2017 Air Quality Annual Status Report (ASR)

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

June 2017

Local Authority Officer	Melissa Bomford
Department	Environmental Health
Address	Lewes District Council (o/b Eastbourne BC), Southover House, Southover Road, Lewes, E Sussex, BN7 1AB
Telephone	01273 471600 x5428
E-mail	Melissa.bomford@lewes.gov.uk
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Executive Summary: Air Quality in Our Area

Air Quality in Eastbourne 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 billion[3]. Improving air quality can benefit those who may find their conditions are made worse through exposure to air pollution, for example people with heart or lung conditions. More information about the health effects of air pollution can be found at:

http://www.eastbourne.gov.uk/residents/pests-food-hygiene-and-pollution/pollution/air-quality/

All air quality objectives were met Eastbourne Borough Council in 2016 and there are currently no Air Quality Management Areas (AQMAs) declared within the local authority area. Road transport is the primary source of local air pollution with industrial sources only representing a small proportion of emissions of air pollutants.

Actions to Improve Air Quality

Eastbourne Borough Council has taken forward a number of initiatives during the current reporting year of 2016 in pursuit of improving local air quality. East Sussex County Council (ESCC) managed to secure funding to deliver cycling and walking projects, one of these areas being Eastbourne (See Section 2.2)

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[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

Conclusions and Priorities

In order to fulfil its goal in producing quantifiable outcomes to appropriate timescales Eastbourne Borough Council will work closely and in collaboration with all its delivery partners, for example - East Sussex County Council.

Local Engagement and How to Get Involved

The public can get more involved in helping to improve the environment in which we live:

- Instead of getting into your vehicle – could you catch a train or a bus? Could you cycle or walk instead? Not only does this give the added benefit of exercise but it can also improve general health and well-being.
- Use alternative routes to get from A to B. Instead of walking or cycling along a major road, use alternative quieter and less polluted routes.
- If you are waiting outside school to pick up children or you are parked up/stationery/waiting/loading or unloading your vehicle – turn the engine off!

Did you know?

Vehicle idling causes air pollution and engines should not be left running unnecessarily. Breathing polluted air is not only extremely unpleasant but is also detrimental to our health. Exhaust emissions contain a range of air pollutants such as carbon monoxide, nitrogen dioxide and particulate matter. Air quality is as important as exercise and diet for health. Reducing air pollutants can help reduce respiratory problems, heart disease, lung cancer and asthma attacks.

Turning off and restarting an engine after 1 minute causes less pollution then keeping the engine running. Idling wastes more fuel and therefore costs more money. Modern vehicle batteries need less engine running time to stay charged. It can take up to an hour for an engine to cool down, so turning off an engine but keeping the ignition and fan blowing will provide warm air for some time. Idling an engine will not keep a catalytic converter warm. They retain their heat for approximately 25 minutes after the engine is switched off. So cut engine, cut pollution!

- When buying a new or second hand vehicle/s consider newer cleaner models. Have a good look at the vehicles emission credentials before buying.

There are various organisations and clubs which offer help and advice on getting active, for example: Sustrans: http://www.sustrans.org.uk/what-you-can-do Bikeability: http://bikeability.org.uk/ programmes – involving schools and workplaces (cycling and walking activities).

Details, including local air quality monitoring data, annual air quality reports and the impact air quality may have on health can be found on the Sussex-air website. Sussex-air also runs the airAlert service providing warnings to people with respiratory and cardiovascular conditions, health professionals and carers in Sussex. The service is free to register/subscribe to and anyone can join. Alerts are sent direct to the airAlert app, email, mobile phone via text message or home phone. Sussex-air also provides a free coldAlert service – providing extreme cold weather warnings and information. Both airAlert and coldAlert are provided as a free service by the Sussex Air Quality Partnership and supported by the Public Health Bodies (East Sussex & West Sussex County Council). Further information can be found: www.sussex-air.net or telephone 01273 484337.

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1   Local Air Quality Management

This report provides an overview of air quality in Eastbourne Borough Council during 2016. 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 Eastbourne 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 Table E.1 in Appendix E.

2   Actions to Improve Air Quality

2.1 Air Quality Management Areas

As there is no exceedance or likely exceedance of an air quality objective within the borough council area, Eastbourne Borough Council is not required to have an Air Quality Management Area (AQMA).

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

Although air quality objectives are not exceeded in Eastbourne, we are required to report on strategies aimed at improving air quality. To achieve the best for Eastbourne's environment it was decided that a collaborative approach was required, thus, the Community Environment Partnership for Eastbourne (CEPE), an Environmental Strategy[4] was developed. It covers a host of topics and issues and actively encourages people to get involved. Some of the topics covered include: climate change, energy, waste and transport.

