



Department  
for Environment  
Food & Rural Affairs

# UK Air Quality Zones Assessment Threshold Status Five year review (2011-2015)

September 2016 (revised September 2018)



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# Introduction

Article 5 of the Air Quality Directive (AQD)<sup>1</sup> specifies the requirement of Member States to assess defined air quality zones against assessment thresholds determined by Section A of Annex II of the Directive. Paragraph 2 of Article 5 requires this assessment to be reviewed at least once every five years.

These requirements are also specified under Article 4, para.6 of the Fourth Daughter Directive (DD4)<sup>2</sup> for metals (arsenic, cadmium and nickel) and PAHs, using benzo[a]pyrene (B[a]P) as the marker.

This document represents a five year review of UK zones against those assessment thresholds covering the period 2011-2015. This is the first stage in a process to determine the number of monitoring sites required in the national network for assessment under the Directives. The assessment is based upon a combination of measured data from the UK's national networks<sup>3</sup> and national air quality models<sup>4</sup> - the same data that underpins the UK annual compliance reports to the European Commission under the directives. The data determines which category each zone falls into relative to the assessment thresholds – below the Lower Assessment Threshold (<LAT'), between the Lower Assessment Threshold and Upper Assessment Threshold ('LAT-UAT') or above the Upper Assessment Threshold(>UAT'). The Assessment Thresholds are specified for each pollutant metric in Annex II of the AQD and DD4 and are summarised in Table 1 and Table 2, respectively. Ozone has no specified Assessment Threshold but, for the purposes of determining a requirement to make measurements, uses exceedances of the Long Term Objective (LTO) over the course of five years as shown in Table 3.

A significant improvement to the emission inventory for B[a]P was implemented in 2017 and annual modelling results for 2016 were revised. This improvement better represents emissions from wood burning in towns and cities, a particularly uncertain component of the inventory. Given the significant differences this has made when compared to the historical modelling, the approach to calculating the Assessment Threshold status has been to omit modelling data from 2011-2015 in favour of the revised 2016 modelling. Though this technically is outside the time period covered by the assessment, it remains the most

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<sup>1</sup> Directive 2008/50/EC (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:152:0001:0044:EN:PDF>)

<sup>2</sup> Directive 2004/107/EC (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32004L0107:EN:NOT>)

<sup>3</sup> UK-AIR website: <http://uk-air.defra.gov.uk/networks/>

<sup>4</sup> Brookes et al (2015) [https://uk-air.defra.gov.uk/assets/documents/reports/cat09/1511251423\\_AQ0650\\_2013\\_MAAQ\\_technical\\_report.pdf](https://uk-air.defra.gov.uk/assets/documents/reports/cat09/1511251423_AQ0650_2013_MAAQ_technical_report.pdf)

robust reflection of the compliance situation and is therefore better evidence to use for this assessment. The monitoring data from 2011-2015 remain unchanged and have been used alongside the 2016 modelling data.

**Table 1 Assessment Thresholds prescribed in Annex II of the Air Quality Directive**

Pollutant	Metric	LAT	UAT
Sulphur Dioxide (SO <sub>2</sub> )	24-hr mean	50 µg m <sup>-3</sup> (3 allowed)	75 µg m <sup>-3</sup> (3 allowed)
	Winter mean*	8 µg m <sup>-3</sup>	12 µg m <sup>-3</sup>
Oxides of Nitrogen (NO <sub>x</sub> )	Annual mean*	19.5 µg m <sup>-3</sup>	24 µg m <sup>-3</sup>
Nitrogen Dioxide (NO <sub>2</sub> )	1-hr mean	100 µg m <sup>-3</sup> (18 allowed)	140 µg m <sup>-3</sup> (18 allowed)
	Annual mean	26 µg m <sup>-3</sup>	32 µg m <sup>-3</sup>
Particulate matter (PM <sub>10</sub> )	24-hr mean	25 µg m <sup>-3</sup> (35 allowed)	35 µg m <sup>-3</sup> (35 allowed)
	Annual mean	20 µg m <sup>-3</sup>	28 µg m <sup>-3</sup>
Particulate matter (PM <sub>2.5</sub> )	Annual mean	12 µg m <sup>-3</sup>	17 µg m <sup>-3</sup>
Lead (Pb)	Annual mean	0.25 µg m <sup>-3</sup>	0.35 µg m <sup>-3</sup>
Benzene (C <sub>6</sub> H <sub>6</sub> )	Annual mean	2 µg m <sup>-3</sup>	3.5 µg m <sup>-3</sup>
Carbon Monoxide (CO)	8-hr mean	5 mg m <sup>-3</sup>	7 mg m <sup>-3</sup>

