2017 Air Quality Annual Status Report (ASR)

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

June 2017

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Executive Summary: Air Quality in Our Area

Air Quality in Thanet

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].

The Local Air Quality Management (LAQM) system, as set out in Part IV of the Environment Act 1995, 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 exceedances are considered likely, the local authority must declare an Air Quality Management Area (AQMA) and prepare an Action Plan setting out the measures it intends to put in place in pursuit of the objectives.

The district of Thanet is located on the eastern side of Kent, in the south-east of England. It has a combination of coastal, urban and rural environments and includes the main towns of Margate, Ramsgate and Broadstairs. It is a popular holiday and day trip destination and, as a result, sees the number of people/vehicular movements grow considerably in the summer months. There is also a working port at Ramsgate.

The main source of air pollution in the district is road traffic emissions from major roads, notably the A28, A299, A254, A255 and A256. An Air Quality Management Area (AQMA) was declared in March 2006 for The Square, Birchington, where exceedances of the annual mean objective for nitrogen dioxide (NO2) were predicted.

A second AQMA was declared at High Street, St Lawrence in April 2010. These two AQMAs were incorporated into a single Thanet Urban AQMA in 2011.

[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

Monitoring results from continuous sites indicate that the annual mean objective and the 1-hour objective for nitrogen dioxide were met at both monitoring locations and there were no exceedances of the annual mean and 24-hour mean PM10 objectives at either monitoring locations.

Updated monitoring showed that there were no exceedances of the AQS objectives outside of the existing AQMA. With regards to nitrogen dioxide (NO2) passive monitoring has shown three locations where the annual NO2 objective was exceeded in 2016, both within the existing AQMA.

Actions to Improve Air Quality

Thanet District Council has an Air Quality Action Plan (AQAP) to address the Thanet Urban Air Quality Management Area (AQMA) that was declared in 2011 where air quality fails to meet required standards.

Policies and actions were subsequently identified and divided into the following broad subjects, based on the area and type of effects that may be achieved:

- Partnership between Thanet District Council and the Local Transport Authority (Kent County Council) - Kent County Council is responsible for overall transport strategy. As the AQMAs in Thanet are dominated by emissions from transport, a partnership arrangement between the District and County Councils for the development of this Action Plan has been used. Kent County Council has put forward proposed actions, which they themselves can implement in pursuit of the air quality objectives. In 2017 Kent County Council and the Kent and Medway Air Quality Partnership will start work on a Kent and Medway Low Emissions Strategy/Action Plan;
- Partnership with Development Planning - Planning is an effective tool to improve air quality. It can be used to locate development to reduce emissions overall, and reduce the direct impacts of new development, through policy requirements. The Air Quality Technical Planning Guidance was produced by Thanet District Council in August 2016. The Local Plan also provides the policies in relation to new development and air quality; and
- Formation of steering group - A steering group was established to develop the Action Plan, which included officers from Environmental Protection and

Development Planning within Thanet District Council and Transport Planning manager at Kent County Council.

Conclusions and Priorities

Monitoring in 2016 showed that there were no exceedances of the AQS objectives outside of the existing AQMA. There is an urban-wide AQMA declared within the District for the exceedances of annual mean NO2 objective. Given the need to meet the NO2 annual mean objective, the focus will need to be on reducing the annual mean concentrations of NO2. Road transport is the dominant source of pollution within Thanet's AQMA, and reducing road traffic emissions within the AQMA is therefore the key air quality priority.

Local Engagement and How to Get Involved

As the main source of air pollution within Thanet is road transport emissions, the easiest way for the public to get involved with helping improving air quality in the District would be to find alternatives to the way they usually travel.

The following are suggested alternatives to private travel that would contribute to improving the air quality within the District:

- Use public transport where available – This reduces the number of private vehicles in operation reducing pollutant concentration through the number of vehicles and reducing congestion;
- Walk or cycle if your journey allows – From choosing to walk or cycle for your journey the number of vehicles is reduced and also there is the added benefit of keeping fit and healthy. In addition many of the cycle routes are off-road meaning you are not in close proximity to emissions from road traffic sources;
- Car/lift sharing – Where a number of individuals are making similar journeys, such as travelling to work or to school car sharing reduces the number of vehicles on the road and therefore the amount of emissions being released. This can be promoted via travel plans through the workplace and within schools; and
- Alternative fuel / more efficient vehicles – Choosing a vehicle that meets the specific needs of the owner, fully electric, hybrid fuel and more fuel efficient cars are available and all have different levels benefits by reducing the amount

of emissions being released. To view the locations of publicly available electric vehicle charging points in Thanet and elsewhere, please visit: www.evsoutheast.net/

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1 Local Air Quality Management

This report provides an overview of air quality in Thanet 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 Thanet 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.

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 Thanet District Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at http://uk-air.defra.gov.uk/aqma/local-authorities?la_id=280.

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	
Thanet Urban AQMA	17/11/2011	NO2 Annual Mean	Thanet	An area encompassing a number of urban areas within Thanet	NO	47 µg/m3	40 µg/m3	Air Quality Action Plan 2013 https://www.thanet.gov.uk/publications/environmental-health/air-quality-action-plan-2013/

☒ **Thanet District Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

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

Defra's appraisal of last year's ASR concluded:

1. The local authority has identified the need to consider PM2.5 and made the link between PM2.5 and Public Health, and this is supported. In future reports they should detail what actions they could take to specifically target PM2.5.

2. The Council also details its priorities for the coming year in terms of air quality and this is supported. This should be included in all future reports.