Transport aim by 2020 is to:

- Make Eastbourne a cycle town – most of the town is flat and is not too far to travel from one side to the other

- reduce carbon emissions by 40%

- have a network of EV charging points

- have a car club – so people can share the cost of transport

- have a quality bus partnership to ensure people have access to affordable and good public transport

Eastbourne Borough Council is also working in partnership with East Sussex County Council to improve local air quality. One of the main mechanisms to achieve this is through the Local Transport Plan (LTP3)[5]. An update on the Local Transport Plan is provided in the Second Implementation Plan (2016/2017 to 2020/2021) which can be

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[4] http://www.eastbourne.gov.uk/about-the-council/council-policies-plans-and-strategies/eastbourne-environment-strategy/

[5] https://www.eastsussex.gov.uk/roadsandtransport/localtransportplan/ltp3/downloadltp3

found at: https://consultation.eastsussex.gov.uk/economy-transport-environment/local-transport-plan-implementation-plan-2016-17-2/supporting_documents/Draft%20LTP_imp_plan_201617_202021%20.pdf

While air quality is no longer an explicit objective for the LTP, there will be co-benefits in terms of the measures designed to tackle climate change and improve quality of life.

A summary of the measures is provided below:

Hailsham/Polegate/Eastbourne Sustainable Transport Corridor

- Improvements to Hempstead Lane junction to alleviate traffic congestion on the A271 and Hailsham town centre
- Enhancements to Cuckoo trail cycle and pedestrian route to Eastbourne
- Improvements for all road users including public transport along the A2270 corridor into Eastbourne town centre
- Bus Corridor Improvements: A259, A2021

Eastbourne Town Centre Movement and Access package

The Town Centre Local Plan for Eastbourne aims to inform the transport measures to be prioritised and funding has been secured from the LEP to deliver improvements and access in and around the town. See website:

http://www.eastbourne.gov.uk/_resources/assets/inline/full/0/223510.pdf

The Eastbourne Town Centre Movement and Access package includes:

- Terminus Road – improvements to bus infrastructure, pedestrian access, cycling access and public realm operation of the town centre
- Review of town centre Ring Road and wider movement/access into and around the town centre

East Sussex County Council (ESCC) managed to bid successfully from the *Active Access for Growth Programme,* gaining funding on delivery of cycling and walking initiatives. The key objectives of this are:

- Improve access to jobs, skills, training and education
- Seek to grow the economy by boosting levels of cycling and walking

- Demonstrate an alignment to health, air quality and reduced vehicle emissions

A few of the 'menu' initiatives include: East Sussex Cycle Hubs – Bikeability Plus Services, use of sustainable travel apps and other technology, Living Streets – active travel maps, Sustrans – active steps scheme and South Downs National Park – led walks and rides.

During the 2016/17 period there have been various cycling and walking schemes in the design phase with design and construction planned for 2017/18. For example:

Cycling

- Horsey Cycleway Phase 1b - a shared pedestrian/cycle route in Ashford Rd

- Langney cycle route – dedicated and signed on-road cycle route from Langney to Sovereign Harbour

- Hospital cycle route from hospital to the town centre

Walking

The Arndale Centre in Eastbourne's Town Centre has been undergoing an £85 million new extension development.

The proposals for the Town Centre have been designed around the concept of Shared Space which aims to improve pedestrian movement and comfort by reducing the dominance of motor vehicles and enable users to share the space.
Shared spaces encourage low vehicle speeds, create an environment in which pedestrians can walk, or stop and chat, without feeling intimidated by motor traffic. They also make it easier for people to move around and promote social interaction.

The key design objectives are to:
- Improve public realm and connections with wider town
- Reallocate road space to pedestrians and public realm
- Reduce conflict of buses and pedestrians
- Improve relationship and connection with railway station
- Retain accessibility and visibility of buses on Terminus Road
- Coordinate the design of street furniture and signage which will be finished to a high standard befitting a key gateway into the Town Centre.
- Future proof design to aid a potential expansion of the shared space concept

Measures are to be implemented to enable walking between key destinations, including residential areas, town centres, schools and employment.

There will be significant pedestrian and bus facility upgrades to Terminus Road and Cornfield Terrace area in association with the redevelopment of the Arndale Centre. Other schemes in the design phase 2016 with potential construction 2017/18 are provision of road crossings (Victoria Drive and near St Andrews School, Darley Rd) and some pedestrian safety improvements near Ocklynge School.

Other – potential improvements mentioned in the Local Transport Plan
- Improvements to bus infrastructure, waiting facilities and information distribution on key routes
- Improved access and presentation of real time information through all delivery channels
- Provision of secure cycle parking facilities at key locations across the area
- Electric vehicle charging points at town centre car parks, stations and key destinations
- ESCC will support and lobby for rail infrastructure and rail service improvements
- Bikeability cycle training
- Travel behaviour change initiatives

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 Eastbourne Borough Council is 4.4% (2015 data), very little change since the previous tears data of 4.3%. This information is available from the following web link:

http://www.phoutcomes.info/search/mortality%20attributable%20to%20particulate%20air%20pollution#pat/15/ati/6/par/E92000001

Figure 1 shows that the fraction of mortality attributable to particulate air pollution calculated for Eastbourne Borough Council is less than that calculated for south east England (4.7 %) and England (4.7 %) as a whole.

