APPENDIX A

DISTRICT OF HARBOROUGH

2016 Air Quality Annual Status Report (ASR)

In fulfilment of

Part IV of the Environment Act 1995

Local Air Quality Management

Date (August, 2016)

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1 Executive Summary: Air Quality in Our Area

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.

1.1 Air Quality in Harborough District Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

The authority has 1 AQMA in Lutterworth declared for exceedences of the annual mean Air Quality Objective (AQO) for Nitrogen Dioxide (NO_2). Copies of the Air quality management orders and a map showing the area covered is available from the council website

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

http://www.harborough.gov.uk/info/20025/environmental_health/101/air_pollution/3.

1.2 Actions to Improve Air Quality

The council is currently in the process of determining if the implementation of a 20mph zone in Lutterworth will have a positive impact on Nitrogen Dioxide levels in the Lutterworth AQMA.

The council attempted to apply for an air quality grant for the works in 2015 however as the conditions of the grant did not allow for the capitalisation of research the council was unable to secure funding from this source. As such the council has secured funding for the research from other council funds. The project consists of a detailed emissions study of the AQMA, detailed vehicle fleet breakdown using ANPR cameras and emissions modelling to determine if the reduction in speed limit will reduce vehicle emissions and is now scheduled to be undertaken in early 2016.

1.3 Local Priorities and Challenges

In 2016 the council plans to

- undertake the 20mph zone emissions impact assessment .
- If the emissions impact assessment shows that a reduction of emissions is likely to undertake dispersion modelling to determine the potential improvements on Nitrogen Dioxide levels which would result.

1.4 How to Get Involved

The main contributions that our community can make to improving air quality are around minimising emissions from traffic and other sources and limiting exposure at times of poor air quality. Specifically that means avoiding unnecessary car use for short journeys, utilising public transport where possible, buying and maintaining low emissions vehicles and

checking the national alert system (https://uk-air.defra.gov.uk/forecasting/) for predicted episodes of poor air quality.

The public can get further information on Air Quality from the following websites

- Harborough District Council Air quality website http://www.harborough.gov.uk/info/20025/environmental_health/101/air_pollution
- DEFRAs UK-AIR: Air information Resource website https://uk-air.defra.gov.uk/
- DEFRAs Local Air Quality Management (LAQM) Support website http://laqm.defra.gov.uk/
- Environmental Protection UK Air Pollution website http://www.environmental-protection.org.uk/policy-areas/air-quality/about-air-pollution/
- Joint Air Quality Initiative (JOAQUIN) website http://www.joaquin.eu

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3 Local Air Quality Management

This report provides an overview of air quality in Harborough District Council during 2015. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 an exceedance is considered likely the local authority must 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. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Harborough District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table G-1 in Appendix G.

4 Actions to Improve Air Quality

4.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of the objectives.

A summary of AQMAs declared by Harborough District Council can be found in Table 4-1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at http://www.harborough.gov.uk/info/20025/environmental_health/101/air_pollution/3.

Table 4-1 Declared Air Quality Management Areas

AQMA Name	Pollutants and Air Quality Objectives	City / Town	One Line Description	Action Plan
Lutterworth	NO_2 annual mean	Lutterworth	An area encompassing properties adjacent to Rugby Road, High street and Market Street.	2013 Lutterworth Air Quality Management Area Action Plan Framework for Harborough District Council http://www.harborough.gov.uk/download/downloads/id/145/lutterworth_air_quality_action_planpdf

4.2 Progress and Impact of Measures to address Air Quality in Harborough District Council

Harborough District Council has worked with Leicestershire County Council Highways department during the current reporting year of 2015 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 4-2. More detail on these measures can be found in the 2013 Lutterworth Air Quality Management Area Action Plan Framework Date April 2013 and policy CS14 of the Harborough District Local Development Framework Core Strategy 2006 - 2028 (http://www.harborough.gov.uk/download/downloads/id/17/core_strategy_-_adopted_versionpdf) .

Key completed measures are:

- Ensure that expansion of Magna Park and other distribution centres does not impact on the AQMA by ensuring that HGV movements do not pass through the AQMA

Progress on the following measures has been slower than expected due to:

- Proposed reduction of speed limit to 20mph was not progressed as we were unable to apply for an air quality capital grant to undertake an air quality impact assessment as the grant conditions did not allow for capitalisation of research.

Harborough District Council expects the following measures to be completed over the course of the next reporting year:

- Complete Air Quality Impact Assessment of proposed speed limit reduction to 20mph.

Harborough District Council's priorities for the coming year are

- Undertake a vehicle emissions impact assessment to determine if a reduction in speed limit with the Lutterworth AQMA to 20mph will result in a reduction in vehicle emissions

- If it can be shown that a reduction is speed limit to 20mph within the Lutterworth AQMA can cause at least a 5% reduction in vehicle emissions, to undertake an air quality impact assessment to determine the impact on air quality

Table 4-2 Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	20mph zone	Traffic Management,	Reduction of speed limits, 20mph zones	Harborough District Council	04/ 2018	04/ 2020	Determine reduction in traffic emissions		Complete	Complete	
							Determine impact on air quality		Ongoing	September 2016	
							Determine exact area of the speed reduction (likely required to be larger than AQMA by Highway authority) and costs of implementation and undertake cost benefit analysis		none	04/2018	

4.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases. Fine Particulates ($PM_{2.5}$) falls within Objective 3 Health Protection of the Public Health frameworks directive. The Objective is to protect the population's health from major incidents and other threats, whilst reducing health inequalities

The Public Health Outcomes Framework (PHOF) (http://www.phoutcomes.info/) is a Department of Health data tool for England, intended to focus public health action on increasing healthy life expectancy and reducing differences in life expectancy between communities. The tool uses indicators to assess improvements. Recognising the significant impact that poor air quality can have on health, the PHOF includes an indicator relating to fine particulate matter ($PM_{2.5}$).

The indicator in the PHOF reports the estimates fraction of all-cause adult mortality attributable to anthropogenic particulate air pollution (measured as fine particulate matter).

Based on the latest available figures the position in Harborough district can be compared to the situation across the rest of England, East Midlands and nearby districts as shown in Figure C-1 in Appendix C. Harborough District Council:

- Has the lowest fraction of attributable deaths to particulate air pollution in Leicestershire;
- Is the 3rd lowest in the East Midlands region; and
- Is slightly below the national average.

$PM_{2.5}$ background air quality data published by DEFRA shows the district has background concentrations between 9.3µgm^{-3} and 12.4µgm^{-3} with the average being 10.5µgm^{-3} . The EU limit value for fine particles ($PM_{2.5}$) is an annual average of 25µgm^{-3}

Whilst Harborough District Council is not currently taking any specific measures to address $PM_{2.5}$, the following measures and activities undertaken by Harborough District Council will work towards improving $PM_{2.5}$ concentrations at a local level:

- The council is looking to implement a 20mph zone in the Lutterworth AQMA which will reduce traffic sourced $PM_{2.5}$
- The council also controls dust and combustion emissions from permitted processes within the district
- Promoting the use of green waste collection and “bring sites” over bonfires to dispose of garden waste
- Work with the Director of Public Health to identify new priority measures to tackle $PM_{2.5}$.

