Ricardo Energy & Environment

2018 Air Quality Annual Status Report (ASR)

Report for Swale Borough Council

2018 Air Quality Annual Status Report (ASR)

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

June 2018

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Executive Summary: Air Quality in Our Area

Air Quality in Swale Borough Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

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

Swale Borough Council is committed to improving air quality. The main pollutant of concern is nitrogen dioxide released from motor vehicles. Swale Borough Council has a comprehensive monitoring network for nitrogen dioxide. In 2017 this included measurement by automatic analysers at two locations and measurement by non-automatic diffusion tubes at 68 locations. At some of the sites there are triplicate and duplicate tubes to ensure the accuracy of the monitoring data.

Five air quality management areas (AQMAs) have been declared where the level of air pollution, specifically nitrogen dioxide, has been shown to exist above permitted concentrations. These AQMAs are listed below:

- Newington declared 2009 (AQMA 1)
- Ospringe Street declared June 2011 (AQMA 6, formerly AQMA 2). Extended up to the Mount in May 2016.
- St Pauls Street, Milton, Sittingbourne declared January 2013 (AQMA 3).
- East Street/Canterbury Road, Sittingbourne declared January 2013 (AQMA 4)
- Teynham declared December 2015 (AQMA 5).

[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

Nitrogen dioxide concentrations measured at both automatic monitoring stations were below the annual objective mean concentration in 2017. There was also no exceedance of the hourly mean objective.

Exceedance of the annual objective was however measured by NO_2 diffusion tubes at a number of locations within AQMA 1, AQMA 6, AQMA 3 and AQMA 4. The other AQMA (AQMA 5) has one site for which non-exceedance results are borderline. Monitoring by both continuous analysers and diffusion tubes should continue within the AQMAs to confirm that the air quality mitigation measures are having the required impact on air quality improvements in the Borough.

Nitrogen dioxide monitoring within Sheerness should also be continued to monitor the impacts of the expansion of Sheerness Port, the regeneration areas at Queenborough, and increased traffic from housing developments on the Island.

PM_{10} concentrations were measured at one automatic monitoring location (Swale Ospringe Roadside 2) within the Borough in 2017. This site had very low data capture for 2017 which introduced uncertainty in the results, as associated with the annualisation process. Annualised PM_{10} concentrations did not exceed the annual objective but the daily objective was deemed to be likely to be exceeded when calculating the 90.4^{th} percentile of 24-hour means. PM_{10} monitoring should continue, or change to $PM_{2.5}$ monitoring. This will help Swale Borough Council demonstrate that they are taking measures to reduce particulate matter concentrations. The Public Health Outcomes Framework (PHOF), which calculated the fraction of mortality attributed to particulate air pollution, showed that the mortality within Swale Borough Council is slightly worse than that calculated for England as a whole.

Actions to Improve Air Quality

Since 2008, more than thirty action projects have been commenced and delivered to improve the air quality in Swale Borough. The main pollutant of concern in the Borough is nitrogen dioxide released from motor vehicles. Accordingly, many of the measures being investigated and implemented to improve local air quality are focused on reducing emissions from road traffic. It was decided to adopt a different, more radical approach in 2017, i.e. to create a unified air quality action plan (AQAP)

for 2018 that considered measure more strategically as well as measure specific to individual AQMAs.

Conclusions and Priorities

Air pollution monitoring data gathered in Swale Borough over several years has shown that some improvements have been made. However, exceedances and borderline non-exceedances continue to be measured within the AQMAs. More needs to be done to continue to improve the local air quality.

Swale Borough Council expects the following measures to be completed over the course of the next reporting year:

- Creating and submitting a single Air Quality Action Plan for all of the AQMAs in Swale in 2018.
- Working towards expanding the work with the freight sector using the Swale Ecostars Kent pilot scheme.
- Investigate the feasibility of creating a Clean Air Corridor/ Low Emission Zone on the A2 throughout its length.

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

- Working with partners to implement the Freight Plan.
- Continuing to support KCC Kent Smarter Travel project.
- Continuing to support Healthy Business Awards.
- Continuing to support KM Schools project promoting sustainable travel to primary schools.
- Working with partners such as the KCC, Highways England, The Environment Agency and Public Health England.
- Continuing to require planning development mitigation measures on new development proposals.
- Continuing to work with communities, stakeholders and steering committees to identify and implement actions and air quality mitigation measures.

Local Engagement and How to get Involved

The Council cannot achieve improvements to air quality alone. In order to fulfil its goal in producing quantifiable outcomes to timescale all residents, businesses, and delivery partners need to take responsibility and engage constructively. Contact has been made with external bodies in 2017 to continue work with them in 2018 and beyond.

If you are interested in becoming involved in improving air quality in the Borough, you can:

- Visit the Kent Air website (www.kentair.org.uk) to learn more about air pollution and local air quality.
- Look at any displays regarding air quality, many of which have ideas for how we can all lesson our contribution to air pollution.
- Take part in a local greening community project.
- Attend Public meetings: all residents and consultees are invited to attend public displays to raise awareness.
- Volunteer to belong to an AQMA steering group. Action plan steering groups have been established for each AQMA. These groups comprise residents and members from each AQMA as well as representatives from organisations who feel able to contribute suggestions to improve local air quality. The groups meet annually to discuss action plans and communicate regularly via email to discuss the progress of air quality improvement initiatives.

Table of Contents

Executive Summary: Air Quality in Our Area i

Air Quality in Swale Borough Council i

Actions to Improve Air Quality ii

Conclusions and Priorities iii

Local Engagement and How to get Involved iv

1 Local Air Quality Management 1

2 Actions to Improve Air Quality 2

2.1 Air Quality Management Areas 2

2.2 Progress and Impact of Measures to address Air Quality in Swale Borough Council 6

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations 21

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance 22

3.1 Summary of Monitoring Undertaken 22

3.1.1 Automatic Monitoring Sites 22

3.1.2 Non-Automatic Monitoring Sites 22

3.2 Individual Pollutants 23

3.2.1 Nitrogen Dioxide (NO_2) 23

3.2.2 Particulate Matter (PM_{10}) 28

Appendix A: Monitoring Results 30

Appendix B: Full Monthly Diffusion Tube Results for 2017 46

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC 50

Appendix D: Maps of Monitoring Locations and AQMAs 54

Appendix E: Summary of Air Quality Objectives in England 65

Glossary of Terms 66

List of Tables

Table 2.1 – Declared Air Quality Management Areas 3

Table 2.2 – Progress on Measures to Improve Air Quality 10

1 Local Air Quality Management

This report provides an overview of air quality in Swale Borough Council during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

A summary of AQMAs declared by Swale Borough 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:

https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=268

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

A list of LAQM reports, including progress reports, updating and screening assessments, further assessments, detailed assessments etc. can be found on the Kent Air library website.[4]

[4] http://www.kentair.org.uk/home/text/438

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		
						At Declaration		Now		Name	Date of Publication	Link
AQMA 1: Newington (A2 / High Street)	Declared 2009	NO_2 Annual Mean	Newington	An area encompassing those parts of London Road and High Street, Newington where the speed limit is 30mph.	YES	50	µg/m^3	48.5 (SW35, 43.1 distance corrected)	µg/m^3	(Interim) Air Quality Action Plan	2017	(*)
AQMA 6: Ospringe Street, Faversham (A2 / Ospringe)	Declared as AQMA 2 in 2011, extended in 2016, consolidated As AQMA 6 in 2017	NO_2 Annual Mean	Faversham	Area incorporating all of Ospringe Street, Ospringe which is a section of the A2 London Road, trunk road near Faversham between the grid reference 600106, 160936 and the grid reference 600466, 160839.	YES	48	µg/m^3	Including the former AQMA 2 (below)		(Interim) Air Quality Action Plan	2017	(*)

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		
						At Declaration		Now		Name	Date of Publication	Link
AQMA 3: East Street, Sittingbourne (A2 / Canterbury Road)	Declared 2013	NO_2 Annual Mean	Sittingbourne	The designated area incorporates the area of East Street, Sittingbourne.	YES	41	µg/m^3	42.5 (SW56)	µg/m^3	(Interim) Air Quality Action Plan	2017	(*)
AQMA 4: St Paul's Street, Milton, Sittingbourne (B2006)	Declared 2013	NO_2 Annual Mean	Sittingbourne	The designated area incorporates the area of St Pauls Street, Sittingbourne	NO	62	µg/m^3	55.7 (SW82)	µg/m^3	(Interim) Air Quality Action Plan	2017	(*)

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		
						At Declaration		Now		Name	Date of Publication	Link
AQMA 5: Teynham (A2 / London Road)	Declared 2015	NO_2 Annual Mean	Teynham	A2 London Teynham.	YES	39	µg/m^3	39.9 (SW80, 37.6 distance corrected)	µg/m^3	(Interim) Air Quality Action Plan	2017	(*)

(*) http://services.swale.gov.uk/meetings/documents/s8359/Interim%20AQAP_Swale_2017_v10_final%20draft.pdf

☒ **Swale Borough 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 Swale Borough Council

Defra's appraisal of last year's 2016 ASR concluded:

Swale Borough Council currently has five AQMAs, which have been declared due to exceedances of the annual mean NO_2 objective. It should be noted that AQMA 6, (declared in 2016) is an extension of AQMA 2. AQMA 2 is due to be revoked. In 2016, air quality monitoring was undertaken at four automatic sites and 65 diffusion tube sites. PM_{10} is monitored at one of the automatic monitoring sites. Exceedances of the annual mean NO_2 objective were recorded at 11 of the diffusion tube sites in 2016. Once distance correction had been applied, the concentrations at 2 of these sites dropped below the objective level.

Table 2.1 of the ASR indicates exceedances in AQMAs 1,4, 5 and 6, while the data tabulated in Table B.1 indicates exceedances only in AQMAs 1,4 and 6.

Currently, there is only an AQAP for AQMA1, which covers parts of London Road and High Street in Newington. Swale Borough Council is in the process of producing an AQAP that will encompass all of the AQMAs.

On the basis of the evidence provided by the local authority the conclusions reached are acceptable for all sources and pollutants.

Swale Borough Council should proceed with revoking AQMA 2 and preparing the next ASR which is due in June 2018.

As a result of an increased budget for air quality in Swale during 2017, a number of improvements have been carried out to the automatic monitoring capability in Swale during 2017. There was also a minor relocation at Ospringe (AQMA 6) due to the construction of a new house immediately adjacent. Coinciding with this move, there has been no automatic data available here since early 2017. To date this is still the position, though the site is expected to resume monitoring in July 2018.

Following the 2016 appraisal from Defra, an Interim Action Plan was submitted to them highlighting the intended course of actions, starting in 2017. This plan contains a number of measures not included in previous ASRs. They are included with previous outstanding actions in this report below in table 2.2.

It is the intention to create a Combined Action Plan for all five AQMAs in 2018, as they all have the same issues, i.e. exceedances of Nitrogen Dioxide from heavily congested 'hot spots' on or near the A2. Suggested remedial measures are common to all the AQMAs though there are local issues which will also be included. The work to complete the Combined Action Plan is proceeding at present.

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

Key completed measures are:

- The (Interim) Air Quality Action Plan, 2017 was completed.
- A Strategic Air Quality Steering Group was formed to oversee the implementation of the Strategic Air Quality Action Plan 2018-2022 for Swale. Further Community Steering Group Meetings have also been held in 2018.
- Information provided on the Kent Air website was updated to reflect current reports.
- Partnership work with Kent County Council and the local Highways Authority continued.
- Participation in the Ecostars initiative has continued.
- The KM school projects to encourage local primary school children to actively travel to school have continued.

Consideration was given to the implementation of the following strategic measures:

- Reclassification of A2 as a 20 mph zone through Newington (AQMA 1).
- Reclassification of A2 as a 20 mph zone through Ospringe (AQMA 6).
- Creation of a Clean Air Corridor on the A2 throughout the Borough.

Swale Borough Council expects the following measures to be completed over the course of the next reporting year:

- Creating and submitting a single Air Quality Action Plan for all of the AQMAs in Swale, later in 2018.
- Working towards expanding the work with the freight sector using the Swale Ecostars Kent pilot scheme.
- Investigate the feasibility of creating a Clean Air Corridor/Low Emission Zone on the A2 throughout the Borough.

Swale Borough Council's air quality priorities for the coming year are:

- Completing its Combined Air Quality Action Plan.
- Continuing to require planning development mitigation measures on new development proposals and the Swale Local Plan.
- Continuing to work with communities, stakeholders and steering committees to identify and implement actions and air quality mitigation measures.
- Working with external partners such as the KCC, Highways England, The Environment Agency and Public Health England.
- Working with partners in to implement the Freight Plan.
- To support the Kent Environment Strategy and other similar initiatives.
- To support KM Schools project promoting sustainable travel to primary schools.

The principal challenges and barriers to implementation that Swale Borough Council anticipates facing are limitations on the extent of traffic mitigation measures that can be implemented along the A2, A249 and M2.

Swale Borough Council anticipates that the measures stated above and in Table 2.2 will eventually achieve compliance in AQMAs 1, 3 and 5.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Swale Borough Council anticipates that further additional measures as a

result of the combined Action Plan, and those not yet prescribed, will be required in subsequent years to achieve compliance and enable the revocation of AQMA 1, AQMA 6 and AQMA 4.

