2019 Air Quality Annual Status Report (ASR)

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

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Executive Summary: Air Quality in Our Area

Air Quality in Medway

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].

Medway Council is a unitary authority which is situated in Kent in the South East of England. It is the largest single conurbation in the southeast, outside of London, and serves a population of approximately 280,000 people. The area is predominantly urban and includes the towns of Chatham, Gillingham, Rainham, Rochester and Strood. It also includes industrial areas and port facilities, including Thamesport and the Hoo Peninsula.

Medway is recognised as part of the developing Thames Gateway Region, and is an area of significant regeneration. It is well served by transport links to London by the M2 motorway and the A2 trunk road. A network of subsidiary routes connects with other towns and small centres of population across Kent. The north Kent rail link connects Medway to London and the south coast, and the Channel Tunnel Rail Link passes through the district.

The main source of air pollution in the district is road traffic emissions from major roads, notably the M2, A2, A228, A229, A230 and A289. Medway suffers from significant congestion, particularly in the town centres. Other pollution sources, including commercial, industrial and domestic sources, also contribute to background pollution concentrations.

[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 is the main pollutant of concern within Medway, with concentrations of all other pollutants measured being below the relevant objectives. In 2018 exceedances of the annual mean nitrogen dioxide objective were measured at 12 monitoring sites (four when distance corrected to represent relevant exposure). All exceedances measured were at sites located adjacent to the roads covered by an AQMA. A weak trend of decreasing measured concentrations of nitrogen dioxide is apparent at most sites from 2011 to 2018.

Medway has declared four AQMAs (Central Medway AQMA, High Street, Rainham AQMA, Pier Road, Gillingham AQMA and Four Elms Hill, Chattenden AQMA), all for exceedances of the annual mean nitrogen dioxide objective. Further details of these AQMAs are available at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=157. Medway Council has developed an Air Quality Action Plan (AQAP) (Medway Council, 2015), which includes measures to improve the air quality within Medway. In January 2018 Medway Council developed the Air Quality Communications Strategy; this plan details a series of recommended communications activities and is designed to support the Medway AQAP.

Medway Council largely manages air quality within its area through the Medway Local Plan (2003) Policy BNE24 ‘Air Quality’, to ensure that new developments do not exacerbate existing air quality issues. The Council also uses the technical guidance document ‘Medway Air Quality Planning Guidance’, issued by the Council in 2016, to deal with planning applications that could impact air quality. Additionally, the Council works to manage local air quality through the implementation of the Medway AQAP and supporting Medway Air Quality Communications Strategy. Medway Council is also working with Public Health colleagues to prioritise action on air quality in its area to help reduce the health burden from air pollution.

Actions to Improve Air Quality

The Medway AQAP sets out a list of measures that Medway Council will implement to improve air quality within Medway. Medway Council has taken forward measures during the current reporting year of 2018 in pursuit of improving local air quality. Some of the key measures that have been implemented are, and progressed on in 2018 are:

- New air quality planning guidance - In conjunction with a review of the Kent & Medway Air Quality Partnership's (K&MAQP) planning guidance, Medway published new air quality planning guidance in 2016.
- Local Enterprise Partnership Funding – these include: A289 Four Elms Roundabout to Medway Tunnel Journey Time and Network Improvements; Medway City Estate Connectivity Improvement Measures; Strood Town Centre Journey Time and Accessibility Enhancements; and Medway Cycling Action Plan.
- Promotion of Walking and Cycling - focusing predominantly on encouraging schoolchildren to walk and cycle.
- Air Quality Communications Strategy delivery – which has three main objectives: To increase awareness about air pollution and how our target audiences can safeguard themselves from the harm it causes; To empower people to protect the environment; and including air quality in all future policies and developments.

Medway Council are currently developing an Air Quality Action Plan for the Four Elms Hill AQMA. The publishing of the AQAP has been delayed with the approval of Defra, to allow the Plan to be released in conjunction with a new Medway Local Plan. A statutory consultation on the draft AQAP is expected in summer 2019.

Conclusions and Priorities

Many challenges still lie ahead for Medway Council in terms of making a positive contribution to improving air quality. Whilst a weak trend of decreasing measured concentrations of nitrogen dioxide is apparent at most sites from 2011 to 2018, monitoring results for 2018 demonstrate that air quality within Medway continues to exceed the annual mean nitrogen dioxide objective at some locations adjacent to roads covered by the Central Medway AQMA, while no exceedances have been recorded at the other three AQMAs (when distance-corrected to represent relevant exposure). Measured pollutant concentrations remain below the national objectives at all monitoring sites located outside the declared AQMAs, and numerous sites within them. No changes to the number and / or extent of the AQMAs are recommended at this stage, although the AQMAs declared at Four Elms Hill, Rainham and Gillingham will be reviewed in next year's ASR.

Road transport is the dominant source of pollution within Medway's AQMAs, and reducing road traffic emissions is, therefore, the key air quality priority. Another significant challenge is accommodating the large demand for development in Medway. This is likely to put existing areas of poor air quality under additional pressure, and could negate the actions that the Council is implementing to improve air quality. For this reason, continuing the implementation of the Medway Air Quality Planning Guidance is a high priority, prior to the adoption of a new Local Plan for Medway (currently under development and expected to be adopted in 2020).

Medway Council's priorities for the coming year are to continue with the work on the measures outlined in the AQAP.

Other priorities which Medway Council delivered on in 2018 were; a logo refresh, to launch the Air Quality Communication Strategy (AQCS), Clean Air Day, Community Engagement within an AQMA, and Green School Awards (KM Charity).

Whilst local authorities have a key role to play in delivering air quality improvements, further support is needed with regards to national and international policies to effect the necessary behavioural change, and reduce vehicle emissions, for example through taking action to ensure the implementation of effective emission control systems, accelerated fleet renewal and the rebalancing of the UK vehicle fleet as a whole towards cleaner technologies.

Local Engagement and How to get Involved

Medway Council has recently developed the Medway Air Quality Communication Strategy, which the Council uses to manage local engagement (as discussed above) and to gauge the current level of public interest and understanding of air quality.

Members of the public can help to improve air quality in Medway by using sustainable transport options, such as walking cycling and using public transport. Medway Council encourages people to car share whenever possible, and the Council has a database for commuter car sharing (https://liftshare.com/uk/community/medway).

Further information on local air quality can be obtained from the Kent Air website (http://www.kentair.org.uk/).

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1 Local Air Quality Management

This report provides an overview of air quality in Medway during 2018. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) (HMSO, 1995) and the relevant Policy and Technical Guidance documents.

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

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Medway 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=157. Alternatively, see Appendix D: Maps of Monitoring Locations and AQMAs, which provides a map of air quality monitoring locations in relation to the AQMAs.

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 HE?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
Central Medway AQMA	29/06/2010	NO_2 Annual Mean	Rochester	A large central AQMA which includes the previous AQMAs of Frindsbury Road, Cuxton Road, Rochester Centre and Chatham Centre which have been slightly extended, but also includes new areas of Luton Road, Chatham High Street, Chatham and Rainham Road	YES	58.4	µg/m^3	47.2	µg/m^3	Air Quality Action Plan 2015	15/12/2015	https://www.medway.gov.uk/downloads/file/1982/medway_air_quality_action_plan_2015

Rainham AQMA	29/06/2010	NO_2 Annual Mean	Rainham	An area running along the High Street in Rainham	YES	52.9	µg/m^3	37.3	µg/m^3	Air Quality Action Plan 2015	15/12/2015	https://www.medway.gov.uk/downloads/file/1982/medway_air_quality_action_plan_2015
Gillingham AQMA	29/06/2010	NO_2 Annual Mean	Gillingham	An area along Pier Road in Gillingham	YES	52.7	µg/m^3	37.9	µg/m^3	Air Quality Action Plan 2015	15/12/2015	https://www.medway.gov.uk/downloads/file/1982/medway_air_quality_action_plan_2015
Four Elms Hill AQMA	01/11/2017	NO_2 Annual Mean	Chattenden	Part of Four Elms Hill, Chattenden	YES	52	µg/m^3	47.4	µg/m^3	Under Development	Under Development	Under Development

☒ **Medway 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 Medway

Medway Council has taken forward a number of direct measures during the current reporting year of 2018 in pursuit of improving local air quality. Details of all measures completed, in progress or planned, as part of the AQAP (2015), are set out in Table 2.2. Further details on these measures can be found in the AQAP.

2.2.1 Medway Air Quality Steering Group

A Steering Group, Chaired by the Assistant Director of Front Line Services, was established in 2016 to provide oversight, and facilitate further development of measures in the action plan. The Steering Group consists of representatives from key council services including, amongst others, Environmental Protection, Public Health, Planning and Integrated Transport, who have agreed to work together with the shared goal of seeking to improve air quality in Medway through behavioural, strategic and infrastructure change.

2.2.2 Development and Implementation of new air quality planning guidance

In conjunction with a review of the Kent & Medway Air Quality Partnership's (K&MAQP) planning guidance, Medway published new air quality planning guidance in 2016. The guidance was developed in response to changes in national planning policy, brought about by the National Planning Policy Framework. The guidance aims to improve local air quality by:

- Introducing a method for assessing the air quality impacts of developments, which includes the quantification of impacts, calculation of damage costs, and the identification of mitigation measures to be implemented to negate the impact of development on air quality
- Ensuring cumulative impacts are included in assessments
- Providing clarity and consistency of the process for developers, the local planning authority and local communities

The Medway guidance exists as a template for all members of the K&MAQP, and is designed to be used as technical guidance, or for adoption as Supplementary

Planning Guidance, and encourages mitigation measures to be implemented where necessary.

The guidance has continued to be used extensively in the consideration of planning applications coming forward in Medway which are likely to have an air quality impact. As a result, significant levels of air quality mitigation are being secured for new developments. A key feature of the Medway guidance is that it requires the implementation of standard air quality mitigation, which includes the installation of electric vehicles charging points, helping to incentivise and accelerate the uptake of electric vehicles.

The status of the guidance will be further underpinned by a new Local Plan Air Quality Policy (Medway Council, 2016).

2.2.3 Local Enterprise Partnership funding

Medway has developed a package of schemes as part of a Local Enterprise Partnership (LEP) bid for the Government's Local Growth Fund (LGF). Funding of over £68 million was granted to the Kent & Medway federated area for projects that commenced in 2015/16. £28.6 million of this funding has been allocated for five schemes in Medway, four of which could have a positive impact on air quality, these include:

A289 Four Elms Roundabout to Medway Tunnel Journey Time and Network Improvements

Four Elms roundabout is adjacent to the Four Elms Hill AQMA. Queues from the Four Elms roundabout currently extend into the AQMA. Improvements along the route will reduce queueing traffic in the AQMA. The delivery programme is being considered in conjunction with the development of the current Housing Infrastructure Fund (HIF) proposals.

The HIF proposals are likely to have benefits associated with measures in the air quality action plan, including:

- Increasing bus patronage: HIF will improve traffic flows enabling faster and more predictable services;
- Promote walking and cycling: HIF will be supporting the delivery of new walking and cycling routes via its Strategic Environmental Management

Scheme. This will seek to connect people to their local services including schools, a new train station and leisure services; and

- Planning and policy: the Hoo peninsula masterplan will embed air quality mitigation and improvement measures such as tree planting, provision of accessible networks, provision of a new passenger station and link together with improvements to the road network to decrease queuing traffic on Four Elms Hill.

An announcement on successful HIF projects being awarded funding is expected in the summer of 2019.

Medway City Estate Connectivity Improvement Measures

Phase 1 of the project is now complete. Works undertaken include:

- Extension of Anthony's Way Exit Lanes;
- new traffic signals on the westbound entrance to Medway Tunnel;
- adjustments to the timing of existing traffic signals on Maritime Way; and
- installation of new CCTV cameras on Anthony's Way

Initial indications are that there has been an improvement in traffic flow and a reduction in queueing traffic waiting to exit the estate since the traffic signals were introduced at the entrance to the westbound Medway Tunnel in October 2016. The scope of Phase 2 is currently being developed. On completion it is anticipated that there will be a slight improvement in air quality as a result of a reduction in traffic congestion.

Strood Town Centre Journey Time and Accessibility Enhancements

Currently underway, this project is scheduled for completion by September 2019. It is anticipated that traffic control measures will have a positive impact on journey times and air quality.

Medway Cycling Action Plan

A programme to extend and improve the existing cycle network was completed in 2018/19. A total of 13.8km of new cycle routes have been completed and a further 2.8km of existing cycle routes have been improved as part of the delivery of the plan. In addition, 14 new cycle counters were installed onto Medway's transport network.

By enhancing the quality and facilities, and safety for cyclists it is anticipated that more people will choose to cycle which will make the local road network operate more efficiently. This will contribute to improved air quality. Cycle count data is currently being collected and will be analysed during 2019/20 before setting a baseline target for 2020/21 to identify the impact of cycle route development and promotion.

Investment in cycling and sustainable transport has continued to be promoted throughout 2018/19 via events and communication opportunities.

2.2.4 Promotion of Walking and Cycling

In addition to LEP funding, the council continued to carry out a significant amount of activity supporting delivery of the action plan measures relating to walking and cycling during 2018. The work carried out in this area is undertaken by the Road Safety and Safer Journeys Team in Integrated Transport, and is backed up with complementary walking and cycling initiatives lead by the Public Health Team. A summary of progress for 2018 is provided below:

Walking Bus/Green Footsteps

At the end of March 2018, the number of children participating on the Walking Bus initiative in Medway was 610, across 35 routes. By September 2018 a total of 11 schools in Medway had signed up to the Super 'WOW' (Walk on Wednesday) initiative, totalling 112 classes with 3,360 children from Medway taking part. A further 4 schools in Medway have signed up to the Green Footsteps initiative to date, totalling 51 classes with 1,488 pupils children taking part.

Cars off the Road

Active travel initiatives have significantly reduced the number of school journeys by car in Medway with 54,446 car journey savings made in Medway between September 2017 and June 2018 according to figures generated via the KM Charity Team school data portal. This accounted for 20% of the overall number of car journeys removed during the academic year across the whole of Kent, Bexley and Bromley.

Walk to school journeys

The number of walk to school journeys made in Medway between September 2017 and June 2018 totalled 130,496 and attributed to 21.3% of the overall number across Kent, Bromley and Bexley councils.

