



2018 Air Quality Annual Status Report  
(ASR)

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

Date (May 2019 )

North West Leicestershire District Council

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## 1 Executive Summary: Air Quality in Our Area

### 1.1 Air Quality in North West Leicestershire 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<sup>1,2</sup>.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion<sup>3</sup>.

Six AQMAs were designated in North West Leicestershire during the first round of review and assessment for the level of nitrogen dioxide concentrations. After Further Assessments it was determined that only two of these locations required AQMA designations and the remaining four were revoked. The Update and Screening Assessment (USA) undertaken in 2006 [1] concluded that these two sites should remain AQMAs and identified three additional locations where Detailed Assessments should be undertaken to determine whether new AQMAs were required for nitrogen dioxide concentrations. The two AQMAs designated during the first round are presented in **Figure E.1** and **Figure E.2** in Appendix F:

The Detailed Assessment [6] undertaken in September 2007 of the three locations identified as possible areas for AQMAs in the USA 2006 [1], the three locations were High Street/Bondgate in Castle Donington, Broom Leys Road, Coalville and Bardon Road, Coalville, found that exceedances of the nitrogen dioxide objective were occurring in Castle Donington at properties located next to the carriageway along High Street and Bondgate due to traffic emissions. Monitoring at both locations in Coalville

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<sup>1</sup> Environmental equity, air quality, socioeconomic status and respiratory health, 2010

<sup>2</sup> Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

<sup>3</sup> Defra. Abatement cost guidance for valuing changes in air quality, May 2013

identified nitrogen dioxide concentrations that exceeded the mean annual objective during 2005, 2006 and 2007. The Detailed Assessment concludes that AQMAs should be designated at all three locations. As a result of these reports, two additional AQMAs were designated; the first in Castle Donington, presented in **Figure E.3** in Appendix F: and the second covering Broom Leys Road and Bardon Road in Coalville, presented in **Figure E.4** in Appendix F:

The Air Quality Progress Report conducted in April 2008 [7] recommended that a detailed assessment of the village of Copt Oak and the area surrounding East Midlands airport be undertaken to determine if AQMAs should be determined at these locations.

The Detailed Assessment of Copt Oak published in January 2009 [9] found that an AQMA should be declared and that the area should cross the district boundary to include an area within the borough of Hinckley and Bosworth as shown in **Figure E.5** in Appendix F:

The Detailed assessment of East Midlands airport published in March 2009 [8] concluded that the Air quality objective for NO<sub>2</sub> would not be exceeded within 1000m of the airport as a result of air traffic emissions.

The further assessment of Bardon Road, Coalville published in February 2009 [10] supported the original declaration of the AQMA comprising the four residential properties at Broom Leys Junction and the one hundred and seventy two residential properties on Bardon Road.

The further assessment of High Street Castle Donington published in April 2009 [11] supported the original declaration of the AQMA comprising ninety one residential properties on High Street and Bondgate, Castle Donington.

The update and screening assessment published October 2009 [11] found that a detailed assessment for SO<sub>2</sub> was required in some areas of the district in relation to the burning of solid fuel, to which this report relates. The report also recommended that the M1 AQMA is expanded to include

an exceedance of the 1-hour mean objective for NO<sub>2</sub> as the yearly mean has exceeded 60µgm<sup>-3</sup>.

The Progress Report published in April 2010 [12] found no significant change in the district.

A Detailed Assessment for SO<sub>2</sub> was conducted in 2010 [13]. This found that solid fuel usage within off-gas areas of the district was insufficient to warrant further investigation.

A Detailed assessment of the M1 AQMA conducted in 2011 [15] found that most of the declared area could be revoked as there is either no relevant receptor or the annual mean air quality standard for NO<sub>2</sub> is not being exceeded.

A Detailed Assessment of the Coalville AQMA conducted in 2011 [14] found that the declared area could be reduced to the declared area of Stephenson Way as the annual mean air quality standard for NO<sub>2</sub> is not being exceeded along Bardon Road.

The 2011 progress report [16] found that Broomleys junction in the Coalville AQMA exceeded the 1-hour mean air quality standard for NO<sub>2</sub> and recommended that a detailed assessment be undertaken.

The progress report also found that the current air quality action plan is insufficient and needs to be updated.

The 2011 detailed assessment of 1-hour Mean Air Quality Standard at Broomleys junction Coalville[17] found that the 1-hour mean air quality standard was being exceeded and the AQMA should be amended.

The 2012 detailed assessment of Castle Donington[19] found that a large proportion of the AQMA was not exceeding the air quality standard and recommended the AQMA be amended.

The 2012 Further assessment of Copt Oak [20] found that a large proportion of the AQMA was not exceeding the Air Quality Standard and recommended the AQMA be amended.

The 2012 Detailed assessment of Kegworth [21] found that it was likely that most of the AQMA was exceeding the Air Quality Standard and recommended a new monitoring location was installed in the north of the AQMA.

The 2013 Further assessment of Coalville AQMA[22] found that some of its area was not exceeding the annual mean or hourly mean air quality standards for NO<sub>2</sub>. The report recommended that a traffic survey be undertaken to further inform action planning

## 1.2 Local Engagement and 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 being linked in to the national alert system for predicted episodes of poor air quality.

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

- North West Leicestershire District Council Air quality website  
[http://www.nwleics.gov.uk/pages/air\\_quality](http://www.nwleics.gov.uk/pages/air_quality)
- DEFRA's UK-AIR: Air information Resource website  
<https://uk-air.defra.gov.uk/>
- DEFRA's 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/>

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## **2 Local Air Quality Management**

This report provides an overview of air quality in North West Leicestershire District Council during 2017. 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 North West Leicestershire 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 F.1** in Appendix F:.

## **3 Actions to Improve Air Quality**

### **3.1 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 compliance with the objectives.

A summary of AQMAs declared by North West Leicestershire District Council can be found in Table 3.1 . Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at [https://uk-air.defra.gov.uk/aqma/local-authorities?la\\_id=184](https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=184) .

**Table 3.1 Declared Air Quality Management Areas**

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan (inc. date of publication)		
						At Declaration		Now				
Kegworth	26/07/2004	NO <sub>2</sub> Annual Mean	Kegworth	Busy trunk road fronted by residential properties	NO			36.7	µgm <sup>-3</sup>			
M1	26/07/2004	NO <sub>2</sub> Annual Mean	Kegworth	Motorway with selected close properties.	YES	51.9	µgm <sup>-3</sup>	29.45	µgm <sup>-3</sup>			
	11/07/2001	NO <sub>2</sub> 1 Hour Mean	Kegworth		YES	64.7	µgm <sup>-3</sup>		µgm <sup>-3</sup>			
Castle Donington	09/01/2008	NO <sub>2</sub> Annual Mean	Castle Donington	An area encompassing the High Street and Bondgate area of Castle Donington.	NO	47.83	µgm <sup>-3</sup>	49.83	µgm <sup>-3</sup>			
Coalville	09/01/2008	NO <sub>2</sub> Annual Mean	Coalville	An area encompassing parts of Stephenson Way, Broom Leys Road and Bardon Road in Coalville.	NO							
	08/02/2012	NO <sub>2</sub> 1 Hour Mean	Coalville		NO							
Copt oak	30/07/2009	NO <sub>2</sub> Annual Mean	Copt Oak	An area of the village of Copt Oak that lies within the boundaries of NW Leicestershire District Council.	YES							

North West Leicestershire District Council confirm the information on UK-Air regarding their AQMA(s) is up to date (confirm by selecting in box)

### **3.2 Progress and Impact of Measures to address Air Quality in North West Leicestershire District Council**

North West Leicestershire District Council is working with Leicestershire County Council Highways department in drafting a new air quality action plan

The construction of the Kegworth Bypass started May 2017 as part of the East Midlands Gateway Project <https://slp-emg.com/>

### **3.3 PM<sub>2.5</sub> – 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<sub>2.5</sub> (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM<sub>2.5</sub> has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

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<sub>2.5</sub>).