Indicator	Period	Eastbourne Count	Eastbourne Value	Region Value	England Value	England Worst/Lowest	England Range	England Best/Highest
3.01 - Fraction of mortality attributable to particulate air pollution	2015	-	4.4%	4.7%	4.7%	7.0%		2.9%

Site EB3 Holly Place monitors for PM$_{2.5}$. Data capture at this site was 74% during 2016, giving an annual mean of 12.7μg/m^3 (see revised figure in Appendix C) As per Technical Guidance (TG) 2016, Box 7.9 if data capture is below 75% then the annual mean needs to be annualised. (See Appendix C). TG16 can be found on:

https://laqm.defra.gov.uk/documents/LAQM-TG16-April-16-v1.pdf

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.

Eastbourne Borough Council undertook automatic (continuous) monitoring at two sites during 2016. Table A.1 in Appendix A shows the details of the sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. Sulphur dioxide is not monitored as there have been no significant changes to potential sources for many years. National monitoring results are available on the UK-AIR website:

https://uk-air.defra.gov.uk/data/data_selector

Eastbourne Borough Council has two continuous monitoring stations EB1 Devonshire Park and EB3 Holly Place (see Appendix A and D for details and locations). EB3 is part of the governments AURN (Automatic Urban and Rural Network) and continuously monitors NO, NO_2, NO_x, PM_{10} and $PM_{2.5}$. EB1 Devonshire Park, as reported in the Sussex Air Pollution Monitoring Network, Annual Report for 2015[6], the PM_{10} analyser was over-reading from October 2014 and throughout 2015. This site had no equipment service and maintenance cover so the fault could not be investigated or repaired. The NOx analyser suffered a fault during November 2014. As a result no automatic monitoring results were reported from this site in 2015. The site had continuing problems during 2016, with no relevant data collection. However Eastbourne Borough Council has managed to acquire funding for new analysers at the Devonshire Park site and they will be up and running sometime during 2017. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

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[6] Sussex Air Pollution Monitoring Network Annual Report, 2015, September 2016, Environmental Research Group, King's College London

3.1.2 Non-Automatic Monitoring Sites

Eastbourne Borough Council undertook non- automatic (passive) monitoring of NO_2 at 11 sites during 2016. 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) and bias adjustment for the diffusion tubes are included in Appendix C.

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of $40\mu g/m^3$ (shows data for both automatic and non-automatic sites)

Figure 2 shows the annual average NO_2 concentrations measured at the automatic monitoring sites from 2012-2016. While concentrations have shown a gradual decline over 4 years at Holly Place, a small increase is shown in 2016 (although this figure has been annualised, as data capture rate was 74%. If over 75% the data would not have required annualising, so caution should be noted on this result). The annual average concentrations are well below the annual objective of $40\mu g/m^3$. Unfortunately the last 2 years of data has not been valid from the Devonshire Park automatic site for a variety of reasons.