\* applicable in ecosystem areas only

**Table 2 Assessment Thresholds prescribed in Annex II of the Fourth Daughter Directive**

Pollutant	Metric	LAT	UAT
Arsenic (As)	Annual mean	3.6 ng m <sup>-3</sup>	2.4 ng m <sup>-3</sup>
Cadmium (Cd)	Annual mean	2 ng m <sup>-3</sup>	3 ng m <sup>-3</sup>
Nickel (Ni)	Annual mean	10 ng m <sup>-3</sup>	14 ng m <sup>-3</sup>
Benzo[a]pyrene (B[a]P)	Annual mean	0.4 ng m <sup>-3</sup>	0.6 ng m <sup>-3</sup>

**Table 3 Ozone Long Term Objectives (LTO) prescribed in Annex VII Section C of the Air Quality Directive**

Pollutant	Metric	LTO
Ozone (O <sub>3</sub> )	8-hr mean	120 µg m <sup>-3</sup> (for health)
	AOT40	6000 µg m <sup>-3</sup> .h (for vegetation)

## **Assessment Threshold status by zone (2011-2015)**

Table 4 shows the status of each UK zone and agglomeration according to the assessment thresholds set out in the AQD for each pollutant metric for the period 2011-2015. Table 5 shows the same information by zone for DD4 pollutants.

**Table 4 Summary of Assessment Threshold status by pollutant/metric for each UK zone (2011-2015) (AQD pollutants)**

Zone code	Zone name	SO <sub>2</sub> 24-hr	SO <sub>2</sub> ecosystem areas	NO <sub>x</sub> ecosystem areas	NO <sub>2</sub> 1-hr	NO <sub>2</sub> annual	PM <sub>10</sub> 24-hr	PM <sub>10</sub> annual	PM <sub>2.5</sub> annual	Pb annual	Benzene annual	CO max 8-hr	O <sub>3</sub> Health LTO	O <sub>3</sub> Vegetation LTO
UK0001	Greater London Urban Area	<LAT			>UAT	>UAT	>UAT	>UAT	LAT-UAT	<LAT	LAT-UAT	<LAT	>LTO	<LTO
UK0002	West Midlands Urban Area	<LAT			>UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0003	Greater Manchester Urban Area	<LAT			LAT-UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0004	West Yorkshire Urban Area	<LAT			LAT-UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0005	Tyneside	<LAT			>UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0006	Liverpool Urban Area	<LAT			LAT-UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0007	Sheffield Urban Area	<LAT			LAT-UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	LAT-UAT	<LAT	>LTO	<LTO
UK0008	Nottingham Urban Area	<LAT			<LAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0009	Bristol Urban Area	<LAT			LAT-UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0010	Brighton/Worthing/Littlehampton	<LAT			<LAT	>UAT	LAT-UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0011	Leicester Urban Area	<LAT			<LAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0012	Portsmouth Urban Area	<LAT			<LAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO



Zone code	Zone name	SO <sub>2</sub> 24-hr	SO <sub>2</sub> ecosystem areas	NO <sub>x</sub> ecosystem areas	NO <sub>2</sub> 1-hr	NO <sub>2</sub> annual	PM <sub>10</sub> 24-hr	PM <sub>10</sub> annual	PM <sub>2.5</sub> annual	Pb annual	Benzene annual	CO max 8-hr	O <sub>3</sub> Health LTO	O <sub>3</sub> Vegetation LTO
UK0013	Teesside Urban Area	<LAT			LAT-UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0014	The Potteries	<LAT			<LAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0015	Bournemouth Urban Area	<LAT			<LAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0016	Reading/Wokingham Urban Area	<LAT			<LAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0017	Coventry/Bedworth	<LAT			-	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0018	Kingston upon Hull	<LAT			<LAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0019	Southampton Urban Area	<LAT			LAT-UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0020	Birkenhead Urban Area	<LAT			-	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0021	Southend Urban Area	<LAT			<LAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0022	Blackpool Urban Area	<LAT			<LAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0023	Preston Urban Area	<LAT			<LAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0024	Glasgow Urban Area	<LAT			>UAT	>UAT	LAT-UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0025	Edinburgh Urban Area	<LAT			<LAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	<LAT	<LTO	<LTO

Zone code	Zone name	SO <sub>2</sub> 24-hr	SO <sub>2</sub> ecosystem areas	NO <sub>x</sub> ecosystem areas	NO <sub>2</sub> 1-hr	NO <sub>2</sub> annual	PM <sub>10</sub> 24-hr	PM <sub>10</sub> annual	PM <sub>2.5</sub> annual	Pb annual	Benzene annual	CO max 8-hr	O <sub>3</sub> Health LTO	O <sub>3</sub> Vegetation LTO
UK0026	Cardiff Urban Area	<LAT			LAT-UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0027	Swansea Urban Area	>UAT			LAT-UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	>UAT	<LAT	>LTO	<LTO
UK0028	Belfast Urban Area	<LAT			LAT-UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0029	Eastern	<LAT	<LAT	LAT-UAT	LAT-UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	>LTO
UK0030	South West	<LAT	<LAT	<LAT	>UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0031	South East	LAT-UAT	<LAT	LAT-UAT	>UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0032	East Midlands	<LAT	<LAT	LAT-UAT	>UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0033	North West & Merseyside	<LAT	<LAT	<LAT	<LAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0034	Yorkshire & Humberside	LAT-UAT	<LAT	>UAT	LAT-UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	>UAT	<LAT	>LTO	<LTO
UK0035	West Midlands	<LAT	<LAT	<LAT	<LAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0036	North East	<LAT	<LAT	<LAT	<LAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0037	Central Scotland	<LAT	<LAT	<LAT	<LAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	LAT-UAT	<LAT	>LTO	<LTO
UK0038	North East Scotland	<LAT	<LAT	<LAT	>UAT	>UAT	LAT-UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO

Zone code	Zone name	SO <sub>2</sub> 24-hr	SO <sub>2</sub> ecosystem areas	NO <sub>x</sub> ecosystem areas	NO <sub>2</sub> 1-hr	NO <sub>2</sub> annual	PM <sub>10</sub> 24-hr	PM <sub>10</sub> annual	PM <sub>2.5</sub> annual	Pb annual	Benzene annual	CO max 8-hr	O <sub>3</sub> Health LTO	O <sub>3</sub> Vegetation LTO
UK0039	Highland	<LAT	<LAT	<LAT	-	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0040	Scottish Borders	<LAT	<LAT	<LAT	LAT-UAT	LAT-UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0041	South Wales	<LAT	<LAT	<LAT	LAT-UAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0042	North Wales	<LAT	<LAT	LAT-UAT	<LAT	>UAT	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO
UK0043	Northern Ireland	<LAT	<LAT	<LAT	-	>UAT	LAT-UAT	<LAT	<LAT	<LAT	<LAT	<LAT	>LTO	<LTO