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 North West Leicestershire 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. North West Leicestershire has:

- the highest fraction of attributable deaths to particulate air pollution in Leicestershire;
- one of the highest in fraction in the east midlands ; and
- is slightly lower than other areas in the east midlands

PM2.5 background air quality data published by DEFRA shows the district has background concentrations between  $9.96\mu\text{gm}^{-3}$  and  $13.00\mu\text{gm}^{-3}$

## **4 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance**

### **4.1 Summary of Monitoring Undertaken**

#### **4.1.1 Automatic Monitoring Sites**

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

North West Leicestershire District Council undertook automatic (continuous) monitoring at 1 sites during 2017.

Aggregate Industries undertook automatic (continuous) monitoring at 1 site for part of 2017 when they were asked to remove the monitor

**Table A.1** in Appendix A: shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D: Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix G:

#### **4.1.2 Non-Automatic Monitoring Sites**

North West Leicestershire District Council undertook non- automatic (passive) monitoring of NO<sub>2</sub> at 31 sites during 2017.

**Table A.2** in Appendix A:shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D:

Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix G:

## **4.2 Individual Pollutants**

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

### **4.2.1 Nitrogen Dioxide (NO<sub>2</sub>)**

Table A.3 in Appendix A compares the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past 5 years with the air quality objective of 40µgm<sup>-3</sup>.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in **Table B.1** in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO<sub>2</sub> hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m<sup>3</sup>, not to be exceeded more than 18 times per year.

#### **4.2.1.1 Coalville AQMA**

All locations were lower than the air quality standard

#### **4.2.1.2 Castle Donington AQMA**

The location on the facade of 34 Bondgate exceeded the air quality standard.

all other locations were below the air quality objective

#### **4.2.1.3 Kegworth AQMA**

All locations were substantially lower than the air quality standard

#### **4.2.1.4 Copt Oak AQMA**

All receptor locations were substantially lower than the air quality standard.

A location on the kerb of the M1 exceeded however there are no relevant receptors linked to this location

#### **4.2.1.5 M1 AQMA**

The only receptor was substantially below the air quality objective

#### **4.2.1.6 Other locations**

No locations outside of AQMAs exceeded the air quality standards

### **4.2.2 Particulate Matter (PM<sub>10</sub>)**

No exceedances of the PM<sub>10</sub> air quality standards was detected

**Table A.5** in Appendix A compares the ratified and adjusted monitored PM<sub>10</sub> annual mean concentrations for the past 5 years with the air quality objective of 40µg/m<sup>3</sup>.

**Table A.6** in Appendix A compares the ratified continuous monitored PM<sub>10</sub> daily mean concentrations for the past 5 years with the air quality objective of 50µg/m<sup>3</sup>, not to be exceeded more than 35 times per year.

## Appendix A: Monitoring Results

**Table A.1**      **Details of Automatic Monitoring Sites**

Site ID	Site Name	Site Type	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)
			X	Y						
1A	Coalville	Roadside	443660	314002	NO NO <sub>2</sub> NO <sub>x</sub>	Y	Chemiluminescence	5.8	2	2
4A	Bradgate Drive Coalville	Other	445147	313563	PM <sub>10</sub>	N	Partisol 2025 Sequential sampler	NA	N/A	2

0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

N/A if not applicable.

**Table A.2 Details of Non-Automatic Monitoring Sites**

Site ID	Site Name	Site Type	OS Grid Ref		Tube No.	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Worst Case Location	Height (m)
			X	Y								
06N	Broomleys junction (1)	Roadside	443632	314026	6	NO <sub>2</sub>	Y	5.8	2	N	Y	2
08N	End Cottage Copt Oak	Rural	448138	313012	8	NO <sub>2</sub>	Y	0	N/A	N	N	2
12N	AEROPARK Castle Donington	Other	444161	326355	12	NO <sub>2</sub>	N	N	N/A	N	N	2
14N	69 HIGH Street Castle Donington	Roadside	444216	326788	14	NO <sub>2</sub>	N	0	2.9	N	Y	2
16N	Bondgate crossroads Castle Donington	Roadside	444450	327233	16	NO <sub>2</sub>	N	7.53	1	N	Y	2
17N	13 Bondgate Castle Donington	Roadside	444512	327335	17	NO <sub>2</sub>	Y	2	2.5	N	Y	2
18N	34 Bondgate Castle Donington	Roadside	444580	327411	18	NO <sub>2</sub>	Y	0	2.3	N	Y	2
19N	94 Bondgate Castle Donington	Roadside	444707	327603	19	NO <sub>2</sub>	Y	0.8	1.4	N	Y	2
20N	Derby Road Kegworth	Roadside	448523	326885	20	NO <sub>2</sub>	Y	3.2	1	N	Y	2
22N	Kegworth A6 2	Roadside	448817	326621	22	NO <sub>2</sub>	Y	0	2.3	N	Y	2
23N	120 Whatton Road Kegworth	Suburban	448108	326305	23	NO <sub>2</sub>	N	N	N/A	N	Y	2
26N	Molehill House	Roadside	447457	326420	26	NO <sub>2</sub>	Y	0	50	N	Y	2
31N	Sinope	Roadside	440167	315264	31	NO <sub>2</sub>	N	7.8	3.2	N	Y	2
32N	M1 Bridge Copt Oak	Other	448082	313100	30	NO <sub>2</sub>	N	N	N/A	N	Y	2
35N	Monitoring station Coalville (1)	Roadside	443660	314002	7	NO <sub>2</sub>	Y	5.8	2	Y	Y	2
36N	Monitoring station Coalville (2)	Roadside	443660	314002	27	NO <sub>2</sub>	Y	5.8	2	Y	Y	2
37N	Monitoring station Castle Donington (1)	Roadside	444534	327365	24	NO <sub>2</sub>	Y	0	1	Y	Y	2
38N	Monitoring station Castle Donington (2)	Roadside	444534	327365	25	NO <sub>2</sub>	Y	0	1	Y	Y	2
39N	NEW M1 LW	Other	446935	323744	11	NO <sub>2</sub>	Y	N	N/A	N	N	2
40N	35 High Street Castle Donington	Roadside	444323	326975	13	NO <sub>2</sub>	N	3	0.9	N	Y	2
41N	18 High Street Castle Donington	Roadside	444474	327171	15	NO <sub>2</sub>	N	4	1	N	Y	2



North West Leicestershire District Council

Site ID	Site Name	Site Type	OS Grid Ref		Tube No.	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Worst Case Location	Height (m)
			X	Y								
43N	Direction Sign Bardon Rd/A511 RBT Coalville	Roadside	443675	313642	2	NO <sub>2</sub>	Y	2.4	3	N	N	2
45N	Outside corner farm Copt Oak	Roadside	448119	312920	4	NO <sub>2</sub>	Y	27	4.3	N	N	2
46N	PO Derby Road Kegworth	Roadside	448724	326702	21	NO <sub>2</sub>	Y	0	1.3	N	Y	2
47N	12 Derby Rd Kegworth	Roadside	448639	326805	28	NO <sub>2</sub>	Y	4.7	2.5	N	Y	2
48N	28 London Road Kegworth	Roadside	448792	326533	29	NO <sub>2</sub>	Y	0.8	1.5	N	Y	2
49N	Hugglescote crossroads	Roadside	442578	312871	5	NO <sub>2</sub>	N	4.1	2.5	N	Y	2
50N	10 Central Road Hugglescote	Roadside	442562	312823	10	NO <sub>2</sub>	N	5.4	1	N	Y	2
51N	40mph sign N of petrol station	roadside	448361	326997	3	NO <sub>2</sub>	Y	9.6	3.2	N	Y	2
52N	lamppost 65 Derby Road Kegworth	roadside	448436	326931	9	NO <sub>2</sub>	Y	5.9	2.5	N	Y	2
53N	20mph sign outside 10 Greenhill Road	roadside	448436	326931	24	NO <sub>2</sub>	N	5.9	2.5	N	y	2
54N	Parking restrictions sign adj drive 12 & 20 Park Lane Castle Donington	roadside	444331	327257	25	NO <sub>2</sub>	N	8.8	2.0	N	y	2
56N	lamppost adjacent 27 Broomleys road	Roadside	443649	314040	1	NO <sub>2</sub>	Y	1.8	1.2	N	y	2

0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

N/A if not applicable.