National Walk to School Week, 21-25 May 2018

The Safer Journeys Team promoted the campaign to Medway schools during May 2018 in partnership with Living Streets and the KM Charity Team. Local focus activities included the 'Walk2Count Challenge', encouraging schools to compete for the highest percentage of walks over the duration. In total, 26 schools competed; Burnt Oak Primary in Gillingham won the primary school category (86.8% walked), Greenacre Academy in Walderslade won the secondary school category (75.1% walked) and for the first time, Cliffe Woods Primary was recognised as 'most improved school' (80.7% walked) having achieved a percentage increase of 50.8% compared to a previous result.

Sustrans The Big Pedal 23 April - 4 May 2018

A national campaign led by Sustrans and promoted locally via Medway Council's Safer Journeys Team. On each day, schools competed for the highest percentage of pupils, staff and parents cycling or scooting to school. Two of the participating schools in Medway achieved 14th and 16th place nationally for the percentage of students cycling and scooting to school over the campaign duration. The participating Medway schools were one of 1,608 schools (513,443 participating pupils) from across the UK that made 989,414 total journeys by bike and scooter.

Bikeability/ Bikeability Balance 2017/18

A total of 1,043 children in Medway received Bikeability Level 1 and 2 courses. An additional 190 Bikeability Balance places were delivered to Medway pupils in Key Stage 1. This forms one of the DfT Bikeability Plus modules delivered in Medway.

Partnership events

Other community-based events supported in 2017/18 included Clean Air Day, Medway Cycling Festival, Schools Parking Initiative, Be Bright Be Seen, Medway Healthy Weight Summit with Public Health, all successfully contributed to by Road Safety officers during the year.

Public Health Initiatives

Medway Public Health delivers a range of complementary active travel initiatives to encourage more active lifestyles through the Supporting Healthy Weight (Adults) team. These initiatives include walking, cycling and Nordic style walking schemes.

Walks

Medway Health Walks range from 10-75 minutes to suit all abilities, including people recovering from illness. These social walks are led by trained volunteer walk leaders and are organised to support people to get the most enjoyment out of walking.

- Current number of walks Apr 18 – Mar 19: 21
- Current number of walkers on system Mar 19: 3409
- New walkers signed up April 2018-March 2019: 146

Cycle Routes

The Public Health cycling groups are aimed at encouraging people back to cycling who have not cycled for a while due to age, illness, lack of fitness or a busy lifestyle. The rides run all year round and are led by trained cycle leaders on flat routes.

- Current number of routes (March 2019): 4
- Number of cyclists on database (all time): 378
- Number of new cyclists (April 2018 - March 2019): 33

Nordic Walking

Nordic walking is a more intensive form of walking using a pair of specially designed walking poles. The walks take place on flat routes and are suitable for all ages.

- Number of courses: N/A (waiting List of 107 +29 from Parkinson UK) [New instructor due in July 2019]
- Number of sessions at Capstone Park: 2 per week
- Number of walkers trained 2018-2019: N/A
- Number of attendees to Capstone on Tuesdays (advance session): 387
- Number of attendees to Capstone on Fridays (beginners): 743

2.2.5 Air Quality Communications Strategy delivery 2018/19

Medway's Air Quality Communication Strategy (AQCS) was developed in January 2018 and has 3 key objectives:

To increase awareness about air pollution and how our target audiences can safeguard themselves from the harm it causes;

- Increase the number of people signing up for the KentAir email forecast service;
- Increase the use of weather forecast alerts on local media (print, social media, broadcast);
- Implementation of a Clean Air Day Campaign in Medway;
- Work in partnership with health professionals to help raise awareness of air pollution to vulnerable people;
- Implement an Idling Campaign aimed at targeted drivers in the Medway area;
- Use interactive toolkits in schools to reduce impact of air pollution to children; and
- Introduce travel planning to local business to promote sustainable travel use.

To empower people to protect the environment;

- Work in partnership with key organisations to raise awareness on vehicle emissions (for example: new car buyers, when children start a new school, and when people develop chronic condition);
- Raise awareness of eco-driving courses for targeted groups;
- Increase the number of people using public transport in the Medway area; and
- Provide council leadership in taking an active role in reducing emissions in all operations.

Including air quality in all future policies and developments;

- Present information to council directorates including the development of materials;
- Present to key councillors including development of materials;
- Produce and distribute staff newsletters; and

- Engage with developers to help ensure that developments are “eco-friendly”.

2.2.6 Priorities for Air Quality in 2018

Logo refresh

The Kent and Medway Air Quality partnership agreed and implemented the new logo in early 2018.

This logo will be used on all subsequent and relevant policies and campaign material.

Air Quality Communication Strategy Launch (AQCS) and implementation plan activities - 21st June 2018

The 21st of June (Clean Air Day) saw the publication of the AQCS on the Council website making the document publicly accessible to all. [4]

To complement the publication of the AQCS we focussed on three areas:

- Clean Air Day;
- Luton Great Get Together; and
- Green School Awards.

Clean Air Day

This campaign aimed to be a prominent, Medway wide, multimedia promotion of the National Clean Air Day encouraging communities, businesses and schools to access

[4] The Strategy can be found here: https://www.medway.gov.uk/downloads/file/2845/medway_air_quality_communication_strategy

the resources on the Clean Air Day website and make a pledge that will help reduce their contribution to air pollution.

Key messages given during activities on Clean Air Day were:

- Give your car a holiday - pledge to not use the car on Clean Air day, i.e., walk to school/ cycle;
- When you use your car, always remember not to leave your engine idling when stationary; and
- If you are, or know of anyone, who is asthmatic or has respiratory conditions, please sign up to the KentAir email forecast service.

Community Engagement - The Luton Great Get Together (22nd June 2018)

The event's aim was to address the high air pollution in this area and raise awareness of the community to the health risks associated with air pollution and actions they can take to improve their health and wellbeing, and that of their families.

In recognition of the need to address the 'causes of the causes' (wider determinates of health), a new way of delivering local health and care services is being implemented in Medway. The Medway Model, forms part of a broader strategic initiative being implemented in Kent and Medway as part of the Sustainable Transformation Partnership (STP). This transformation programme aims to ensure the population of Medway access more effective and efficient health and care services. At a local level, the 'Medway Model' sees Medway divided into 6 community health hubs. Chatham Central is the hub with the highest levels of disadvantage and the lowest life expectancy.

Green School Awards (soft launch June 2018)

Public Health sponsored this KM Charity initiative which aims to get schools involved in monitoring air quality and mitigation measures and taking action.

All schools in Medway were invited to take part, for which they will be given diffusion tubes to collect air quality data over a 6 month period. 6 schools signed up for the first year of this project, and it is hoped that the data schools collect will emphasise the environmental benefits of taking part in the KM Walk to School campaign.

The Green School Awards are organised by the KM Charity Team and showcase environmental campaigns and best practice. They are staged to help children become more knowledgeable about the environment and what can be done to help protect and conserve it.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Review Regional Freight Strategy	Freight and Delivery Management	Other	Medway Council Integrated Transport and Kent County Council	2016	2017-2020	Completed or not	5%	Complete. Medway Council worked with Kent County Council on a draft revised regional Freight Action Plan (including Medway). Consultation and adoption to be undertaken during 2017. Link to draft plan http://consultations.kent.gov.uk/consult.ti/freightactionplan/consultationHome. Movement of freight also tackled locally through the Medway draft Network Management Plan for 2017-2020. The draft plan aims to tackle road congestion, and performance indicators, such as journey times, traffic data, cycle count data, air quality monitoring data can be used as a means of measuring the plans impact against a baseline scenario.	2020	
2	HGV route optimisation	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	Medway Council Integrated Transport and Kent County Council	n/a	2017-2020. Ongoing for life of plans under no.1 above.	Completed or not		Ongoing. Tackled through no.1 above.	2020. Ongoing for life of plans under no.1 above.	
3	HGV Sat Nav review	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	Medway Council Intergrated Transport and Kent County Council	n/a	2017-2020. Ongoing for life of plans under no.1 above.	Completed or not		Ongoing. Tackled through no.1 above.	2020. Ongoing for life of plans under no.1 above.	
4	Monitor % HGV's through AQMA's	Freight and Delivery Management	Other	Medway Council Integrated Transport, DfT	n/a	Ongoing	Completed or not		HGV flows are not monitored by Medway Council. However, DfT data are available for a number of locations on the Medway road network, and includes locations within/near to AQMA's. Historic DfT data shows significant reductions in	Ongoing	Relies on continued monitoring by DfT

									the number of HGV's in many areas of Medway, including in the Medway AQMA's. This however has been offset by increases in the numbers of other vehicles on Medway roads. In contrast, the number of HGV's on the strategic M2 motorway have been increasing. Ongoing analysis of HGV traffic flow data could be used to determine effectiveness of no.1-3 above, and whether further intervention/review is required.		
5	Investigate the feasibility of a Quality Bus Partnership (or equivalent) with the local bus operator	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	Medway Council Integrated Transport	2018/19	2019/20	Completed or not		The Council does not have a formal Quality Bus Partnership, however all bus operators are signed up to a Punctuality Improvement Partnership, and regular bus operator meetings and roadworks meetings have continued. A wide range of issues are discussed at these meetings with regards to the efficient running of the local bus services. Following visits to other QMP meetings in Kent, the setting up of a QBP, for Medway has been discussed with operators who are supportive of the principle. During 2018 discussions have taken place on the introduction of data reporting to include fleet composition and journey time information. This continues to be investigated but no further progress was made during 2018.	Unknown	Relies on support from local bus operator and Medway council.
6	Increase proportion of Euro V, and subsequent (or equivalent) buses in fleet	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	Medway Council Integrated Transport	Ongoing	Unknown	Annual fleet status.	5%	The biggest bus operator in Medway, Arriva, submitted a bid for funding under the 2018 Ultra Low Emission Bus scheme (supported by Medway Council) to renew their entire fleet with ultra-low emission buses. Unfortunately the bid was unsuccessful. One of the smaller local bus operators, NU Venture, have invested in second hand retrofitted buses that achieve the Euro 5 emissions standard. The Nu Venture fleet now contains only 1 Euro 3 and 2 Euro 4 vehicles, the remainder being Euro 5. No fleet	Ongoing	Operator investment budgets. External funding is likely to be required to support the smaller bus operators in renewal/retrofitting of their vehicle fleets.

									updates have been received for the other local bus operators.		
7	Increase bus patronage	Promoting Travel Alternatives	Other	Medway Council Integrated Transport	Ongoing	Ongoing	Annual bus patronage figures		Bus patronage figures can fluctuate year to year for a variety of reasons. The last five financial years are: 2014/15 8,676,271; 2015/16 8,709,267; 2016/17 8,902,079, 2017/18 8,383,939; 2018/19 8,060,018. Despite increases over the 2014-2017 period, patronage fell back again from 2017-19. There could be a number of factors causing this fall. Factors thought to be behind this fall nationally include the rising car ownership of older persons, older persons qualification age for bus passes increasing, increasing cost of fares and increased competition from private hire vehicles. Locally within Medway there continues to be an unprecedented level of utility works on main corridors, new developments and regeneration works which could all have had an impact on the reliability of services. Arriva continue to promote contactless fare payment for their services.	Ongoing	
8	Improve bus flow and reliability	Transport Planning and Infrastructure	Bus route improvements	Medway Council Intergrated Transport	Ongoing	Ongoing	Number of bus infrastructure improvements		Bus infrastructure improvements can have a complementary role in improving patronage by providing better stop facilities and improved information for passengers. The programme of bus stop infrastructure and other improvements continued during 2018/19. Current schemes include approx £30k investment in contactless ticketing machines to support two local operators, new bus information screens, bollards in Livingstone Circus, bus stop flags, and a new bus shelter in Western Avenue.	Ongoing	Reliant on continued budget provision for improvements to be made.

9	Review taxi licensing conditions	Promoting Low Emission Transport	Taxi Licensing conditions	Medway Council Licensing	2018/19	Unknown	Completed or not		The Medway Air Quality Steering Group have discussed how the lack of progress on this measure can be addressed. The Environmental Protection Team have investigated further and have proposed that a Taxi ULEV Feasibility Study is carried out, and used as the basis for reviewing the Medway taxi licensing policy and conditions, and to identify what infrastructure is required to support operators. No budget is available currently to carry out the study, and the council continues to investigate possible external grant funding sources for the study as and when made available. No further progress was made on this during 2018. A review of Medway Taxi Licensing Policy is expected during 2019/20	2019/20	Funding required for ULEV feasibility study.
10	Annual audit of taxi fleet	Promoting Low Emission Transport	Other	Medway Council Licensing	2018/19	Unknown	Percent ULEV in annual audit of taxi fleet		Historic fleet information is available. Analysis of the information is needed to identify any trends in the numbers of ULEVs present in the taxi fleet before any interventions are investigated. A comprehensive audit and analysis of the current Medway fleet would be undertaken as part of the ULEV feasibility study above.	Unknown	Detailed fleet analysis required. External funding may be required to support drivers/companies to renewal/retrofit vehicles, and provide supporting infrastructure (EV charging points). Funding required for ULEV feasibility study.
11	Carry out maintenance of E-mote system to protect asset for future use	Traffic Management	Other	Medway Council Integrated Transport	Unknown	Unknown	Completed or not	8-10%	No action is being proposed at present to progress this measure. The e-motes have not been operative for several years since a pilot project was carried out in Medway. There are currently no plans, or funding available to carry out maintenance of the system.	Unknown	No budet is available for this measure. The E-mote system would also have to be a beneficial traffic management tool for this measure to be

											progressed.
12	Annually report number and location of roadworks in or around AQMA's	Traffic Management	Other	Medway Council Integrated Transport	2016/17	2017	Completed or not		No further action is proposed as this is not a SMART indicator. However, a Street Works Permit scheme was introduced by the Council in January 2017 as a traffic management tool to reduce the disruption caused by work on the highway. Contractors are required to obtain a permit before work commences, and day of the week/time restrictions are in place for Traffic Sensitive Streets, where permits will only be issued where there is to be compliance with the time restrictions. Time restrictions may include weekend, off peak and/or night time working hours. The scheme covers all roads in Medway.	Ongoing	Ongoing implementation of permit scheme required.
13	Report AADT annually	Traffic Management	Other	Medway Council Integrated Transport	Unknown	Unknown	Completed or not		No further action is proposed as this is not a SMART indicator. However, performance indicators for the draft Network Management Plan (see no.1 above) are more appropriate going forward (journey times etc.). DfT traffic flow data are also available for many locations/roads in Medway. According to DfT data 890.1 million miles were recorded in Medway in 2018, a reduction of 7.4 million miles compared to 2017. This in contrast to the long term trend increases seen since 1993. National trends continue to show traffic growth across Great Britain as reported by DfT, rising from 327.1 billion vehicle miles travelled in 2017 to 328.1 billion vehicle miles in 2018.	Ongoing	Regular reporting of internal indicators required. Relies on continued monitoring by DfT.
14	Link ANPR vehicle class data to provide detailed source apportionment	Traffic Management	Other	Medway Council Integrated Transport	As required	As required	Completed or not		ANPR has not worked for several years, and has never been capable of giving vehicle split classifications. Traffic master data and base map software are used to obtain results. This is based on phone signal data, and is not for every vehicle. It	Ongoing	Regular reporting of internal indicators required. Relies on continued monitoring by

