



2018 Air Quality Annual Status Report (ASR)

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

June 2018

Hastings Borough Council

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Executive Summary: Air Quality in Our Area

Air Quality in Hastings Borough 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 billion³.

More information about the health effects of air pollution can be found at:

http://www.hastings.gov.uk/environmentalhealth/pollution/air/health_effects/

Particulate matter (PM₁₀) has been measured at Bulverhythe (Hastings) since 2001. While the annual mean PM₁₀ concentration has never exceeded the annual objective concentration of 40 µg/m³, exceedance of the 50 µg/m³ daily mean objective concentration lead to declaration of an Air Quality Management Area (AQMA) in 2003. The AQMA encompassed properties between the junction of the A259 (Bexhill Road) and Harley Shute Road, and number 576 Bexhill Road on its northern side, and numbers 211 to 585 Bexhill Road on its southern side. An air quality monitoring station (AQMS) was established in Bulverhythe and is located within the AQMA.

The Air Quality Action Plan published in 2005 showed that over half of the annual mean PM₁₀ concentration originated from regional background sources but nearly a quarter originated from resuspension of dust and 9 percent from direct exhaust emissions from Bexhill Road. Dust suppression measures such as wheel washing and increased road sweeping were subsequently put in place to control PM₁₀ concentrations.

The number of exceedances of the daily mean value above 50 µg/m³ peaked at 62 per year in 2003 and decreased significantly since then with only four

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

exceedances in 2017. As the objective has not been exceeded for more than 12 years an application to revoke the AQMA has been accepted, the AQMA was revoked in April 2017.

We also monitor Nitrogen Dioxide (NO₂) at Bulverhythe by a continuous monitor in the AQMS, and at 14 other locations by diffusion tubes. NO₂ concentrations within the AQMA in Bulverhythe continue to be consistently below the annual objective concentration of 40 µg/ m³.

Elsewhere within the Borough NO₂ concentrations were less than 40 µg/m³ in 2017 but monitoring should continue at these locations as NO₂ was within 10% of the annual objective at three locations in 2017 (Bexhill Road 'Boat' (36.4 µg/m³), 81 Bexhill Road (36.5 µg/m³) and 104 Bohemia Road (36.8 µg/m³)).

Actions to Improve Air Quality

Hastings Borough Council, together with partners, has been involved in taking forward several initiatives during 2017 in pursuit of improving local air quality. This includes the continued operation of the Bexhill to Hastings link road, working with our partners at Sussex Air and utilisation of the Sussex air quality planning guidance document. In addition, works to undertake the installation of a priority bus lane between the western side of the borough through to Bexhill (Ravenside) continue to be developed.

Conclusions and Priorities

The 2017 ASR has confirmed that levels of PM₁₀ and NO₂ continue to reduce within the borough and PM₁₀ within the AQMA continue to be within compliance of the air quality objectives. A revocation order revoking the AQMA 1 (Bulverhythe) was submitted to Defra by Hastings Borough Council in April 2017.

Hastings Borough Council's priorities for the coming year are:

- Continue to work with partners such as East Sussex County Council (ESCC) and bus operators to improve bus routes, traffic management systems and new road links to reduce congestion and pollution.
- Continued promotion of sustainable transport options, such as cycling, bus information and electric vehicle charge point information.

- Work with taxi licencing to introduce clean taxi operations across the borough.

Local Engagement and How to get Involved?

Road vehicles are a major source of many pollutants in urban areas. They produce over 50 percent of the emissions of Nitrogen Oxides (NO_x) in the UK.

Before using your car, ask yourself:

- do I really need to make this journey?
- could I walk or cycle instead of taking the car?
- could I take a bus, or train or car pool?
- are the levels of air pollution already too high today?

If you must drive:

- drive smoothly. You'll save fuel, and your engine will also pollute less;
- don't rev your engine unnecessarily;
- maintain your car. Keep the engine properly tuned and the tyres at the right pressure; and
 - turn off the engine when your car is stationary.

At home

- Buy water-based or low-solvent paints, varnishes, glues and wood preservatives.
- Avoid burning solid fuels, if possible.
- Avoid lighting bonfires, but if you must, don't light them when pollution levels are high or while the weather is still and cold. Only burn dry material and never burn household waste, especially plastic, rubber, foam or paint. Levels of pollution can be quite high on bonfire night and other events/festivals with bonfires, and sensitive people, including people with respiratory conditions, may notice some effects. However, exposure can be considerably reduced by remaining indoors and keeping windows closed.

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1 Local Air Quality Management

This report provides an overview of air quality in Hastings Borough 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 Hastings Borough 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 Appendix E.

2 Actions to Improve Air Quality

2.1 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 Hastings Borough Council can be found in Table 2.1. The AQMA was declared for exceedances of the 24-Hour Mean PM₁₀ (35 exceedances of 50µg/m³ per annum).

The opening of the Hastings Link Road in 2015 and closure of a waste transfer site adjacent to the AQMA resulted in the required reduction in emissions and concentrations of PM₁₀ within the AQMA. Traffic reductions as a result of these activities have reduced, especially for Heavy Goods Vehicles (HGV) and monitoring data has consistently measured concentrations below the 24-hour mean PM₁₀ objective (see Figure A.3).

The AQMA, was revoked in April 2017, and a copy of the revocation order submitted to Defra.

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=123.

Alternatively, see Appendix D, which provides a map of air quality monitoring locations and the monitoring locations in relation to the AQMA(s).

Table 2.1 – 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	
AQMA 1	08/12/2003	PM ₁₀ 24-hour mean	Bulverhythe, Hastings	An area encompassing properties between the junction of the A259 (Bexhill Road) and Harley Shute Road, and number 576 Bexhill Road on its northern side, and numbers 211 to 585 Bexhill Road on its southern side.	No	52 (24hr exceedances of AQO in 2002)	4 (2017) *Now revoked	Draft action plan found at: 2005 Hastings AQAP * AQMA now revoked

Hastings Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date (confirm by selecting in box)

Number of exceedances of PM₁₀ 24-hour mean (> 50µg/m³) sourced from Hastings BC Detailed Assessment of Particulate levels on and around the A259, Bexhill Road, Hastings, East Sussex (Dr S. Vardoulakis Project Development Officer Sussex Air Quality Steering Group) 2004

[http://www.hastings.gov.uk/content/env_health/pdfs/Detailed_Assessment_\(.pdf_1,527KB\).pdf](http://www.hastings.gov.uk/content/env_health/pdfs/Detailed_Assessment_(.pdf_1,527KB).pdf)

2.2 Progress and Impact of Measures to address Air Quality in Hastings Borough Council

Defra have not raised or submitted any adverse comment to Hastings Borough Council following submission of the previous year's ASR.