Figure 2: Annual average NO_2 concentrations measured at automatic monitoring sites in Eastbourne from 2012-2016
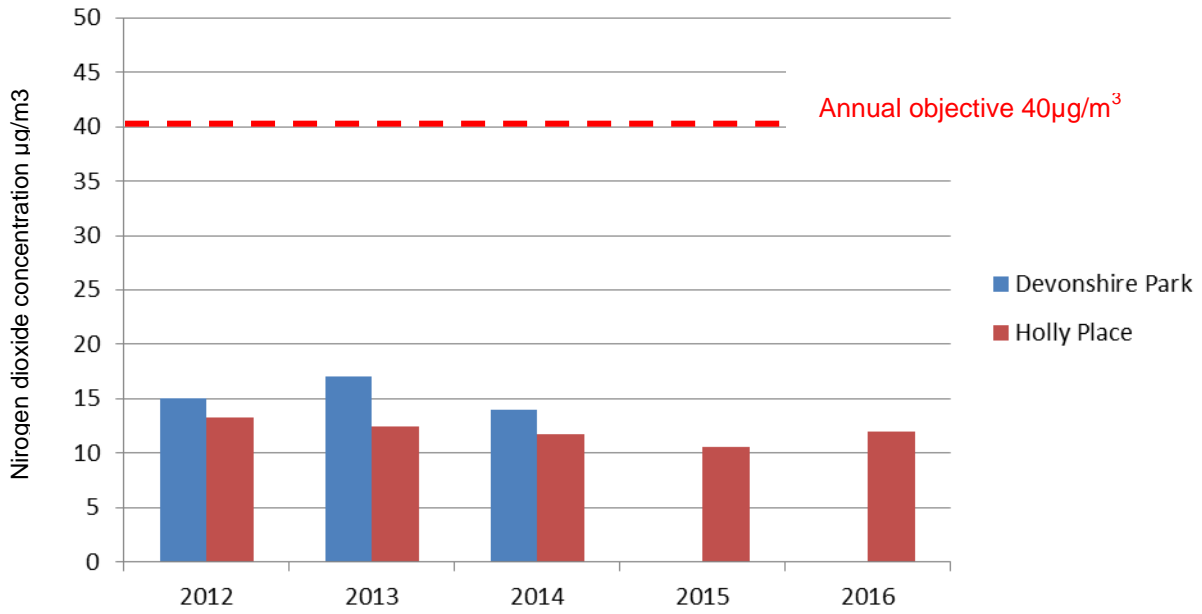
Figure 3: Annual average NO_2 concentrations measured at diffusion tube monitoring sites in Eastbourne from 2012-2016
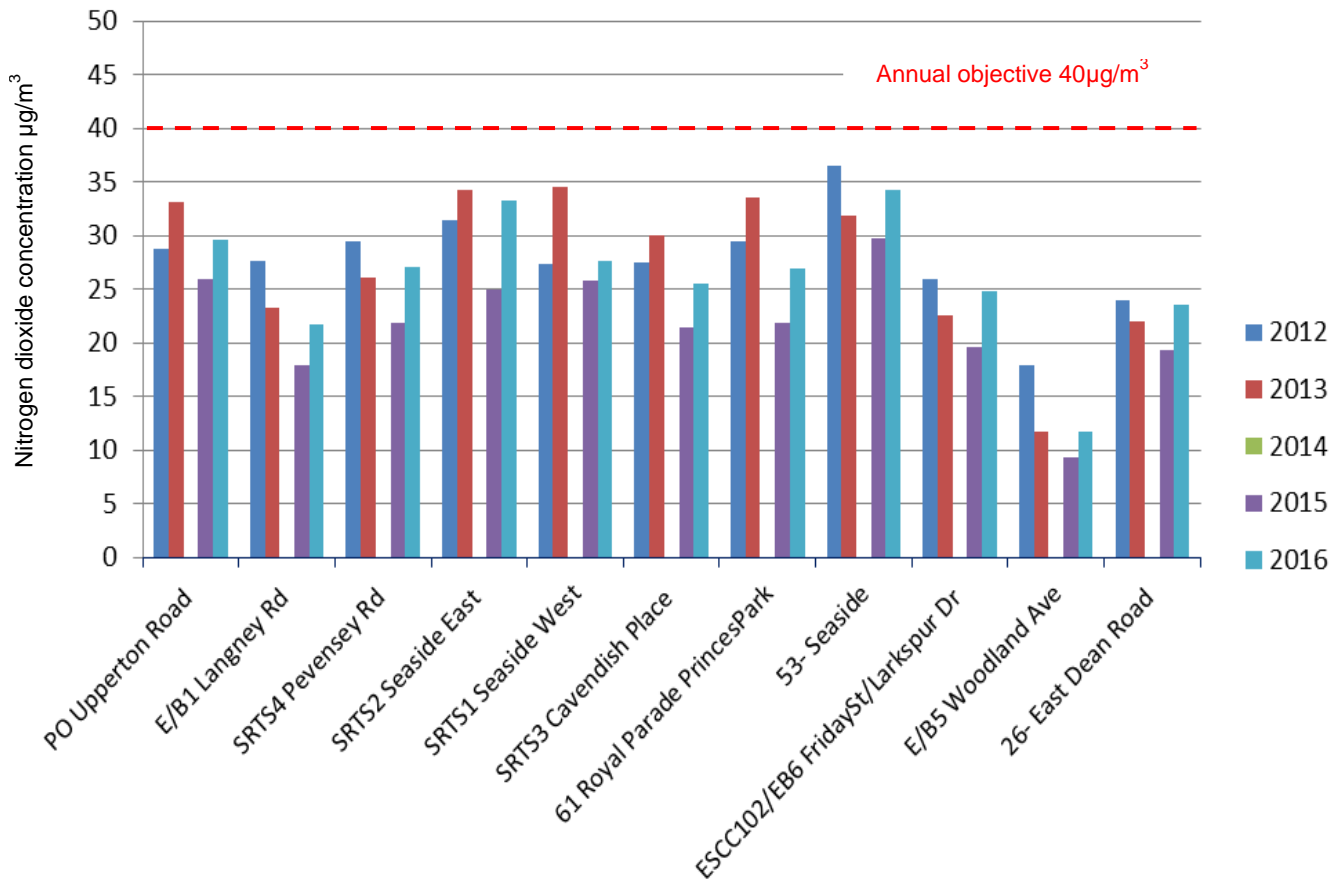

Figure 3 demonstrates that all 11 diffusion tube sites measuring nitrogen dioxide had concentrations below the annual objective of $40\mu g/m^3$. There is no diffusion tube data for the year 2014 as tubes were being vandalised.

The highest reading was recorded at 53 Seaside with $34 \mu g/m^3$, followed by Seaside East, with $33 \mu g/m^3$. Tube readings showed a slight increase this year at all sites, however there has been a great deal of major regeneration/building works in Eastbourne which may have affected tube readings during 2016.

For diffusion tubes, the full 2016 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of $200 \mu g\ m^{-3}$, not to be exceeded more than 18 times per year. There were no exceedance of the hourly objective of $200 \mu g\ m^{-3}$ since monitoring began at these sites

3.2.2   Particulate Matter (PM$_{10}$)

Table A.5 in Appendix A compares the ratified and adjusted monitored PM$_{10}$ annual mean concentrations at the automatic monitoring stations for the past 5 years with the air quality objective of 40µg/m^3.

