



**2015 Updating and Screening Assessment for
Harborough District Council
In fulfillment of Part IV of the
Environment Act 1995
Local Air Quality Management**

Friday, 05 June 2015

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Report Reference number	HDC-USA-2015
Date	Friday, 05 June 2015

Executive Summary

Under Part IV of the Environment Act 1995 there is a requirement for all Local Authorities to assess their local air quality and to predict future conditions against the National Air Quality Standards.

This report has been compiled as part of the forth round of the air quality assessment for Harborough District Council. The Progress Report has been carried out in accordance with the requirements of the DEFRA guidance LAQM.TG(09) [9].

The Update and screening assessment has been carried out in accordance with the requirements of the DEFRA guidance LAQM.TG(09)[9]

The report has found that:

- Air quality in the district is generally within the Air Quality Standard
- That there are exceedences of the air quality standard in and around the Lutterworth Air Quality Management Area (AQMA).

The following actions are being taken by the authority

- Secure funding and undertake detailed traffic emissions assessment and model impact of 20mph zone on Lutterworth AQMA
- Submit 2016 Progress report.

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1 Introduction

1.1 Description of Local Authority Area

Harborough District Council is a diverse, largely rural authority covering approximately 590 Km² (230 mi²) of Southern Leicestershire, as shown in Figure. 1. Geographically it is the largest of the Leicestershire districts. Approximately 85,382 people (Census 2011 by The Office for National Statistics [40]) live within the District.

The two major population centres are the market towns of Market Harborough and Lutterworth, providing the main shopping and business services. These two towns, together with the villages of Thurnby, Bushby and Scraftoft adjoining Leicester City, and the villages of Broughton Astley, Great Glen, Kibworth and Fleckney accommodate 67% of the district population. The remaining residents live in villages varying from populations of several hundreds to hamlets comprising of a handful of dwellings.

The District borders on to the suburbs of Leicester to the north, Rutland to the east, Warwickshire to the west and Northamptonshire to the south.

Located at the heart of England, Harborough District has excellent transport links. The M1, M6 “Catthorpe” interchange connects Harborough District to Felixstowe, Birmingham, London and Edinburgh. The M1 and M6 and A14 are all identified on the Trans-European Network. The A5, A6, A5199 and A47 also run through the district which are a major part of the East Midlands road network and consequently are heavily used.

The Midland Main Line railway runs through the district and Market Harborough has an Inter-City station with direct links to London St. Pancras.

These good transport links have encouraged a number of industrial estates to develop, containing medium sized businesses carrying out a range of coating and spraying activities, moulding, and timber processes. In the south west of the District there is a cluster of mineral activities including sand and gravel extraction, cement batching plants and other associated products.

Although agriculture still plays an important role in the local economy, manufacturing and distribution are of ever increasing importance. At the LAQM USA 2015

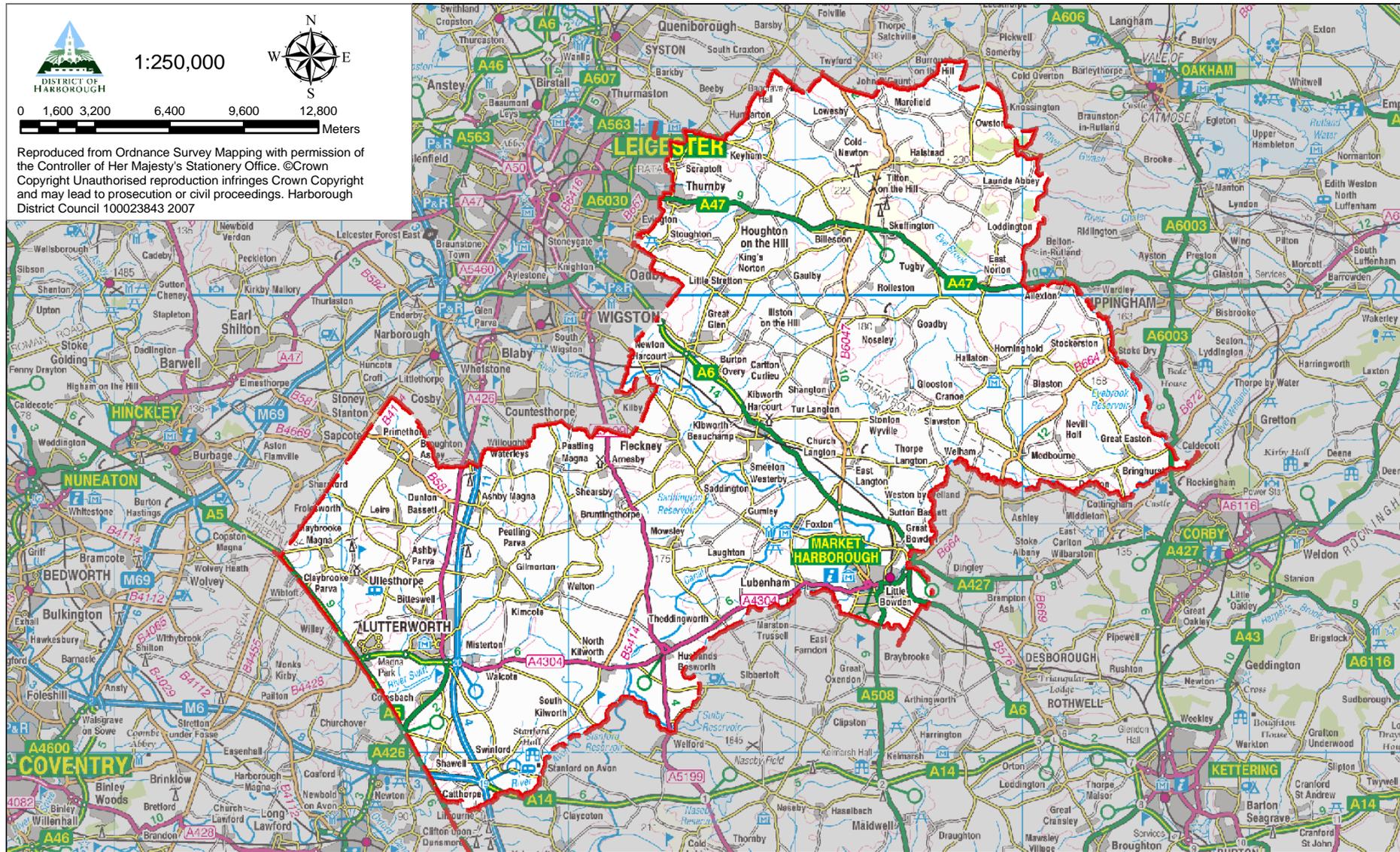
extreme western side of the District is Magna Park, which is a major warehousing and distribution site, covering approximately 2.3Km² (0.9 square miles). A number of the major manufacturers within the UK are located on this site and the 24-hour operation results in a great deal of traffic as most of the products are transported by road. Magna Park is located between the M1 and the A5, therefore a majority of the traffic is directed onto these major roads; however the nearby town of Lutterworth is affected by the increase in road traffic.

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.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

Figure. 1. Map of the Local Authority Area



1.3 Air Quality Objectives

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

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

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g.m}^{-3}$	Running annual mean	31.12.2003
	5.00 $\mu\text{g.m}^{-3}$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g.m}^{-3}$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g.m}^{-3}$	Annual mean	31.12.2004
	0.25 $\mu\text{g.m}^{-3}$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g.m}^{-3}$, not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g.m}^{-3}$	Annual mean	31.12.2005
Particles (PM ₁₀) (gravimetric)	50 $\mu\text{g.m}^{-3}$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g.m}^{-3}$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g.m}^{-3}$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g.m}^{-3}$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g.m}^{-3}$, 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 Review and Assessment of the local air quality takes place over a number of stages. The First Stage Review and Assessment [29] carried out in Harborough district concluded that further investigation would be required for Carbon Monoxide, Lead, Particulates and Nitrogen Dioxide. The Second and Third Stage review [28] concluded that with the exception of Nitrogen Dioxide all of the National Air Quality Standards would be met within the appropriate time frame. As it was anticipated that the national objective for Nitrogen Dioxide was unlikely to be met in Lutterworth Town Centre, an Air Quality Management Area (AQMA) was declared in July 2001.[6] See Figure. 2 for a map of the AQMA.

