as follows:

All data from the Air Quality Stations: Sipson, Hayes, Hillingdon AURN, Harlington AURN and three BAA sites Sipson, Hayes, Hillingdon AURN, Harlington AURN are managed by external consultants (AEA) to quality procedures developed under the UK National Network. The data management processes represent best practice and fully meet the requirements set out in LAQM TG(09).

All data are screened and scaled (on the basis of site calibrations) and the final data sets presented within this report have benefited from a full process of data ratification, including through additional data quality checks that include site UKAS quality control audits and a final data ratification process that corrects data for instrument sensitivity drift between routine calibrations".

Benzene diffusion tubes

QC/QA

The measurement method used in benzene survey was consistent with the sampling, analysis and QA/QC requirements of ***EN 14662-4: 2005 Ambient air quality – Standard method for measurement of benzene concentrations – Part 4: Diffusive sampling followed by thermal desorption and gas chromatography***.

Benzene, toluene, ethyl benzene, m, p and o-xylene *(BTEX)* measurements were made using Perkin-Elmer type diffusive samplers[9]. These are 9cm long stainless steel tubes packed with Chromosorb 106 polymer, an adsorbent material with an excellent affinity for benzene, and sealed at both ends with protective caps. One end is sealed with a brass fitting containing a Teflon ferrule, the other end with a white Teflon cap. On exposure, the white Teflon cap is removed and replaced with a diffusive cap, which allows air to diffuse at a constant rate into the tube.

The samplers operate on the principle of molecular diffusion, whereby during exposure benzene in air will migrate to the adsorbent at a rate dependent on several quantifiable variables defined by Fick's Law of Diffusion:

(a) The path length between the top surface of the monitor and the absorbent bed.

(b) The cross sectional area of the sampler

(c) The exposure time

(d) The diffusive coefficient of benzene through air

(e) The ambient concentration of benzene

Bureau Veritas prepared all tubes in accordance with in-house technical procedure note: TP44 AIR(C). The tubes were despatched by special post to each borough and exposed for periods of approximately 2-weeks, following which the diffuser head was replaced with the original protective cap. Upon receipt the tubes were stored in a refrigerator prior to analysis. Although tubes are exposed for 2-week periods, previous work has shown that the uptake for benzene onto Chromosorb 106 differs by less than 1% for exposure periods of one, two and 4 weeks. For most adsorbents their uptake rates decline rapidly over the first 16-24 hours of sampling, after which rates tend to stabilise.

Sample Analysis

All tubes were analysed by a UKAS accredited laboratory using desorption scanning gas chromatography/mass spectrometry *(GC/MS)*. This method of analysis gives unequivocal identification of BTEX peaks.

QC Checks

Quantitation was performed and determined by the internal standard technique with formal native compound calibration. A QC standard solution was spiked on to a blank tube together with the internal standard. The validity of the internal calibration was then verified by the analysis of the sample. A blank tube was also spiked with internal standard and analysed. A variation of +/- 20% was considered acceptable for the analysis of samples to continue.

Detection Limits

These were also assessed from the low standards sample i.e. 1ng on the tube and this was determined to be better than 1ng for the benzene based on the minimum detectable peak on the mass chromatogram.

Cleaning of Tubes

After analysis all tubes were heated to 230°C for 60 minutes with a desorption flow of 100ml/min. 10% of tubes were then spiked with internal standard and analysed. These tubes were then re-cleaned. The mass of BTEX collected in the tube was then expressed as an average airborne concentration *(µg/m-3)* measured over the monitoring period.

As identified above quality control procedures integral to the analytical procedure involve verification of the benzene peak and calibration against internal spiking solutions. All cleaned tubes were analysed

prior to exposure to ensure the Chromosorb retains no benzene. Duplicate and Triplicate tubes were also exposed in a selection of boroughs each month thus allowing the coefficient of variation between tubes to be assessed.

Appendix B: Long term nitrogen dioxide data

NO_2			Objective: Annual mean of 40 $\mu g\ m^{-3}$		Objective: 1 hour mean of 200 $\mu g.m^{-3}$ not exceeded >18 times in year
Site	Year	Data capture	achieved?	value	achieved?
LHR2	1994	86%	No	60.5	No
	1995	96%	No	60.7	Yes
	1996	95%	No	63.0	No
	1997	95%	No	60.0	No
	1998	96%	No	54.0	Yes
	1999	98%	No	55.5	Yes
	2000	97%	No	56.6	Yes
	2001	98%	No	53.8	Yes
	2002	96%	No	52.1	Yes
	2003	96%	No	58.8	Yes
	2004	99%	No	55.2	Yes
	2005	97%	No	53.5	Yes
	2006	86%	No	53.2	Yes
	2007	99%	No	54.0	Yes
	2008	99%	No	53.0	Yes
Hillingdon 1	1999	27%	No	46.7	Yes
	2000	98%	No	44.4	Yes
	2001	97%	No	45.1	Yes
	2002	98%	No	43.7	Yes
	2003	99%	No	52.7	No
	2004	83%	No	48.5	Yes
	2005	79%	No	45.8	Yes
	2006	98%	No	41.8	Yes
	2007	77%	No	48.7	No
	2008	100%	No	46.0	Yes
London Hillingdon	1996	82%	No	43.9	Yes
	1997	97%	No	58.7	No
	1998	75%	No	50.9	Yes
	1999	45%	No	50.2	Yes
	2000	98%	No	47.7	Yes
	2001	96%	No	46.2	Yes
	2002	97%	No	45.2	Yes
	2003	83%	No	53.7	Yes
	2004	98%	No	45.3	Yes
	2005	94%	No	45.3	Yes
	2006	90%	No	49.7	Yes

Council Name - England

	2007	98%	No	45.0	Yes
	2008	83%	No	51.0	Yes
Hillingdon 2	2002	2%	No	60.2	Yes
	2003	41%	No	41.4	No
	2004	85%	Yes	36.7	No
	2005	88%	Yes	38.6	Yes
	2006	91%	Yes	37.3	Yes
	2007	27%	No	43.4	Yes
	2008	99%	No	46.0	Yes
London Harlington	2004	99%	Yes	38.2	Yes
	2005	99%	Yes	38.1	Yes
	2006	98%	Yes	36.8	Yes
	2007	94%	Yes	37.0	Yes
	2008	98%	Yes	35.0	Yes
Hillingdon 3	2005	73%	Yes	37.3	Yes
	2006	75%	No	41.1	Yes
	2007	97%	No	43.4	Yes
	2008	93%	No	42.0	Yes
Sipson	2006	31%	No	45.0	No
	2007	82%	No	40.3	Yes
	2008	99%	Yes	38.0	Yes
Heathrow Green Gates	2001	50%	Yes	29.0	Yes
	2002	97%	Yes	32.0	Yes
	2003	97%	No	46.0	Yes
	2004	99%	Yes	39.0	Yes
	2005	99%	Yes	36.0	Yes
	2006	99%	Yes	37.0	Yes
	2007	90%	Yes	38.0	Yes
	2008	85%	Yes	38.0	Yes
Hillingdon Harmondsworth	2007	40%	Yes	35.0	Yes
	2008	93%	Yes	32.0	Yes

Carbon Monoxide data

CO		Objective: Maximum daily running 8-hour mean of 10.0 mg m^{-3}		
Site	Year	data capture	achieved?	value
LHR2	1994	96%	No	10.7
	1995	95%	Yes	4.7
	1996	89%	No	11.0
	1997	95%	Yes	8.3
	1998	55%	Yes	3.0
	1999	68%	Yes	3.5
	2000	97%	Yes	4.3
	2001	98%	Yes	3.5
	2002	97%	Yes	2.5
	2003	93%	Yes	2.4
	2004	97%	Yes	2.9
	2005	98%	Yes	2.1
	2006	94%	Yes	1.9
	2007	19%	Yes	0.5
London Hillingdon	1996	88%	Yes	9.1
	1997	96%	Yes	8.4
	1998	97%	Yes	7.2
	1999	97%	Yes	3.1
	2000	91%	Yes	6.2
	2001	94%	Yes	4.2
	2002	86%	Yes	2.7
	2003	96%	Yes	4.0
	2004	98%	Yes	3.1
	2005	98%	Yes	2.1
	2006	81%	Yes	1.9
	2007	69%	Yes	0.4
London Harlington	2004	92%	Yes	3.2
	2005	99%	Yes	2.3
	2006	98%	Yes	1.9
	2007	97%	Yes	0.3
	2008	17%	Yes	0.4

Appendix C: Petrol Stations

Operator	Name/Location
Esso Tolcarne	Esso Tolcarne, Joel Street, Northwood Hills, HA5 2PA
BP Bury Street	BP Bury Street, Bury Street, Ruislip, HA4 7TW
Pace Eastcote	High Road, Eastcote ,HA5 2ET
Midcroft Service Station	Midcroft Service Station, Midcroft Road, Ruislip, HA4 7BH
Cooper Young and Co	Gulf 141 Ickenham Service Station, Ickenham Road, HA4 7DH
TCS Ickenham	TCS Ickenham, High Road, Ickenham, UB10 8LF
Shell Swakeleys	Shell Swakeleys, Long Lane, Ickenham, UB10 8TB
TCS Ruislip	TCS Ruislip, 300, West End Road, Ruislip, HA4 6QQ
Sainsbury Ruislip	Sainsbury, 11, Long Drive, South Ruislip, HA4 0HQ
BP Eastcote	BP Eastcote, 726, Field End Road, Ruislip, HA4 0QP
BP Victoria Road	BP Service Station, Victoria Road, Ruislip, HA4 0SA
Shell Uxbridge	St Johns Road, Uxbridge ,UB8 2UY
Esso Express Cowley	High Road, Cowley, UB8 2HS
Shell Yiewsley	Shell Yiewsley, 209, High Street, Yiewsley, UB7 7QP
Gulf West Drayton	127 Station Road, West Drayton ,UB7 7ND
Mill Road Service Station	Mill Road Filling Station, Mill Road, West Drayton, UB7 7EQ
TCS West Drayton	TCS West Drayton, Holloway Lane, West Drayton, UB7 9JS
Total Longford	Total Service Station, Bedford, Bath Road, Longford, UB7 0BA
Hertz Hillingdon	Hertz Rent A Car, Northern Perimeter Rd, HAL, TW6 2QD
Eurocar Northern Perimeter	Europcar, Northern Perimeter Road, HAL, TW6 2QE
Colham Self Serve	Total Limited, 148, Colham Green Road, Hdn, UB8 JY
Texaco Uxbridge	1190 Uxbridge Road, Hayes ,UB4 8JE
Tesco North Hyde Road	Tesco North Hyde Road,, UB3 2NE
Total Hayes	Total Service Station, Hayes, Coldharbour Lane, Hayes, UB3 3HG
Sainsbury Hayes	Sainsbury, Lombardy Retail Park, Hayes, UB3 3HN
Somerfield Hayes	Lees Corner, Hillingdon, UB4 0JN
Tesco Hayes	Tesco Stores, Glencoe Road, Yeading, Hayes, UB4 9SQ