Hastings Borough Council has taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

Key completed measures are:

- Hastings Link Road has been operational since 2015 and has reduced general traffic volumes and HGV routing through the AQMA, resulting in the revocation order (April 2017).

Hastings Borough Council's priorities for the coming year are:

- Continue to work with partners such as East Sussex County Council (ESCC) and bus operators to improve bus routes, traffic management systems and new road links to reduce congestion and pollution.
- Continued promotion of sustainable transport options, such as cycling, bus information and electric vehicle charge point information.
- Work with taxi licencing to introduce clean taxi operations across the borough.
- Review the Action Plan and develop an Air Quality Strategy following the revocation of the AQMA.

Hastings Borough Council has implemented a number of measures stated above and in Table 2.2 have achieved compliance in AQMA 1 (Bulverhythe). The AQMA was revoked in April 2017, a copy of the revocation order is presented in Appendix F.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Implementati on Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Estimated / Actual Completion Date	Comments / Barriers to implementation	Progress to date
1	Link Road (built) reducing traffic flows in the Air Quality Management Area	Traffic Management		ESCC	2015 onwards	Traffic volumes (reduction)	Reduced emissions and conc. > 20% (achieved)	2015		Completed- AQMA revocation May 2017 as a result of reduced traffic (esp. HGV)
2	Proposed dedicated bus lane from Filsham Rd to Glyne Gap.	Traffic Management		ESCC/Bus Companies	2017/18	TBC	Yes	TBC		Awaiting method statement and timetable of works from ESCC
3	A feasibility design project to consider options to upgrade the current SCOOT traffic signal management system on the Glyne Gap to the junction of Filsham Road and seafront east to town centre at Pelham Place	Traffic Management		ESCC	TBC	TBC	Yes	TBC	The upgrade of the A259 SCOOT Traffic system is under review	TBC
4	Proposed Queensway Gateway Road	Traffic Management		ESCC	2016/17	Traffic volumes (reduction)	Yes	TBC	Reduce congestion and re-direct traffic away from areas of concern.	Build ongoing
5	The extension of Real Time bus information systems into Hastings	Promoting Travel Alternatives		Bus Companies	TBC	TBC	Yes	TBC	ESCC and the Hastings and Rother QBP are committed to this project, but implementation has slipped due to technical difficulties	Ongoing

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6	The implementation of travel choice measures to manage demand to travel by car.	Promoting Travel Alternatives		ESCC/HBC	2015 - on going	Increase cycle	Yes	On going	The Council has its own Staff Transport Plan including various initiatives to encourage alternative modes of transport to the car	Ongoing
7	Promote use of electric vehicles and charging network (Energise).	Promoting Low Emission Transport		HBC/Sussex-air	2015 - on going	Increase charge point usage	Yes	On going	On-going promotion of EV charge point	Ongoing
8	Actively seek alternative renewable solutions and avoid combustion plant in the AQMA	Promoting Low Emission Plant		HBC via planning process /Clean Air Act	2005 onwards	Solid fuel burning prone to emission peaks on starting up. NOx and PM higher than for oil and coal	Yes	On going		Ongoing
9	Taxi Licence Policy	Promoting Low Emission Transport		HBC taxi licencing	2016 onwards	Number of Euro 6 taxis	Yes	On going	Any licensed Hackney carriages will be more environmentally friendly	On going
10	Encourage domestic solid fuel burning to use smokeless fuels and exempt appliances	Environmental Permits		Env. Protection Team duties relating to Statutory Nuisance and the Clean Air Act	2013 onwards	Less NOx, PM and smoke reduction of indoor CO	Yes	On going		On going
11	Households and building trade to avoid fires to dispose of	Environmental Permits		Env. protection team duties relating to complaints and nuisance	2005 onwards	Less NOx, PM and smoke targeted	Yes	On going		On going

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	waste in the AQMA									
12	Anti-idling signage	Promoting Low Emission Transport		HBC	TBC	Less NOx, PM	Yes	TBC	Permissions from ESSC highways and costs	New initiative

2.3 PM_{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations

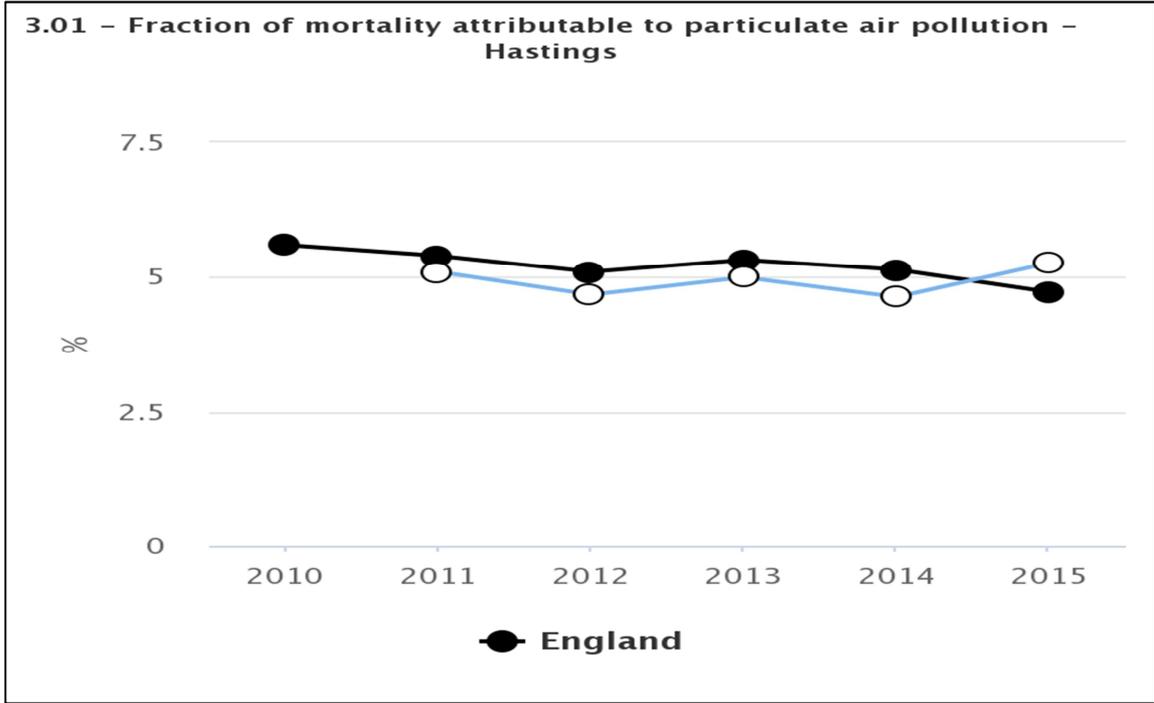
As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions and cardiovascular diseases.