Thanet District Council have continued to engage with stakeholders to promote air quality and encourage reductions of PM2.5 emissions, through the use of emissions mitigation for new planning applications, detailed travel plans, sustainable transport options, policies and strategies.

Thanet District Council has taken forward a number of direct measures during the current reporting year of 2016 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

More detail on these measures can be found in the Action Plan. Key completed measures are:

- The first Quality Bus Partnership in East Kent was formed in Thanet and helped to pioneer the development of these in the rest of the county. The Thanet Quality Bus Partnership provided the framework for the introduction of 'The Loop' service linking Margate, Westwood Cross, Ramsgate, Broadstairs and Margate, which was supported with Kickstart funding from the Department for Transport and Kent County Council;
- Thanet District Council published a walking strategy back in 2005 called 'Feet First– enabling and promoting walking in Thanet'. The strategy recognises that walking has health benefits; is socially inclusive and contributes to reduced congestion and improved air quality; and

- The Air Quality Technical Planning Guidance 2016 for Thanet District Council has been prepared and updated in conjunction with the Kent and Medway Air Quality Air Quality Partnership
- Thanet District Council supports improvements to vehicle technology and emission reduction and has three electric vehicles within the Council's fleet of vehicles.
- Since 2015 the council have provided electric vehicle charging bays at two town centre car parks: 2 in Leopold Street car park Ramsgate and 2 in Mill Lane car park Margate. The electric charging is free but the occupation of the space is charged as per the tariff with a maximum stay of 3 hours within the charging bay. If demand of the current charging points increases then the council will look at increasing the number of charging points within the district's car parks with external funding if available.

Thanet District Council does not expect any measures to be completed over the course of the next reporting year because all outstanding measures are ones that require continual work as they are on-going measures.

Thanet District Council's priorities for the coming year are:

- Continue the partnership with Kent County Council in the implementation of Local Transport Plan;
- Keep engaging with land-use and transport planners to ensure the actions are supported by all parts of the authority;
- Keep raising awareness of air quality issues within the District;
- Continue to work with Kent County Council to undertake identified feasibility studies of measures to tackle air pollution, to determine more robustly the effectiveness and cost of options;
- Participate in the production of a Kent and Medway Low Emissions Strategy/Action Plan; and

- Encourage the public to use sustainable transportation including public transport, car sharing, cycling and walking.

The principal challenge and barrier to implementation that Thanet District Council faces is a lack of resources.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Thanet District Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of the Thanet Urban AQMA.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Air Quality Guidance	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	TDC	2015/2016	On-going	-	-	Completed in August 2016	-	Work is being undertaken to assess the number of planning approvals with emissions mitigation.
2	Investigate Traffic Signal and Junction Configuration to improve traffic flows	Traffic Management	UTC, Congestion management, traffic reduction	KCC /TDC	2011/12	2012-2015	Peak queue lengths	-	On-going	-	Measure update with KCC
3	Improving Movement of Freight	Vehicle Fleet Efficiency	Driver training and ECO driving aids	KCC /TDC	2011/12	2012-2013	% HGV on roads through AQMA	2%	On-going	-	Measure update with KCC
4	Encouragement of Public Transport	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	KCC /TDC	2012	2012-2015	Number of Euro IV or above buses, bus patronage, number of bus infrastructure improvement projects	5%	On-going	-	Measure update with KCC
5	Car Sharing and Travel Planning	Promoting Travel Alternatives	Workplace Travel Planning	KCC /TDC	2011/12	2012-2013	Number of registered users of scheme or travel plan	2%	On-going	-	Measure update with KCC

6	Promotion of Cycling and Walking Measures	Promoting Travel Alternatives	Promotion of cycling	KCC /TDC	2011/12	2012	Number of cyclists/walkers	1%	On-going	-	Measure update with KCC
7	Promotion of air quality issues	Public Information	Via the Internet	TDC	2011/12	2012	Number of press releases, reports on website	-	On-going	-	Always ongoing. Promoted National Clean Air Day via website.
8	Parking Enforcement	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	TDC	2012	2013	Number of Penalty Charge Notices served	-	On-going	-	The number of penalty charge notices issued in 2015/2016 was 63,094

Note: TDC = Thanet District Council – KCC = Kent County Council
(1) Urban Traffic Control

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.

The Public Health Outcomes Framework indicator for the percentage of deaths attributable to PM2.5 in Thanet is 5.2%, which is just below the national average of 5.3%.

Thanet District Council does not currently undertake any monitoring of PM2.5, and consequently there are currently no measures in place to specifically address PM2.5 concentrations within the District. However, Thanet District Council's existing eight air quality action plan measures will address PM2.5 as well as other pollutants of concern.

Thanet District Council is part of the Kent Health and Wellbeing Board, which brings together County and District Councillors, senior officers from the NHS Area Team, Clinical Commissioning Groups, Social Care and Public and members of the Local Healthwatch. The board produced the Kent Joint Health and Wellbeing Strategy, which sets out how the multidisciplinary teams can align their plans to improve public health and tackle key health issues over the coming years.

Thanet District Council is working with Public Health colleagues to prioritise action on air quality in its local area to help reduce the health burden from air pollution. The Public Health Outcomes Framework is a Department of Health data tool for England, intended to focus public health action on increasing healthy life expectancy and reducing differences in life expectancy between communities. The PHOF includes an indicator, based on the effect of particulate matter (PM2.5) on mortality. The approach used in partnership with Public Health colleagues includes the encouragement of active travel, which will also have wider public health benefits captured in other indicators such as increased physical activity (indicator 2.13) and reducing excess weight at various ages (indicators 2.6 & 2.12).