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
Strategic AQAP measures											
1	Swale Freight Manage-ment Plan (2016)	Freight and Delivery Management	Delivery and Service plans	KCC	2016	2018- 2022	Reduced emissions from freight vehicles	2%	Ongoing	2022	KCC and SBC to support Swale FMP by delivering recommendations (section 5) Document submitted to Defra 2016.
2	"Clear air signage and information scheme"	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	KCC	2018	New proposal to be evaluated (builds on FMP) Roadside information includes "switch-off engine" congestion signage and over-night lorry parking ban information on A2	Clearer signage to assist with lower emissions	2%	Ongoing	2022	New proposal to be evaluated (builds on FMP) Roadside information includes "switch-off engine" congestion signage and over-night lorry parking ban information on A2
3	Swale Low Emission Zone or Corridor	Promoting Low Emissions transport	Low Emissions Zone (LEZ) or Clean Air Zone (CAZ)	KCC/ SBC	2018	New proposal to be evaluated (builds on FMP) Create a (Euro emission class) restriction zones for all vehicles with strategic ANPR	Lower Emissions	2%	Not started yet	2022	New proposal to be evaluated (builds on FMP) Create a (Euro emission class) restriction zones for all vehicles with strategic ANPR cameras.

						cameras.					
4	HGV "Clear air zone"	Promoting Low Emission Transport	Low Emission Zone (LEZ) or Clean Air Zone (CAZ)	KCC/ SBC	2018	New proposal to be evaluated (builds on FMP) Create a HGV (Euro emission class) restriction zones with strategic ANPR cameras.	"	1%	Not started yet	2022	New proposal to be evaluated (builds on FMP) Create a HGV (Euro emission class) restriction zones with strategic ANPR cameras.
5	Swale and Medway A2 corridor Planning Agreement	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	SBC/ Medway Council	2018/19	New Proposal to be evaluated (building on Kent AQ Planning Document)	Reduced emissions from new developments	n/a	Not finalised yet	Unknown at present	New Proposal to be evaluated (building on Kent AQ Planning Document) Establish a planning policy mechanism for major developments with significant impact on A2 corridor to mitigate impact.
6	Swale Air Quality and Planning Guidance (update)	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	SBC	2017/18 update	In-place and active since 2016	Planning guidance	n/a	Update planned for 2018	2019	Update to include minimum standards and conditions for approval i.e. ULEV parking, alt transport options, charge points, low NOx boilers, distance from road
7	Air Quality and Low Emission Strategy	Policy Guidance and Development Control	Low Emissions Strategy	SBC	2017/18	Not yet finalised	Lower NOx and PM10 emissions	1%	Ongoing	2022	New proposal to be evaluated (includes sustainable procurement, SBC fleet improvements, low emission fuels and installation (STOR) guidance)

8	Low emission taxi licencing scheme (Kent)	Promoting Low Emission Transport	Taxi Licensing conditions	SBC	2017/18	Education of drivers for compliance from 2017/18	Lower emissions from taxis	0.5%	Ongoing	2019	New proposal to be evaluated Improve emissions from taxis, subsidies for lower local fares
9	Clean-flow traffic manageme nt	Traffic Management	UTC, Congestion management ,traffic reduction	KCC	2017	Not yet in place	Smoother traffic flows leading to lower emissions		Not started yet	2022	New proposal to be evaluated. Traffic smoothing though average speed camera section management. Linked to localised AQMA "20's plenty" measure
10	Clean-air walking and cycle ways	Promote travel alternatives	Intensive active travel campaign & infrastructure	KCC/ SBC	2017/18	From 2018	Reduction of vehicles by encouraging the use of cycling		Not started yet	2022	New proposal to be evaluated. Work with KCC & Development Management/Planni ng Policy to develop further walking and cycling infrastructure for local commuter and school routes
11	Clean-air travel planning	Promote travel alternatives	Personalised Travel Planning	KCC /SBC	2017/18	From 2018	Lower vehicle emissions		Not started yet	2022	New proposal to be evaluated. Require strategic travel plan requirements for new developments and businesses (KCC and SBC Planning & Dev Control)
12	Promote and encourage change of transport modes	Promote low emission transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	SBC	2018	Summer 2019-2020	% increase in electric /hybrid vehicles on the road using traffic counts.		Not started yet	2022	New proposal to be evaluated. Support bids for eV infrastructure, alt. fuels, hybrid vehicles and low emission taxis. Encourage use of buses and trains as alternatives to cars by installing infrastructure at PnR and stations.

13	Eco Stars	Vehicle Efficiency Fleet	Driver training and ECO driving aids	SBC	2014	2015-2018	Number of HGV and LGV drivers taken through scheme.	2%	Ongoing	n/a	Ecostars pilot continues in 2017 (Initially 14 companies signed up in Swale with 812 vehicles
14	Air pollution alerts and information	Public information	Via other mechanisms	SBC	-	2018 - 2022	Number of (vulnerable) people using the alert service in Swale	n/a	Not started	?	Communications and marketing directed to vulnerable people (COPD) and information on health effects Use business forums to promote best eco practices for travel
Local AQMA measures											
1	"20's plenty" zones	Traffic Management	Reduction of speed limits, 20mph zones	KCC	2017	2018-2022	Smoothing Traffic flow to reduce emissions		Not started yet	?	Community steering group proposal to be evaluated. (AQMA's: 1,2,3,4,5)
2	Campaigns for anti idling, smoky exhausts	Traffic Management	Anti-idling enforcement	SBC	2017	2018-2022	Sustainable business, cleaner greener Swale		Not started yet	?	Community steering group proposal to be evaluated. Promotion to raise awareness of health and air pollution (AQMA 2)
3	Quiet delivery zones	Freight and delivery management	Quiet and out of hours delivery	KCC	2016	2018-2022	Reducing noise and emissions by restricting delivery times		Not started yet	?	Community steering group proposal to be evaluated. School and night-time hours restricted freight delivery times for noise and AQ. (AQMAs: all)
4	Pinch-point parking alternatives (red-route)	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	KCC	2017	2018-2022			Not started yet	?	New proposal to be evaluated. Remove pinch point A2 parking by providing alternate off-street parking and camera enforcement and

											signage(AQMAs: 1,2,4, 5)
5	Local LEV car-club	Promoting Low Emission Transport	Other	SBC	2017	2018-2022			Not started yet	?	Set-up low emission community car club or car-share scheme for AQMAs (AQMAs: 1,2,4, 5)
6	Local school and business travel plans	Promoting travel alternatives	Promotion of walking and cycling and travel plans	KCC (+ PH SBC)	2010	2013 Swale already participating in the Kent Travel scheme and involved in Better business for all	% of schools participant in Kent smarter travel challenge recorded by KCC	2%	Annual bids to KCC	Ongoing	Community steering group proposal to be evaluated. (AQMAs: all)
7	Tree planting scheme	Public information	Other	SBC	2017/18	2018-2022	Tree Planting to reduce emissions	0.5%	Ongoing	Ongoing	Community steering group proposal in favour of tree planting schemes. Funding obtained by the community in 2016 -2017 to commence in Teynham

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
Current Priority Measures											
1	Care hire and share schemes	Alternatives to private vehicle use	Car Clubs	KCC	2017	2017-2018	KCC journey reductions	0.5%	Ongoing	Ongoing	Promotion of the KCC and other car share schemes
2	Environmental permits for large combustion plants, going	Environmental Permits	Large Combustion Plant Permits and National Plans going	Defra, SBC	2017	2017-2022	Regeneration and sustainable business	3%	Ongoing	2022	Legislation and guidance

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
	beyond BAT		beyond BAT								
3	Swale Ecostars tyre inflation and smart driving campaigns	Vehicle Fleet Efficiency	Driver training and ECO driving aids	SBC	2014-2015	2015-2017	Sustainable business, cleaner greener Swale	2%	Ongoing	2022	Swale Ecostars scheme in 2015-16 to be repeated in 2017-2018. Two other Councils in Kent (Dartford and Medway) have expressed an interest and been provided with information to enable them to develop similar schemes for their authorities.
4	Speed reduction in Faversham town centre	Traffic Management	Reduction of speed limits, 20mph zones	KCC, SBC	2016-2017	2017-2018	Safer travel	1%	Commence with a local led scheme in Faversham town centre	2022	This may not be practical in most of the AQMAs in Swale since they are on the A2.
5	Swale Freight Management Plan	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	KCC, SBC	2012	2013-2022	Reduced climate change gases and air quality improvements	1%	Ongoing	Ongoing	Swale Freight management plan produced in 2016 to coincide with the KCC freight transport plan and feed into their consultation in 2017.
6	Policy guidance with Defra	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	Defra with all LAs	2016-2018	2017-2022	Climate change air quality strategic document produced	1%	Ongoing	Ongoing	Dependent on Defra

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
7	Low emission plants, new legislation from Defra	Promoting Low Emission Plant	Emission control equipment for small and medium sized stationary combustion sources / replacement of combustion sources	Defra	2017-2018	2017-2022	Climate change and air quality	5%	Ongoing	2022	New legislation
8	Low Emission Zones (LEZ) or Clean Air Zones (CAZ)	Promoting Low Emission Transport	Low Emission Zone (LEZ)	SBC	2018	2018-2022	Climate change and air quality	5%	Ongoing	2022	To be considered as London scheme expands to Kent and a funded model/scheme is devised for smaller councils. Cities have received funding in 2017. Action plan being developed with stakeholders.
9	KM "Walk to School" campaign, active travel campaigns	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	KCC, SBC	2012	Ongoing	Climate change, air quality, healthy travel, obesity reduction, children's health	3%	Majority of schools have embraced the KM project in Swale	2022	Awards for Swale schools in Swale and partnership work continues in 2017.
10	Increasing public awareness	Public Information	Other	SBC, KCC, DfT, Defra	Annually	Ongoing	Climate change, air quality, improving communications	0.50%	Ongoing	Ongoing	Leaflets on AQ and health and Ecostars produced for Swale. Information provided annually for website with updates when changes occur. Promotion via the Swale Means Business Website and the Economic Development E-bulletins.

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
Measures that were previously implemented and/or ongoing											
11	Promotion of public transport alternatives with quality bus and train services at enhanced frequencies	Alternatives to private vehicle use	Other	KCC	Ongoing	Ongoing	Statistical evidence of behaviour and travel choices	1%	Ongoing	Ongoing	Still being done with promotion of KCC smarter travel planning website link from our website.
12	Investigation of impact from additional traffic from any proposed planning applications re housing and industry	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance			Commenced, implemented 2012	Responses are made on application regarding air quality mitigation	2%	Commenced	Ongoing	Continuing. Some mitigation measures were suggested to planning at the development stage.
13	Diversion of HGV traffic (time/weight or other restriction)	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	DfT, SBC, KCC	Northern relief road partially completed	Started	Traffic counts	3%	Ongoing	Ongoing	Discussed at Freight transport plant meeting
14	Work with Satellite Navigation companies to amend appropriate (HGV) routes	Public Information	Via other mechanisms	KCC	Discussions with KCC	Started	Traffic counts	1%	By KCC	2015	KCC have SN route planning

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
15	Amended signage to direct traffic away from Newington	Transport Planning and Infrastructure	Other	KCC	Suggested in discussions with KCC Highways	Started	Signs improved to ask HGV to avoid the A2 and use the M2	2%			Discussed at Freight transport plant meeting
16	Industry: Encourage consideration of alternative routes / times for traffic	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	KCC / MKIP, Healthy workplace initiative	Partnership project	Started	Number of travel planning schemes	1%	Ongoing	2020	Discussed at Freight transport plant meeting with Head of MKIP parking
17	Stagger school times	Policy Guidance and Development Control	Other policy	KCC	Considered by KCC and schools	Ongoing	Less traffic congestion		Ongoing	Ongoing	Some schools wanted it and did it.
18	Promotion of public transport, i.e. Ride on the train, green taxis and bus schemes	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	KCC, SBC, local transport and businesses	In progress	Ongoing discussions and partnership activities	Change in travel modes and measurement of the use of alternatives	1%	Ongoing	2022	Work continues with the KCC partnership projects each year
19	Working through the planning process to require and encourage action to minimise the impact of new developments on the High Street	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	SBC, KCC	In progress	Ongoing discussions	Number of air quality reports resulting in mitigation	1%	Ongoing	2022	Ongoing work with Strategic Planning
20	Reduction of traffic	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services		In progress	Ongoing discussions and partnership activities	Change in travel modes and measurement of the use of alternatives	1%	Ongoing	2022	Discussed at Bus Quality partnership meeting in 2013

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
21	Supporting reduction in traffic impact	Promoting Travel Alternatives	Promotion of cycling	SBC	In progress	Ongoing discussions and partnership activities	Change in travel modes and measurement of the use of alternatives	1%	Ongoing	2022	Involved in promotion and marketing of an annual KCC project
22	Promotion of more efficient vehicles (especially Council owned or supported bus services)	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	SBC, KCC	In progress	Ongoing discussions and partnership activities	Change in travel modes and measurement of the use of alternatives	1%	Planning	2022	Considered when contractors, fleets and vehicles are procured
23	Plug in points for electric cars and bikes in village car parks, local employers and at the station	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	SBC, KCC	In progress	Ongoing discussions and partnership activities	Change in travel modes and measurement of the use of alternatives	1%	Ongoing	2022	Climate change synergies and regional funds enabled some charging points for vehicles in Swale
24	New monitoring equipment in Sittingbourne in two locations as well as re-sited in Ospringe to measure in the street canyon	Public Information	Via the Internet	SBC	2012	2013	Results of measuring improved air pollution	3%	Planned and installed	2013/2014	Equipment sites reduced due to resource restrictions to only 3 for the whole of Swale. One at Ospringe to be re-sited again.

