2020 Air Quality Annual Status Report (ASR)

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

June 2020

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wood. Floor 23 25 Canada Square Canary Wharf London E14 5LQ Doc Ref: 42940-WOD-XX-XX-RP-OA-0001_A_C01.2	**Document revisions** No. Details Date 1 Draft 24/6/20 2 Final 29/6/20 Third-party disclaimer Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Wood at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Wood excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability. Management systems This document has been produced by Wood Environment & Infrastructure Solutions UK Limited in full compliance with our management systems, which have been certified to ISO 9001, ISO 14001 and OHSAS 18001 by LRQA.

Executive Summary: 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. Medway 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.

Nitrogen dioxide is the main pollutant of concern within Medway, with concentrations of all other pollutants measured being below the relevant Air Quality Objectives (AQOs). In 2019 exceedances of the annual mean nitrogen dioxide AQO were measured at 12

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

monitoring sites (seven when distance corrected to represent relevant exposure). Ten of the twelve diffusion tube sites showing exceedance were located within an AQMA and one within 200m of an AQMA. One monitoring location that exceeded the annual mean nitrogen dioxide AQO was located a significant distance from an AQMA, however when distance corrected to estimate exposure, the concentration was within legal limits.

There were no exceedances of the AQOs for particulate matter (PM_{10}) and concentrations of PM_{10} and $PM_{2.5}$ decreased when compared with 2018 concentrations. Concentrations of sulphur dioxide (SO_2) also complied with the relevant AQOs.

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 AQO. 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. An AQAP for Four Elms AQMA is currently being produced, however has been delayed with permission by Defra to coincide with the release of the new Medway Local Plan. A draft plan is expected to be available for consultation late 2020. During 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 actively 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. A new Local Plan is currently under development and will be used in the future to manage air quality. 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 2019 in pursuit of improving local air quality. Some of the key measures that have been implemented are, and progressed on in 2019 are:

- Regional Freight Strategy and Freight Action Plan;
- Air Quality Communications Strategy; and
- Bidding for Central Government Funds to implement air quality improvement measures.

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 2019, monitoring results for 2019 demonstrate that air quality within Medway continues to exceed the annual mean nitrogen dioxide AQO at some locations adjacent to roads covered by the Central Medway AQMA and Four Elms Hill AQMA, while no exceedances have been recorded at the other two AQMAs (when distance-corrected to represent relevant exposure). Measured pollutant concentrations remain below AQOs 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 AQMA declared at Gillingham consistently records concentrations below the AQO, it is recommended that the AQMA remain in place due to ongoing development at Chatham Docks.

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 2021).

Medway Council's priorities for the coming year are to continue with the work on the measures outlined in the AQAP and those detailed in Table 2.2 of the ASR.

A priority for 2020 will be completion of the Four Elms Hill AQAP and Kent and Medway Energy and Low Emissions Strategy. Also, Medway Council will continue to follow the Air Quality Communication Strategy to increase awareness of the impacts of air quality over the coming year through working with KM Charity Team to promote the Green School Awards and continuing to support walking, cycling and car share schemes. Medway Council will continue to apply for schemes providing funding for initiatives to improve air quality.

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/km).

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 2019. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the Air Quality Objectives (AQOs) 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 AQOs. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Medway Council to improve air quality and any progress that has been made.

The statutory AQOs 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

AQMAs are declared when there is an exceedance or likely exceedance of an AQO. After declaration, the authority must prepare an AQAP within 12-18 months setting out measures it intends to put in place in pursuit of compliance with AQOs

A summary of AQMAs declared by Medway Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=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 previous AQMAs and new areas	YES	58.4	µg/m^3	48.3	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
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	39.3	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	35.8	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	52.0	$\mu g/m^3$	46.4	$\mu g/m^3$	Delay in production of the new Local Plan has impacted delivery of the Four Elms Hill AQAP. The AQAP is expected to be completed late in 2020.

☒ **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

The conclusions presented by Medway Council in last year's ASR were accepted by Defra for all sources and pollutants. Defra's appraisal recognised limitations in delivering some measures due to challenges relating to funding and resourcing. The suggestion was made that measures should focus on AQMAs and pollution hotspots to achieve the greatest impact.

Medway Council has taken forward a number of direct measures during the current reporting year of 2019 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. Further details on some of these measures can be found in the AQAP (2015).

2.2.1 Key measures in 2019

Freight Action Plan

The Freight Action Plan has been developed alongside Kent County Council (KCC) with the aim of promoting safe and sustainable distribution networks around Kent and Medway. The main objectives include:

- Tackling the problem of overnight lorry parking which may cause congestion or prolonged idling for refrigerated units or in-cab eaters, resulting in increased emissions;
- Finding a long-term solution to Operation Stack. Whilst Operation Stack is implemented in Kent, the impact to traffic flows are far reaching and greater burden is placed on major roads within Medway, including the M2, as people try to avoid Operation Stack thereby impact air quality;
- Effectively managing routing of HGVs to ensure they stay on the strategic road network as far as possible by developing an online freight journey planner that feeds directly into HGV-specific Satellite Navigation systems. This helps to ensure HGVs are not travelling on unsuitable roads where they may cause congestion and impact air quality;

- Taking steps to address problems caused by freight traffic on local communities. Within Medway, legally enforceable restrictions may be put in place on certain roads deemed unsuitable for large volumes of HGVs, including areas where the local community may be impacted by poor air quality; and
- Ensuring the use of planning and development powers to reduce the impact of freight traffic. This encourages Medway Council to comment on, suggest amendments to or object to any scheme which may increase HGV movements during the construction or operational phase which may adversely affect air quality.

Air Quality Communications Strategy

Medway Council Environmental Protection Team have developed an Air Quality Communications Strategy (AQCS) with the Public Health Team to increase awareness amongst key stakeholders and local groups of the health impacts of air pollution. Existing methods of communication were reviewed alongside engaging with local groups to develop the AQCS, which was published in June 2018 and implemented throughout 2018 and 2019.

The main communication objectives are:

1. To increase awareness about air pollution and how our target audiences can safeguard themselves from the harm it causes;
2. To motivate people to improve the air quality in Medway; and
3. To include air quality planning in future developments and strategies planned by Medway Council.

There are a wealth of measures to improve air quality and methods to implement them whilst achieving maximum engagement by targeting specific groups detailed in the full AQCS, which is available here: https://www.medway.gov.uk/downloads/file/2845/medway_air_quality_communication_strategy

During 2019, Medway Council focussed on the following:

- Encouraging schools in Medway to become involved in the KM Green School Awards aiming to promote school-led schemes to improve the environment,

including those directly related to air quality. As of February 2020, 30 schools in Medway were involved. The Green School Awards are organised by KM Charity Team and allow Medway Council to implement the AQCS within schools encouraging children to become involved in air quality monitoring project work where the impacts of air quality mitigation measures can be observed through the Clean Air for Schools initiative (https://www.medway.gov.uk/news/article/525/celebrating_medway_schools_at_the_km_green_school_awards);

- Promoting walking through the Council website. This includes regular Health Walks (25 guided routes at different locations per week), guided Nordic Walks and cycling groups. In October 2019, more than 20 schools took part in 'Walk to School Month' with 57,374 journeys completed on foot. In addition, Medway Council provide information on cycle groups and offer free bike riding lessons to promote cycling. In June 2019, Medway Council supported the Medway Big Ride Festival to encourage people to take up cycling; and
- Promotion of car share schemes. This was taken over by the Environmental Protection Team in 2019 and led to a slight net gain in uptake of the initiative. Marketing materials focus on the benefit to users and how they are making a difference in line with the AQCS (https://www.medway.gov.uk/downloads/download/122/medway_carshare).

Successful bidding for Central Government funds

In November 2019, Medway Council were awarded £170 million from Central Government after successfully bidding for the Housing Infrastructure Fund (HIF). Some of this money will be used to make improvements to roads in Medway, including the A228 and A229, to ease congestion, therefore improving air quality. In addition, a new relief road and improvements to rail connections are proposed for the Hoo Peninsular, which will reduce queuing traffic through the Four Elms Hill AQMA as housing volume is increased in the area over the next 20 years. Proposals also include improvements to green infrastructure and walking and cycling routes.

2.2.2 Focus for 2020

Medway Council will focus on the following measures over the course of the next reporting year:

- Completion of the Four Elms Hill Air Quality Action Plan;
- Continuing to follow and develop the AQCS;
- Bidding for various funds available from Central Government to implement additional measures to improve air quality;
- Development of the Kent and Medway Energy and Low Emissions Strategy to tackle poor air quality, energy and reduce carbon emissions in parallel; and
- Implementation of the Regional Freight Strategy in line with the Freight Action Plan, including HGV route optimisation and Sat-Nav review.

