2016 Air Quality Annual Status Report (ASR)

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

October 2016

Local Authority Officer	Linda Deacon
Department	Environmental Health
Address	Town Hall Bexhill on Sea East Sussex TN39 3JX
Telephone	01424 787333
E-mail	Linda.deacon@rother.gov.uk
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Prepared by: .....
Pietro Paolo Bertagnolio
Graduate Scientist

Checked by: .....
Alistair Thorpe
Principal Air Quality Scientist

Approved by: .....
Gareth Collins
Regional Director

Rev No	Comments	Checked by	Approved by	Date
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Sunley House, 4 Bedford Park, Croydon, Surrey. CR0 2AP
Telephone: 0870 905 0906 Website: http://www.aecom.com

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Executive Summary: Air Quality in Our Area

Air Quality in Rother

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 existing heart and lung conditions. There is also often a strong correlation with equalities issues, because areas of poor air quality often coincide with less affluent areas[1,2].

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

The District of Rother is the second-largest district in East Sussex, and one of the most rural districts in England. Road traffic is the dominant source of air pollution in the area, the major routes being the A21, the A28, the A265, the A258, the A27 and the A268. The main pollutants of concern with respect to road traffic are nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$). Currently, there are no areas in Rother where members of the public are exposed to levels of these pollutants in excess of the UK Air Quality Objectives.

Rother District Council manages local air quality in close collaboration with East Sussex County Council, which provided part of the monitoring until 2014, and with the Sussex Air Quality Partnership (Sussex Air). The partnership provides assistance to members and information to the public via its web-site with recent air quality data, news updates, educational resources, links and other services such as airAlert.

In recent years, local monitoring has identified elevated levels of NO_2 at three roadside locations (Rye South Undercliff, High St Flimwell and A2100 Beauport Park). NO_2 levels at these locations in 2013 and 2014 exceeded, or were close to exceeding the UK Air Quality Objective for annual mean NO_2. In 2015, all monitoring

[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

locations in the district achieved the objective, with concentrations lower than 40 µg/m^3.

PM_{10} is monitored in Rother at De La Warr Road, Bexhill, and in recent years concentrations have been consistently low (well below the UK annual mean objectives), with no significant increasing or decreasing tendency.

As in other suburban and rural areas of East Sussex, ozone (O_3) is of considerable concern. Ozone is monitored at Rye Harbour, where high levels have been monitored since 2011.

A large area of the countryside in the District is within the High Weald Area of Outstanding Natural Beauty (AONB). The impact of traffic-related air pollution on some of these areas has been assessed in past years. Current and future traffic flows are not expected to put the Pevensey Levels Special Area of Conservation (SAC) at risk from excessive nitrogen deposition.

Actions to Improve Air Quality

Rother District Council is helping the public to avoid the worst effects of O_3 pollution by monitoring O_3 levels at Rye Harbour, and informing the public of pollution events through the airAlert pollution warning service. This service is provided and maintained through the Sussex Air partnership. As of June 2016 the airAlert service had 805 registered subscribers, 35 of which are from the Rother District.

Rother District Council, together with Sussex Air, supports the Energise Network, an integrated network of electric charging points for vehicles. Charging points are now located across East and West Sussex, Kent, Surrey, Greater London and neighbouring counties.

Rother District Council contributes to the Air Quality and Emissions Mitigation Guidance for Sussex. The guidance supports the principles of the Sussex Air Quality Partnership to improve air quality across Sussex, encourage emissions reductions and improve the environment and health of the population. Other actions being implemented to improve public health include promoting active modes of transportation like walking, cycling and using public transport, as well as car clubs and car sharing.

Local Priorities and Challenges

The main challenge for air quality management in Rother is balancing population and business growth in the District with conservation of the natural habitats that constitute most of the District's territory. The majority of the countryside in the District is within the High Weald Area of Outstanding Natural Beauty (AONB). Rother District Council will address the challenges posed by air pollution by managing a sustainable level of development, especially close to protected sites such as Dungeness SAC and SPA.

Another challenge facing Rother District Council is the presence of pollutants such as O_3 that originate outside the District, and sometimes outside the country. Rother District Council will continue to protect public health by providing real-time O_3 measurements on the Sussex Air website and alerting the general public in advance of pollution events through the airAlert service.

How to Get Involved

Everyone concerned about air quality in Rother and the rest of Sussex can find real-time information on pollution levels on the Sussex Air website sussex-air.net. People are encouraged to sign up for advance warnings with the airAlert service at airalert.info. Warnings are provided by text or voice message, email, or using an Android or iOS app. The service is also available to schools and is a great way to get everyone engaged in thinking about the importance of air quality.

Drivers planning to replace their vehicles are encouraged to consider low and ultra-low emission vehicles, such as electric cars, plug-in hybrids and extended-range electric vehicles. The Energise Network provides members with access to more than 150 electric vehicle charging points across the South East. These include most local authority charge points in Kent, Surrey and Sussex, plus a number of Southern Rail fast chargers. For a map of the charging points and details on how to join, please visit energisenetwork.co.uk.

Table of Contents

List of Tables

List of Figures

1 Local Air Quality Management

This report provides an overview of air quality in Rother District during 2015. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Rother District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E. For reference, other relevant objectives from the UK Air Quality Strategy[4] have been included in Table E.2.

[4] Defra and Devolved Administrations (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1)

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Rother District currently does not have any AQMAs, because previous monitoring and modelling studies have not indicated any likelihood of the UK air quality objectives being exceeded.

Since Rother District Council has no AQMAs, no formal Air Quality Action Plan has been implemented for the District.

2.2 Progress and Impact of Measures to address Air Quality in Rother District

Rother District Council is a member of the Sussex Air Quality Partnership (Sussex Air), which produced an air quality strategic plan 2010 to 2015[5]. Rother District Council contributed to the development of this strategy, which aims to provide a consistent approach to air quality across a number of district councils.

This plan has 5 key objectives:

1. Provide advice and support and improve the expertise and knowledge base
2. Project development and implementation
3. Partnership working
4. Develop cross cutting work on health improvement, climate change, environment and transport
5. Communicate air quality issues and initiatives in Sussex.

Rother District Council has taken forward a number of measures during the current reporting year of 2015 in pursuit of improving local air quality and improving public awareness of air quality issues, in close collaboration with the Sussex Air Quality Partnership.

[5] Sussex Air Quality Partnership Air Quality Strategic Plan 2010 http://www.sussex-air.net/Reports/SAQP_Vision_Strategy_2015.pdf

Key completed measures are:

1. Website

   Rother District Council supports the Sussex Air Quality website (http://www.sussex-air.net), which provides access to air quality statistics and relevant local information and improves public awareness of air quality.

2. airAlert

   Rother District Council supports the airAlert air pollution warning service, offered by the Sussex Air Quality Partnership to vulnerable people, schools, health professionals and general public in Sussex. The airAlert service provides warnings based on ozone levels monitored within the Rother District at Rye Harbour. As of June 2016 the service had 805 registered subscribers, 35 of which are from the Rother District.

3. Local ozone monitoring

   High ozone levels can cause difficulty in breathing for vulnerable people with existing breathing or heart conditions. Rother District Council monitors ozone levels at the Rye Harbour rural monitoring station. Data from this station is available on the Sussex-Air website and feeds the airAlert service.

4. Guidance.

   Rother District Council contributed to the Air Quality and Emissions Mitigation Guidance for Sussex, first published in 2013 and updated in 2014. The guidance is helping to mitigate potential air quality impacts from developments across Sussex. It is also contributing to improving public health by promoting active modes of transportation like walking, cycling and using public transport, as well as car clubs and car sharing.