Following the declaration of the Air Quality Management Area a Stage 4 assessment [24] was required to give the council the opportunity to supplement any information already gathered in earlier review and assessment work.

The findings of the Stage 4 assessment confirmed that the annual average National Air Quality Objective for Nitrogen Dioxide was unlikely to be achieved. New Monitoring Data confirmed the source of the problem was traffic related, and an Action Plan [25] was developed which was incorporated into the second Leicestershire County Council Local Transport Plan which ran from 2006 to 2011.

In 2009 the Council undertook an update and screening assessment [19] which found that generally the air quality in Harborough district is very good; however the air quality in Lutterworth remains high and exceeds the national air quality objective. During 2008 it became apparent that the diffusion tubes in the area were showing a potential exceedence of the objective levels outside of the existing Air Quality Management Area (AQMA). It was necessary to relocate some of the diffusion tubes to confirm the initial findings, and was recommended that a detailed assessment of Lutterworth High Street would be required to confirm whether the existing AQMA needed to be extended.

A detailed assessment of Lutterworth was conducted in 2010 [17]The assessment found that the AQMA did not require extension to the north of the currently declared area but that the air quality standard was being exceeded to the south of the currently declared area. In order to improve the data for the further assessment of the proposed extension to the AQMA it was necessary for several NO₂ diffusion tubes to be relocated.

A Further Assessment was undertaken in 2012[14]. The Further Assessment assessed the area to the south of the AQMA as amended following the Detailed Assessment and also looked at source apportionment. The assessment found that the area south of the Amended AQMA is exceeding the Annual Mean Air Quality Standard for NO₂ and requires amendment. It also found that (based on Annual Average Daily Traffic Flow (AADT) data):

- There are ~15000 vehicle movements through the AQMA on a daily basis.

- Approximately 85% of these movements are made by cars, 6% are made by Heavy Goods Vehicles (HGVs), and 8% are made by Light Goods Vehicles (LGVs). The remainder of movements are made by buses and motorcycles.

Progress report published in 2013 [13] and 2014 [12] found Air quality in the district is generally within the Air Quality Standard and that there are exceedences of the air quality standard in and around the Lutterworth AQMA.

2 Data handling and modelling

2.1 Façade Correction

Some diffusion tubes have undergone a façade correction (presented in **Error! Reference source not found.**) the corrections were undertaken using the procedure outlined in Box 2.3: Predicting nitrogen dioxide concentrations at different distances from road of the technical guidance [9] (reproduced in Figure. 3 for reference).

Figure. 3. Box 2.3: Predicting nitrogen dioxide concentrations at different distances from road of the technical guidance [9]

Box 2.3: Predicting nitrogen dioxide concentrations at different distances from roads	
<p>A method has been developed to allow NO₂ measurements made at one distance from a road to be used to predict concentrations at a different distance from the same road. It is appropriate for distances between 0.1 m and 140 m of the kerb.</p> <p>Step 1: Identify the local background concentration in µgm⁻³, either from local monitoring or from the national maps published at www.airquality.co.uk. (Note that the background concentration must be less than the measured concentration).</p> <p>Step 2: apply the following calculation</p> $C_z = \left(\frac{C_y - C_b}{-0.5476 \times \ln(D_y) + 2.7171} \right) \times (-0.5476 \times \ln(D_z) + 2.7171) + C_b$ <p>Where:</p> <p>C_z is the total predicted concentration (µgm⁻³) at distance D_z;</p> <p>C_y is the total measured concentration (µgm⁻³) at distance D_y;</p> <p>C_b is the background concentration (µgm⁻³);</p> <p>D_y is the distance from the kerb at which concentrations were measured; and</p> <p>D_z is the distance from the kerb (m) at which concentrations are to be predicted.</p> <p>$\ln(D)$ is the natural log of the number D.</p> <p>Results derived in this way will have a greater uncertainty than the measured data. Further assistance with this procedure and interpretation of the results can be obtained from the Review and Assessment helpdesk (www.uwe.ac.uk/aqm/review).</p> <p style="text-align: center;">Calculator</p> <p>The equation above is available as a simple calculator (available at http://www.airquality.co.uk/archive/laqm/tools.php). This is set up to work from 0.1 to 50 m from the kerb, as this is the range that is likely to be relevant for Local Air Quality Management (LAQM) work. Kerbside sites should be treated as being at 0.1 m from the kerb. The calculator works for receptors either closer to or further from the kerb than the monitor. The greater the distance between the receptor and monitor, the greater the uncertainty in the derived receptor concentration. It is therefore recommended that if the receptor is further from the kerb than the monitor it should be no more than 20 m away. If the receptor is closer to the kerb, then it should be no more than 10 m from the monitor.</p>	

Modified from Box 2.3 page 2-6 of the technical Guidance 2009 [9] (modification are improved layout of equation and insertion of hyperlinks where footnotes are present in the original).

2.2 Annualisation

Where data does not cover the whole year it is possible to estimate the annual mean using the method in Box 3.2 Estimation of annual mean concentrations

from short-term monitoring data of the technical guidance [9] (reproduced in Figure. 4 for reference).

Figure. 4. Estimation of annual mean concentrations from short-term monitoring data

Box 3.2: Estimation of annual mean concentrations from short-term monitoring data

Example
 It has only been possible to carry out a monitoring survey (automatic or diffusion tube) at site **S** for six months between July and December 2008. The measured mean concentration **M** for this period is $30.2\mu\text{gm}^{-3}$. How can this be used to estimate the annual mean for this location?

Adjustment to estimate annual mean
 The adjustment is based on the fact that patterns in pollutant concentrations usually affect a wide region. Thus if a six month period is above average at one place it will almost certainly be above average at other locations in the region. The adjustment procedure is as follows:

1. Identify two to four nearby, long-term, continuous monitoring sites, ideally those forming part of the national network. These should be background sites to avoid any very local effects that may occur at roadside sites, and should, wherever possible lie within a radius of about 50 miles.
2. Obtain the annual means, **Am**, for the calendar year for these sites, 2008 in this example.
3. Work out the period means, **Pm**, for the period of interest, in this case July to December 2008. [It may be necessary to use unratified automatic data.]
4. Calculate the ratio, **R**, of the annual mean to the period mean $\left(\frac{Am}{Pm}\right)$ for each of the sites.
5. Calculate the average of these ratios, **R_a**. This is then the adjustment factor.
6. Multiply the measured period mean concentration **M** by this adjustment factor **R_a** to give the estimate of the annual mean for 2008.

Long term site	Annual mean 2008 (Am)	Period Mean 2008 (Pm)	Ratio $\left(\frac{Am}{Pm}\right)$
A	28.6	29.7	0.963
B	22.0	22.8	0.965
C	26.9	28.9	0.931
D	23.7	25.9	0.915
Average (Ra)			0.944

For this example the best estimate of the annual mean for site **S** in 2008 will be

$$\begin{aligned}
 S &= M \times R_a \\
 &= 30.2 \times 0.944 \\
 &= 28.5\mu\text{gm}^{-3}
 \end{aligned}$$

Notes

- Monitoring data for the long-term sites must have adequate data capture rates: above 90% is preferable; sites with data capture below 75% should not be used.
- It may be appropriate to use diffusion tube results from a long-term survey to adjust short-term diffusion tube results. To allow for the greater uncertainty of diffusion tubes results from four or more sites should be used. Ensure that the tubes are from the same supplier using the same method of preparation.
- If the short-term period covers, for instance, February to June 2009, and the work is being carried out in August 2009, then an annual mean for 2009 will not be available. The calculation can then be carried out using the ratio to the 2008 annual mean, but the result is then an estimate of the 2008 annual mean at the short-term site.

Modified from Box 3.2 page 3-4 of the technical Guidance 2009 [9].