**Table A.3 Annual Mean NO<sub>2</sub> Monitoring Results**

Site ID	Site Name	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2017 (%) <sup>(2)</sup>	NO <sub>2</sub> Annual Mean Concentration (µgm <sup>-3</sup> ) <sup>(3)</sup>								
					2009	2010	2011	2012	2013	2014	2015	2016	2017
					BAF= 0.9	BAF= 1.06	BAF= 1.06	BAF= 0.91	BAF= 0.87	BAF= 0.98	BAF= 0.95	BAF= 1.01	BAF= 0.97
1A	Coalville	Automatic	84.3	84.3		67.1	36.96	45.56	43.73	46.9	45.1	50.0	43.2
06N	Broomleys junction (1)	Diffusion Tube	75.0%	75.0%	39.37	43.77	39.66	41.18	36.11	38.06	35.32	35.53	36.16
08N	End Cottage Copt Oak	Diffusion Tube	75.0%	75.0%	29.02	33.76	31.27	30.94	28.64	26.82	23.67	25.85	24.79
12N	AEROPARK Castle Donington	Diffusion Tube	75.0%	75.0%	17.44	28.36	21.68	22.37	23.65	21.27	18.06	19.01	18.48
14N	69 HIGH Street Castle Donington	Diffusion Tube	75.0%	75.0%	25.42	33.14	29.33	28.36	29.36	26.69	21.18	22.96	22.16
16N	Bondgate crossroads Castle Donington	Diffusion Tube	75.0%	75.0%	33.46	42.10	33.44	35.57	36.62	37.22	31.64	34.19	34.39
17N	13 Bondgate Castle Donington	Diffusion Tube	66.7%	66.7%	33.61	44.69	36.13	37.23	37.05	37.06	31.58	31.07	32.42
18N	34 Bondgate Castle Donington	Diffusion Tube	83.3%	83.3%	43.94	57.88	59.07	49.22	49.52	53.04	45.66	49.77	47.81
19N	94 Bondgate Castle Donington	Diffusion Tube	83.3%	83.3%	29.78	41.14	35.95	34.43	32.41	32.92	25.93	32.56	28.59
20N	Derby Road Kegworth	Diffusion Tube	83.3%	83.3%	35.69	43.18	33.48	35.16	32.84	31.28	27.32	29.13	29.91
22N	Kegworth A6 2	Diffusion Tube	83.3%	83.3%	36.95	46.50	38.64	35.95	34.08	35.69	28.66	33.50	29.23
23N	120 Whatton Road Kegworth	Diffusion Tube	75.0%	75.0%	18.75	27.82	24.19	24.80	23.96	20.66	14.48	20.84	20.54
26N	Molehill House	Diffusion Tube	75.0%	75.0%	40.64	41.29	36.13	37.08	33.64	34.24	29.41	29.45	31.70
31N	Sinope	Diffusion Tube	75.0%	75.0%	30.44	37.89	38.78	36.70	32.99	31.49	20.31	30.75	27.61
32N	M1 Bridge Copt Oak	Diffusion Tube	83.3%	83.3%	58.28	71.21	50.79	50.55	49.16	53.61	56.49	55.02	58.09
35N	Monitoring station Coalville (1)	Diffusion Tube	33.3%	33.3%		48.90	39.32	35.95	36.54	38.17	32.54	37.56	32.09
36N	Monitoring station Coalville (2)	Diffusion Tube	33.3%	33.3%		47.90	31.62	40.45	42.37	37.52	32.12	36.46	33.48
39N	NEW M1 LW	Diffusion Tube	25.0%	25.0%		34.35	31.91	29.62	32.28	29.87	26.03	27.28	19.76
40N	35 High Street Castle Donington	Diffusion Tube	75.0%	75.0%			27.52	31.02	29.36	27.81	22.18	23.51	34.80
41N	18 High Street Castle Donington	Diffusion Tube	83.3%	83.3%			37.67	39.71	41.25	42.24	35.64	38.43	39.85
43N	Direction Sign Bardon Rd/A511 RBT Coalville	Diffusion Tube	83.3%	83.3%			33.47	32.26	28.95	25.83	23.77	29.09	28.72

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Site ID	Site Name	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO <sub>2</sub> Annual Mean Concentration (µgm <sup>-3</sup> ) (3)								
					2009	2010	2011	2012	2013	2014	2015	2016	2017
					BAF= 0.9	BAF= 1.06	BAF= 1.06	BAF= 0.91	BAF= 0.87	BAF= 0.98	BAF= 0.95	BAF= 1.01	BAF= 0.97
45N	Outside corner farm Copt Oak	Diffusion Tube	75.0%	75.0%			<b>38.79</b>	35.41	34.08	33.84	29.67	33.51	31.29
46N	PO Derby Road Kegworth	Diffusion Tube	75.0%	75.0%			<b>44.12</b>	<b>42.52</b>	<b>42.78</b>	<b>40.60</b>	32.09	<b>36.72</b>	31.95
47N	12 Derby Rd Kegworth	Diffusion Tube	83.3%	83.3%			32.86	<b>43.59</b>	<b>37.92</b>	<b>39.29</b>	31.48	35.73	34.44
48N	28 London Road Kegworth	Diffusion Tube	83.3%	83.3%			<b>45.15</b>	<b>40.19</b>	<b>40.96</b>	<b>42.22</b>	33.37	35.19	33.56
49N	Hugglescote crossroads	Diffusion Tube	75.0%	75.0%				27.02	33.58	33.34	32.13	34.39	33.66
50N	10 Central Road Hugglescote	Diffusion Tube	66.7%	66.7%				27.96	34.29	34.66	29.29	35.06	<b>36.97</b>
51N	40mph sign N of petrol station Kegworth	Diffusion Tube	75.0%	75.0%					<b>37.78</b>	<b>36.10</b>	30.60	30.67	32.66
52N	lamppost 65 Derby Road Kegworth	Diffusion Tube	75.0%	75.0%					<b>37.19</b>	<b>37.31</b>	30.58	32.16	32.12
53N	20mph sign outside 10 Greenhill Road	Diffusion Tube	58.3%	58.3%						26.94	18.75	21.87	22.48
54N	Parking restrictions sign adj drive 12 & 20 Park Lane Castle Donington	Diffusion Tube	50.0%	50.0%						34.82	22.70	22.82	23.69
56N	lamppost adjacent 27 Broomleys road	Diffusion Tube	83.3%	83.3%							<b>36.75</b>	35.88	35.74

Notes: Exceedances of the NO<sub>2</sub> annual mean objective of 40µg.m<sup>-3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined** data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(1) 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%).

(2) Means for diffusion tubes have been corrected for bias. means in green 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.