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
Measures that have not been started											
25	Church Lane residents parking survey	Promoting Travel Alternatives	Personalised Travel Planning	SBC	Not done	Not started	Number of parked vehicles		None	Uncertain	Suggestion dismissed by steering group
26	Reclassification of A2 through Newington	Transport Planning and Infrastructure	Other	National	Not realistic	Not started			None	Uncertain	Major old road with no alternatives other than bypasses which will not be funded.
27	Average speed cameras in village (replacing single fixed camera)	Traffic Management	Reduction of speed limits, 20mph zones	KCC, Parish Council	Discussions with KCC	Not started	CCTV only local cameras		None	Uncertain	Discussed at steering groups and KCC and Freight transport meeting
28	Close Bull Lane to vehicles	Transport Planning and Infrastructure	Other	KCC	Discussions with KCC	Consideration given by KCC			None	Uncertain	Would need to be agreed to be implemented by KCC and Highways England
29	Diversion of HGV traffic at Key Street	Transport Planning and Infrastructure	Other	KCC	Discussions with KCC	Not started			None	Uncertain	Discussed at Freight transport plan meeting. The A2 is used when the M2 is blocked.
30	Ideas such as NOx absorbing paint, tarmac, roofing, etc.	Public Information	Other	SBC, Highways and Property owners	Pilot investigated	Not started			None	Uncertain	On hold until sponsorship and funding available

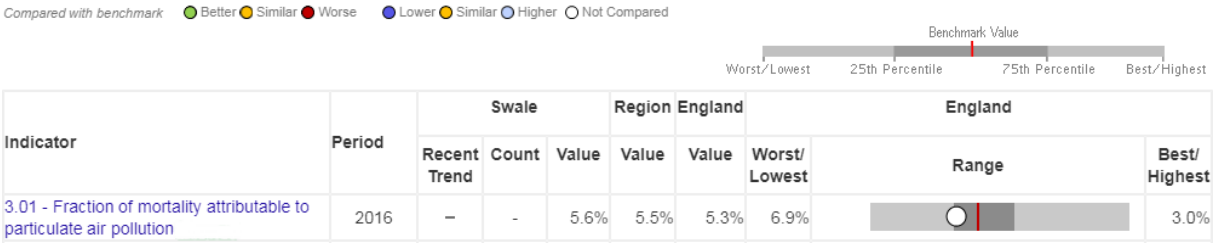
2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

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

Work carried out by Public Health England as part of the Public Health Outcomes Framework (PHOF) shows that the mortality associated with particulate air pollution within Swale Borough Council is 5.6%.

The mortality calculated for Swale Borough Council is slightly greater than that calculated for south east England (5.5 %) and England (5.3 %) as a whole.

Figure 2-1 Fraction of mortality attributed to particulate air pollution in Swale Borough Council



Indicator	Period	Swale			Region	England	England		
		Recent Trend	Count	Value	Value	Value	Worst/ Lowest	Range	Best/ Highest
3.01 - Fraction of mortality attributable to particulate air pollution	2016	–	-	5.6%	5.5%	5.3%	6.9%		3.0%

Swale Borough Council does not currently monitor levels of $PM_{2.5}$. As mentioned previously, the main pollutant of concern in the Borough is nitrogen dioxide (NO_2) from motor vehicle emissions, and the Borough maintains an extensive network for monitoring NO_2 levels as well as one automatic monitoring site for PM_{10}. Many sources that contribute to $PM_{2.5}$ emissions, including motor vehicle emissions, also contribute to PM_{10} and NO_2 emissions. For this reason, measures to reduce NO_2, such as those described in Section 2.2, should also be effective at reducing levels of PM_{10} and $PM_{2.5}$. Trends in NO_2 and PM_{10} levels, as measured by the Borough's current monitoring network, should also reflect general trends of $PM_{2.5}$ levels, i.e. a general decrease in NO_2 and PM_{10} levels should correspond to a general decrease in levels of $PM_{2.5}$. Swale Borough Council will continue to investigate synergistic air pollution improvement measures with the aim to reduce levels of NO_2, PM_{10} and $PM_{2.5}$.

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.

Swale Borough Council undertook automatic (continuous) monitoring at three sites during 2017:

• Newington 3	AQMA 1 NO_2 measurements
• Ospringe Roadside 2, Faversham*	AQMA 6 (formerly AQMA 2) NO_2 & PM_{10} measurements
• St Paul's Street, Milton Regis, Sittingbourne	AQMA 4 NO_2 measurements

Table A.1 in Appendix A shows the details of the sites. A map showing the location of the automatic monitoring sites is provided in Figure D.1. Monitoring results are available on the Kent Air website[5].

Maps showing the location of the monitoring sites are provided in Appendix D. The Ospringe Roadside 2 site was stopped because of an adjacent development on 27/01/2017. As the data capture rate for PM_{10} was less than 75% in 2017, the concentrations required annualisation. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Swale Borough Council undertook non-automatic (passive) monitoring of NO_2 using diffusion tubes at 68 sites during 2017. Table A.2 in Appendix A shows the details of the sites. The passive monitoring sites are listed in five different geographical areas: Sheerness (6 sites), Newington (14 sites), Faversham (15 sites), Teynham (8 sites)

[5] http://www.kentair.org.uk/

- *Data only available until February 2017

and Sittingbourne (25 sites). Maps showing the location of the monitoring sites are provided in Appendix D.

Where the data capture for 2017 was less than 75%, the concentrations were corrected using annualisation (SW78 only). All diffusion tube concentrations were corrected using a nationally-derived bias adjustment factor of 0.77. All concentrations were also adjusted for distance using the NO_2 fall-off with distance calculator available on the LAQM Support website.[6]

Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. "annualisation" and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias and "annualisation" and not those following any fall off with distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40 µg/m^3.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200 µg/m^3, not to be exceeded more than 18 times per year.

Figure 3-1 shows the annual mean NO_2 concentration from 2013 to 2017 measured at both of the automatic monitoring stations. Trends in annual concentrations at the automatic monitoring sites are summarised below:

- The concentration at Newington 3, along the High Street in Newington, reached a maximum of 34.8 µg/m^3 in 2013 and has since steadily decreased to 29.7 µg/m^3 in 2017.

[6] https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

- Automatic monitoring of NO_2 began at St Paul's Street, in 2013. Since then, the concentration has been fairly consistent, varying from a low of 33.6 µg/m^3 in 2013 to a high of 37.7 µg/m^3 in 2015. The concentration was 35.4 µg/m^3 in 2017.

Figure 3-1 Nitrogen dioxide concentrations measured at automatic monitoring stations from 2013 to 2017

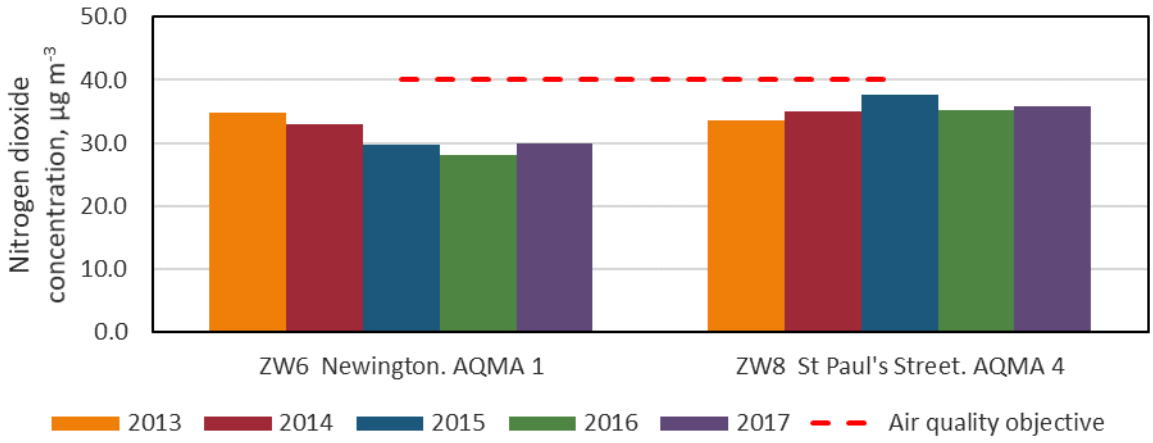
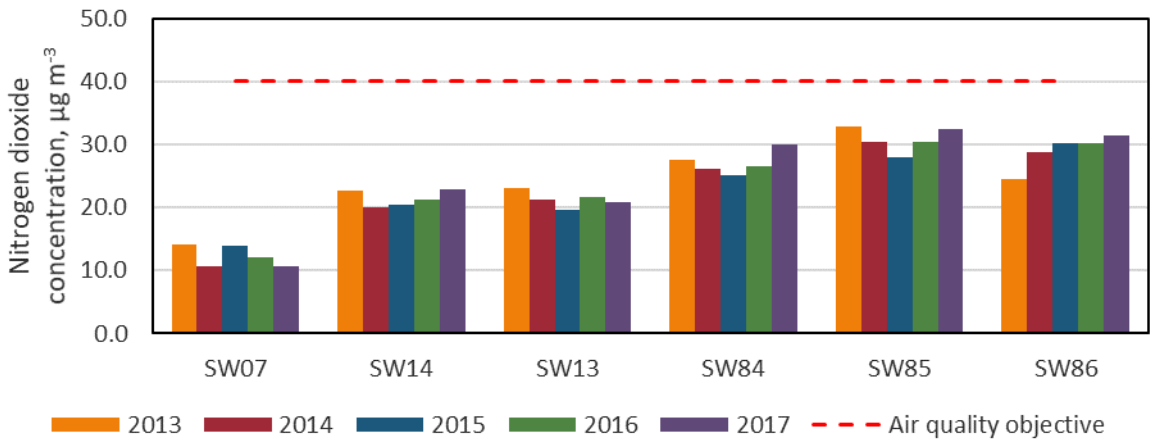


Figure 3-2 to Figure 3-7 show the annual mean NO_2 concentration from 2013 to 2017 measured at each of the 68 passive monitoring sites. This data is also presented in Table A.3 in Appendix A. The full 2017 dataset of monthly mean diffusion tube values is provided in Appendix B.

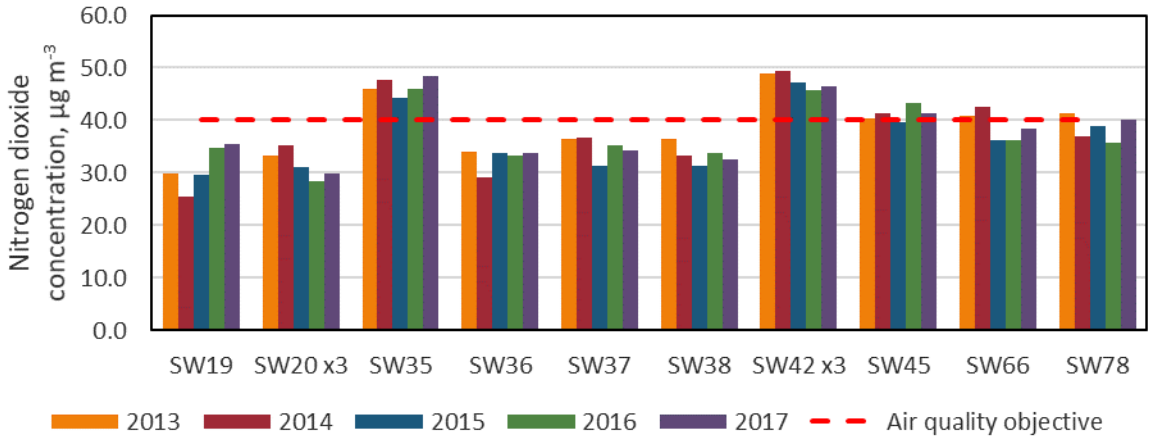
NO_2 concentrations measured in Sheerness (Figure 3-2) have been consistently below the air quality objective of 40 µg/m^3.

Figure 3-2 Nitrogen dioxide concentrations measured by diffusion tubes in Sheerness from 2013 to 2017



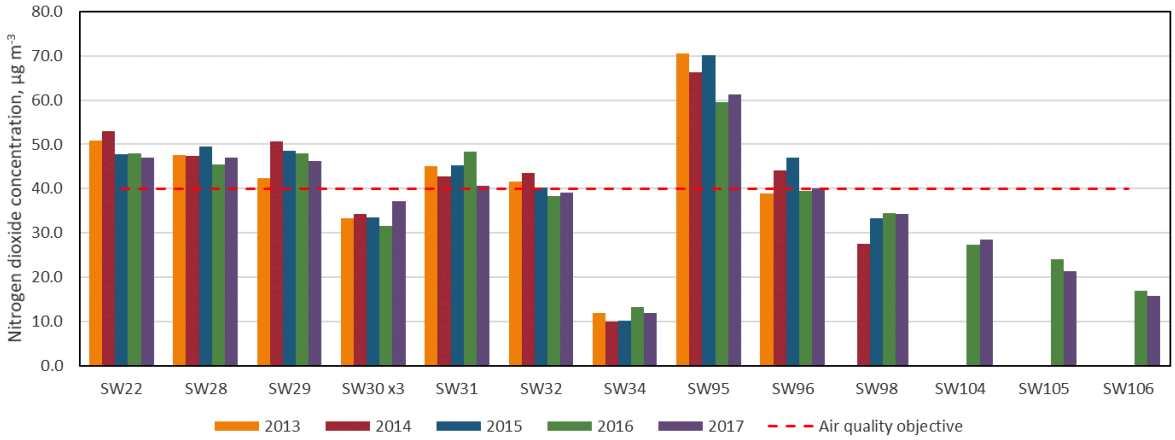
The NO_2 concentrations measured in Newington (Figure 3-3) in 2017 contain some of the lowest concentrations measured in the past five years, for example, at sites SW20, SW37 and SW38. However, four sites exceeded the air quality objective of 40 µg/m^3 in 2017: SW35, SW42, SW45 and SW78. These four sites are all located on the High Street between Church Lane and Callaways Lane, and are included in AQMA 1.

Figure 3-3 Nitrogen dioxide concentrations measured by diffusion tubes in Newington from 2013 to 2017. Area contains AQMA 1.