5. Energise Network.

   The Sussex Air Partnership manages the Energise Network, an integrated network of electric charging points for vehicles with regional coverage. Electric car charging points are now located across East and West Sussex, Kent, Surrey, Greater London and neighbouring counties.

6. Garden Bonfires.

   Rother District Council, in partnership with Wealden District Council, published in 2013 public-facing material discouraging the practice of burning garden waste, and encouraging sustainable alternatives such as composting and recycling.

Together with neighbouring local authorities, Rother District Council has been assessing the air quality impacts of new traffic and development on protected natural habitats and designated sites in the District, in particular the Pevensey Levels (Special Area of Conservation (SAC) and Ramsar site), the Dungeness SAC and the Dungeness to Pett Level Special Protection Area (SPA).

Key completed measures regarding protected habitats are:

1. Pevensey Levels Assessment

Rother District Council commissioned in 2009 a study[6] to assess the potential air quality impact on the Pevensey Levels of increases in traffic on the A259 associated with planned population growth up to 2026. The conclusion was that an increase in nitrogen deposition and NOx concentrations is likely, but these will still be below the Critical Levels set by the Habitats Directive[7], therefore there is unlikely to be a significant effect on the Ramsar site.

2. Dungeness Sites Protection

Rother District Council currently screens all business development applications in the Port of Rye for their potential to have adverse effects on the integrity of the Dungeness internationally-designated sites. The main focus is on traffic and shipping emissions, and where necessary, makes recommendations for mitigation measures to be implemented[8].

[6] Rother District Council, Hastings Borough Council. Wealden District Council and Eastbourne Borough Council (2009). Appropriate Assessment and Air Quality Local to the Pevensey Levels Ramsar Site. Available at: http://www.wealden.gov.uk/nmsruntime/saveasdialog.aspx?lID=14305&sID=5509

[7] EC Habitats Directive 1992, interpreted into British law by the Conservation (Natural Habitats &c) Regulations 1994 (as amended in 2007).

[8] Rother District Council (2014). Local Plan – Core Strategy. Adopted 29th September 2014.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Air Quality and Emissions Mitigation Guidance for Sussex	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Sussex Air Quality Partnership		2014		N/A		Completed	
2	Air Quality Strategic Plan 2010	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	Sussex Air Quality Partnership		2010 - 2015		N/A		Ongoing	
3	Sussex Air website	Public Information	Via the Internet	Sussex Air Quality Partnership				N/A		Ongoing	
4	airAlert	Public Information	Via other mechanisms	Sussex Air Quality Partnership			805 registered subscribers, 35 from Rother District	N/A		Ongoing	
5	Energise Network	Promoting Low Emission Transport	Procuring alternative refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Sussex Air Quality Partnership				N/A		Ongoing	
6	Garden Bonfires	Public Information	Via leaflets	Rother District Council		2013		N/A		Completed	

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 2.5 µm 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.

Rother District Council is taking the following measures to address $PM_{2.5}$:

- Supporting the Energise Network of electric vehicle charging points, together with the Sussex Air Quality Partnership;
- Requiring the assessment of $PM_{2.5}$ as part of Air Quality Assessments for planning applications.

Further measures will be considered in future years.

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

3.1 Summary of Monitoring Undertaken

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

3.1.1 Automatic Monitoring Sites

Automatic (continuous) monitoring within the Rother District was undertaken at two sites during 2015: De La Warr Road, Bexhill (monitoring NO_2 and PM_{10}) and Rye Harbour (monitoring O_3). Fine particulate matter ($PM_{2.5}$) is currently not monitored in the district. Table A.1 in Appendix A shows the details of the sites.

Both stations are part of the Sussex Air Quality Monitoring Network (SAQMN), managed on behalf of Sussex Air by King's College London Environmental Research Group (KCL-ERG). Regional monitoring results are available at www.sussex-air.net.

Data capture for 2015 was the following:

- De La Warr Road, Bexhill: 32% for NO_2, 24% for PM_{10}
- Rye Harbour: 0% for O_3

The Rye Harbour station was inoperative for all of 2015 due to instrument faults. The monitoring station is the responsibility of Sussex Air and a new analyser was installed in June 2016. The purchase of the new monitor has been jointly funded by Sussex Air and Rother District Council, with the on-going costs covered by Sussex Air and Rother District Council providing Local Site Operator support.

Maps showing the locations of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and maintained and how the data has been processed are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Rother District Council undertook non-automatic (passive) monitoring of NO_2 at 18 sites during 2015, using diffusion tubes. Table A.2 in Appendix A shows the details of the sites.

Most sites are classified as kerbside, with two (Battle Wellington Gardens and Rye Cinque Ports Street) classified as urban background. Until 2014, both Rother District Council and East Sussex County Council (ESCC) operated diffusion tubes in the district. All sites currently active are maintained by Rother District Council.

Data capture for 2015 was generally good; however, September and November data were missing for all diffusion tube sites. Four sites (A2100 Beauport Park, Rye Cinque Ports Street, Rye South Undercliff and A259 Bexhill-on-Sea) required "annualisation", as fewer than 8 months of valid data was collected.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC), bias adjustment and "annualisation" calculations for the diffusion tubes are included in Appendix C. The full 2015 dataset of monthly mean values for diffusion tubes is provided in Appendix B.

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 monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40 µg/m^3. The results indicate that the annual mean NO_2 concentrations at the De La Warr Road, Bexhill automatic monitoring site were well within the UK air quality objective (40 µg/m^3) in all years between 2011 and 2015. Due to the low data capture (32%), the result for 2015 should be viewed with caution.

None of the 18 diffusion tube sites exceeded the annual mean objective for NO_2 in 2015. The highest annual mean NO_2 concentration was 35.5 µg/m^3 at the kerbside site 3 - A2100 Beauport Park. The second-highest annual mean NO_2 concentration

was 34.3 µg/m^3 at the kerbside site 21 - Rye South Undercliff. This is the only location to have exceeded the annual mean objective in the period 2011-2015 (43.8 µg/m^3 in 2013).

Table A.4 in Appendix A compares the ratified monitored NO_2 hourly mean concentrations from the De La Warr Road, Bexhill continuous monitoring station with the 1-hour air quality objective of 200 µg/m^3, not to be exceeded more than 18 times per year. The De La Warr Road, Bexhill automatic monitoring site did not exceed the 200 µg/m^3 standard in 2015, nor was the standard exceeded in any year since 2011. The 2015 results should be treated with caution as the data capture was poor (32%). However, the 99.8th percentile of 1-hour NO_2 concentrations for 2015 was 100 µg/m^3, which is well below the 200 µg/m^3 objective level.

Diffusion tubes cannot provide hourly measurements of NO_2; however, the Defra Technical Guidance states that where annual mean NO_2 concentrations measured by diffusion tubes exceed 60 µg/m^3 there is a likelihood that the 1-hour objective may be exceeded. All of the annual mean NO_2 concentrations at diffusion tube monitoring locations between 2011 and 2015, inclusive, were well below 60 µg/m^3 and so the 1-hour objective is very unlikely to have been exceeded. The results indicate that the 1-hour NO_2 air quality objective is unlikely to be exceeded at any location in the district.