5 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

5.1 Summary of Monitoring Undertaken

5.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Harborough District Council did not undertake any automatic (continuous) monitoring at any sites during 2015.

Bureau Veritas currently operate an AURN site on behalf of DEFRA near to Eye Brook Reservoir. 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

Table A-1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix F. Further details on how the monitors are calibrated and how the data has been adjusted are available from http://uk-air.defra.gov.uk .

5.1.2 Non-Automatic Monitoring Sites

Harborough District Council undertook non- automatic (passive) monitoring of NO_2 at 20 sites during 2015. Table A-2in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix F. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix D.

1 new monitoring location was set up along the A6 in Kibworth to determine if properties further along the road from current monitoring locations may be affected

2 new monitoring locations were started at receptors along the A5 as it is believed that proposed extensions to Magna Park and a new distribution centre adjacent to Magna Park may cause a short term exceedence to the AQO at properties along the A5.

5.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for “annualisation” and bias. Further details on adjustments are provided in Appendix D.

5.2.1 Nitrogen Dioxide (NO_2)

Table A-3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40 μgm^{-3}.

For diffusion tubes, the full 2015 dataset of monthly mean values is provided in Table B-1in Appendix B.

Table A-4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200 μgm^{-3}, not to be exceeded more than 18 times per year.

5.2.1.1 Lutterworth

There are several monitoring points in and around the Lutterworth AQMA. Trends in annual mean concentrations are shown in Figure D-1 in Appendix D. Only 3 monitoring locations, which are within the AQMA, exceeded the annual mean AQO for NO_2 in 2015.

- Tube 01n Service Shop Market Street Lutterworth
- Tube 24n 4-9 regent court Lutterworth
- Tube 26n 24 Rugby Road

Tubes 01n and 26n are located on or adjacent to the facades of receptors, Tube 24n is located on a lamppost between the receptor and kerb. When a façade correction is applied the receptor is still shown to be exceeding the AQO. Details of façade corrections are attached as Table E-1 in Appendix E.

All locations have generally decreased in concentration over the last 6 years.

5.2.1.2 Kibworth

There is 1 long term monitoring sites and 2 new monitoring sites. Trends in annual mean concentrations are shown in Figure D-2 in Appendix D

No exceedences occurred at the long term monitoring site. Though 1 of the new monitoring sites has exceeded the annual mean AQO for NO_2 however there is only 1 month of data available for the location which is insufficient information to show that an exceedence of the AQO has occurred.

5.2.1.3 Eyebrook Reservoir

Trends in annual mean concentrations are shown in Figure D-4 in Appendix D

No exceedences of either AQO for NO_2 have occurred at Eyebrook Reservoir

5.2.1.4 Other Locations

No exceedences occurred at monitoring locations in

- A5
- Walcote
- Theddingworth
- Market Harborough

Trends in annual mean concentrations are shown in Figure D-3 in Appendix D

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7 Appendices

Appendix A. Monitoring Results

Table A-1 Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
1A	Market Harborough AURN site	Rural	483335	295896	NO; NO_2; PM_{10}	N	Unknown	N/A	N/A	unknown

1. 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).
2. N/A if not applicable.

Table A-2 Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m)[1]	Distance to kerb of nearest road (m)[2]	collocated with a Continuous Analyser?	Height (m)
			X	Y						
01n	Lutterworth Service Shop	Roadside	454475	284560	NO_2	Y	0	4.2	N	2
11n	Day Nursery	Roadside	454539	284932	NO_2	N	9	1.3	N	2
12n	A6 Kibworth	Roadside	468425	294314	NO_2	N	10.7	1.3	N	2
13n	Rockingham Road	Roadside	474731	287585	NO_2	N	9	2.8	N	2
16n	Walcote	Roadside	456810	283652	NO_2	N	12.5	3	N	2
17n	The Square	Roadside	473373	287231	NO_2	N	2.5	3	N	2
18n	Jazz Hair	Roadside	454443	284348	NO_2	N	0	3	N	2
19n	Wistow Rd Kibworth	Roadside	467739	294611	NO_2	N	2.5	5.4	N	2
22n	77 Leicester road Lutterworth	Roadside	454533	284872	NO_2	N	0	13.5	N	2
23n	6 The Terrace Rugby Road	Roadside	454428	284274	NO_2	N	0	2.5	N	2
24n	4-9 regent court	Roadside	454410	284326	NO_2	N	0	16.25	N	2
25n	26 Market Street Lutterworth	Roadside	454497	284618	NO_2	Y	1.6	4.8	N	2
26n	24 Rugby Road Lutterworth	Roadside	454432	284229	NO_2	N	0	2	N	2
27n	17 Rugby road Lutterworth	Roadside	454476	284178	NO_2	N	3.7	5.2	N	2
28n	Spencerdene main street theddingworth	Roadside	466535	285545	NO_2	N	1.2	0.2	N	2
29n	Homeside main street Theddingworth	Roadside	466651	285607	NO_2	N	0.2	1.4	N	2
30n	40 regent Street Lutterworth	Roadside	454318	284288	NO_2	N	0	2.5	N	2
31n	lampost outside 69 leicester road kibworth	Roadside	467933	294660	NO_2	N	3.5	4	N	2
32n	Alma House, Watling Street Claybrooke Parva	Roadside	448065	287719	NO_2	N	0	7	N	2
33n	signpost outside White House Farm Watling street	Roadside	448948	286554	NO_2	N	14	1	N	2
34n	sign outside 64 Leicester Road Kibworth	Roadside	468143	294351	NO_2	N	0.5	2.3	N	2

1. 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).
2. N/A if not applicable.