3 New Monitoring Data

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

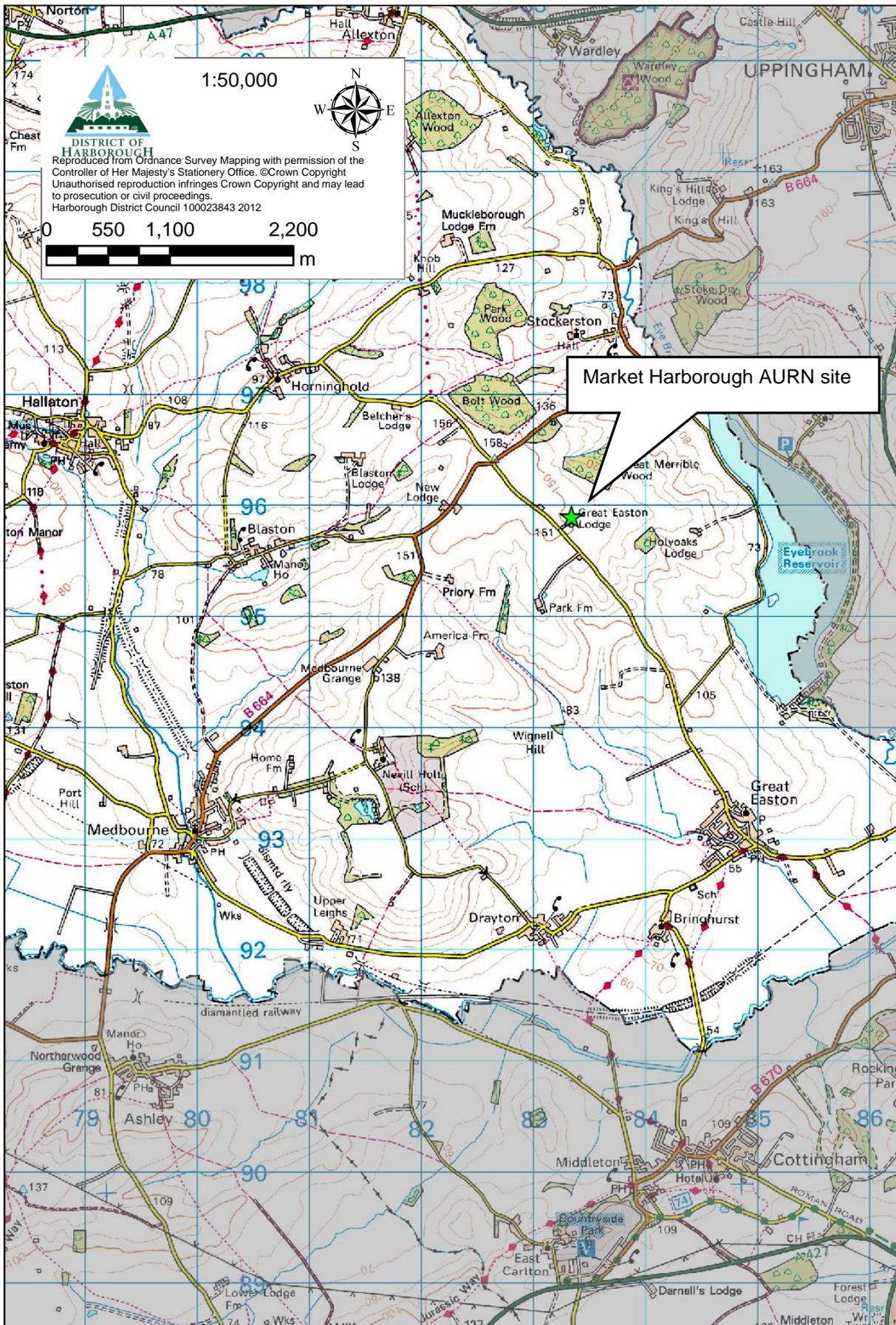
The council does not currently operate any automatic monitoring stations.

Bureau Veritas currently operate an AURN site on behalf of DEFRA near to Eye Brook Reservoir (Figure. 5). This site monitors for nitrogen dioxide, carbon monoxide and ozone. Details of the site can be found at http://uk-air.defra.gov.uk/networks/site-info?uka_id=UKA00463 (correct 21/04/2014).

Table 2. Details of Automatic Monitoring Sites

Site ID		1		
Site Name		Market Harborough AURN site		
Site Type		Rural		
OS Grid Ref	X	483335		
	Y	295896		
Pollutants Monitored		NO	NO ₂	Ozone
Monitoring Technique		unknown	unknown	unknown
In AQMA ?		No		
Relevant Exposure? (Y/N with distance (m) to relevant exposure)		N/A		
Distance to kerb of nearest road (N/A if not applicable)		N/A		
Does this location represent worst-case exposure?		N/A		

Figure. 5. Map of AURN Automatic Monitoring Site



3.1.2 Non-Automatic Monitoring Sites

As part of the assessment of the local air quality, a number of diffusion tubes are located throughout the district. These tubes are a simple and cost effective method for screening air quality and provide a good indication of the annual average levels of Nitrogen Dioxide

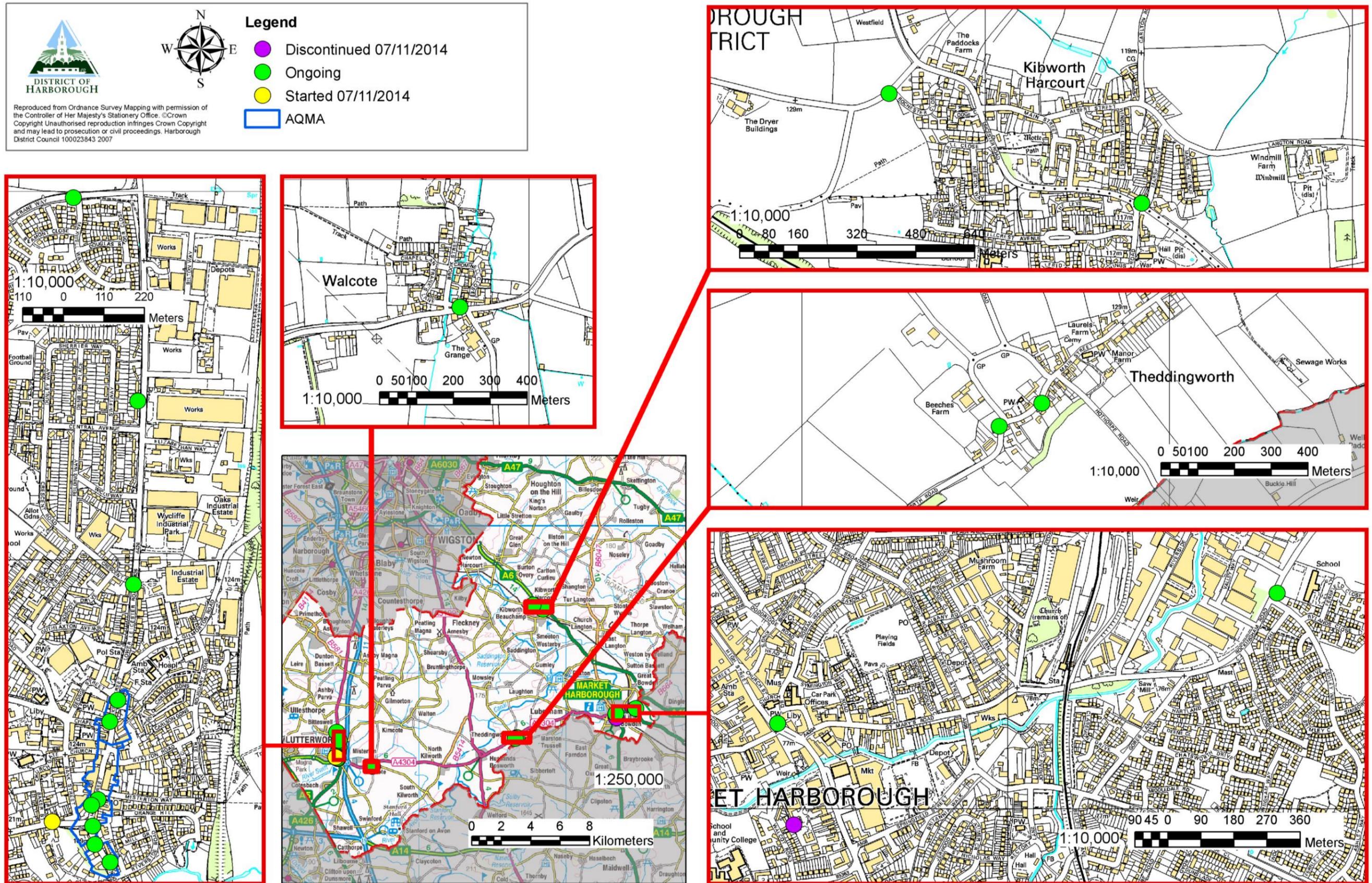
The diffusion tube supplied and analysed by Lambeth Scientific services by spiking with 50% triethanolamine (TEA) in acetone.