Figure 1 shows the trend in NO_2 concentrations monitored at the De La Warr Road, Bexhill automatic monitoring station between 2008 and 2015. The results indicate little variation in NO_2 concentrations from year to year (between 20 µg/m^3 and 27 µg/m^3), with a slight downward trend between 2012 and 2015. Concentrations have been well below the Air Quality Objective of 40 µg/m^3 in all years.

Figure 1: Trends in Annual Mean NO_2 Concentrations measured at Automatic Monitoring Sites

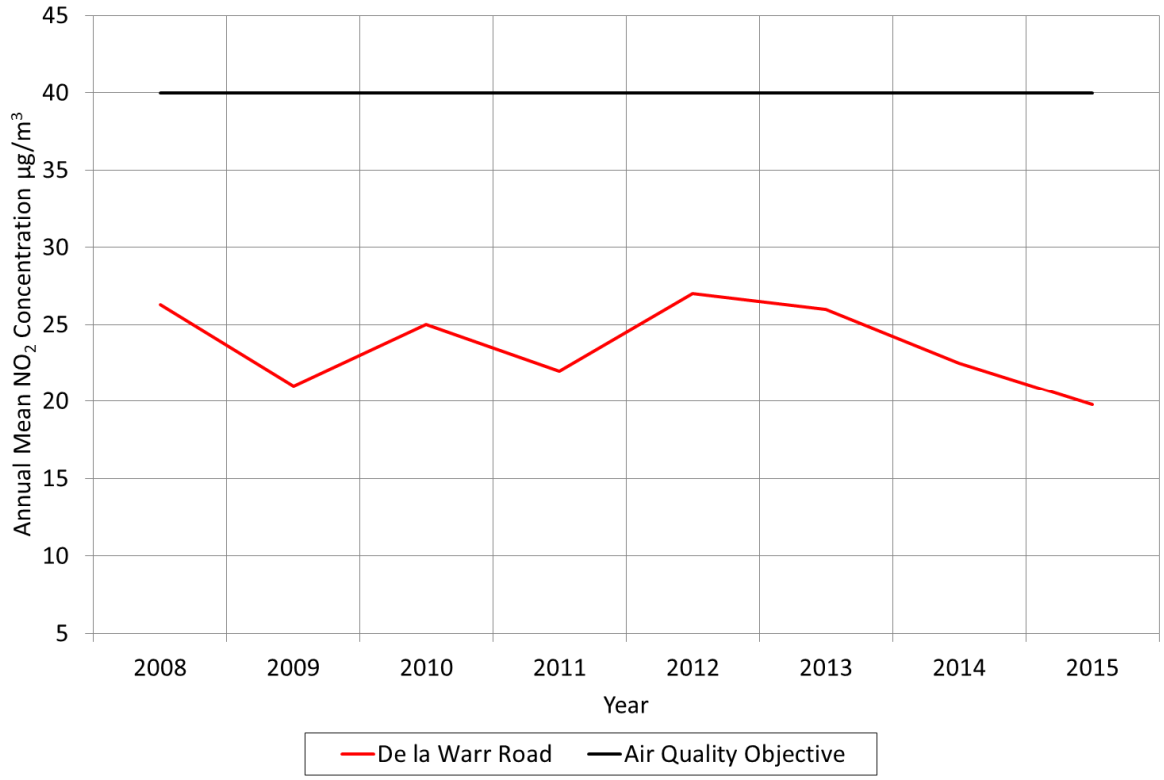
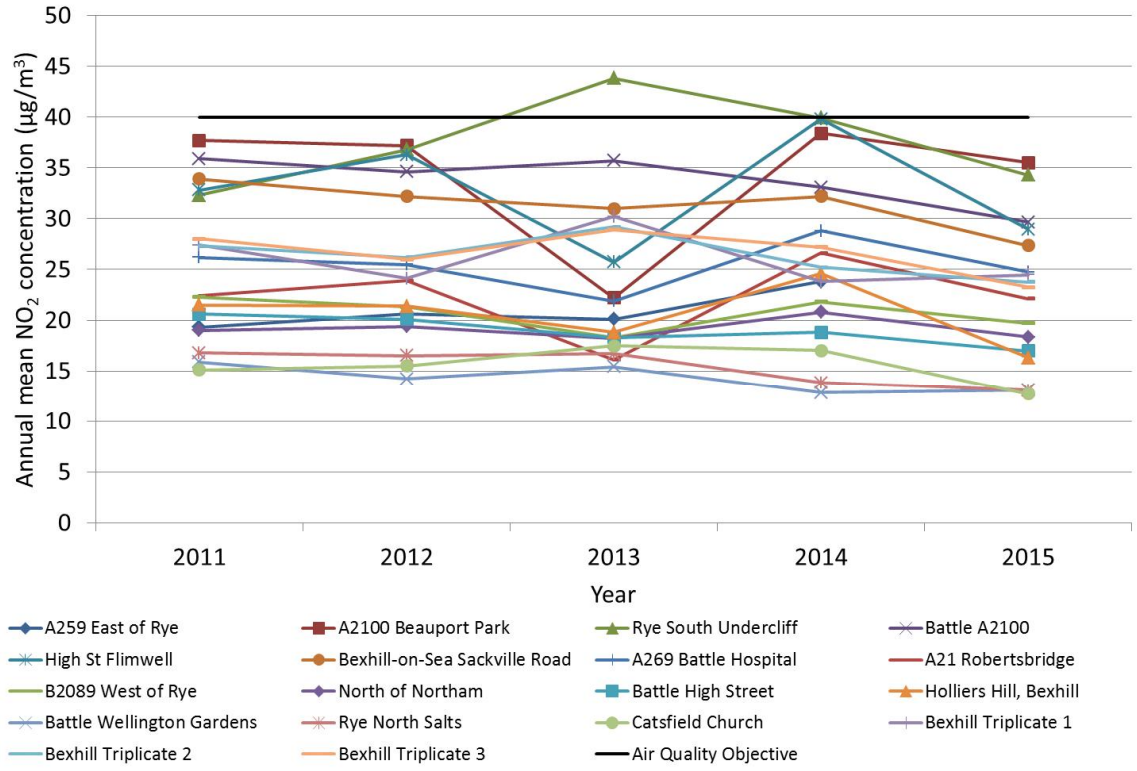


Figure 2 shows trends in annual mean NO_2 concentrations measured at the eighteen diffusion tube sites. A trend for gradually decreasing concentrations can be observed at most sites, despite considerable year-to-year variability.

Figure 2: Trends in Annual Mean NO_2 Concentrations measured at Diffusion Tube Monitoring Sites



3.2.2 Particulate Matter (PM_{10})

PM_{10} concentrations are monitored at the De La Warr Road, Bexhill site. Table A.5 in Appendix A compares the ratified, gravimetric-equivalent monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of 40 µg/m^3. The results indicate that annual mean PM_{10} concentrations were well below the UK air quality objective between 2011 and 2015. Due to the low data capture (24%), the 2015 result should be viewed with caution.

Figure 3**Error! Reference source not found.** shows the trend in annual mean PM_{10} concentrations. In the 2008 to 2015 period annual mean PM_{10} concentrations have varied between around 19 µg/m^3 to 25 µg/m^3, although there is little evidence of any upward or downward trend. Concentrations have been consistently well below the annual mean Air Quality Objective.