Table A-3 Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%)[1]	Valid Data Capture 2015 (%) [2]	NO_2 Annual Mean Concentration (μgm^{-3}) [3]						
					2009	2010	2011	2012	2013	2014	2015
1A	Rural	Automatic	94.14	94.14	11.98	11.74	9.27	15.31	13.12	14.29	9.02
01n	Roadside	Diffusion Tube	66.7%	66.7%	**58.65**	**58.04**	**49.47**	**48.72**	**45.51**	39.80	**43.52**
11n	Roadside	Diffusion Tube	100.0%	100.0%	36.04	**47.79**	**40.55**	34.80	36.24	35.80	36.11
12n	Roadside	Diffusion Tube	100.0%	100.0%	**48.86**	**42.67**	37.10	32.19	30.43	28.20	29.72
13n	Roadside	Diffusion Tube	100.0%	100.0%	**42.67**	35.16	33.53	26.50	22.31	25.73	24.85
16n	Roadside	Diffusion Tube	100.0%	100.0%	31.93	31.98	28.97	24.51	23.79	21.44	22.41
17n	Roadside	Diffusion Tube	91.7%	91.7%	38.32	34.45	28.15	29.00	26.49	25.00	24.48
18n	Roadside	Diffusion Tube	100.0%	100.0%	**52.95**	**52.33**	**45.16**	**43.34**	**42.15**	39.20	37.52
19n	Roadside	Diffusion Tube	81.8%	75.0%	25.78	26.77	23.99	23.71	22.48	20.93	20.38
22n	Roadside	Diffusion Tube	100.0%	100.0%	27.12	28.80	26.15	22.26	20.96	19.93	19.45
23n	Roadside	Diffusion Tube	66.7%	66.7%		**40.75**	37.49	31.47	34.18	27.60	28.87
24n	Roadside	Diffusion Tube	91.7%	91.7%		29.17	26.62	**51.40**	**47.45**	38.84	**47.80**
25n	Roadside	Diffusion Tube	100.0%	100.0%		**42.91**	35.83	31.06	37.80	34.87	34.38
26n	Roadside	Diffusion Tube	91.7%	91.7%		**47.54**	**49.53**	**41.83**	**41.02**	**40.67**	**40.63**
27n	Roadside	Diffusion Tube	100.0%	100.0%		**42.83**	36.78	33.85	32.85	29.80	32.32
28n	Roadside	Diffusion Tube	91.7%	91.7%			21.93	23.33	19.30	21.13	19.43
29n	Roadside	Diffusion Tube	91.7%	91.7%			30.23	31.08	30.36	27.53	28.15
30n	Roadside	Diffusion Tube	100.0%	100.0%						20.89	21.00
31n	Roadside	Diffusion Tube	100.0%	100.0%							33.12
32n	Roadside	Diffusion Tube	100.0%	16.7%							25.27
33n	Roadside	Diffusion Tube	100.0%	16.7%							26.50
34n	Roadside	Diffusion Tube	100.0%	8.3%							**55.00**

Notes: Exceedances of the NO_2 annual mean objective of 40 μgm^{-3} are shown in **bold**.

NO_2 annual means exceeding 60μgm^{-3}, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

1. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

2. data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).
3. Means for diffusion tubes have been corrected for bias. means in purple cells have been "annualised" as per Technical Guidance LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.
4. Yellow cells indicate site had insufficient data to be annualised

Table A-4 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	NO_2 1-Hour Means > 200µgm^{-3} (3)				
					2011	2012	2013	2014	2015
1A	Rural	Automatic	94.14	94.14	0	0	0	0	0

Notes: Exceedances of the NO_2 1-hour mean objective (200µgm^{-3} not to be exceeded more than 18 times/year) are shown in **bold.**

1. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
2. data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).
3. If the period of valid data is less than 90%, the 99.8th percentile of 1-hour means is provided in brackets.

Appendix B. Full Monthly Diffusion Tube Results for 2015

Table B-1 NO_2 Monthly Diffusion Tube Results - 2015

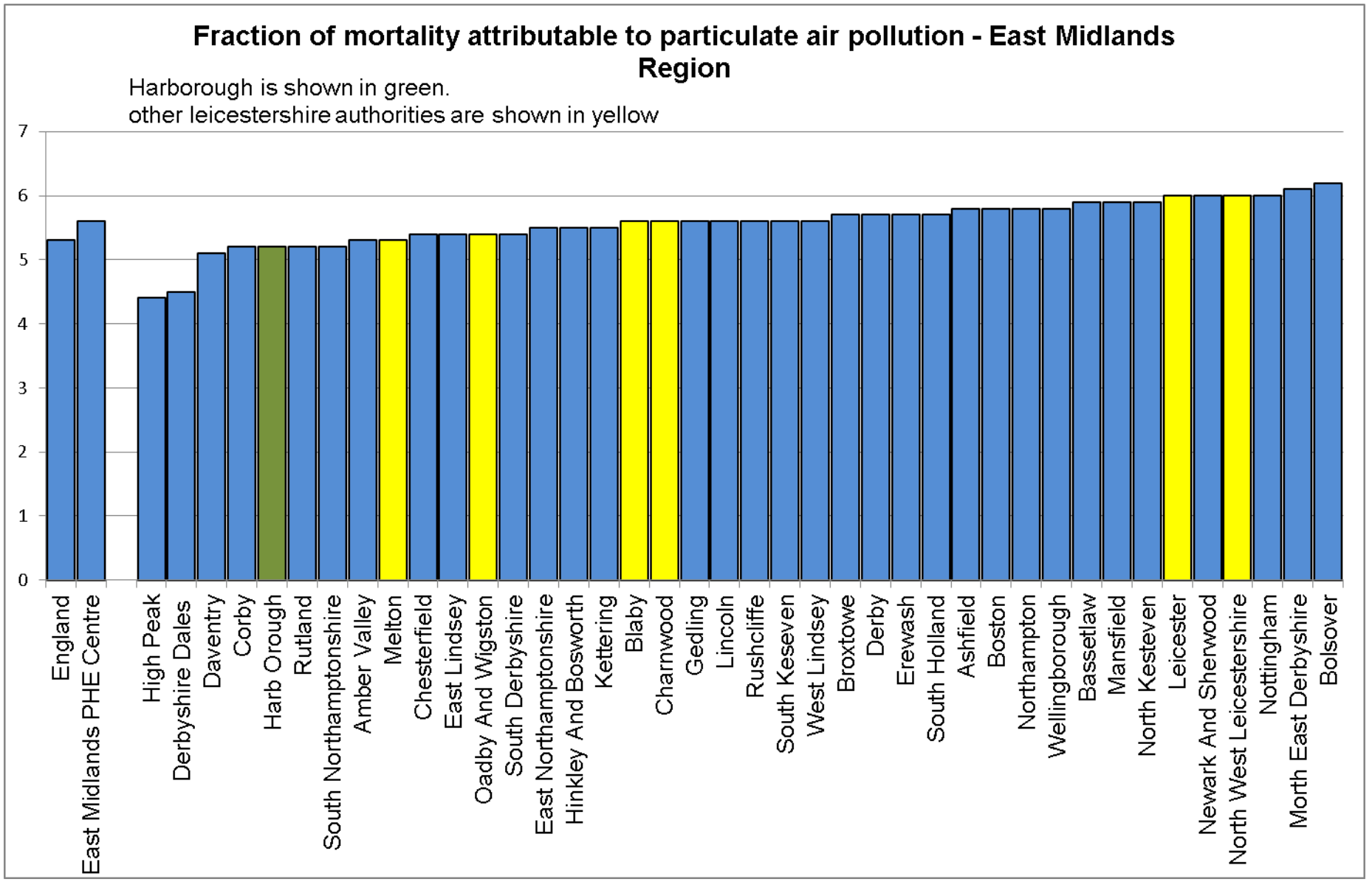
Site ID	NO_2 Mean Concentrations (μgm^{-3})													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
01n	37	60	51			55			54	66	57	50	53.73	**43.52**
11n	33	54	40	35	35	37	36	39	60	56	56	54	44.58	**36.11**
12n	32	31	30	25	38	36	33	39	39	49	49	40	36.69	29.72
13n	28	28	25	28	28	23	25	34	31	45	42	33	30.68	24.85
16n	23	39	24	22	18	25	21	28	33	37	31	31	27.67	22.41
17n		27	42	34	24	28	22	28	36	41	27	24	30.22	24.48
18n	33	46	42	51	37	50	37	54	60	65	45	37	46.32	**37.52**
19n	22	26	25	17		23	20	30	26	35			24.97	20.22
22n	19	23	19	25	20	21	18	24	30	36	27	26	24.02	19.45
23n	28	35	35	33	30		25	35		64			35.64	28.87
24n	21	57	52		59	70	55	71	76	68	65	55	59.02	**47.80**
25n	23	42	39	45	38	44	34	43	59	59	38	44	42.45	34.38
26n	43	56	45	45	58		44	52	47	54	60	49	50.16	**40.63**
27n	27	40	39	45	34	42	36	44	44	49	40	39	39.90	32.32
28n	16	24	24	23	21	21	20	25	29	37		24	23.99	19.43
29n	24	41	26	30	33	30	30	34	47	50		37	34.75	28.15
30n	20	28	25	24	23	23	17	26	31	40	26	28	25.93	21.00
31n	36	43	38	32	44	44	27	41	60	59	35	32	40.88	33.12
32n											36	28	31.85	25.80
33n											42	25	33.40	27.05
34n												68	68.00	**55.00**