Esso Heathrow North	Esso Heathrow North, Shepiston Lane, Hayes, UB3 1LL
MT Operations Base	MT Operations Base, Heathrow Airport, UB3 5AP
BP Heathrow Airside	BP Heathrow Airside, Inner Ring Road, HAL, UB3 5AP
Star Harlington	Star Harlington, Sipsons Corner, Bath Road, UB3 5AZ
BP Heathrow Landside	BP Heathrow Landside, Central Inner Ring, HAL, UB3 5AP
National Cars	Northern Perimiter Road, Hillingdon ,TW6 2QB
Avis Northrop	Avis Rent A Car, Northrop Road, HAL, TW6 2QA

Other Part B processes

Address	Post Code	Permit Granted	Type of activity
119 Field End Road Eastcote	HA5 1QH	13/05/2008	Dry Cleaning
1044 Uxbridge Road	UB4 0RJ	31/10/2007	Dry Cleaning
116 Victoria Road	HA4 0AL	25/10/2007	Dry Cleaning
131 High Street	HA4 8JY	25/10/2007	Dry Cleaning
148 High Street	UB7 7BD	31/10/2007	Dry Cleaning
210 High Street	UB7 7DD	25/03/2008	Dry Cleaning
38 Station Road	HA4 9EA	25/10/2007	Dry Cleaning
3 Whitby Parade	HA4 8LS	25/10/2007	Dry Cleaning
98 High Street	UB10 0LG	25/10/2007	Dry Cleaning
1 Crescent Parade, Uxbridge Road	HA5 1QZ	31/10/2007	Dry Cleaning
201 Field End Road	HA6 2QB	31/10/2007	Dry Cleaning
30 Green Lane	UB8 1LD	31/10/2007	Dry Cleaning
229 High Street	UB4 8BZ	31/10/2007	Dry Cleaning
250 Kingshill Avenue	UB10 9JU	31/10/2007	Dry Cleaning
321 Long Lane	HA4 6LR	31/10/2007	Dry Cleaning
11 New Pond Parade, West End Road	UB9 6BU	31/10/2007	Dry Cleaning
42 School Parade	HA6 2XN	25/10/2007	Dry Cleaning
8 Station Approach	UB10 8DG	25/10/2007	Dry Cleaning
53 Swakeleys Road	UB4 0RL	25/10/2007	Dry Cleaning
980 Uxbridge Road	HA4 0HD	25/10/2007	Dry Cleaning
522 Victoria Road	UB8 1AB	25/10/2007	Dry Cleaning
47 Windsor Street	UB4 9AX	25/10/2007	Dry Cleaning
260 Yeading Lane	UB8 2SL	25/10/2007	Dry Cleaning

Eskdale Road	TW6 2	14/05/2008	Respraying of Road Vehicles
Cranford Lane	UB7 0AE	10/04/2006	Blending, Packing, Loading, Unloading and Use of Bulk Cement
Sipson, Holloway Lane	UB7 8NF	10/02/1994	Blending, Packing, Loading, Unloading and Use of Bulk Cement
Old Stockley Road	UB9 6JL	29/03/2000	Blending, Packing, Loading, Unloading and Use of Bulk Cement
Skip Lane	TW6 2JA	02/04/1993	Blending, Packing, Loading, Unloading and Use of Bulk Cement
Engineering Maintenance Base, TBC (S343)	UB8 2SD	01/02/1996	Coating and Recoating of Aircraft and Aircraft Components
Arundel Road	TW19 6BN	19/11/1993	Manufacture of Coating Materials
Robbs Nursery, Spout Lane North	TW19 6BN	04/10/2002	Mobile Crushing and Screening
Robbs Nursery, Spout Lane North	TW19 6BN	04/10/2002	Mobile Crushing and Screening
Robbs Nursery, Spout Lane North	UB9 6JW	04/10/2002	Mobile Crushing and Screening
Skip Lane	HA4 7SL	26/01/2009	Mobile Crushing and Screening
Breakspear Road	HA16 1PF	01/06/1994	Crematoria
12 The Broadway, Joel Street	UB3 1ET	26/10/2007	Dry Cleaning
Rigby Works, Rigby Lane	UB3 3BL	12/01/1999	Iron, Steel and non-ferrous metal foundry
Unit 9, Silver Industrial Centre	UB7 8NF	06/04/1993	Processes Melting and Producing Aluminium and its Alloys
West Drayton Depot, Old Stockley Road	UB3 3LZ	29/11/1993	Roadstone Coating Processes
Hayes Works, Pump Lane	UB3 1ET	06/04/1993	Roadstone Coating Processes
Three Ways Wharf, Rigby Lane	TW6 3JE	28/09/1992	Manufacture of Timber and Wood-Based Products
Building 523, Stirling Road	UB4 0SL	29/10/1996	Gas Turbines (20-50Mw)
Beaconsfield Road, Off Springfield Road	UB7 8HY	01/10/1993	Respraying of Road Vehicles
Berrite Works, Ironbridge Road	UB8 2JF	16/02/1996	Respraying of Road Vehicles
Bridge Works, Iver Lane	HA4 7TT	07/11/2001	Respraying of Road Vehicles
Reservoir Road	UB7 8JU	21/12/1993	Respraying of Road Vehicles
Stone Close, Horton Road	UB8	23/10/1995	Respraying of Road Vehicles

Canal Bridge Yard, Packet Boat Lane	UB7 7RS	27/11/1992	Waste Oil Burner (Under 0.4Mw)
The Walnuts, Trout Road		09/02/1998	Waste Oil Burner (Under 0.4Mw)

Appendix D: Air Quality Monitoring Reports

Produced by AEA on behalf of BAA

HEATHROW GREEN GATES
01 January to 31 December 2008

These data have been fully ratified by AEA

Green Gates Meadow, Bath Road. Longford

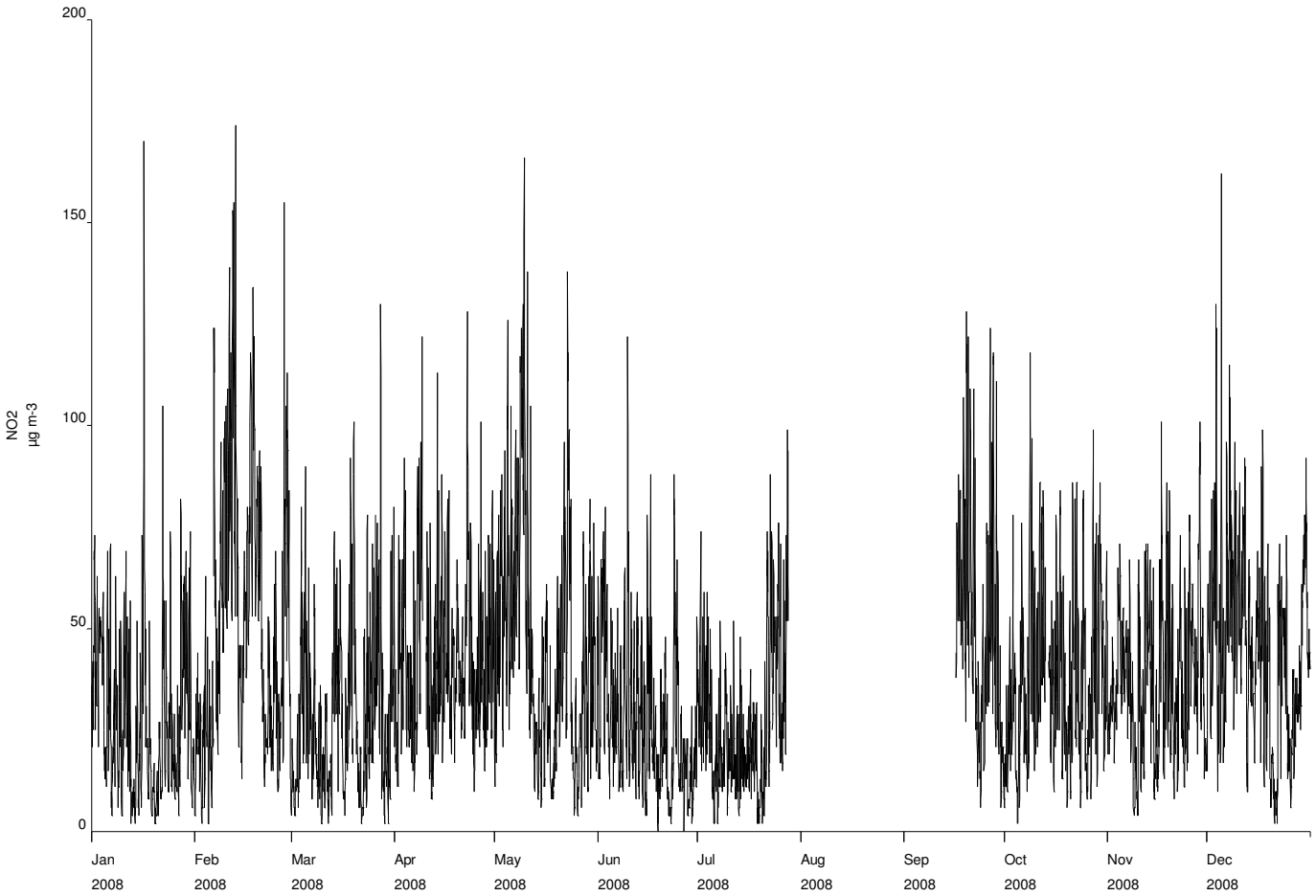
POLLUTANT	NO_2
Number Very High	0
Number High	0
Number Moderate	0
Number Low	7509
Maximum 15-minute mean	185 µg m^{-3}
Maximum hourly mean	174 µg m^{-3}
Maximum running 8-hour mean	137 µg m^{-3}
Maximum running 24-hour mean	112 µg m^{-3}
Maximum daily mean	112 µg m^{-3}
Average	38 µg m^{-3}
Data capture	85.5 %

All mass units are at 20'C and 1013mb

Pollutant	Air Quality (England) Regulations 2000 and (Amendment) Regulations 2002	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	0

Produced by AEA on behalf of BAA

Heathrow Green Gates Air Monitoring
Hourly Mean Data for 01 January to 31 December 2008



Council Name - England

Produced by AEA on behalf of Heathrow Airport Limited

HEATHROW LHR2
01 January to 31 December 2008

These data have been fully ratified by AEA

On Northern apron.