**Table A.4 1-Hour Mean NO<sub>2</sub> Monitoring Results**

Site ID		Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO <sub>2</sub> 1-Hour Means > 200µg/m <sup>3</sup> (3)							
						2010	2011	2012	2013	2014	2015	2016	2017
1	Coalville	Roadside		84.3	84.3	29 (270.4 4)	20	3	2	7	0	4	0

Notes: Exceedances of the NO<sub>2</sub> 1-hour mean objective (200µg.m<sup>-3</sup> 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 85%, the 99.8<sup>th</sup> percentile of 1-hour means is provided in brackets.
- (4) Boxes shade green indicate the result has been annualised inline with Box 7.9 – Example: Annualising Continuous Monitoring Data of LAQM.TG(16)

**Table A.5 Annual Mean PM<sub>10</sub> Monitoring Results**

Site ID	Site Name	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2017 (%) <sup>(2)</sup>	PM10 Annual Mean Concentration (µg.m <sup>-3</sup> ) <sup>(3)</sup>						
				2011	2012	2013	2014	2015	2016	2017
4	Bradgate drive coalville	100	47.95	21.73	19.93	21.67	22.23	21.69	19.31	26.65 <sup>(3)</sup>

Notes: Exceedances of the PM<sub>10</sub> annual mean objective of 40µg.m<sup>-3</sup> 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) All means have been “annualised” as per Technical Guidance LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

**Table A.6 24-Hour Mean PM<sub>10</sub> Monitoring Results**

Site ID	Site Name	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2017 (%) <sup>(2)</sup>	PM10 24-Hour Means > 50 µg.m <sup>-3</sup> <sup>(3)</sup>						
				2011	2012	2013	2014	2015	2016	2017
4	Bradgate drive coalville	100	47.95	11	9	14	12	20	8	13 (44.6)

Notes: Exceedances of the PM<sub>10</sub> 24-hour mean objective (50µg.m<sup>-3</sup> not to be exceeded more than 35 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 85%, the 90.4<sup>th</sup> percentile of 24-hour means is provided in brackets.

## Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 NO<sub>2</sub> Monthly Diffusion Tube Results - 2017

Site ID		NO <sub>2</sub> Mean Concentrations (µg.m <sup>-3</sup> )														
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
														Raw Data	Bias Adjusted (1)	Distance Corrected to Nearest Exposure (2)
06N	Broomleys junction (1)	44	36			38		31	34	37	41	48	30	37.67	<b>36.16</b>	29.04
08N	End Cottage Copt Oak	33				23	19	21	25	24	28	32	26	25.82	24.79	Not Roadside
12N	AEROPARK Castle Donington	34	23			21	15	13		17	25	24	2	19.25	18.48	Not Roadside
14N	69 HIGH Street Castle Donington	35				24	18	17	18	20	29	25	22	23.09	22.16	N/A
16N	Bondgate crossroads Castle Donington		34			37	34	34	35	37	39	39	33	35.82	34.39	25.51
17N	13 Bondgate Castle Donington					34	30	28	31	35	37	41	34	33.77	32.42	29.72
18N	34 Bondgate Castle Donington	65	54			32	46	46	47	48	55	56	50	49.80	<b>47.81</b>	N/A

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Site ID		NO <sub>2</sub> Mean Concentrations (µg.m <sup>-3</sup> )														
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
														Raw Data	Bias Adjusted (1)	Distance Corrected to Nearest Exposure (2)
19N	94 Bondgate Castle Donington	38	34			27	23	24	26	30	34	31	31	29.78	28.59	27.38
20N	Derby Road Kegworth	43	38			32	21	22	27	27	38	35	30	31.16	29.91	28.82
22N	Kegworth A6 2	40	39			17	26	24	28	32	34	41	23	30.45	29.23	N/A
23N	120 Whatton Road Kegworth	26	23			19	10	12		15	26	35	25	21.40	20.54	Not Roadside
26N	Molehill House	46	32			31	26	24	30	34	36	40		33.03	31.70	N/A
31N	Sinope	39	31			22	23		25	31	29	32	28	28.76	27.61	22.18
32N	M1 Bridge Copt Oak	65	56			60	59	56	55	55	77	69	54	60.51	<b>58.09</b>	Not Roadside
35N	Monitoring station Coalville (1)							32	31	35		36		33.42	32.09	26.26
36N	Monitoring station Coalville (2)							34	33	34		39		34.88	33.48	27.21
39N	NEW M1 LW	32	29									1		20.59	19.76	Not Roadside
40N	35 High Street Castle Donington	46	32			60	26	24	30	34	36	40		36.25	34.80	28.73

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Site ID		NO <sub>2</sub> Mean Concentrations (µg.m <sup>-3</sup> )														
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
														Raw Data	Bias Adjusted (1)	Distance Corrected to Nearest Exposure (2)
41N	18 High Street Castle Donington	49	39			44	41	37	37	42	40	49	39	41.51	<b>39.85</b>	31.41
43N	Direction Sign Bardon Rd/A511 RBT Coalville	52	28			28	21	24	26	25	33	34	29	29.92	28.72	26.46
45N	Outside corner farm Copt Oak	41	34			35	27	26	29	30	37	36		32.59	31.29	24.53
46N	PO Derby Road Kegworth	53	39			27	27	25	27	31		37	33	33.28	31.95	N/A
47N	12 Derby Rd Kegworth	46	32			60	26	24	30	34	36	40	33	35.87	34.44	30.29
48N	28 London Road Kegworth	46	40			22	29	27	32	35	38	46	33	34.95	33.56	31.89
49N	Hugglescote crossroads	47	36			35		26	28	34	38	39	33	35.06	33.66	28.53
50N	10 Central Road Hugglescote	49	41			34	37		30	37	32	48		38.51	<b>36.97</b>	27.73
51N	40mph sign N of petrol station Kegworth	47	32			30	28	29		31	37	41	32	34.02	32.66	30.28