The principal challenges and barriers to implementation that Medway Council anticipates facing are securing funding and available staff resource within Medway Council.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Medway Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of Central Medway AQMA, Rainham AQMA and Four Elms Hill AQMA. Concentrations measured within Gillingham AQMA will be monitored over the coming year to determine whether this AQMA may be revoked.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	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	2017	Medway Council Integrated Transport and Kent County Council	n/a	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 https://www.kent.gov.uk/about-the-council/strategies-and-policies/transport-and-highways-policies/freight-action-plan. 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	2017	Medway Council Integrated Transport and Kent County Council	n/a	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	2017	Medway Council Integrated Transport and Kent County Council	n/a	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	Unknown	Medway Council Integrated Transport, DfT	n/a	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 AQMAs. Historic DfT data shows significant reductions in the number of HGVs in many areas of Medway, including in the Medway AQMAs. This however has been offset by increases in the numbers of other vehicles on Medway roads. In contrast, the number of HGV on the strategic M2 motorway have been	Ongoing	Relies on continued monitoring by DfT

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
									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	Unknown	Medway Council Integrated Transport	n/a	Completed or not	-	The Council does not have a formal Quality Bus Partnership(QBP) 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 QBP 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 2019.	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	Unknown	Medway Council Integrated Transport	External funding required for vehicle retrofit/renewal	Annual fleet status.	5%	A local bus operator, ASD, operates the following fleet in Medway: Euro 6- 15, Euro V- 19, Euro 4- 3 Euro 3- 12. 69% of the ASD fleet is now Euro 5 or better, up from just 38% as reported in the 2018 ASR. As of December 2019, the Arriva bus fleet consisted of: Euro 3- 33%, Euro 4- 9%, Euro 5- 45%, Euro 6 13%. 58% of the Arriva fleet was Euro 5 or better in 2019, up slightly from 55% as reported in the 2018 ASR. There are plans for Arriva to increase this to nearly two thirds of buses based at the Gillingham depot by replacing a number of Euro 3 vehicles with Euro 6. No data for 2019 has been provided by the other local bus operators.	Ongoing	Operator investment budgets. External funding is likely to be required to support the smaller bus operators in renewal/retrofitting of their vehicle fleets
7	Increase bus patronage	Promoting Travel Alternatives	Other	Unknown	Medway Council Integrated Transport	n/a	Annual bus patronage figures	-	Over the last year all bus operators in Medway have now moved over to contactless payment. This speeds up boarding and gives customers more options. Unfortunately, in line with national trends, bus patronage has continued to fall.	Ongoing	

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
									Medway are continuing with small scale schemes including bus stop accessibility improvements with raised kerbs, and clearways to help passengers and bus operators on bus routes in Wayfield, Rainham, and Cliffe Woods.		
8	Improve bus flow and reliability	Transport Planning and Infrastructure	Bus route improvements	Unknown	Medway Council Integrated Transport	Bus infrastructure improvements currently delivered through internal budgets.	Number of bus infrastructure improvements	-	Small scale schemes continued during 2019 with bus stop accessibility improvements with raised kerbs, and clearways to help passengers, and bus operators, on bus routes in Wayfield, Rainham, and Cliffe Woods.	Ongoing	Reliant on continued budget provision for improvements to be made.
9	Review taxi licensing conditions	Promoting Low Emission Transport	Taxi Licensing conditions	Unknown	Medway Council Licensing	External funding secured through DfT funded programmes.	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, however the Environmental Protection Team continued to explore sources of funding this important work during 2019 and successfully applied to the Energy Saving Trust for a fully funded taxi and private hire ULEV feasibility study, and this work is expected to be carried out during 2020. A review of Medway Taxi Licensing Policy is expected during 2020/21 and the feasibility study will explore potential licensing policy and conditions changes.	2021/22	Funding required for ULEV feasibility study.
10	Annual audit of taxi fleet	Promoting Low Emission Transport	Other	Unknown	Medway Council Licensing	External funding secured through DfT funded programmes.	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.	2022	Detailed fleet analysis required. External funding may be required to support drivers/companies to renew/retrofit vehicles, and provide supporting

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
											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	Unknown	Medway Council Integrated Transport	n/a	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 budget 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	Unknown	Medway Council Integrated Transport	n/a	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	Unknown	Medway Council Integrated Transport	n/a	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.

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14	Link ANPR vehicle class data to provide detailed source apportionment to support feasibility study worth	Traffic Management	Other	Unknown	Medway Council Integrated Transport	n/a	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 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.	Ongoing	Regular reporting of internal indicators required. Relies on continued monitoring by DfT.
15	Promoting and monitoring cycling and walking	Promoting Travel Alternatives	Promotion of cycling	Unknown	Medway Council Safer Journeys Team,	n/a	Medway mode of travel data	1%	Cycling and walking are actively promoted by Medway Council through their website, including routes available, groups to join and guided tours/ training. Cycling is monitored in line with the Medway Cycling Action Plan.	Ongoing	
16	Develop and continue walk or cycle to school scheme and events	Promoting Travel Alternatives	School Travel Plans	Unknown	Medway Council Safer Journeys Team	n/a	Number of schools participating	-	Medway Council have partnered with KM Charity Team to promote walking and cycling to school through a number of events.	Ongoing	
17	Develop and continue healthy walk scheme and cycle scheme	Promoting Travel Alternatives	Promotion of cycling	Unknown	Medway Council Supporting Healthy Weight Team	n/a	Number of individuals involved	-	Cycling and walking are actively promoted by Medway Council through their website, including routes available, groups to join and guided tours/ training. In addition, events are held to encourage uptake.	Ongoing	
18	Run internal Eco-driving courses	Vehicle Fleet Efficiency	Driver training and ECO driving aids	Unknown	Medway Council Business Development and Environmental Protection	May require external funding to progress this measure.	Number of drivers on training courses	<1%	No progress has been made during 2019.	Unknown	No budget available for this measure.
19	Engage with business to promote Eco-driving	Vehicle Fleet Efficiency	Driver training and ECO driving aids	Unknown	Medway Council Business Development	May require external funding to progress this measure.	Number of business engaged	-	No progress has been made during 2019. 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	Unknown	Medway Council Procurement	n/a	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	Ongoing	

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
									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 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. Fleet Reviews have been carried out by EST focusing on the Grey Fleet and the Commercial Vehicle Fleet (including refuse collection vehicles). A range of recommendations have been made and these are to be represented to senior managers in early 2020 to seek agreement to take these forward with the relevant departments. Whilst Medway's own fleet is still not inclusive of ULEV vehicle, tenders are composed to promote the use of such vehicles. The Council is also investigating carrying out an electric vehicle pool car pilot project.		
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	Unknown	Medway Council Procurement	n/a	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 current Procurement Strategy needs to be updated. This was expected to be carried out during 2019/20 but has been put on hold. Whilst greater consideration has been given to the utilisation of ULEV vehicles, no corporate decision has been made to weight these elements, meaning that whilst they are desirable, they are not mandatory. Whilst this will be addressed in the Procurement Strategy, a Social Value Policy is also being enacted which will propose the weighting of environmental impacts on future projects.	2019/20	

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
22	Develop and improve school travel plans	Promoting Travel Alternatives	School Travel Plans	Unknown	Medway Council Business Development Team	n/a	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	Unknown	Medway Council Business Development Team	n/a	Completed or not	-	No progress has been made during 2019. 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. No staff availability.
24	Develop work place travel plans	Promoting Travel Alternatives	Workplace Travel Planning	Unknown	Medway Council Business Development Team	n/a	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 a 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	Unknown	Medway Council Integrated Transport	Currently being delivered through internal budgets.	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 during 2018 and 2019, 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	Ongoing	No budget available for this measure.

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
									that users are automatically removed from the scheme if their email address is no longer active, however the number of users leaving has been offset by new user registrations. Further promotion of the car share scheme is expected during 2020.		
26	Review and rewrite relevant planning policies and develop a supplemental planning document to reflect this action plan and relevant and related corporate strategies	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Unknown	Medway Council Planning and Environmental Protection	n/a	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 be extracted for the Habitats Regulations Assessment (HRA) and Air Quality Assessment. A final STA report is anticipated late during 2020. 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. Local plan adoption is now anticipated in 2021.	2021	Requires implementation and recording of policy on decision notices.

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
27	Improve and then maintain awareness of the health and financial impacts of air pollution to all stakeholder groups; businesses, schools, public, vulnerable groups, members, and internal managers	Public Information	Other	Unknown	Medway Council	Currently being delivered through internal budgets.	Number of notifications and consultations carried out	-	The Air Quality Communication Strategy facilitates increasing public awareness of the impacts of poor air quality on health. Methods of effective communication to stakeholders specified in the AQCS are followed by Medway Council.	Ongoing	
28	Development of promotional material to support Eco-driving within businesses	Vehicle Fleet Efficiency	Other	Unknown	Medway Council Environmental Protection, Public Health and Communications	May require external funding to progress this measure.	Number of press releases, reports on websites, presentations delivered, workshops delivered and leaflets dropped	<1%	No progress has been made during 2019.	Unknown	
29	Develop an air quality communications strategy with public relations team	Public Information	Other	2018	Medway Council Communications and Environmental Protection	Delivered through internal budgets.	Completed or not	-	Complete. The Medway Air Quality Communication Strategy was launched in 2018. Details of activities for 2019 can be found in the supplementary information.	2018	
30	Set up AQAP Steering Group and book 6 monthly meetings with stakeholders	Policy Guidance and Development Control	Other policy	2016	Medway Council Environmental Protection	n/a	Completed or not	-	Complete. The Air Quality Steering Group continued to meet on a quarterly basis during 2019.	Ongoing	
31	Engage with business, internal members and managers as priority	Public Information	Via other mechanisms	Unknown	Medway Council Communications and Environmental Protection	n/a	Number of events and presentations where the AQAP has been represented	-	No progress to report during 2019.	Unknown	
32	Integrate, where appropriate, AQAP target into internal service plans	Policy Guidance and Development Control	Other policy	Unknown	Medway Council Performance Hub and Environmental Protection	n/a	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. No progress to report during 2019.	Ongoing	
33	Identify corporate policies and strategies where consultation of	Policy Guidance and Development Control	Other policy	Unknown	Medway Council Environmental Protection	n/a	Number identified	-	Ongoing input provided in to development of the new Local Plan. In April 2019, Full Council declared a climate emergency and committed to producing a rolling 5 year Climate	Ongoing	

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
	changes is requested and notify accountable department								Change action plan (to be reviewed annually). Estimated Actual Completion Date – End of 2020 A key focus of the Climate Change action plan will be a reduction in emissions from transport. This will serve to reduce air pollution from vehicles and by doing so improve air quality in Medway. See Supplementary Information.		
34	Develop business case for evaluation or quantification studies to take forward 2016-2017	Other	Other	Unknown	Medway Council Environmental Protection	External funding may be required on a case by case basis.	Completed or not	-	See above updates on EST fleet reviews and Taxi and Private Hire ULEV Feasibility Study.	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 AQOs. Medway undertook automatic (continuous) monitoring at two sites during 2019. 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 42 sites during 2019. 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.