The DEFRA Review and assessment helpdesk National Diffusion Tube Bias Adjustment Factor Spreadsheet 03/2015 [42] has data for Lambeth Scientific Services in 2013 the average Bias adjustment for 2013 is 0.80

Table 3. Details of Non- Automatic Monitoring Sites

Site ID	location	Site Type	Grid Reference		Our Tube No.	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (m) (N/A if not applicable)	Worst-case Location?
			X	Y						
01n	Lutterworth Service Shop	Roadside	454475	284560	2	NO ₂	Y	0	4.2	Y
03n	Brooklands (Home)	Urban background	473418	286956	3	NO ₂	N	N/A	N/A	Y
09n	Maxwell Way	Roadside	454376	285981	8	NO ₂	N	11.1	1.2	Y
11n	Day Nursery	Roadside	454539	284932	10	NO ₂	N	9	1.3	N
12n	A6 Kibworth	Roadside	468425	294314	11	NO ₂	N	10.7	1.3	Y
13n	Rockingham Road	Roadside	474731	287585	12	NO ₂	N	9	2.8	Y
16n	Walcote	Roadside	456810	283652	15	NO ₂	N	12.5	3	Y
17n	The Square	Roadside	473373	287231	16	NO ₂	N	2.5	3	Y
18n	Jazz Hair	Roadside	454443	284348	17	NO ₂	N	0	3	Y
19n	Wistow Rd Kibworth	Roadside	467739	294611	14	NO ₂	N	2.5	5.4	Y
22n	77 Leicester road Lutterworth	Roadside	454533	284872	9	NO ₂	N	0	13.5	Y
23n	6 The Terrace Rugby Road	Roadside	454428	284274	1	NO ₂	N	0	2.5	Y
24n	4-9 regent court	Roadside	454410	284326	4	NO ₂	N	0	16.25	Y
25n	26 Market Street Lutterworth	Roadside	454497	284618	5	NO ₂	Y	1.6	4.8	Y
26n	24 Rugby Road Lutterworth	Roadside	454432	284229	13	NO ₂	N	0	2	Y
27n	17 Rugby road Lutterworth	Roadside	454476	284178	7	NO ₂	N	3.7	5.2	Y
28n	Spencerdene main street theddingworth	Roadside	466535	285545	18	NO ₂	N	1.2	0.2	N
29n	Homeside main street Theddingworth	Roadside	466651	285607	6	NO ₂	N	0.2	1.4	Y
30n	40 regent Street Lutterworth	Roadside	454318	284288	3	NO ₂	N	0	2.5	Y

Figure 6. Map of Non-Automatic Monitoring Sites



3.2 Comparison of Monitoring Results with Air Quality Objectives

3.2.1 Nitrogen Dioxide

3.2.1.1 Automatic Monitoring Data

Table 4. Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective of $40\mu\text{gm}^{-3}$

Site ID	1	
Site Name	Market Harborough AURN site	
Site Type	Rural	
Within AQMA?	N	
Valid Data Capture for period of monitoring % ^a	95.73%	
Valid Data Capture 2012 % ^b	95.47%	
Annual Mean Concentration μgm^{-3}	2007* ^c	11.57
	2008* ^c	10.80
	2009* ^c	11.98
	2010* ^c	11.74
	2011 ^c	9.27
	2012 ^c	15.3
	2013 ^c	13.12
2014	14.29	

^a i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

^c Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.

*Annual mean concentrations for previous years are optional.

Table 5. Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective

Site ID	1	
Site Name	Market Harborough AURN site	
Site Type	Rural	
Within AQMA?	N	
Valid Data Capture for period of monitoring % ^a	95.73%	
Valid Data Capture 2011 % ^b	95.47%	
Number of Exceedences of Hourly Mean ($200\mu\text{gm}^{-3}$)	2007* ^c	0
	2008* ^c	0
	2009* ^c	0
	2010* ^c	0
	2011 ^c	0
	2012 ^c	0
	2013 ^c	0
2014	0	

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

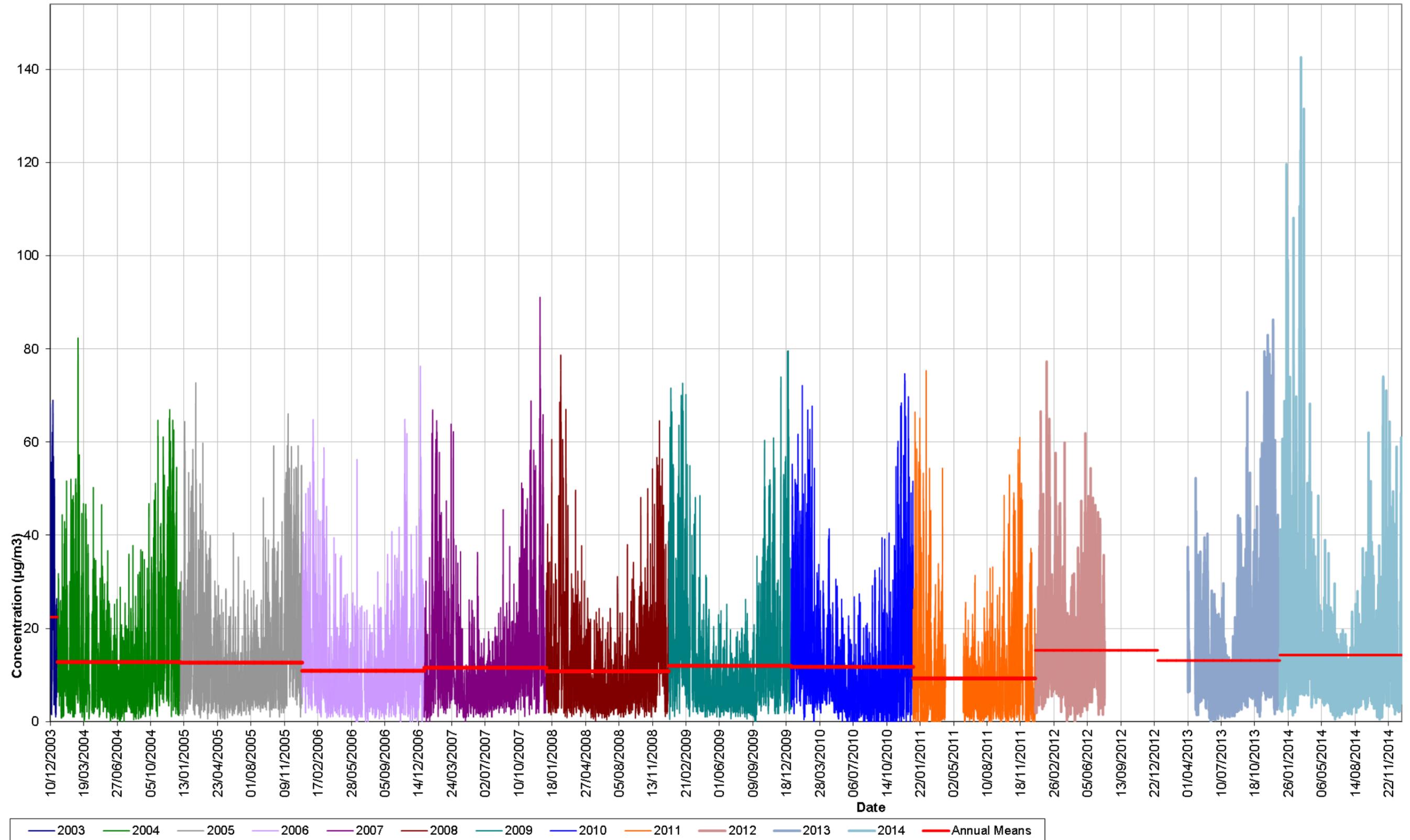
^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