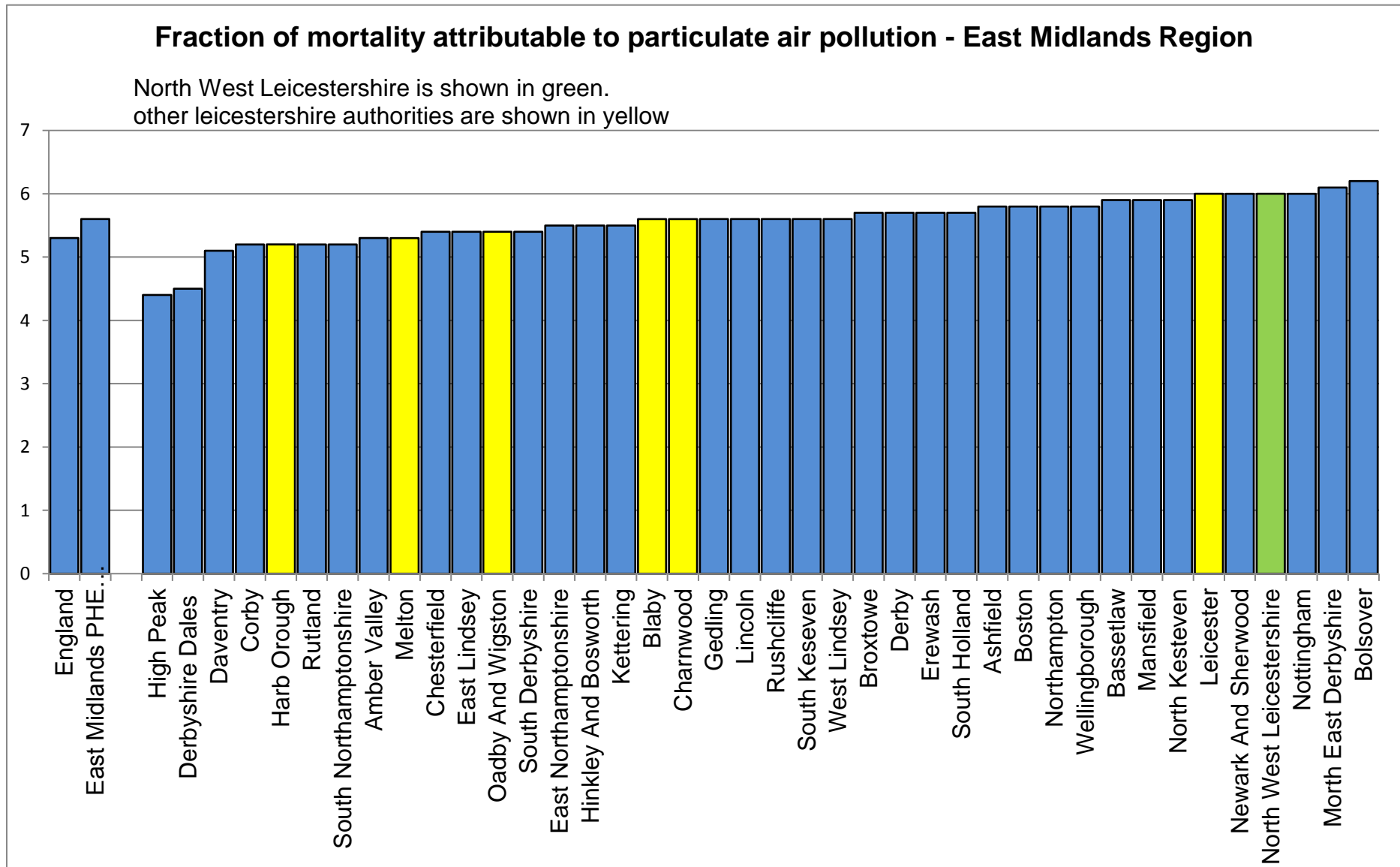
North West Leicestershire District Council

Site ID		NO <sub>2</sub> Mean Concentrations (µg.m <sup>-3</sup> )														
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
														Raw Data	Bias Adjusted (1)	Distance Corrected to Nearest Exposure (2)
52N	lamppost 65 Derby Road Kegworth	45	36			27	27	27	31	32	35	41		33.46	32.12	30.33
53N	20mph sign outside 10 Greenhill Road	37				19	15		18	20	26	28		23.42	22.48	23.57
54N	Parking restrictions sign adj drive 12 & 20 Park Lane Castle Donington					23	19	18		24	36	28		24.68	23.69	19.80
56N	lamppost adjacent 27 Broomleys road	48	39			33	32	30	33	36	38	48	35	37.23	35.74	N/A

## **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 B.1 Fraction of Mortality attributable to particulate air pollution – East Midlands region**