Figure 3: Trends in Annual Mean Particulate Matter (PM_{10}) Concentrations measured at Automatic Monitoring Sites

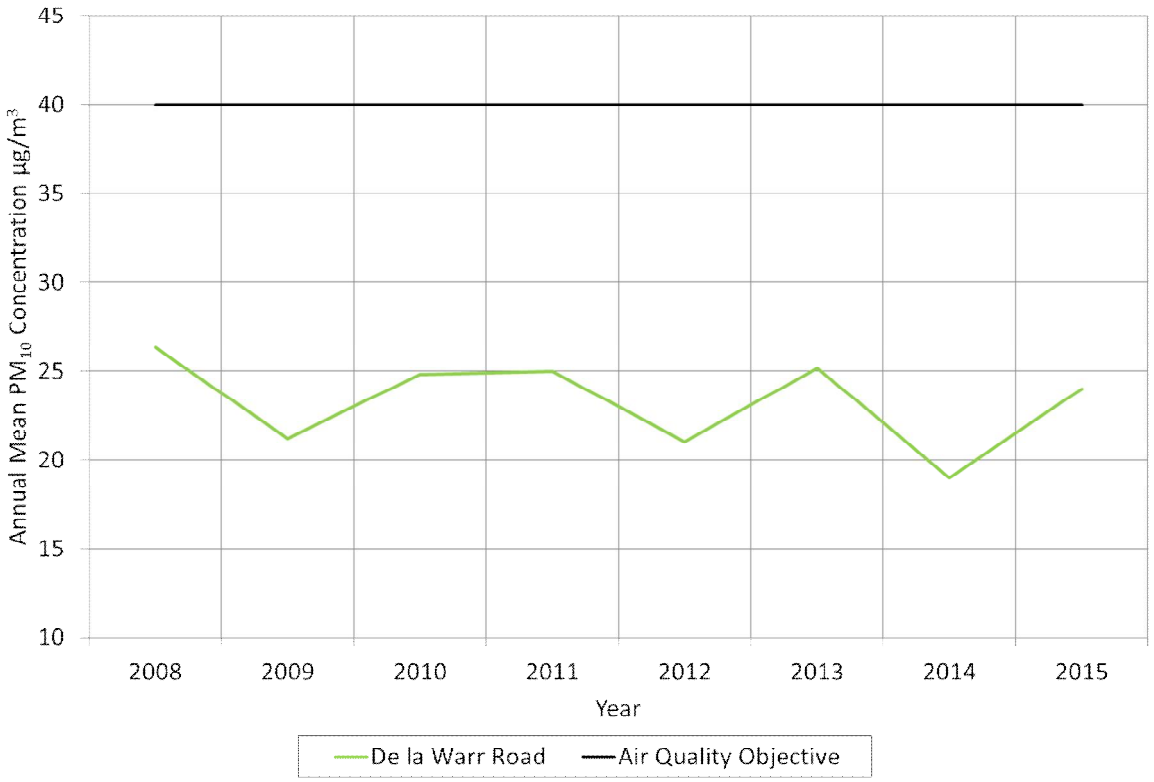


Table A.6 in Appendix A compares the ratified monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50 µg/m^3, not to be exceeded more than 35 times per year. These results show that the De La Warr Road site achieved the daily PM_{10} objective every year from 2011 to 2015. The result for 2015 should be viewed with caution due to the low data capture rate (24%). However, the 90.4th percentile of daily mean PM_{10} concentrations for 2015 was 33 µg/m^3, which is well below the objective level of 50 µg/m^3.

Based on the information gathered from the De La Warr Road site, it is expected that PM_{10} levels throughout the Rother district are likely to achieve the UK air quality objectives for annual and daily mean concentrations.

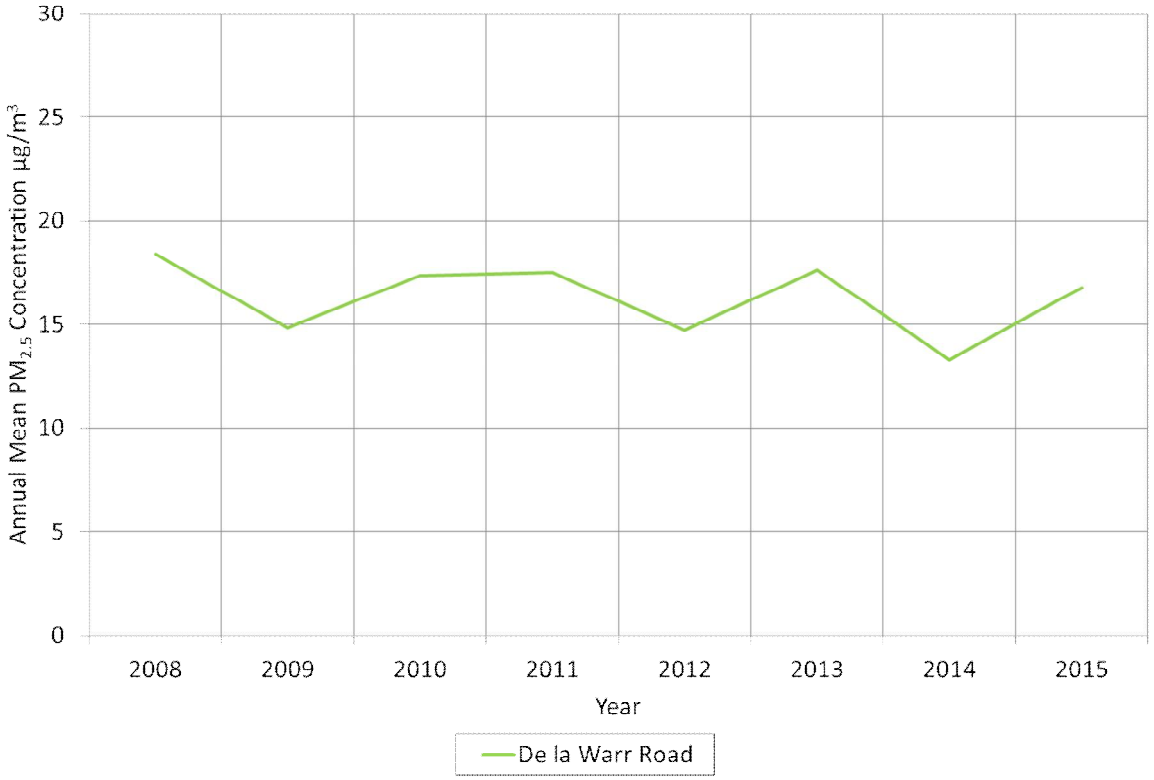
3.2.3 Particulate Matter ($PM_{2.5}$)

There is no $PM_{2.5}$ monitoring undertaken within Rother District. The PM_{10} annual average concentrations measured at the De La Warr Road site have been used to estimate $PM_{2.5}$ annual average concentrations by using the nationally-derived correction ratio of 0.7 suggested in Defra's Technical Guidance. Based on this assumption, between 2011 and 2015 the estimated annual mean $PM_{2.5}$

concentrations were in the range of 13 µg/m^3 to 18 µg/m^3 (see Table A.7 in Appendix A).

Figure 4 shows the trend in annual mean $PM_{2.5}$ concentrations. No clear trend is evident in the results between 2008 and 2015.

Figure 4: Trends in Annual Mean Particulate Matter ($PM_{2.5}$) Concentrations Estimated From PM_{10} Measurements



3.2.4 Sulphur Dioxide (SO_2)

There is no monitoring of sulphur dioxide within the district. Therefore, no results are presented in this section.

3.2.5 Ozone (O_3)

Table A.8 in Appendix A presents the ratified continuous monitored O_3 concentrations for the past 5 years at the Rye Harbour rural site. Due to low data capture during 2015 no results are presented for this period. Between 2011 and 2014, the annual mean O_3 concentrations ranged from 51 µg/m^3 to 57 µg/m^3. There is no annual mean objective or target value for annual mean O_3 concentration.