1. National Bias adjustment factor of 0.81 for ESG Didcot 2015 50% TEA in Acetone diffusion tubes used

Appendix C. Public Health Outcomes Framework

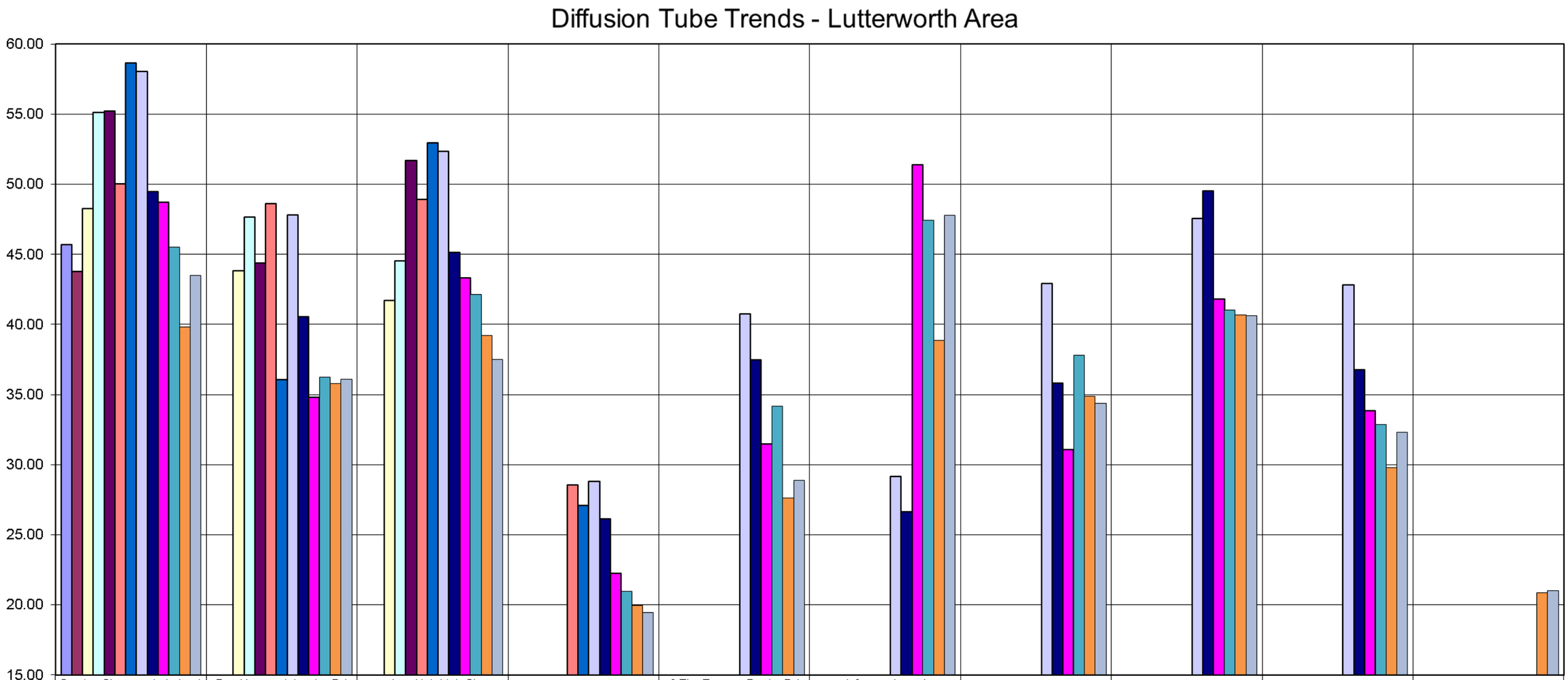
Data is taken from http://www.phoutcomes.info/public-health-outcomes-framework#page/0/gid/1000043/pat/104/ati/101/are/E07000131 on 15/07/2016

Figure C-1 Fraction of Mortality attributable to particulate air pollution – East Midlands region