The Local Transport Plan for Kent sets out a 20 year transport delivery plan for the county. The Local Transport Plan sets out a number of strategies to improve the transport infrastructure to support future growth and specifically targets AQMAs and congestion hotspots for improvements. These transport improvements are expected to reduce PM2.5 emissions, especially through the AQMAs where health is of key concern, but also on a wider basis.

Thanet District Council is part of the Kent and Medway Air Quality Partnership (K&MAQP), which aims to deliver a consistent approach to tackling air pollution across the County, sharing knowledge and information between Kent County Council, district councils, health authorities, Highways England, the Environment Agency, Public Health England and various consultants and research partners. The Kent and Medway Air Quality Monitoring Network (K&MAQMN) contains a number of sites monitoring pollution across the County, allowing concentrations of PM2.5 to be continuously monitored. Data for the network is reported through its dedicated website, KentAir, which can be found at www.kentair.org.uk. Thanet District Council will be working with members of K&MAQP and KCC on the production of a Kent and Medway Low Emissions Strategy/Action Plan.

Planning is also particularly important for reducing concentrations of PM2.5 and Thanet District Council is focussed through its planning policy on preventing particulate matter concentrations being inadvertently increased. Policy EP5 states that “development proposals that might lead to such a significant deterioration in local air quality resulting in unacceptable effects on human health, local amenity or the natural environment, will require the submission of an air quality assessment”.

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. Thanet District Council undertook automatic (continuous) monitoring at two sites during 2016. Both sites included NO2 and PM10 monitoring. Table A.1 in Appendix A shows the details of the sites. Monitoring results are available at http://www.kentair.org.uk/

A map showing the location of the monitoring sites is provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted, where relevant, are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Thanet District Council undertook non- automatic (passive) monitoring of NO2 at 24 sites during 2016. Table A.2 in Appendix A shows the details of the sites. A map showing the location of the monitoring sites is 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.

There were eight triplicate sites in 2016, these were:

- TH13/46/47 - The Square, Birchington;
- TH37/38/45 - Kentmere Avenue, Ramsgate;
- TH50/61/62 - 63 Hereson Road, Ramsgate;
- TH51/52/53 - Boundary Road, Ramsgate (co-located with ZH4);
- TH54/64/65 - High Street, St. Lawrence;
- TH67/68/69 - 20 Hereson Road, Ramsgate;
- TH70/71/72 - 9 High Street, St. Lawrence; and
- TH73/74/75 - 3 Hereson Road, Ramsgate.

Triplicate co-located NO2 diffusion tubes are installed at ZH4 Thanet Ramsgate (Boundary Road, Ramsgate) automatic monitoring site.

3.2 Individual Pollutants

The air quality monitoring results presented in this section have been, where relevant, adjusted for 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 40µg/m^3.

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 200µg/m^3, not to be exceeded more than 18 times per year.

Data capture was above 75% for all sites in 2016, meaning that there was no requirement for annualisation of the dataset. Automatic monitoring results indicate that both annual mean objective and 1-hour objectives continued to be met at both monitoring locations in 2016.

Figure 3.1 shows the trend in annual mean concentrations at the continuous monitoring locations between 2012 and 2016. This shows generally stable concentrations at Thanet Ramsgate. Site ZH5 Thanet Birchington has shown an increase in 2016 but is still below the peak seen in 2012.