Work carried out by Public Health England as part of the Public Health Outcomes Framework (PHOF) shows that the mortality associated with particulate air pollution within Hastings Borough Council for the year 2015 is 5.3%. This information is available from the following web link:

<http://www.phoutcomes.info/search/air%20quality#page/4/gid/1/pat/6/par/E12000008/ati/101/are/E07000062/iid/30101/age/230/sex/4>

Figure 2.1 shows that the mortality calculated for Hastings Borough Council is slightly above than that calculated for south east England (4.7 %) and England (4.7 %) as a whole.

Figure 2.1: Fraction of mortality attributed to particulate air pollution in Hastings Borough Council



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Hastings Borough Council is developing processes to determine how it will approach measures to address PM_{2.5} in partnership with Sussex Air and the ESCC Public Health team. Hastings Borough Council is taking the following measures to address PM_{2.5}:

- Hastings will utilise the Sussex air quality mitigation and planning guidance (2013) to reduce emissions of PM_{2.5} from new developments;
- The draft Action Plan is to be reviewed in light of the AQMA revocation and a new Air Quality Strategy for Hastings will be developed in partnership with Sussex-air and ESCC.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

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

Hastings Borough Council undertook automatic (continuous) monitoring at one site during 2017. Table A. 1 in Appendix A shows the details of the site.

There are no Automatic Urban and Rural Network (AURN) national monitoring stations within the Hastings Borough. The Hastings air quality monitoring station located at Bulverhythe, forms part of the Sussex Air Quality Partnership (Sussex-air) network which provides data at the following web-site: <http://www.sussex-air.net/AQNearMe/Monitoring/SiteDetails.aspx> (Site Name = Hastings - Bulverhythe).

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 C.

3.1.2 Non-Automatic Monitoring Sites

Hastings Borough Council undertook non-automatic (passive) monitoring of NO₂ at 14 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 C.

3.2 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 C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. No measurement location within Hastings exceeded the annual air quality objective of 40µg/m³ in 2017.

For diffusion tubes, the full 2017 monitoring dataset of monthly mean values is provided in Appendix B. Some monitoring locations only captured data for eleven sampling periods out of twelve in the year, the lowest data capture for the period was 92%. Therefore, annualisation of the data was not required as all monitoring locations had data capture of >75%. Data was distance corrected to represent the closest local exposure concentrations. Concentrations were adjusted for bias using the national BIAS adjustment factor of 0.89 (see Appendix C).

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations measured at Bulverhythe for the past five years with the air quality objective of 200 µg/m³, not to be exceeded more than 18 times per year. There were no exceedances of the hourly concentration threshold at any point during the last five years.

As the annual average concentrations at diffusion tube sites were significantly less than 60 µg/m³ it is also highly unlikely that there is exceedance of the 1-hour mean objective at these sites.

3.2.2 Particulate Matter (PM₁₀)

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. The annual mean concentration remains significantly below the annual objective concentration.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past five years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year.

Automatic PM₁₀ monitoring began at Bulverhythe in June 2001. The number of exceedances of the daily mean above 50 µg/m³ and the associated data capture are shown in Table 3.1 –. The largest reduction in daily exceedances actually occurred

from 2003 (62 exceedances) to 2004 (13 exceedances). Since 2011 the number of measured exceedances has been less than five each year.

Based on the measurements being consistently below the air quality objective within the AQMA, Hastings Borough Council revoked the AQMA in 2017.

Table 3.1 – Number of PM₁₀ exceedances of daily mean objective of 50 µg/m³ and the associated data capture at Bulverhythe since 2001

Year	Number of days above 50 µg/m ³	Data Capture (%)
2001	24 ⁴	48
2002	52	78
2003	62	96
2004	13	94
2005	23	87
2006	20	84
2007	20	88
2008	10	93
2009	15	95
2010	8	100
2011	2	97
2012	1	92
2013	0	44
2014	0	61
2015	3	86
2016	3	87
2017	4	96

#Please note that at the time of writing this ASR, the 2017 data has been ratified until November 2017, therefore the December 2017 results are still provisional.

⁴While the data extracted from the Sussex-Air website had only 48 % data capture for 2001, the 2005 Air Quality Action Plan used an extrapolation method to estimate that there were 48 exceedances of the daily objective of 50 µg/m³.

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)
HT1	Hastings-Bulverhythe	Roadside	577633	108726	NO ₂	Now revoked	Chemiluminescent	5	3	1.7
					PM ₁₀		TEOM			

Notes:

(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	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
1	St Luke's / Alma Terrace	Roadside	580831	109964	NO2	NO	1	1	NO	2
2	Carlisle Parade	Roadside	581496	109288	NO2	NO	5	1	NO	2.5
3	Manor Road	Roadside	582223	110361	NO2	NO	0	10	NO	2.5
4	Ore Chur/Old London Rd	Roadside	583610	111325	NO2	NO	0	2	NO	2.5
5	Harley Shute	Roadside	578382	109601	NO2	Now revoked	10	1	NO	2
6	Bexhill Road 'Boat'	Roadside	576770	108101	NO2	Now revoked	15	1.5	NO	2.5
7	81 Bexhill Road	Roadside	578500	108771	NO2	NO	0.2	1.5	NO	2.5
8	45 Bexhill Road	Roadside	578637	108798	NO2	NO	1.5	2.8	NO	2
9	71 Bexhill Road	Roadside	578532	108776	NO2	NO	0.5	0.45	NO	2.5
10	138 Bexhill Rd	Roadside	578290	108819	NO2	NO	1.5	2	NO	2
11	Railway Bridge Bexhill Rd	Roadside	578447	108794	NO2	NO	10	3	NO	2.5
12	West Marina Gardens	Roadside	578946	108746	NO2	NO	10	0.5	NO	2.5
13	104 Bohemia Rd	Roadside	580252	110058	NO2	NO	0.5	1.5	NO	2
14	116 Bohemia Rd	Roadside	580246	110064	NO2	NO	0.5	1.5	NO	2