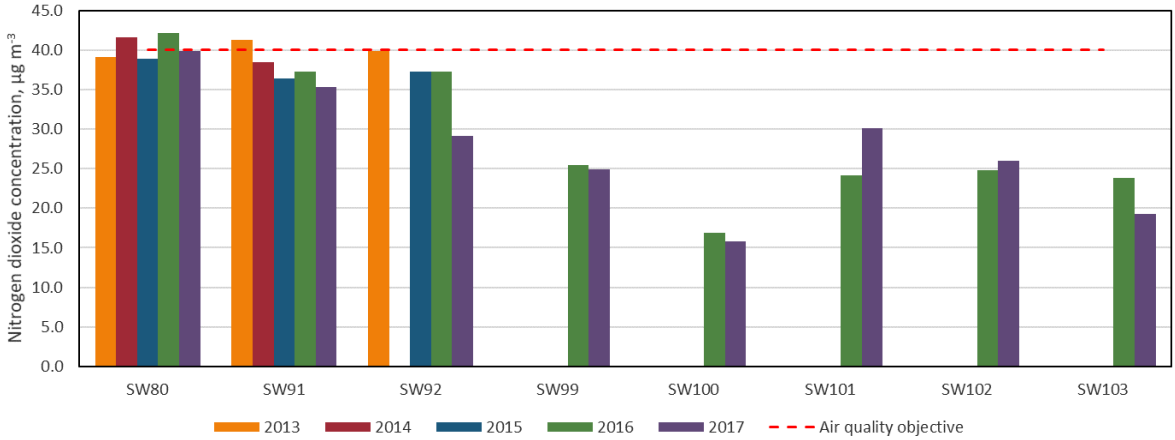
The concentrations measured in Faversham (Figure 3-4) in 2017 also contain some of the lowest concentrations measured in the past five years, particularly for sites which have tended to exceed the air quality objective, such as SW22, SW29, SW31, SW32 and SW95. The air quality objective was exceeded at six sites in 2017: SW22, SW28, SW29, SW31, SW95 and SW96. These sites are all located along Ospringe Street / London Road, and are included in AQMA 6. SW95 measured an annual concentration of 61.3 µg/m^3 which is above 60 µg/m^3 and is therefore indicative of an exceedance of the daily NO_2 objective. SW95 has the highest measured NO_2 concentrations of any of the Swale Borough County monitoring sites. Concentrations measured at the sites that started measurements in 2016 (SW104, SW105 and SW106) remained well below the air quality objective.

Figure 3-4 Nitrogen dioxide concentrations measured by diffusion tubes in Faversham from 2013 to 2017. Area contains AQMA 6.



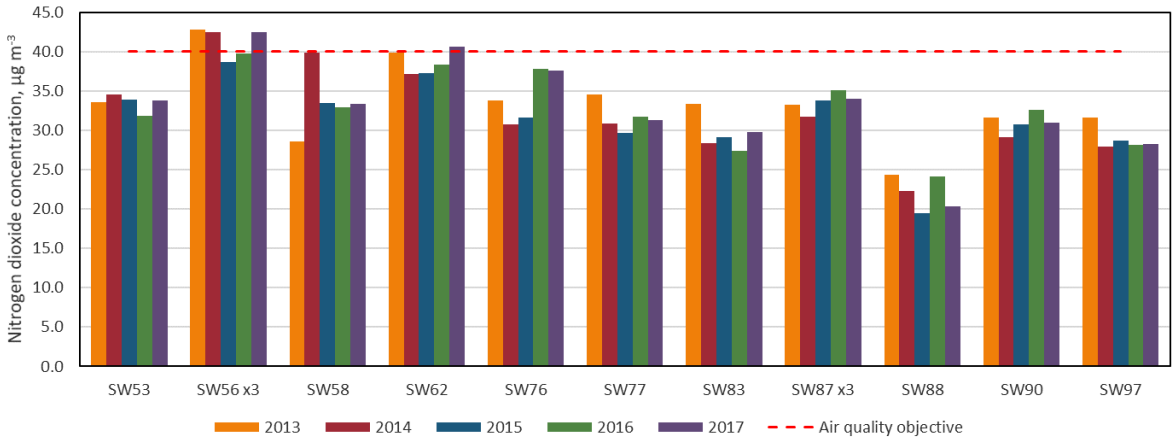
NO_2 concentrations measured in Teynham are presented in Figure 3-5. None of the diffusion tube sites located in Teynham exceeded the air quality objective in 2017, although site SW80 was close with a concentration of 39.9 µg/m^3. SW80 is located along London Road and falls within AQMA 5. The concentrations measured at the diffusion tube sites introduced in 2016 (SW99, SW100, SW101, SW102 and SW103) all remained well below the air quality objective.

Figure 3-5 Nitrogen dioxide concentrations measured by diffusion tubes in Teynham from 2013 to 2017. Area contains AQMA 5.



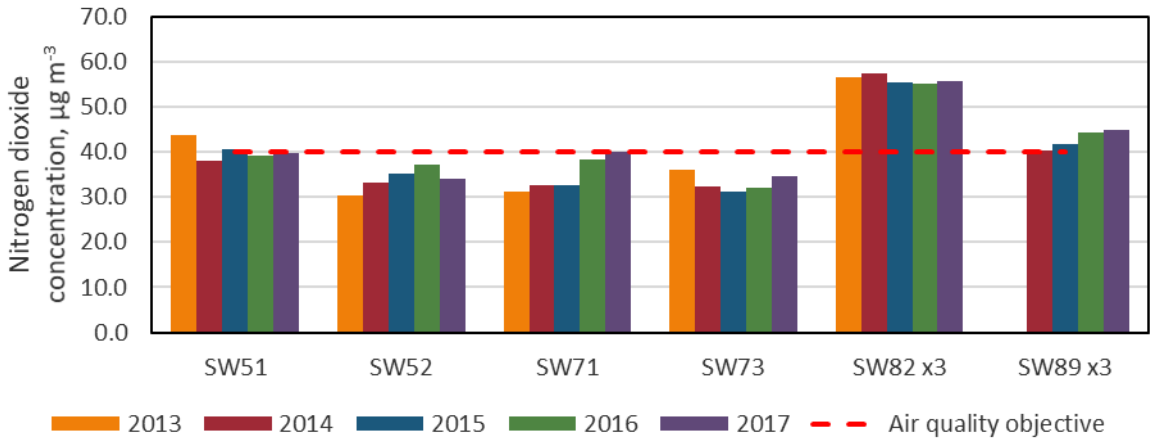
Concentrations measured in Sittingbourne are presented in Figure 3-6.Two of the diffusion tube sites located in Sittingbourne exceeded the air quality objective in 2017: SW56 and SW62. SW56 is located on East Street and is within AQMA 3. SW62 is located on Key Street.

Figure 3-6 Nitrogen dioxide concentrations measured by diffusion tubes in Sittingbourne from 2013 to 2017. Area contains AQMA 3.



Concentrations measured in Milton (Sittingbourne) are presented in Figure 3-7. Sites SW51, SW52, SW82 and SW89 are contained within AQMA 4. Sites SW82 and SW89 have consistently exceeded the air quality objective for the past five and four years respectively. Site SW51 measured close to the air quality objective in 2017 with a value of 39.6 µg/m^3. Site SW71 measured an annual NO_2 concentration of 40.0 µg/m^3 in 2017.

Figure 3-7 Nitrogen dioxide concentrations measured by diffusion tubes in Milton from 2013 to 2017. Area contains AQMA 4.



In summary, there were 15 diffusion tube monitoring sites which measured exceedances of the 40 µg/m^3 NO_2 air quality objective in 2017 (prior to distance correction). All 15 of these sites are located within existing AQMAs. There was one annual average concentration exceeding 60 µg/m^3 at NO_2 diffusion tube site SW95, which indicates that it would be likely for there to be an exceedance of the hourly NO_2 objective at this site.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200 µg/m^3, not to be exceeded more than 18 times per year. There was only a single measured 1-hour mean above 200 µg/m^3, which was measured at the St Paul's Street automatic monitoring site (ZW8). This is well below the 18 permitted exceedances per year, and therefore the hourly objective for NO_2 has not been exceeded in 2017.

Table B.1 in the Appendix shows NO_2 annual mean concentrations distance corrected to nearest exposure. When distance corrected, 10 diffusion tube monitoring sites measured exceedances of the 40 µg/m^3 NO_2 air quality objective in 2017. All 10 of these sites are located within existing AQMAs. No distance corrected annual average concentrations exceeded 60 µg/m^3.

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. This is also presented visually in Figure 3-8. The measured annual mean PM_{10} concentration has remained consistently more than 10 µg m^{-3} below the annual mean objective concentration.

Figure 3-8 PM_{10} concentrations measured at Ospringe Road from 2013 to 2017. Located in AQMA 6 (formerly AQMA 2).

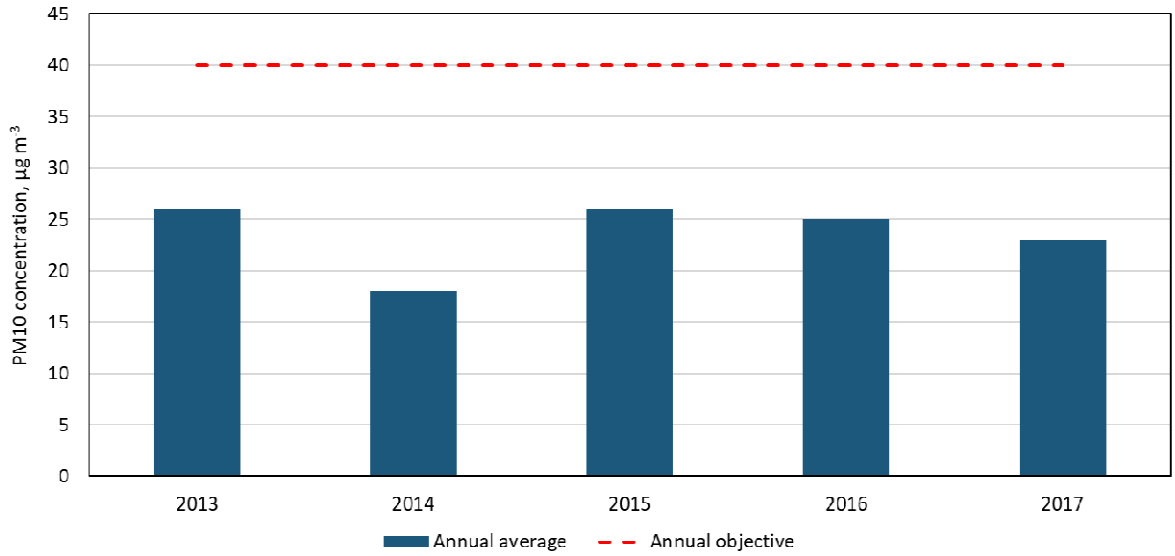
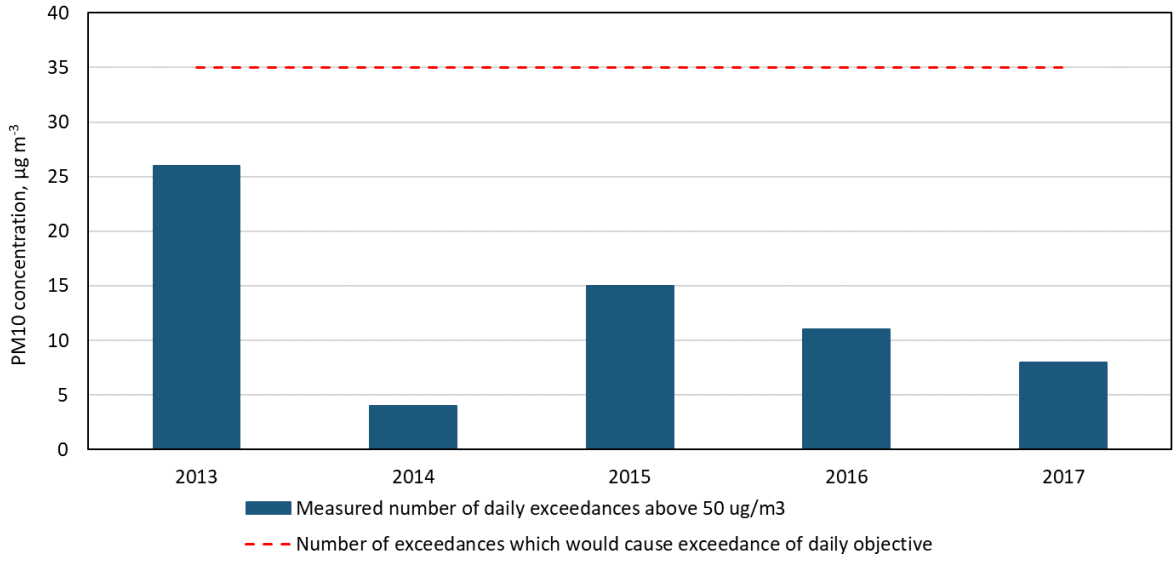


Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50 µg/m^3, not to be exceeded more than 35 times per year. Figure 3-9 compares the number of

days which exceeded the air quality objective of 50 µg/m^3 with the number of days (35) which would cause an exceedance of the air quality objective. The number of measured exceedances is well below the permitted 35 days. However, as the period of valid data for PM_{10} in 2017 is below 85%, the 90.4th percentile of 24-hour means is used to determine if there are any exceedances of the daily objective for PM_{10}. The 90.4th percentile of 24-hour means for PM_{10} in 2017 is 64.1 µg/m^3, which is larger than the 50 µg/m^3 limit and therefore indicates that the daily objective for PM_{10} would likely be exceeded for 2017. However, there is a large degree of uncertainty in this calculation, as the data capture for 2017 was very low at 7.4%.