Figure 3.1 – Trends in Annual Mean NO2 Concentrations

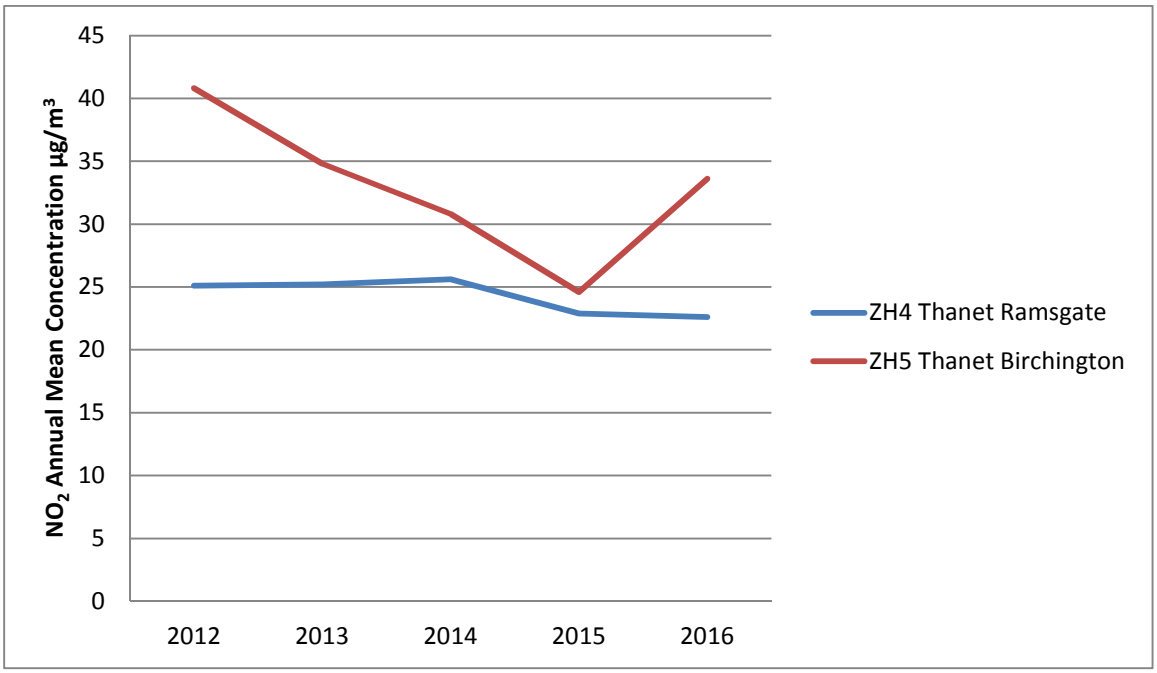


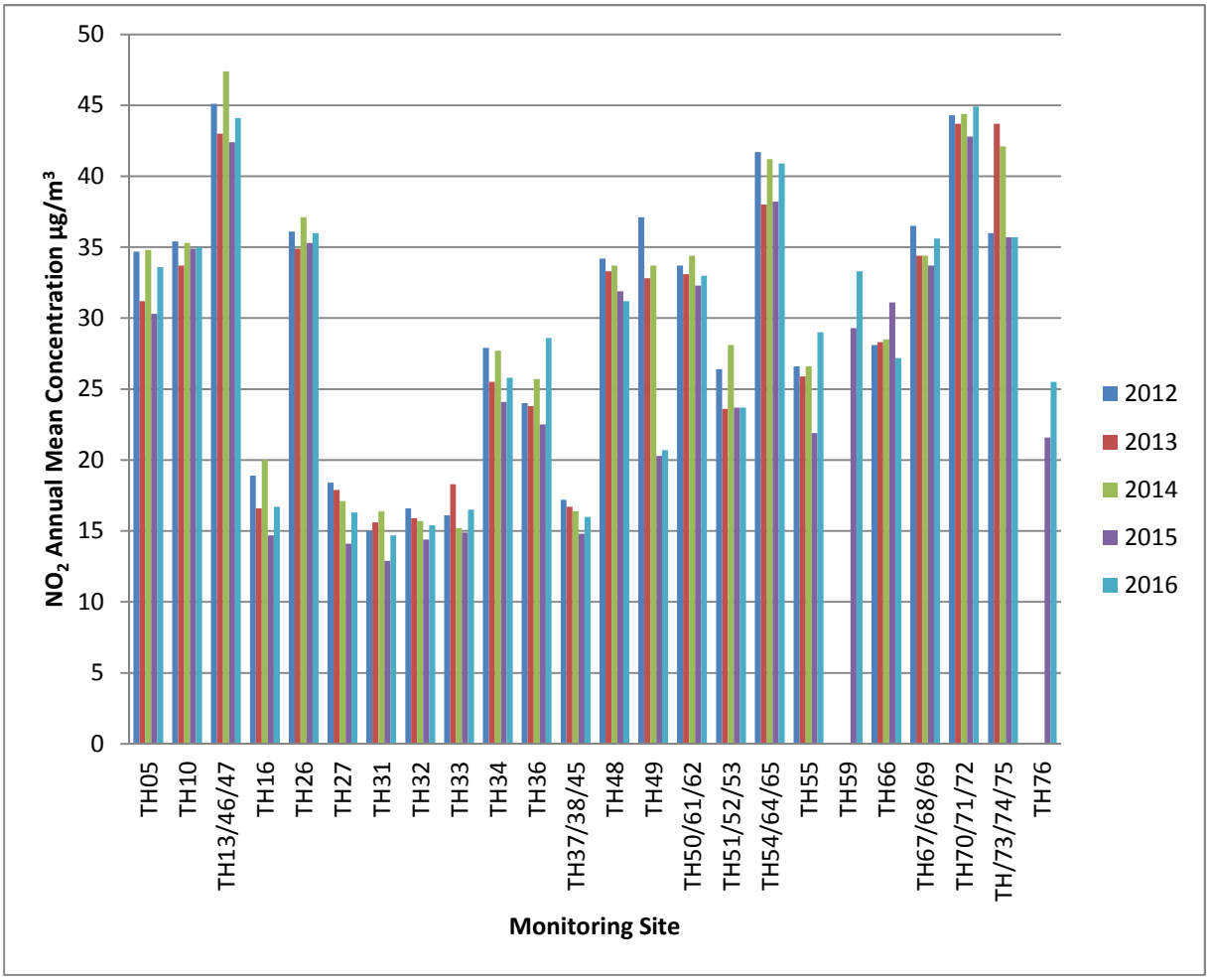
Figure 3.2 shows the trend in annual mean NO2 concentrations at the diffusion tube monitoring sites between 2012 and 2016. The annual mean NO2 concentration in 2016 has either stayed the same or increased compared to 2015 for all sites except at site TH66 located on High Street, St Lawrence.

For the 2016 data set, there were three locations where the annual mean AQS objective was exceeded, all located within the AQMA:

- TH13/46/47 at Birchington Square;
- TH54/64/65 at High Street, St Lawrence ; and
- TH70/71/72 at 9 High Street, St Lawrence

These three sites have shown consistent exceedances of the annual mean objective since 2012. There are no sites exceeding 60µg/m3, which would be an indication of a potential exceedance of the hourly NO2 objective. Consequently, the 1-hour mean objective is unlikely to be exceeded at any monitoring site.

Figure 3.2– Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring 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 for the past 5 years with the air quality objective of 40µg/m^3.