Figure 5 shows the trend in annual mean O_3 concentrations at the Rye Harbour monitoring station. No clear trend is evident in the results between 2011 and 2014.

Figure 5: Trends in Annual Mean O_3 Concentrations measured at Automatic Monitoring Sites

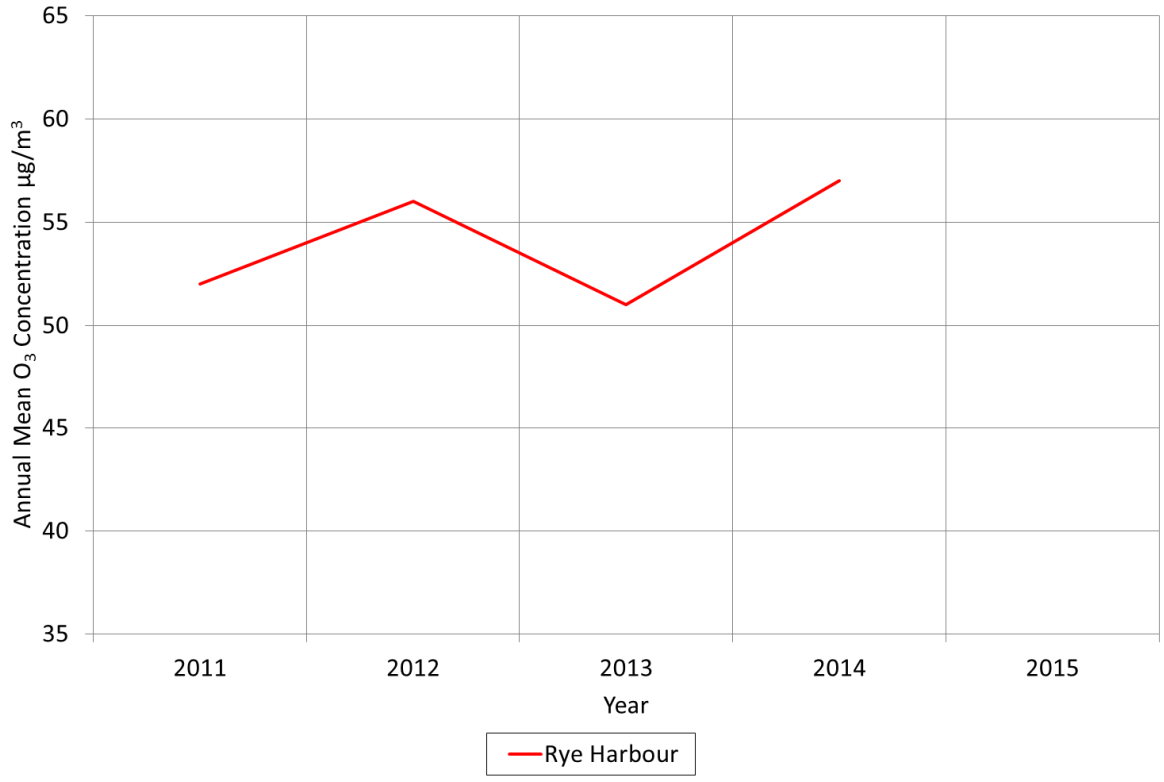


Table A.9 in Appendix A compares the ratified running 8-hour mean O_3 concentrations for the past 5 years with the UK Air Quality Objective of 100 µg/m^3, not to be exceeded on more than 10 days per year. The monitoring results show that the Rye Harbour site exceeded the O_3 objective from 2011 to 2013, but achieved the objective in 2014. The maximum recorded number of days above the standard was 24 days in 2012.

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)
RY1	Rye Harbour	Rural	594440	119150	O_3	N	UV Absorption	N/A	N/A	3.5
RY2	De La Warr Road	Roadside	575595	108054	NO_2, PM_{10}	N	Chemi-luminiscence	N (2m)	1m	2.02

(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)
2	North of Northam	Kerbside	583515	126517	NO_2	N	10	1	N	1.87
3	A2100 Beauport Park	Kerbside	577608	114083	NO_2	N	>150	1	N	1.83
4	A269 Battle Hospital	Kerbside	573071	115896	NO_2	N	40	1	N	2.10
5	B2089 West of Rye	Kerbside	590753	119799	NO_2	N	50	1	N	2.20
7	Holliers Hill, Bexhill	Kerbside	574296	108917	NO_2	N	10	1	N	2.38
8	Military Road, A259 Rye	Kerbside	591643	119138	NO_2	N	10	1	N	1.80
9	A21 Robertsbridge	Kerbside	574057	124328	NO_2	N	40	1	N	1.77
10	Catsfield Church	Kerbside	572823	113359	NO_2	N	15	1	N	2.06
12	High St Flimwell	Kerbside	571431	131224	NO_2	N	5	1	N	1.97

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)
13	Battle Wellington Gardens	Urban Background	574357	116222	NO_2	N	30	N/A	N	2.12
14	Battle A2100	Kerbside	574509	116846	NO_2	N	10	1	N	2.17
16	Battle High Street	Kerbside	574775	115925	NO_2	N	0	1	N	2.37
17	Rye North Salts	Urban Background	592339	120975	NO_2	N	15	1	N	2.14
19	Rye Cinque Ports Street	Urban Background	592121	120543	NO_2	N	8	N/A	N	2.10
21	Rye South Undercliff	Kerbside	591255	120273	NO_2	N	2	1	N	2.27
22	Bexhill-on-Sea Sackville Road	Kerbside	573985	107409	NO_2	N	2	1	N	2.06
25	A259 Bexhill-on-Sea	Kerbside	573871	108033	NO_2	N	20	1	N	2.06
27-29	Bexhill Triplicate	Kerbside	575595	108060	NO_2	N	15	1	Y	2.04

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2015 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2011	2012	2013	2014	2015
RY2	Roadside	Automatic	32	32	22.0	27.5	26.0	22.5	19.8
2	Kerbside	Diffusion Tube	83	83	19.0	19.4	18.2	20.8	18.4
3	Kerbside	Diffusion Tube	50	50	37.7	37.2	22.2	38.4	35.5
4	Kerbside	Diffusion Tube	83	83	26.2	25.5	21.9	28.8	24.8
5	Kerbside	Diffusion Tube	75	75	22.3	21.3	18.3	21.8	19.7
7	Kerbside	Diffusion Tube	75	75	21.5	21.4	18.8	24.6	16.3
8	Kerbside	Diffusion Tube	75	75	25.9	24.5	21.9	-	-
9	Kerbside	Diffusion Tube	83	83	22.4	23.9	16.1	26.6	22.1
10	Kerbside	Diffusion Tube	83	83	15.1	15.5	17.5	17.0	12.7
12	Kerbside	Diffusion Tube	83	83	32.8	36.3	25.7	39.8	29.0
13	Urban Background	Diffusion Tube	75	75	15.9	14.2	15.4	12.8	13.1
14	Kerbside	Diffusion Tube	83	83	35.9	34.6	35.7	33.1	29.6
16	Kerbside	Diffusion Tube	83	83	20.6	20.1	18.3	18.8	17.0
17	Urban Background	Diffusion Tube	83	83	16.8	16.5	16.7	13.8	13.0
19	Urban Background	Diffusion Tube	33	33	29.9	28.3	30.4	-	-

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2011	2012	2013	2014	2015
21	Kerbside	Diffusion Tube	67	67	32.3	36.8	**43.8**	39.9	34.3
22	Kerbside	Diffusion Tube	83	83	33.9	32.2	31.0	32.2	27.4
25	Kerbside	Diffusion Tube	58	58	37.5	37.3	38.8	-	-
27	Kerbside	Diffusion Tube (Triplicate)	75	75	27.4	24.1	30.2	23.8	24.5
28	Kerbside		83	83	27.3	26.2	29.2	25.2	23.8
29	Kerbside		83	83	28.0	26.0	28.9	27.2	23.2

Notes: Exceedances of the NO_2 annual mean objective of $40\mu g/m^3$ are shown in **bold**.