	to support feasibility study wortk								provides journey times and volumes only. Dedicated surveys therefore may be required for future studies or source apportionment work. More detailed Dft data are however available for a number of locations/roads within Medway.		DfT.
15	Promoting and monitoring cycling and walking	Promoting Travel Alternatives	Promotion of cycling	Medway Council Safer Journeys Team,	Ongoing	Ongoing	Medway mode of travel data	1%	See supplementary information.	Ongoing	
16	Develop and continue walk or cycle to school scheme and events	Promoting Travel Alternatives	School Travel Plans	Medway Council Safer Journeys Team	Ongoing	Ongoing	Number of schools participating		See supplementary information.	Ongoing	
17	Develop and continue healthy walk scheme and cycle scheme	Promoting Travel Alternatives	Promotion of cycling	Medway Council Supporting Healthy Weight Team	Ongoing	Ongoing	Number of individuals involved		See supplementary information.	Ongoing	
18	Run internal Eco-driving courses	Vehicle Fleet Efficiency	Driver training and ECO driving aids	Medway Council Business Development and Environmental Protection	Unknown	Unknown	Number of drivers on training courses	<1%	No progress has been made during 2018.	Unknown	No budget available for this measure.
19	Engage with business to promote Eco-driving	Vehicle Fleet Efficiency	Driver training and ECO driving aids	Medway Council Business Development	Unknown	Unknown	Number of business engaged		No progress has been made during 2018. However, development of this measure is expected under no.29 below.	Unknown	Budget constraints.
20	Increase ULEV component within Medway fleet	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	Medway Council Procurement	2018/19	2019/20	Number of ULEV within Medway fleet		Medway Council currently do not have any ULEVs. The EU class is not currently logged but the fuel type is estimated at over 90% diesel. There are contracts which Medway Council award where there is an initiative within the industry to deploy ULEVs. The number of ULEVs is heavily dependent on the councils Procurement activities, which has so far failed to result in a switch to cleaner vehicles. The Medway Air Quality Steering Group have discussed progressing this measure	Ongoing	

									as a priority, and The Environmental Protection Team have recommended that a council wide fleet review, carried out by the Energy Saving Trust, could provide the basis for further work on this measure. The review is free to local authorities who meet the criteria. Baseline data and supporting information has been compiled and an application to the EST will be submitted in the early part of 2019. The Council is also investigating carrying out an electric vehicle pool car pilot project, which is anticipated to take place in 2019. Progress on these projects will be reported in the 2020 ASR.		
21	Review of Medway Procurement Policy to ensure positive support for ULEV and third party emission reduction	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	Medway Council Procurement	2018/19	2019/20	Completed or not		A Procurement Strategy covering 2016-2021 has been produced. No obvious support for ULEV and third party emissions reduction. This will need to be explored further. The councils procurement of services, vehicles etc would be included in the Energy Saving Trust fleet review above. The current Procurement Strategy needs reworking and is showing its age. This will be carried out during 2019/20 to include a new sub-section titled Green Procurement, and this will specifically target areas such as emissions. Work is to be carried out on reworking how teams engage with Procurement via the internal TopDesk system, with the engagement form drawing in relevant stakeholders into a procurement project once initiated.	2019/20	
22	Develop and improve school travel plans	Promoting Travel Alternatives	School Travel Plans	Medway Council Safer Journeys Team	Ongoing	Ongoing	Number of schools with active travel plans		90% of all schools in Medway have previously developed a school travel plan, and there is a continued requirement to produce these in accordance with planning applications that impact upon the travel and transport needs associated with school journeys.	Ongoing	Relies on significant changes occurring that require planning permission

23	Review and align Medway Travel Plan with AQAP	Promoting Travel Alternatives	Workplace Travel Planning	Medway Council Business Development Team	Unknown	Unknown	Completed or not		No progress has been made during 2018. No budget is allocated to travel planning, and no staff availability to promote this. Various staff travel benefits are still running, including discounted bus tickets, interest free loans for bus and rail tickets, cycling facilities, interest free cycle loans, and various other ICT developments and working practices that reduce the need for office attendance, including ongoing investment to facilitate home/remote working.	Ongoing	No budget available for this measure.
24	Develop work place travel plans	Promoting Travel Alternatives	Workplace Travel Planning	Medway Council Business Development Team	Unknown	Unknown	Number of businesses with a travel plan		No budget is allocated to travel planning, and no staff availability to promote this. A new travel plan steering group has been set up for the London Medway Commercial Park as result of a Section 106 agreement drawn up through the planning process. The travel plan has a dedicated travel plan coordinator, ongoing monitoring arrangements and trip reduction initiatives including a dedicated bus service.	Unknown	No budget available for this measure.
25	Promote car sharing and reduce the number of trips	Alternatives to private vehicle use	Car & lift sharing schemes	Medway Council Intergrated Transport	2018/19	2018/19	Number registered on Liftshare scheme		The Medway car share scheme has been in existence for a number of years and has received little ongoing support in terms of promoting the scheme, and increasing the number of registered users. In 2018, the Environmental Protection Team took on the scheme from Integrated Transport, as it supports implementation of the Air Quality Communications Strategy. Engagement and awareness raising initiatives have been carried out under the Communications Strategy, including promoting the car share scheme. This has resulted in a small net gain in both the number of registered users and the number of journeys undertaken. It is important to note that users are automatically removed from the scheme if their email address is no longer active, however the number of users leaving	Ongoing	No budget available for this measure.

									has been offset by new user registrations. Further promotion of the car share scheme is expected during 2019.		
26	Review and re-write relevant planning policies and develop a supplementary planning document to reflect this action plan and relevant and related corporate strategies	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Medway Council Planning and Environmental Protection	Ongoing	Ongoing	Number of relevant policies reviewed and re-written that are beneficial to air quality		New air quality planning guidance was adopted in April 2016, emphasising mitigation of impacts using a damage costs approach. Work on the new Medway Local Plan has continued. The Council has commissioned Sweco to complete a Strategic Transport Assessment (STA) and Air Quality Assessment. All potential Local Plan site allocations that form the 'Preferred Development Strategy' have now been forwarded to the consultants and inputted into the transport model (May 2019). In June 2019, mitigation will be factored in, along with a Lower Thames Crossing (LTC) sensitivity testing. Following this work, AQ data will extracted for the Habitats Regulations Assessment (HRA) and Air Quality Assessment. A final report is due towards the end of June 2019. Emerging planning policy for Air Quality and Sustainable are set out in the Local Plan consultation documents. A draft Air Quality policy has been produced in conjunction with Environmental Protection Officers and informed by Local Plan Regulation 18 consultation responses. The policy will be tested through the Sustainability Appraisal (SA) process.	Autumn 2019/ Ongoing	Requires implementation and recording of policy on decision notices.
27	Improve and then maintain awareness of the health and financial impacts of air pollution to all stakeholder groups; businesses,	Public Information	Other	Medway Council	Ongoing	Ongoing	Number of notifications and consultations carried out		See 29 below.	Ongoing	

	schools, public, vulnerable groups, members, and internal managers										
28	Development of promotional material to support Eco-driving within businesses	Vehicle Fleet Efficiency	Other	Medway Council Environmental Protection, Public Health and Communications	2018/19	2018/19	Number of press releases, reports on websites, presentations delivered, workshops delivered and leaflets dropped	<1%	No progress has been made during 2018. However, development of this measure is expected under no.29 below.	Unknown	
29	Develop an air quality communications strategy with public relations team	Public Information	Other	Medway Council Communications and Environmental Protection	2017/18	2018/19	Completed or not		Complete. The Medway Air Quality Communication Strategy was launched in 2018 to coincide with activities to support the June 2018 national Clean Air Day. Details of activities can be found in the supplementary information.	Ongoing	
30	Set up AQAP Steering Group and book 6 monthly meetings with stakeholders	Policy Guidance and Development Control	Other policy	Medway Council Environmental Protection	2016	Ongoing	Completed or not		Complete. The Air Quality Steering Group continues to meet on a quarterly basis. Quarterly meetings have been arranged in advance with stakeholders for the third year of the Steering Group through to 2019. Frequency of meetings, membership, terms of reference etc are reviewed by the group at the 4th quarterly meeting.	Ongoing	
31	Engage with business, internal members and managers as priority	Public Information	Via other mechanisms	Medway Council Communications and Environmental Protection	2018/19	2018/19	Number of events and presentations where the AQAP has been represented		See supplementary information.	Unknown	
32	Integrate, where appropriate, AQAP target into internal service plans	Policy Guidance and Development Control	Other policy	Medway Council Performance Hub and Environmental Protection	Ongoing	Ongoing	Number of service plans with AQAP related actions included		The AQAP features in the Environmental Protection Team service plan. Work required to identify if appropriate to integrate AQAP into other service plans going forward.	Ongoing	

33	Identify corporate policies and strategies where consultation of changes is requested and notify accountable department	Policy Guidance and Development Control	Other policy	Medway Council Environmental Protection	Ongoing	Ongoing	Number identified		Ongoing input provided in to development of the new Local Plan, including draft air quality policy, town centre plans and other master plans.	Ongoing	
34	Develop business case for evaluation or quantification studies to take forward 2016-2017	Other	Other	Medway Council Environmental Protection	Ongoing	Ongoing	Completed or not		See supplementary information.	Ongoing	Budget constraints. Staff resources.

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7) (Defra, 2016a), 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.

Contained within the AQAP are a variety of measures that are aimed at managing emissions from road traffic. Measures intended to tackle road traffic pollution emissions (including $PM_{2.5}$ emissions) include a variety of traffic management measures, freight and delivery management measures, transport planning and infrastructure measures, vehicle fleet efficiency measures, measures to promote travel alternatives and alternatives to private vehicle use and measures to promote low emission transport. Other measures being implemented by Medway Council, including the establishment of the Medway Air Quality Steering Group, the development and implementation of new air quality planning guidance, local enterprise partnership funding, activity supporting walking and cycling and public health initiatives, will also help to reduce concentrations of $PM_{2.5}$ within Medway. Medway Council also support the Local Transport Plan for Kent (2017) and has developed a Local Plan which the Council is in the process of updating; both of these plans include measures aimed at improving air quality through the management of road traffic, which will have a positive impact on concentrations of $PM_{2.5}$.

Medway Council is part of the Kent Health and Wellbeing Board, which works to improve public health through tackling key health issues (including poor air quality). In addition, the K&MAQP aims to tackle air pollution across the County, and works with Public Health colleagues to prioritise action on air quality in its area, taking into consideration the PHOF, which includes an indicator based on the effect of $PM_{2.5}$ on mortality (indicator 3.01).

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.

Medway undertook automatic (continuous) monitoring at two sites during 2018. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at https://uk-air.defra.gov.uk/networks/network-info?view=aurn.

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

3.1.2 Non-Automatic Monitoring Sites

Medway undertook non- automatic (passive) monitoring of NO_2 at 38 sites during 2018. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied ("annualisation" and distance correction), are included in Appendix C.

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

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

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in Appendix B.

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

Measured concentrations at both automatic monitoring sites were below the annual mean objective in 2018. Measured concentrations were also below the annual mean objective at 26 of the 38 NO_2 diffusion tube monitoring sites, increasing to 34 out of 38 sites when distance-corrected to represent relative exposure.

Of the twelve sites at which an exceedance was measured in 2018, eight sites are located adjacent to roads covered by Central Medway AQMA (reducing to four sites when distance-corrected), and three sites are located within Four Elms Hill AQMA (no sites when distance-corrected). Only one site (DT20) is located a significant distance from an AQMA (approximately 134 m to the west of Central Medway AQMA), and the measured concentration at this site falls below the annual mean objective when distance-corrected to represent relevant exposure.

Of the eight exceeding sites located adjacent to Central Medway AQMA, two sites (DT02 and DT36) experienced increases in annual mean concentrations (0.8 – 1.8 µg/m^3 change respectively) between 2017 and 2018, the remaining six sites (DT03, DT06, DT17, DT18, DT19, and DT28) experienced decreases in annual mean concentrations (ranging from 1.4 – 7.6 µg/m^3 change). The exceeding three sites within Four Elms Hill AQMA (DT24, DT32, and DT33), all experienced a decrease in annual mean concentrations (ranging from 1.2 - 3.4 µg/m^3 change) between 2017 and 2018. The one exceeding site located 134 m away from the Central Medway AQMA (DT20) experienced a decrease in annual mean concentration (3.8 µg/m^3 change) between 2017 and 2018.

There were no measured exceedances of the 1-hour objective in 2018 by either of the automatic monitoring sites. Furthermore, measured annual mean concentrations at all diffusion tube monitoring sites were below 60 µg/m^3, indicating that an exceedance of the 1-hour mean objective is unlikely.

Exceedances of the annual mean objective were measured at two of the AQMAs declared within Medway (Medway Central and Four Elms Hill AQMAs), however there were no exceedances in the Four Elms Hill AQMA when distance-corrected to represent relevant exposure. Furthermore, increases in the concentrations between 2017 and 2018 were only

measured at sites within Central Medway AQMA. The monitoring sites within the three other AQMAs all experienced a decrease in nitrogen dioxide concentration from 2017 to 2018.

Both automatic monitoring sites show a weak overall trend of decreasing measured annual mean concentrations from 2011 to 2018 (see Figure 3.1). This trend is also apparent in the measured concentrations at diffusion tube monitoring sites (bias adjusted and annualised), (see Figure A1.1). However, some sites (notably DT13) do exhibit a stronger trend of decrease over this period.