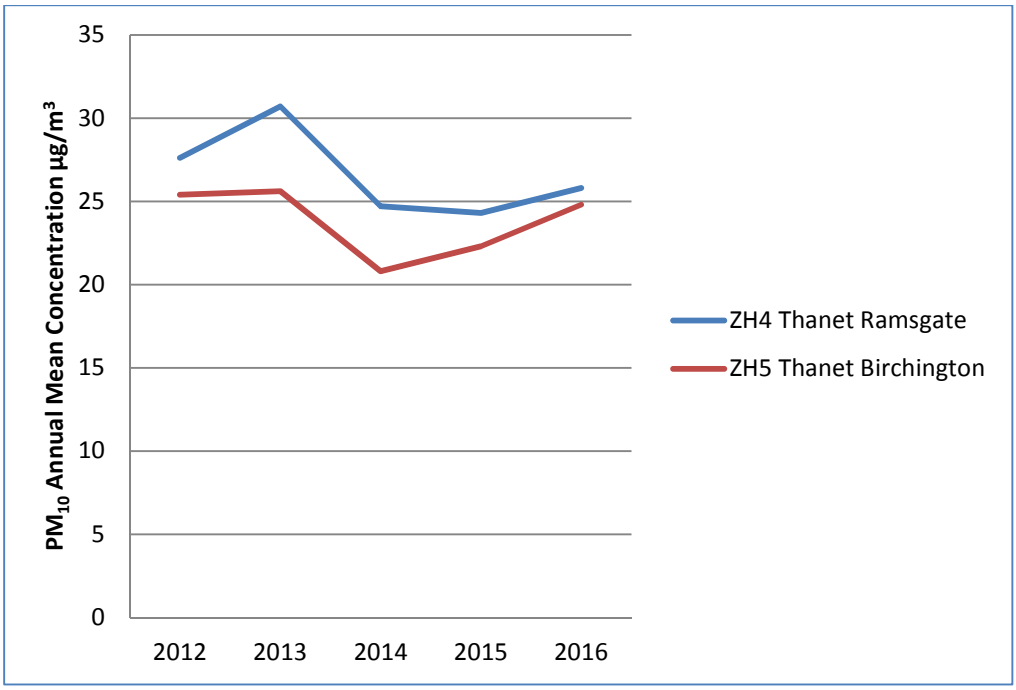
Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

The 2016 results show that both annual mean and 24-hour mean objectives were met at both monitoring sites during 2016. The number of exceedances of the 24-hour mean in 2016 decreased at ZH4 Thanet Ramsgate and at ZH5 Thanet Birchington when compared to 2015 values.

Figure 3.3 shows the trend in annual mean PM10 concentrations at the two continuous monitoring sites ZH4 and ZH5 between 2012 and 2016. The result shows

that, through the monitoring period, the ZH4 Thanet Ramsgate site consistently monitored higher PM10 concentrations than the ZH5 Thanet Birchington site. The Birchington site has also shown an increasing trend since 2014 and in 2016 the site had similar levels to that of the Ramsgate site.

Figure 3.3 – Trends in Annual Mean PM10 Concentrations



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)
ZH4 Thanet Ramsgate	Boundary Road, Ramsgate	Roadside	638483	165430	NO2; PM10	YES	Chemiluminescence, beta attenuation	16m	4m	2
ZH5 Thanet Birchington	The Square, Birchington	Roadside	630284	169052	NO2; PM10	YES	Chemiluminescence, beta attenuation	4m	3m	2

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)
TH05	The Broadway, Broadstairs	Kerbside	639020	167982	NO2	YES	N	2.5	NO	2.5
TH10	College Road, Margate	Kerbside	635539	169840	NO2	YES	0	2	NO	2.5
TH13/46/47	The Square, Birchington	Kerbside	630254	169037	NO2	YES	2	<1	NO	2.5
TH16	Earlsmede Crescent, Cliffend	Urban Background	634445	164416	NO2	YES	3	N/A	NO	2.5
TH26	King Street, Ramsgate	Kerbside	638492	165410	NO2	YES	0	3	NO	2.5
TH27	Avebury Avenue, Ramsgate	Urban Background	639097	165971	NO2	YES	7	N/A	NO	2.5
TH31	High Street, Manston	Urban Background	634662	166026	NO2	NO	9	N/A	NO	2.5
TH32	Bell-Davies Drive, Manston	Urban Background	632994	166428	NO2	NO	10	N/A	NO	2.5
TH33	Hill-House Drive, Minster	Urban Background	631161	165486	NO2	NO	9	N/A	NO	2.5
TH34	Pizza Hut, Westwood Road, Broadstairs	Roadside	636570	167894	NO2	YES	N	14	NO	2.5
TH36	Star Lane, Ramsgate Road, Margate	Kerbside	636405	168227	NO2	YES	0	2	NO	2.5
TH37/ 38/45	Kentmere Avenue, Ramsgate	Kerbside	635932	165333	NO2	YES	10	N/A	YES	2.5