NO_2 annual means exceeding $60\mu g/m^3$, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

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

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

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

Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	NO_2 1-Hour Means > $200\mu g/m^3$ (3)				
					2011	2012	2013	2014	2015
RY2	Roadside	Automatic	32	32	0	0	0	0 (105)(3)	0 (100)(3)

Notes: Exceedances of the NO_2 1-hour mean objective ($200\mu g/m^3$ 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.

Table A.5 – Annual Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (3)				
				2011	2012	2013	2014	2015
RY2	Roadside	24	24	25	21	25	19(3)	24(3)

Notes: Exceedances of the PM_{10} annual mean objective of $40\mu g/m^3$ 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.

Table A.6 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	PM_{10} 24-Hour Means > $50\mu g/m^3$ (3)				
				2011	2012	2013	2014	2015
RY2	Roadside	24	24	12	8 (37)	7	0 (30)	2 (33)

Notes: Exceedances of the PM_{10} 24-hour mean objective ($50\mu g/m^3$ 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.

Table A.7 – $PM_{2.5}$ Estimated Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	$PM_{2.5}$ Annual Mean Concentration (µg/m^3) (3)				
				2011	2012	2013	2014	2015
RY2	Roadside	24	24	17.5	14.7	17.6	13.3	16.8

Notes: $PM_{2.5}$ annual mean concentrations have been estimated by multiplying the measured PM_{10} concentrations by the nationally derived correction ratio of 0.7.

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

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

(3) All means have been "annualised" as per Technical Guidance LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.8 – Annual Mean O_3 Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	O_3 Annual Mean Concentration (µg/m^3) (3)				
				2011	2012	2013	2014	2015
RY1	Rural	0	0	52	56	51	57	-

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

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

(3) All means have been "annualised" as per Technical Guidance LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.9 – Running 8-Hour Mean O_3 Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	Days With O_3 Running 8-Hour Means > 100µg/m^3				
				2011	2012	2013	2014	2015
RY1	Rural	0	0	**21**	**24**	**12**	2	-

Notes: Exceedances of the O_3 running 8-hour mean objective (100 µg/m^3 not to be exceeded more than 10 days/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%).

Appendix B: Full Monthly Diffusion Tube Results for 2015

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2015

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data (1)	Bias Adjusted (2)
2	25.5	21.6	27.9	41.9	18.2	12.0	16.2	16.5	-	11.0	-	18.1	20.9	18.4
3	47.0	47.2	46.1	-	-	-	52.1	47.1	-	40.3	-	-	**40.4**	35.5
4	34.6	30.0	30.5	24.7	26.1	27.3	27.8	32.3	-	24.6	-	23.3	28.1	24.8
5	26.4	23.8	25.8	23.2	20.1	19.5	21.5	21.1	-	-	-	19.9	22.4	19.7
7	20.0	22.7	-	17.6	16.3	15.8	14.8	17.4	-	23.5	-	18.8	18.5	16.3
8	23.4	27.0	25.1	-	20.4	20.8	20.6	23.0	-	22.9	-	20.0	22.6	19.9
9	27.3	29.8	30.3	19.0	21.3	22.7	20.8	28.3	-	33.7	-	18.0	25.1	22.1
10	18.1	16.5	16.6	11.8	11.8	12.7	12.4	13.4	-	15.6	-	15.2	14.4	12.7
12	36.7	36.2	45.0	13.7	30.4	29.7	25.1	39.3	-	45.5	-	27.5	32.9	29.0
13	18.3	14.3	16.2	29.4	9.7	11.0	10.2	10.7	-	-	-	14.2	14.9	13.1
14	34.6	33.7	37.1	37.2	30.8	30.5	31.7	36.1	-	34.3	-	30.9	33.7	29.6
16	24.9	20.8	20.7	26.3	15.9	15.8	16.0	17.1	-	16.4	-	18.8	19.3	17.0
17	18.3	15.7	17.4	17.4	11.5	11.0	13.3	13.3	-	15.5	-	14.6	14.8	13.0
19	-	-	-	-	-	22.5	-	29.0	-	29.2	-	12.4	25.5	22.4

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data (1)	Bias Adjusted (2)
21	48.4	-	47.8	24.5	38.0	34.8	39.4	46.8	-	45.1	-	-	39.0	34.3
22	36.9	39.0	34.9	38.0	24.3	27.9	23.5	31.9	-	30.8	-	23.9	31.1	27.4
25	-	39.3	39.7	30.7	30.9	-	15.7	36.5	-	-	-	26.9	31.4	27.7
27	32.7	31.6	33.0	27.1	-	29.7	20.1	26.6	-	29.1	-	20.5	27.8	24.5
28	31.7	33.1	33.9	26.0	21.1	26.3	21.4	26.7	-	30.4	-	19.8	27.0	23.8
29	31.3	31.3	31.6	25.5	22.1	23.1	21.5	24.7	-	32.8	-	20.3	26.4	23.2

(1) Annualised, if data capture for the year was less than 75%.

(2) See Appendix C for details on bias adjustment

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

Diffusion Tube Bias Adjustment Factors

Bias adjustment is effectively a calculated factor which shows whether diffusion tubes are over or under-reading ambient concentrations, thereby allowing a correction to be made.

Rother District Council has a co-location of triplicate diffusion tubes and an automatic continuous analyser at De La Warr Road; however, in 2015, data capture of the continuous analyser was not sufficient to allow a valid local bias adjustment factor to be derived. Therefore, the national database of bias adjustment factors (version 03/16) was used to select the appropriate bias adjustment factor. Figure 6 shows the national bias adjustment factor used in this report (Gradko, 20% TEA in water).

Figure 6: National Diffusion Tube Bias Adjustment Factor for Rother District Council.