**Appendix D: Map(s) of Monitoring Locations**

**Figure D.1 Map of Automatic Monitoring Sites**

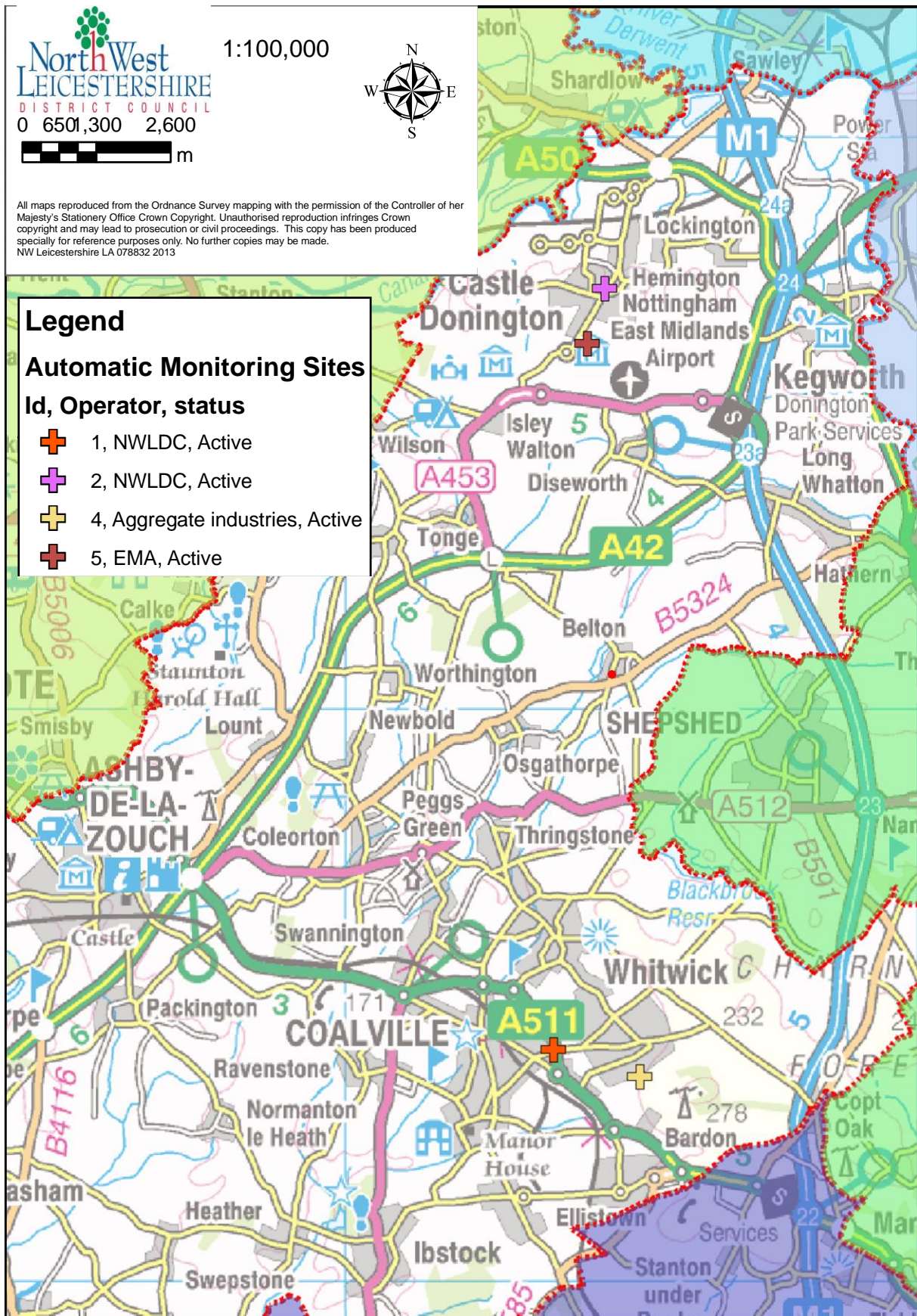
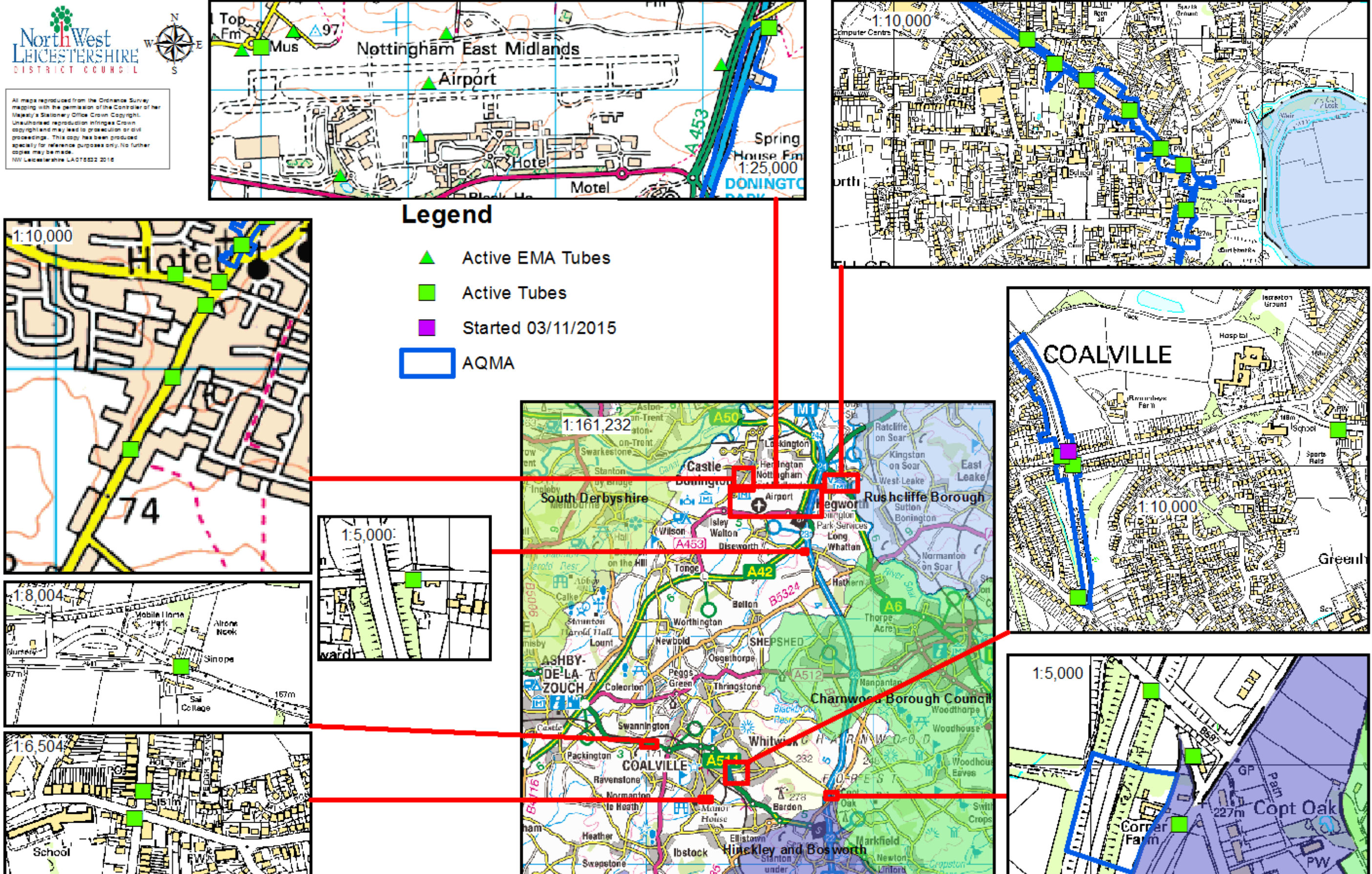
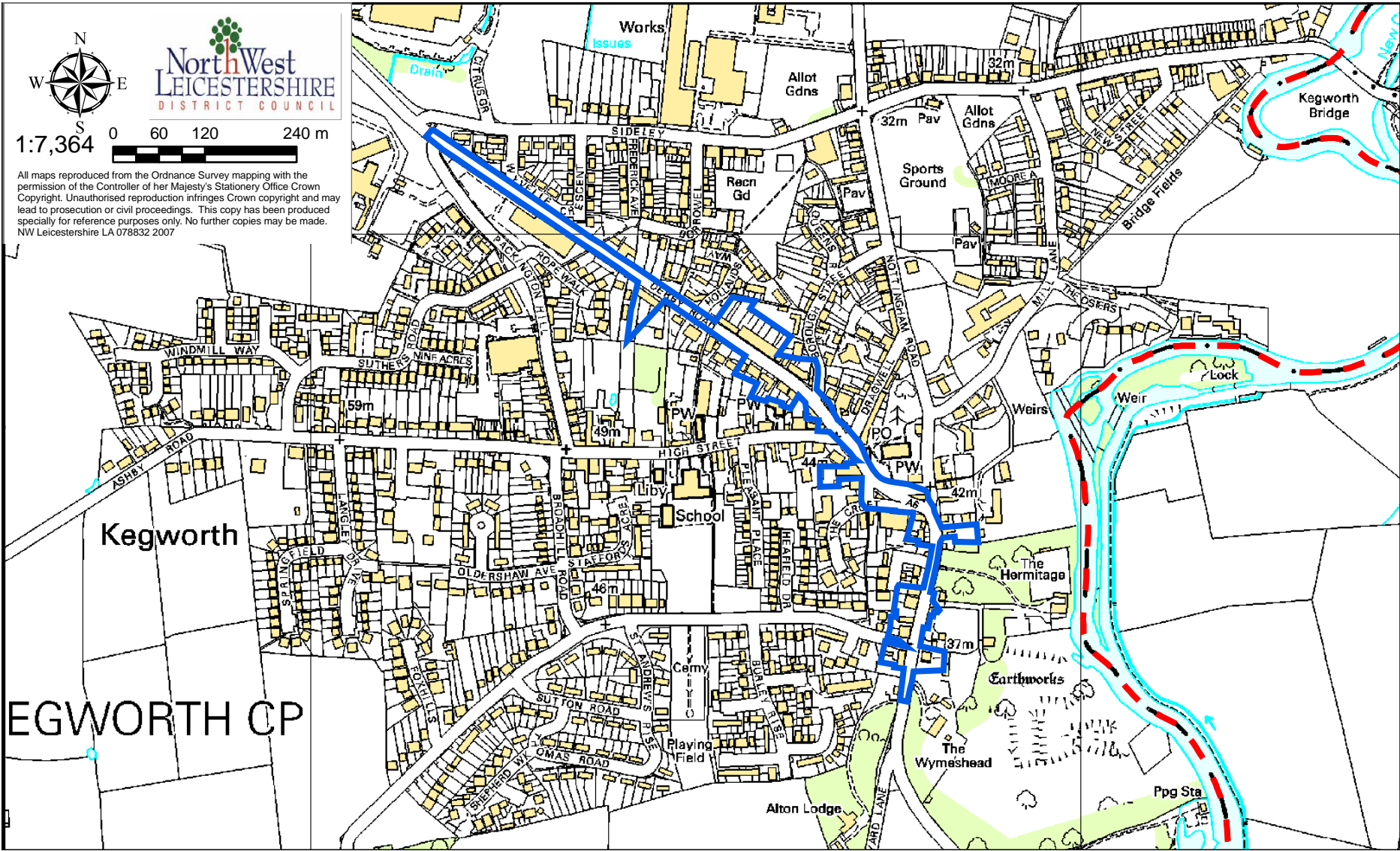