During 2019, four additional passive monitoring locations were added (DT40, DT41, DT42, DT43) and DT36 was relocated to a replacement lamp post (renamed DT44).

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias[4], "annualisation" (where the data capture falls below 75%), and distance correction[5]. 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 AQO of 40µg/m^3. Note that the concentration data

[4] https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html
[5] Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

presented in Table A.3 represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2019 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the AQO 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 AQO in 2019. Measured concentrations were also below the annual mean AQO at

30 of the 42 NO_2 diffusion tube monitoring sites, increasing to 35 out of 42 sites when distance-corrected to consider locations of relative exposure.

Of the twelve sites at which an exceedance was measured in 2019, seven sites are located adjacent to roads covered by Central Medway AQMA (reducing to six sites when distance-corrected) and three sites are located within Four Elms Hill AQMA (one site when distance-corrected). Monitoring site DT20 is not located within an AQMA, however it is approximately 130 m further along the A2 London Road than the boundary of the Central Medway AQMA. Given that DT20 has exceeded the annual mean AQO for the past few years, this will be monitored further over the coming year. Only one site that exceeds the AQO (DT40) is located a significant distance from an AQMA (approximately 3.3 km to the west of Central Medway AQMA) with a monitored concentration of 43.4 µg/m^3, however when distance corrected to estimate the concentration at a location of relevant exposure, this is reduced to 36.2 µg/m^3. DT40 is located on the A228, a key road between the M20 and M2/A2, which is likely to be impacted by the Lower Thames Crossing. Monitoring will continue and may be expanded to more sites in this area.

Of the seven exceeding sites located adjacent to Central Medway AQMA, four sites (DT06, DT08, DT18 and DT28) experienced increases in annual mean concentrations (1.9, 2.9, 2.5 and 3.9 µg/m^3 change respectively) between 2018 and 2019, the remaining two sites (DT03 and DT19) experienced decreases in annual mean concentrations (2.8 and 1.6 µg/m^3 change, respectively). On 5th of September 2019 site 36 was removed due to the planned future removal of the lamppost it was attached to and the site was re-installed on a nearby

lamppost with a new reference (site 44). The annualised concentration at DT44 exceeded the 40 µg/m^3 annual mean AQO, whereas the annualised concentration at DT36 was below.

Of the three exceeding sites within Four Elms Hill AQMA (DT24, DT32, and DT33), DT24 and DT33 experienced increases in annual mean concentrations of 5.8 and 0.4 µg/m^3, respectively, when compared to 2018 concentrations, whereas DT32 experienced a decreased by 3.2 µg/m^3.

There were no measured exceedances of the 1-hour AQO in 2019 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 AQO were measured at two of the AQMAs declared within Medway (Medway Central and Four Elms Hill AQMAs). There were no exceedances of the AQO at Rainham or Gillingham AQMAs. There has only been one exceedance of the AQO at one of the three diffusion tubes located within the Gillingham AQMA in the past five years, however due to ongoing development at Chatham Docks this AQMA will be retained.

Both automatic monitoring sites show a weak overall trend of decreasing measured annual mean concentrations from 2015 to 2019 (see Figure A1.1). However, Chatham automatic monitoring site experienced an increase during 2019. This trend is also apparent in the measured concentrations at the collocated diffusion tube monitoring sites (bias adjusted and annualised).

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 AQOs in 2019, however the number of exceedances of the daily mean had increased when compared to previous years.

There is a weak trend of increasing concentrations at both the Chatham and Rochester automatic monitors between 2015 and 2018, with concentrations decreasing slightly in 2019.

The PM monitoring equipment at the Chatham site was changed from an FDMS TEOM to a BAM at the end of 2016, which may have affected results.

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.

There is a trend of increasing concentrations of $PM_{2.5}$ between 2015 and 2018 at the Chatham monitoring site, however concentrations decreased in 2019. As mentioned above, some of this change may have been attributable to the change in monitoring equipment in 2016. The Rochester Stoke monitoring site shows concentrations fluctuating between 8.9 µg/m^3 and 11.3 µg/m^3 in 2015 to 2019.

3.2.4 Sulphur Dioxide (SO_2)

Table A.8 in Appendix A compares the ratified continuous monitored SO_2 concentrations for 2019 with the AQO for SO_2. In 2019 there were no measured exceedances of the 15-minute mean, 1-hour mean or 24-hour mean AQO 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 (Easting)	Y OS Grid Ref (Northing)	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	68908	NO_2	YES	0	4.2	NO	2.2
DT08	Railway Street, Chatham	Roadside	575642	167779	NO_2	YES	0	5.5	NO	3.0
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	4.0
DT11	High Street, Chatham (Orbit Housing)	Roadside	576393	167495	NO_2	YES	0	3.1	NO	2.5
DT12	28 Frindsbury Road	Roadside	573865	169646	NO_2	YES	0	3.1	NO	2.1

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
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	2.0
DT21	88 Spire Way, Wainscott	Roadside	574999	170882	NO_2	YES	0	29	NO	2.2

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
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,	Roadside	574760	167892	NO_2	YES	6.1	2.9	NO	2.5

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
	New Road Avenue									
DT30	Lamp post NDK6 adjacent Tuition Centre, New Road Avenue/Manor Road junction	Roadside	575473	167837	NO_2	YES	0	3.1	NO	2.5
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	Roadside	573518	169176	NO_2	YES	8	1.5	NO	2.2

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
	Road, Strood									
DT36	Lamp post HKA8, High Street, Strood	Roadside	573573	169262	NO_2	YES	4.8	1.2	NO	2.0
DT37	Lamp post adjacent Former Churchills Pub, The Brook, Chatham	Roadside	575862	168104	NO_2	YES	2.4	2.4	NO	2.2
DT38	Lamp post adjacent The Brook/Queen Street junction	Roadside	576056	167835	NO_2	YES	N/A	3.7	NO	2.2
DT39	Lamp post adjacent Iceland, The Brook, Chatham	Roadside	576084	167762	NO_2	YES	N/A	3.9	NO	2.1
DT40	Lamp post adjacent 7 Rochester Road	Roadside	570615	166065	NO_2	NO	2.5	1.2	NO	1.9
DT41	3 Formby Terrace	Roadside	570281	164949	NO_2	NO	0	6.0	NO	1.9
DT42	Lamp post ASP3 adjacent Aspdin Close	Roadside	570276	165016	NO_2	NO	6.5	13.5	NO	2.0

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
DT43	13 Squires Close, Strood	Roadside	570713	169417	NO_2	NO	0	14.1	NO	2.0
DT44	Lamp post adjacent Strood Hub, High Street, Strood	Roadside	573590	169263	NO_2	YES	N/A	1.0	NO	2.0

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration (µg/m³) (3) (4)				
							2015	2016	2017	2018	2019
Chatham	577437	166993	Urban Centre	Automatic	98.9	98.9	23.5	25.7	25.4	23.4	24.4
Rochester Stoke	583158	176314	Rural	Automatic	94.8	94.8	13.0	13.3	14.7	13.0	12.3
DT01	581568	165952	Roadside	Diffusion Tube	100	100	**43.4**	**42.2**	**45.4**	37.3	39.3
DT02	573482	169282	Roadside	Diffusion Tube	100	100	42.0	47.0	43.0	43.8	30.8
DT03	573793	169164	Roadside	Diffusion Tube	100	100	**53.9**	**51.7**	**51.0**	**46.4**	**43.6**
DT04	576565	167336	Roadside	Diffusion Tube	100	100	36.8	38.6	37.9	32.5	33.8
DT05	577426	166506	Roadside	Diffusion Tube	100	100	33.2	33.0	34.2	30.3	30.3
DT06	574589	168087	Roadside	Diffusion Tube	100	100	**51**	**50.9**	**51**	**45.9**	**47.8**

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3) (4)				
							2015	2016	2017	2018	2019
DT07	573078	168908	Roadside	Diffusion Tube	100	100	36.9	39.4	38.8	35.9	34.6
DT08	575642	167779	Roadside	Diffusion Tube	91.7	91.7	39.7	39.3	38.8	37.6	**40.5**
DT09	577434	166993	Roadside	Diffusion Tube	100	100	27.7	25.6	25.5	22.8	24.5
DT10	575681	167691	Roadside	Diffusion Tube	83.3	83.3	32.6	34.0	32.4	31.0	32.5
DT11	576393	167495	Roadside	Diffusion Tube	91.7	91.7	36.3	35.6	35.7	32.2	32.7
DT12	573865	169646	Roadside	Diffusion Tube	91.7	91.7	36.3	36.6	35.5	33.6	33.2
DT13	583152	176305	Rural	Diffusion Tube	75	75	17.0	12.2	13.8	13.1	13.1
DT15	581709	165922	Roadside	Diffusion Tube	100	100	34.4	35.3	36.0	31.8	30.8

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3) (4)				
							2015	2016	2017	2018	2019
DT16	581843	165886	Roadside	Diffusion Tube	100	100	25.8	28.6	28.6	24.1	24.2
DT17	577768	166922	Roadside	Diffusion Tube	100	100	**45.0**	**43.5**	**45.3**	**40.6**	38.8
DT18	576508	167404	Roadside	Diffusion Tube	100	100	**45.4**	**46.3**	**48.0**	**40.4**	**42.9**
DT19	573329	169294	Roadside	Diffusion Tube	100	100	**49.0**	**47.4**	**48.0**	**43.7**	**42.1**
DT20	573168	169305	Roadside	Diffusion Tube	91.7	91.7	**46.0**	**48.5**	**51.0**	**47.2**	**43.3**
DT21	574999	170882	Roadside	Diffusion Tube	100	100	21.5	23.4	22.4	21.4	19.9
DT22	575488	171616	Roadside	Diffusion Tube	100	100	31.0	29.0	31.0	28.0	27.2
DT23	575044	171351	Roadside	Diffusion Tube	100	100	24.7	27.0	25.3	29.0	24.4