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/16

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2016

LAQM Helpdesk Website

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.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

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[3] 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[2]	If you have your own co-location study then see footnote[4]. 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 (To undo your selection, choose (All) from the pop-up list)	Year[2] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2015	R	Ards and North Down Borough Council	12	38	26	48.6%	G	0.67
Gradko	20% TEA in water	2015	UC	Breckland Council	12	30	29	1.5%	G	0.99
Gradko	20% TEA in water	2015	R	Cheltenham Borough Council	12	35	35	2.7%	G	0.97
Gradko	20% TEA in water	2015	R	Lisburn & Castlereagh City Council	10	36	29	24.8%	G	0.80
Gradko	20% TEA in water	2015	R	Luton Borough Council	12	46	44	6.0%	G	0.94
Gradko	20% TEA in water	2015	R	Monmouthshire County Council	12	41	37	11.0%	G	0.90
Gradko	20% TEA in water	2015	B	Pembrokeshire Council	10	4	3	36.7%	G	0.73
Gradko	20% TEA in water	2015	R	City of Lincoln Council	12	39	33	17.9%	G	0.85
Gradko	20% TEA in water	2015	R	Borough Council of King's Lynn and West Norfolk	12	29	22	32.5%	G	0.75
Gradko	20% TEA in water	2015	R	Cheshire West and Chester	10	38	40	-5.2%	G	1.06
Gradko	20% TEA in water	2015	R	Dudley MBC	12	47	50	-5.9%	G	1.06
Gradko	20% TEA in water	2015	R	Dudley MBC	12	40	35	14.0%	G	0.88
Gradko	20% TEA in water	2015	R	Dudley MBC	12	34	31	10.0%	G	0.91
Gradko	20% TEA in water	2015	UB	Dudley MBC	11	23	19	20.9%	G	0.83
Gradko	20% TEA in water	2015	KS	Glasgow City Council	12	60	61	-0.9%	P	1.01
Gradko	20% TEA in water	2015	UB	Glasgow City Council	10	25	25	3.3%	P	0.97
Gradko	20% TEA in water	2015	R	Glasgow City Council	9	30	31	-2.8%	P	1.03
Gradko	20% TEA in water	2015	R	Glasgow City Council	12	43	38	14.0%	P	0.88
Gradko	20% TEA in water	2015	KS	Marylebone Road Intercomparison	12	102	81	26.2%	G	0.79
Gradko	20% TEA in water	2015	UB	Liverpool	12	20	22	-9.0%	G	1.10
Gradko	20% TEA in water	2015	R	Preston City Council	12	29	27	8.9%	G	0.92
Gradko	20% TEA in water	2015	R	Thurrock Borough Council	12	28	45	-37.1%	G	1.59
Gradko	20% TEA in water	2015	R	Gateshead Council	11	33	33	-0.8%	G	1.01
Gradko	20% TEA in water	2015	R	Gateshead Council	10	36	33	11.2%	G	0.90
Gradko	20% TEA in water	2015	R	Gateshead Council	12	28	25	9.2%	G	0.92
Gradko	20% TEA in water	2015	KS	New Forest DC	11	47	36	31.1%	P	0.76
Gradko	20% TEA in water	2015	R	New Forest DC	11	33	25	31.7%	G	0.76
Gradko	20% TEA in water	2015	R	Wokingham Borough Council	11	36	33	-69.0%	G	0.93
Gradko	20% TEA in water	2015	UC	Southampton City Council	12	28	29	-3.5%	G	1.04
Gradko	20% TEA in water	2015		**Overall Factor[3] (29 studies)**				Use		0.91

Discussion of Choice of Factor to Use

Rother District Council in 2015 had no means of deriving a valid local bias adjustment factor as there was insufficient data capture from the continuous analyser at De La Warr Road. Therefore, the national bias adjustment factor of 0.91 has been used.

PM Monitoring Adjustment

The PM_{10} data from the TEOM continuous analyser at De La Warr Road (RY2) has been corrected using the volatile correction model[9] (VCM) to ensure gravimetric equivalence.

Short-term to Long-term Data Adjustment

As data capture for the De La Warr Road, Bexhill continuous NO_2 analyser was 32% in 2015, period adjustment was carried out using data from three continuous NO_2 analysers in urban background sites in neighbouring local authorities: Eastbourne – Holly Place (EB3), Lewes – Denton Community Centre (LS6), and Brighton and Hove – Preston Park (BH0). The EB3 and LS6 analysers had 99% data capture and the BH0 analyser had 98% data capture. The period used in the adjustment calculation was 04/09/15 - 31/12/15. The average ratio of the annual mean to the period mean is the adjustment factor used. The details of this adjustment calculation are given in Table C.1.

Table C.1 – Period Adjustment of 2015 NO_2 Data for De La Warr Road, Bexhill (RY2) automatic monitoring site.

Site ID	Annual Mean Concentration (µg/m^3)	Period Mean Concentration (µg/m^3)	Annual Mean to Period Mean Ratio
EB3	10.6	10.2	1.04
LS6	10.2	9.7	1.05
BH0	14.6	13.8	1.06
Average Ratio			1.05

[9] King's College London Volatile Correction Model. Information available at: http://www.volatile-correction-model.info/

As data capture for the De La Warr Road, Bexhill continuous PM_{10} analyser was 24% in 2015, period adjustment was carried out using data from three continuous PM_{10} analysers in background sites within 75 miles: Thurrock (THUR), Reading – New Town (REA1), and Southampton Centre (SOUT), which had data capture rates of 98%, 94% and 90%, respectively. The period used in the adjustment calculation was 02/10/2015 - 31/12/2015. The average ratio of the annual mean to the period mean is the adjustment factor used. The details of this adjustment calculation are given in Table C.2.

Table C.2 – Period Adjustment of 2015 PM_{10} Data for De La Warr Road, Bexhill (RY2) automatic monitoring site.

Site ID	Annual Mean Concentration ($\mu g/m^3$)	Period Mean Concentration ($\mu g/m^3$)	Annual Mean to Period Mean Ratio
THUR	17.1	17.2	1.00
REA1	12.6	12.9	0.98
SOUT	16.5	18.1	0.91
Average Ratio			0.96

QA/QC of Automatic Monitoring

As previously described in Section 2.1, monitoring stations within East Sussex are part of the SAQMN and, therefore, measurements made at these sites are traceable to national standards and operational procedures defined for the regional network.

QA/QC of Diffusion Tube Monitoring

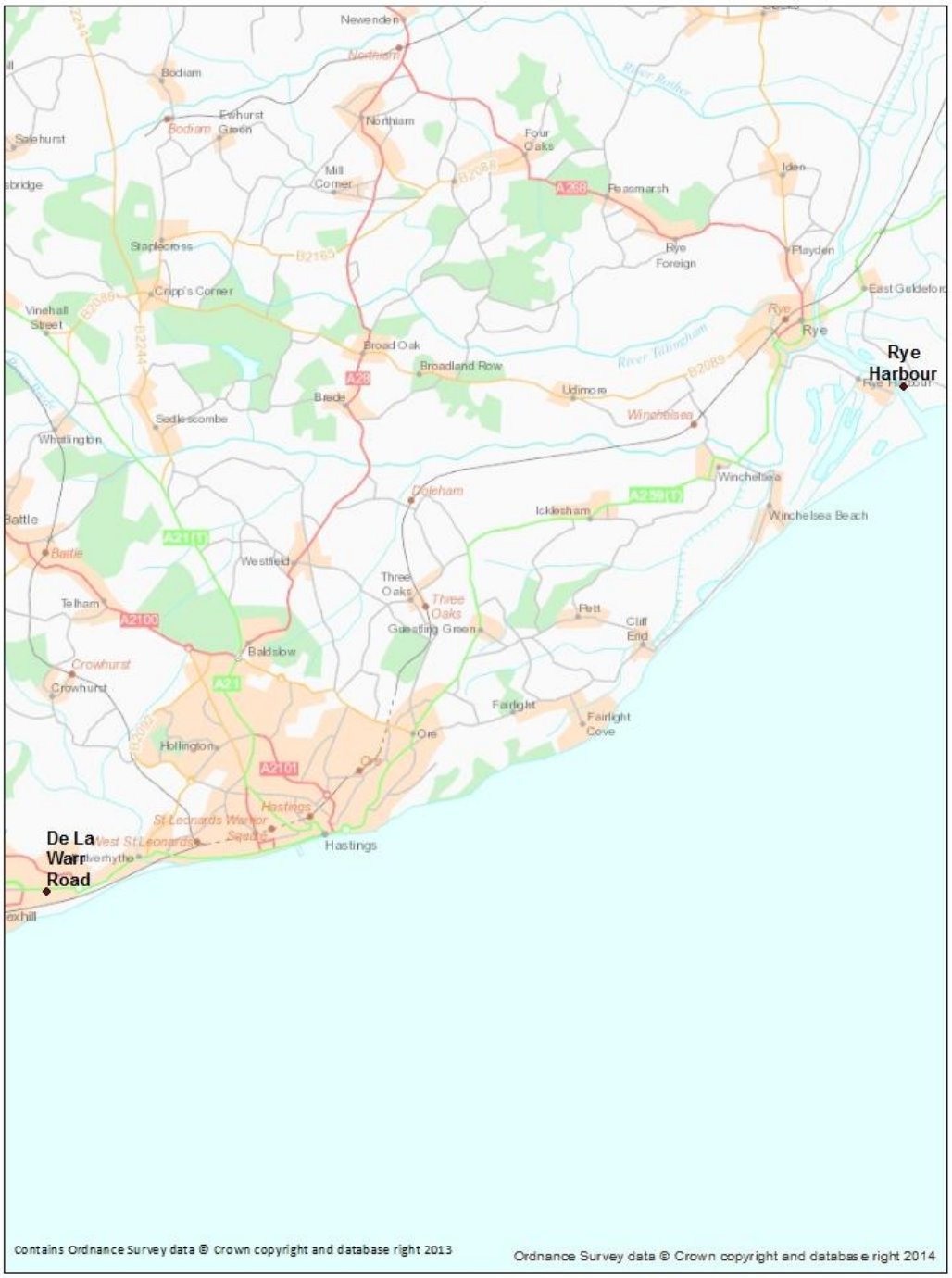
AIR is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR PT is a new scheme, started in April 2014, which combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL Workplace Analysis Scheme for Proficiency (WASP) PT scheme.