Notes:

(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 NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
HT1	Roadside	Automatic	97%	97%	28 (25.2)	22 (23.3)	18.8	18.4	18.0
1	Roadside	Diffusion Tube	100%	100%	18.9	24.2	19.7	21.1	22.6
2	Roadside	Diffusion Tube	100%	100%	26.9	29.9	23.3	21.5	24.5
3	Roadside	Diffusion Tube	100%	100%	14.3	15.2	13.7	17.6	15.5
4	Roadside	Diffusion Tube	92%	92%	25.7	25.9	24.6	24.9	24.8
5	Roadside	Diffusion Tube	100%	100%	37.4	40.4 (27.7)	31.9	19.5	28.6
6	Roadside	Diffusion Tube	92%	92%	42.9 (28.2)	54.9 (33.9)	37.1	22.7	36.4
7	Roadside	Diffusion Tube	100%	100%	39.5 (39.5)	44.6 (44.6)	30.6	35.4	36.5
8	Roadside	Diffusion Tube	92%	92%	29.7	33.1	25.6	26.2	28.2
9	Roadside	Diffusion Tube	100%	100%	40.1 (39.7)	44.5 (44.1)	33.2	34.2	35.0
10	Roadside	Diffusion Tube	92%	92%	29.3	32.2	25.9	25.3	27.3
11	Roadside	Diffusion Tube	92%	92%	24.7	27.9	23.6	18.7	24.3
12	Roadside	Diffusion Tube	92%	92%	28.5	28.4	20.8	15.9	24.2
13	Roadside	Diffusion Tube	100%	100%	35.1	39.1	31.8	31.7	36.8
14	Roadside	Diffusion Tube	100%	100%	33.7	39.5	28.3	26.5	30.4

- ☒ Diffusion tube data has been bias corrected
- ☒ If applicable, all data has been distance corrected for relevant exposure

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

NO₂ concentrations in (brackets) have been readjusted for distance to sensitive receptor.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year. Please note that at the time of writing this ASR, the 2017 data has been ratified until November 2017, therefore the December 2017 results are still provisional.

(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. No annual means have been 'annualised' as all valid data capture for the full calendar year is greater than 75%.

Please note that at the time of writing this ASR, the 2017 data has been ratified until November 2017, therefore the December 2017 results are still provisional.

Figure A.1 – Trends in Annual Mean NO₂ Concentrations

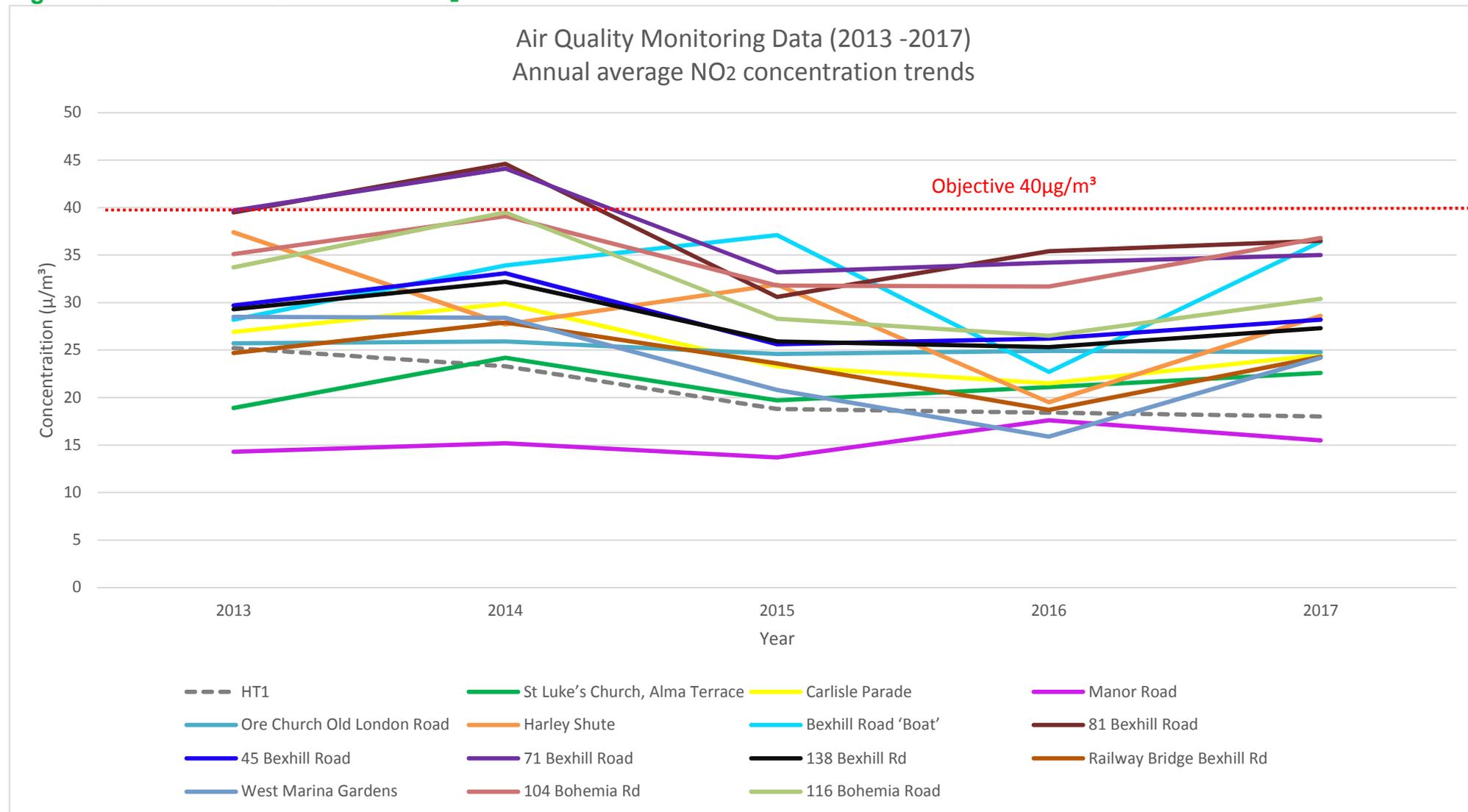


Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2013	2014	2015	2016	2017
HT1	Roadside	Automatic	97	97	0	0	0	0	0

Notes:

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ 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. Please note that at the time of writing this ASR, the 2017 data has been ratified until November 2017, therefore the December 2017 results are still provisional.