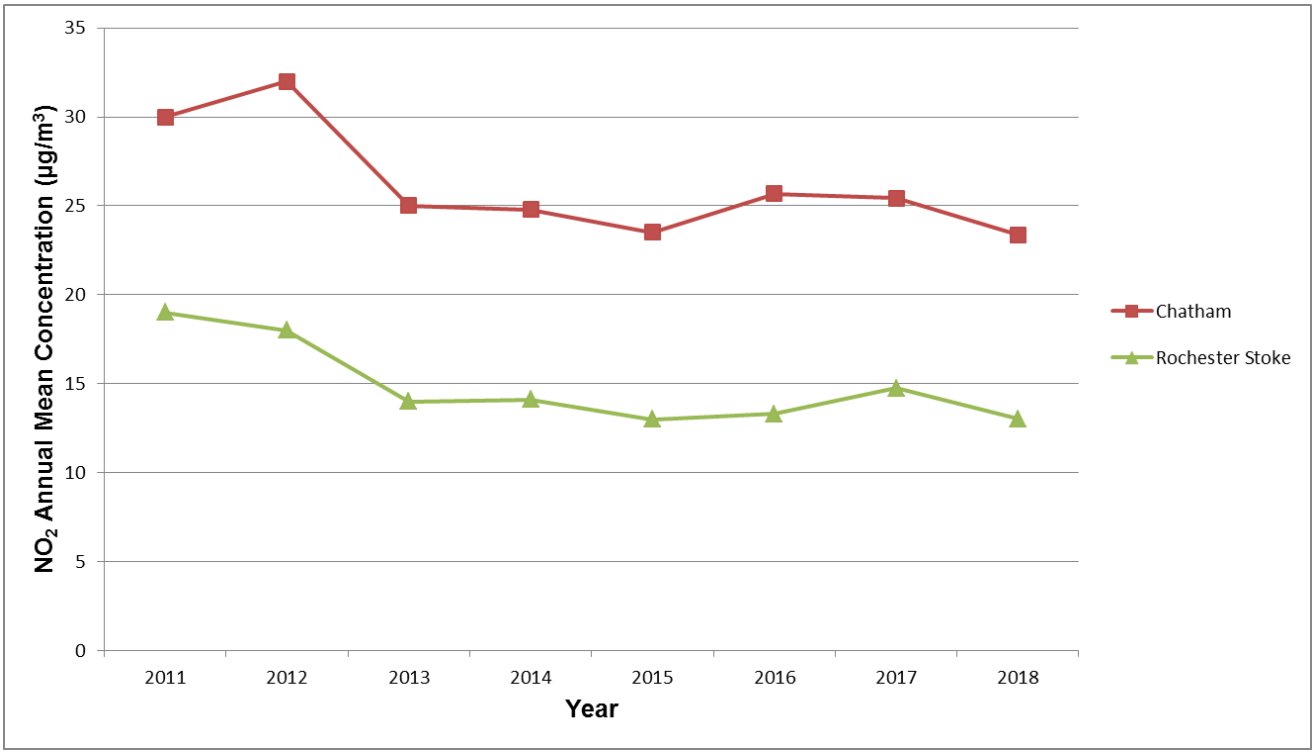

Figure A.1 – Trends in Measured Annual Mean Nitrogen Dioxide Concentrations at Medway Automatic Monitoring Sites

3.2.2 Particulate Matter (PM_{10})

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

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

Measured concentrations at both monitoring sites were well below the annual and 24-hour mean air quality objectives in 2018.

Measured annual mean concentrations of PM_{10} over the past seven years are presented in Figure 3.2. There is a weak trend of decreasing concentrations at the Chatham monitoring site from 2013 to 2015, however, there has been an increase in concentrations since then. There has been a similar trend at the Rochester Stoke monitoring site, with 2018 concentrations remaining similar to those measured in 2011. The PM monitoring equipment at the Chatham site was changed from an FDMS TEOM to a BAM at the end of 2016, and this may have had some influence on measured concentrations in 2017 and 2018 due to the different monitoring techniques employed.

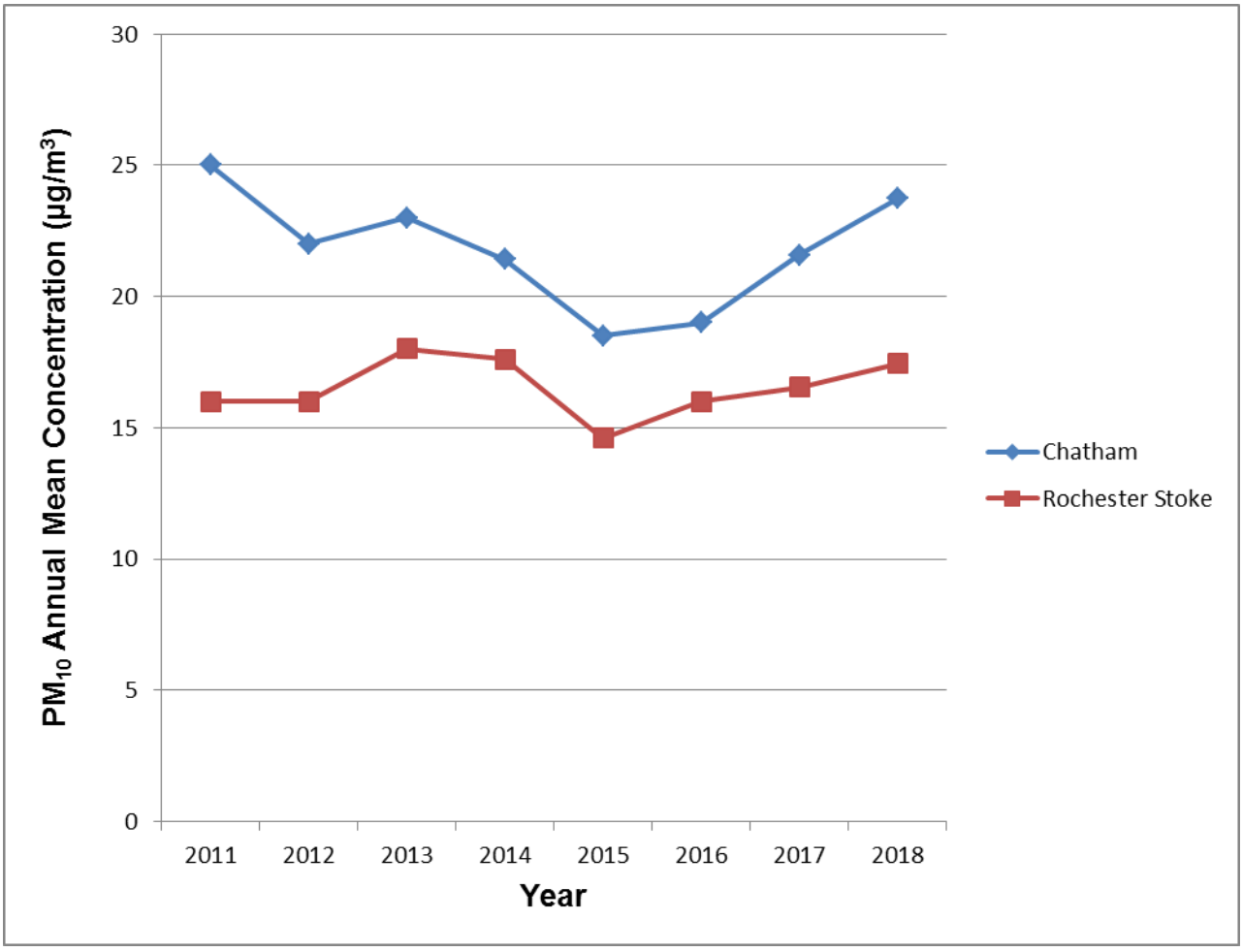

Figure A.2 – Trends in Annual Mean PM_{10} Concentrations

3.2.3 Particulate Matter ($PM_{2.5}$)

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

Measured annual mean concentrations of $PM_{2.5}$ over the past seven years are presented in Figure 3.2. There is a trend of decreasing concentrations at the Chatham monitoring site

from 2011 to 2016, however this site did record an increased concentration from 2016 to 2018. As discussed above, some of this change may have been attributable to the change in monitoring equipment. The Rochester Stoke monitoring site shows an overall trend of decreasing concentrations from 2011 to 2017.

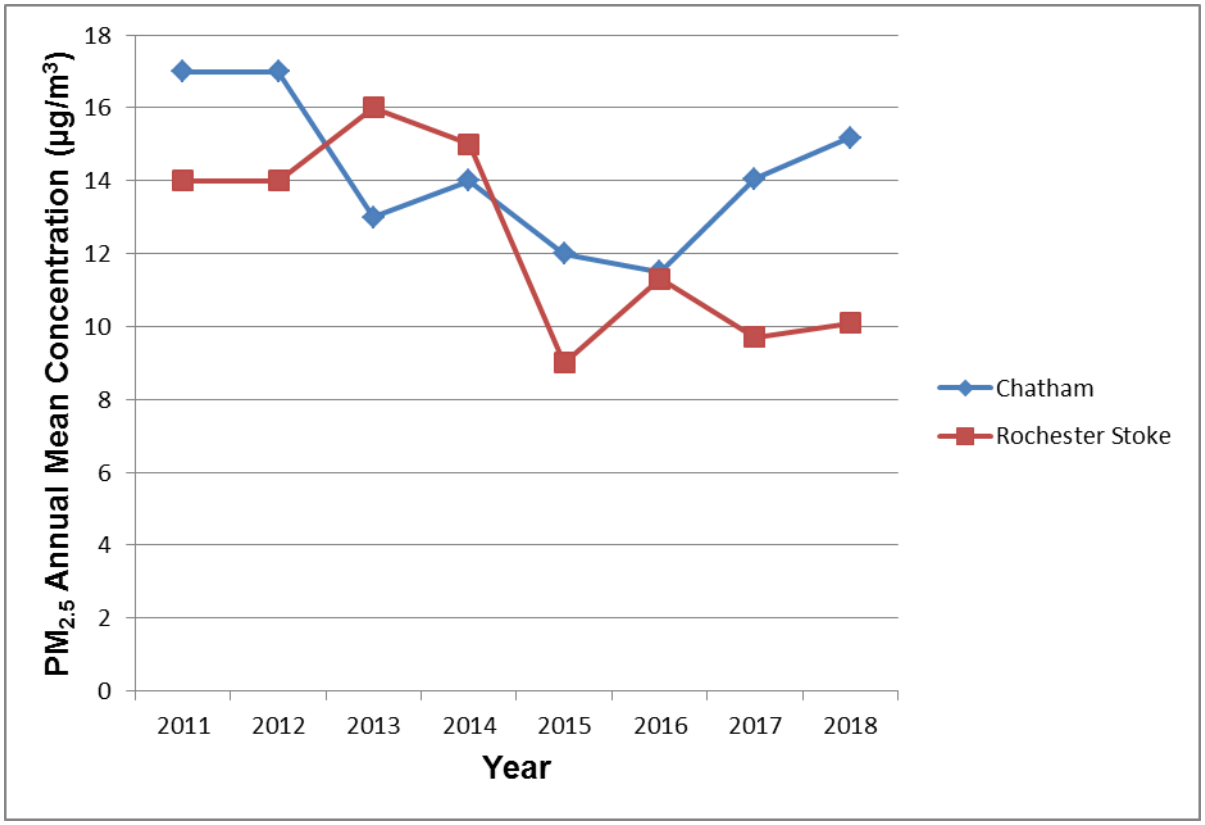

Figure A.3 – Trends in Annual Mean $PM_{2.5}$ Concentrations

3.2.4 Sulphur Dioxide (SO_2)

Table A.8 in Appendix A compares the ratified continuous monitored SO_2 concentrations for 2018 with the air quality objectives for SO_2.

In 2018 there were no measured exceedances of the 15-minute mean, 1-hour mean or 24-hour mean objectives for SO_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)
Chatham	Chatham (AURN)	Urban Centre	577437	166993	NO_2, PM_{10}, $PM_{2.5}$	YES (3)	NO_2 - Chemiluminescent analyser, PM_{10} and $PM_{2.5}$ - BAM (FDMS previous to November 2016)	0	4	2.5
Rochester Stoke	Rochester Stoke (AURN)	Rural	583158	176314	NO_2, PM_{10}, $PM_{2.5}$, SO_2, O_3	NO	NO_2 - Chemiluminescent analyser, PM_{10} and $PM_{2.5}$ - FIDAS (FDMS previous to August 2018), SO_2 and O_3 - UV fluorescent analyser	0	N/A	2.5

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.

(3) Located adjacent to a road covered by an AQMA.