Figure D.2 Map of Non-Automatic Monitoring Sites



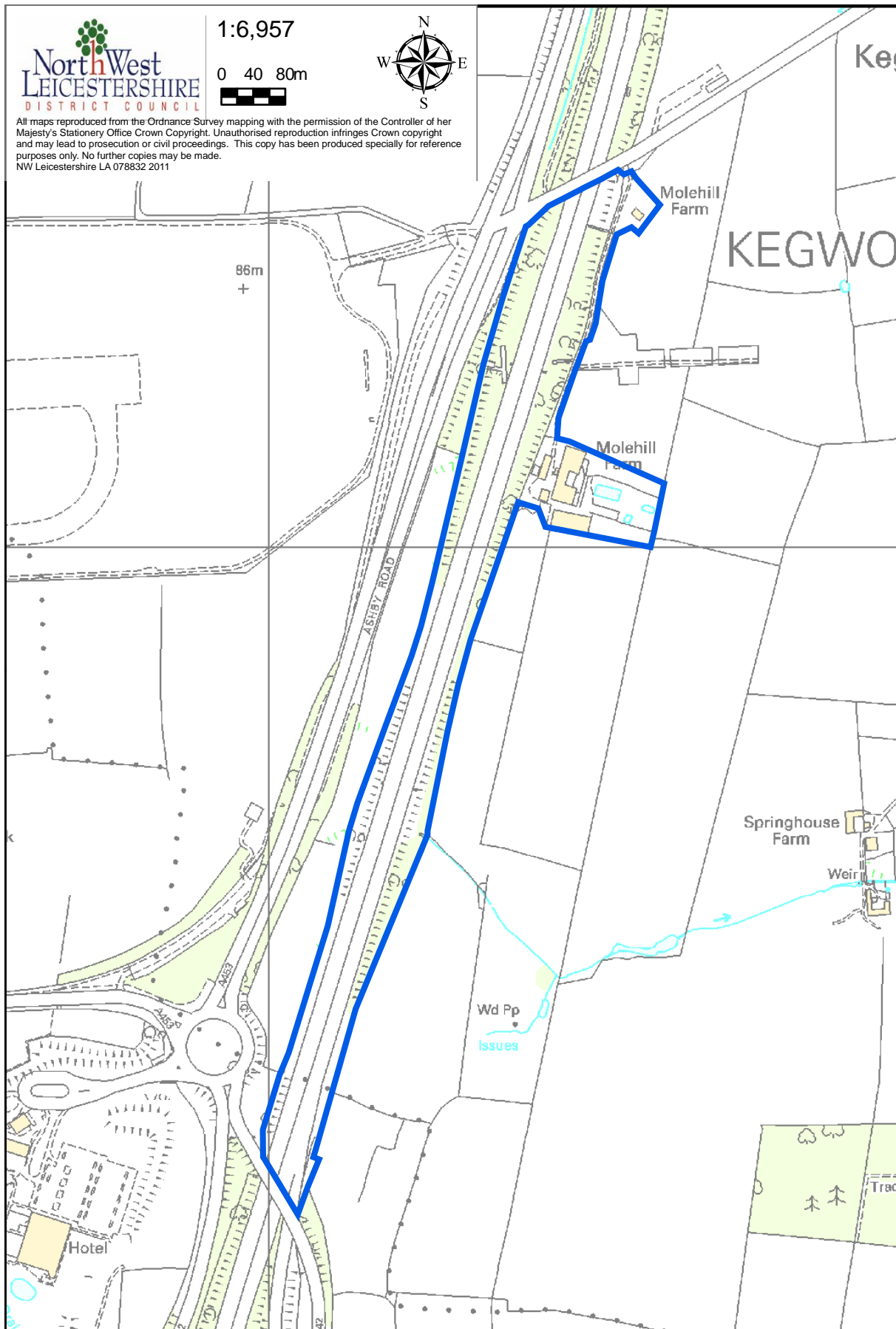
**Appendix E: Maps of AQMA's**

Figure E.1 Kegworth AQMA (highlighted in blue).





**Figure E.2 M1 AQMA (Outlined in Dark Blue)**





**Figure E.4 Coalville Air Quality Management Area (Broom Leys)**

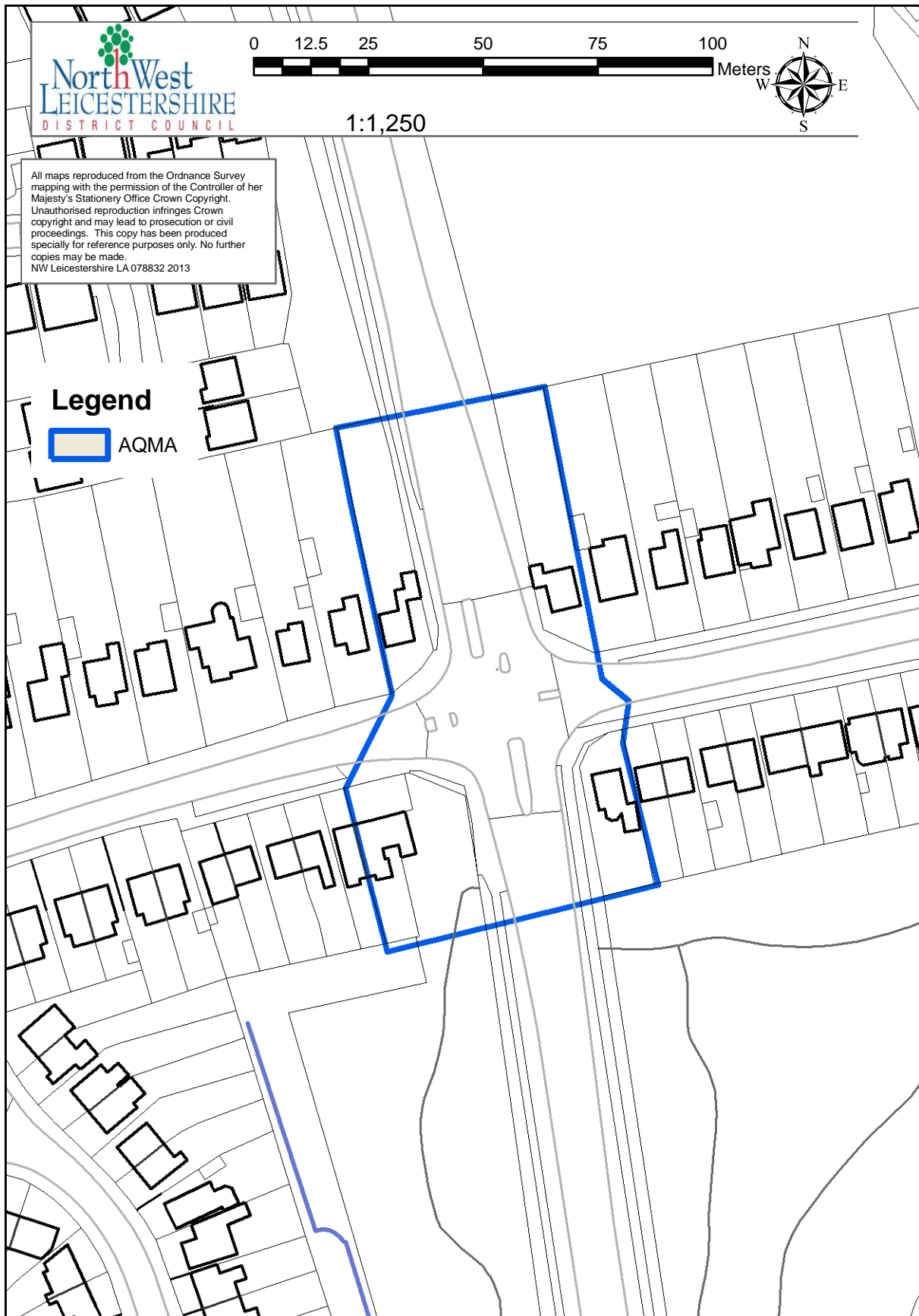
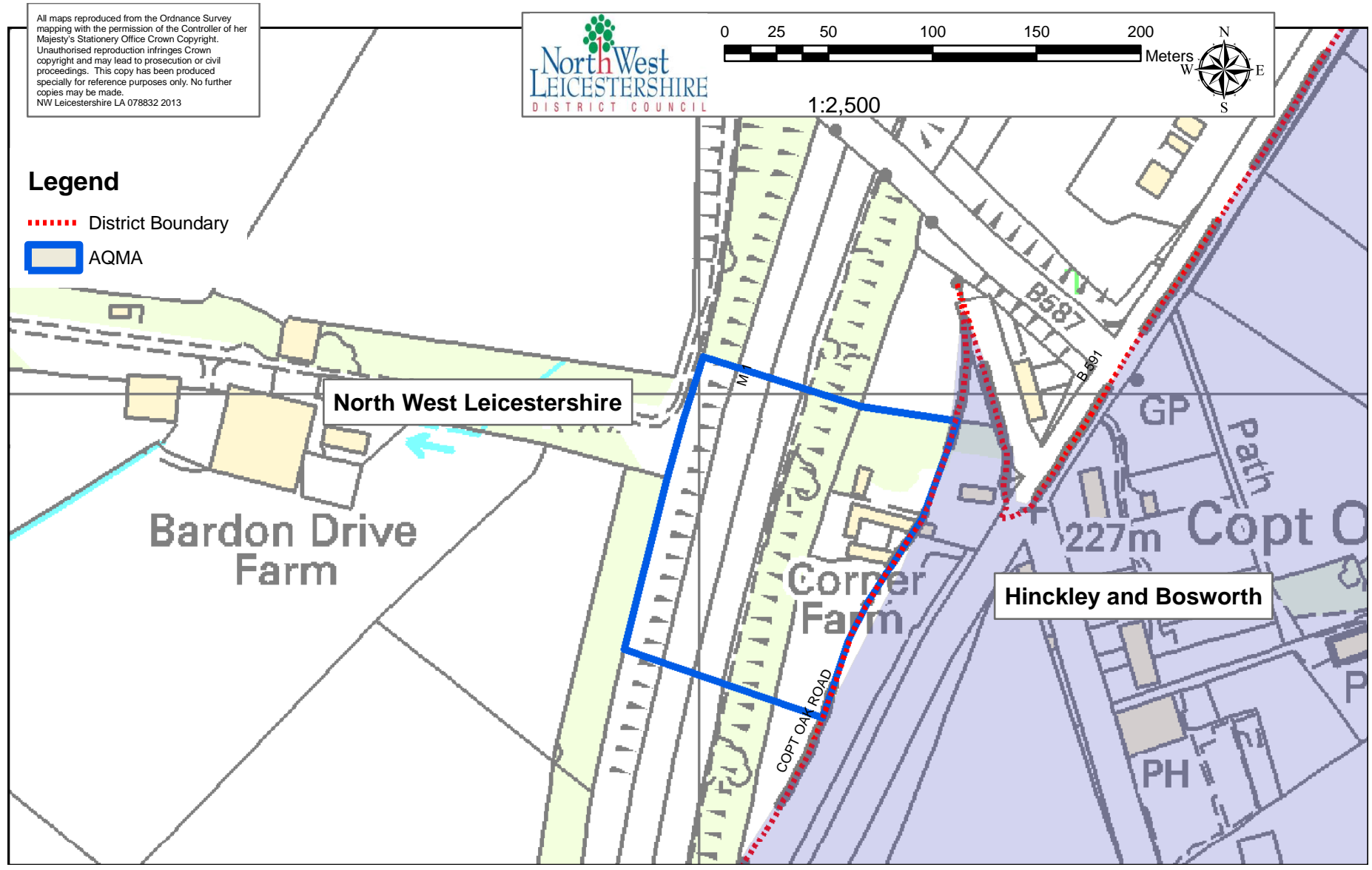