Medway Council

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3) (4)				
							2015	2016	2017	2018	2019
DT24	575948	171847	Kerbside	Diffusion Tube	100	100	**52.0**	**50.9**	**50.8**	**47.4**	**53.2**
DT25	577908	169285	Roadside	Diffusion Tube	83.3	83.3	37.6	36.5	**42.9**	37.9	35.8
DT26	578007	169262	Roadside	Diffusion Tube	100	100	25.8	33.6	28.1	27.9	24.4
DT 27	577889	169319	Roadside	Diffusion Tube	75	75	37.6	33.5	39.1	35.6	34.1
DT28	575737	167670	Roadside	Diffusion Tube	100	100	N/A	39.6	**41.9**	**40.5**	**44.4**
DT29	574760	167892	Roadside	Diffusion Tube	91.7	91.7	N/A	35.9	35.4	30.5	32.5
DT30	575473	167837	Roadside	Diffusion Tube	100	100	N/A	24.5	38.2	36.2	34.1
DT31	574788	164568	Roadside	Diffusion Tube	100	100	N/A	N/A	26.5	21.6	21.0

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3) (4)				
							2015	2016	2017	2018	2019
DT32	575903	171802	Roadside	Diffusion Tube	91.7	91.7	N/A	N/A	**47.5**	**46.3**	**43.1**
DT33	575971	171833	Roadside	Diffusion Tube	100	100	N/A	N/A	**43.5**	**41.6**	**42.0**
DT34	574499	168495	Roadside	Diffusion Tube	100	100	N/A	N/A	37.3	38.6	36.1
DT35	573518	169176	Roadside	Diffusion Tube	75	75	N/A	N/A	30.2	31.5	29.4
DT36	573573	169262	Roadside	Diffusion Tube	33.3	33.3	N/A	N/A	**45.3**	**47.1**	38.6
DT37	575862	168104	Roadside	Diffusion Tube	83.3	83.3	N/A	N/A	N/A	31.4	33.1
DT38	576056	167835	Roadside	Diffusion Tube	100	100	N/A	N/A	N/A	30.7	29.1
DT39	576084	167762	Roadside	Diffusion Tube	83.3	83.3	N/A	N/A	N/A	31.1	31.5

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3) (4)				
							2015	2016	2017	2018	2019
DT40	570615	166065	Roadside	Diffusion Tube	91.7	91.7	N/A	N/A	N/A	N/A	**43.4**
DT41	570281	164949	Roadside	Diffusion Tube	75	75	N/A	N/A	N/A	N/A	23.1
DT42	570276	165016	Roadside	Diffusion Tube	91.7	91.7	N/A	N/A	N/A	N/A	18.8
DT43	570713	169417	Roadside	Diffusion Tube	83.3	83.3	N/A	N/A	N/A	N/A	29.4
DT44	573590	169263	Roadside	Diffusion Tube	33.3	33.3	N/A	N/A	N/A	N/A	**48.3**

☒ **Diffusion tube data has been bias corrected**

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

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance adjustment**

Notes:

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

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

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

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

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(4) Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

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

Figure A.1 – Trends in Annual Mean NO_2 Concentrations

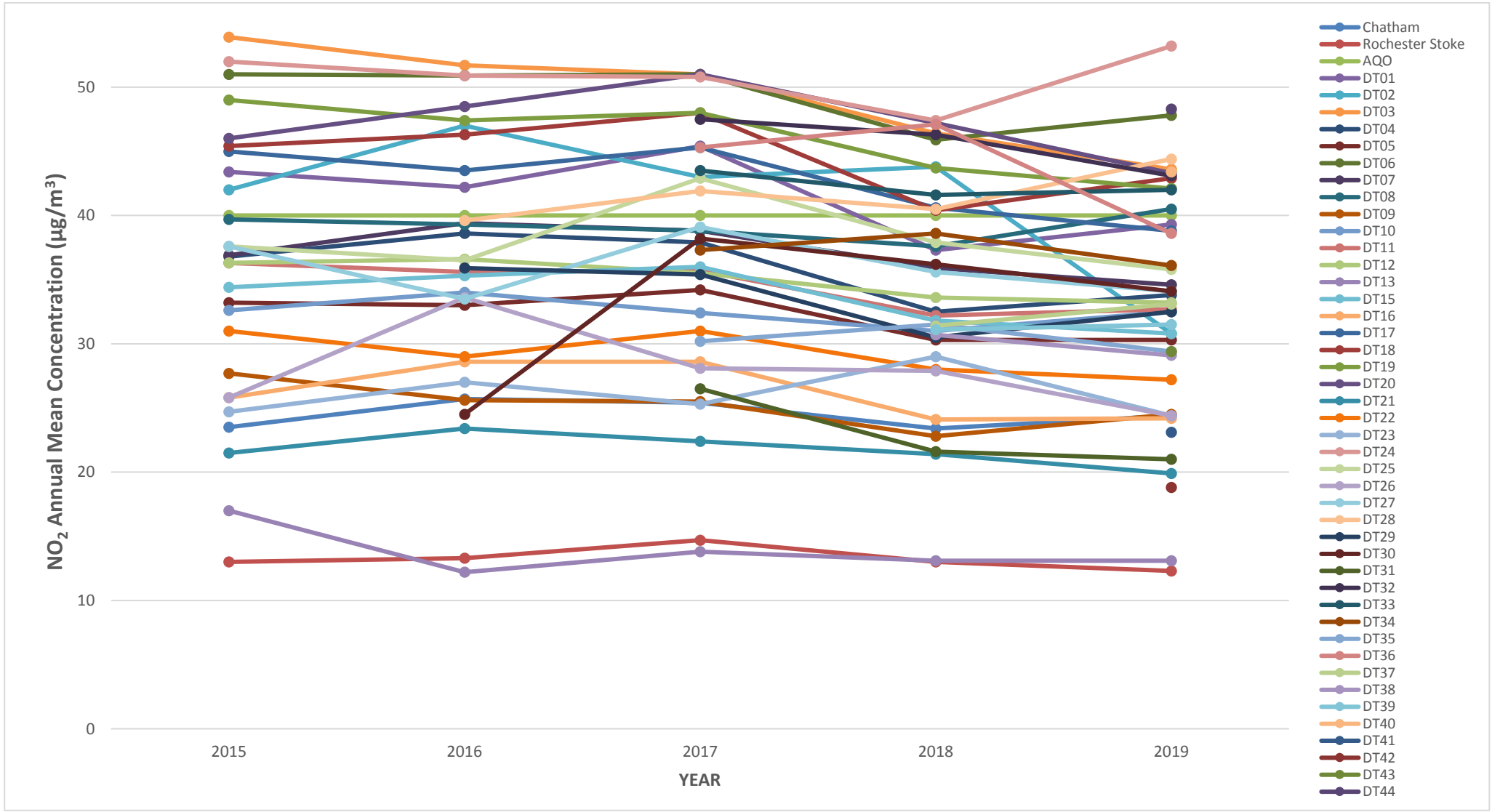

Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
							2015	2016	2017	2018	2019
Chatham	577437	166993	Urban Centre	Automatic	98.9	98.9	0	0	0	0	0
Rochester Stoke	583158	176314	Rural	Automatic	94.8	94.8	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.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (3)				
						2015	2016	2017	2018	2019
Chatham	577437	166993	Urban Centre	95.9	95.9	18.5	19.1	21.6	23.7	23.0
Rochester Stoke	583158	176314	Rural	99.5	99.5	14.6	15.8	15.8	17.4	15.0

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.