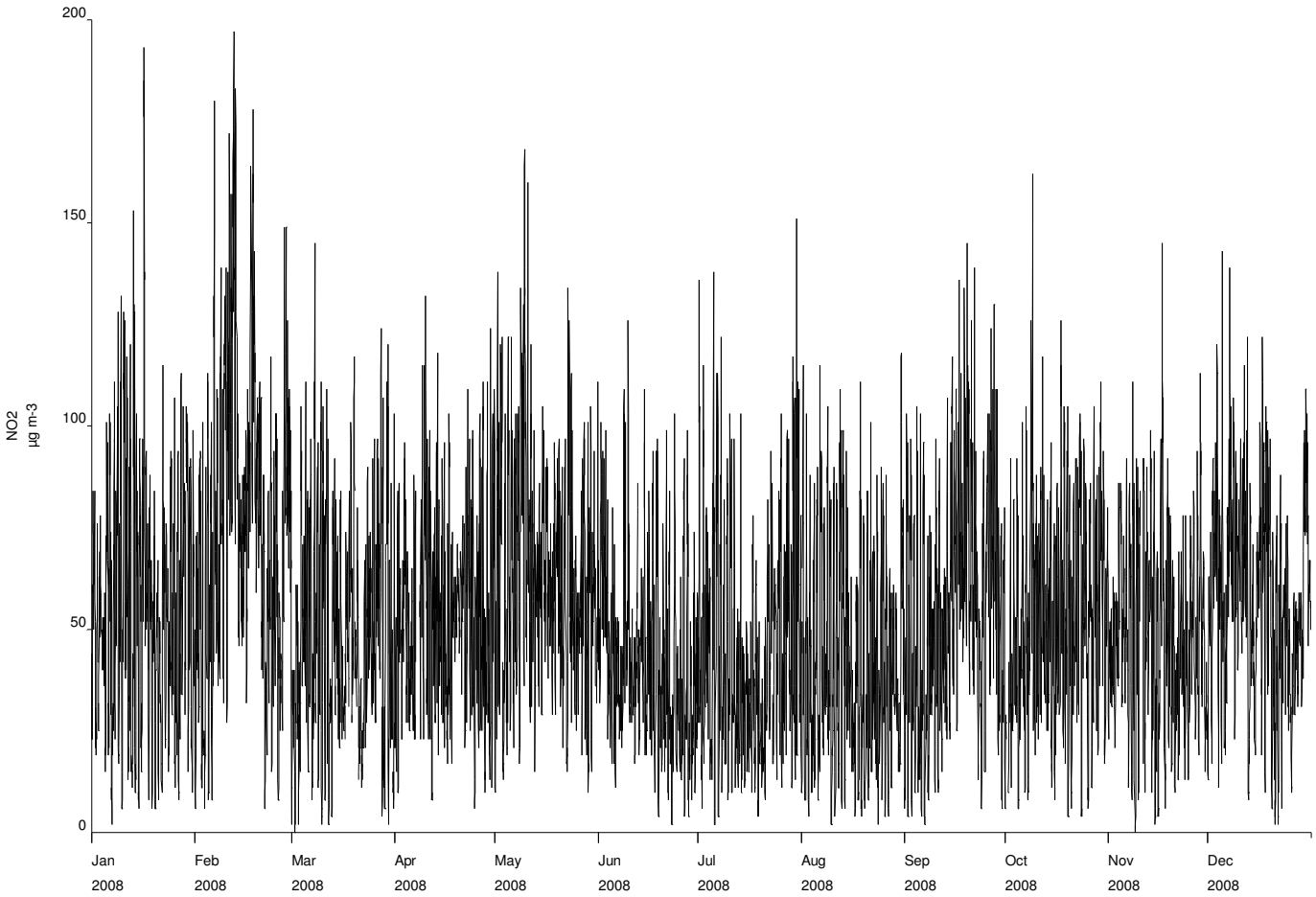
POLLUTANT	NO_2
Number Very High	0
Number High	0
Number Moderate	0
Number Low	8695
Maximum 15-minute mean	363 µg m^{-3}
Maximum hourly mean	197 µg m^{-3}
Maximum running 8-hour mean	168 µg m^{-3}
Maximum running 24-hour mean	146 µg m^{-3}
Maximum daily mean	137 µg m^{-3}
Average	53 µg m^{-3}
Data capture	99.0 %

All mass units are at 20'C and 1013mb

Pollutant	Air Quality (England) Regulations 2000 and (Amendment) Regulations 2002	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	1	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	0

Produced by AEA on behalf of Heathrow Airport Limited

Heathrow LHR2 Air Monitoring
Hourly Mean Data for 01 January to 31 December 2008



Council Name - England

Produced by AEA on behalf of BAA

HEATHROW OAKS ROAD
01 January to 31 December 2008

These data have been fully ratified by AEA

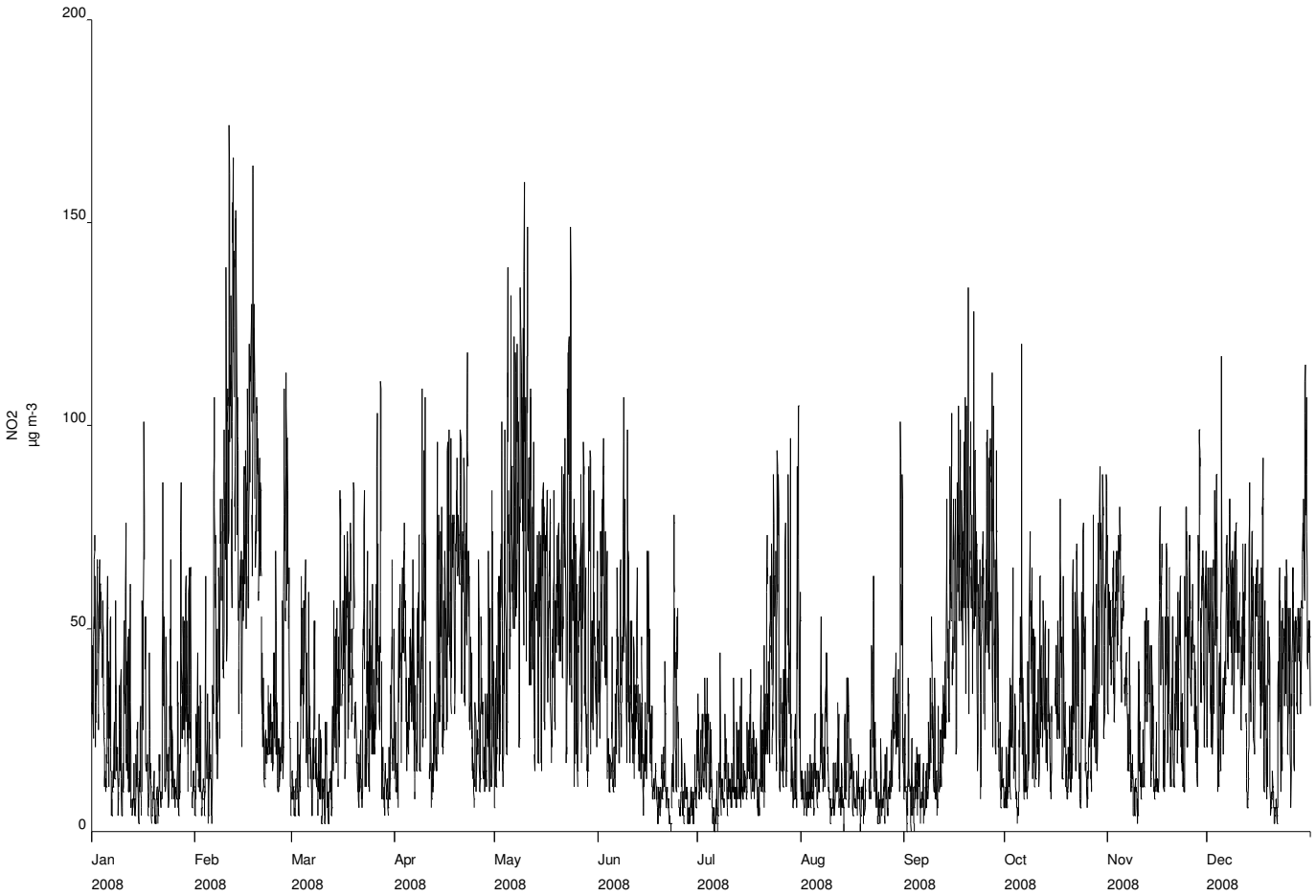
POLLUTANT	NO_2
Number Very High	0
Number High	0
Number Moderate	0
Number Low	8388
Maximum 15-minute mean	212 µg m^{-3}
Maximum hourly mean	174 µg m^{-3}
Maximum running 8-hour mean	142 µg m^{-3}
Maximum running 24-hour mean	122 µg m^{-3}
Maximum daily mean	117 µg m^{-3}
Average	35 µg m^{-3}
Data capture	95.5 %

All mass units are at 20'C and 1013mb

Pollutant	Air Quality (England) Regulations 2000 and (Amendment) Regulations 2002	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	0

Produced by AEA on behalf of BAA

Heathrow Oaks Road Air Monitoring
Hourly Mean Data for 01 January to 31 December 2008



Council Name - England

Produced by AEA on behalf of BAA

LONDON HARLINGTON
01 January to 31 December 2008

These data have been fully ratified by AEA

Located in grounds of Imperial College Sports Facility in Harlington. 300 m from outskirts of Harlington and 1 km from Heathrow Airport perimeter road