^c If the period of valid data is less than 90%, include the 99.8th percentile of hourly means in brackets

*Number of exceedences for previous years are optional

Figure 7. Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Automatic Monitoring Site Eyebrook Reservoir

Automatic monitoring AURN Site Eyebrook Reservoir Annual trends Nitrogen dioxide



3.2.1.2 Diffusion Tube Monitoring Data

Table 6. Results of Nitrogen Dioxide Diffusion Tubes in 2014

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture for monitoring period (%) ^a	Data Capture 2013 (%) ^a	Data with less than 9 months has been annualised (Y/N) ^b	Annual mean concentration (BAF = 0.8) ^{b, c, d, e}	Facade corrected data
01n	Lutterworth Service Shop	Roadside	Y	N	100.0%	100.0%	N	39.80	
03n	Brooklands (Home)	Urban background	N	N	40.0%	33.3%	Y	16.66	
09n	Maxwell Way	Roadside	N	N	100.0%	100.0%	N	23.87	18.64
11n	Day Nursery	Roadside	N	N	100.0%	100.0%	N	35.80	26.09
12n	A6 Kibworth	Roadside	N	N	100.0%	100.0%	N	28.20	20.89
13n	Rockingham Road	Roadside	N	N	100.0%	100.0%	N	25.73	22.30
16n	Walcote	Roadside	N	N	83.3%	83.3%	N	21.44	19.21
17n	The Square	Roadside	N	N	66.7%	66.7%	N	25.00	23.09
18n	Jazz Hair	Roadside	Y	N	91.7%	91.7%	N	39.20	
19n	Wistow Rd Kibworth	Roadside	N	N	100.0%	100.0%	N	20.93	18.93
22n	77 Leicester road Lutterworth	Roadside	N	N	100.0%	100.0%	N	19.93	
23n	6 The Terrace Rugby Road	Roadside	Y	N	83.3%	83.3%	N	27.60	
24n	4-9 regent court	Roadside	Y	N	91.7%	91.7%	N	38.84	33.17
25n	26 Market Street Lutterworth	Roadside	Y	N	100.0%	100.0%	N	34.87	33.08
26n	24 Rugby Road Lutterworth	Roadside	Y	N	100.0%	100.0%	N	40.67	
27n	17 Rugby road Lutterworth	Roadside	Y	N	100.0%	100.0%	N	29.80	27.11
28n	Spencerdene main st Thed	Roadside	N	N	100.0%	100.0%	N	21.13	17.93
29n	Homeside main st Thed	Roadside	N	N	100.0%	100.0%	N	27.53	27.04
30n	40 Regent Street Lutterworth	Roadside	N	N	100.0%	16.7%	Y	20.89	

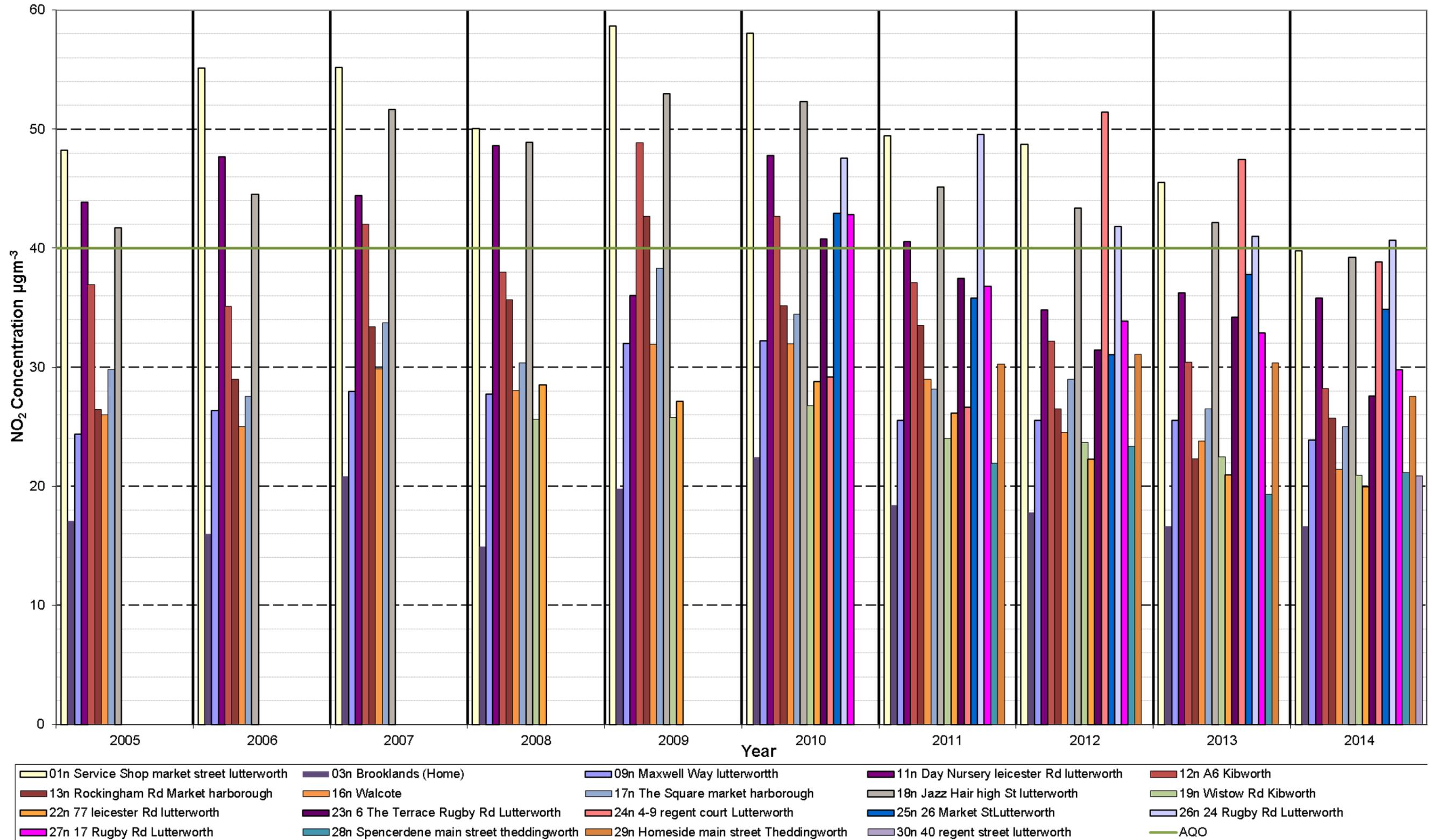
- a. i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
b. Means should be "annualised" as in Box 3.2 of TG(09) pg3-4, if monitoring was not carried out for the full year. Annualised data highlighted in green
c. Values exceeding the AQ objective are shown in red
d. Values exceeding $36 \mu\text{g m}^{-3}$ (1 standard deviation below the AQ objective) are shown in Blue.
e. BAF is Bias Adjustment Factor .