Figure 3-9 Number of exceedances of daily PM_{10} mean objective of 50 µg/m^3 at Ospringe Street from 2012 to 2016. Located in AQMA 6 (formerly AQMA 2).



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)
ZW6	Newington 3	Roadside	585861	164817	NO_2	YES	Chemiluminescent	5.0	1.6	2.4
ZW8	St Paul's Street	Roadside	590264	164396	NO_2	YES	Chemiluminescent	9.0	2.5	3.2
ZW3	Ospringe Roadside (2)	Roadside	600360	160869	NO2, PM_{10}	YES	Chemiluminescent & TEOM	0.0	1.7	2.0

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)
Newington										
SW66	96/94 High Street, Newington	Kerbside	586083	164745	NO_2	YES	0	1.2	NO	1.9
SW45	64 High Street, Newington	Kerbside	585992	164772	NO_2	YES	0	1.2	NO	2.3
SW35	60 High Street, Newington	Kerbside	585961	164779	NO_2	YES	1.4	1.4	NO	2.4
SW42	High Street, Opp Church Lane	Kerbside	585936	164788	NO_2	YES	1.4	1.3	NO	2.2
SW42	High Street, Opp Church Lane	Kerbside	585936	164788	NO_2	YES	1.4	1.3	NO	2.2
SW42	High Street, Opp Church Lane	Kerbside	585936	164788	NO_2	YES	1.4	1.3	NO	2.2
SW19	Newington Social Club	Kerbside	585918	164790	NO_2	YES	0	2.3	NO	2.4
SW37	32 High Streeet, Newington	Kerbside	585867	164801	NO_2	YES	4	1.7	NO	2.3
SW38	15a High Street, Newington	Kerbside	585781	164834	NO_2	YES	1.6	2.4	NO	2
SW20	Newington Co Op	Kerbside	585846	164820	NO_2	YES	0	1.6	YES	2.3
SW20	Newington Co	Kerbside	585846	164820	NO_2	YES	0	1.6	YES	2.3

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)
	Op									
SW20	Newington Co Op	Kerbside	585846	164820	NO_2	YES	0	1.6	YES	2.3
SW36	49 High Street, Newington	Kerbside	585928	164798	NO_2	YES	1	3.1	NO	2.2
SW78	55-57 High Street, Newington	Kerbside	585960	164787	NO_2	YES	0.9	2.2	NO	1.9
Sittingbourne										
SW62	Key Street, Sittingbourne	Kerbside	588178	164235	NO_2	NO	15	1.9	NO	2.1
SW82	Conservative Club, St Pauls Street	Roadside	590228	164396	NO_2	YES	Unknown	1.65	NO	2.3
SW82	Conservative Club, St Pauls Street	Roadside	590228	164396	NO_2	YES	Unknown	1.65	NO	2.3
SW82	Conservative Club, St Pauls Street	Roadside	590228	164396	NO_2	YES	Unknown	1.65	NO	2.3
SW52	20/22 St Pauls Street	Kerbside	590203	164409	NO_2	YES	0	3	NO	2.25
SW51	14/16 St Pauls Street	Kerbside	590235	164408	NO_2	YES	0.5	2	NO	2.2
SW89	St Pauls Air Quality Station	Kerbside	590264	164396	NO_2	YES	9	4	YES	3.1
SW89	St Pauls Air Quality Station	Kerbside	590264	164396	NO_2	YES	9	4	YES	3.1
SW89	St Pauls Air Quality Station	Kerbside	590264	164396	NO_2	YES	9	4	YES	3.1

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)
SW71	o/s 8 Staple Close, Staplehurst Road, Sittingbourne	Roadside	590096	164455	NO_2	NO	6.1	3	NO	2.2
SW73	14 Chalkwell Road, Sittingbourne	Roadside	590122	164405	NO_2	NO	2.8	3	NO	2.2
SW58	Dover Street Filling Station	Kerbside	590356	163748	NO_2	NO	N(3)	2	NO	2
SW83	Pembury Court, Dover Street	Roadside	590375	163774	NO_2	NO	N(3)	1.5	NO	2.05
SW97	Crown Quay Lane, Sittingbourne	Roadside	591007	163614	NO_2	NO	1.6	2.4	NO	2
SW53	114 East Street, Sittingbourne	Kerbside	590402	163465	NO_2	NO	0	5.1	NO	1.6
SW56	126 East Street, Sittingbourne	Kerbside	591451	163465	NO_2	YES	0	2.9	NO	1.85
SW56	126 East Street, Sittingbourne	Kerbside	591451	163465	NO_2	YES	0	2.9	NO	1.85
SW56	126 East Street, Sittingbourne	Kerbside	591451	163465	NO_2	YES	0	2.9	NO	1.85
SW87	Canterbury Road AQ Station	Roadside	591489	163472	NO_2	YES	N(3)	4.8	YES	1.7

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)
SW87	Canterbury Road AQ Station	Roadside	591489	163472	NO_2	YES	N(3)	4.8	YES	1.7
SW87	Canterbury Road AQ Station	Roadside	591489	163472	NO_2	YES	N(3)	4.8	YES	1.7
SW90	Junction of Canterbury Road Goodnestone Road	Roadside	591551	163456	NO_2	NO	2.9	2	NO	1.6
SW76	155 Canterbury Road, Sittingbourne	Roadside	592194	163306	NO_2	NO	3.5	1.7	NO	2.2
SW77	Kemsley Fields, Swale Way, Sittingbourne	Roadside	591035	166521	NO_2	NO	N(3)	4.4	NO	2
SW88	Sonara Way, Sonara Fields, Sittingbourne	Urban Background	589320	165047	NO_2	NO	N(3)	1.8	NO	1.9
Sheerness										
SW07	Capel Hill Farm, Harty	Rural	600745	169572	NO_2	NO	N(3)	N(3)	NO	3
SW14	Rushenden Road, Queenborough	Kerbside	591170	172087	NO_2	NO	1.4	1.7	NO	3
SW13	Main Road, Queenborough	Kerbside	591487	172048	NO_2	NO	1.4	3.8	NO	3

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)
SW84	Sheerness College 1, Bridge Road, Sheerness	Roadside	591725	175045	NO_2	NO	N(3)	3.5	NO	1.85
SW85	Sheerness College 2, Bridge Road, Sheerness	Roadside	591751	175009	NO_2	NO	N(3)	2.3	NO	1.9
SW86	Swale Foyer, Bridge Road, Sheerness	Roadside	591723	175020	NO_2	NO	N(3)	1.6	NO	2
Teynham										
SW99	A2 Frognal Lane, Teynham	Roadside	594790	162600	NO_2	NO	N(3)	2	NO	1.9
SW100	Frognal Lane, Teynham	Urban Background	594818	162647	NO_2	NO	N(3)	1	NO	2.15
SW80	A2 Teynham, 107 London Road	Roadside	595160	162470	NO_2	YES	0.6	1.5	NO	1.8
SW91	Adj to 72 London Road, Teynham	Roadside	595451	162446	NO_2	NO	0	2	NO	1.75
SW101	A2 Lynsted Lane, Jct	Roadside	595131	162463	NO_2	NO	N(3)	1.3	NO	1.85
SW92	FJ Williams, London Road	Roadside	595195	162446	NO_2	YES	1	3.1	NO	1.9
SW102	Michaels A2, Teynham	Roadside	595206	162457	NO_2	YES	N(3)	2.6	NO	1.8
SW103	Station Road, Teynham	Roadside	595310	162439	NO_2	NO	N(3)	1.7	NO	1.95

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)
Faversham										
SW28	Mayors Arms, Ospringe	Kerbside	600223	160889	NO_2	YES	0	1.5	NO	2.4
SW30	ZW3 Ospringe Street	Kerbside	600358	160869	NO_2	YES	1.7	2.3	YES	1.9
SW30	ZW3 Ospringe Street	Kerbside	600358	160869	NO_2	YES	1.7	2.3	YES	1.9
SW30	ZW3 Ospringe Street	Kerbside	600358	160869	NO_2	YES	1.7	2.3	YES	1.9
SW31	Site 7, 4 Ospringe Street	Kerbside	600444	160848	NO_2	YES	1	1.5	NO	2.4
SW95	The Mount, London Road, Ospringe	Kerbside	600517	160825	NO_2	YES	3.6	1.6	NO	1.9
SW32	11 Ospringe Street, Ospringe	Kerbside	600420	160845	NO_2	YES	1.3	2.3	NO	2
SW96	Maison Dieu, Ospringe Street	Kerbside	600358	160859	NO_2	YES	0	3	NO	1.9
SW22	35 Ospringe Street, Ospringe	Kerbside	600307	160863	NO_2	YES	0	2.7	NO	2
SW29	Opp Lions Yard, Ospringe Street	Kerbside	600274	160871	NO_2	YES	3	2.4	NO	2.07
SW98	Canterbury Road, Preston, Faversham	Kerbside	601818	160474	NO_2	NO	2	0.5	NO	1.9

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)
SW104	260 The Street, Boughton	Roadside	605486	159536	NO_2	NO	N(3)	1.7	NO	2
SW105	209 The Street, Boughton	Roadside	605522	159491	NO_2	NO	N(3)	1.3	NO	1.9
SW34	Hernehill Village Hall, Hernehill	Rural	606624	161110	NO_2	NO	N(3)	1.7	NO	1.9
SW106	39/40 Priory Row, Davington	Urban Background	601116	162006	NO_2	NO	N(3)	1.3	NO	1.9

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 2017 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3)				
					2013	2014	2015	2016	2017
ZW6	Roadside	Automatic	97%	97%	34.8	32.9	29.7	28.1	29.7
ZW8	Roadside	Automatic	96%	96%	33.6	35.1	37.7	35.1	35.4
Newington									
SW66	Kerbside	Diffusion Tube	92%	92%	**40.9**	**42.6**	36.2	36.3	38.5
SW45	Kerbside	Diffusion Tube	83%	83%	**40.4**	**41.3**	39.6	**43.3**	**41.2**
SW35	Kerbside	Diffusion Tube	92%	92%	**45.9**	**47.7**	**44.2**	**46.0**	**48.5**
SW42 x3	Kerbside	Diffusion Tube	92%	92%	**48.8**	**49.3**	**47.3**	**45.7**	**46.4**
SW19	Kerbside	Diffusion Tube	92%	92%	29.8	25.4	29.6	34.8	35.4
SW37	Kerbside	Diffusion Tube	100%	100%	36.5	36.7	31.4	35.1	34.2
SW38	Kerbside	Diffusion Tube	75%	75%	36.4	33.4	31.4	33.8	32.6
SW20 x3	Kerbside	Diffusion Tube	92%	92%	33.4	35.3	31.2	28.3	29.9
SW36	Kerbside	Diffusion Tube	100%	100%	34.1	29.2	33.8	33.3	33.7
SW78	Kerbside	Diffusion Tube	58%	58%	**41.3**	37.0	38.8	35.8	**40.2**
Sittingbourne									
SW62	Kerbside	Diffusion Tube	100%	100%	39.9	37.1	37.2	38.3	**40.6**
SW82 x3	Roadside	Diffusion	100%	100%	**56.4**	**57.4**	**55.5**	**55.1**	**55.7**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2017 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2013	2014	2015	2016	2017
		Tube							
SW52	Kerbside	Diffusion Tube	100%	100%	30.4	33.3	35.2	37.2	33.9
SW51	Kerbside	Diffusion Tube	100%	100%	**43.7**	38.1	**40.5**	39.2	39.6
SW89 x3	Kerbside	Diffusion Tube	100%	100%	**44.0**	**40.3**	**41.8**	**44.3**	**44.7**
SW71	Roadside	Diffusion Tube	100%	100%	31.3	32.5	32.7	38.3	**40.0**
SW73	Roadside	Diffusion Tube	100%	100%	35.9	32.4	31.1	32.2	34.6
SW58	Kerbside	Diffusion Tube	100%	100%	28.6	39.8	33.5	32.9	33.4
SW83	Roadside	Diffusion Tube	100%	100%	33.3	28.4	29.1	27.4	29.7
SW97	Roadside	Diffusion Tube	100%	100%	31.6	27.9	28.7	28.1	28.2
SW53	Kerbside	Diffusion Tube	100%	100%	33.6	34.5	33.9	31.9	33.8
SW56 x3	Kerbside	Diffusion Tube	100%	100%	**42.8**	**42.5**	38.7	39.8	**42.5**
SW87 x3	Roadside	Diffusion Tube	92%	92%	33.2	31.7	33.8	35.1	34.0
SW90	Roadside	Diffusion Tube	100%	100%	31.6	29.1	30.7	32.6	31.0
SW76	Roadside	Diffusion Tube	100%	100%	33.8	30.7	31.6	37.8	37.6
SW77	Roadside	Diffusion Tube	92%	92%	34.5	30.9	29.7	31.8	31.3
SW88	Urban Background	Diffusion Tube	92%	92%	24.3	22.3	19.5	24.1	20.4