Figure 4 shows the annual mean concentration has remained significantly below the annual objective at both sites. There was no PM$_{10}$ reported for the Devonshire Park site during 2015 and 2016 as the analyser was not providing valid data.
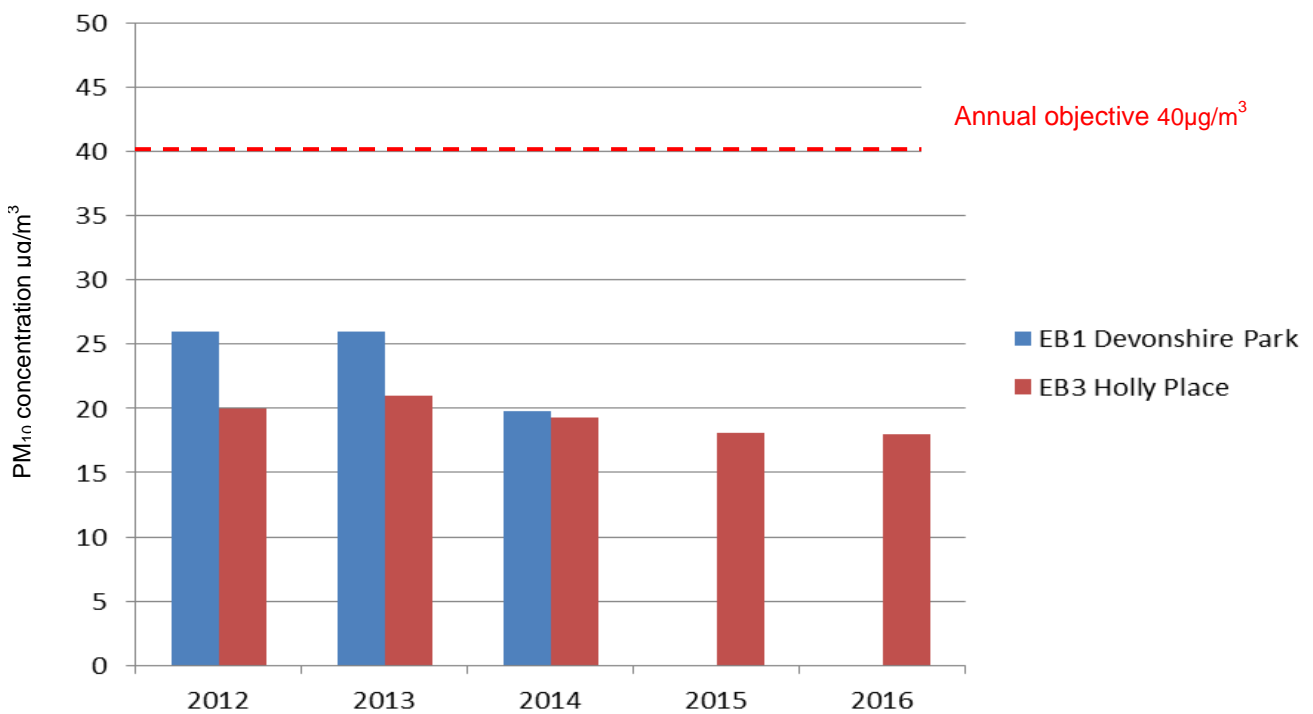
Although data is missing for Devonshire Park, the general trend appears to be showing a decrease in concentration of PM$_{10}$

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of $50\mu g/m^3$, not to be exceeded more than 35 times per year.

Figure 5: Number of exceedances of the $50\mu g/m^3$ daily average at Devonshire Park and Holly Place
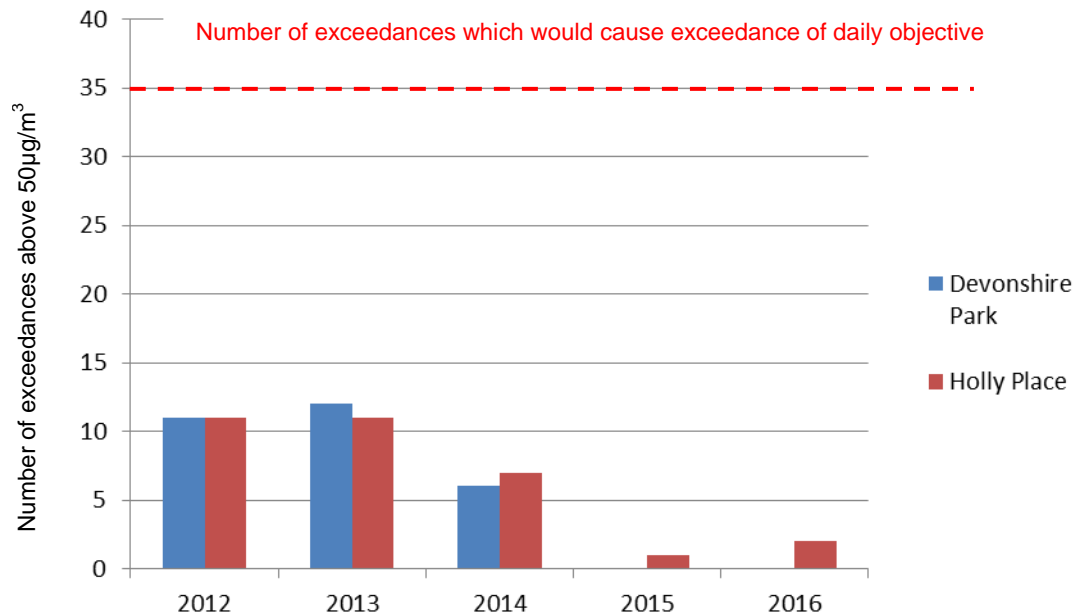

3.2.3   Particulate Matter ($PM_{2.5}$)

Table A.7 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past 5 years.