Table 7. Results of Nitrogen Dioxide Diffusion Tubes (2005 to 2014)

Site ID	Location	Within AQMA ?	Data Capture for monitoring period ^a %	Data Capture for full calendar year 2011 ^b %	Annual mean concentrations ($\mu\text{g.m}^{-3}$) ^{c, d, e, f, g}									
					2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
					BAF = 0.81	BAF = 0.87	BAF = 0.90	BAF = 0.83	BAF = 1.02	BAF = 1.06	BAF = 1.06	BAF = 0.87	BAF = 0.83	BAF = 0.80
01n	Lutterworth Service Shop	Y	100%	100%	48.24	55.13	55.20	50.03	51.75	58.04	49.47	48.72	45.51	39.80
03n	Brooklands (Home)	N	92%	92%	17.08	15.98	20.86	14.94	17.48	22.45	18.41	17.80	16.67	16.66
09n	Maxwell Way	N	100%	100%	24.38	26.39	27.98	27.74	28.23	32.24	25.53	25.55	25.52	23.87
11n	Day Nursery	N	100%	100%	43.84	47.68	44.40	48.62	31.80	28.80	26.15	34.80	36.24	35.80
12n	A6 Kibworth	N	100%	100%	36.94	35.09	42.00	37.97	43.11	47.79	40.55	32.19	30.43	28.20
13n	Rockingham Road	N	100%	100%	26.46	29.00	33.38	35.69	37.65	42.67	37.10	26.50	22.31	25.73
16n	Walcote	N	100%	100%	26.01	24.99	29.88	28.07	28.17	31.98	28.97	24.51	23.79	21.44
17n	The Square	N	75%	75%	29.84	27.55	33.75	30.34	33.81	34.45	28.15	29.00	26.49	25.00
18n	Jazz Hair	Y	83%	83%	41.72	44.54	51.68	48.90	46.72	52.33	45.16	43.34	42.15	39.20
19n	Wistow Rd Kibworth	N	92%	92%				25.59	22.75	26.77	23.99	23.71	22.48	20.93
22n	77 Leicester road Lutterworth	N	100%	100%				28.54	23.93	28.80	26.15	22.26	20.96	19.93
23n	6 The Terrace Rugby Road	Y	92%	92%						41.22	37.49	31.47	34.18	27.60
24n	4-9 regent court	Y	75%	75%						29.51	26.62	51.40	47.45	38.84
25n	26 Market Street Lutterworth	Y	83%	83%						43.41	35.83	31.06	37.80	34.87
26n	24 Rugby Road Lutterworth	Y	92%	92%						48.09	49.53	41.83	41.02	40.67
27n	17 Rugby road Lutterworth	Y	83%	83%						43.33	36.78	33.85	32.85	29.80
28n	Spencerdene main st Thed	N	100%	75%							21.97	23.33	19.30	21.13
29n	Homeside main st Thed	N	89%	67%							30.28	31.08	30.36	27.53
30n	40 Regent Street Lutterworth	N	100%	16.7%										20.89

- a. i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
- b. i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
- c. Means should be "annualised" as in Box 3.2 of TG(09) pg3-4, if monitoring was not carried out for the full year. Annualised data highlighted in green
- d. Annual mean concentrations for previous years are optional.
- e. Values exceeding the AQ objective are shown in red
- f. Values exceeding $36 \mu\text{g.m}^{-3}$ (1 standard deviation below the AQ objective) are shown in Blue.
- g. BAF is Bias Adjustment Factor

Figure 8. Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites
NO₂ Diffusion tube trends (2005 to 2014)
 (Annualised values used where calculated)



3.2.2 Particulate Matter (PM₁₀)

This Authority Does Not Currently Monitor for this pollutant

3.2.3 Sulphur Dioxide

This Authority Does Not Currently Monitor for this pollutant

3.2.4 Benzene

This Authority Does Not Currently Monitor for this pollutant

3.2.5 Other pollutants monitored

This Authority Does Not Currently Monitor for this pollutant

3.2.6 Summary of Compliance with AQS Objectives

Several of tubes located within the currently declared AQMA have recorded exceedences of the annual mean AQS for NO₂. The tube located outside 17 rugby road has not exceeded the AQS for NO₂

There have been no exceedences outside of the AQMA

Harborough District Council has examined the results from monitoring in the district. Concentrations outside of the AQMA are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

4 Road Traffic Sources

4.1 Narrow Congested Streets with Residential Properties Close to the Kerb

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

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

Harborough District Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to

traffic.

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

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

4.4 Junctions

Harborough District Council confirms that there are no new/newly identified busy junctions/busy roads.

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

Harborough District Council confirms that there are no new/proposed roads which have not been subject to an air quality assessment.

4.6 Roads with Significantly Changed Traffic Flows

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

4.7 Bus and Coach Stations

Harborough District Council confirms that there are no relevant bus stations in the Local Authority area.

5 Other Transport Sources

5.1 Airports

Harborough District Council confirms that there are no airports in the Local Authority area.

5.2 Railways (Diesel and Steam Trains)

5.2.1 Stationary Trains

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

5.2.2 Moving Trains

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

5.3 Ports (Shipping)

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

6 Industrial Sources

6.1 Industrial Installations

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

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

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

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

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

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

6.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

6.3 Petrol Stations

Harborough District Council confirms that there are no petrol stations meeting the specified criteria.

6.4 Poultry Farms

Harborough District Council confirms that there are no poultry farms meeting the specified criteria.

7 Commercial and Domestic Sources

7.1 Biomass Combustion – Individual Installations

There have been 2 new Bio-mass plants since the previous update and screening assessment. Planning reference

- 12/01031/FUL <http://pa2.harborough.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=M73XFUHWGJ000> and
- 13/00712/FUL <http://pa2.harborough.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=MMJ20NHWGJ000>)

Permission 12/01031/FUL included an air quality impact assessment undertaken by WYG Planning and environment and has had a ‘small’ to ‘imperceptible’ impact on air quality

Permission 13/00712/FUL is for a boiler <50kW and is not covered by this assessment

Harborough District Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

7.2 Biomass Combustion – Combined Impacts

The most appliances in a 500x500m area (identified by HETAS notifications) is 24. A map of the numbers of appliances in 500x500 grid square is shown in LAQM USA 2015

Figure. 9 It is unknown what kind of appliance these may be. Taking a worst case emission of a wood burning fireplace of $27.43 \text{ kg}\cdot\text{year}^{-1}$ taken from Table 5.3 of LAQM.TG(09).

The solid fuel burning premises occupy 5835m^2 of the 250000m^2 grid square

$$(24 \times 27.43) \left(\frac{5835}{250000} \right) = 15.36$$

The UK Background maps <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2011> report the 2015 background PM_{10} level for grid square 473500 286500 as $16.06 \mu\text{g}\cdot\text{m}^{-3}$. When plotted against Figure 5.22 of LAQM.TG(09) (reproduced as Figure. 10) the grid square is significantly below the relevant threshold nomogram..

As the fraction of land occupied is likely to be similar in all of the grid squares it is unlikely that grid squares with a lower number of appliances will exceed the relevant nomogram.

Harborough District Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

Figure 9. Map showing 500mx500m grid with counts of properties with HETAS competent persons notifications