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

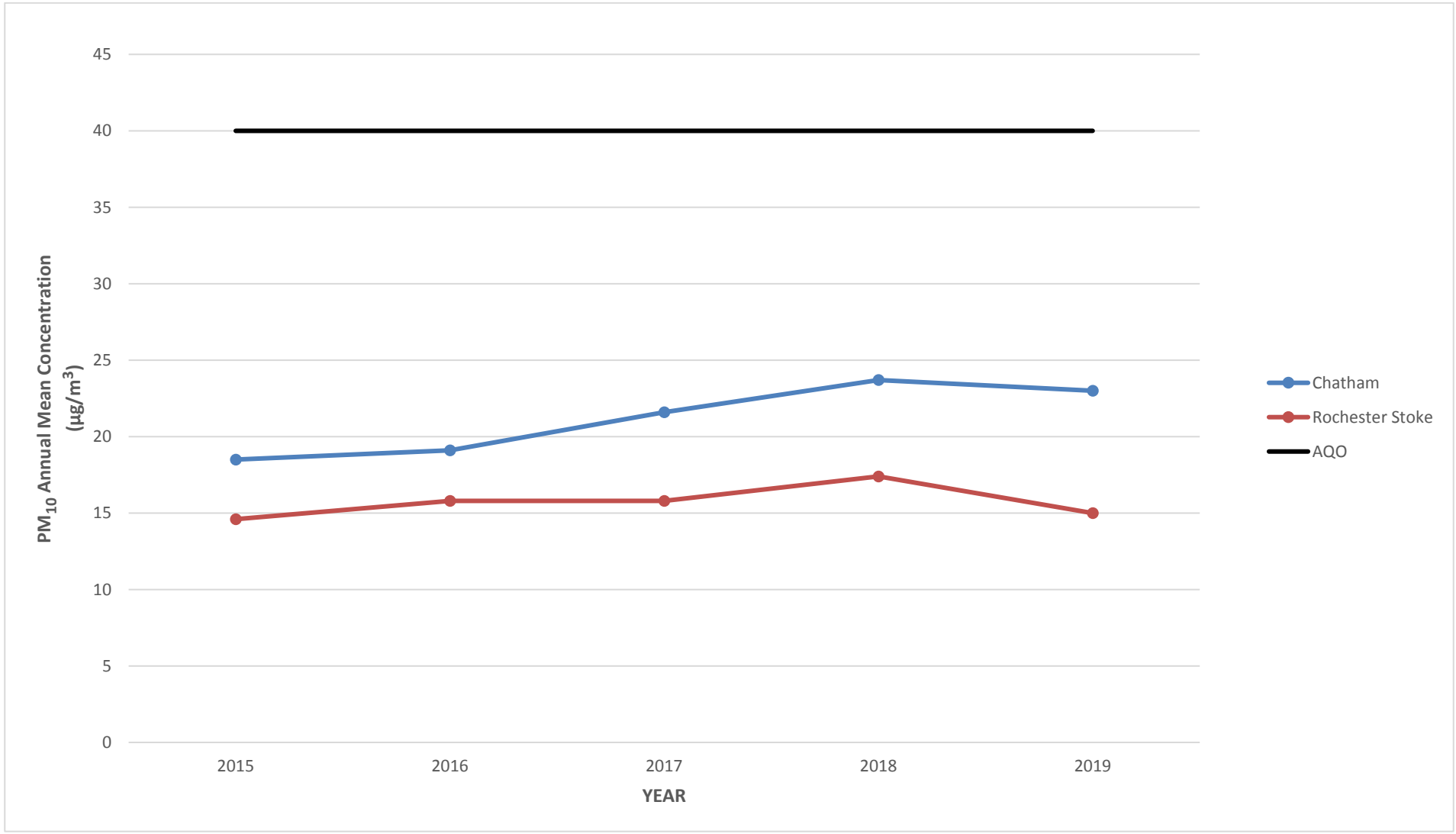

Table A.6 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	PM_{10} 24-Hour Means > 50µg/m³ (3)				
						2015	2016	2017	2018	2019
Chatham	577437	166993	Urban Centre	95.9	95.9	4	3	7	11	14
Rochester Stoke	583158	176314	Rural	99.5	99.5	2 (24)	4 (32)	4	0	10

Notes:

Exceedances of the PM_{10} 24-hour mean objective (50µg/m³ 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.3 – Trends in Number of 24-Hour Mean PM_{10} Results >50µg/m^3

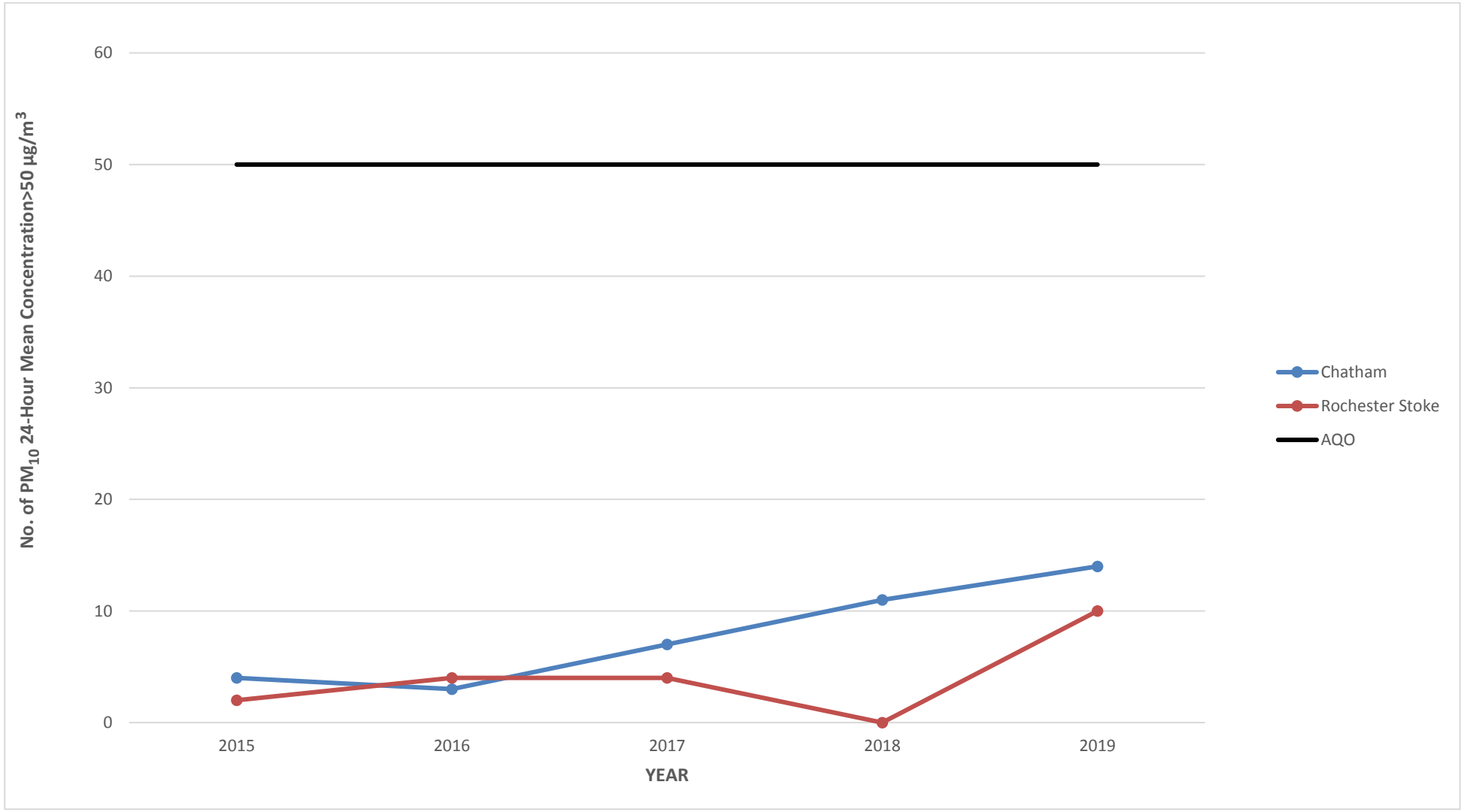

Table A.7 – $PM_{2.5}$ Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	$PM_{2.5}$ Annual Mean Concentration ($\mu g/m^3$) (3)				
						2015	2016	2017	2018	2019
Chatham	577437	166993	Urban Centre	89.0	89.0	11.8	11.5	14.1	15.2	13.7
Rochester Stoke	583158	176314	Rural	99.5	99.5	8.9	11.3	9.7	10.1	10.9

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.

Figure A.4 – Trends in Annual Mean $PM_{2.5}$ Concentrations

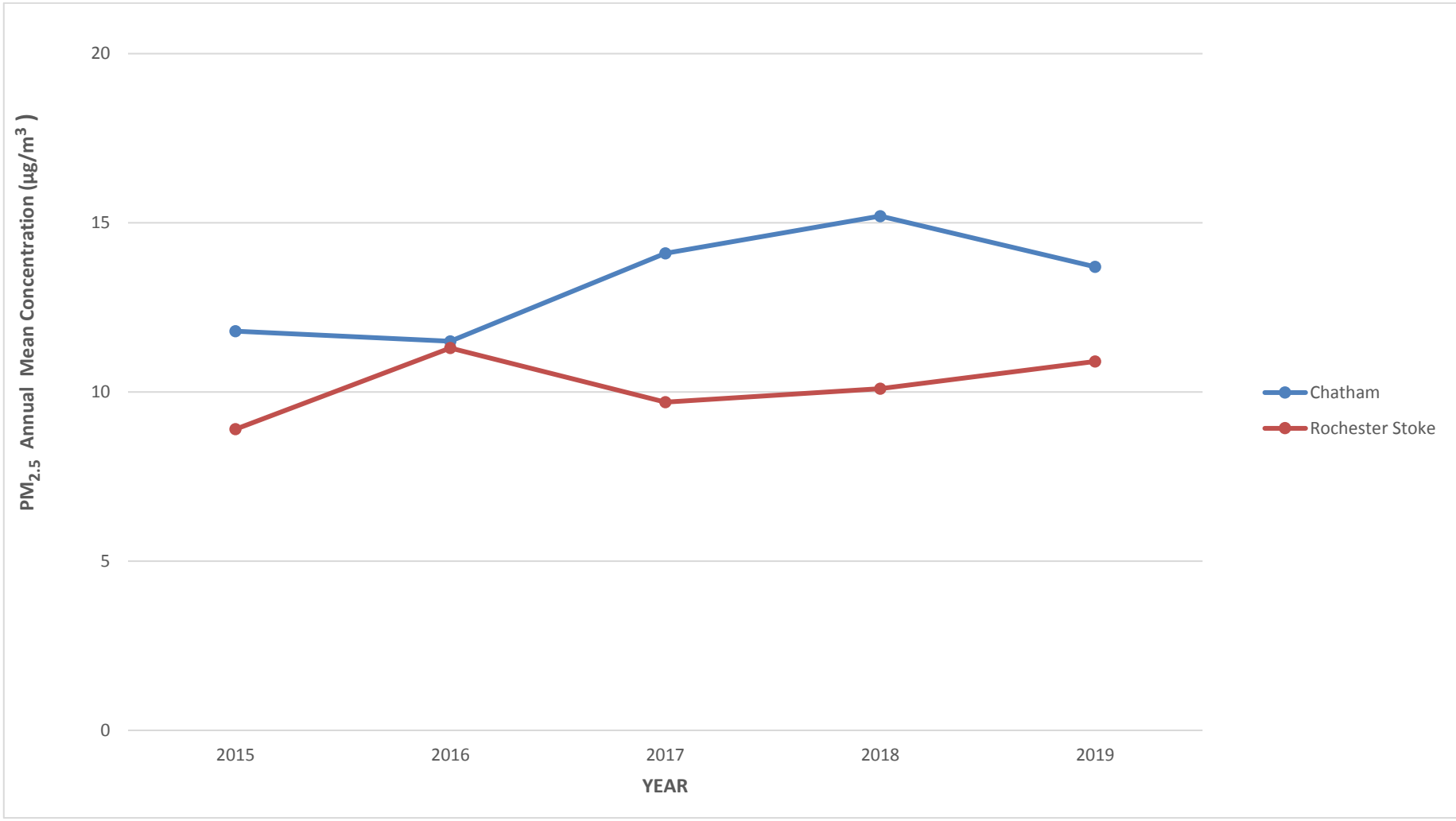

Table A.8 – SO_2 Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	Number of Exceedances 2019 (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	583158	176314	Rural	94.3	94.3	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 2019