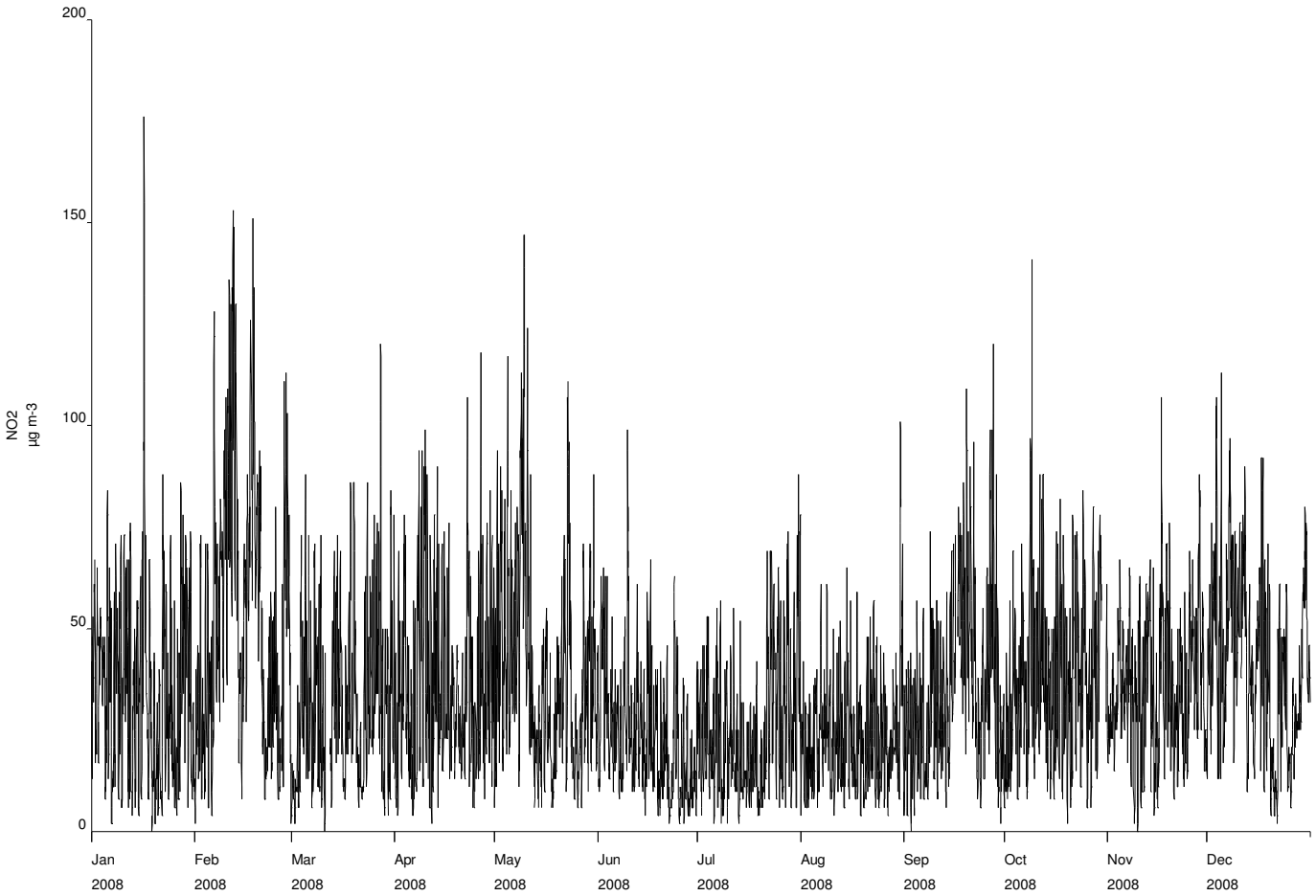
POLLUTANT	NO_2
Number Very High	0
Number High	0
Number Moderate	0
Number Low	8581
Maximum 15-minute mean	206 µg m^{-3}
Maximum hourly mean	176 µg m^{-3}
Maximum running 8-hour mean	136 µg m^{-3}
Maximum running 24-hour mean	112 µg m^{-3}
Maximum daily mean	108 µg m^{-3}
Average	35 µg m^{-3}
Data capture	97.7 %

All mass units are at 20'C and 1013mb

Pollutant	Air Quality (England) Regulations 2000 and (Amendment) Regulations 2002	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	0

Produced by AEA on behalf of BAA

London Harlington Air Monitoring
Hourly Mean Data for 01 January to 31 December 2008



Council Name - England

Produced by AEA on behalf of Lakeside Energy from Waste Ltd

LONDON HILLINGDON HARMONDSWORTH
01 January to 31 December 2008

These data are provisional from 01/07/2008 and may be subject to further quality control

Moor Lane

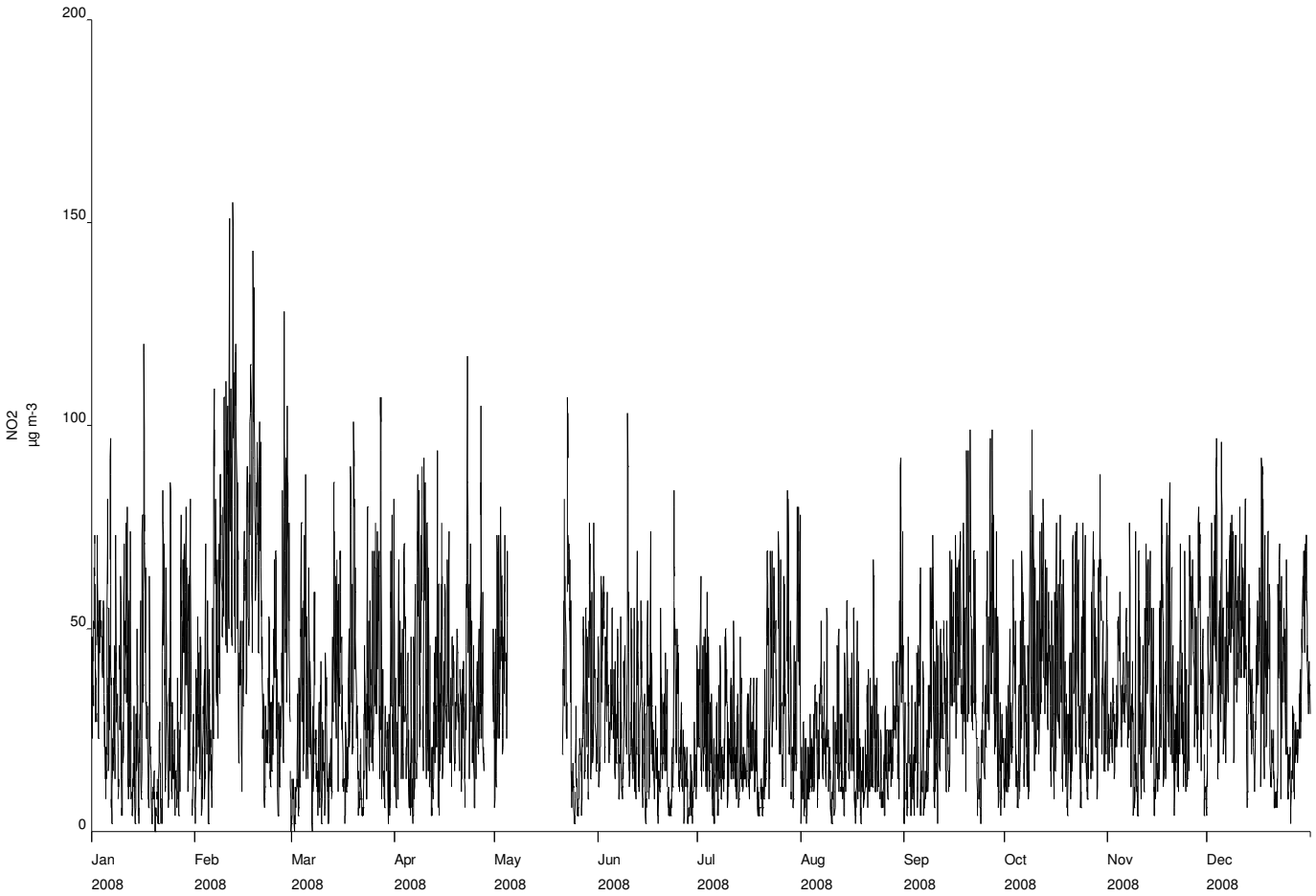
POLLUTANT	NO_2
Number Very High	0
Number High	0
Number Moderate	0
Number Low	8177
Maximum 15-minute mean	164 µg m^{-3}
Maximum hourly mean	155 µg m^{-3}
Maximum running 8-hour mean	128 µg m^{-3}
Maximum running 24-hour mean	98 µg m^{-3}
Maximum daily mean	95 µg m^{-3}
Average	32 µg m^{-3}
Data capture	93.1 %

All mass units are at 20'C and 1013mb

Pollutant	Air Quality (England) Regulations 2000 and (Amendment) Regulations 2002	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	0

Produced by AEA on behalf of Lakeside Energy from Waste Ltd

London Hillingdon Harmondsworth Air Monitoring
Hourly Mean Data for 01 January to 31 December 2008



Council Name - England

Produced by AEA on behalf of London Borough of Hillingdon

LONDON HILLINGDON HAYES
01 January to 31 December 2008

These data have been fully ratified by AEA

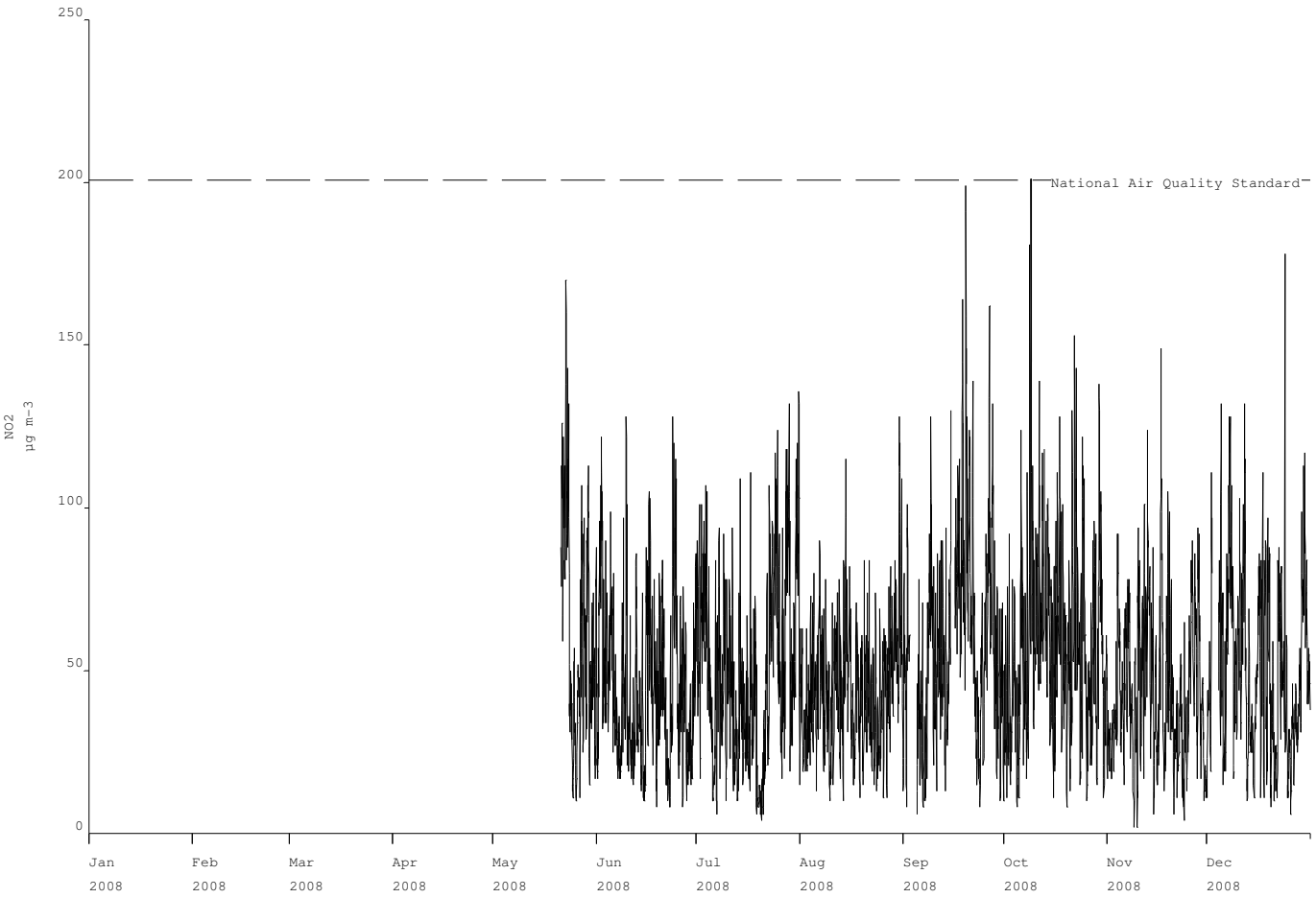
POLLUTANT	NO_2
Number Very High	0
Number High	0
Number Moderate	0
Number Low	5244
Maximum 15-minute mean	313 µg m^{-3}
Maximum hourly mean	201 µg m^{-3}
Maximum running 8-hour mean	161 µg m^{-3}
Maximum running 24-hour mean	122 µg m^{-3}
Maximum daily mean	107 µg m^{-3}
Average	50 µg m^{-3}
Data capture	59.7 %