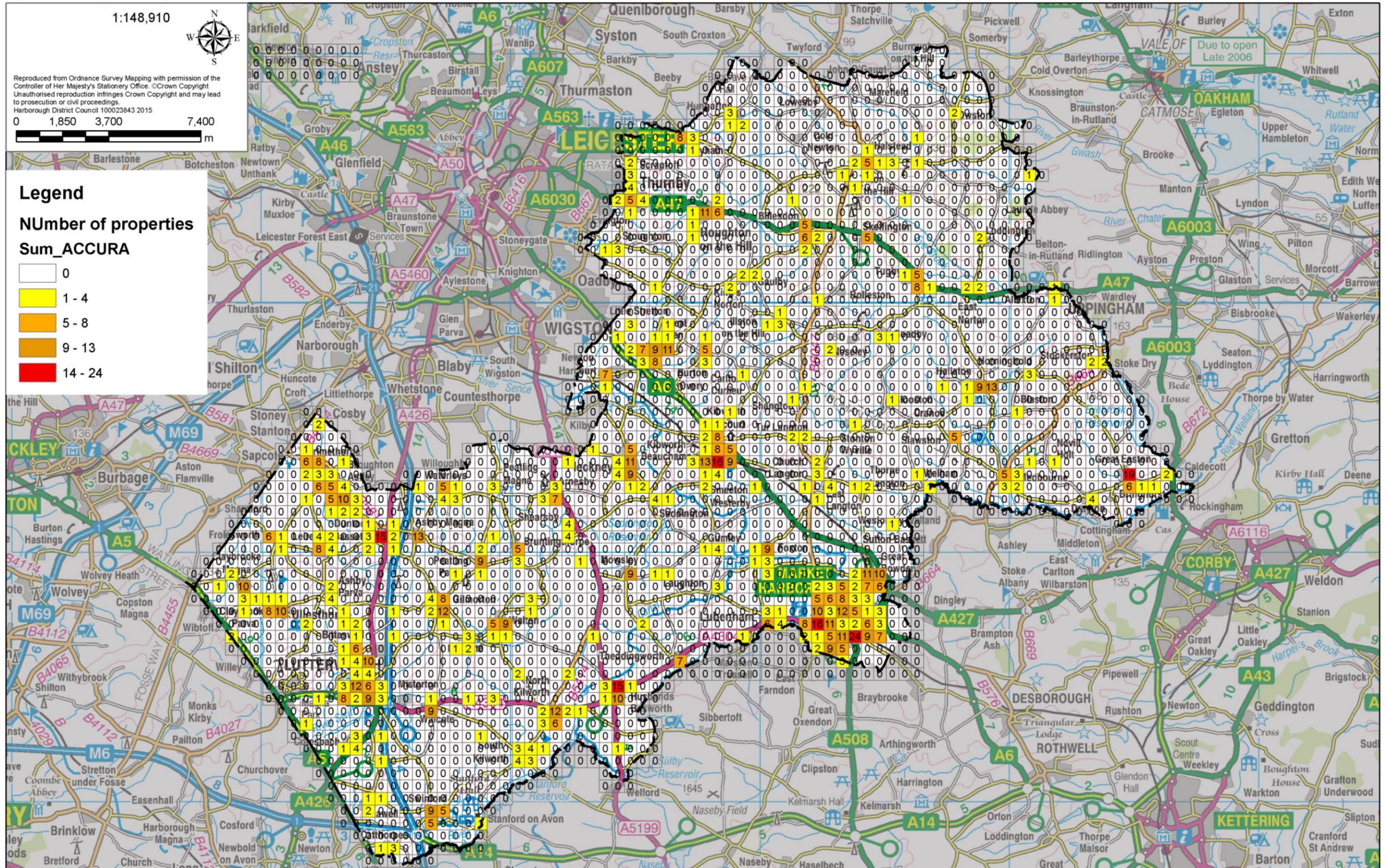
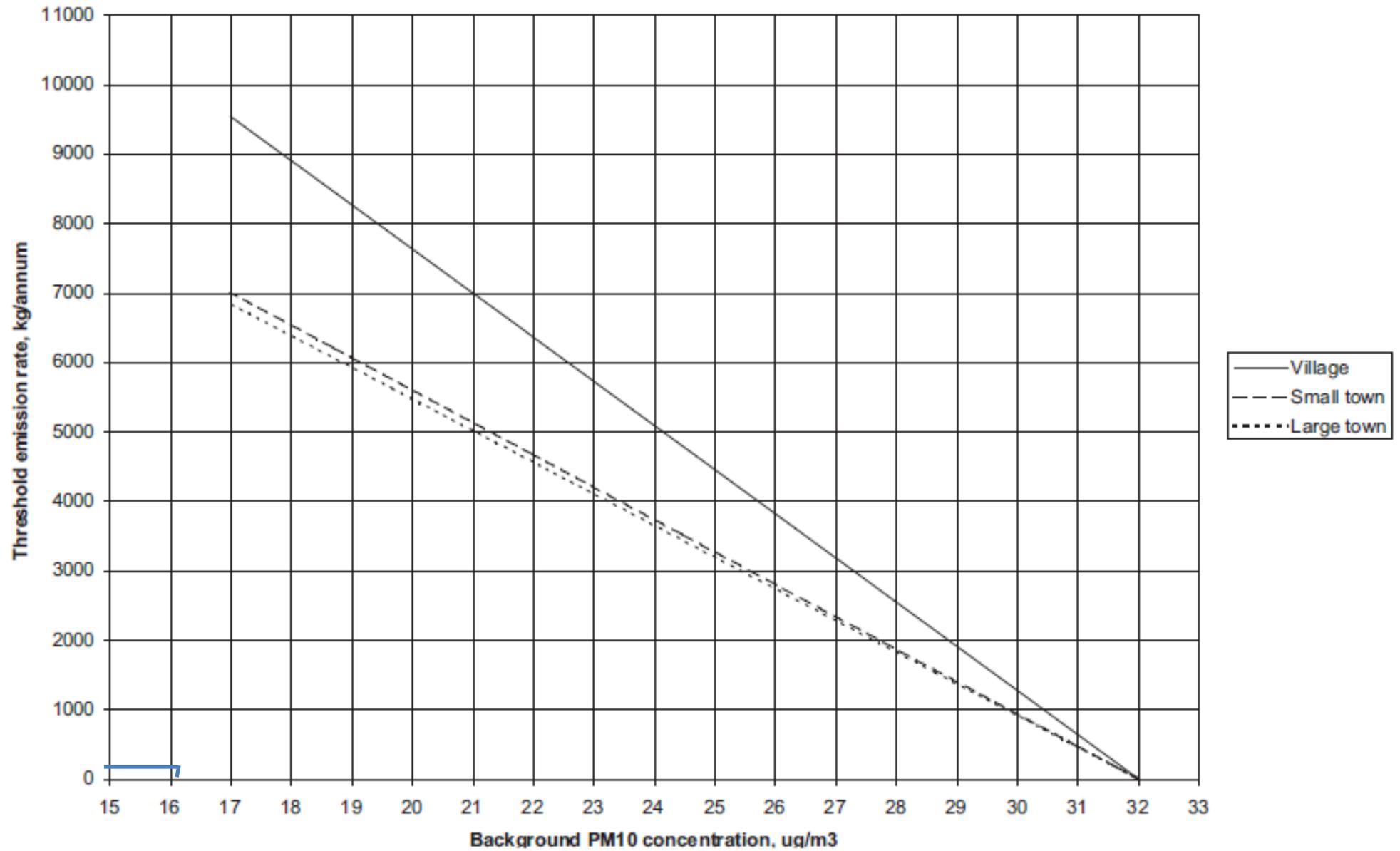


Figure. 10. Figure 5.22 Threshold emissions density of emissions from a 500 m x 500 m area that may produce an exceedence of the daily mean objective for PM₁₀



7.3 Domestic Solid-Fuel Burning

There are no areas in Harborough district likely to have more than 50 homes burning coal or smokeless fuel as their primary source of heating.

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

8 Fugitive or Uncontrolled Sources

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

9 Implementation of Action Plans

The council has adopted a new action plan framework and is currently working with LCC Highways to design schemes which will improve Air Quality in the districts AQMA

The council attempted to apply for an air quality grant to undertake a detailed traffic emissions study and assess impacts of a 20mph zone on the Lutterworth AQMA. However as this work could not be capitalised it was not (i.e. it is research as apposed to capital expenditure) it did not meet the conditions of the grant. The council is currently in the processes of securing funding for this to be undertaken.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

The annual mean air quality standard for NO₂ is being exceeded within the AQMA.

No exceedences have occurred outside of the AQMA

10.2 Conclusions from Assessment of Sources

No areas requiring detailed assessment have ben identified

10.3 Proposed Actions

- Secure funding and undertake detailed traffic emissions assessment and model impact of 20mph zone on Lutterworth AQMA

- Submit 2016 Progress report.