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2017 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2013	2014	2015	2016	2017
Sheerness									
SW07	Rural	Diffusion Tube	83%	83%	14.1	10.7	14.0	12.1	10.7
SW14	Kerbside	Diffusion Tube	100%	100%	22.7	20.0	20.5	21.3	22.8
SW13	Kerbside	Diffusion Tube	100%	100%	23.1	21.3	19.6	21.7	20.8
SW84	Roadside	Diffusion Tube	100%	100%	27.6	26.1	25.2	26.4	30.0
SW85	Roadside	Diffusion Tube	100%	100%	32.8	30.3	27.9	30.3	32.5
SW86	Roadside	Diffusion Tube	100%	100%	24.4	28.8	30.1	30.2	31.4
Teynham									
SW99	Roadside	Diffusion Tube	92%	92%	-	-	-	25.5	24.9
SW100	Urban Background	Diffusion Tube	100%	100%	-	-	-	16.9	15.8
SW80	Roadside	Diffusion Tube	100%	100%	39.1	**41.6**	38.9	**42.1**	39.9
SW91	Roadside	Diffusion Tube	83%	83%	**41.3**	38.5	36.4	37.3	35.3
SW101	Roadside	Diffusion Tube	92%	92%	-	-	-	24.2	30.1
SW92	Roadside	Diffusion Tube	92%	92%	39.9	-	37.3	37.3	29.1
SW102	Roadside	Diffusion Tube	92%	92%	-	-	-	24.8	26.0
SW103	Roadside	Diffusion Tube	83%	83%	-	-	-	23.9	19.3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2017 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2013	2014	2015	2016	2017
Faversham									
SW28	Kerbside	Diffusion Tube	100%	100%	**47.5**	**47.4**	**49.4**	**45.5**	**47.0**
SW30 x3	Kerbside	Diffusion Tube	83%	83%	33.3	34.3	33.4	31.6	37.2
SW31	Kerbside	Diffusion Tube	100%	100%	**45.1**	**42.7**	**45.2**	**48.3**	**40.7**
SW95	Kerbside	Diffusion Tube	83%	83%	**70.5**	**66.3**	**70.2**	**59.6**	**61.3**
SW32	Kerbside	Diffusion Tube	100%	100%	**41.5**	**43.6**	**40.2**	38.2	39.1
SW96	Kerbside	Diffusion Tube	100%	100%	38.8	**44.1**	**47.0**	39.4	**40.0**
SW22	Kerbside	Diffusion Tube	100%	100%	**50.8**	**52.9**	**47.7**	**47.9**	**47.0**
SW29	Kerbside	Diffusion Tube	100%	100%	**42.3**	**50.7**	**48.6**	**48.0**	**46.2**
SW98	Kerbside	Diffusion Tube	100%	100%	-	27.6	33.2	34.4	34.3
SW104	Roadside	Diffusion Tube	100%	100%	-	-	-	27.3	28.4
SW105	Roadside	Diffusion Tube	100%	100%	-	-	-	24.1	21.3
SW34	Rural	Diffusion Tube	100%	100%	11.9	10.0	10.2	13.2	11.9
SW106	Urban Background	Diffusion Tube	83%	83%	-	-	-	16.8	15.8

☒ Diffusion tube data has been bias corrected

☒ 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) 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 2017 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2013	2014	2015	2016	2017
ZW6	Roadside	Automatic	97	97	1	1	0	1	0
ZW8	Roadside	Automatic	96	96	0	0	1 (120)	0	1

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 2017 (%) (2)	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (3)				
				2013	2014	2015	2016	2017
ZW3	Roadside	7.4	7.4	26	18	26	25	23

☒ **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 2017 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
				2013	2014	2015	2016	2017
ZW3	Roadside	7	7	26	4	15	11	8 (**64**)

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 2017

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2017

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 (0.77) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
DT1	36	42.1	-	-	59.1	52.9	-	47	55	38.4	45.2	46.8	46.9	**42.3**	**41.2**
DT2	35.7	23.3	19.7	17.1	18.2	19.5	25.7	17	27	19	33	27.6	23.6	21.2	21.2
Newington															
SW66	68.7	51.9	51.2	48.7	45.7	45.5	41.6	48.6	47.0	5.5	-	5.4	50.0	38.5	38.5
SW45	69.7	52.1	51.0	58.9	47.1	5.2	46.6	45.3	54.6	59.8	-	-	53.5	**41.2**	**41.2**
SW35	87.4	6.8	64.5	58.0	46.4	59.7	53.3	51.6	-	63.7	9.8	56.5	63.0	**48.5**	**43.1**
SW42 x3	83.1	63.2	6.6	61.6	57.7	58.5	5.7	51.1	58.3	58.9	-	58.8	6.2	**46.4**	**41.1**
SW19	61.8	39.3	47.9	41.1	41.2	4.3	32.2	35.2	39.7	-	77.2	5.5	46.4	35.4	35.4
SW37	45.7	4.3	43.5	47.8	43.8	43.4	35.4	39.8	43.7	43.5	67.8	38.2	44.5	34.2	28.2
SW38	49.5	4.9	43.6	-	4.3	37.7	3.4	38.9	-	-	64.0	35.6	42.3	32.6	32.6
SW20 x3	53.0	4.1	39.3	-	36.2	32.7	28.4	33.8	33.9	35.8	6.2	34.2	38.8	29.9	29.9
SW36	65.8	42.9	36.7	44.4	39.8	33.7	31.4	36.6	42.5	39.0	68.2	44.5	43.8	33.7	32.2
SW78	77.4	52.5	5.0	-	5.3	49.2	-	4.8	-	-	74.4	-	56.4	**40.2**	37.9
Sittingbourne															
SW62	66.1	52.4	49.0	49.7	35.9	46.5	4.6	42.9	51.0	5.3	89.2	59.1	52.7	**40.6**	28.1

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 (0.77) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
SW82 x3	11.0	68.9	74.3	57.5	66.6	72.5	62.9	69.0	63.8	68.5	1.3	63.6	72.4	**55.7**	**55.7**
SW52	68.8	44.5	39.9	42.8	42.0	37.3	32.2	42.4	39.8	34.7	62.8	41.5	44.6	33.9	33.9
SW51	57.4	42.0	55.1	54.7	49.5	45.8	43.0	5.1	49.9	45.0	79.0	46.3	51.5	39.6	38.4
SW89 x3	74.4	58.8	56.5	55.3	6.0	57.1	5.2	51.4	58.4	5.4	77.1	56.6	58.1	**44.7**	35.1
SW71	7.5	53.2	49.8	53.2	33.6	37.6	38.6	48.2	45.1	51.4	9.9	51.3	52.0	**40.0**	32.9
SW73	58.2	46.2	44.7	43.1	36.0	37.9	4.6	41.0	39.4	4.9	65.6	44.9	44.9	34.6	31.3
SW58	57.7	49.6	44.7	34.6	36.6	4.3	3.0	33.6	41.5	37.5	65.6	48.3	43.3	33.4	33.4
SW83	54.0	42.0	42.6	36.1	33.7	31.8	27.4	31.8	35.3	3.4	59.4	38.7	38.6	29.7	29.7
SW97	6.9	35.6	53.5	33.7	36.6	31.8	26.9	34.0	3.4	25.1	44.0	27.6	36.7	28.2	26.7
SW53	58.7	45.0	43.4	46.0	36.4	39.6	35.8	39.9	38.1	38.9	63.0	41.9	43.9	33.8	33.8
SW56 x3	64.5	54.8	49.7	52.7	45.3	52.7	46.5	55.0	47.6	53.7	88.1	51.5	55.2	**42.5**	**42.5**
SW87 x3	5.4	43.2	41.1	45.9	39.7	38.6	34.3	39.5	38.6	-	68.0	46.6	44.2	34.0	34.0
SW90	6.0	36.4	4.4	38.7	31.6	36.7	27.5	31.1	32.9	37.0	66.0	44.8	4.3	31.0	27.8
SW76	69.7	51.9	46.6	43.6	33.0	44.2	33.7	37.1	45.8	46.9	82.7	5.6	48.8	37.6	31.3
SW77	49.6	38.8	43.0	42.3	36.5	43.4	29.6	39.2	33.4	-	59.1	32.4	4.7	31.3	31.3
SW88	48.2	32.9	32.2	24.6	2.4	18.1	15.9	21.1	21.7	26.0	-	29.7	26.4	20.4	20.4
Sheerness															
SW07	28.2	17.1	16.6	1.8	12.2	12.3	6.9	1.7	11.7	12.1	-	-	13.9	10.7	10.7
SW14	49.1	31.8	29.5	24.9	23.2	22.2	18.8	22.3	24.4	24.1	55.7	29.9	29.7	22.8	21.6
SW13	45.2	28.2	25.8	24.4	2.8	2.5	15.7	21.6	2.0	24.9	45.4	32.4	27.8	20.8	20.3

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 (0.77) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
SW84	53.7	35.6	39.3	41.9	35.7	4.9	24.0	3.8	32.8	33.4	7.1	28.6	38.9	30.0	30.0
SW85	62.5	46.2	45.9	33.2	28.4	29.1	32.5	36.6	4.7	39.8	67.1	44.8	42.2	32.5	32.5
SW86	61.9	44.0	39.7	37.6	36.3	31.9	29.3	36.4	37.0	34.8	62.6	38.0	4.8	31.4	31.4
Teynham															
SW99	51.6	-	34.0	32.7	22.9	24.8	2.3	23.4	24.6	27.7	56.3	37.9	32.4	24.9	24.9
SW100	37.8	24.7	2.2	16.5	15.3	15.1	12.2	18.5	16.0	18.0	28.2	23.3	2.5	15.8	15.8
SW80	61.2	48.6	49.2	65.7	54.3	49.0	44.2	45.8	44.0	37.7	75.2	46.4	51.8	39.9	37.6
SW91	-	5.0	48.2	-	37.1	38.9	37.1	39.7	44.1	43.2	73.7	46.9	45.9	35.3	35.3
SW101	54.7	42.4	45.0	44.7	34.9	-	38.6	28.4	3.6	23.4	54.3	33.4	39.1	30.1	30.1
SW92	44.7	32.5	31.6	34.8	29.1	28.1	25.5	37.4	-	43.5	65.0	43.8	37.8	29.1	27.7
SW102	42.6	33.8	31.3	32.7	-	31.5	25.5	28.7	29.7	28.0	52.7	35.1	33.8	26.0	26.0
SW103	6.9	32.5	31.1	27.3	24.6	-	22.7	21.8	27.7	22.5	-	33.6	25.7	19.3	19.3
Faversham															
SW28	77.1	58.2	54.3	63.0	61.4	61.5	56.1	59.4	61.3	49.9	78.8	51.7	61.6	**47.0**	**47.0**
SW30 x3	52.3	41.8	-	-	4.4	5.3	41.0	44.3	46.3	45.4	75.2	45.9	48.3	37.2	33.7
SW31	65.7	52.7	46.3	62.8	55.3	52.7	45.6	5.5	5.1	42.5	64.0	45.7	52.8	**40.7**	37.4
SW95	85.0	69.7	58.6	85.5	84.4	77.5	-	87.4	-	7.8	115.0	62.7	79.7	**61.3**	**48.2**
SW32	66.9	51.1	47.6	49.0	4.6	47.0	43.1	46.3	47.1	48.6	72.6	49.5	5.8	39.1	36.1
SW96	58.1	42.0	52.6	53.0	43.7	53.8	45.8	47.8	49.7	48.2	75.1	54.1	52.0	**40.0**	**40.0**
SW22	62.8	61.7	65.0	58.9	55.9	63.9	48.3	52.9	61.5	58.1	86.2	57.6	61.7	**47.0**	**47.0**

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 (0.77) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
SW29	7.5	6.0	63.1	62.5	53.7	57.4	53.0	47.7	59.0	54.4	81.7	56.7	60.0	**46.2**	39.2
SW98	59.1	43.5	45.1	39.5	39.2	41.0	34.0	4.4	42.6	41.2	63.1	46.0	44.6	34.3	28.1
SW104	5.5	39.7	36.1	35.0	32.5	31.4	29.1	31.0	31.4	28.6	6.0	37.8	36.9	28.4	28.4
SW105	39.3	3.7	28.5	25.8	2.7	21.5	19.3	19.5	25.3	2.7	49.3	31.8	27.7	21.3	21.3
SW34	26.7	17.6	16.0	12.1	11.8	11.1	9.4	1.3	13.9	11.6	27.8	17.6	15.5	11.9	11.9
SW106	-	24.3	2.8	17.9	17.6	15.9	-	19.1	18.2	18.5	32.8	2.6	2.6	15.8	15.8

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

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

☒ **Where applicable, 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) 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

C.1 Annualisation of NO_2 monitoring data

Due to insufficient data capture rates of less than 75%, it was necessary to annualise monitoring data for one diffusion tube monitoring sites (SW78). Three nearby background continuous NO_2 monitoring sites with data capture greater than 90% were identified in order to carry out the annualisation calculations: AURN Rochester Stoke, AURN Southend-on-Sea and AURN Canterbury. Annualisation was carried out according to the guidance in LAQM.TG(16).

C.2 Diffusion tube bias adjustment factors

In keeping with the guidance in LAQM.TG(16) a comparison is made between the national bias adjustment factor spreadsheet and the locally derived co-located studies.

C.2.1 National bias adjustment factor spreadsheet

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 2017 (based on 27 studies) has been derived from the national bias adjustment calculator[7]. A screenshot of the calculator is provided below.