(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 99.8th percentile of 1-hour means is provided in brackets.

Please note that at the time of writing this ASR, the 2017 data has been ratified until November 2017, therefore the December 2017 results are still provisional.

Table A.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2013	2014	2015	2016	2017
HT1	Roadside	96	96	20.6	21.6	23.3	19.3	22

Notes:

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year. Please note that at the time of writing this ASR, the 2017 data has been ratified until November 2017, therefore the December 2017 results are still provisional.

(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 Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Please note that at the time of writing this ASR, the 2017 data has been ratified until November 2017, therefore the December 2017 results are still provisional.

Figure A.2 – Trends in Annual Mean PM₁₀ Concentrations

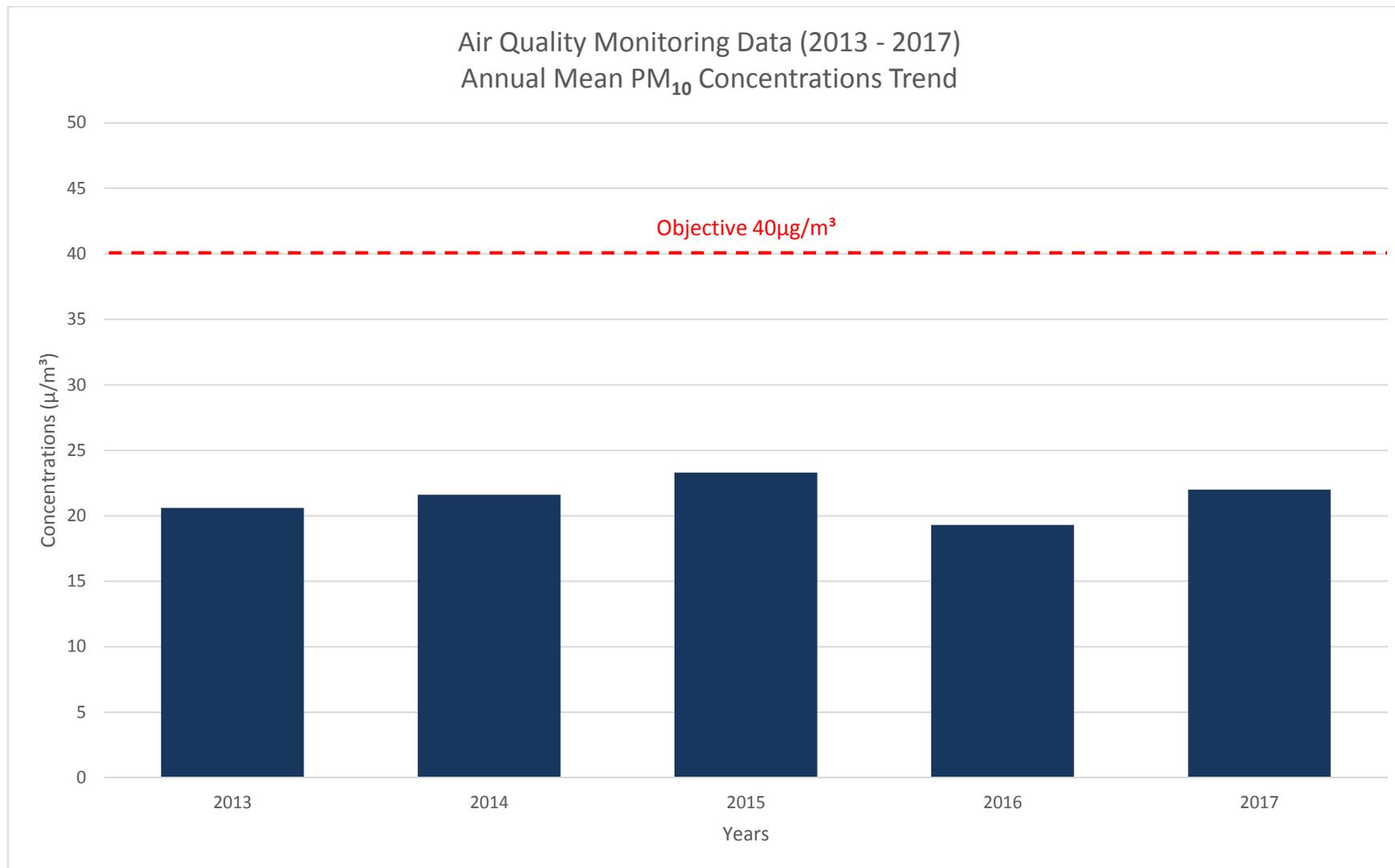


Table A.6 – 24-Hour Mean PM₁₀ Monitoring

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	PM ₁₀ 24-Hour Means > 50µg/m ³ ⁽³⁾				
				2013	2014	2015	2016	2017
HT1	Roadside	96	96	0	0	3	3	4

Notes:

Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

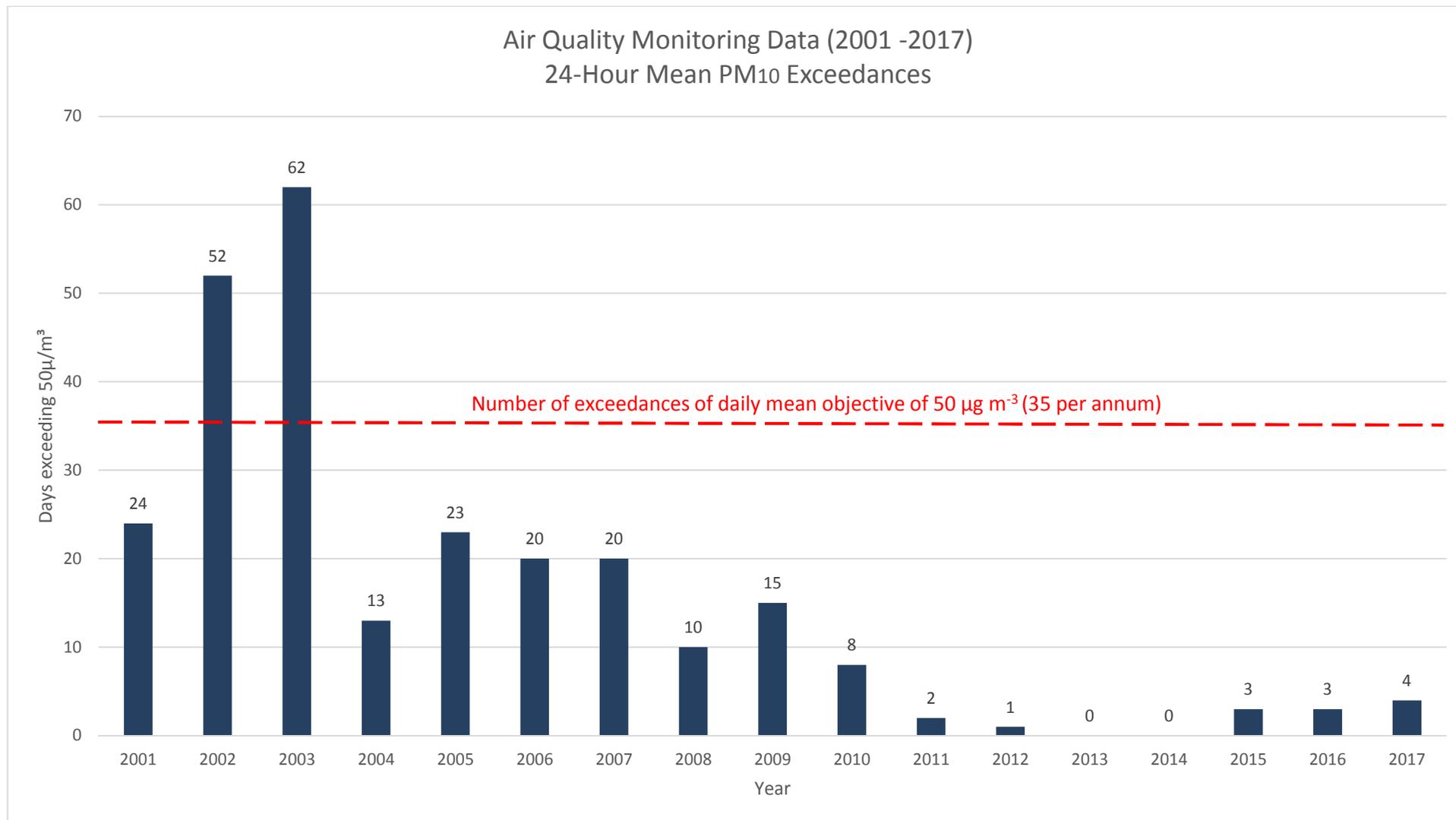
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year. Please note that at the time of writing this ASR, the 2017 data has been ratified until November 2017, therefore the December 2017 results are still provisional.

(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 90.4th percentile of 24-hour means is provided in brackets.

Please note that at the time of writing this ASR, the 2017 data has been ratified until November 2017, therefore the December 2017 results are still provisional.

Figure A.3 – Trends in Number of 24-Hour Mean PM₁₀ Results >50µg/m³



Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO₂ Monthly Diffusion Tube Results – 2017

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.89) ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
1	35.6	27.5	27.0	23.1	21.0	21.4	19.5	20.0	23.8	25.7	31.6	28.5	25.4	22.6	21.1
2	39.7	25.5	31.5	27.0	28.1	23.5	21.8	23.2	24.8	24.3	33.2	28.3	27.6	24.5	20.1
3	27.1	19.1	20.0	14.5	16.0	14.5	12.7	13.4	15.5	16.2	21.65	18.5	17.4	15.5	-
4	41.1	29.1	missing	24.0	29.2	28.3	23.4	26.7	26.0	24.4	29.02	26.05	27.9	24.8	-
5	44.4	33.8	34.6	31.6	28.2	29.3	27.3	27.9	30.2	30.7	34.17	33.0	32.1	28.6	19.5
6	55.9	36.4	45.3	43.2	41.6	43.3	38.2	missing	34.7	32.9	40.1	38.5	40.9	36.4	23.3
7	56.9	39.1	47.2	40.9	41.6	41.5	31.7	33.5	38.8	33.4	46.09	41.5	41.0	36.5	35.7
8	40.1	29.8	37.4	29.1	31.7	missing	28.3	31.0	31.9	29.2	30.4	29.8	31.7	28.2	26.1
9	53.2	34.9	42.7	43.7	39.7	39.8	30.5	32.9	36.8	34.9	41.94	41.5	39.4	35.0	31.6
10	41.0	29.8	33.4	33.5	29.4	28.1	missing	24.8	26.0	26.7	34.27	30.0	30.6	27.3	24.9
11	40.95	29.5	35.8	33.3	22.7	missing	17.1	22.1	24.4	31.8	25.84	30.2	27.3	24.3	18.5
12	40.6	27.7	27.0	24.0	25.8	25.6	20.5	22.7	23.4	missing	32.53	29.6	27.2	24.2	16.0
13	54.8	37.1	45.2	38.3	30.5	34.9	32.1	35.6	37.4	38.6	70.91	40.3	41.3	36.8	35.2
14	49.3	32.1	40.5	27.0	28.1	30.1	26.8	31.3	32.3	28.6	46.93	36.7	34.1	30.4	29.2

National bias adjustment factor used

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure. The distance corrected annual mean is only required if the location is not relevant to public exposure and meets the criteria specified in para 7.78 of TG16.

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

QA/QC of automatic monitoring data

The site is part of the Sussex Air Quality Network; hence the standards of QA/QC are similar to those of the government's Automatic Urban and Rural Network (AURN) sites. The calibrations and filter change data are sent to the Environmental Research Group (ERG) at Kings College, London on a fortnightly basis.

The ERG collect data from the instruments on a daily basis, verifying the data against other monitoring stations in the south-east and ratifying it using the calibration information supplied. The Local Site Operations (LSO) duties are carried out by trained officers from the Council.

Diffusion Tube Bias Adjustment Factors

Diffusion tubes may systematically under or over-read NO₂ concentrations when compared to the reference chemiluminescence analyser. This is described as bias and can be corrected to improve the accuracy of the diffusion tube results, using a suitable bias adjustment factor. Hastings Borough Council's diffusion tubes are prepared and analysed by Gradko using the 20% TEA in water method. This laboratory takes part in the QA/QC Field Intercomparison, operated on behalf of DEFRA.