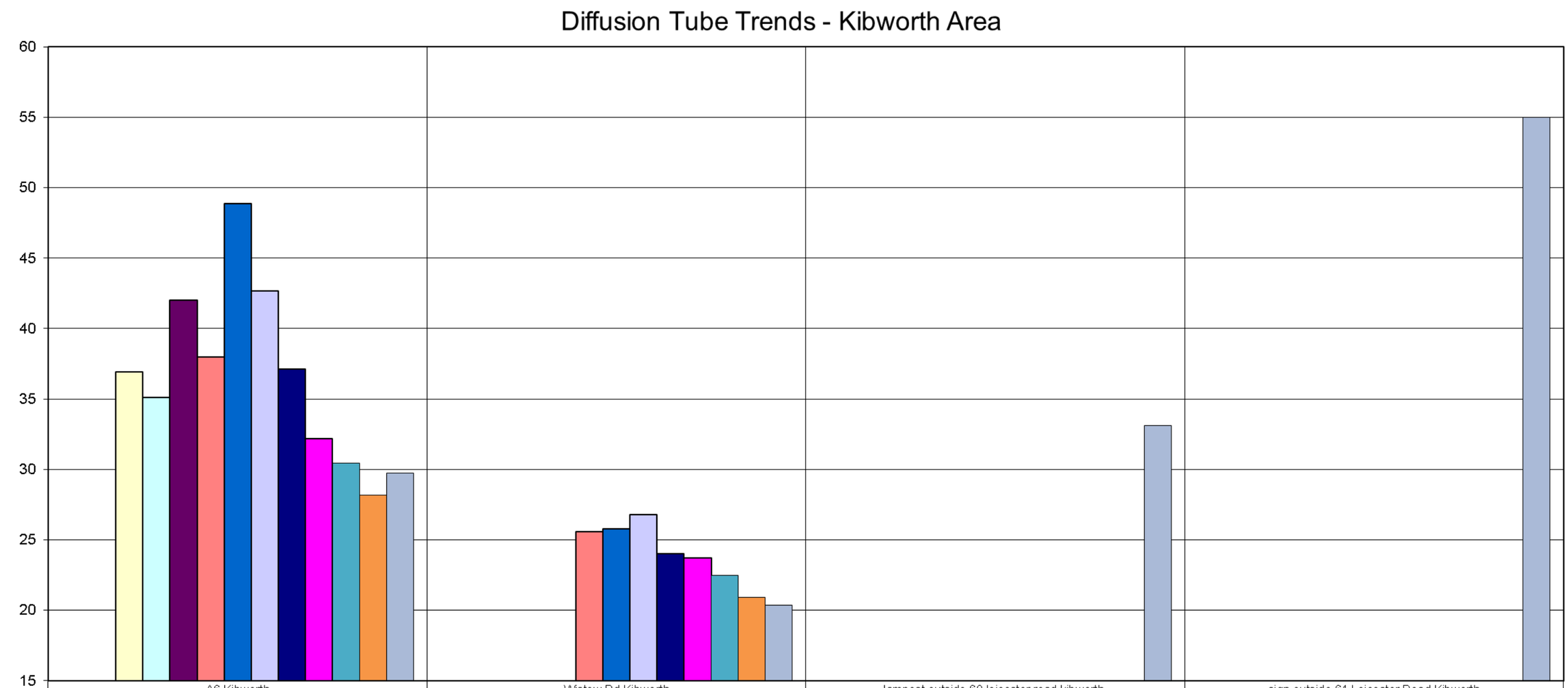
Appendix D. Trends in monitoring results

Figure D-1 NO_2 Diffusion Tube trends – Lutterworth Area



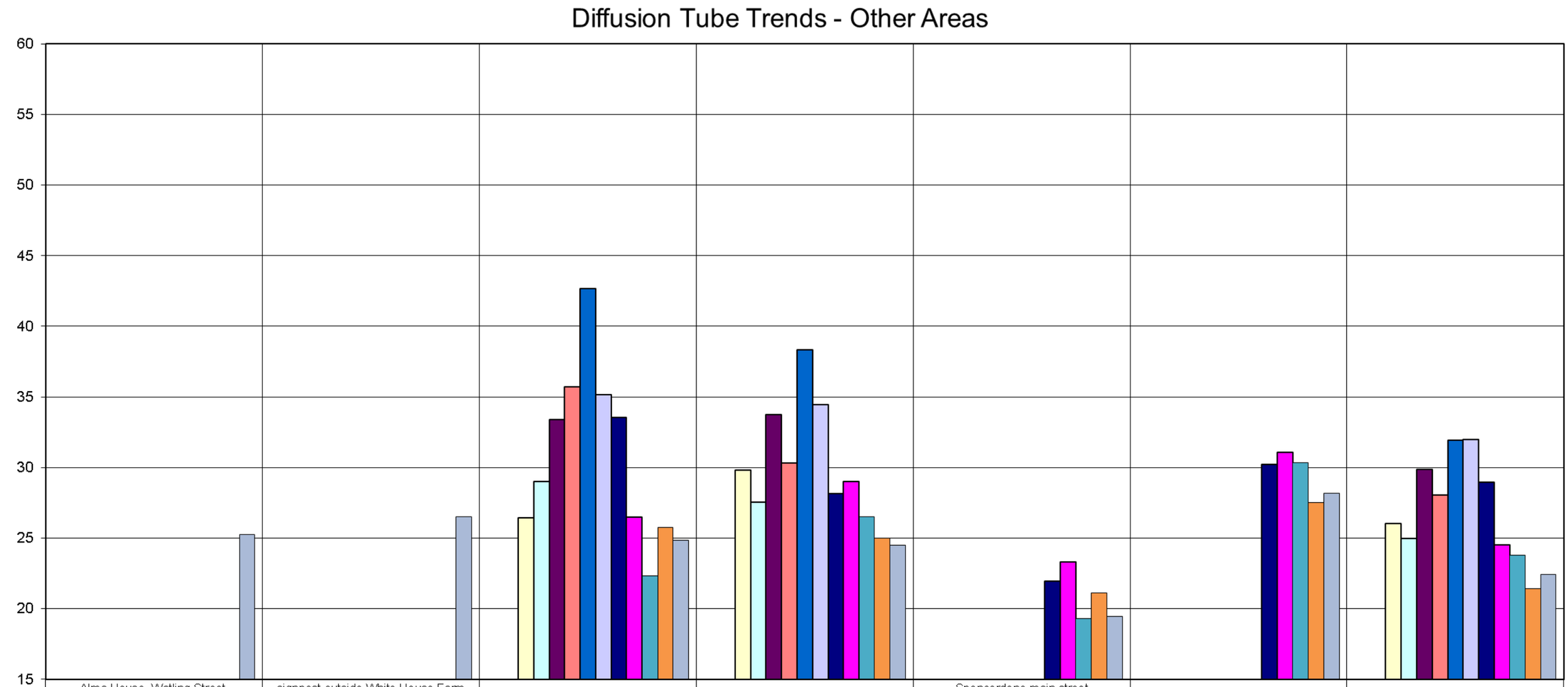
	Service Shop market street lutterworth 01n	Day Nursery leicester Rd lutterworth 11n	Jazz Hair high St lutterworth 18n	77 leicester Rd lutterworth 22n	6 The Terrace Rugby Rd Lutterworth 23n	4-9 regent court Lutterworth 24n	26 Market StLutterworth 25n	24 Rugby Rd Lutterworth 26n	17 Rugby Rd Lutterworth 27n	40 regent street lutterworth 30n
2003	45.70									
2004	43.76									
2005	48.24	43.84	41.72							
2006	55.13	47.68	44.54							
2007	55.20	44.40	51.68							
2008	50.03	48.62	48.90	28.54						
2009	58.65	36.04	52.95	27.12						
2010	58.04	47.79	52.33	28.80	40.75	29.17	42.91	47.54	42.83	
2011	49.47	40.55	45.16	26.15	37.49	26.62	35.83	49.53	36.78	
2012	48.72	34.80	43.34	22.26	31.47	51.40	31.06	41.83	33.85	
2013	45.51	36.24	42.15	20.96	34.18	47.45	37.80	41.02	32.85	
2014	39.80	35.80	39.20	19.93	27.60	38.84	34.87	40.67	29.80	20.89
2015	43.52	36.11	37.52	19.45	28.87	47.80	34.38	40.63	32.32	21.00

