



Dover District Council Annual Status Report 2021

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2021 Air Quality Annual Status Report (ASR)

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

Date: September 2021

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Executive Summary: Air Quality in Our Area

Air Quality in Dover District Council

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

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages³, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁴.

Dover is “the gateway to England” and its location at the narrowest crossing point in the Channel has always given it great significance for both trade and military activities.

Dover is the district’s principal town, the major employment centre, an international gateway and a transport hub. In addition to Dover, Deal and Sandwich are the other main towns within the district.

The main sources of pollutant emissions within Dover are linked with port activities; regular cross-channel ships and large volumes of road traffic arising as a result of associated transport of good along the A2 and A20 entering and leaving the town.

Dover District Council (the Council) has an adopted Core Strategy (CS) which includes ambitious plans to regenerate Dover and other areas of the district and has an adopted Land Allocations Local Plan (LALP). The Council is currently in the process of preparing a new Local Plan which will replace the Adopted CS, LALP and ‘saved’ 2002 Local Plan Policies. Air quality will be one of a number of key considerations that will need to be taken

¹ Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

² Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

³ Defra. Air quality appraisal: damage cost guidance, July 2020

⁴ Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

into account as part of the development, consultation, adoption and implementation of the new Local Plan.

There are currently two Air Quality Management Areas (AQMAs) declared within the district. Both have been designated due to exceedances of the annual mean Air Quality Strategy (AQS) objective for nitrogen dioxide (NO₂), with the elevated concentrations caused primarily by road traffic emissions. These are:

- A20 AQMA, declared in 2004 (and amended in 2007 and 2009); and
- High Street/Ladywell AQMA, declared in 2007.

In 2018, a dispersion modelling exercise was carried out for both AQMAs to establish whether any changes to the extent of AQMA boundary could be made. The results concluded that exceedances of the annual mean NO₂ objective were still evident within both AQMAs. In addition, there were also areas outside of the existing AQMAs where exceedances were predicted; these include the areas along High Street towards Victoria Crescent and east towards Ladywell, and properties along Marine Parade.

Following the modelling report, it was recommended that the AQMAs remain as currently declared until more monitoring data was made available to support the predicted exceedances. A new Air Quality Action Plan (AQAP) is currently under development to be released in 2021. A further dispersion modelling assessment along the main roads in Dover and both AQMAs is being undertaken using the latest monitoring data, alongside an updated source apportionment study to identify the extent to which different key sources are contributing to air quality exceedances in the area. The outcomes of this assessment will help ascertain whether any amendments to the existing AQMA will be required.

There were no exceedances of the annual mean NO₂ objective in 2020. All sites excluding site DV30 recorded annual mean concentrations below 36 µg/m³ (not within 10% of the AQS objective). Site DV30 is adjacent to 19B High Street Dover, slightly to the north of the High Street/ Ladywell AQMA boundary. Exceedances of the annual mean NO₂ AQS objective have been recorded at DV30 since its installation in 2017 and 2020 is the first year the site hasn't exceeded the AQS objective.

When compared to 2019 concentrations, results of the monitoring for 2020 show a decrease in annual mean concentrations at all diffusion tube monitoring sites. The maximum reduction of 9.4 µg/m³ was recorded at DV10 (Townwall Street, Dover), with an annual mean concentration of 26.5 µg/m³ in 2020.

During 2020, no changes have been made to the diffusion tube network. In 2019, following a review of the Council's monitoring commitments and to address concerns of possible further pollution hotspots, three new diffusion tube sites were added. DV34 (New Street) and DV35 (42 High Street) were installed in June 2019 in Sandwich following concerns that narrow streets in Sandwich result in elevated levels of pollution. DV36 (Sholden Primary School) was installed in Sholden in October 2019 following concerns surrounding elevated pollution levels in an area where children are present. To date the monitoring results have reported NO₂ concentrations well below the AQS objective in these areas.

There have been no exceedances of the PM₁₀ AQS objective within the past five years at the single PM₁₀ monitoring location on Townwall Street (Dover Centre). There is currently no monitoring undertaken for PM_{2.5} within the District. However, the annual mean PM_{2.5} concentration at Dover Centre in 2020 was estimated in accordance with the methodology presented in LAQM.TG(16) to be 15.9 µg/m³.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy⁵ sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero⁶ sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of AQMAs are designated due to elevated concentrations heavily influenced by transport emissions.

A package of measures to improve air pollution within the district are to be identified in the updated AQAP that is due to be published this year. A draft AQAP was previously developed, although a decision was made in early 2018 to put the AQAP on hold due to the Council's need to focus on contingency planning for the UK's departure from the European Union as Dover is anticipated to be a key area of impact. The AQAP has been

⁵ Defra. Clean Air Strategy, 2019

⁶ DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

further delayed due to the Covid-19 pandemic, however works are now underway for it to be published later in 2021. Dispersion modelling with a source apportionment study will allow identification of the key areas of exceedance and the sources that are contributing to the air quality exceedances in the area.