**Table 5 Summary of Assessment Threshold status by pollutant/metric for each UK zone (2011-2015) (DD4 pollutants)**

Zone code	Zone name	Arsenic (As)	Cadmium (Cd)	Nickel (Ni)	B(a)P
UK0001	Greater London Urban Area	<LAT	<LAT	<LAT	LAT-UAT
UK0002	West Midlands Urban Area	<LAT	LAT-UAT	LAT-UAT	<LAT
UK0003	Greater Manchester Urban Area	<LAT	<LAT	<LAT	LAT-UAT
UK0004	West Yorkshire Urban Area	<LAT	<LAT	<LAT	LAT-UAT
UK0005	Tyneside	<LAT	<LAT	<LAT	<LAT
UK0006	Liverpool Urban Area	<LAT	<LAT	<LAT	>UAT
UK0007	Sheffield Urban Area	<LAT	<LAT	>UAT	<LAT
UK0008	Nottingham Urban Area	<LAT	<LAT	<LAT	<LAT
UK0009	Bristol Urban Area	<LAT	<LAT	<LAT	LAT-UAT
UK0010	Brighton/Worthing/Littlehampton	<LAT	<LAT	<LAT	LAT-UAT
UK0011	Leicester Urban Area	<LAT	<LAT	<LAT	<LAT
UK0012	Portsmouth Urban Area	<LAT	<LAT	<LAT	>UAT
UK0013	Teesside Urban Area	<LAT	<LAT	<LAT	<LAT

Zone code	Zone name	Arsenic (As)	Cadmium (Cd)	Nickel (Ni)	B(a)P
UK0014	The Potteries	<LAT	<LAT	<LAT	<LAT
UK0015	Bournemouth Urban Area	<LAT	<LAT	<LAT	LAT-UAT
UK0016	Reading/Wokingham Urban Area	<LAT	<LAT	<LAT	LAT-UAT
UK0017	Coventry/Bedworth	<LAT	<LAT	<LAT	<LAT
UK0018	Kingston upon Hull	<LAT	<LAT	<LAT	<LAT
UK0019	Southampton Urban Area	<LAT	<LAT	<LAT	LAT-UAT
UK0020	Birkenhead Urban Area	<LAT	<LAT	<LAT	LAT-UAT
UK0021	Southend Urban Area	<LAT	<LAT	<LAT	<LAT
UK0022	Blackpool Urban Area	<LAT	<LAT	<LAT	<LAT
UK0023	Preston Urban Area	<LAT	<LAT	<LAT	LAT-UAT
UK0024	Glasgow Urban Area	<LAT	<LAT	<LAT	<LAT
UK0025	Edinburgh Urban Area	<LAT	<LAT	<LAT	<LAT
UK0026	Cardiff Urban Area	<LAT	<LAT	<LAT	LAT-UAT
UK0027	Swansea Urban Area	<LAT	<LAT	>UAT	>UAT

Zone code	Zone name	Arsenic (As)	Cadmium (Cd)	Nickel (Ni)	B(a)P
UK0028	Belfast Urban Area	<LAT	<LAT	<LAT	>UAT
UK0029	Eastern	<LAT	<LAT	>UAT	LAT-UAT
UK0030	South West	LAT-UAT	<LAT	<LAT	LAT-UAT
UK0031	South East	>UAT	<LAT	<LAT	>UAT
UK0032	East Midlands	>UAT	<LAT	LAT-UAT	<LAT
UK0033	North West & Merseyside	LAT-UAT	<LAT	<LAT	>UAT
UK0034	Yorkshire & Humberside	>UAT	<LAT	<LAT	>UAT
UK0035	West Midlands	>UAT	<LAT	<LAT	<LAT
UK0036	North East	<LAT	<LAT	<LAT	<LAT
UK0037	Central Scotland	<LAT	<LAT	<LAT	<LAT
UK0038	North East Scotland	<LAT	<LAT	<LAT	<LAT
UK0039	Highland	<LAT	<LAT	<LAT	<LAT
UK0040	Scottish Borders	LAT-UAT	<LAT	<LAT	<LAT
UK0041	South Wales	<LAT	<LAT	>UAT	>UAT

Zone code	Zone name	Arsenic (As)	Cadmium (Cd)	Nickel (Ni)	B(a)P
UK0042	North Wales	<LAT	<LAT	<LAT	<LAT
UK0043	Northern Ireland	<LAT	<LAT	<LAT	>UAT