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)
TH49	Kent Gardens, Canterbury Road (A28), Birchington	Roadside	630186	168983	NO2	YES	3	3.5	NO	2.5
TH50/61/62	63 Hereson Road, Ramsgate	Roadside	638616	165564	NO2	YES	5	<1	NO	2.5
TH51/52/53	Boundary Road, Ramsgate	Roadside	638472	165432	NO2	YES	>20	4.1	YES	2.5
TH54/64/65	High Street, St. Lawrence	Roadside	637135	165354	NO2	YES	7	<1	NO	2.5
TH55	Coxes Lane, Margate Road, Ramsgate	Roadside	636815	167297	NO2	YES	3	10	NO	2
TH59	Church Street, St Peters	Kerbside	638220	168614	NO2	YES	3	2	NO	2.5
TH66	High Street, St. Lawrence,Façade	Roadside	637112	165331	NO2	YES	0	3	NO	2.5
TH67/68/69	20 Hereson Road, Ramsgate	Roadside	638536	165465	NO2	YES	0	2	NO	2.5
TH70/71/72	9 High Street, St. Lawrence	Roadside	637092	165340	NO2	YES	0	1.5	NO	2.5
TH/73/74/75	3 Hereson Road, Ramsgate	Roadside	638529	165427	NO2	YES	0	2	NO	2.5
TH76	Buenos Ayres, Margate	Roadside	634752	170679	NO2	YES	9.5	2.4	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 NO_2 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 ($\mu g/m^3$) [3]				
					2012	2013	2014	2015	2016
ZH4 Thanet Ramsgate	Roadside	Automatic	84	84	25.1	25.2	25.6	22.9	22.6
ZH5 Thanet Birchington	Roadside	Automatic	100	100	**40.8**	34.8	30.8	24.6	33.6
TH05	Kerbside	Diffusion Tube	83	83	34.7	31.2	34.8	30.3	33.6
TH10	Kerbside	Diffusion Tube	92	92	35.4	33.7	35.3	34.9	35
TH13/46/47	Kerbside	Diffusion Tube	92	92	**45.1**	**43**	**47.4**	**42.4**	**44.1**
TH16	Urban Background	Diffusion Tube	100	100	18.9	16.6	20	14.7	16.7
TH26	Kerbside	Diffusion Tube	92	92	36.1	34.9	37.1	35.3	36
TH27	Urban Background	Diffusion Tube	100	100	18.4	17.9	17.1	14.1	16.3
TH31	Urban Background	Diffusion Tube	92	92	15	15.6	16.4	12.9	14.7
TH32	Urban Background	Diffusion Tube	92	92	16.6	15.9	15.7	14.4	15.4
TH33	Urban Background	Diffusion Tube	100	100	16.1	18.3	15.2	14.9	16.5
TH34	Roadside	Diffusion Tube	100	100	27.9	25.5	27.7	24.1	25.8
TH36	Kerbside	Diffusion Tube	83	83	24	23.8	25.7	22.5	28.6
TH37/38/45	Kerbside	Diffusion Tube	100	100	17.2	16.7	16.4	14.8	16

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2016 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2012	2013	2014	2015	2016
TH48	Kerbside	Diffusion Tube	92	92	34.2	33.3	33.7	31.9	31.2
TH49	Roadside	Diffusion Tube	92	92	37.1	32.8	33.7	20.3	20.7
TH50/61/62	Roadside	Diffusion Tube	92	92	33.7	33.1	34.4	32.3	33
TH51/52/53	Roadside	Diffusion Tube	83	83	26.4	23.6	28.1	23.7	23.7
TH54/64/65	Roadside	Diffusion Tube	92	92	**41.7**	38	**41.2**	38.2	**40.9**
TH55	Roadside	Diffusion Tube	83	83	26.6	25.9	26.6	21.9	29
TH59	Kerbside	Diffusion Tube	100	100				29.3	33.3
TH66	Roadside	Diffusion Tube	100	100	28.1	28.3	28.5	31.1	27.2
TH67/68/69	Roadside	Diffusion Tube	92	92	36.5	34.4	34.4	33.7	35.6
TH70/71/72	Roadside	Diffusion Tube	100	100	**44.3**	**43.7**	**44.4**	**42.8**	**44.9**
TH/73/74/75	Roadside	Diffusion Tube	92	92	36	**43.7**	**42.1**	35.7	35.7
TH76	Roadside	Diffusion Tube	92	92	-			21.6	25.5

☒ Diffusion tube data has been bias corrected

☒ Annualisation has been conducted where data capture is <75%

☒ If applicable, all data has been distance corrected for relevant exposure

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/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 Boxes 7.9 and 7.10 in 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 2016 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2012	2013	2014	2015	2016
ZH4 Thanet Ramsgate	Roadside	Automatic	84	84	**0**	**0**	**0**	**0**	**0**
ZH5 Thanet Birchington	Roadside	Automatic	100	100	**0**	**1**	**0**	**0**	**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.

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 ($\mu g/m^3$) (3)				
				2012	2013	2014	2015	2016
ZH4 Thanet Ramsgate	Roadside	91	91	27.6	30.7	24.7	24.3	25.8
ZH5 Thanet Birchington	Roadside	96	96	25.4	25.6	20.8	22.3	24.8

☒ **Annualisation has been conducted where data capture is <75%**

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 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.