Figure E.5 Copt Oak AQMA



## Appendix F: Summary of Air Quality Objectives in England

**Table F.1 Summary of Air Quality Objectives in England**

Pollutant	Air Quality Objective <sup>4</sup>	
	Concentration	Measured as
Nitrogen Dioxide (NO <sub>2</sub> )	200 µg.m <sup>-3</sup> not to be exceeded more than 18 times a year	1-hour mean
	40 µg.m <sup>-3</sup>	Annual mean
Particulate Matter (PM <sub>10</sub> )	50 µg.m <sup>-3</sup> , not to be exceeded more than 35 times a year	24-hour mean
	40 µg.m <sup>-3</sup>	Annual mean
Sulphur Dioxide (SO <sub>2</sub> )	350 µg.m <sup>-3</sup> , not to be exceeded more than 24 times a year	1-hour mean
	125 µg.m <sup>-3</sup> , not to be exceeded more than 3 times a year	24-hour mean
	266 µg.m <sup>-3</sup> , not to be exceeded more than 35 times a year	15-minute mean

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<sup>4</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## **Appendix G: QA/QC Data**

### **QA/QC of automatic monitoring**

The analyser at Coalville is an API 200 chemiluminescence analyser, Routine instrument calibrations are conducted once per month, which involve zero and span checks, a written record of the gas analyser diagnostics and a general visual inspection of all equipment is undertaken.

### **Data retrieval and daily data checking**

Data from the monitoring station is retrieved and processed on a data logger as 15-minute mean data. The logger is interrogated via a Siemens TC35i GSM modem at 8-hourly intervals by the ENVIEW 2000 software hosted at TRL. This is used to retrieve, check and archive data.

TRLs internal QA/QC procedures require all data to be backed up on a secure server and all documentation associated with each site to be uniquely identified and securely stored to provide an audit trail.

Daily data inspections are undertaken during office hours using the facilities of the Data Management System. Initial observations of the Management System indicate whether the site has been contacted during its nominated 'poll time' overnight. If this has not been successful a manual poll of the site may be required. If this is not successful further investigation of the communications integrity will be required to establish contact with the site modem and data logger.

Three day plots of recorded data are viewed for the requested site, and these are inspected and assessed for continuity, validity, minimum and maximum values, date and time, power failures and general integrity. All anomalies are recorded on the Daily Check sheet, as required. Any anomalies or queries arising from daily inspection of data, or system operation, are brought to the attention of the Project Manager who will evaluate the situation, and initialise any necessary action. In the event that the PM is not available, contact will be made with the next available senior

person within the monitoring team. Any issues identified with equipment operation will be referred to the client for attention within 24 hours (excluding weekends).

On a weekly basis, data are examined using summary statistics and outlier analysis to establish data validity. In the event that unusual data episodes are recorded, these would be routinely examined over longer data periods to establish their impact on trends, but would also be cross referenced with data peaks and troughs recorded at other national monitoring stations. In addition, integrity and validity of data logger clock times are checked, and any significant errors recorded in the Data Management System logbook.

All site data recorded through the Data Management System is archived on TRLs Network. The data is backed up daily, and the TRL IT Department maintains these data within their long-term and secure archives. This secures all data in the event of any system failure.

### **Data calibration and ratification**

Data is ratified as per AURN recommended procedures. The calibration and ratification process for automatic gas analysers corrects the raw dataset for any drift in the zero baseline and the upper range of the instrument. This is done using a Microsoft Excel-based calibration and ratification file which incorporates the zero and span check information from the calibration visits. The zero reading recorded during the calibration visits is used to adjust any offset of the baseline of the data. The difference between the span value obtained between one calibration visit and the next visit is used to calculate a factor. This change is assumed to occur at the same rate over the period between calibrations and as such the factor is used as a linear data scaler. This effectively results in the start of the period having no factor applied and the end of the period being scaled with the full factor with a sliding scale of the factor in-between. After applying the calibration factors, it is essential to screen the data, by visual examination, to see if they contain any unusual

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measurements or outliers. Errors in the data may occur as a result of equipment failure, human error, power failures, interference or other disturbances. Data validation and ratification is an important step in the monitoring process. Ratification involves considerable knowledge of pollutant behaviour and dispersion, instrumentation characteristics, field experience and judgement.

On completion of this data correction procedure, these data were converted to hourly means and a summary of these data were provided to North West Leicestershire District Council.



## 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 <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide
...	...

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