Additionally, the Council are in the process of preparing a new Local Plan to assess how future development will impact air quality within the area, with particular attention paid to any scenarios that will negatively impact air quality in sensitive areas, such as within AQMAs or within any of the internationally designated sites within the district. The Council welcomed the public consultation on the draft Dover District Local Plan (Regulation 18) for a period of eight weeks, which ended in March 2021. The current timetable is for the Local Plan to be adopted in February 2023⁷.

The Council's fleet is being updated to include a proportion of electric vehicles (EVs). Five EV chargers were installed in the Council's car park during 2019 and in 2020, the Council applied for OLEV grant funding to increase the number of EV charging points across the district.

Dover faces a number of challenges to manage traffic associated with the Port, discussions are currently taking place with Central Government and Highways England to manage expected major increase in housing stock in south east England coupled with proposals for the third Thames crossing.

Conclusions and Priorities

During 2020, there were no exceedances of the relevant annual mean objective for both NO₂ or PM₁₀ across Dover for the first time since the AQMAs were declared. The concentrations at all sites across the NO₂ diffusion tube network decreased compared to 2019 concentrations likely due to a decrease in road traffic as a result of Covid-19 restrictions. Site DV30 was the only site that had an annual mean concentration within 10% of the AQS objective. All other sites had annual mean concentrations below 36 µg/m³.

There have been no exceedances of the PM₁₀ annual mean objective within the past five years.

⁷ <https://dover-consult.objective.co.uk/kse/event/35956/section/s1594932399943#s1594932399943>

The AQAP based upon detailed modelling of the AQMAs and taking into consideration Defra's proposals for 'tackling roadside nitrogen dioxide concentrations' is currently being updated. This will be placed in the context of identified significant developments in Dover, including re-development of the Western Docks through the Dover Western Docks Revival Project and work on the Dover Waterfront area. The potential impact upon air quality from these developments will be appraised through the Strategic Environmental Assessment approach and through requests for air quality assessments under the planning and development regime. The impacts of the Covid-19 pandemic upon the air quality and traffic within Dover have caused delays in the development of the AQAP, nevertheless the Council aims to complete this by the end of 2021.

The impacts of Brexit upon the port will continue to be a key influence in the coming years and any decisions made will be assessed in terms of the air quality impacts within Dover.

Local Engagement and How to get Involved

There are several ways that everyone can get involved to help improve air quality in Dover. Due to road traffic being the main source of pollutant emissions within the district you can look to move to more sustainable methods of transport. For example: looking to minimise unnecessary car journeys by choosing to walk, cycle, car-share or use public transport instead.

For further information regarding air quality the following links are provided:

- To download DDC's air quality monitoring data, you can visit:
<https://kentair.org.uk/data> ;
- To report a nuisance or pollution problem, please fill in the form located here:
<https://forms.dover.gov.uk/nuisance> ; and
- All other general enquiries should be made by either ringing 01304 872428 or emailing DDC.EnvProtection@DOVER.GOV.UK. You can also visit
<https://www.dover.gov.uk/Environment/Environmental-Health/Air-Quality/Air-%20Quality-Monitoring.aspx%20for%20further%20information> .

Table of Contents

Executive Summary: Air Quality in Our Area	i
Air Quality in Dover District Council	i
Actions to Improve Air Quality	iii
Conclusions and Priorities	iv
Local Engagement and How to get Involved.....	v
1 Local Air Quality Management.....	1
2 Actions to Improve Air Quality.....	2
Air Quality Management Areas	2
Progress and Impact of Measures to address Air Quality in Dover District Council.....	4
PM _{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations	10
3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance	12
Summary of Monitoring Undertaken	12
3.1.1 Automatic Monitoring Sites	12
3.1.2 Non-Automatic Monitoring Sites	12
Individual Pollutants	12
3.1.3 Nitrogen Dioxide (NO ₂)	13
3.1.4 Particulate Matter (PM ₁₀)	14
3.1.5 Particulate Matter (PM _{2.5}).....	14
3.1.6 Sulphur Dioxide (SO ₂).....	14
Appendix A: Monitoring Results	16
Appendix B: Full Monthly Diffusion Tube Results for 2020	28
Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	30
New or Changed Sources Identified Within Dover District Council During 2020	30
Additional Air Quality Works Undertaken by Dover District Council During 2020	30
QA/QC of Diffusion Tube Monitoring	30
Diffusion Tube Annualisation	31
Diffusion Tube Bias Adjustment Factors	31
NO ₂ Fall-off with Distance from the Road.....	32
QA/QC of Automatic Monitoring	33
PM ₁₀ Monitoring Adjustment	33
Automatic Monitoring Annualisation	33
Appendix D: Maps of Monitoring Locations and AQMAs.....	35
Appendix E: Summary of Air Quality Objectives in England.....	41
Appendix F: Impact of COVID-19 upon LAQM	42
Impacts of COVID-19 on Air Quality within Dover District Council	43
Opportunities Presented by COVID-19 upon LAQM within Dover District Council	43