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

National diffusion tube bias adjustment calculator spreadsheet:

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/18

Follow the steps below in the correct order to show the results of relevant co-location studies
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 spreadhseet 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 2018
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 make your selection, choose (All) from the pop-up list)	Year[2] (To make 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[4]	Bias Adjustment Factor (A) (Cm/Dm)
ESG Didcot	50% TEA in acetone	2017	R	Suffolk Coastal DC	12	45	37	21.7%	G	**0.82**
ESG Didcot	50% TEA in acetone	2017	R	Dumfries and Galloway Council	12	36	29	23.3%	G	**0.81**
ESG Didcot	50% TEA in acetone	2017	KS	Marylebone Road Intercomparison	12	106	79	34.3%	G	**0.74**
ESG Didcot	50% TEA in acetone	2017	R	Vale of White Horse District Council	11	31	25	26.0%	G	**0.79**
ESG Didcot	50% TEA in acetone	2017	UB	Cardiff City Council	10	29	21	35.1%	G	**0.74**
ESG Didcot	50% TEA in acetone	2017	R	Cambridge City Council	12	45	33	37.7%	G	**0.73**
ESG Didcot	50% TEA in acetone	2017	R	Wrexham County Borough Council	12	20	17	14.5%	G	**0.87**
ESG Didcot	50% TEA in acetone	2017	UI	North Lincolnshire Council	12	22	16	40.7%	G	**0.71**
ESG Didcot	50% TEA in acetone	2017	KS	Caerphilly CBC	12	37	32	15.8%	G	**0.86**
ESG Didcot	50% TEA in acetone	2017	R	Caerphilly CBC	11	44	29	51.2%	G	**0.66**
ESG Didcot	50% TEA in acetone	2017	UB	City of York Council	12	23	15	53.4%	G	**0.65**
ESG Didcot	50% TEA in acetone	2017	R	City of York Council	10	37	28	30.8%	G	**0.76**
ESG Didcot	50% TEA in acetone	2017	R	City of York Council	11	32	23	41.0%	G	**0.71**
ESG Didcot	50% TEA in acetone	2017	R	City of York Council	12	40	25	58.6%	G	**0.63**
ESG Didcot	50% TEA in acetone	2017	R	Hambleton District Council	10	21	20	4.0%	G	**0.96**
ESG Didcot	50% TEA in acetone	2017	R	Horsham District Council	11	35	29	18.1%	G	**0.85**
ESG Didcot	50% TEA in acetone	2017	R	Horsham District Council	12	31	26	21.3%	G	**0.82**
ESG Didcot	50% TEA in acetone	2017	R	Horsham District Council	11	33	23	41.1%	G	**0.71**
ESG Didcot	50% TEA in acetone	2017	UC	Leeds City Council 1	12	41	32	28.5%	G	**0.78**
ESG Didcot	50% TEA in acetone	2017	R	Leeds City Council 10	11	48	38	25.1%	S	**0.80**
ESG Didcot	50% TEA in acetone	2017	R	Leeds City Council 2	12	47	35	34.4%	S	**0.74**
ESG Didcot	50% TEA in acetone	2017	R	Leeds City Council 4	11	56	43	29.1%	S	**0.77**
ESG Didcot	50% TEA in acetone	2017	R	Leeds City Council 7	11	38	27	39.8%	S	**0.72**
ESG Didcot	50% TEA in acetone	2017	R	Slough Borough Council	12	45	35	26.4%	G	**0.79**
ESG Didcot	50% TEA in acetone	2017	UB	Slough Borough Council	12	32	25	28.6%	G	**0.78**
ESG Didcot	50% TEA in acetone	2017	UB	Slough Borough Council	11	39	33	19.2%	G	**0.84**
ESG Didcot	50% TEA in acetone	2017	R	Tunbridge Wells	12	56	40	38.2%	G	**0.72**
ESG Didcot	50% TEA in acetone	2017		**Overall Factor[3] (27 studies)**				**Use**		**0.77**

C.2.2 Factor from Local Co-location studies

There are two co-location studies in Swale Borough Council. The spreadsheet tool[8] developed to support local authorities calculate bias was used to assess the bias for each co-location study. Screen shots showing the diffusion tube concentrations, associated concentrations measured by the automatic analyser and the derived A and B bias factors are shown in the following screen prints. Table C.1 summarises the required bias information (using the information shown in the respective blue boxes).

[8] https://laqm.defra.gov.uk/bias-adjustment-factors/local-bias.html

Newington (SW20)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	04/01/2017	01/02/2017	63.7	50.6	44.7	53	9.7	18	24.2
2	01/02/2017	01/03/2017	42.7	42.9	34.7	40	4.7	12	11.6
3	01/03/2017	29/03/2017	40.0	40.6	36.5	39	2.2	6	5.5
4	29/03/2017	26/04/2017							
5	26/04/2017	31/05/2017	32.1	33.3	43.2	36	6.1	17	15.1
6	31/05/2017	27/06/2017	31.4	33.7	33.0	33	1.2	4	2.9
7	27/06/2017	02/08/2017	26.2	28.3	30.8	28	2.3	8	5.7
8	02/08/2017	30/08/2017	31.7	35.8	33.9	34	2.1	6	5.1
9	30/08/2017	27/09/2017	37.1	30.7		34	4.5	13	40.7
10	27/09/2017	01/11/2017	37.0	38.8	31.5	36	3.8	11	9.4
11	01/11/2017	07/12/2017	53.1	61.5	65.9	60	6.5	11	16.2
12	06/12/2017	04/01/2018	36.9	27.4	38.2	34	5.9	17	14.6
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
49.2875	100	Good	Good
25.7489	78.422619	Good	Good
24.9825	99.404762	Good	Good
29.9849	100		Good
26	97.97619	Good	Good
22	100	Good	Good
21	95.717593	Good	Good
26	97.619048	Good	Good
29	97.470238	Good	Good
29	99.880952	Good	Good
37.8979	100	Good	Good
34.1057	100	Good	Good
Overall survey -->		Good precision	Good Overall

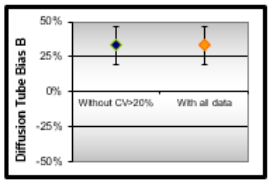
(Check average CV & DC from Accuracy calculations)

Site Name/ ID: SW20 (ZW6 Newington)

Precision 11 out of 11 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 11 periods of data
Bias factor A 0.76 (0.69 - 0.85)
Bias B 31% (17% - 45%)
Diffusion Tubes Mean: 39 µgm^{-3}
Mean CV (Precision): 11 caution
Automatic Mean: 30 µgm^{-3}
Data Capture for periods used: 97%
Adjusted Tubes Mean: 30 (27 - 33) µgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 11 periods of data
Bias factor A 0.76 (0.69 - 0.85)
Bias B 31% (17% - 45%)
Diffusion Tubes Mean: 39 µgm^{-3}
Mean CV (Precision): 11 caution
Automatic Mean: 30 µgm^{-3}
Data Capture for periods used: 97%
Adjusted Tubes Mean: 30 (27 - 33) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

St Paul's (SW89)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	04/01/2017	01/02/2017	77.1	75.2	70.8	74	3.2	4	8.0
2	01/02/2017	01/03/2017	60.0	54.6	61.7	59	3.7	6	9.2
3	01/03/2017	29/03/2017	56.2	61.4	52.0	57	4.7	8	11.7
4	29/03/2017	26/04/2017	54.8	54.7	56.4	55	1.0	2	2.4
5	26/04/2017	31/05/2017	51.2	51.5	50.2	51	0.7	1	1.7
6	31/05/2017	27/06/2017	56.9	57.0	57.4	57	0.3	0	0.7
7	27/06/2017	02/08/2017	48.1	51.7	50.9	50	1.9	4	4.7
8	02/08/2017	30/08/2017	51.7	54.0	48.4	51	2.8	5	7.0
9	30/08/2017	27/09/2017	57.7	59.6	58.0	58	1.0	2	2.5
10	27/09/2017	01/11/2017	46.1	53.6	51.6	50	3.9	8	9.6
11	01/11/2017	06/12/2017	75.2	78.0	78.2	77	1.7	2	4.2
12	06/12/2017	04/01/2018	57.8	55.7	56.3	57	1.1	2	2.7
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
53.6251	94.047619	Good	Good
30.8744	78.422619	Good	Good
34.7988	99.404762	Good	Good
38.5374	99.404762	Good	Good
35	100	Good	Good
30	88.888889	Good	Good
28	100	Good	Good
32	100	Good	Good
33	100	Good	Good
28	99.880952	Good	Good
44.4441	100	Good	Good
37.1834	100	Good	Good
Overall survey -->		Good precision	Good Overall

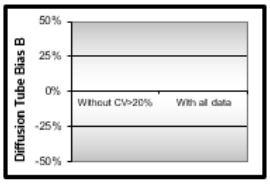
(Check average CV & DC from Accuracy calculations)

Site Name/ ID: SW89 (ZW8 St Pauls)

Precision 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 12 periods of data
Bias factor A 0.61 (0.57 - 0.66)
Bias B 63% (52% - 75%)
Diffusion Tubes Mean: 58 µgm^{-3}
Mean CV (Precision): 4
Automatic Mean: 36 µgm^{-3}
Data Capture for periods used: 97%
Adjusted Tubes Mean: 35 (33 - 38) µgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 12 periods of data
Bias factor A 0.61 (0.57 - 0.66)
Bias B 63% (52% - 75%)
Diffusion Tubes Mean: 58 µgm^{-3}
Mean CV (Precision): 4
Automatic Mean: 36 µgm^{-3}
Data Capture for periods used: 97%
Adjusted Tubes Mean: 35 (33 - 38) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

Table C.2.1: A summary of bias factors and annual averages derived from co-located spreadsheets

Co-located sampling site	Periods of data used	Bias A factor	Bias B factor	NO_2 concentration measured by	
				Diffusion tube, µg m^{-3}	Continuous analyser, µg m^{-3}
Newington 3 (SW20)	11	0.76	0.31	39	30
St Paul Street (SW89)	12	0.61	0.63	58	36

Following the guidance in LAQM.TG(16) a reasonable approximation for the combined bias can be obtained by adding the average of the Bias B factors (0.47) to 1.0 and then taking the inverse. This resulted in a bias factor of 0.68. The bias factor derived from the national adjustment spreadsheet (0.77) is higher and therefore presents a more conservative approach.

C.3 NO_2 fall-off with distance

The NO_2 monitoring results presented in Section 3.2.1 as well as Table A.3 and Table B.1 have been corrected for distance according to the guidance provided in LAQM.TG(16) and the NO2 fall-off with distance calculator available on the LAQM Support website.[9]

C.4 Volatile Correction Model (VCM) correction for PM_{10} data

The raw PM_{10} data collected by Swale Borough Council is from a tapered element oscillating microbalance (TEOM) instrument. TEOM instruments are operated at 50℃ and as such cannot measure the volatile components of particulate air pollution. The raw TEOM data was corrected for this underestimation using the tools available on the Volatile Correction Model website.[10]

[9] http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html
[10] http://www.volatile-correction-model.info

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D1: Location of automatic analysers in Swale Borough Council