Figure D-2 NO_2 Diffusion Tube trends – Kibworth Area



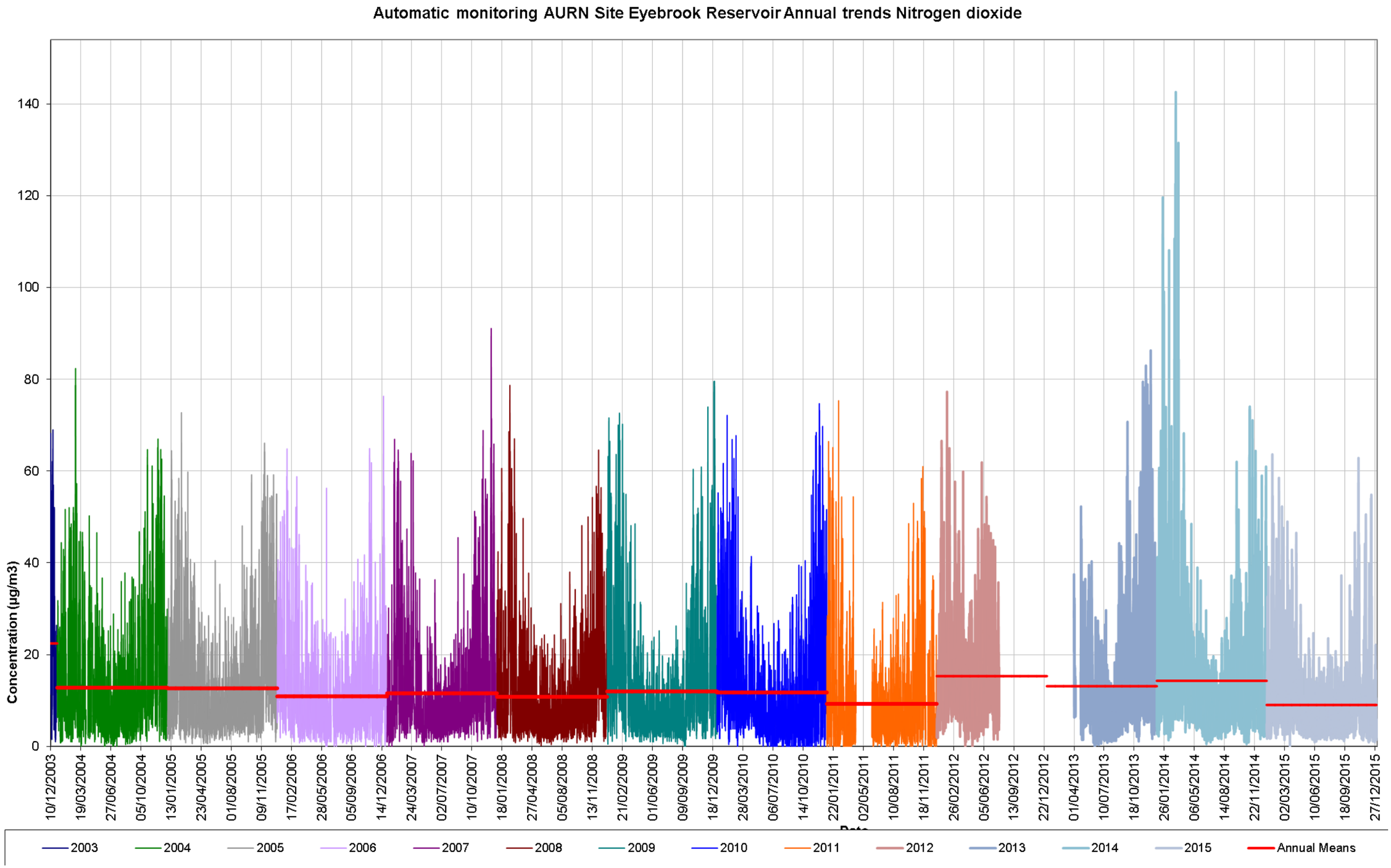
	A6 Kibworth 12n	Wistow Rd Kibworth 19n	lampost outside 69 leicester road kibworth 31n	sign outside 64 Leicester Road Kibworth 34n
2003				
2004				
2005	36.94			
2006	35.09			
2007	42.00			
2008	37.97	25.59		
2009	48.86	25.78		
2010	42.67	26.77		
2011	37.10	23.99		
2012	32.19	23.71		
2013	30.43	22.48		
2014	28.20	20.93		
2015	29.72	20.38	33.12	55.00

Figure D-3 NO_2 Diffusion Tube trends – Other Areas



	Alma House, Watling Street Claybrooke Parva 32n	signpost outside White House Farm Watling street 33n	Rockingham Rd Market harborough 13n	The Square market harborough 17n	Spencerdene main street theddingworth 28n	Homeside main street Theddingworth 29n	Walcote 16n
2003							
2004							
2005			26.46	29.84			26.01
2006			29.00	27.55			24.99
2007			33.38	33.75			29.88
2008			35.69	30.34			28.07
2009			42.67	38.32			31.93
2010			35.16	34.45			31.98
2011			33.53	28.15	21.93	30.23	28.97
2012			26.50	29.00	23.33	31.08	24.51
2013			22.31	26.49	19.30	30.36	23.79
2014			25.73	25.00	21.13	27.53	21.44
2015	25.27	26.50	24.85	24.48	19.43	28.15	22.41