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)
DT01	60 High Street, Rainham	Roadside	581568	165952	NO_2	YES	0	2.5	NO	2.3
DT02	High Street, Strood (Tanning studio)	Roadside	573482	169282	NO_2	YES	0	2.5	NO	2.5
DT03	46 High Street, Strood (Heating shop)	Roadside	573793	169164	NO_2	YES	0	2.1	NO	2.5
DT04	30-32 Luton Road (Funeral Directors)	Roadside	576565	167336	NO_2	YES	0	2.9	NO	2.5
DT05	27 High Street, Luton	Roadside	577426	166506	NO_2	YES	0	2	NO	2.5
DT06	18 Star Hill	Roadside	574589	168087	NO_2	YES	0	3.3	NO	2.5
DT07	92 Cuxton Road, Strood	Roadside	573078	168908	NO_2	YES	0	4.2	NO	2.2
DT08	Railway Street, Chatham	Roadside	575642	167779	NO_2	YES	0	5.5	NO	3
DT09	Chatham AQ station	Roadside	577434	166993	NO_2	YES	0	3.3	YES	2.5
DT10	Flat, 4 New Road, Chatham	Roadside	575681	167691	NO_2	YES	0	8.2	NO	4
DT11	High Street, Chatham	Roadside	576393	167495	NO_2	YES	0	3.1	NO	2.5

	(Orbit Housing)									
DT12	28 Frindsbury Road	Roadside	573865	169646	NO_2	YES	0	3.1	NO	2.1
DT13	Stoke AQ station	Rural	583152	176305	NO_2	NO	0	N/A	YES	2.5
DT15	Lamp post adjacent White Horse pub, 95 High Street, Rainham	Roadside	581709	165922	NO_2	YES	1	2.4	NO	2.5
DT16	Care home, 117 High Street, Rainham	Roadside	581843	165886	NO_2	YES	0	4.9	NO	2.5
DT17	Lamp post adjacent 159 Rainham Road, Gillingham (Canterbury Street junction)	Roadside	577768	166922	NO_2	YES	2.8	1.9	NO	2.5
DT18	Lamp post adjacent 4b Luton Road (Luton Arches junction)	Roadside	576508	167404	NO_2	YES	1	1.8	NO	2.5
DT19	5 London Road, Strood (Dentist)	Roadside	573329	169294	NO_2	YES	0	2.5	NO	2.5
DT20	Lamp post adjacent 33 London Road, Strood	Roadside	573168	169305	NO_2	YES	6.7	1.7	NO	2
DT21	88 Spire Way,	Roadside	574999	170882	NO_2	YES	0	29	NO	2.2

	Wainscott									
DT22	Joy Lodge, Four Elms Hill	Roadside	575488	171616	NO_2	YES	0	12	NO	1.2
DT23	1 Omaha Place, Wainscott	Roadside	575044	171351	NO_2	NO	0	34	NO	2.1
DT24	Sign post RS106 adjacent 1A Main Road, Chattenden	Kerbside	575948	171847	NO_2	YES	2.2	0.5	NO	2.6
DT25	Lamp post PAS23 adjacent 2A Pier Road	Roadside	577908	169285	NO_2	YES	0.4	3.3	NO	2.3
DT26	Lamp post PAS512 adjacent 24 Pier Road	Roadside	578007	169262	NO_2	YES	6.8	2.6	NO	2.4
DT27	Lamp post PAS22 adjacent Liberty Quays, Pier Road	Roadside	577880	169319	NO_2	YES	4.6	3.8	NO	2.4
DT28	Lamp post NDL49 adjacent 9 New Road, Chatham	Roadside	575737	167670	NO_2	YES	6.4	1	NO	2.5
DT29	Lamp post NDJ4 adjacent Trinity College, New Road Avenue	Roadside	574760	167892	NO_2	YES	6.1	2.9	NO	2.5
DT30	Lamp post NDK6	Roadside	575473	167837	NO_2	YES	0	3.1	NO	2.5

	adjacent Tuition Centre, New Road Avenue/Manor Road junction									
DT31	7 Highview Drive, Chatham	Roadside	574788	164568	NO_2	YES	0	8.4	NO	2.5
DT32	Lamp post FEA016 adjacent 6 Balls Cottages, Main Road, Chattenden	Roadside	575903	171802	NO_2	YES	8.4	1.9	NO	2.4
DT33	Lamp post FEA20 adjacent 2 Broadwood Road, Chattenden	Roadside	575971	171833	NO_2	YES	2.4	1.8	NO	2.6
DT34	Lamp post CP019, Corporation Street	Roadside	574499	168495	NO_2	YES	N/A	2.2	NO	2.1
DT35	Sign post adjacent McDonalds, Commercial Road, Strood	Roadside	573518	169176	NO_2	YES	8	1.5	NO	2.2
DT36	Lamp post HKA8, High Street, Strood	Roadside	573573	169262	NO_2	YES	4.8	1.2	NO	2
DT37	Lamp post adjacent former	Roadside	575862	168104	NO_2	YES	2.4	2.4	NO	2.23

	Churchills Pub, The Brook, Chatham									
DT38	Lamp post adjacent The Brook/Queen Street junction	Roadside	576056	167835	NO_2	YES	N/A	3.65	NO	2.15
DT39	Lamp post adjacent Iceland, The Brook, Chatham	Roadside	576084	167762	NO_2	YES	N/A	3.94	NO	2.08

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 2018 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2014	2015	2016	2017	2018
Chatham	Urban Centre	Automatic	98.9	98.9	24.8	23.5	25.7	25.4	23.4
Rochester Stoke	Rural	Automatic	94.7	94.7	14.1	13.0	13.3	14.7	13.0
DT01	Roadside	Diffusion Tube	100	100	**44.7**	**43.4**	**42.2**	**45.4**	37.3
DT02	Roadside	Diffusion Tube	100	100	**44.4**	**42.0**	**47.0**	**43.0**	**43.8**
DT03	Roadside	Diffusion Tube	100	100	**56.2**	**53.9**	**51.7**	**51.0**	**46.4**
DT04	Roadside	Diffusion Tube	100	100	38.2	36.8	38.6	37.9	32.5
DT05	Roadside	Diffusion Tube	100	100	34.8	33.2	33.0	34.2	30.3
DT06	Roadside	Diffusion Tube	100	100	**54.1**	**51**	**50.9**	**51**	**45.9**
DT07	Roadside	Diffusion Tube	100	100	37.8	36.9	39.4	38.8	35.9
DT08	Roadside	Diffusion Tube	100	100	**40.3**	39.7	39.3	38.8	37.6
DT09	Roadside	Diffusion Tube	83	83	26.2	27.7	25.6	25.5	22.8
DT10	Roadside	Diffusion Tube	75	75	34.8	32.6	34.0	32.4	31.0
DT11	Roadside	Diffusion Tube	92	92	35.2	36.3	35.6	35.7	32.2
DT12	Roadside	Diffusion Tube	100	100	37.7	36.3	36.6	35.5	33.6
DT13	Rural	Diffusion Tube	83	83	16.9	17.0	12.2	13.8	13.1
DT15	Roadside	Diffusion Tube	83	83	34.4	34.4	35.3	36.0	31.8
DT16	Roadside	Diffusion Tube	100	100	26.9	25.8	28.6	28.6	24.1
DT17	Roadside	Diffusion Tube	100	100	**43.7**	**45.0**	**43.5**	**45.3**	**40.6**
DT18	Roadside	Diffusion Tube	100	100	**45.4**	**45.4**	**46.3**	**48.0**	**40.4**
DT19	Roadside	Diffusion Tube	100	100	**49.2**	**49.0**	**47.4**	**48.0**	**43.7**

DT20	Roadside	Diffusion Tube	100	100	**46.2**	**46.0**	**48.5**	**51.0**	**47.2**
DT21	Roadside	Diffusion Tube	100	100	N/A	21.5	23.4	22.4	21.4
DT22	Roadside	Diffusion Tube	100	100	N/A	31.0	29.0	31.0	28.0
DT23	Roadside	Diffusion Tube	100	100	N/A	24.7	27.0	25.3	29.0
DT24	Kerbside	Diffusion Tube	42	42	N/A	**52.0**	**50.9**	**50.8**	**47.4**
DT25	Roadside	Diffusion Tube	92	92	N/A	37.6	36.5	**42.9**	37.9
DT26	Roadside	Diffusion Tube	100	100	N/A	25.8	33.6	28.1	27.9
DT27	Roadside	Diffusion Tube	100	100	N/A	37.6	33.5	39.1	35.6
DT28	Roadside	Diffusion Tube	92	92	N/A	N/A	39.6	**41.9**	**40.5**
DT29	Roadside	Diffusion Tube	100	100	N/A	N/A	35.9	35.4	30.5
DT30	Roadside	Diffusion Tube	83	83	N/A	N/A	24.5	38.2	36.2
DT31	Roadside	Diffusion Tube	100	100	N/A	N/A	N/A	26.5	21.6
DT32	Roadside	Diffusion Tube	100	100	N/A	N/A	N/A	**47.5**	**46.3**
DT33	Roadside	Diffusion Tube	92	92	N/A	N/A	N/A	**43.5**	**41.6**
DT34	Roadside	Diffusion Tube	83	83	N/A	N/A	N/A	37.3	38.6
DT35	Roadside	Diffusion Tube	100	100	N/A	N/A	N/A	30.2	31.5
DT36	Roadside	Diffusion Tube	92	92	N/A	N/A	N/A	**45.3**	**47.1**
DT37	Roadside	Diffusion Tube	100	25	N/A	N/A	N/A	N/A	31.4
DT38	Roadside	Diffusion Tube	100	25	N/A	N/A	N/A	N/A	30.7
DT39	Roadside	Diffusion Tube	100	25	N/A	N/A	N/A	N/A	31.1

☒ **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 (Defra, 2016a) if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(4) DT9 and DT13 are the average of a triplicate of tubes used for co-location with Chatham and Rochester Stoke respectively.

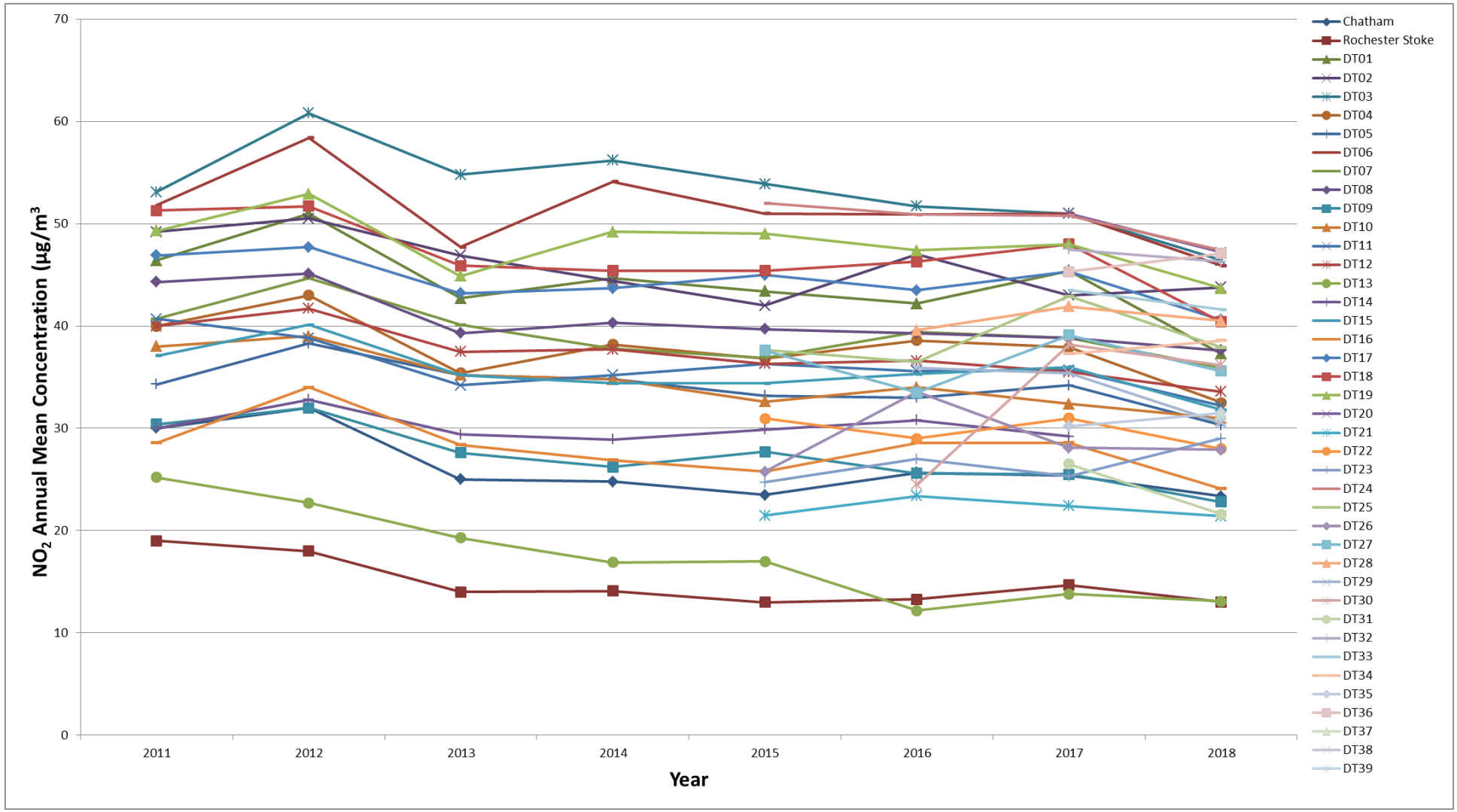

Figure A.4 – Trends in Annual Mean NO_2 Concentrations

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 2018 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2014	2015	2016	2017	2018
Chatham	Urban Centre	Automatic	98.9	98.9	0	0	0	0	0
Rochester Stoke	Rural	Automatic	94.7	94.7	0	0	0	0	0

Notes:

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold.**

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

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

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

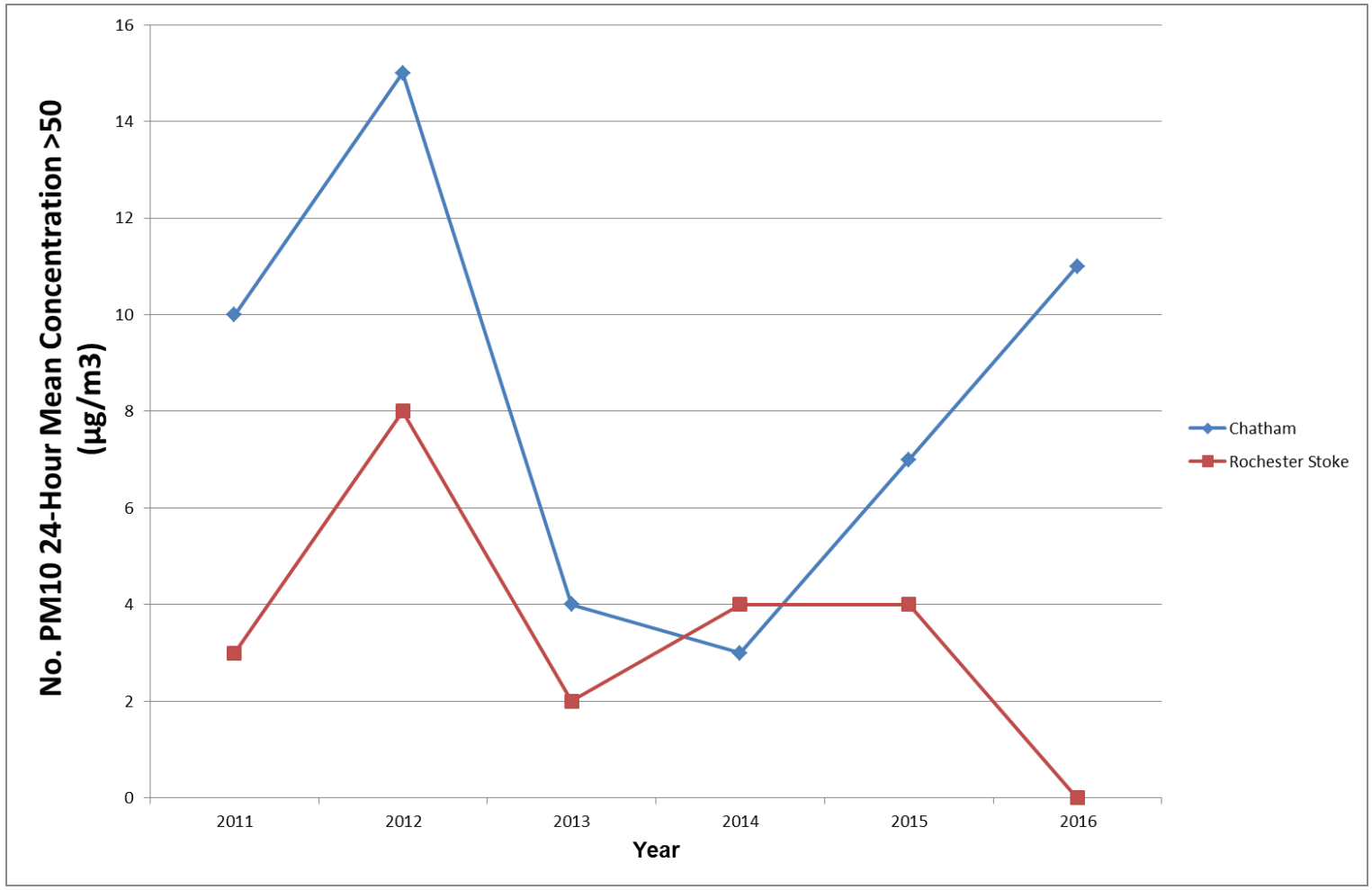

Figure A.5 – Trends in Number of NO_2 1-Hour Means > 200µg/m^3

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

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (3)				
				2014	2015	2016	2017	2018
Chatham	Urban Centre	96.4	96.4	21.4	18.5	19.1	21.6	23.7
Rochester Stoke	Rural	97.5	97.5	17.6	14.6	15.8	15.8	17.4