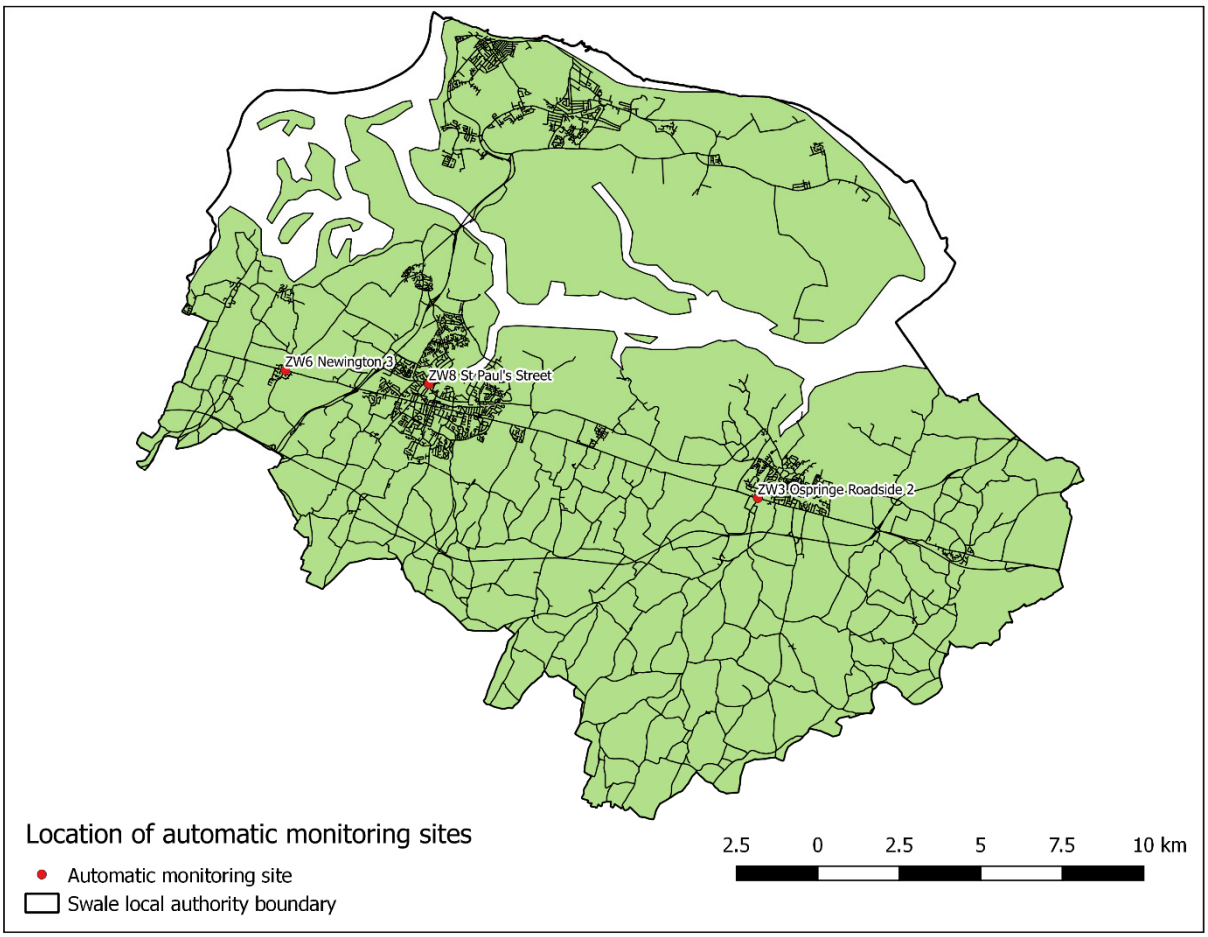


Figure D2: Location of NO_2 diffusion tubes in Swale Borough Council

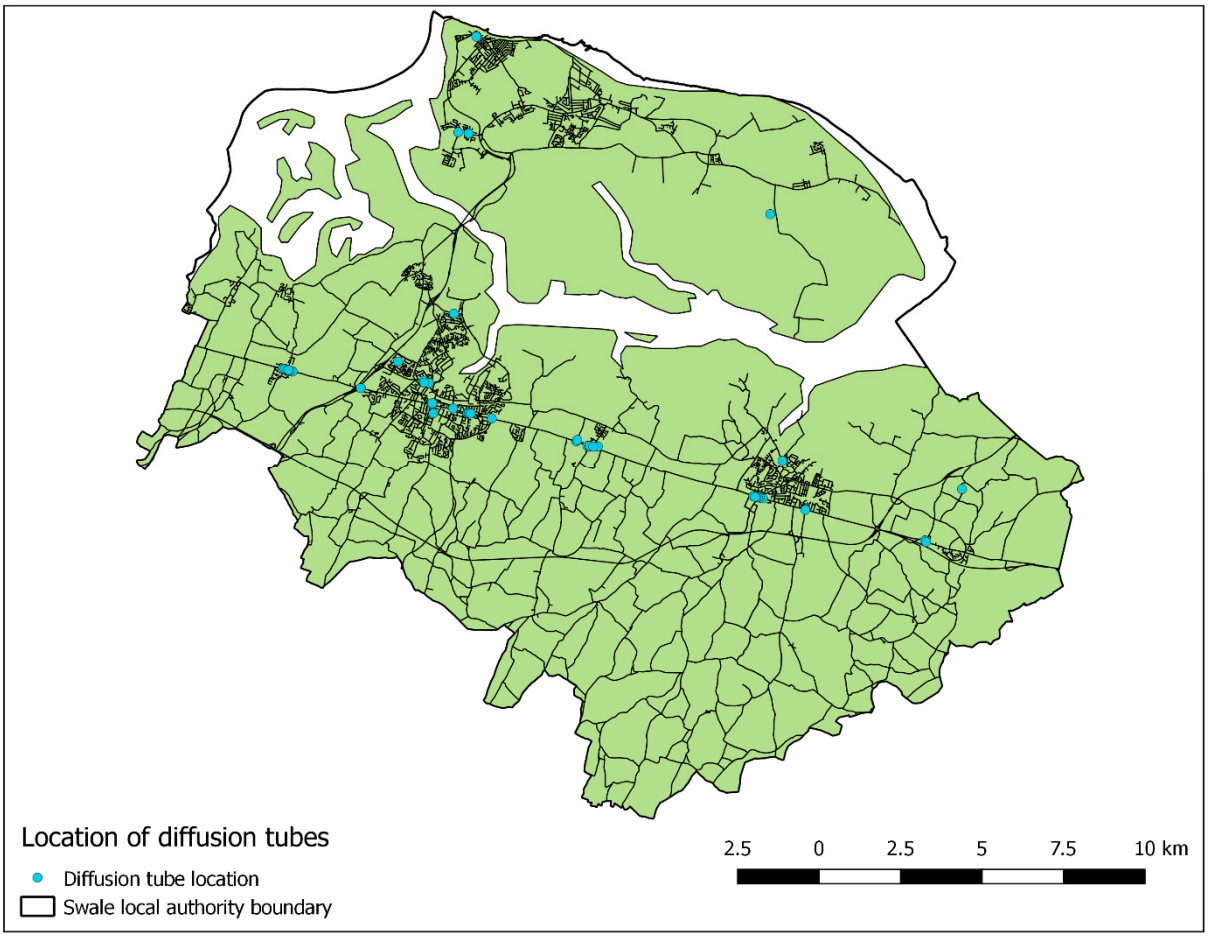


Figure D3: Location of NO_2 diffusion tubes in Sheerness

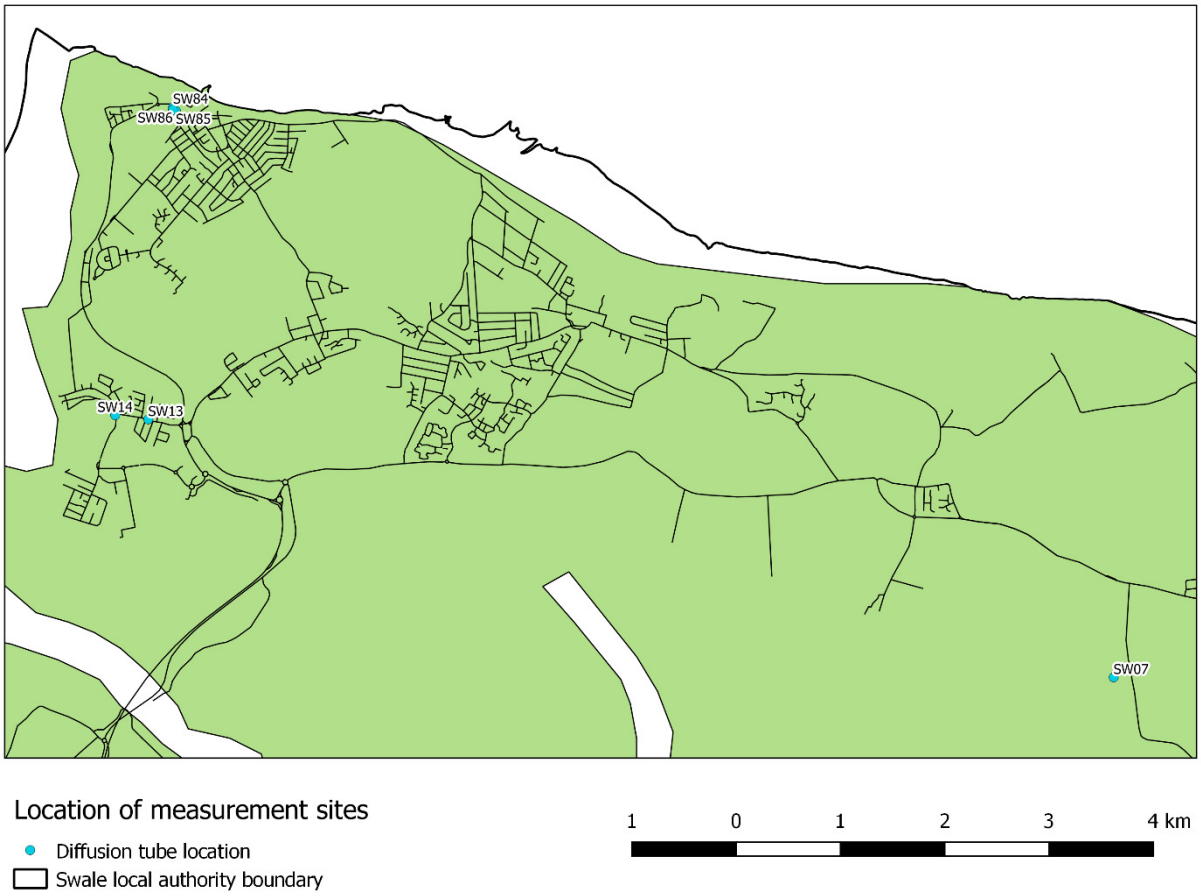


Figure D4: Location of NO_2 diffusion tubes in Newington (AQMA 1)

Figure D5: Location of NO_2 diffusion tubes in Faversham (AQMA 6)

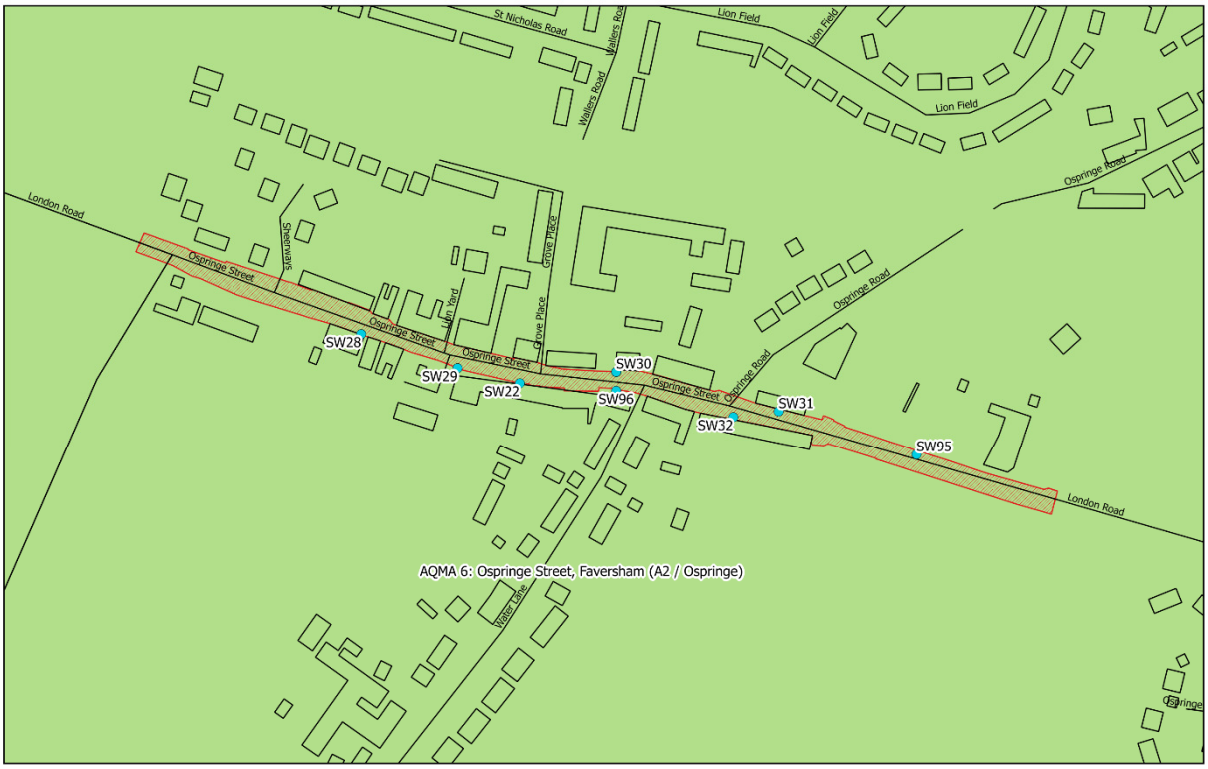


Figure D6: Location of NO_2 diffusion tubes in Faversham (north of AQMA 6)

Figure D7: Location of NO_2 diffusion tubes in Faversham (east of AQMA 6)

Figure D8: Location of NO_2 diffusion tubes in Teynham (AQMA 5)

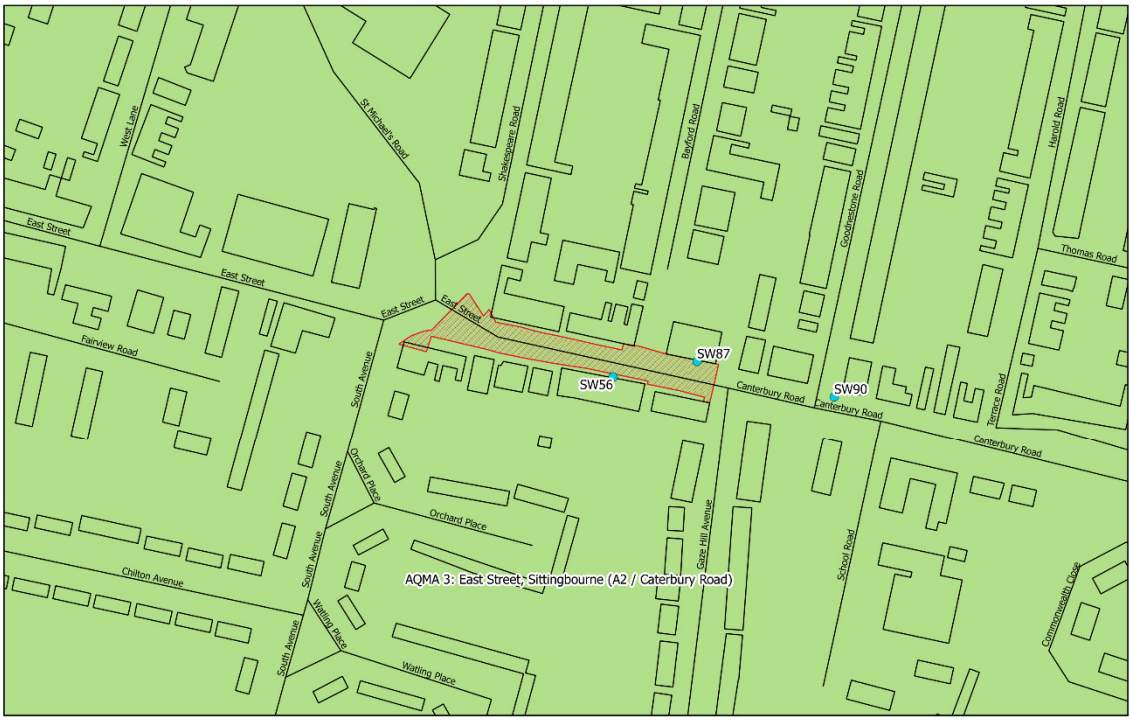
Figure D9: Location of NO_2 diffusion tubes in East Street, Sittingbourne (AQMA 3)

Location of measurement sites

100 0 100 200 300 400 km

Diffusion tube location

AQMA



Location of measurement sites

25 0 25 50 75 100 km

Automatic monitoring site

Diffusion tube location

AQMA

Figure D10: Location NO_2 diffusion tubes in Sittingbourne (north of AQMA 3 and AQMA 4)

Figure D11: Location NO_2 diffusion tubes in St Paul's Street, Milton, Sittingbourne (AQMA 4)

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[11]	
	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

[11] 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
KCC	Kent County Council
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
SBC	Swale Borough Council