All mass units are at 20'C and 1013mb

Pollutant	Air Quality (England) Regulations 2000 and (Amendment) Regulations 2002	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	1	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	2	1

Produced by AEA on behalf of London Borough of Hillingdon

London Hillingdon Hayes Air Monitoring
Hourly Mean Data for 01 January to 31 December 2008



Council Name - England

Produced by AEA on behalf of Defra

LONDON HILLINGDON
01 January to 31 December 2008

These data have been fully ratified by AEA

The monitoring station is within a self-contained, air-conditioned housing located on an open grass area approximately 2.5 metres from the kerb of a residential road. The site is bordered on three sides by residential roads and on the fourth by the busy M4 motorway, approximately 30 metres distance. The manifold inlet is approximately 3 metres high. The general area is open and protected from the M4 by trees.

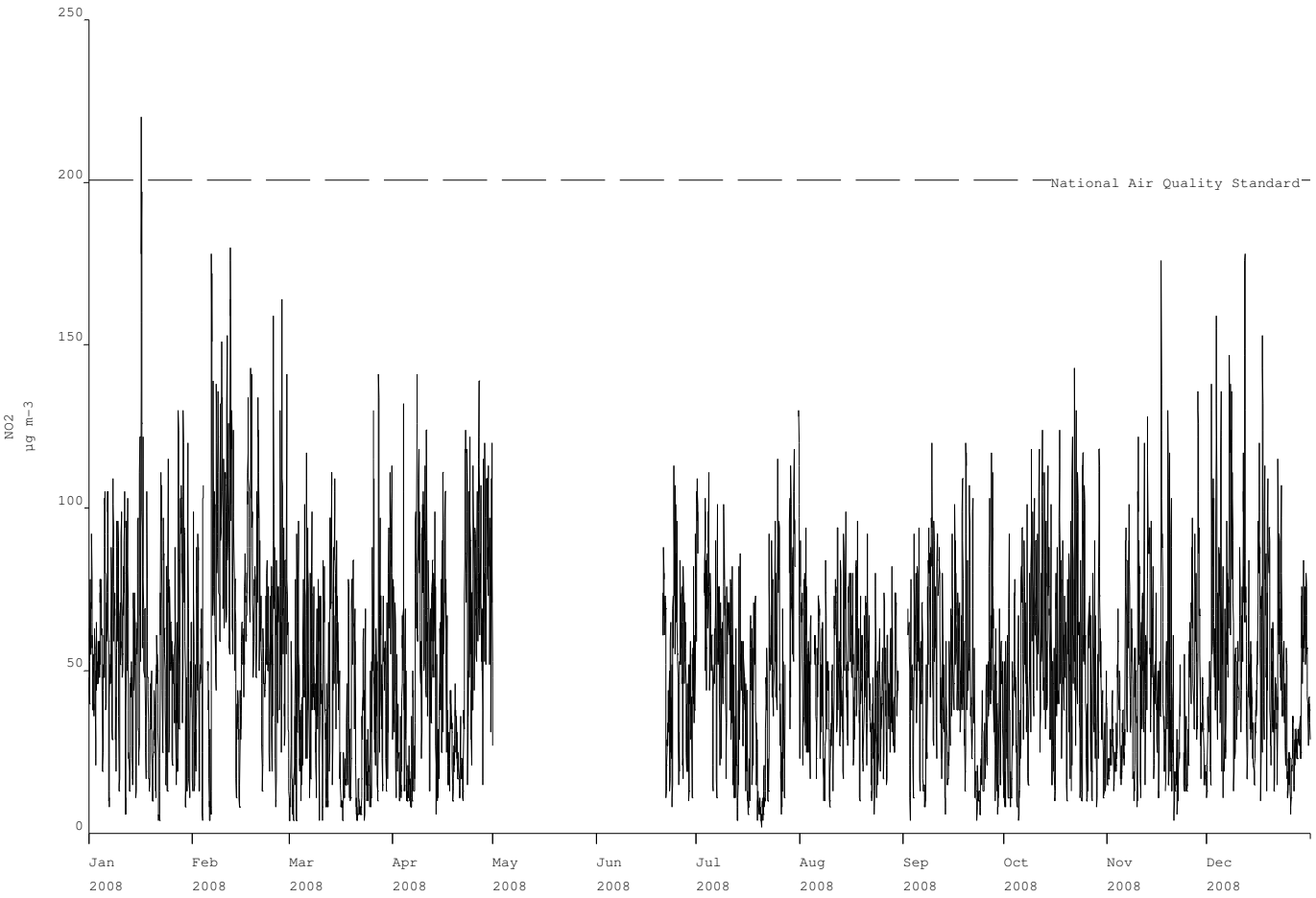
POLLUTANT	NO_2
Number Very High	0
Number High	0
Number Moderate	0
Number Low	7300
Maximum 15-minute mean	267 µg m^{-3}
Maximum hourly mean	220 µg m^{-3}
Maximum running 8-hour mean	166 µg m^{-3}
Maximum running 24-hour mean	114 µg m^{-3}
Maximum daily mean	108 µg m^{-3}
Average	51 µg m^{-3}
Data capture	83.1 %

All mass units are at 20'C and 1013mb

Pollutant	Air Quality (England) Regulations 2000 and (Amendment) Regulations 2002	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	1	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	1	1

Produced by AEA on behalf of Defra

London Hillingdon Air Monitoring
Hourly Mean Data for 01 January to 31 December 2008



Council Name - England

Produced by AEA on behalf of London Borough of Hillingdon

SIPSON
01 January to 31 December 2008

These data have been fully ratified by AEA

Sipson, Ashby Way

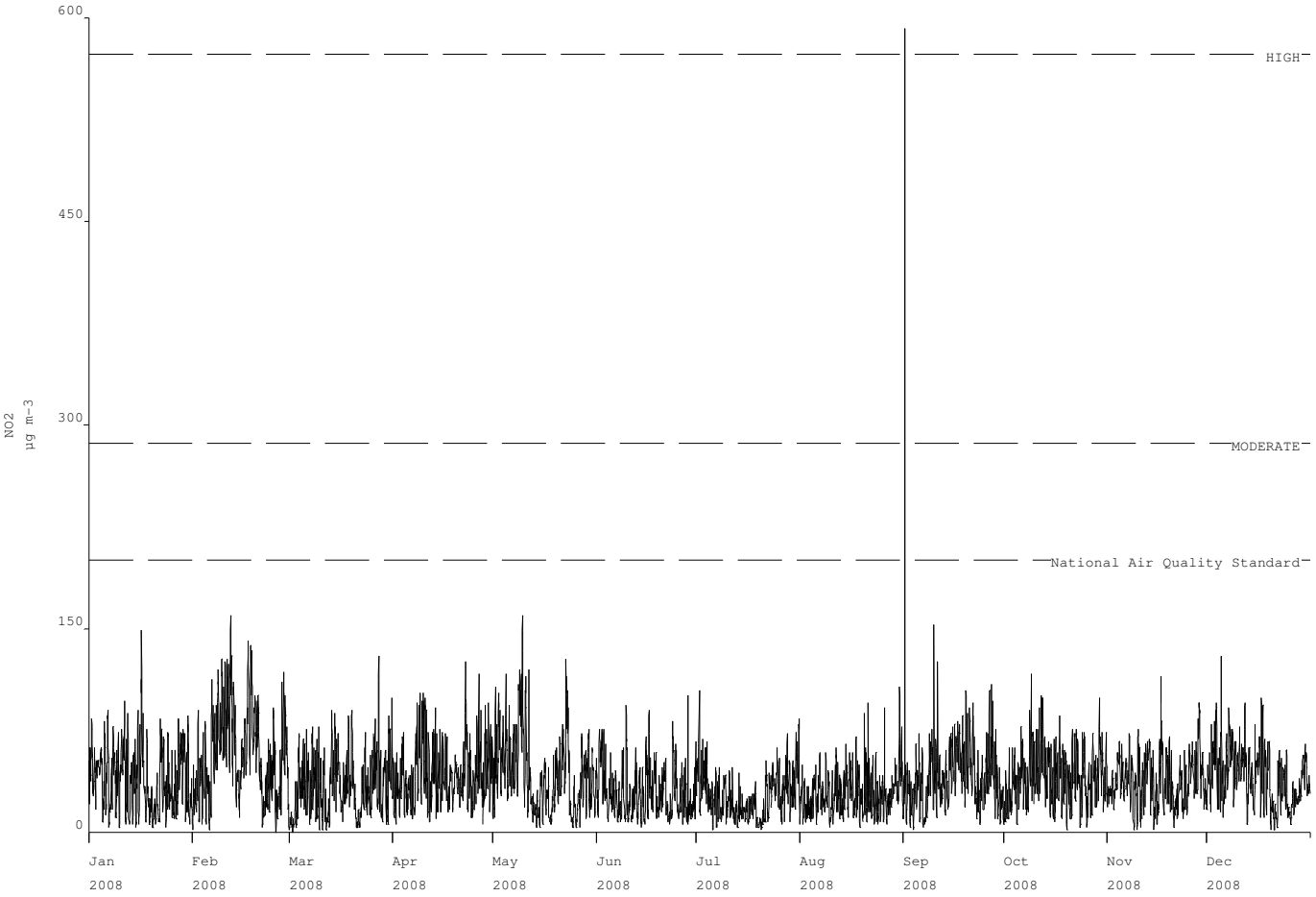
POLLUTANT	NO_2
Number Very High	0
Number High	1
Number Moderate	1
Number Low	8752
Maximum 15-minute mean	934 µg m^{-3}
Maximum hourly mean	592 µg m^{-3}
Maximum running 8-hour mean	164 µg m^{-3}
Maximum running 24-hour mean	102 µg m^{-3}
Maximum daily mean	102 µg m^{-3}
Average	38 µg m^{-3}
Data capture	99.7 %