☒ **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 2018 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
				2014	2015	2016	2017	2018
Chatham	Urban Centre	95.9	95.9	15	4	3	7	11
Rochester Stoke	Rural	97.3	97.3	8	2 (24)	4 (32)	4	0

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.

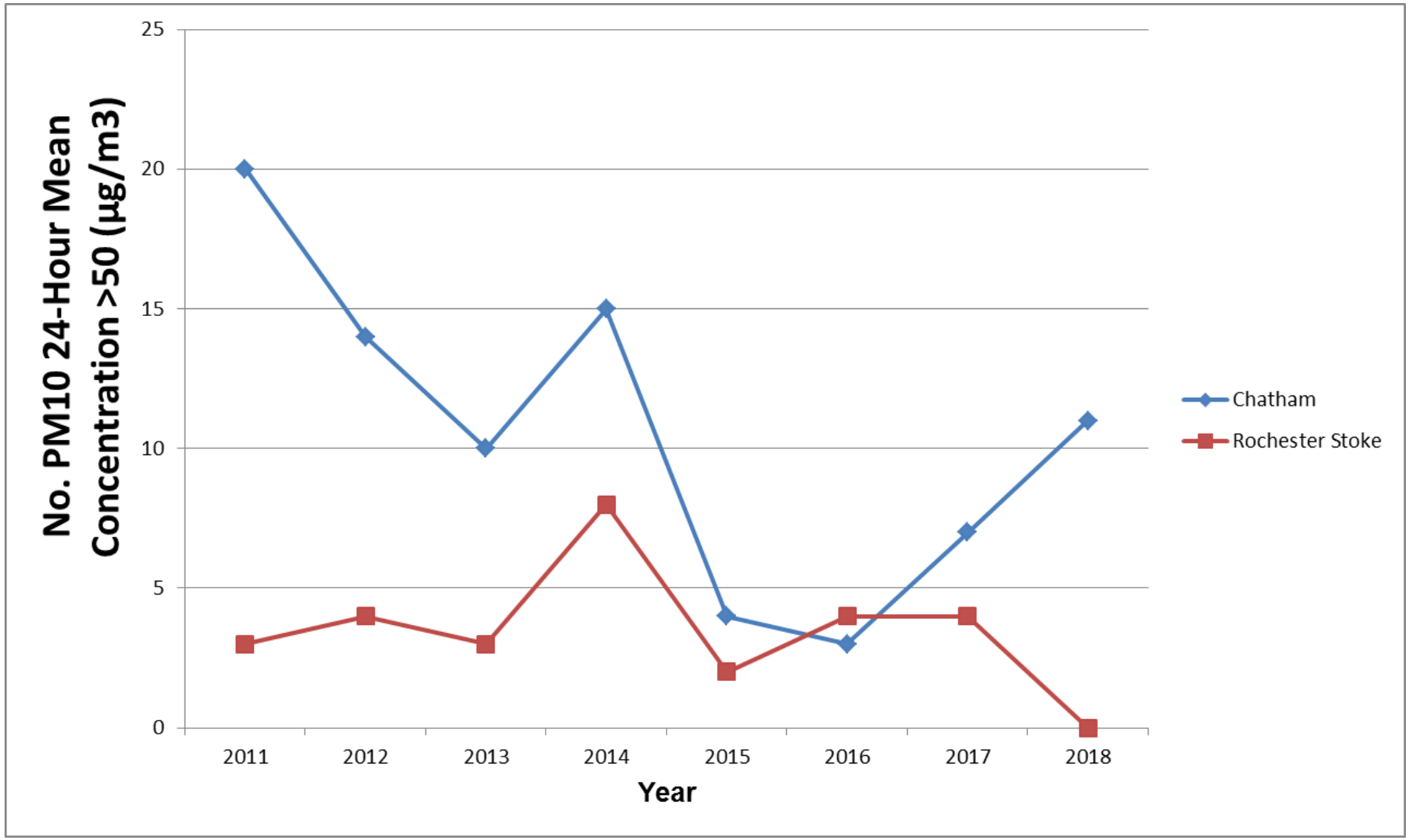

Figure A.6 – Trends in Number of 24-Hour Mean PM_{10} Results >50µg/m^3

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

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	$PM_{2.5}$ Annual Mean Concentration (µg/m^3) (3)				
				2014	2015	2016	2017	2018
Chatham	Urban Centre	96.1	96.1	14	11.8	11.5	14.1	15.2
Rochester Stoke	Rural	97.2	97.2	15	8.9	11.3	9.7	10.1

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

Notes:

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

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

(3) All means have been "annualised" as per 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.8 – SO_2 Monitoring Results

Site ID	Site Type	Valid Data Capture for monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	Number of Exceedances 2018 (percentile in bracket) [3]		
				15-minute Objective (266 µg/m^3)	1-hour Objective (350 µg/m^3)	24-hour Objective (125 µg/m^3)
Rochester Stoke	Rural	93.4	93.4	0	0	0

Notes:

Exceedances of the SO_2 objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year)

(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 relevant percentiles are provided in brackets.

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2018

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
DT01	58.6	40.7	57.2	49.2	45.7	33.5	51.7	55.1	54.8	48.7	39.3	54.5	49.1	37.3	37.3
DT02	58.4	53.6	56.6	47.7	65.2	58.8	61.1	51.9	49.2	65.7	63.8	59.1	57.6	**43.8**	**43.8**
DT03	53	59.9	63.2	59.7	70.9	61.1	67.9	60.1	58.8	65.9	48.5	64.1	61.1	**46.4**	**46.4**
DT04	43.2	39.8	60	41.9	38.2	32	41.2	41.9	40.1	49.6	36.5	49.2	42.8	32.5	32.5
DT05	44.2	38.7	44.3	39.3	40.6	35.1	38.7	35.3	36.8	42.1	39.8	44.1	39.9	30.3	30.3
DT06	58.6	48.9	61.1	53.5	58.5	51.4	63.1	60.9	62	65.4	66.2	74.8	60.4	**45.9**	**45.9**
DT07	43.4	49.4	49.8	48.5	51.1	45.4	47.8	44.3	45.6	49.8	42.2	48.9	47.2	35.9	35.9
DT08	52.3	43.7	51.5	52.3	48.6	43.7	48.4	49.5	52.2	49.8	51.5	49.7	49.4	37.6	37.6
DT09	35.4			30.7	26.4	22.6	27.1	31.1	33	29.8	29.3	38.1	30.4	22.8	22.8
DT10				43.9	34.4	28.3	39.3	39.8	38.4	46.5	50.3	45.8	40.7	31.0	31.0
DT11	38.9		50.6	46	34.3	31.8	40.7	40.8	41	43.8	47.6	50.1	42.3	32.2	32.2
DT12	45.9	41.1	53.6	40.3	44.4	36.4	46.8	43.8	40.1	43.4	50.8	43.5	44.2	33.6	33.6
DT13	25.4			20.8	17	11.8	14.8	21.3	21.9	24.1	23	27.1	20.7	13.1	13.1
DT15	41.4	43.3	42.4		35	34.2	44.7		41.3	45.2	42.6	47.8	41.8	31.8	30.3
DT16	30.5	32.8	36.1	29.7	32.8	24.6	30.2	31.7	30.2	35.8	30.1	36.6	31.8	24.1	24.1

DT17	58	54.1	62.1	48.4	47.7	35.3	52.9	54.3	54.9	57.1	50.7	66.3	53.5	**40.6**	36.7
DT18	55.7	48.8	59.2	50.3	46.9	40.2	51.6	54.9	54.4	51.8	63.4	60.3	53.1	**40.4**	38.1
DT19	59.1	55.4	66	58.4	49.4	43.1	63.6	57.9	58.4	55.3	57.6	65.7	57.5	**43.7**	**43.7**
DT20	68.6	61.6	66.4	60.4	70.2	62.7	68.1	58.2	54.8	57.1	54.5	62.8	62.1	**47.2**	36.6
DT21	32	29.2	35.5	23.8	25	22.5	28	24	25.9	29.4	33.4	28.5	28.1	21.4	21.4
DT22	42	36	41.1	37.7	34.6	32.5	37.9	35.1	36	32.5	34.4	42	36.8	28.0	28.0
DT23	32.8	36.2	42.9	33.4	37.8	32.5	36.5	28.5	29	33.1	39.9	74.9	38.1	29.0	29.0
DT24	67.1							77.9	76.2		68.9	34.8	65.0	**47.4**	38.4
DT25	55.3	49.3	53.3	55	45	35.1	48.2	51.5	53.2		44.6	57.8	49.8	37.9	37.3
DT26	37.3	39.7	39.8	32.2	46.6	41.4	29.1	30.2	29.5	39.3	36	39.3	36.7	27.9	24.7
DT27	50	43.9	50.4	45.3	55.1	27.9	45.9	43.6	44.9	56.4	44	55	46.9	35.6	31.9
DT28	44.5	52.8	58.9	49.5	69	55.6	57.4	51.6	46.5	50.3	49.5		53.2	**40.5**	31.9
DT29	39	41.8	49.1	32.6	36.5	29	36.2	37.8	40.7	42.4	46.5	50	40.1	30.5	26.6
DT30	48.6	47.1		46.1	48		46.7	42.5	42.1	51	50.3	54.1	47.7	36.2	36.2
DT31	34.9	28.9	32	27.5	21	16.3	24.1	27.5	29.1	32.2	30.9	36.7	28.4	21.6	21.6
DT32	70.2	51.1	68	66	49.8	51.5	59.2	56	61.4	64.9	62.7	70.3	60.9	**46.3**	34.9
DT33	60.4		59.2	55.8	47.4	45.8	50	50.4	55.3	57.6	55.7	64.4	54.7	**41.6**	36.9
DT34		67.4	67.6	50.9		51.8	57.9	46	42.7	15.6	54.7	53.4	50.8	38.6	N/A
DT35	46.3	40.6	45.8	40.9	35.8	32.2	40.9	37.7	35.8	44.9	49.5	46.2	41.4	31.5	25.9
DT36	73.9		70.3	58.5	54.4	45.6	60.6	63.5	50.5	69.3	66.6	69	62.0	**47.1**	37.2
DT37										49.5	45.1	48.8	47.8	31.4	28.5
DT38										50.5	44.4	45.3	46.7	30.7	N/A
DT39										48	45.7	48.6	47.4	31.1	N/A

☐ **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

Changed / Additional Pollutant Sources

Changed and new sources of pollution have been investigated and any changes to existing sources or new sources are listed below:

Table C.1: Changed / Additional Pollutant Sources in 2018

Changed / Additional Pollutant Sources	Screening Assessment Required	Any Changes to Monitoring / Fast Track AQMA Declaration
Industrial Installations (new installations and those with significantly increased emissions)		
Sicame UK Ltd, P/B/071/P2 – Di-isocyanate storage.	No	No
Tarmac Trading Ltd, P/B/073 – Cement batching	No	No
New developments		
Planning application number	**Address**	**Environmental Protection Team Recommendations**
MC/17/3144	1 Luton Road, Chatham, ME4 5AE	Air quality mitigation scheme recommended.
MC/17/4057	1 Old Road, Chatham, ME4 6BJ	Air quality mitigation scheme recommended.
MC/17/4319	Medway Park Leisure Centre, Mill Road, Gillingham, ME7 1HF	Refusal recommended as air quality assessment required up font with application.
MC/17/4408	Land at Walnut Tree Farm, High Halstow, ME3 8SQ	Air quality mitigation scheme recommended.
MC/17/4424	Stoke Road Business Centre, Stoke Road, Hoo St.Werburgh, ME3 9BP	Air quality mitigation scheme recommended.
MC/17/4447	11 Frindsbury Road, Strood, ME2 4ST	Air quality mitigation scheme recommended.
MC/18/0074	Land at North Sea Terminal, Slat Lane, Cliffe, ME3 7SX	Air quality assessment submitted.
MC/18/0092	Unit 1-2 New Cut Industrial Cenre, New Cut, Chatham, ME4 6AD	Air quality mitigation scheme recommended.
MC/18/0141	Rear of 161-163 High Street, Strood	Air quality mitigation scheme recommended.
MC/18/0161	Station Road West, Rainham, Kent	Refusal recommended as air quality assessment required up front with application.
MC/18/0185	29 London Road, Strood, ME2 3JB	Air quality mitigation scheme recommended.
MC/18/0215	304-306 St.Margarets Banks, Rochester, ME1 1HS	Refusal recommended as air quality assessment required up front with application.