Table B.1 - NO_2 Monthly Diffusion Tube Results - 2019

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m^3)														
															Annual Mean		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (factor) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
DT01	581568	165952	63.3	61.2	59.6	40.3	42.0	45.1	46.0	56.2	48.6	52.5	62.9	50.4	**52.3**	39.3	N/A
DT02	573482	169282	44.5	37.0	42.7	37.5	37.3	39.5	38.5	41.9	42.9	42.5	53.6	35.1	**41.1**	30.8	N/A
DT03	573793	169164	71.0	61.5	67.7	64.6	51.6	50.1	51.3	48.1	56.1	55.3	75.6	44.6	**58.1**	**43.6**	N/A
DT04	576565	167336	56.6	45.4	48.0	46.5	36.4	38.8	38.0	40.5	40.6	47.3	59.2	42.9	**45.0**	33.8	N/A
DT05	577426	166506	51.6	44.8	40.3	46.2	33.6	36.8	31.1	34.1	36.1	39.5	52.4	38.4	**40.4**	30.3	N/A
DT06	574589	168087	66.1	69.6	61.9	53.0	52.2	56.6	60.6	68.5	65.1	67.3	76.0	67.3	**63.7**	**47.8**	N/A
DT07	573078	168908	52.2	47.2	49.2	50.8	45.1	41.0	39.9	40.4	46.2	46.3	56.1	39.5	**46.2**	34.6	N/A
DT08	575642	167779	N/A	58.7	49.4	48.4	42.2	50.7	49.8	63.6	50.5	56.9	58.8	65.0	**54.0**	**40.5**	N/A
DT09	577434	166993	42.3	39.0	36.8	27.1	27.0	28.7	26.6	33.3	30.5	32.7	40.6	32.3	33.1	24.5	N/A
DT10	575681	167691	51.4	42.6	N/A	44.5	32.3	N/A	35.6	42.8	40.2	46.2	51.5	46.2	43.3	32.5	N/A
DT11	576393	167495	47.1	N/A	46.8	39.3	36.6	38.3	36.1	46.4	43.6	41.0	57.4	46.4	43.5	32.7	N/A
DT12	573865	169646	45.8	52.0	44.5	N/A	37.1	39.5	35.2	40.7	41.2	46.5	56.9	47.0	44.2	33.2	N/A
DT13	583152	176305	35.1	23.0	N/A	17.2	12.5	13.4	13.7	N/A	16.6	21.1	31.1	N/A	20.4	13.1	N/A
DT15	581709	165922	44.5	37.0	42.7	37.5	37.3	39.5	38.5	41.9	42.9	42.5	53.6	35.1	41.1	30.8	29.5
DT16	581843	165886	43.1	35.5	37.0	32.3	28.5	23.9	24.6	31.2	28.3	31.3	41.3	29.7	32.2	24.2	N/A

DT17	577768	166922	55.3	53.7	56.1	45.2	44.8	41.4	45.5	48.8	50.3	54.6	72.9	51.6	**51.7**	38.8	34.1
DT18	576508	167404	68.0	62.3	60.7	51.9	48.7	46.5	49.3	54.0	53.5	60.3	70.5	61.0	**57.2**	**42.9**	**40.4**
DT19	573329	169294	73.8	67.6	41.0	52.0	49.0	49.4	46.8	51.7	55.5	57.3	66.6	63.2	**56.2**	**42.1**	N/A
DT20	573168	169305	64.1	64.5	61.8	N/A	51.5	51.8	50.0	69.7	50.2	54.9	63.9	53.1	**57.8**	**43.3**	34.2
DT21	574999	170882	27.0	33.9	25.9	30.1	19.0	21.7	19.5	26.0	25.6	26.4	35.6	28.0	26.6	19.9	N/A
DT22	575488	171616	41.1	44.1	45.5	33.5	28.7	34.0	32.1	36.5	31.4	30.6	38.5	39.0	36.3	27.2	N/A
DT23	575044	171351	39.4	35.2	31.1	40.4	27.3	28.7	24.5	29.2	30.3	31.0	45.0	28.6	32.6	24.4	N/A
DT24	575948	171847	63.0	85.3	75.7	66.4	55.0	63.8	57.3	72.0	69.2	75.0	88.7	80.4	**71.0**	**53.2**	**42.5**
DT25	577908	169285	56.3	59.0	N/A	41.8	40.4	39.7	38.4	N/A	44.3	45.8	62.4	49.7	**47.8**	35.8	35.3
DT26	578007	169262	45.2	37.9	37.4	34.7	26.0	26.0	21.2	26.3	28.9	28.8	47.0	31.0	32.5	24.4	22.3
DT27	577880	169319	57.7	43.0	N/A	51.7	40.0	37.0	35.0	N/A	N/A	43.5	63.1	37.6	45.4	34.1	31.1
DT28	575737	167670	123.4	53.6	53.6	61.3	50.7	51.6	47.9	49.3	53.4	52.6	67.8	44.5	59.1	**44.4**	33.2
DT29	574760	167892	51.5	44.6	48.2	43.8	34.9	N/A	32.2	38.9	39.8	44.0	58.3	41.0	43.4	32.5	27.9
DT30	575473	167837	56.1	36.6	48.2	50.9	39.7	42.3	36.0	39.3	44.1	45.5	63.6	43.8	45.5	34.1	N/A
DT31	574788	164568	32.7	36.8	31.0	22.4	20.5	21.1	23.3	28.8	25.7	27.9	35.9	29.6	28.0	21.0	N/A
DT32	575903	171802	61.1	60.6	N/A	44.4	51.7	52.0	51.7	56.5	55.3	54.2	77.3	66.9	57.4	**43.1**	33.0
DT33	575971	171833	71.0	63.4	71.7	50.1	46.1	37.1	44.4	51.3	51.4	55.5	68.6	61.2	56.0	**42.0**	37.2
DT34	574499	168495	56.1	57.9	54.7	62.7	43.1	39.8	34.8	36.9	48.0	46.7	56.6	39.8	48.1	36.1	N/A
DT35	573518	169176	N/A	47.4	43.5	42.2	33.8	36.8	35.5	37.8	36.9	N/A	N/A	38.5	39.2	29.4	24.7
DT36	573573	169262	71.5	79.0	64.9	47.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**65.8**	38.6	31.6
DT37	575862	168104	47.1	46.1	47.2	47.2	37.2	N/A	N/A	38.4	41.8	40.7	55.7	40.1	**44.2**	33.1	31.2
DT38	576056	167835	58.6	45.8	39.0	35.2	28.4	31.7	27.8	34.4	36.7	37.4	50.3	40.1	38.8	29.1	N/A
DT39	576084	167762	55.6	44.5	44.0	34.8	34.7	32.4	N/A	37.3	39.5	N/A	55.8	41.8	**42.0**	31.5	N/A
DT40	570615	166065	N/A	67.6	64.8	55.6	48.9	50.7	52.4	51.5	42.8	59.5	79.2	63.1	**57.8**	**43.4**	36.2
DT41	570281	164949	N/A	38.9	N/A	30.1	25.5	25.2	26.6	30.5	28.8	32.9	39.0	N/A	30.8	23.1	N/A
DT42	570276	165016	N/A	31.6	26.2	31.3	18.4	20.6	16.9	20.0	21.8	26.0	36.6	25.8	25.0	18.8	17.8

DT43	570713	169417	N/A	N/A	44.9	33.5	32.1	32.3	35.2	42.4	37.0	40.7	55.3	38.4	39.2	29.4	N/A
DT44	573590	169263	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	59.0	61.8	71.3	69.2	**65.3**	**48.3**	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 in the final column**

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 2019

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/19/3012	245 Canterbury Street, Gillingham, ME7 5XE	Air quality mitigation condition recommended.
MC/19/3129	Land South of Stoke Road, Hoo St Werburgh	Air quality mitigation condition recommended.
MC/19/2799	The Britannia, 376 HighStreet, Rochester, ME1 1DJ	Air quality mitigation condition recommended.
MC/19/0298	76 Station Road, Rainham, ME8 7PJ Rochester Medway ME3 8NL	Air quality mitigation condition recommended.
MC/19/0029	4 London Road, Strood, Rochester, Kent ME2 3HT	Refusal recommended.
MC/19/3126	24 Gun Lane, Strood, Kent	Air quality mitigation condition recommended.
MC/19/1002	42 Chattenden Lane, Chattenden Rochester Medway ME3 8NL	Air quality mitigation condition recommended.
MC/19/1967	35 Rainham Road Gillingham Medway ME7 5LS	Air quality mitigation condition recommended.
MC/19/2496	Ist Flr 2A Luton Road Luton Chatham Medway ME4 5AA	Air quality mitigation condition recommended.
MC/19/2709	St Bartholomews Hospital New Road Rochester Medway ME1 1DS	Refusal recommended.
MC/19/2532	The Maltings Rainham Gillingham Medway	Air quality mitigation condition recommended.
MC/19/3158	Formby Road Halling Rochester Medway	Air quality mitigation condition recommended.