Figure D-4 Trend in automatic monitoring at Eyebrook reservoir



Appendix E. Supporting Technical Information / Air Quality Monitoring Data QA/QC

Table E-1 details of Annualisation and façade correction

Site ID	location	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?	BIAS = 0.81		Confidence level 80%			confidence interval	% period coverage	% year data coverage	annualisation (in line with box 7.9 pg 7-49 of LAQM.TG(16))(only where year data capture is Greater than 75%)						Façade Correction (See Box 2.3 pg 2-6 LAQM.TG(09))			
																		period means		Annual / period mean ratio		annualised bias adjusted mean		find relevant background concentration			Façade Corrected Bias Adjusted Mean (μgm^{-3})
		X	Y							arithmetic mean (μgm^{-3})	Bias adjusted arithmetic Mean (μgm^{-3})	Standard Deviation	period length	no of results				Jan - Oct	Nov - Dec	Jan - Oct	Nov - Dec	Jan - Oct	Nov - Dec	X	Y	background NO_2 (μgm^{-3})	
01n	Lut. Service Shop	454475	284560	2	NO_2	Y	0	4.2	Y	53.73	43.52	8.42	12	8	3.81	66.7	66.7							453500	284500	13.18	
11n	Day Nursery	454539	284932	10	NO_2	N	9	1.3	N	44.58	36.11	10.19	12	12	3.77	100	100	42.53	54.80	1.05	0.81			453500	284500	13.18	26.01
12n	A6 Kibworth	468425	294314	11	NO_2	N	10.7	1.3	Y	36.69	29.72	7.19	12	12	2.66	100	100	35.14	44.45	1.04	0.83			467500	293500	12.42	21.54
13n	Rockingham Road	474731	287585	12	NO_2	N	9	2.8	Y	30.68	24.85	6.75	12	12	2.50	100	100	29.31	37.55	1.05	0.82			473500	287500	15.95	21.60
16n	Walcote	456810	283652	15	NO_2	N	12.5	3	Y	27.67	22.41	6.50	12	12	2.41	100	100	27.03	30.85	1.02	0.90			455500	283500	15.43	19.44
17n	The Square	473373	287231	16	NO_2	N	2.5	3	Y	30.22	24.48	7.00	12	11	2.70	91.7	91.7	31.28	25.45	0.97	1.19			472500	286500	12.50	22.60
18n	Jazz Hair	454443	284348	17	NO_2	Y	0	3	Y	46.32	37.52	9.99	12	12	3.70	100	100	47.44	40.70	0.98	1.14			453500	283500	12.64	
19n	Wistow Rd Kibworth	467739	294611	14	NO_2	N	4.4	2.6	Y	24.97	20.22	5.39	11	9	2.30	81.8	75.0					20.38		466500	294500	12.51	18.32
22n	77 leicester road lutterworth	454533	284872	9	NO_2	N	0	13.5	Y	24.02	19.45	5.20	12	12	1.92	100	100	23.59	26.15	1.02	0.92			453500	284500	13.18	
23n	6 The Terrace Rugby Road	454428	284274	1	NO_2	Y	0	2.5	Y	35.64	28.87	11.95	12	8	5.42	66.7	66.7							453500	283500	12.64	
24n	regent court	454410	284326	4	NO_2	Y	2	1	Y	59.02	47.80	14.87	12	11	5.74	91.7	91.7	58.79	60.05	1.00	0.98			453500	283500	12.64	40.02
25n	26 Market Street Lutterworth	454497	284618	5	NO_2	Y	1.6	4.8	Y	42.45	34.38	9.91	12	12	3.67	100	100	42.71	41.15	0.99	1.03			453500	284500	13.18	32.59
26n	24 Rugby Road Lutterworth	454432	284229	13	NO_2	Y	0	2	Y	50.16	40.63	6.01	12	11	2.32	91.7	91.7	49.30	54.05	1.02	0.93			453500	283500	12.64	
27n	17 Rugby road Lutterworth	454476	284178	7	NO_2	Y	3.7	5.2	Y	39.90	32.32	5.79	12	12	2.14	100	100	39.92	39.80	1.00	1.00			453500	283500	12.64	29.13
28n	Spencerdene main street theddingworth	466535	285545	18	NO_2	N	1.2	0.2	N	23.99	19.43	5.32	12	11	2.06	91.7	91.7	24.04	23.50	1.00	1.02			465500	285500	10.01	16.64
29n	Homeside main street Theddingworth	466651	285607	6	NO_2	N	0.2	1.4	Y	34.75	28.15	8.31	12	11	3.21	91.7	91.7	34.57	36.60	1.01	0.95			465500	285500	10.01	27.63
30n	40 regent street lutterworth	466651	285607	3	NO_2	N	0.2	1.4	Y	25.93	21.00	5.92	12	12	2.19	100	100	25.63	27.40	1.01	0.95			465500	285500	10.01	20.68
31n	lampost outside 69 leicester road kibworth	467933	294660	8	NO_2	N	3.5	4	Y	40.88	33.12	10.26	12	12	3.79	100	100	42.45	33.05	0.96	1.24			466500	294500	12.51	29.49
32n	Alma House, Watling Street Claybrooke Parva Leicestershire LE17 5BE	448065	287719	19	NO_2	N	0	7	Y	31.85	25.80	5.44	2	2	4.93	100	16.7						25.27	447500	287500	12.25	
33n	signpost outside White House Farm Watling street	448948	286554	20	NO_2	N	14	1	Y	33.40	27.05	12.02	2	2	10.89	100	16.7						26.50	447500	286500	11.97	18.82
34n	sign outside 64 Leicester Road Kibworth	468143	294351	14	NO_2	N	0.5	2.3	Y	67.90	55.00		1	1		100	8.3							467500	293500	12.42	52.97
																		Average ratio		1.01	0.98					