The diffusion tube national adjustment factor spreadsheet is shown in Figure C.1 below. **The national adjustment factor derived from the spreadsheet was 0.89 for 2017.**

Figure C.1– The diffusion tube national adjustment factor spreadsheet (2017) (Version 03/18)

National Diffusion Tube Bias Adjustment Factor Spreadsheet						Spreadsheet Version Number: 03/18				
Follow the steps below in the correct order to show the results of relevant co-location studies						This spreadsheet will be updated at the end of June 2018				
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods						LAQM Helpdesk Website				
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet						Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.				
This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.										
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.										
Step 1:	Step 2:	Step 3:	Step 4:							
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor ⁵ shown in blue at the foot of the final column.							
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data.	If you have your own co-location study then see footnote ⁶ . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953							
Analysed By ¹	Method ² To indicate selection, please click on the paper-clip icon	Year ³ To indicate year selection, please click on (All)	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision ⁴	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2017	R	Bath & North East Somerset	12	45	45	-0.2%	G	1.00
Gradko	20% TEA in water	2017	R	NOTTINGHAM CITY COUNCIL	12	38	41	-6.6%	G	1.07
Gradko	20% TEA in water	2017	R	Lancaster City Council	12	35	32	9.7%	G	0.91
Gradko	20% TEA in water	2017	R	Thurrock Borough Council	12	54	52	3.3%	S	0.97
Gradko	20% TEA in water	2017	R	Thurrock Borough Council	11	35	33	7.0%	G	0.93
Gradko	20% TEA in water	2017	R	Thurrock Borough Council	9	33	29	14.3%	G	0.87
Gradko	20% TEA in water	2017	UB	Thurrock Borough Council	11	30	28	8.0%	S	0.93
Gradko	20% TEA in water	2017	R	Dudley MBC	12	50	50	0.0%	G	0.99
Gradko	20% TEA in water	2017	UB	Dudley MBC	12	24	19	26.6%	G	0.79
Gradko	20% TEA in water	2017	R	City of Lincoln Council	12	42	31	33.2%	G	0.75
Gradko	20% TEA in water	2017	R	Geedling Borough Council	12	35	31	10.1%	G	0.91
Gradko	20% TEA in water	2017	R	Gateshead Council	12	36	37	-2.7%	G	1.03
Gradko	20% TEA in water	2017	R	Gateshead Council	12	29	25	17.5%	G	0.85
Gradko	20% TEA in water	2017	R	Gateshead Council	12	34	35	-5.3%	G	1.06
Gradko	20% TEA in water	2017	R	LB Hounslow	12	65	54	22.2%	G	0.82
Gradko	20% TEA in water	2017	R	LB Hounslow	12	59	53	10.6%	G	0.90
Gradko	20% TEA in water	2017	B	LB Hounslow	11	28	30	-6.0%	G	1.06
Gradko	20% TEA in water	2017	R	LB Hounslow	11	43	34	28.8%	G	0.78
Gradko	20% TEA in water	2017	B	LB Hounslow	9	38	33	14.9%	G	0.87
Gradko	20% TEA in water	2017	R	LB Hounslow	11	52	42	24.4%	G	0.80
Gradko	20% TEA in water	2017	UB	Liverpool	11	20	17	15.2%	G	0.87
Gradko	20% TEA in water	2017	R	North Ayrshire Council	12	26	21	23.2%	G	0.81
Gradko	20% TEA in water	2017	R	South Gloucestershire Council	12	25	23	10.3%	G	0.91
Gradko	20% TEA in water	2017	KS	Marlyebone Road Intercomparison	12	101	79	28.6%	G	0.78
Gradko	20% TEA in water	2017		Overall Factor⁵ (34 studies)					Use	0.89

Annualisation of measurements

NO₂ diffusion tube measurements required no annualised correction as all measurement data was above 75%.

Distance correction for NO₂ measurements

Distance correction of NO₂ diffusion tube measurements used the NO₂ fall-off with distance calculator available on the LAQM website and discussed in Paragraphs 7.77-7.79 of LAQM.TG16. The spreadsheet is shown in Table C.1 below.

Background concentration concentrations were sourced from the Defra background 1km x 1km maps⁵.

Table B.1 presents the 2017 NO₂ diffusion tube measurements as distance corrected to the nearest exposure.

⁵ Background maps, available at: <https://uk-air.defra.gov.uk/data/laqm-background-home>

Table C.1 – The NO₂ fall off with distance from roads calculator (Version 4.2)