Holly Place is the only automatic monitoring station that monitors for $PM_{2.5}$ therefore there is no data from the Devonshire Park station.

Currently there is no annual objective in England for $PM_{2.5}$. The UK Air Quality Objectives and Pollutants - LAQM is worded as: *working towards reducing emissions/concentrations of fine particulate matter (PM _{2.5}).*

Figure 6: Shows annual mean PM$_{2.5}$ concentrations at Holly Place (automatic monitoring site) from 2012-2016

Holly Place

	2012	2013	2014	2015	2016
■ Holly Place	16	15	12.4	12.3	14.4

PM2.5 concentration µg/m3
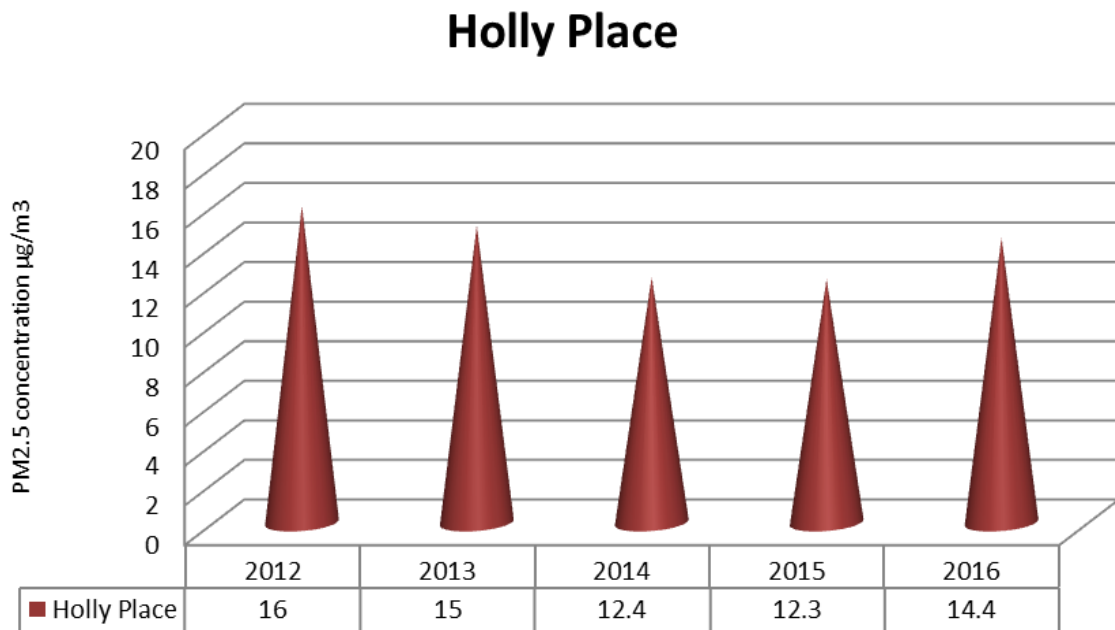
Note: 2015 and 2016 – annualised data used

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)
EB1	Devonshire Park	Urban background	561150	98341	PM_{10} $PM_{2.5}$ NO_2; O_3	N/A	TEOM FDMS Chemiluminescent; Ultraviolet (UV) photometry		5	
EB3	Holly Place	Urban background	560085	103118	PM_{10} $PM_{2.5}$ NO_2;	N/A	TEOM FDMS Chemiluminescent;		N/A	

(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	PO Upperton Road	Kerbside	560774	99163	NO_2	N/A	2	0	N	
2	E/B1 Langney Rd	Kerbside	561458	99116	NO_2	N/A	4	0	N	
3	SRTS4 Pevensey Rd	Kerbside	561568	99108	NO_2	N/A	3	0	N	
4	SRTS2 Seaside East	Kerbside	561717	99061	NO_2	N/A	3	0	Y	
5	SRTS1 Seaside West	Kerbside	561621	99004	NO_2	N/A	3	0	N	
6	SRTS3 Cavendish Place	Kerbside	561737	98948	NO_2	N/A	3	0	N	
7	61 Royal Parade PrincesPark	Kerbside	562692	100149	NO_2	N/A	4	0	N	
8	53- Seaside	Kerbside	562655	100970	NO_2	N/A	10	0	N	
9	ESCC102/EB6 FridaySt/Larkspur Dr	Kerbside	561885	103847	NO_2	N/A	8	1	N	
10	E/B5 Woodland Ave	Urban Background	559392	102006	NO_2	N/A	N/A	0	N	
11	26- East Dean Road	Roadside	557829	98190	NO_2	N/A	200	3	N	