Appendix F. Map(s) of Monitoring Locations

Figure F-1 Map of Automatic Locations

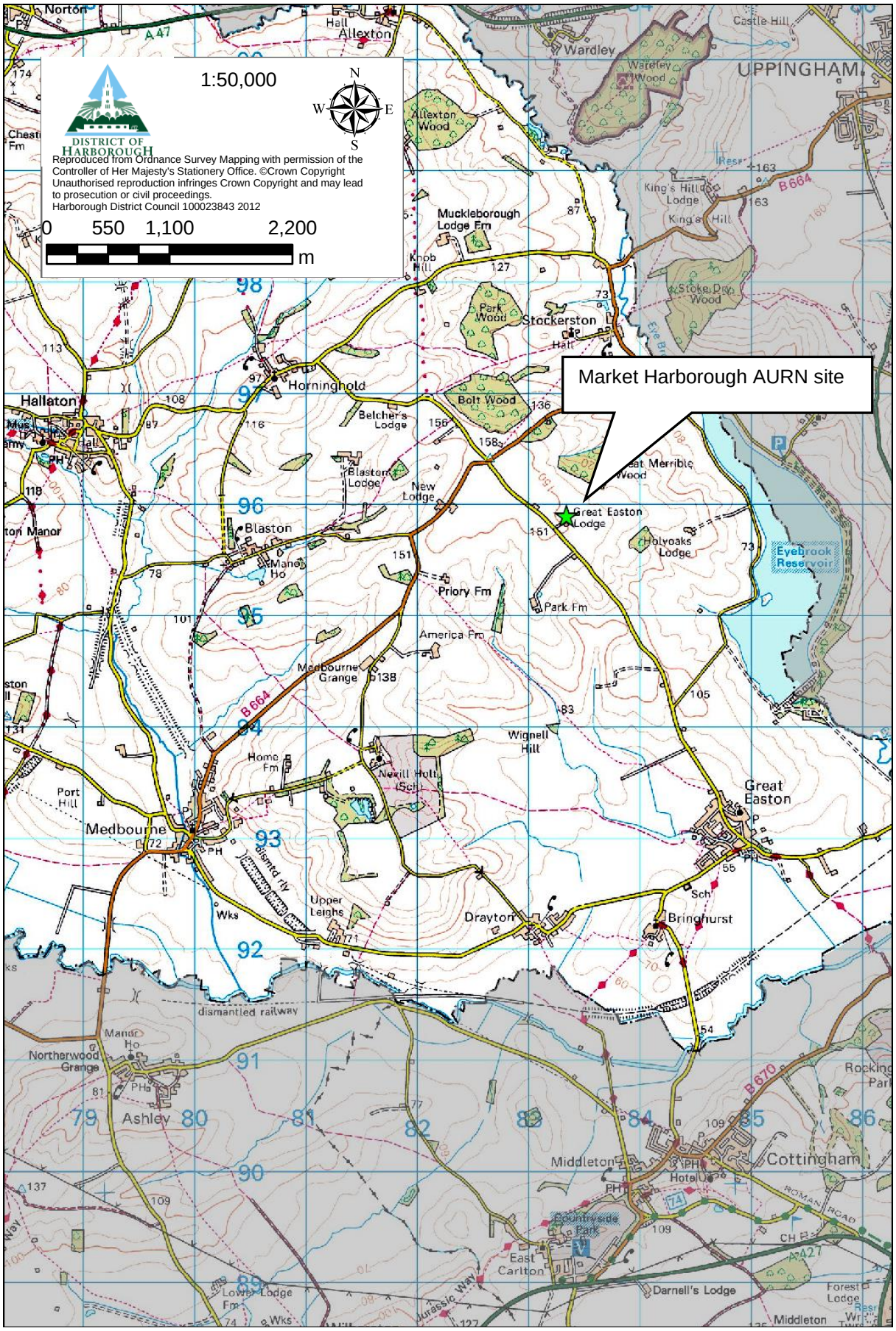
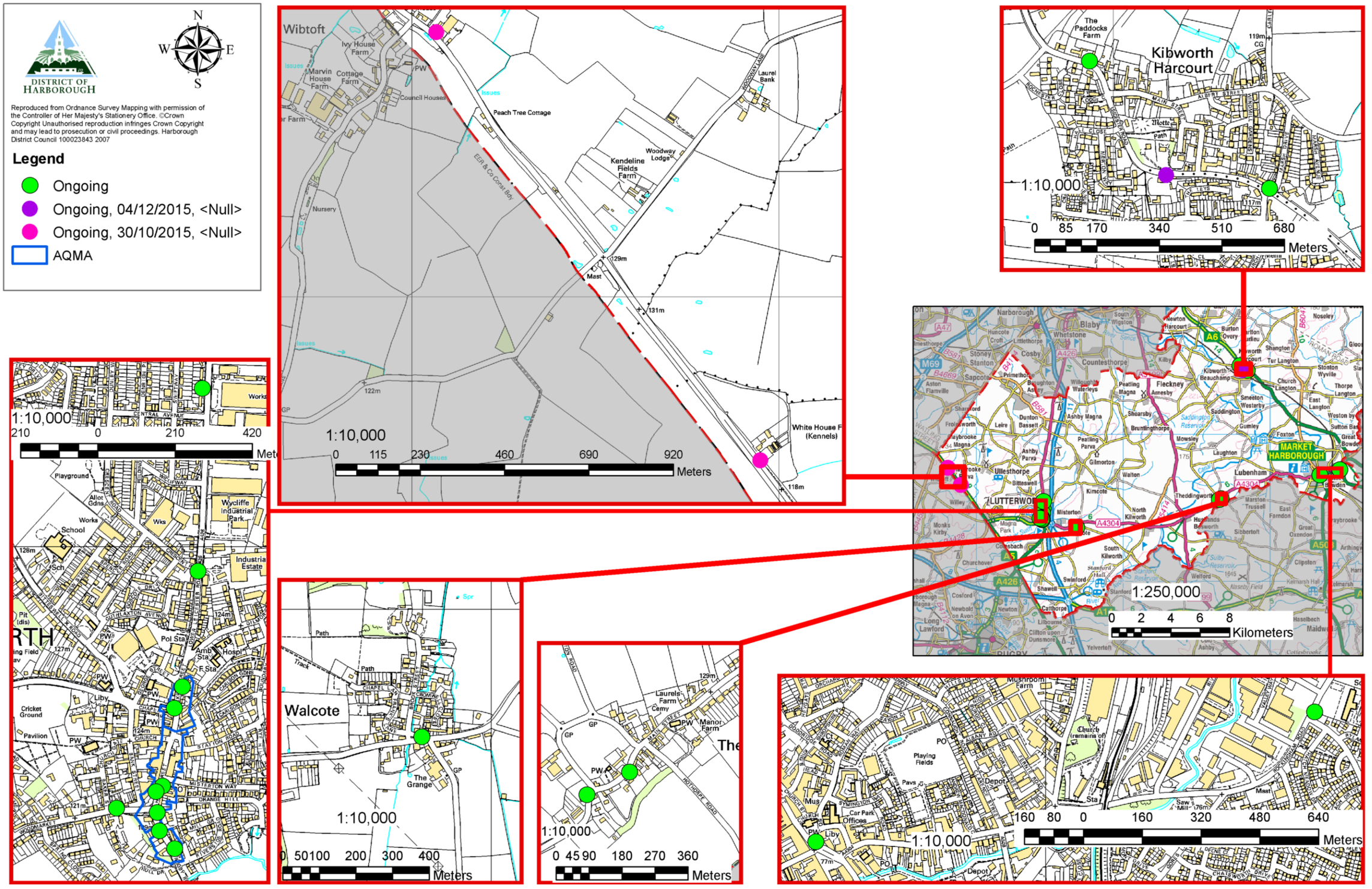


Figure F-2 Map of Diffusion Tube Locations



Appendix G. Summary of Air Quality Objectives in England

Table G-1 Air Quality Objectives in England

Pollutant	Air Quality Objective[4]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 μgm^{-3} not to be exceeded more than 18 times a year	1-hour mean
	40 μgm^{-3}	Annual mean
Particulate Matter (PM_{10})	50 μgm^{-3}, not to be exceeded more than 35 times a year	24-hour mean
	40 μgm^{-3}	Annual mean
Sulphur Dioxide (SO_2)	350 μgm^{-3}, not to be exceeded more than 24 times a year	1-hour mean
	125 μgm^{-3}, not to be exceeded more than 3 times a year	24-hour mean
	266 μgm^{-3}, not to be exceeded more than 35 times a year	15-minute mean

[4] The units are in microgrammes of pollutant per cubic metre of air ($\mu g/m^3$).

Appendix H. Glossary of Terms

Please add a description of any abbreviation included in the ASR – An example is provided below.

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
…	…