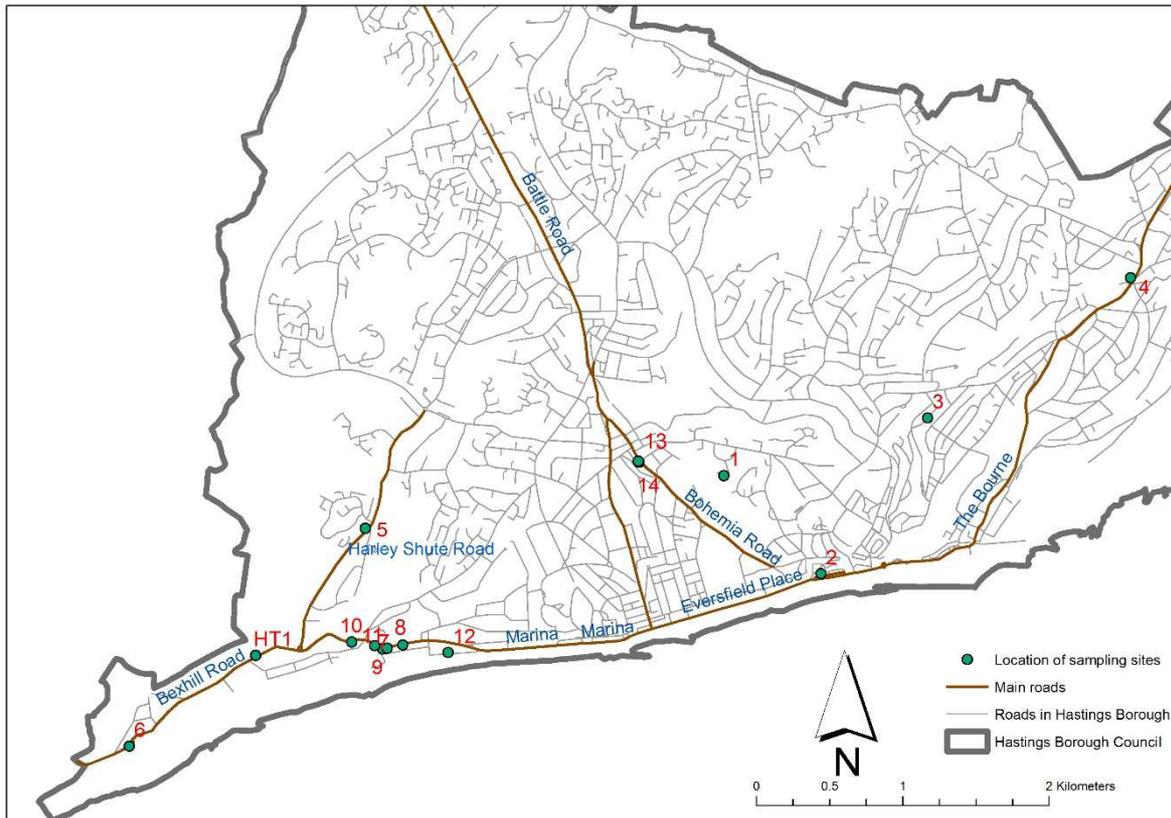


Enter data into the pink cells

Site Name/ID	Distance (m)		NO ₂ Annual Mean Concentration (µg/m ³)		
	Monitoring Site to Kerb	Receptor to Kerb	Background	Monitored at Site	Predicted at Receptor
St Luke's	1.0	2.0	12.0	22.6	21.1
Carlisle Place	1.0	6.0	12.4	24.5	20.1
Manor Road	10.0	10.0	11.1	15.5	15.5
Ore Chur/Old London Rd	2.0	2.0	10.5	24.8	24.8
Harley Shute	1.0	11.0	9.9	28.6	19.5
Bexhill Road "Boat"	1.5	16.5	11.4	36.4	23.3
81 Bexhill	1.5	1.7	9.0	36.5	35.7
45 Bexhill	2.8	4.3	9.0	28.2	26.1
71 Bexhill	0.5	1.0	9.0	35.0	31.6
138 Bexhill	2.0	3.5	9.0	27.3	24.9
Railway Bridge	3.0	13.0	9.0	24.3	18.5
West Marina	0.5	10.5	9.0	24.2	16.0
104 Bohemia Rd	1.5	2.0	11.4	36.8	35.2
116 Bohemia Rd	1.5	2.0	11.4	30.4	29.2

Appendix D: Map(s) of Monitoring Locations and AQMAs

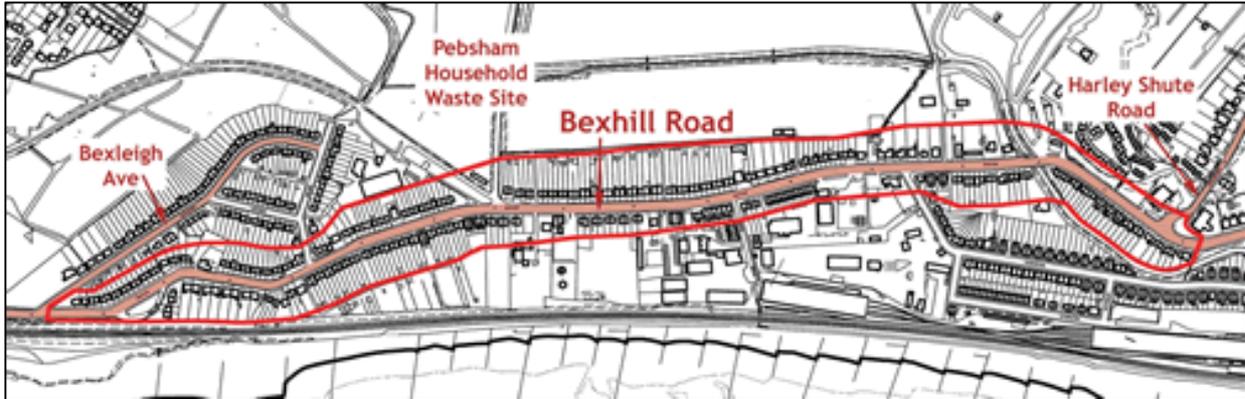
Figure D.1 – Monitoring locations adjacent to revoked AQMA 1 along Bexhill Road in Hastings.



Key:

Site ID	Location	Site ID	Location
HT1	Bulverhythe AQMS		
1	St Luke's Church, Alma Terrace	8	45 Bexhill Road
2	Carlisle Parade	9	71 Bexhill Rd
3	Manor Road	10	138 Bexhill Rd
4	Ore Church Old London Road	11	Railway Bridge
5	Harley Shute Road	12	West Marina/Grosvenor Gardens
6	Bexhill Road "Boat"	13	104 Bohemia Rd
7	81 Bexhill Road	14	116 Bohemia Rd

Figure D.2 – The extent of the now revoked AQMA 1 along Bexhill Road in Hastings.



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁶	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁶ The units are in micrograms of pollutant per cubic metre of air (µg/m³).

Appendix F: Revocation Order AQMA 1- Bulverhythe

HASTINGS BOROUGH COUNCIL

ORDER 2017

ENVIRONMENT ACT 1995 PART IV SECTION 83(2)(b)

ORDER REVOKING AN AIR QUALITY MANAGEMENT AREA

Hastings Borough Council, in exercise of the powers conferred upon it by Section 83(2)(b) of the Environment Act 1995, HEREBY makes the following order:-

1. This Order shall revoke the area known as **Hastings Air Quality Management Area [AQMA 1]** for particles (PM10) around the designated area incorporating the A259, Bulverhythe, Hastings as shown in the attached (original) map.
2. The Order shall come into force on 28th April 2017

The Common Seal of
Hastings Borough Council
was hereto affixed
in the presence of:



Dated *S. Adams*.....
20/3/2017

Glossary of Terms

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
AQMS	Air Quality Monitoring Station
ASR	Air quality Annual Status Report
AURN	Automatic Urban and Rural Network
Defra	Department for Environment, Food and Rural Affairs
ERG	Environmental Research Group
EU	European Union
LAQM	Local Air Quality Management
LSO	Local Site Operatives
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



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