Defra and the Devolved Administrations advise that diffusion tubes used for Local Air Quality Management should be obtained from laboratories that have demonstrated satisfactory performance in the AIR PT scheme.

Rother District Council used Gradko International for diffusion tubes, with a 20% triethanolamine (TEA) in water preparation. In the 12 most recent AIR PT testing rounds, Gradko achieved 100% satisfactory results, and so there is high confidence in the accuracy of the diffusion tube results.

Appendix D: Map(s) of Monitoring Locations

Figure 7: Automatic Monitoring Locations



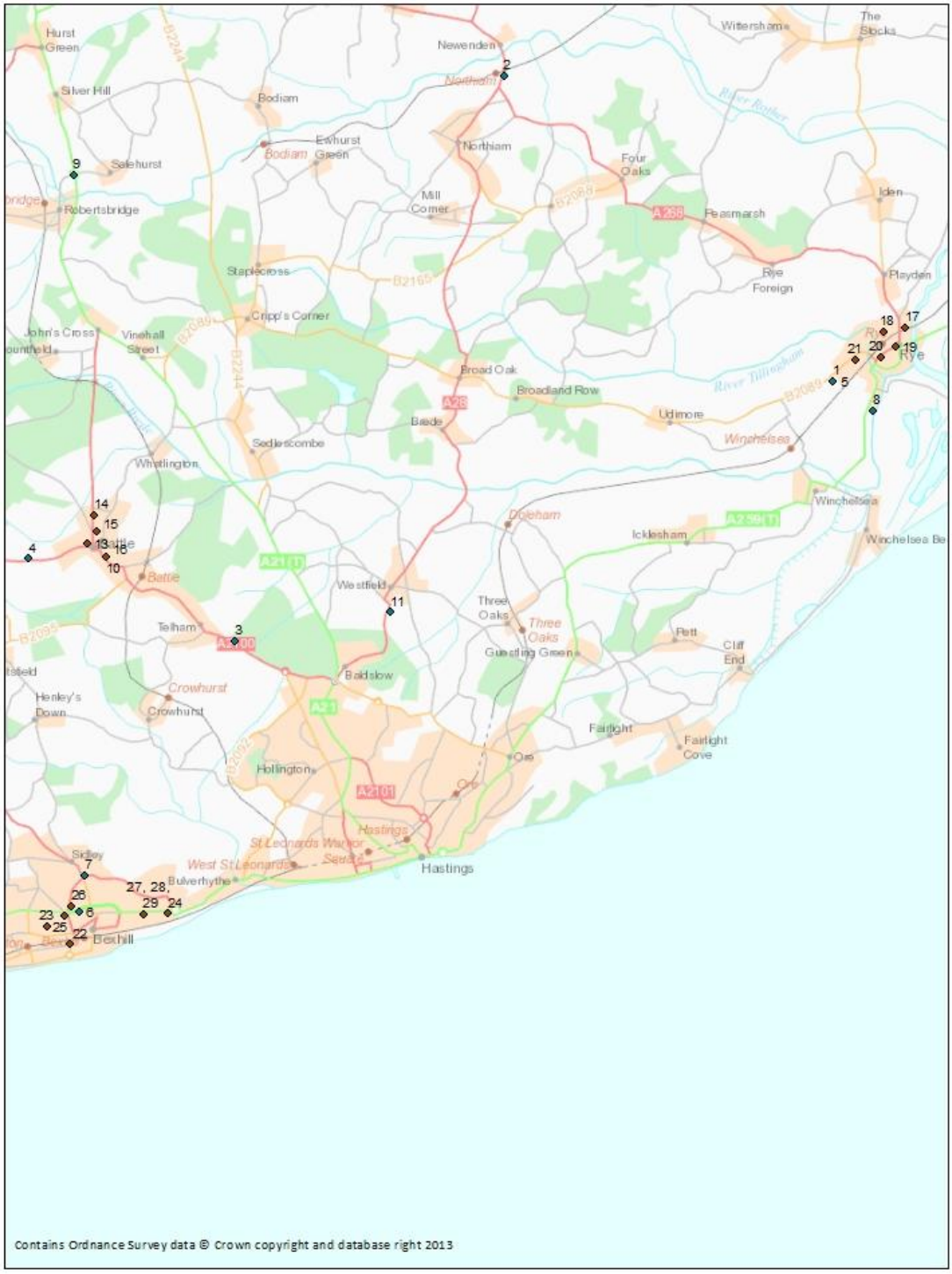
Automatic Air Quality Monitoring Locations in the Rother District

AECOM
Sunley House, 4 Bedford Park, Croydon, CR0 2AP
Tel: +44 (0)20 8639 3500, Fax: +44 (0)20 8663 6723
www.aecom.com

Legend

- Automatic Monitors

Figure 8: Non-Automatic Monitoring Locations



Air Quality Monitoring Locations in the Rother District

AECOM
Sunley House, 4 Bedford Park, Croydon, CR0 2AP
Tel: +44 (0)20 8639 3500, Fax: +44 (0)20 8663 6723
www.aecom.com

Legend

- Rother Diffusion Tubes
- ESCC Diffusion Tubes

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[10]	
	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
Particulate Matter ($PM_{2.5}$)	Work towards reducing emissions/concentrations	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

Table E.2 – Additional objectives from the UK Air Quality Strategy

Pollutant	Air Quality Objective[15]	
	Concentration	Measured as
Ozone (O_3)	100 µg/m^3, not to be exceeded more than 10 days a year	Running 8-hour mean

[10] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

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
SAC	Special Area of Conservation
SO_2	Sulphur Dioxide
SPA	Special Protection Area
O_3	Ozone

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