MC/19/0797	High Street Rainham Gillingham Medway	Air quality mitigation condition recommended.
MC/19/0951	The Tug and Shovel 65 North Street Strood Rochester Medway ME2 4SW	Air quality mitigation condition recommended.
MC/19/1044	Fenn House Farm Fenn Street St Mary Hoo Rochester Medway ME3 8QT	Air quality mitigation condition recommended.
MC/19/1596	233 Frindsbury Hill Wainscott Rochester Medway ME2 4JS	Air quality mitigation condition recommended.
MC/19/1648	63A High Street Chatham Medway ME4 4EE	Air quality mitigation condition recommended.
MC/19/1720	The Windmill Ratcliffe Highway Hoo St Werburgh Rochester Medway ME3 8QB	Air quality mitigation condition recommended.
MC/19/1859	Durland House 160 High Street Rainham Gillingham Medway ME8 8AT	Air quality mitigation condition recommended.
MC/19/2814	Formby Road Halling Rochester Medway	Air quality mitigation condition recommended.
MC/19/2949	272-274 Luton Road Luton Chatham Medway ME4 5BU	Air quality mitigation condition recommended.
MC/19/3009	Chatham Hill Luton Chatham Medway	Air quality mitigation condition recommended.
MC/19/0188	Orchard Kennels, Meresborough Road, Rainham	Refusal recommended.
MC/19/0299	Land at Thamesport, Grain Road, Isle of Grain	Air quality mitigation condition recommended.
MC/19/0573	3 New Road, Chatham	Air quality mitigation condition recommended.
MC/19/0616	61 High Street, Chatham	Air quality mitigation condition recommended.
MC/19/1566	Land Off Pump Lane, Rainham	Refusal recommended.
MC/19/1748	Plot 1, St.Anthony's Way, Medway City Estate	Air quality mitigation condition recommended.
MC/19/1964	249 London Road, Rainham	Air quality mitigation condition recommended.
MC/19/0765	Land at East Hill, Chatham	Refusal recommended.
MC/19/0336	Gibraltar Farm, Ham Lane, Hempstead, Gillingham	Air quality mitigation condition recommended.
MC/19/0787	27 Cuxton Road, Strood	Air quality mitigation condition recommended.
MC/19/0994	Land Adjacent To Balancing Pond, St.Andrew's Park, Halling	Refusal recommended.
MC/19/2211	Former Tug And Shovel PH, 65 North Street, Strood	Air quality mitigation condition recommended.
MC/19/3328	Land at Hillcrest, Hoo	Air quality mitigation condition recommended.

There were no changed or new sources of the following types in 2019:

- 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	33.1	24.4	0.74
Rochester Stoke	20.4	12.3	0.64

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 02/2020) was used to obtain an overall adjustment factor of 0.75 for 2019. 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 (0.75) 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.

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 0.74 and 0.64 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 DT36 and DT44 have been annualised using 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 2019, 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 - DT36 Annualisation Factor Calculation

2019 Month	Exposure Days	Raw Diffusion Tube Mean NO_2 Conc. (µg/m^3)	Automatic Mean NO_2 Conc. (µg/m^3) when Diffusion Tube Data is Available			
		DT 36	Canterbury	London Bexley	Rochester Stoke	Thurrock
January	31	71.5	19.4	33.4	20.1	36.4
February	28	79.0	16.8	34.6	19.5	27.3
March	31	64.9	11.3	23.1	10.8	23.0
April	30	47.6	17.0	28.3	13.1	23.2
May	31		10.2	19.0	9.4	19.6
June	30		8.6	13.1	8.0	15.5
July	31		7.6	14.1	8.5	17.9
August	31		8.4	15.4	6.2	18.4
September	30		8.5	16.6	9.4	21.1
October	31		10.1	20.6	11.6	22.6
November	30		14.2	28.5	16.3	29.4
December	31		13.0	24.1	15.0	26.3
PERIOD MEAN		65.8	*16.1*	*29.8*	*15.9*	*27.5*
ANNUAL MEAN:			**12.1**	**22.6**	**12.3**	**23.4**
ANNUALISATION FACTOR:			**0.749**	**0.756**	**0.775**	**0.851**

Table C.4 - DT44 Annualisation Factor Calculation

2019 Month	Exposure Days	Raw Diffusion Tube Mean NO_2 Conc. (µg/m^3)	Automatic Mean NO_2 Conc. (µg/m3) when Diffusion Tube Data is Available			
		DT 44	Canterbury	London Bexley	Rochester Stoke	Thurrock
January	31		19.4	33.4	20.1	36.4
February	28		16.8	34.6	19.5	27.3
March	31		11.3	23.1	10.8	23.0
April	30		17.0	28.3	13.1	23.2
May	31		10.2	19.0	9.4	19.6
June	30		8.6	13.1	8.0	15.5
July	31		7.6	14.1	8.5	17.9
August	31		8.4	15.4	6.2	18.4
September	30	59.0	8.5	16.6	9.4	21.1
October	31	61.8	10.1	20.6	11.6	22.6
November	30	71.3	14.2	28.5	16.3	29.4
December	31	69.2	*13.0*	*24.1*	*15.0*	*26.3*
PERIOD MEAN		65.3	*16.1*	*29.8*	*15.9*	*27.5*
ANNUAL MEAN:			**11.4**	**22.4**	**13.1**	**24.8**
ANNUALISATION FACTOR:			**1.056**	**1.005**	**0.943**	**0.942**

Table C.5 - Average Annualisation Factors

DT36	DT44
0.783	0.986

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 2019 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 AQO 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 (µg/m^3), determined using Defra's background maps; and
- the measured annual mean nitrogen dioxide concentration at the site (µg/m^3)

Table C.6 details the parameters used to derive distance corrected concentrations at the nearest relevant receptors. The "NO2 fall-off with distance" spreadsheet version 4.2 developed by Bureau Veritas and available on the LAQM website[6] was used.

Table C.6: Distance correction to predict concentrations at locations of relevant exposure

Site ID	Distance (m)		NO_2 Annual Mean Concentration (µg/m^3)		
	Monitoring Site to Kerb	Receptor to Kerb	Background	Monitored at Site	Predicted at Receptor
DT15	2.4	3.4	15.0	30.8	29.5
DT17	1.9	4.7	16.5	38.8	34.1
DT18	1.8	2.8	17.9	42.9	**40.4**
DT20	1.7	8.4	17.9	43.3	34.2
DT24	0.5	2.7	17.2	53.2	**42.5**
DT25	3.3	3.7	20.2	35.8	35.3
DT26	2.6	9.4	17.8	24.4	22.3
DT27	3.8	8.4	20.2	34.1	31.1
DT28	1.0	7.4	16.7	44.4	33.2
DT29	2.9	9.0	16.7	32.5	27.9
DT32	1.9	10.3	17.2	43.1	33.0
DT33	1.8	4.2	17.2	42.0	37.2
DT35	1.5	9.5	17.9	29.4	24.7
DT36	1.2	6.0	17.9	38.6	31.6
DT37	2.4	4.8	21.8	33.1	31.2
DT40	1.2	3.7	12.7	43.4	36.2
DT42	13.5	20.0	12.8	18.8	17.8