All mass units are at 20'C and 1013mb

Pollutant	Air Quality (England) Regulations 2000 and (Amendment) Regulations 2002	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	2	1

Produced by AEA on behalf of London Borough of Hillingdon

Sipson Air Monitoring
Hourly Mean Data for 01 January to 31 December 2008



Appendix E: Scaled Traffic Data

LAEI 2006 Traffic Data scaled using the Regional Traffic Forecast (RTF) factors

No	Road Name	Road Type	2006 AADT	% HDV	2008 AADT	%HDV	Speed
1	A3044	A road	8703	5.3	8799	5.4	57
2	A312	A road	24071	4.8	24336	4.9	64
3	A40(T)	A road	50031	5.2	50581	5.3	35
4	A40(T)	A road	54224	5.4	54820	5.4	95
5	A408	A road	9280	3.3	9382	3.3	46
6	A408	Motorway	21861	6.1	22101	6.2	28
7	A437	A road	7209	4.4	7288	4.5	35
8	AIRPORT WAY A3113	A road	22761	8.5	23011	8.6	51
9	AIRPORT WAY A3113	A road	45522	8.5	46023	8.6	51
10	BATH ROAD A4(T)	A road	10594	6.1	10710	6.2	35
11	BATH ROAD A4(T)	A road	11515	7.4	11641	7.5	43
12	BATH ROAD A4(T)	A road	13393	6.9	13540	7.0	53
13	BATH ROAD A4(T)	A road	14578	8.1	14738	8.2	39
14	BATH ROAD A4(T)	A road	26786	6.9	27081	7.0	53
15	BURY STREET A4180	A road	16784	3.2	16969	3.2	51
16	CHURCH ROAD A4125	A road	17746	1.7	17941	1.7	39
17	COLNBROOK BY-PASS A4(T)	A road	13071	11.8	13215	11.9	35
18	COLNBROOK BY-PASS A4(T)	A road	13393	6.9	13540	7.0	53
19	COLNBROOK BY-PASS A4(T)	A road	17432	6.2	17623	6.3	58
20	COLNBROOK BY-PASS A4(T)	A road	26142	11.8	26430	11.9	35
21	COWLEY ROAD A4020	A road	15537	6.9	15707	6.9	29
22	COWLEY ROAD A408	A road	9280	3.3	9382	3.3	46
23	COWLEY ROAD A408	A road	18559	3.3	18763	3.3	46
24	CROSS STREET A4020	A road	15537	6.9	15707	6.9	29
25	DAWLEY ROAD A437	A road	9292	4.1	9394	4.2	38
26	DAWLEY ROAD A437	A road	18584	4.1	18788	4.2	38
27	DUCKS HILL ROAD A4180	A road	16784	3.2	16969	3.2	51
28	FALLING LANE A408	A road	9280	3.3	9382	3.3	46
29	FALLING LANE A408	A road	18559	3.3	18763	3.3	46
30	GREAT SOUTH-WEST ROAD A30(T)	A road	23893	4.7	24155	4.7	50
31	HARLINGTON ROAD A437	A road	9292	4.1	9394	4.2	38
32	HARLINGTON ROAD A437	A road	18584	4.1	18788	4.2	38
33	HATCH LANE A3044	A road	17406	5.3	17597	5.4	57
34	HIGH ROAD A408	A road	18559	3.3	18763	3.3	46
35	HIGH STREET A408	A road	9280	3.3	9382	3.3	46
36	HIGH STREET A408	A road	18559	3.3	18763	3.3	46
37	HIGH STREET A4125	A road	17746	1.7	17941	1.7	39
38	HIGH STREET A4180	A road	8392	3.2	8484	3.2	51
39	HIGH STREET A4180	A road	17799	4.4	17995	4.5	27
40	HIGH STREET A437	A road	17007	6.5	17194	6.6	41
41	HILLINGDON HILL A4020	A road	20242	5.0	20464	5.1	46
42	HOLLOWAY LANE A3044	A road	8703	5.3	8799	5.4	57
43	HOLLOWAY LANE A3044	A road	17406	5.3	17597	5.4	57
44	HOLLOWAY LANE A408	A road	10825	7.1	10944	7.2	52
45	HOLLOWAY LANE A408	A road	21650	7.1	21888	7.2	52
46	LONG LANE A437	A road	13657	3.7	13807	3.7	41
47	LONG LANE A437	A road	14369	3.9	14527	3.9	35
48	LONG LANE A437	A road	27314	3.7	27614	3.7	41
49	M25	Motorway	84548	8.2	85478	8.2	88
50	M25	Motorway	85009	9.4	85944	9.5	88
51	M4	Motorway	37039	3.1	37446	3.1	62
52	M4	Motorway	65026	5.0	65741	5.1	84
53	M4	Motorway	67831	4.8	68577	4.9	100
54	NEW WINDSOR STREET A4007	A road	4894	4.3	4948	4.3	35
55	NEW WINDSOR STREET A4007	A road	9788	4.3	9896	4.3	35
56	NORTH HYDE ROAD A312	A road	18584	4.1	18788	4.2	38
57	NORTH HYDE ROAD A437	A road	9292	4.1	9394	4.2	38
58	NORTH HYDE ROAD A437	A road	18584	4.1	18788	4.2	38
59	NORTHWOOD WAY A4125	A road	17746	1.7	17941	1.7	39
60	OXFORD ROAD A4020	A road	13002	5.2	13145	5.2	35
61	OXFORD ROAD A4020	A road	15537	6.9	15707	6.9	29
62	OXFORD ROAD A4020	A road	26003	5.2	26289	5.2	35
63	PARK VIEW ROAD A408	A road	9280	3.3	9382	3.3	46
64	PARK VIEW ROAD A408	A road	18559	3.3	18763	3.3	46
65	PINNER ROAD A404	A road	13920	3.3	14073	3.3	40
66	PINNER ROAD A404	A road	27839	3.3	28145	3.3	40
67	RICKMANSWORTH ROAD A404	A road	9631	2.2	9736	2.2	46
68	RICKMANSWORTH ROAD A404	A road	9631	2.2	9736	2.2	46
69	RICKMANSWORTH ROAD A404	A road	19261	2.2	19473	2.2	46
70	RICKMANSWORTH ROAD A404	A road	23273	2.9	23529	2.9	48
71	ROCKINGHAM ROAD A4007	A road	9788	4.3	9896	4.3	35
72	SIPSON ROAD A408	A road	5653	5.8	5715	5.9	38
73	SIPSON ROAD A408	A road	11305	5.8	11429	5.9	38
74	SLOUGH ROAD A4007	A road	9788	4.3	9896	4.3	35
75	STANWELL MOOR ROAD	A road	15147	9.6	15314	9.7	59

No	Road Name	Road Type	2006 AADT	% HDV	2008 AADT	%HDV	Speed
76	STANWELL MOOR ROAD A3044	A road	12784	2.8	12924	2.8	35
77	STANWELL MOOR ROAD A3044	A road	15147	9.6	15314	9.7	59
78	STATION ROAD A437	A road	8504	6.5	8597	6.6	41
79	STATION ROAD A437	A road	17007	6.5	17194	6.6	41
80	STOCKLEY ROAD A408	A road	9280	3.3	9382	3.3	46
81	STOCKLEY ROAD A408	A road	18559	3.3	18763	3.3	46
82	THE PARKWAY A312	A road	24071	4.8	24336	4.9	64
83	THE PARKWAY A312	A road	26315	4.7	26604	4.7	64
84	THE PARKWAY A312	A road	30171	4.3	30502	4.3	58
85	TRUMPER WAY A4020	A road	15537	6.9	15707	6.9	29
86	TRUMPER WAY A408	A road	9280	3.3	9382	3.3	46
87	UXBRIDGE ROAD A4020	A road	14404	4.7	14562	4.8	33
88	UXBRIDGE ROAD A4020	A road	15975	5.3	16151	5.4	38
89	UXBRIDGE ROAD A4020	A road	20242	5.0	20464	5.1	46
90	UXBRIDGE ROAD THE BROADWAY A4020	A road	14007	5.1	14161	5.2	29
91	UXBRIDGE ROAD THE BROADWAY A4020	A road	28013	5.1	28321	5.2	29
92	WATFORD ROAD A4125	A road	16997	2.4	17184	2.4	35
93	WATFORD ROAD A4125	A road	17746	1.7	17941	1.7	39
94	WEST END ROAD A4180	A road	9810	3.0	9917	3.0	36
95	WEST END ROAD A4180	A road	14798	5.0	14961	5.1	43
96	WEST END ROAD A4180	A road	19619	3.0	19835	3.0	36
97	WEST END ROAD A4180	A road	29596	5.0	29922	5.1	43
98	WESTERN AVENUE A40(T)	A road	48755	6.0	49291	6.1	93
99	WESTERN AVENUE A40(T)	A road	50031	5.2	50581	5.3	35
100	WESTERN AVENUE A40(T)	A road	52702	7.0	53282	7.0	35
101	WESTERN AVENUE A437	A road	7654	6.0	7738	6.1	35
102	WESTERN AVENUE A437	A road	9912	4.6	10021	4.6	35
103	A404	B road	9749	3.0	9856	3.0	34
104	BATH ROAD	B road	191	100.0	193	101.1	40
105	BATH ROAD	B road	382	100.0	386	101.1	40
106	BATH ROAD	B road	397	23.1	401	23.3	34
107	BATH ROAD	B road	793	23.1	802	23.3	37
108	CUCKOO HILL B466	B road	3067	3.1	3101	3.1	18
109	CUCKOO HILL B466	B road	6134	3.1	6201	3.1	32
110	DAWLEY ROAD	B road	14284	8.0	14441	8.1	30
111	DAWLEY ROAD	B road	28567	8.0	28881	8.1	30
112	DAWLEY ROAD A437	B road	14284	8.0	14441	8.1	30
113	DAWLEY ROAD A437	B road	28567	8.0	28881	8.1	30
114	EASTCOTE ROAD B466	B road	7923	3.6	8010	3.6	43
115	EASTCOTE ROAD B466	B road	24381	2.8	24649	2.8	37
116	GREEN LANE B469	B road	2066	14.8	2089	14.9	35
117	GREEN LANE B469	B road	4132	14.8	4177	14.9	35
118	HAREFIELD ROAD B467	B road	4742	11.0	4794	11.1	29
119	HAREFIELD ROAD B467	B road	9483	11.0	9587	11.1	29
120	HAREFIELD ROAD B467	B road	11954	6.9	12085	7.0	10
121	HEWENS ROAD	B road	976	5.1	987	5.2	28
122	HIGH ROAD EASTCOTE B466	B road	6134	3.1	6201	3.1	32
123	HIGH ROAD EASTCOTE B466	B road	24381	2.8	24649	2.8	37
124	HIGH ROAD EASTCOTE B466	B road	25641	3.1	25923	3.1	5
125	HIGH ROAD, ICKENHAM B466	B road	15933	3.9	16108	4.0	38
126	HIGH ROAD, ICKENHAM B466	B road	31866	3.9	32217	4.0	38
127	HILLINGDON ROAD A4020	B road	8389	8.0	8481	8.1	29
128	ICKENHAM ROAD B466	B road	12900	3.6	13042	3.6	29
129	ICKENHAM ROAD B466	B road	15933	3.9	16108	4.0	38
130	ICKENHAM ROAD B466	B road	31866	3.9	32217	4.0	38
131	IVER LANE B470	B road	6362	5.5	6432	5.6	29
132	JOEL STREET B472	B road	9749	3.0	9856	3.0	34
133	JOEL STREET B472	B road	19497	3.0	19711	3.0	34
134	LONG LANE B466	B road	8129	3.7	8218	3.7	33
135	LONG LANE B466	B road	16257	3.7	16436	3.7	33
136	OXFORD ROAD A4020	B road	9225	11.2	9326	11.3	35
137	PARK ROAD B467	B road	7424	6.9	7505	6.9	33
138	PARK ROAD B467	B road	11954	6.9	12085	7.0	10
139	PARK ROAD B483	B road	3809	7.4	3851	7.5	33
140	PARK ROAD B483	B road	5893	6.6	5958	6.7	17
141	PARK ROAD B483	B road	7424	6.9	7505	6.9	33
142	PARK ROAD B483	B road	8389	8.0	8481	8.1	29
143	PARK VIEW ROAD	B road	7203	9.2	7282	9.3	29
144	PARK VIEW ROAD	B road	14406	9.2	14564	9.3	29
145	STATION ROAD	B road	7742	11.5	7827	11.7	18
146	SWAKELEYS ROAD B467	B road	7814	4.1	7899	4.2	29
147	SWAKELEYS ROAD B467	B road	11077	4.3	11198	4.4	35
148	SWAKELEYS ROAD B467	B road	15627	4.1	15799	4.2	29
149	SWAKELEYS ROAD B467	B road	21847	6.9	22087	6.9	25
150	SWAKELEYS ROAD B467	B road	22153	4.3	22397	4.4	35