MC/18/0247	Land at White House Farm, Stoke Road, Hoo St.Werburgh, ME3 9BH	Air quality mitigation scheme recommended.
MC/18/0288	Allhallows Golf Course, Avery Way, Allhallows	Air quality mitigation scheme recommended.
MC/18/0477	Wylie House, Elmwood Road, Chattenden	Air quality mitigation scheme recommended.
MC/18/0556	Gibraltar Farm, Ham Lane, Hempstead	Renewal of permission. AQ condition included on permission.
MC/18/0601	12 New Road Avenue, Chatham, ME 6BB	Prior approval/notification application. In an AQMA however air quality cannot be considered.
MC/18/0620	Land West of Elm Avenue and South of Broadwood Road, Chattenden	Refusal recommended as air quality assessment not acceptable.
MC/18/0706	Acorn Shipyard, Gas House Road, Rochester, ME1 1PJ	Air quality mitigation scheme recommended.
MC/18/0715	21-23 New Road, Chatham, ME4 4QJ	Air quality mitigation scheme recommended.
MC/18/0830	48 High Street, Strood	Prior approval/notification application. In an AQMA however air quality cannot be considered.
MC/18/1113	16-20 Batchelor Street, Chatham, ME4 4BJ	Refusal recommended as air quality assessment not acceptable.
MC/18/1185	H E Services, Whitewall Road, Medway City Estate, Rochester, ME2 4DZ	Air quality assessment submitted. AQ condition recommended.
MC/18/1461	Land adjacent to 23 Whitehorse Hill, Luton, Chatham	Air quality mitigation scheme recommended.
MC/18/1503	259-261 High Street, Rochester, ME1 1HQ	Refusal recommended as air quality assessment required up front with application.
MC/18/1796	Land South of Lower Rainham Road, Rainham, ME8 7UD	Air quality assessment unacceptable and required revision.
MC/18/1818	Plot 1 Anthony's Way, Medway City Estate, Rochester, ME2 DW	Air quality mitigation scheme recommended.
MC/18/2047	Land East of Mierscourt Road, Rainham	Refusal recommended as air quality assessment required up front with application.
MC/18/2331	13-17 Church Street, Chatham, ME4 4BT	Air quality mitigation scheme recommended.
MC/18/2437	Land West of 65 Layfield Road, Gillingham, ME7 2QY	Air quality mitigation scheme recommended.
MC/18/2609	Land rear of Mulver House, 636 Mierscourt Road, Rainham	Air quality assessment submitted.
MC/18/2864	4, 16, 20 and 22 High Street, Rainham	346A High Street, Chatham, ME4 4NP
Mc/18/2961	Land West of Town Road, Cliffe Woods, Rochester, ME3 8JX	Air quality mitigation scheme recommended.
MC/18/3021	Rear of 106-108 Cuxton Road, Strood, ME2 2JA	Air quality mitigation scheme recommended.
MC/18/3084	346A High Street, Chatham, ME4 4NP	Prior approval/notification application. In an AQMA

		however air quality cannot be considered.
MC/18/3160	Land Off Lower Rainham Road, Rainham, ME8 7UB	Air quality mitigation scheme recommended.
MC/18/3209	Land Rear of 12 New Road Avenue (Fronting Gundulph Road), Chatham, ME4 6BB	Air quality mitigation scheme recommended.
MC/18/3245	Land North of Four Elms Hill, Chattenden	Air quality mitigation scheme recommended.
MC/18/3299	346A High Street, Chatham, ME4 4NP	Prior approval/notification application. In an AQMA however air quality cannot be considered.
MC/18/3347	Land Rear of Walnut Tree Farm, Grain Road, Lower Stoke, ME3 9RE	Air quality mitigation scheme recommended.

There were no changed or new sources of the following types in 2018:

- Road sources, including:
    - Narrow congested streets with residential properties close to the kerb;
    - busy streets where people may spend 1-hour or more close to traffic;
    - roads with a high flow of buses and / or heavy goods vehicles (HGVs);
    - junctions;
    - new roads constructed since the last round of Review and Assessment;
    - roads with significantly changed traffic flow;
    - bus and coach stations;
- other transport sources, including
    - airports;
    - railway (diesel and steam trains);
    - ports (shipping);
- the following types of industrial sources:
    - major petrol storage depots;
    - petrol stations;
    - poultry farms; and
- commercial and domestic sources, including:
    - biomass combustion (including domestic solid-fuel burning for PM_{10});
    - CHP installations; and
    - Domestic solid-fuel burning (SO_2).

Diffusion Tube Bias Adjustment Factors

Measurements from co-located diffusion tubes and automatic monitors at Chatham (AURN) and Rochester Stoke (AURN) monitoring sites have been compared to determine local bias adjustment factors.

Table C.2: Local Bias Adjustment Factor Calculation

Monitoring Site	Diffusion Tube Annual Mean Concentration ($\mu g/m^3$)	Automatic Annual Mean Concentration ($\mu g/m^3$)	Adjustment Factor
Chatham	30.4	23.4	0.75
Rochester Stoke	20.7	13.0	0.63

A database of bias adjustment factors determined from Local Authority co-location studies throughout the UK has been collated by the LAQM Helpdesk. The National Diffusion Tube Bias Adjustment Factor Spreadsheet (Version 03/19) was used to obtain an overall adjustment factor of 0.76 for 2018. This overall factor is based on 21 co-location studies where the tube preparation method and analysis laboratory used were the same as those used by Medway Council.

The national bias adjustment factor (0.76) is based on a greater number of studies than the local adjustment factors and, for most areas within Medway, is, therefore, considered to be more reliable. Furthermore, the national factor is higher than either of the two local adjustment factors and, therefore, provides a worst-case approach.

The co-location diffusion tubes are missing data for February and March at both automatic monitoring sites. The Local Adjustment Factor has been calculated in accordance with Technical Guidance LAQM.TG16, using the spreadsheet supplied by Defra. The factor will therefore not be exactly equal to the automatic annual mean concentration divided by the diffusion tube triplicate annual mean concentration.

Based on the above, the national bias adjustment factor has been applied to all sites, with the exception of the co-located tubes, to which the local adjustment factor of 0.75 and 0.63 were applied to the Chatham monitoring site (DT09) and the Rochester Stoke monitoring site (DT13) were applied respectively.

Diffusion Tube Annualisation

Diffusion tube monitoring sites have been annualised as per Technical Guidance LAQM.TG16 in instances where valid data capture was less than 75% (and at least 25%).

Sites DT24, DT37, DT38, and DT39 have been annualised against automatic monitoring sites ‘Rochester Stoke’, ‘Canterbury’, ‘Thurrock’, and ‘London Bexley’, which fulfil the criteria specified by LAQM.TG16 guidance of being long-term continuous background monitoring sites with data capture over 85% for 2018, preferably forming part of the AURN network.

Four adjustment factors (one for each of the automatic sites used) have been calculated for each diffusion tube site based on the ratio of the mean concentration measured by the automatic sites during the monitoring period for which data for the diffusion tube site was available and annual mean concentrations measured by the automatic sites (see Table C.3, and Table C.4). An average of the four adjustment factors was then calculated (see Table C.5) and applied to the diffusion tube bias adjusted annual means.

Table C.3: DT24 Annualisation Factor Calculation

2018 Month	Exposure Days	Raw Diffusion Tube Mean NO_2 Conc. ($\mu g/m^3$)	Automatic Mean NO_2 Conc. ($\mu g/m^3$) when Diffusion Tube Data is Available			
		DT 24	Canterbury	London Bexley	Rochester Stoke	Thurrock
January	27.0	67.1	14.3	27.0	15.2	29.2
February	30.1		14.2	26.9	13.1	28.7
March	26.0		15.2	27.1	15.4	30.7
April	36.0		11.2	22.8	13.2	24.4
May	35.0		11.0	22.2	14.1	22.5
June	28.0		6.9	13.2	7.3	17.0
July	28.0		10.0	17.9	11.0	22.9
August	35.9	77.9	10.3	18.6	11.0	21.7
September	27.0	76.2	10.1	20.9	12.5	22.5
October	29.0		14.7	27.1	13.7	27.6
November	33.2	68.9	14.2	26.1	14.9	24.8
December	35.8	34.8	14.1	27.7	14.9	28.0
PERIOD MEAN		*64.2*	*12.6*	*24.0*	*13.7*	*25.2*
ANNUAL MEAN:			**12.0**	**22.9**	**13.0**	**24.8**
ANNUALISATION FACTOR:			**0.9504**	**0.9532**	**0.9514**	**0.9831**

Table C.4: DT37, DT38, and DT39 Annualisation Factor Calculation

2018 Month	Exposure Days	Raw Diffusion Tube Mean NO_2 Conc. ($\mu g/m^3$)			Automatic Mean NO_2 Conc. ($\mu g/m^3$) when Diffusion Tube Data is Available			
		DT 37	DT 38	DT 39	Canterbury	London Bexley	Rochester Stoke	Thurrock
January	27.0	-	-	-	14.3	26.9	15.2	29.1
February	28.0	-	-	-	14.1	27.5	13.1	29.3
March	28.0	-	-	-	15.2	26.6	15.2	29.9
April	36.0	-	-	-	11.2	22.8	13.2	24.4
May	35.0	-	-	-	11.0	22.2	14.1	22.5
June	28.0	-	-	-	6.9	13.2	7.3	17.0
July	26.0	-	-	-	10.2	18.0	11.0	23.1
August	38.0	-	-	-	10.1	18.4	11.1	21.6

September	**27.9**	-	-	-	10.2	21.1	12.6	22.6
October	**27.2**	49.5	50.5	48	14.2	26.6	13.2	27.1
November	**34.0**	45.1	44.4	45.7	14.6	26.6	15.3	25.4
December	**36.9**	48.8	45.3	48.6	14.8	28.5	15.5	28.5
PERIOD MEAN		*47.7*	*46.4*	*47.4*	*14.6*	*27.3*	*14.8*	*27.0*
ANNUAL MEAN:					**12.0**	**22.9**	**13.0**	**24.8**
ANNUALISATION FACTOR:					**0.8214**	**0.8379**	**0.8786**	**0.9159**

Table C.5: Average Annualisation Factors

DT24	DT37	DT38	DT39
0.960	**0.864**	**0.864**	**0.864**

QA/QC of Automatic Monitoring

The Chatham (AURN) monitoring site is calibrated every two weeks and the Rochester Stoke (AURN) monitoring site every three months.

QA/QC of Diffusion Tube Monitoring

Nitrogen dioxide analysis procedures are compliant with the Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance. The diffusion tubes are supplied and analysed by SOCOTEC Didcot utilising the 50% Triethanolamine (TEA) in acetone preparation method. SOCOTEC Didcot is a UKAS accredited laboratory which participates in the WASP scheme.

Distance from Road Calculation

A number of the roadside diffusion tube monitoring sites measuring nitrogen dioxide concentrations in 2018 were not located at sites of relevant public exposure. As such, it is necessary to distance correct the measured concentrations at these sites in order to estimate concentrations experienced at the nearest relevant exposure to these sites. These estimated concentrations can then be compared to the relevant air quality objectives to establish whether or not an exceedance is likely to have taken place.

Distance correction calculations have been undertaken for each nitrogen dioxide monitoring site that is not representative of relevant exposure using Defra's 'NO_2 with Distance from Roads Calculator Tool v4.2', which requires the following inputs:

- distance from the monitoring site to the kerb (m);
- distance from the closest relevant exposure to the kerb (m);
- the local annual mean background nitrogen dioxide concentration ($\mu g/m^3$), determined using Defra's background maps; and
- the measured annual mean nitrogen dioxide concentration at the site ($\mu g/m^3$).

The distance corrected 2018 nitrogen dioxide annual mean concentrations are presented in Table B.1.

Appendix D: Maps of Monitoring Locations and AQMAs

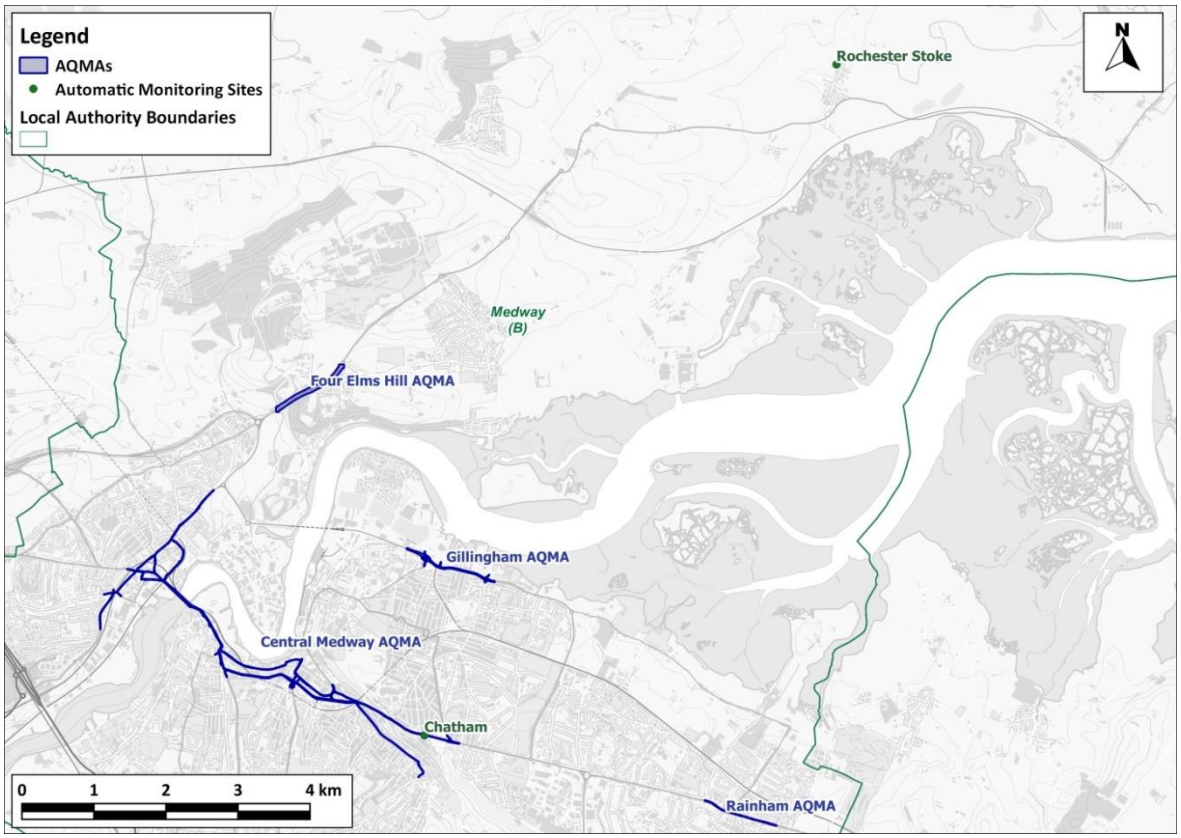

Figure D.1 – Map of Automatic Monitoring Sites and AQMA Locations within Medway

Figure D.2 – Map of Diffusion Tube Monitoring Site within Medway (North)