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
ZH4 Thanet Ramsgate	Roadside	91	91	16	9 (39.5)	15	9	5
ZH5 Thanet Birchington	Roadside	96	96	11	16 (41.5)	6	6	4

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

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 ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (factor) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
TH05	42.9	42.5		37.9	44	32	36.4	37.7	42.8	38.2		41.4	39.6	33.6	33.6
TH10	43.2	44.8	42	43.6	49.2	36.1		34	45.9	39.4	44.1	30.6	41.2	35.0	35.0
TH13/46/47	51.475	50.85	42.575	45.95	50.225	38.975	42.225	45.3	57.53333	36.1	51.95	57.375	51.9	**44.1**	35.5
TH16	21.9	22.6	18.6	19.2	19.8	12.7	14.9	14.7	19.3	20.3	22.2	30	19.7	16.7	16.7
TH26	43.2	42.8	39.9	36.5	47.1		41.3	40.5	42.1	39.4	45.5	47.7	42.4	36.0	36.0
TH27	25.3	19.2	17.6	17.8	20.5	14.4	14	13.8	17.4	16.6	22.6	31.2	19.2	16.3	16.3
TH31	18.8	15.8	14.7	16.3	18.2	13.1	12.1	15.6		18.5	23.1	23.8	17.3	14.7	14.7
TH32	22.1	19.9	12.5	15.9	18.8	13.1		14.3	18.9	18.9	23.9	21.1	18.1	15.4	15.4
TH33	21	21.2	18.4	18.8	20.8	14.7	12.8	12.9	18.1	20.5	23.5	29.6	19.4	16.5	16.5
TH34	35.3	31.3	28.1	30.8	33.9	22.6	23.1	24	32.8	31.3	36.6	34.7	30.4	25.8	25.8
TH36	30.3			27	37.3	25.3	27.3	29.7	33.1	36	43.9	46.3	33.6	28.6	28.6
TH37/38/45	21.0	19.1	15.8	16.3	19.5	13.3	14.1	14.2	18.7	19.1	24.5	29.7	18.8	16.0	16.0
TH48	40.1	40.5	40.6	35.9	33.1	30.3	25.1	32.8		36.1	44.1	45.5	36.7	31.2	31.2
TH49	27.7	16.1	21.7	22.4	24.7	17.3	17.2	21.8		31	33.3	35.1	24.4	20.7	20.2

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (factor) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
TH50/61/62	32.1	41.9	32.1	38.7	44.1	30.1	33.9	34.7	44.5	38.9	43.0	45.3	38.8	33.0	23.2
TH51/52/53	32.6	28.9	23.6	26.5	31.0	21.5			29.8	24.2	28.5	32.3	27.9	23.7	17.1
TH54/64/65	54.0	46.9	43.9	54.0	36.1	38.7	39.6	41.6	48.9	47.2	54.8	60.4	48.1	**40.9**	26.0
TH55	36.5	34.2		35.4	34.6	23.1	26		35.1	33.7		48.7	34.1	29.0	38.1
TH59	42.5	40.3	38	43.1	43.4	35.4	36	34.1	40.9	31.4	37.3	47.5	39.2	33.3	31.0
TH66	33.1	34.8	32	33.2	36.2	26.1	24.5	26	25.2	35.9	38.4	38.7	32.0	27.2	27.2
TH67/68/69	33.7	38.9	42.3	45.1	50.7	43.1	33.6	39.9	44.0	42.3	45.7	43.7	41.9	35.6	35.6
TH70/71/72	49.7	55.4	45.9	56.1	60.5	51.1	43.3	49.3	54.4	57.3	55.4	55.9	52.9	**44.9**	**44.9**
TH/73/74/75	36.9	40.7	37.9	43.6	51.2	38.1	35.2	40.9	46.2	42.7	39.7	43.5	42.0	35.7	35.7
TH76	36.2	29.9		24.7	30.9	24.2	25.4	26.5	29.1	30.3	34.1	38.4	30.0	25.5	19.9

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 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.

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

Diffusion Tube Bias Adjustment Factors

The diffusion tube data has been corrected using a bias adjustment factor, which is an estimate of the difference between diffusion tube concentration and continuous monitoring, the latter assumed to be a more accurate method of monitoring. The Defra Technical Guidance LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NOx/NO2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

With regard to the application of a bias adjustment factor for diffusion tubes, the Defra Technical Guidance LAQM.TG16 and the LAQM Helpdesk[4] recommend the use of a local bias adjustment factor where available and relevant to diffusion tube sites.

Factor from National Co-location Studies

The diffusion tubes are supplied and analysed by Environmental Scientifics Group (ESG) Didcot, utilising the 50% triethanolamine (TEA) in acetone preparation method. A bias adjustment of 0.77 for the year 2016 (based on 24 studies) has been derived from the national bias adjustment calculator.

Factor from Local Co-location Studies

Triplicate co-located NO2 diffusion tubes are installed at the automatic monitoring site TH51/52/53 - Boundary Road, Ramsgate (co-located with ZH4).

The local bias correction factor is shown below in Table C.1.

Table C.1– Local Bias Factors

Location	Diffusion Tube Data Capture	Continuous Monitor Data Capture	Diffusion Tube Annual Mean (µg/m3)	Continuous Monitor Annual Mean (µg/m3)	Ratio
ZH4 Thanet Ramsgate	83%	99%	28	24	0.85

Discussion of Choice of Factor to Use

It was decided to use the local bias adjustment factor derived from the ZH4 co-location study (0.85) for the year 2016, as it provides more conservative results than if using the national bias adjustment factor of 0.77. Data capture was reasonable for

the co-location study used to calculate the bias factor, which included 9 periods of data for the ZH4 Thanet Ramsgate site. For previous data, years 2012 to 2015, the bias adjustment factors have been taken from the Council's previous LAQM annual reports. The factors used were 0.82 (2012), 0.82 (2013) and 0.81 (2014) and 0.88 (2015).

PM Monitoring Adjustment

Thanet District Council undertook monitoring of PM10 based on beta attenuation at two locations during 2016. The measured results for the monitors have been adjusted by dividing the data by 1.2 prior to reporting in accordance with LAQM TG (16) Paragraph 7.150.