(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 2016 (%) [2]	NO_2 Annual Mean Concentration (µg/m³) [3]				
					2012	2013	2014	2015	2016
EB1 Devonshire Park	Urban Background	Automatic	0	0	15.1	17.1	14.0	No valid data	No Valid data
EB3 Holly Place	Urban Background	Automatic	99	99	13.3	12.5	12.1 (11.8) a	10.6	12
PO Upperton Rd	Kerbside	Diffusion Tube	100	100	28.8	33.2	N/A	25.9	29.6
E/B1 Langney Rd	Kerbside	Diffusion Tube	100	100	27.7	23.3	N/A	18.0	21.7
SRTS4 Pevensey Rd	Kerbside	Diffusion Tube	92	92	29.5	26.1	N/A	21.9	27.1
SRTS2 Seaside East	Kerbside	Diffusion Tube	100	100	31.5	34.3	N/A	25.0	33.3
SRTS1 Seaside West	Kerbside	Diffusion Tube	100	100	27.3	34.6	N/A	25.8	27.6
SRTS3 Cavendish Place	Kerbside	Diffusion Tube	100	100	27.5	30.1	N/A	21.5	25.6
61 Royal Parade Princes Park	Kerbside	Diffusion Tube	92	92	29.5	33.5	N/A	21.9	27.0
53 – Seaside (Tesco)	Kerbside	Diffusion Tube	92	92	36.5	31.8	N/A	29.7	34.3
ESCC102/EB6 Friday St/Larkspur Dr	Kerbside	Diffusion Tube	100	100	25.9	22.6	N/A	19.7	24.8
E/B5 Woodland Ave	Urban Background	Diffusion Tube	100	100	17.9	11.8	N/A	9.4	11.7
26 East Dean Rd	Roadside	Diffusion Tube	92	92	24.0	22.0	N/A	19.4	23.6

Notes: Exceedances of the NO_2 annual mean objective of 40µg/m³ are shown in **bold**.

NO_2 annual means exceeding 60µg/m³, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **<u>bold and underlined.</u>**

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

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means 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.

Data with an 'a' were annualised in previous USA's or Progress Reports

All 2016 data ratified for Holly Place

☒ Diffusion tube data has been bias corrected

Note: 2014 – invalid data for this year due to continual vandalism

Table A.4 – 1-Hour Mean NO$_2$ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2016 (%) [2]	NO$_2$ 1-Hour Means > 200µg/m^3 [3]				
					2012	2013	2014	2015	2016
EB1 Devonshire Park	Urban Background	Automatic	0	0	0	0	0	No valid data	No valid data
EB3 Holly Place	Urban Background	Automatic	99	99	0	0	0 (67.8)	0 (62)	0

Notes: Exceedances of the NO$_2$ 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold.**

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

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

2016 data is ratified

Table A.5 – Annual Mean PM$_{10}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2016 (%) [2]	PM$_{10}$ Annual Mean Concentration (µg/m^3) [3]				
				2012	2013	2014	2015	2016
EB1 Devonshire Park	Urban Background	N/A	N/A	26.0	26b	19.8b	No valid data	No valid data
EB3 Holly Place	Urban Background	95	95	20b	21b	19.3b	18.1	18

Notes: Exceedances of the PM$_{10}$ annual mean objective of 40µg/m^3 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.

Data with a 'b' were annualised in previous USA's or Progress Reports

Data for 2016 is ratified

Table A.6 – 24-Hour Mean PM$_{10}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2016 (%) [2]	PM$_{10}$ 24-Hour Means > 50µg/m^3 [3]				
				2012	2013	2014	2015	2016
EB1 Devonshire Park	Urban Background	N/A	N/A	11	12 (42.0)a	6 (32.9)a	No valid data	No valid data
EB3 Holly Place	Urban Background	95	95	11 (40.0)a	11 (41.0)a	7 (29.1)a	1 (26)	2

Notes: Exceedances of the PM$_{10}$ 24-hour mean objective (50µg/m^3 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[th] percentile of 24-hour means is provided in brackets.

Data with an 'a' were annualised in previous USA's or Progress reports

Data for 2016 is ratified

Table A.7 – PM$_{2.5}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2016 (%) [2]	PM$_{2.5}$ Annual Mean Concentration (µg/m^3) [3]				
				2012	2013	2014	2015	2016
EB3 Holly Place	Urban Background	74	74	16.0	15.0	12.4	10.4 (12.3)	12.7 (14.4)

(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. An annualised factor of 1.135 was derived for the 2016 annual mean concentration. Figure in bracket is the annualised figure