Council Name - England

No	Road Name	Road Type	2006 AADT	% HDV	2008 AADT	%HDV	Speed
151	SWAKELEYS ROAD B467	B road	43694	6.9	44175	6.9	25
152	WEST DRAYTON ROAD B465	B road	976	5.1	987	5.2	28
153	WEST DRAYTON ROAD B465	B road	1952	5.1	1973	5.2	28
154	WEST DRAYTON ROAD B465	B road	4056	7.5	4101	7.6	23
155	WEST DRAYTON ROAD B465	B road	4149	9.2	4195	9.3	26
156	WEST DRAYTON ROAD B465	B road	8112	7.5	8201	7.6	23
157	WEST DRAYTON ROAD B465	B road	8298	9.2	8389	9.3	26
158	WESTERN AVENUE A40(T)	B road	21847	6.9	22087	6.9	25
159	A3044	Minor road	1297	4.5	1311	4.6	39
160	A3044	Minor road	2594	4.5	2623	4.6	39
161	A3044	Minor road	21453	5.9	21688	5.9	20
162	ANGEL LANE	Minor road	885	5.5	895	5.6	33
163	BEACON ROAD	Minor road	1213	25.1	1226	25.3	31
164	BELMONT ROAD	Minor road	2510	11.3	2537	11.4	38
165	BELMONT ROAD	Minor road	3712	6.0	3752	6.1	41
166	BELMONT ROAD	Minor road	7423	6.0	7505	6.1	41
167	BELMONT ROAD	Minor road	9199	13.6	9300	13.7	26
168	BILTON WAY	Minor road	4135	12.5	4180	12.6	20
169	BILTON WAY	Minor road	8269	12.5	8360	12.6	20
170	BLYTH ROAD	Minor road	868	6.2	878	6.3	31
171	BLYTH ROAD	Minor road	2324	7.1	2350	7.2	21
172	BOTWELL LANE	Minor road	175	81.4	177	82.3	41
173	BOTWELL LANE	Minor road	350	81.4	354	82.3	41
174	BOTWELL LANE	Minor road	583	4.2	589	4.2	30
175	BOTWELL LANE	Minor road	1166	4.2	1179	4.2	30
176	BOTWELL LANE	Minor road	1258	7.7	1272	7.8	18
177	BOTWELL LANE	Minor road	1718	21.8	1737	22.1	23
178	BOTWELL LANE	Minor road	6240	19.6	6309	19.8	11
179	BREAKSPEAR ROAD	Minor road	7489	4.5	7571	4.5	21
180	BREAKSPEAR ROAD NORTH	Minor road	973	2.7	984	2.7	54
181	BREAKSPEAR ROAD NORTH	Minor road	6593	2.6	6666	2.7	18
182	BREAKSPEAR ROAD SOUTH	Minor road	6520	4.5	6592	4.5	47
183	BRIDLE ROAD	Minor road	14175	5.2	14331	5.2	25
184	CENTRAL AVENUE	Minor road	2218	7.4	2242	7.5	34
185	CENTRAL AVENUE	Minor road	3688	2.1	3729	2.1	6
186	CENTRAL AVENUE	Minor road	4436	7.4	4485	7.5	34
187	CHARVILLE LANE	Minor road	224	42.0	226	42.4	40
188	CHARVILLE LANE	Minor road	448	42.0	453	42.4	40
189	CHERRY LANE	Minor road	7416	9.2	7498	9.3	32
190	CHERRY LANE	Minor road	14832	9.2	14995	9.3	32
191	CHIPPENDALE WAYE	Minor road	2510	11.3	2537	11.4	38
192	CHIPPENDALE WAYE	Minor road	5019	11.3	5074	11.4	38
193	CHURCH HILL	Minor road	14142	4.5	14298	4.5	47
194	CHURCH ROAD	Minor road	2693	12.3	2723	12.4	30
195	CHURCH ROAD	Minor road	4026	19.6	4070	19.9	33
196	CHURCH ROAD	Minor road	4059	13.4	4103	13.5	28
197	CHURCH ROAD	Minor road	8117	13.4	8206	13.5	28
198	CHURCH WALK	Minor road	3468	8.8	3506	8.9	22
199	CLAYTON ROAD	Minor road	43	0.0	43	0.0	33
200	COLHAM GREEN ROAD	Minor road	3704	23.1	3745	23.3	20
201	COLHAM GREEN ROAD	Minor road	6672	16.7	6745	16.9	26
202	COLHAM GREEN ROAD	Minor road	6672	16.7	6745	16.9	26
203	COWLEY MILL ROAD	Minor road	266	0.0	269	0.0	24
204	DAWLEY ROAD	Minor road	28092	8.5	28401	8.6	46
205	DAWLEY ROAD A437	Minor road	2324	7.1	2350	7.2	21
206	DICK TURPIN WAY	Minor road	2231	8.0	2255	8.1	13
207	EASTCHURCH ROAD	Minor road	16518	10.8	16699	10.9	46
208	EASTCHURCH ROAD	Minor road	33035	10.8	33398	10.9	46
209	EASTCOTE LANE	Minor road	8075	4.8	8164	4.8	26
210	EASTCOTE ROAD B466	Minor road	9954	2.4	10063	2.4	17
211	EASTERN AVENUE	Minor road	19323	3.0	19536	3.1	22
212	FIELD END ROAD	Minor road	776	14.9	784	15.1	35
213	FIELD END ROAD	Minor road	1551	14.9	1568	15.1	28
214	FIELD END ROAD	Minor road	2693	7.3	2723	7.4	46
215	FIELD END ROAD	Minor road	3317	9.8	3353	9.9	38
216	FIELD END ROAD	Minor road	3793	12.9	3835	13.1	30
217	FIELD END ROAD	Minor road	3896	8.4	3939	8.5	38
218	FIELD END ROAD	Minor road	4393	7.5	4441	7.5	39
219	FIELD END ROAD	Minor road	5386	7.3	5445	7.4	46
220	FIELD END ROAD	Minor road	9922	4.6	10031	4.6	39
221	FIELD END ROAD	Minor road	19844	4.6	20062	4.6	39
222	FINE BUSH LANE	Minor road	7489	4.5	7571	4.5	21
223	FREEMANS LANE	Minor road	2038	7.1	2060	7.2	37
224	FREEMANS LANE	Minor road	4075	7.1	4120	7.2	37
225	FREEZELAND WAY	Minor road	7654	6.0	7738	6.1	35