Short to Long Term Adjustment

There were no monitoring sites requiring annualisation in 2016.

QA/QC of Automatic Monitoring

The QA/QC procedures for the sites are those of the Kent and Medway Air Quality Monitoring Network (K&MAQMN). The K&MAQMN procedures are equivalent to the UK Automatic Urban and Rural Network (AURN) procedures, with the exception of the following:

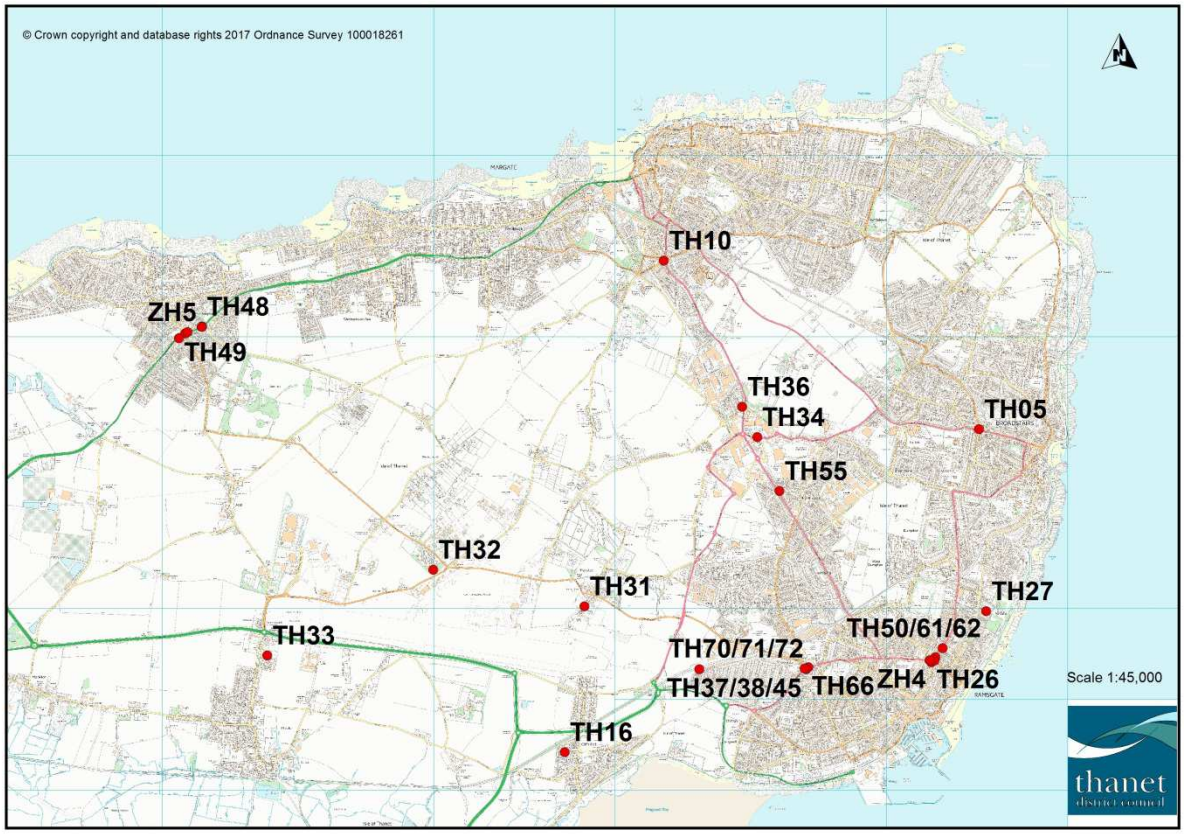
- Calibration of NOx analysers with NO gas (AURN also use NO2);
- Data checks are done once daily and downloads are done twice daily (AURN are hourly); and
- Independent audits of the stations are undertaken annually (AURN are 6 monthly). K&MAQMN managers AEA ratify the data for these sites.

QA/QC of Diffusion Tube Monitoring

ESG Didcot is a UKAS accredited laboratory and participates in the new AIR PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO2 tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO2 concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance. In the latest available results, AIR-PT AR012 (January to February 2016), AIR-PT AR 013 (April to May2016), AR015 (July to August 2015) and AIR-PT AR 016 (September to October 2016) ESG Didcot have scored 100%. The percentage score reflects the results deemed to be satisfactory based upon the zscore of $< \pm 2$. Based on 26 studies from ESG Didcot utilising the 50% TEA, 77% of all local Authority co-location studies in 2015 were rated as 'good' (tubes are considered to have "good" where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more periods during the year is less than 20%).

[4]Laqm.defra.gov.uk

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



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[4]	
	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

[4] 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
SO_2	Sulphur Dioxide
TDC	Thanet District Council
KCC	Kent County Council

References

- Local Air Quality Management Technical Guidance LAQM.TG16 Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. Published by Defra
- Air Quality Technical Planning Guidance 2016. Published by Thanet District Council
- Thanet District Council 2015 Updating and Screening Assessment.
- National Diffusion Tube Bias Adjustment Spreadsheet, version 03/17 published in April 2017.
- http://laqm.defra.gov.uk/documents/LAQM-AIR-PT-Rounds-1-12-(April-2014-February-2016)-NO2-report.pdf
- https://www.thanet.gov.uk/publications/environmental-health/air-quality-actionplan-2013/3-action-plan-development/
- http://www.phoutcomes.info/public-health-outcomesframework#page/0/gid/1000043/pat/6/par/E12000008/ati/101/are/E07000114