Data for 2106 is ratified

Appendix B: Full Monthly Diffusion Tube Results for 2016

Table B.1 – NO$_2$ Monthly Diffusion Tube Results - 2016

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 [1]
EBC09 Upperton Rd	31.47	29.94	31.61	34.58	36.33	27.74	26.07	30.02	25.98	30.36	37.86	35.55	31.5	29.6
EB1 Langney Rd	20.10	25.63	23.75	23.55	23.74	19	17.11	18.90	22.75	23.53	29.95	28.79	23.1	21.7
SRTS-4 Pevensey Rd		48.89	26.45	28.03	25.66	20.93	22.41	25.25	29.65	26.27	32.06	31.63	28.8	27.1
SRTS-2 Seaside Rd East	37.11	33.45	33.44	36.15	37.36	27.87	28.55	35.69	43.58	34.8	37.85	38.62	35.4	33.3
SRTS-1 Seaside Rd West	28.79	29.43	31.49	30.8	30.44	23.02	23.5	28.06	31.08	29.61	34.40	31.90	29.4	27.6
Cavendish Place	25.05	26.47	26.56	28.61	27.54	22.02	22.53	23.58	31.96	27.15	33.13	31.81	27.2	25.6
Royal Parade/Princes Park	28.03	26.72	28.43	28.87	31.46	20.55	26.69	29.34	29.64	30.00	35.66		28.7	27.0
53- Seaside/Tesco	36.48	38.38	35.63	35.21	37.29	29.58	31.11	36.70	43.23	37.86		39.5	36.5	34.3
Friday St/Larks Park Drive	27.51	26.96	26.35	27.04	23.3	18.38	22.46	23.97	28.76	29.98	32.42	28.86	26.3	24.8
EB-5 Woodland Ave	11.86	12.02	11.68	11.19	10.96	8.59	8.97	12.83	11.73	13.02	19.17	16.89	12.4	11.7

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 (1)
East Dean Rd	19.79	24.74	22.14	27.09	25.97	20.21	19.92	21.98	35.53	28.63		30.65	25.2	23.6

(1) See Appendix C for details on bias adjustment

Bias adjustment used: 0.94 for 2016

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

QC/QC of automatic monitoring

The continuous monitoring stations in Eastbourne Borough Council are managed by the Sussex Air Quality Partnership (https://www.sussex-air.net). All continuous monitoring activities are subject to the same quality assurance/quality control objectives set out in the AURN local site operator's manual. These procedures are:

- Overnight 24 hour IZS calibration checks (NO$_x$ analyser);
- Fortnightly manual zero/span calibration using certified cylinders (carried out by Council employees fully trained in LSO duties);
- Full data analysis and ratification by the Environmental Research Group at King's College London for Devonshire Park* and by Ricardo Energy & Environment for Holly Place;

Six monthly service visits and site audits

*Note: Devonshire Park has been out of action

QA/QC of diffusion tube monitoring

The Ambient, Indoor, Workplace Air and Stack Emissions Proficiency Testing Scheme (AIR PT)[7] is an independent analytical proficiency-testing scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). Defra and the Devolved Administrations advise that diffusion tubes used for LAQM should be obtained from laboratories that have demonstrated satisfactory performance in the AIR PT scheme. AIR NO$_2$ PT forms an integral part of the UK NO$_2$ Network's QA/QC, and is a useful tool in assessing the analytical performance of those laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM). In 2016 Gradko participated in the AIR PT programme, and obtained a 100% rating for the whole year (AIR PT rounds AR012, AR013, AR015, AR016 and AR018). Further information can be found on this link:

https://laqm.defra.gov.uk/assets/airptrounds7to18apr2015feb2017.pdf

National bias adjustment factor spreadsheet.

The diffusion tubes are supplied and analysed by Gradko utilising the 20 % triethanolamine (TEA) in water preparation method. A bias adjustment of 0.94 for the year 2016 (based on 21 studies) has been derived from the national bias adjustment calculator. The spreadsheet is shown below in Figure 7:

Spreadsheet can be downloaded from the link:
http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

An annualisation factor of 1.135 was used to scale the $PM_{2.5}$ at Holly Place (this was required as data capture was less than 75%. Data capture was 74% in this instance) This factor was derived from using $PM_{2.5}$ concentrations from two stations on the UK-AIR site: London Bexley and Portsmouth. Both are background sites and with data capture over 85% for 2016

The annual mean and the associated period mean concentrations (corresponding to when Holly Place had validated data) were then calculated. The average of the ratios gave 1.135. The values are illustrated in Figure 8 below

Site	PM2.5 Annual Mean µg/m^3 (A_m)	PM2.5 Period Mean µg/m^3 (P_m)	Ratio (A_m/P_m)
London Bexley	11	10.22	1.08
Portsmouth	12	10.11	1.19
			Average: 1.135

Appendix D: Map(s) of Monitoring Locations

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

| Pollutant | Air Quality Objective[7] | |
	Concentration	Measured as
Nitrogen Dioxide (NO₂)	200 µg/m³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m³	Annual mean
Particulate Matter (PM₁₀)	50 µg/m³, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m³	Annual mean
Sulphur Dioxide (SO₂)	350 µg/m³, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m³, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m³, not to be exceeded more than 35 times a year	15-minute mean

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[7] The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

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
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
…	…

References

[1]Environmental equity, air quality, socioeconomic status and respiratory health, 2010

[2] Defra. 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
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/197898/pb13912-airquality-abatement-cost-guide.pdf

[4]Eastbourne Environmental Strategy (2010 – 2013)
http://www.eastbourne.gov.uk/about-the-council/council-policies-plans-and-strategies/eastbourne-environment-strategy/

[5]East Sussex Transport Plan (LTP 3)
https://www.eastsussex.gov.uk/roadsandtransport/localtransportplan/ltp3/downloadltp3

[6]Sussex Air Pollution Monitoring Network Annual Report, 2015, September 2016, Environmental Research Group, King's College London

[7]Ambient, Indoor, Workplace Air and Stack Emissions Proficiency Testing Scheme (AIR PT)