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

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

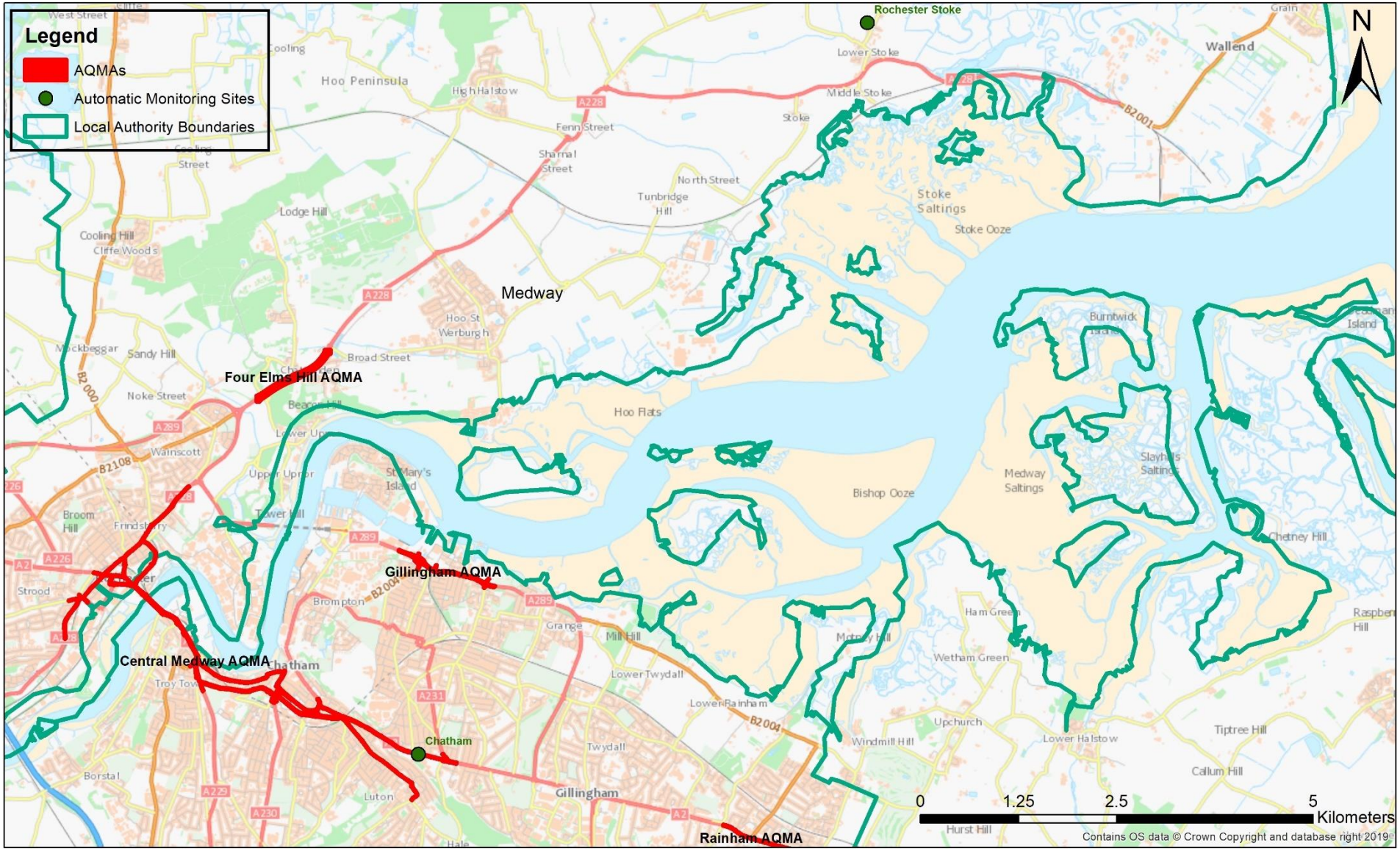

Figure D.1 – Map of Automatic Monitoring Sites and AQMA Locations within Medway

Figure D.2 – Location of Monitoring Sites within Central Medway AQMA and Gillingham AQMA

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

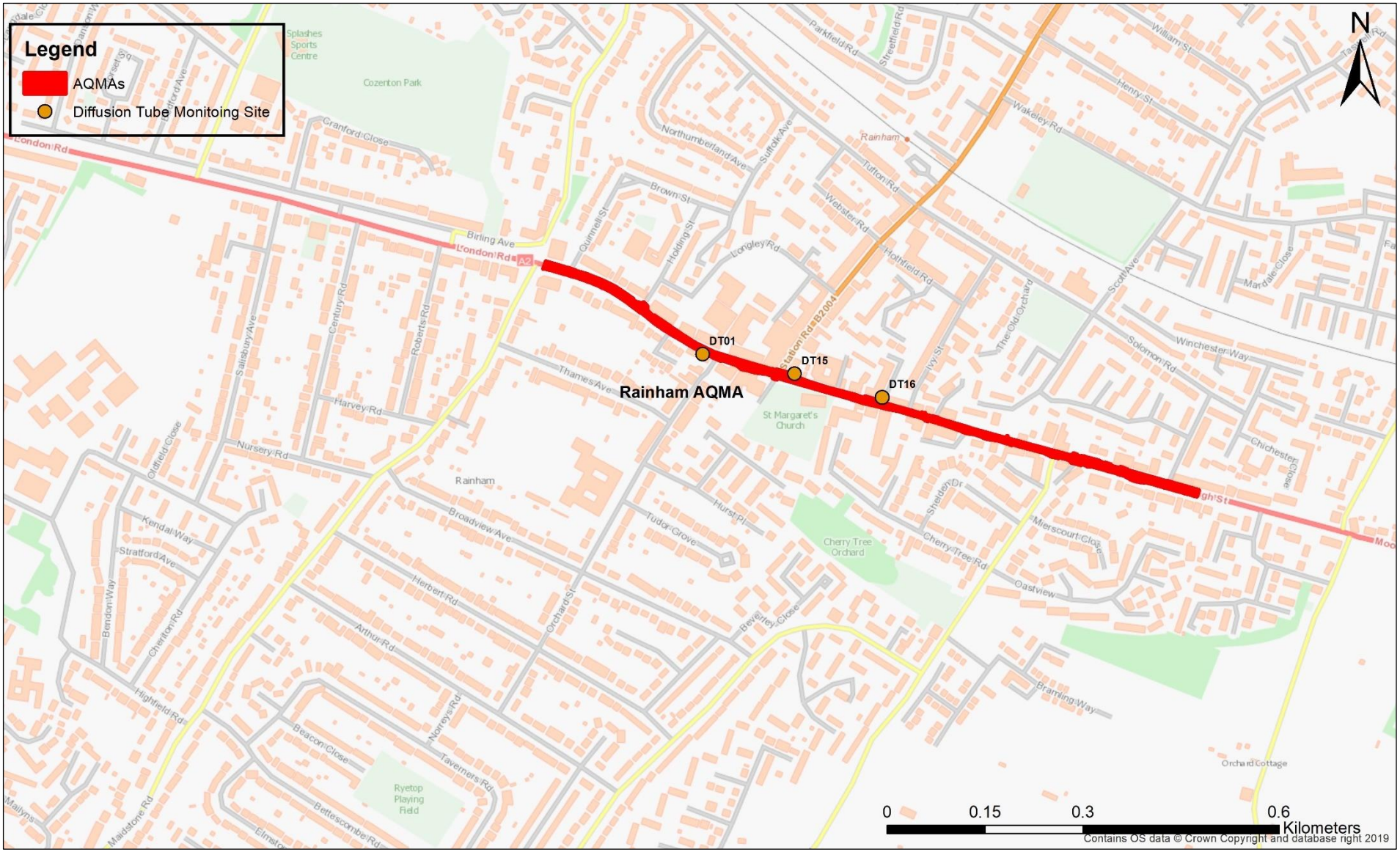

Figure D.4 – Location of Monitoring Sites within Rainham AQMA

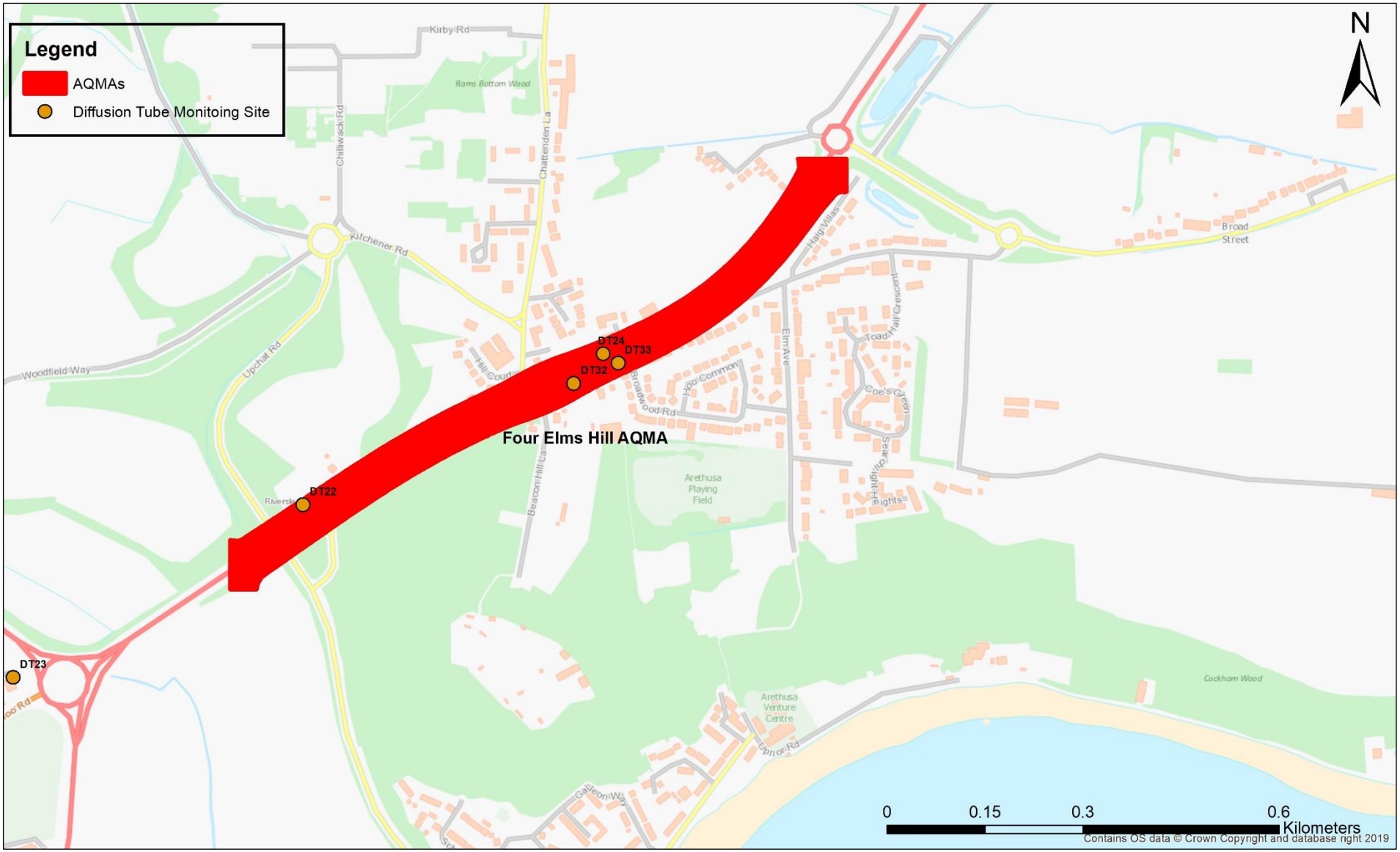

Figure D.4 – Location of Monitoring Sites within Four Elms Hill AQMA

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[7]	
	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

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

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HMSO. (1995). Environment Act.

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