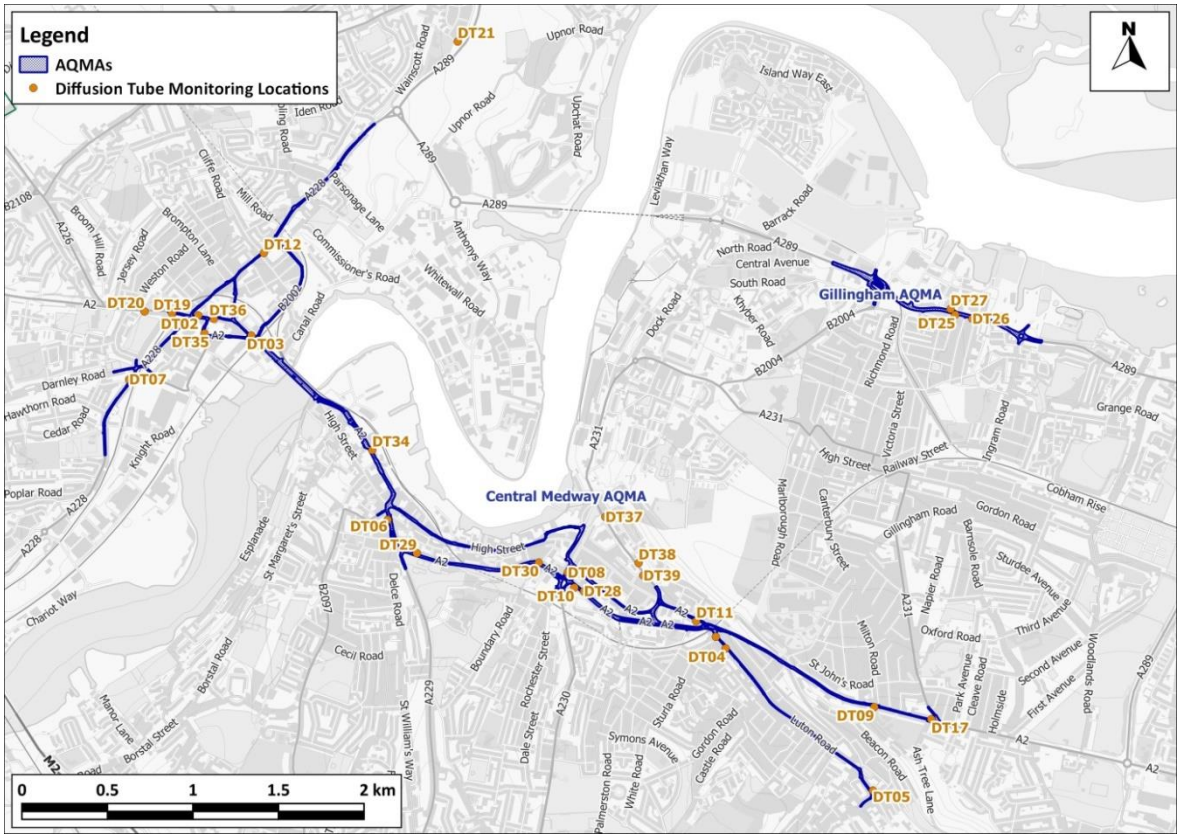

Figure D.3 – Location of Monitoring Sites within Central Medway and Gillingham AQMA

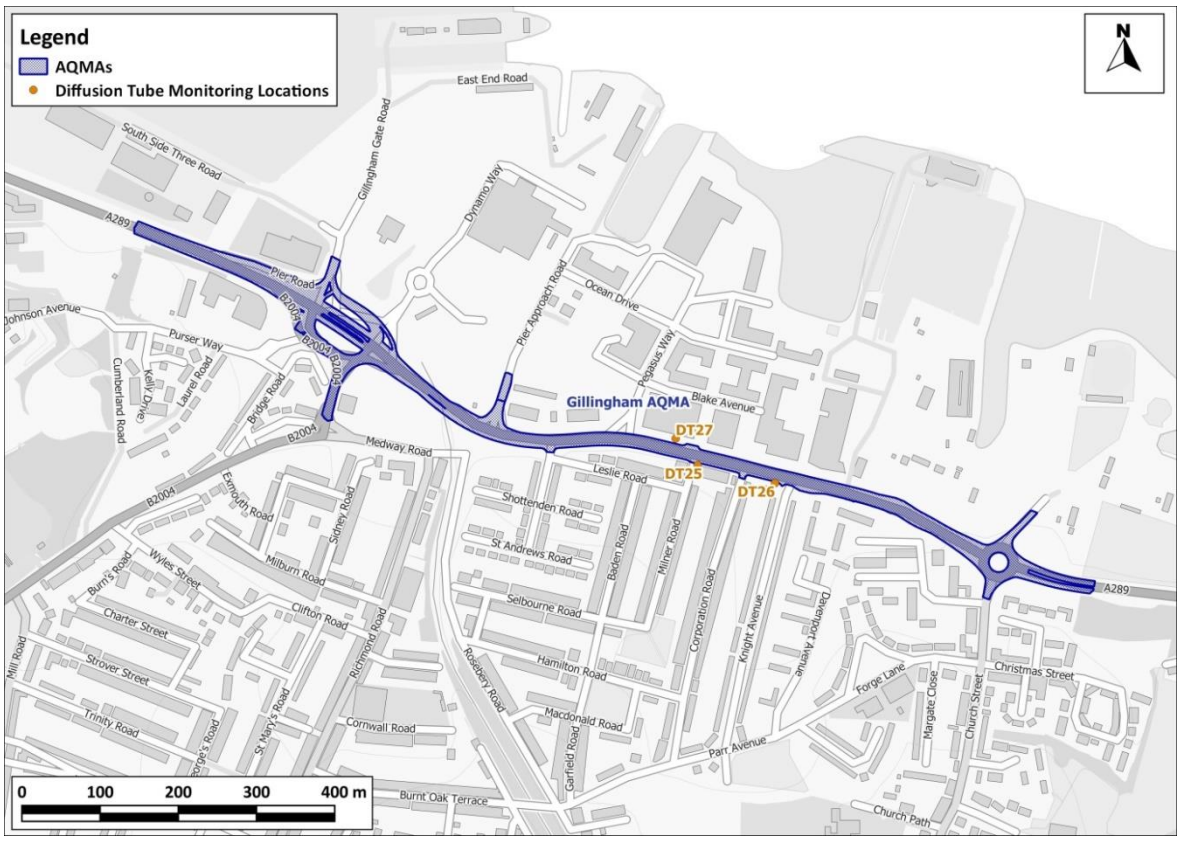

Figure D.4 – Location of Monitoring Sites within Gillingham AQMA

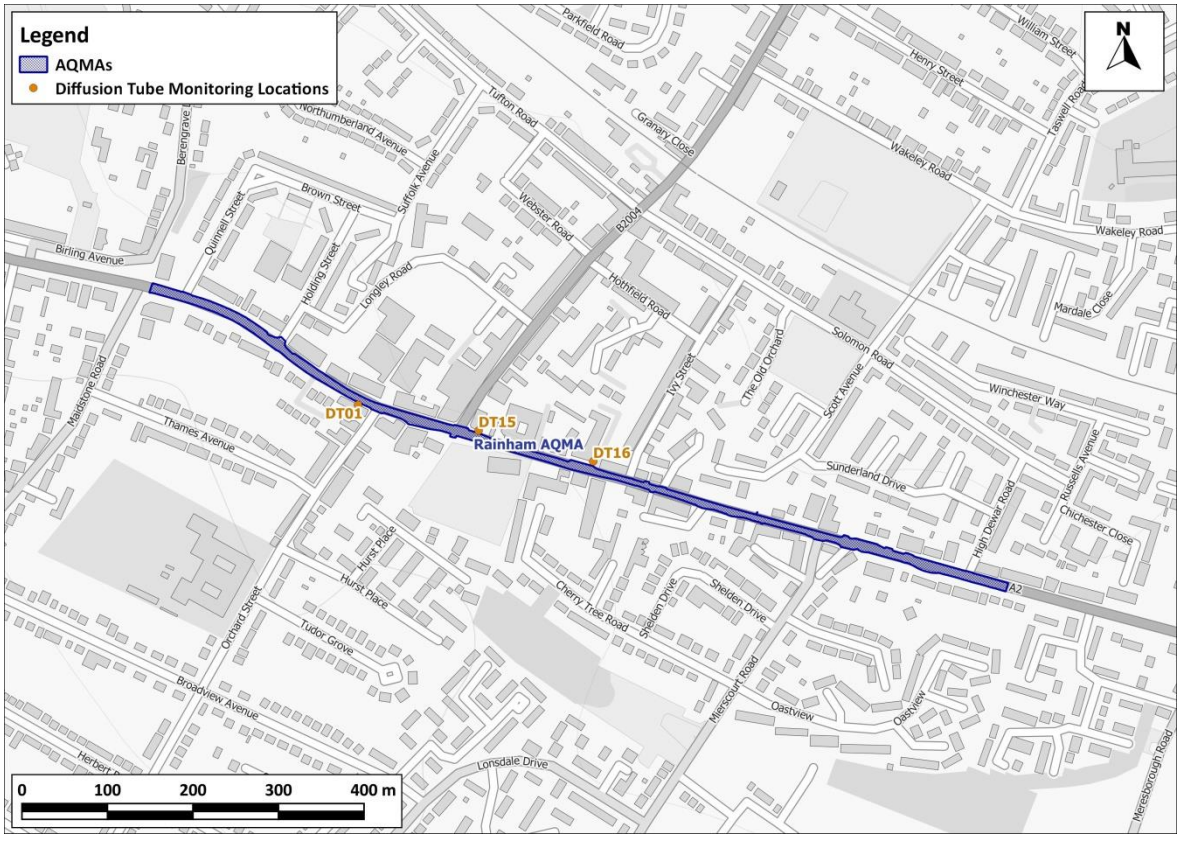

Figure D.5 – Location of Monitoring Sites within Rainham AQMA

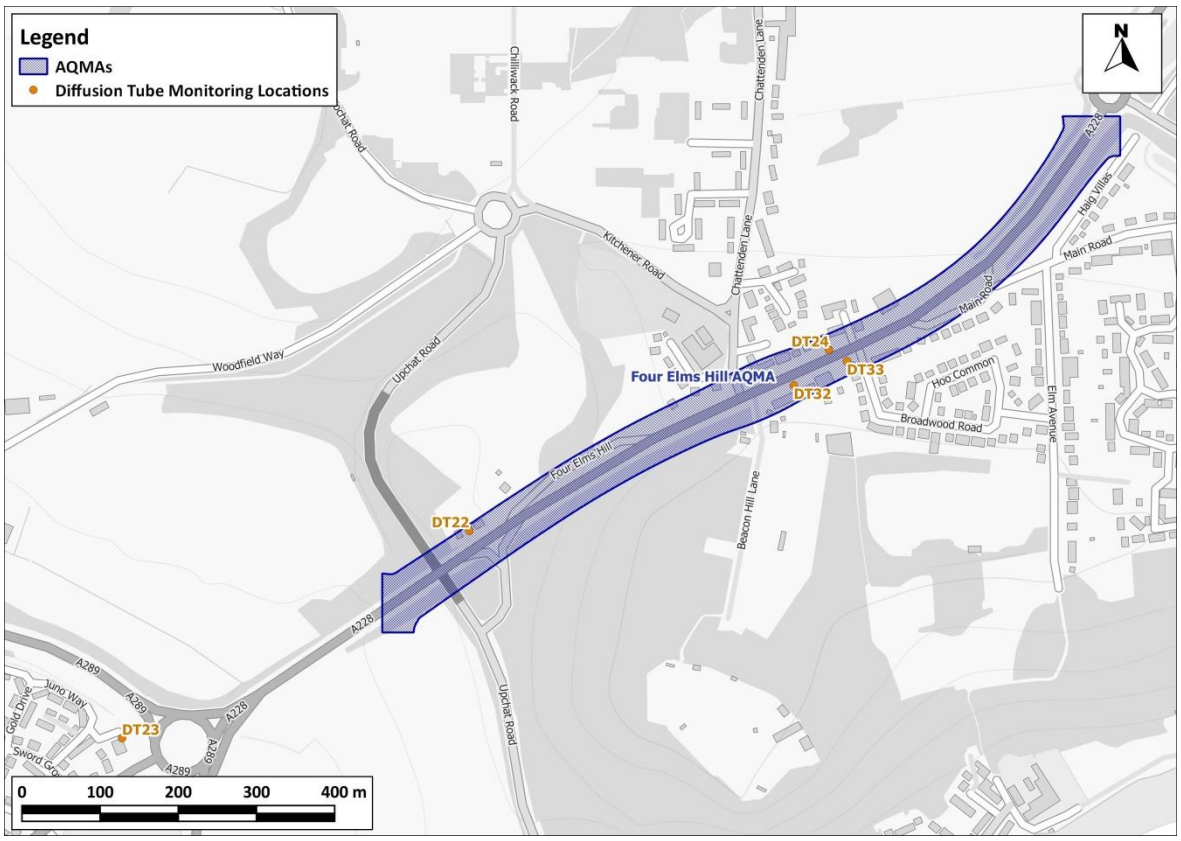

Figure D.6 – Location of Monitoring Sites within Four Elms Hill AQMA

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[5]	
	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

[5] 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'
AQCS	Air Quality Communication Strategy
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

Defra. (2016a). *Local Air Quality Management Policy Guidance (PG16).*

HMSO. (1995). *Environment Act.*

Medway Council. (2015). *Medway Air Quality Action Plan .*

Medway Council. (2016). *Air Quality Planning Guidance.*