No	Road Name	Road Type	2006 AADT	% HDV	2008 AADT	%HDV	Speed
226	GRANGE ROAD	Minor road	3468	8.8	3506	8.9	22
227	HALL CIRCUS	Minor road	1734	14.7	1753	14.9	40
228	HAREFIELD ROAD	Minor road	4849	4.1	4902	4.1	45
229	HAREFIELD ROAD B467	Minor road	486	17.9	491	18.1	24
230	HAREFIELD ROAD B467	Minor road	4600	13.6	4650	13.7	26
231	HARMONDSWORTH ROAD	Minor road	6993	7.8	7069	7.9	22
232	HARMONDSWORTH ROAD	Minor road	13985	7.8	14139	7.9	22
233	HARVIL ROAD	Minor road	14142	4.5	14298	4.5	47
234	HARVIL ROAD	Minor road	16612	7.0	16795	7.1	47
235	HARVIL ROAD	Minor road	33224	7.0	33589	7.1	47
236	HATTON ROAD	Minor road	5357	11.5	5415	11.6	21
237	HATTON ROAD	Minor road	16518	10.8	16699	10.9	16
238	HATTON ROAD NORTH	Minor road	11984	5.5	12115	5.6	16
239	HERCIES ROAD	Minor road	12963	7.6	13105	7.7	28
240	HERCIES ROAD	Minor road	25925	7.6	26210	7.7	28
241	HIGH STREET	Minor road	4600	13.6	4650	13.7	26
242	HIGH STREET	Minor road	9199	13.6	9300	13.7	26
243	HIGH STREET	Minor road	13062	7.5	13206	7.5	22
244	HIGH STREET	Minor road	14142	4.5	14298	4.5	47
245	HIGH STREET	Minor road	16960	7.6	17147	7.7	23
246	HILL END ROAD	Minor road	4183	5.0	4229	5.1	45
247	HILLSIDE ROAD	Minor road	2411	5.4	2438	5.5	32
248	HILLSIDE ROAD	Minor road	2559	4.2	2587	4.2	24
249	HILLSIDE ROAD	Minor road	5118	4.2	5174	4.2	24
250	HOLLOWAY LANE A408	Minor road	14046	8.5	14201	8.6	46
251	HONEY HILL	Minor road	2785	5.8	2816	5.9	39
252	HONEYCROFT HILL	Minor road	5084	9.4	5139	9.5	34
253	HONEYCROFT HILL	Minor road	10167	9.4	10279	9.5	34
254	HORTON ROAD	Minor road	486	17.9	491	18.1	24
255	HORTON ROAD	Minor road	972	17.9	983	18.1	44
256	HORTON ROAD	Minor road	4218	11.4	4264	11.5	40
257	HORTON ROAD	Minor road	8147	14.7	8236	14.8	36
258	HORTON ROAD A3113	Minor road	4218	11.4	4264	11.5	40
259	ICKENHAM ROAD B466	Minor road	115	0.0	116	0.0	36
260	JUDGE HEATH LANE	Minor road	1734	14.7	1753	14.9	40
261	JUDGE HEATH LANE	Minor road	3467	14.7	3505	14.9	26
262	KINGSEND	Minor road	18711	4.2	18917	4.2	28
263	KINGSHILL AVENUE	Minor road	1092	5.1	1104	5.2	33
264	KINGSHILL AVENUE	Minor road	2385	12.0	2411	12.1	28
265	KINGSTON LANE	Minor road	1333	40.1	1348	40.6	37
266	KINGSWAY	Minor road	3076	8.0	3110	8.1	32
267	KINGSWAY	Minor road	6152	8.0	6220	8.1	32
268	LANGDALE DRIVE	Minor road	869	23.6	879	23.8	35
269	LANSBURY DRIVE	Minor road	475	65.3	480	66.0	22
270	LANSBURY DRIVE	Minor road	869	23.6	879	23.8	35
271	LEES ROAD	Minor road	2947	12.5	2979	12.6	22
272	LEES ROAD	Minor road	5893	12.5	5958	12.6	22
273	LONG DRIVE	Minor road	2358	3.8	2384	3.9	38
274	LONG DRIVE	Minor road	13191	4.2	13336	4.2	28
275	LONG DRIVE	Minor road	13191	4.2	13336	4.2	28
276	MILL ROAD	Minor road	6425	3.9	6496	3.9	34
277	MOORHALL ROAD	Minor road	7034	5.4	7111	5.5	35
278	MORGAN'S LANE	Minor road	698	4.0	706	4.1	24
279	MORGAN'S LANE	Minor road	4752	20.5	4804	20.7	30
280	NENE ROAD	Minor road	9562	9.0	9667	9.1	9
281	NEWBURY ROAD	Minor road	14539	11.3	14698	11.4	39
282	NORTH VIEW	Minor road	19323	3.0	19536	3.1	20
283	NORTHERN PERIMETER ROAD	Minor road	16518	10.8	16699	10.9	43
284	NORTHERN PERIMETER ROAD	Minor road	33035	10.8	33398	10.9	43
285	NORTHERN PERIMETER ROAD (WEST)	Minor road	1852	23.1	1872	23.3	20
286	NORTHERN PERIMETER ROAD (WEST)	Minor road	8298	12.3	8389	12.5	48
287	NORTHERN PERIMETER ROAD (WEST)	Minor road	14539	11.3	14698	11.4	39
288	NORTHERN PERIMETER ROAD (WEST)	Minor road	16518	10.8	16699	10.9	34
289	NORTHERN PERIMETER ROAD (WEST)	Minor road	16595	12.3	16778	12.5	48
290	NORTHERN PERIMETER ROAD (WEST)	Minor road	29077	11.3	29397	11.4	34
291	NORTHERN PERIMETER ROAD (WEST)	Minor road	33439	10.6	33807	10.7	45
292	NORTHWOOD ROAD	Minor road	5620	2.2	5682	2.2	39
293	NORTHWOOD WAY	Minor road	146	39.0	148	39.5	39
294	NORTHWOOD WAY	Minor road	292	39.0	295	39.5	39
295	NORTHWOOD WAY	Minor road	2484	0.8	2511	0.9	24
296	PARK LANE	Minor road	474	0.0	479	0.0	47
297	PARK LANE	Minor road	503	31.8	509	32.2	34
298	PARK LANE	Minor road	546	5.1	552	5.2	27
299	PARK LANE	Minor road	1092	5.1	1104	5.2	33
300	PARK ROAD	Minor road	5670	10.2	5732	10.4	36

No	Road Name	Road Type	2006 AADT	% HDV	2008 AADT	%HDV	Speed
301	PARK ROAD	Minor road	6791	9.8	6866	9.9	18
302	PARK ROAD B483	Minor road	3712	6.0	3752	6.1	41
303	PARK ROAD B483	Minor road	5019	11.3	5074	11.4	38
304	PARK WAY	Minor road	19535	3.1	19750	3.1	24
305	PEMBROKE ROAD	Minor road	19125	4.8	19335	4.9	21
306	PIELD HEATH ROAD	Minor road	2693	12.3	2723	12.4	30
307	PIELD HEATH ROAD	Minor road	3704	23.1	3745	23.3	20
308	PIELD HEATH ROAD	Minor road	4015	21.8	4059	22.1	14
309	PIELD HEATH ROAD	Minor road	4104	14.5	4149	14.7	26
310	POLE HILL ROAD	Minor road	448	42.0	453	42.4	40
311	POLE HILL ROAD	Minor road	448	42.0	453	42.4	40
312	POTTER STREET	Minor road	5118	4.2	5174	4.2	24
313	POTTER STREET	Minor road	5957	3.1	6023	3.1	32
314	POTTER STREET HILL	Minor road	4221	3.6	4267	3.6	28
315	PRINTINGHOUSE LANE	Minor road	1383	5.4	1398	5.4	26
316	PUMP LANE	Minor road	8269	12.5	8360	12.6	36
317	QUEENS WALK	Minor road	2358	3.8	2384	3.9	38
318	RAYNTON DRIVE	Minor road	869	23.6	879	23.8	35
319	RICKMANSWORTH ROAD	Minor road	4849	4.1	4902	4.1	40
320	RICKMANSWORTH ROAD	Minor road	9118	5.4	9218	5.4	24
321	ROYAL LANE	Minor road	2197	7.5	2221	7.5	39
322	ROYAL LANE	Minor road	4393	7.5	4441	7.5	39
323	ROYAL LANE	Minor road	4687	7.6	4739	7.7	33
324	SHEPISTON LANE	Minor road	14046	8.5	14201	8.6	46
325	SHEPISTON LANE	Minor road	28092	8.5	28401	8.6	46
326	SIPSON ROAD	Minor road	1436	6.0	1452	6.1	10
327	SIPSON ROAD	Minor road	8608	6.7	8703	6.8	28
328	SIPSON ROAD	Minor road	14832	9.2	14995	9.3	32
329	SOUTHERN PERIMETER ROAD	Minor road	740	34.9	748	35.2	55
330	SOUTHERN PERIMETER ROAD	Minor road	1213	25.1	1226	25.3	31
331	SOUTHERN PERIMETER ROAD	Minor road	1432	18.4	1447	18.6	28
332	SOUTHERN PERIMETER ROAD	Minor road	1480	34.9	1496	35.2	55
333	SOUTHERN PERIMETER ROAD	Minor road	8298	12.3	8389	12.5	48
334	SOUTHERN PERIMETER ROAD	Minor road	16518	10.8	16699	10.9	44
335	SOUTHERN PERIMETER ROAD	Minor road	18002	5.8	18200	5.9	34
336	SOUTHERN PERIMETER ROAD	Minor road	33035	10.8	33398	10.9	44
337	SPRINGWELL LANE	Minor road	4183	5.0	4229	5.1	8
338	STATION APPROACH	Minor road	13191	4.2	13336	4.2	28
339	STATION ROAD	Minor road	2693	12.3	2723	12.4	30
340	STATION ROAD	Minor road	13062	7.5	13206	7.5	22
341	STATION ROAD	Minor road	14761	11.6	14923	11.7	16
342	STATION ROAD	Minor road	17216	6.7	17405	6.8	28
343	STATION ROAD	Minor road	29522	11.6	29847	11.7	16
344	STOCKLEY ROAD A408	Minor road	486	17.9	491	18.1	24
345	SWAN ROAD	Minor road	6425	3.9	6496	3.9	34
346	THE FAIRWAY	Minor road	2358	3.8	2384	3.9	38
347	THE GREEN	Minor road	6425	3.9	6496	3.9	34
348	THE GREENWAY	Minor road	14335	10.7	14493	10.8	15
349	THORNEY MILL ROAD	Minor road	6425	3.9	6496	3.9	34
350	TORRINGTON ROAD	Minor road	727	2.1	735	2.1	35
351	TREVOR ROAD	Minor road	1431	5.5	1447	5.5	8
352	TUNNEL ROAD EAST	Minor road	1571	10.9	1588	11.0	12
353	UXBRIDGE ROAD	Minor road	4752	20.5	4804	20.7	30
354	VICTORIA ROAD	Minor road	1734	14.7	1753	14.9	26
355	VICTORIA ROAD	Minor road	4607	5.1	4657	5.1	20
356	VICTORIA ROAD	Minor road	9022	5.1	9121	5.2	43
357	VICTORIA ROAD	Minor road	9213	5.1	9314	5.1	21
358	VICTORIA ROAD	Minor road	19844	4.6	20062	4.6	22
359	VINE LANE	Minor road	2785	5.8	2816	5.9	39
360	VINE STREET	Minor road	2785	5.8	2816	5.9	39
361	WESTERN AVENUE A437	Minor road	7654	6.0	7738	6.1	35
362	WESTERN PERIMETER ROAD	Minor road	8298	12.3	8389	12.5	48
363	WESTERN PERIMETER ROAD	Minor road	16595	12.3	16778	12.5	48
364	WILLOW TREE LANE	Minor road	1297	4.5	1311	4.6	39
365	WILLOW TREE LANE	Minor road	2594	4.5	2623	4.6	39
366	WINDMILL HILL	Minor road	9954	2.4	10063	2.4	17
367	WINDMILL HILL	Minor road	19907	2.4	20126	2.4	17
368	WOOD END	Minor road	3468	8.8	3506	8.9	22
369	WOOD END GREEN ROAD	Minor road	2312	8.2	2337	8.3	46
370	WOOD END GREEN ROAD	Minor road	4623	8.2	4674	8.3	46
371	WOOD LANE	Minor road	229	0.0	232	0.0	36
372	YORK ROAD	Minor road	2510	11.3	2537	11.4	38
373	YORK ROAD	Minor road	5019	11.3	5074	11.4	38