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12 Appendices

Appendix A. Raw 2013 Diffusion Tube Data and façade calculations

Site ID	location	Site Type	Grid Reference		Our Tube No.	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?	Measurement Period (μgm^{-3})												BIAS =		Confidence level			confidence interval	% period coverage	% year data coverage	Façade Correction (See Box 2.3 pg 2-6 LAQM.TG(09))			Façade Corrected Bias Adjusted Mean (μgm^{-3})
			X	Y							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	0.80		80%						find relevant background concentration			
																							arithmetic mean (μgm^{-3})	Bias adjusted arithmetic Mean (μgm^{-3})	Standard Deviation	period length	no of results				X	Y	background NO_2 (μgm^{-3})	
01n	Lut. Service Shop	Roadside	454475	284560	2	NO ₂	Y	0	4.2	Y	54	48	57	47	60	48	49	54	35	47	51	47	49.75	39.80	6.34	12	12	2.35	100	100	453500	284500	13.75	
03n	Brooklands (Home)	Urban background	473418	286956	3	NO ₂	N	N/A	N/A	Y	21	24	21	17									20.75	16.60	2.87	10	4	1.84	40.0	33.3	472500	286500	12.83	Urban background
09n	Maxwell Way	Roadside	454376	285981	8	NO ₂	N	11.1	1.2	Y	34	31	39	22	27	18	22	23	28	38	41	35	29.83	23.87	7.64	12	12	2.83	100	100	453500	285500	13.14	18.64
11n	Day Nursery	Roadside	454539	284932	10	NO ₂	N	9	1.3	N	54	55	50	40	47	36	37	35	39	49	50	45	44.75	35.80	7.11	12	12	2.63	100	100	453500	284500	13.75	26.09
12n	A6 Kibworth	Roadside	468425	294314	11	NO ₂	N	10.7	1.3	Y	47	39	38	25	35	27	33	33	34	38	39	35	35.25	28.20	5.77	12	12	2.13	100	100	467500	293500	12.74	20.89
13n	Rockingham Road	Roadside	474731	287585	12	NO ₂	N	9	2.8	Y	29	38	28	51	28	27	26	29	36	29	31	34	32.17	25.73	6.99	12	12	2.59	100	100	473500	287500	16.34	22.30
16n	Walcote	Roadside	456810	283652	15	NO ₂	N	12.5	3	Y			35	24	28	22	15	26	26	30	33	29	26.80	21.44	5.71	12	10	2.31	83.3	83.3	455500	283500	16.20	19.21
17n	The Square	Roadside	473373	287231	16	NO ₂	N	2.5	3	Y	28	26	55	29		26	25	27			34		31.25	25.00	10.00	12	8	4.53	66.7	66.7	472500	286500	12.83	23.09
18n	Jazz Hair	Roadside	454443	284348	17	NO ₂	Y	0	3	Y	52	46	55	53	49	50	41		61	44	46	42	49.00	39.20	6.02	12	11	2.32	91.7	91.7	453500	283500	13.24	
19n	Wistow Rd Kibworth	Roadside	467739	294611	14	NO ₂	N	4.4	2.6	Y	29	29	30	25	25	21	24	28	27	24	27	25	26.17	20.93	2.62	12	12	0.97	100	100	466500	294500	12.84	18.93
22n	77 leicester road Lutterworth	Roadside	454533	284872	9	NO ₂	N	0	13.5	Y	27	30	28	24	25	21	21	22	25	25	27	24	24.92	19.93	2.78	12	12	1.03	100	100	453500	284500	13.75	
23n	6 The Terrace Rugby Road	Roadside	454428	284274	1	NO ₂	Y	0	2.5	Y	44		45	34	36	29	33	33		31	34	26	34.50	27.60	5.99	12	10	2.43	83.3	83.3	453500	283500	13.24	
24n	regent court	Roadside	454410	284326	4	NO ₂	Y	2	1	Y	54	55	60	46	42	37	53	52	62	34	39		48.55	38.84	9.49	12	11	3.67	91.7	91.7	453500	283500	13.24	33.17
25n	26 Market Street Lutterworth	Roadside	454497	284618	5	NO ₂	Y	1.6	4.8	Y	46	48	41	43	42	37	31	37	50	47	53	48	43.58	34.87	6.33	12	12	2.34	100	100	453500	284500	13.75	33.08
26n	24 Rugby Road Lutterworth	Roadside	454432	284229	13	NO ₂	Y	0	2	Y	67	67	57	21	55	45	42	48	52	53	55	48	50.83	40.67	12.13	12	12	4.49	100	100	453500	283500	13.24	
27n	17 Rugby road Lutterworth	Roadside	454476	284178	7	NO ₂	Y	3.7	5.2	Y	44	44	39	39	43	33	35	35	40	30	34	31	37.25	29.80	4.94	12	12	1.83	100	100	453500	283500	13.24	27.11
28n	Spencerdene main street theddingworth	Roadside	466535	285545	18	NO ₂	N	1.2	0.2	N	29	29	27	28	26	24	21	24	33	24	27	25	26.42	21.13	3.15	12	12	1.16	100	100	465500	285500	10.33	17.93
29n	Homeside main street Theddingworth	Roadside	466651	285607	6	NO ₂	N	0.2	1.4	Y	38	36	38	34	35	26	28	29	42	39	42	26	34.42	27.53	5.85	12	12	2.17	100	100	465500	285500	10.33	27.04
30n	40 regent street Lutterworth	Roadside	454318	284288	3	NO ₂	N	0	2.5	Y													26.00	20.80	0.00	2	2		100	16.7	453500	283500	13.24	

Appendix B. Annualisation of diffusion tubes

Site ID	location	BIAS =		% period coverage	% year data coverage	annualisation (in line with box 3.2 pg 3-4 of LAQM.TG(09))(only where year data capture is Greater than 75%)					
		0.80				period means		annual/period mean ratio		annualised bias adjusted mean	
		arithmetic mean (μgm^{-3})	Bias adjusted arithmetic Mean (μgm^{-3})			Jan - Oct	Nov - Dec	Jan - Oct	Nov - Dec	Jan - Oct	Nov - Dec
01n	Lut. Service Shop	49.75	39.80	100.0%	100.0%	49.90	49.00	1.00	1.02		
03n	Brooklands (Home)	20.75	16.60	40.0%	33.3%					16.66	
09n	Maxwell Way	29.83	23.87	100.0%	100.0%	28.20	38.00	1.06	0.79		
11n	Day Nursery	44.75	35.80	100.0%	100.0%	44.20	47.50	1.01	0.94		
12n	A6 Kibworth	35.25	28.20	100.0%	100.0%	34.90	37.00	1.01	0.95		
13n	Rockingham Road	32.17	25.73	100.0%	100.0%	32.10	32.50	1.00	0.99		
16n	Walcote	26.80	21.44	83.3%	83.3%	25.75	31.00	1.04	0.86		
17n	The Square	31.25	25.00	66.7%	66.7%						
18n	Jazz Hair	49.00	39.20	91.7%	91.7%	50.11	44.00	0.98	1.11		
19n	Wistow Rd Kibworth	26.17	20.93	100.0%	100.0%	26.20	26.00	1.00	1.01		
22n	77 leicester road lutterworth	24.92	19.93	100.0%	100.0%	24.80	25.50	1.00	0.98		
23n	6 The Terrace Rugby Road	34.50	27.60	83.3%	83.3%	35.63	30.00	0.97	1.15		
24n	regent court	48.55	38.84	91.7%	91.7%	49.50	39.00	0.98	1.24		
25n	26 Market Street Lutterworth	43.58	34.87	100.0%	100.0%	42.20	50.50	1.03	0.86		
26n	24 Rugby Road Lutterworth	50.83	40.67	100.0%	100.0%	50.70	51.50	1.00	0.99		
27n	17 Rugby road Lutterworth	37.25	29.80	100.0%	100.0%	38.20	32.50	0.98	1.15		
28n	Spencerdene main street theddingworth	26.42	21.13	100.0%	100.0%	26.50	26.00	1.00	1.02		
29n	Homeside main street Theddingworth	34.42	27.53	100.0%	100.0%	34.50	34.00	1.00	1.01		
30n	40 regent street lutterworth	26.00	20.80	100.0%	16.7%						20.89
						Average ratio		1.00	1.00		