Challenges and Constraints Imposed by COVID-19 upon LAQM within Dover District Council .43

Glossary of Terms45

References46

Figures

Figure A.1 – Trends in Annual Mean NO ₂ Concentrations at all Monitoring Locations outside AQMAs	21
Figure A.2 – Trends in Annual Mean NO ₂ Concentrations at Monitoring Locations in the A20 AQMA	22
Figure A.3 – Trends in Annual Mean NO ₂ Concentrations at the Monitoring Location in the High Street AQMA	23
Figure A.5 – Trends in Annual Mean PM ₁₀ Concentrations at Dover Centre	25
Figure A.6 – Trends in Number of 24-Hour Mean PM ₁₀ Results > 50 µg/m ³	27
Figure C.1 – Bias Adjustment Factor	32
Figure D.1 – Monitoring Locations: A20 AQMA West	35
Figure D.1 - Monitoring Locations: A20 AQMA East	36
Figure D.2 - Monitoring Locations: High Street AQMA	37
Figure D.3 - Monitoring Locations: Buckland Valley	38
Figure D.4 - Monitoring Locations: Sandwich	39
Figure D.5 - Monitoring Locations: Sholden	40

Tables

Table 2.1 – Declared Air Quality Management Areas	3
Table 2.2 – Progress on Measures to Improve Air Quality	6
Table A.1 – Details of Automatic Monitoring Sites	16
Table A.2 – Details of Non-Automatic Monitoring Sites	17
Table A.3 – Annual Mean NO ₂ Monitoring Results: Non-Automatic Monitoring (µg/m ³)	19
Table A.4 – Annual Mean PM ₁₀ Monitoring Results (µg/m ³)	24
Table A.5 – 24-Hour Mean PM ₁₀ Monitoring Results, Number of PM ₁₀ 24-Hour Means > 50 µg/m ³	26
Table B.1 – NO ₂ 2020 Diffusion Tube Results (µg/m ³)	28
Table C.2 – Bias Adjustment Factor	32
Table C.3 – Annualisation Summary (concentrations presented in µg/m ³)	34
Figure D.1 – Monitoring Locations: A20 AQMA West	35
Figure D.1 - Monitoring Locations: A20 AQMA East	36
Figure D.2 - Monitoring Locations: High Street AQMA	37
Figure D.3 - Monitoring Locations: Buckland Valley	38
Figure D.4 - Monitoring Locations: Sandwich	39

Figure D.5 - Monitoring Locations: Sholden.....	40
Table E.1 – Air Quality Objectives in England	41
Table F 1 – Impact Matrix	44

1 Local Air Quality Management

This report provides an overview of air quality in Dover District Council during 2020. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

Air Quality Management Areas

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

A summary of AQMA declared by Dover District Council can be found in Table 2.1. The table presents a description of the AQMA that are currently designated within Dover District Council. Appendix D: Maps of Monitoring Locations and AQMA provides maps of the AQMA and also the air quality monitoring locations in relation to the AQMA.

The air quality objectives pertinent to the current AQMA designations is for NO₂ annual mean.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
A20 AQMA	2004 (amended in 2007 and 2009)	NO ₂ Annual Mean	An area following the A20 from just west of the Limekiln Roundabout at the western end to a point c.140m from the Eastern Docks in Dover. No longer includes properties in Marine Parade and East Cliff to the east.	YES	49.8 µg/m ³	28.9 µg/m ³	Jul-07	http://www.kentair.org.uk/home/text/454
High Street/Ladywell AQMA	2007	NO ₂ Annual Mean	An area encompassing roads and properties between the junction of Effingham Crescent/High Street, and Priory Hill/High Street.	NO	50.5 µg/m ³	33.7 µg/m ³	Jul-07	http://www.kentair.org.uk/home/text/454

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

☒ Dover District Council confirm that all current AQAPs have been submitted to Defra.

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

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

"It is promising to see that the Council have continued to review their monitoring strategy and have deployed three new monitoring locations. The Council are encouraged to continue reviewing their monitoring strategy and deploy/decommission tubes where they deem appropriate."

"The Council have presented NO₂ trends with respects to AQMA and areas outside of the AQMA. This is extremely useful as it allows the reader to easily understand spatial trends in NO₂ within the district. This approach to data/trend presentation is encouraged in future reports."

This year, the trends within AQMA's and outside of AQMA's have been presented in Appendix A, in a similar way to the 2020 ASR.

"The Council monitors NO₂ and PM via a network of 17 NO₂ diffusion tube sites (with three new sites deployed in 2019) and 1 automatic monitor for PM₁₀ only. During 2019, there were no exceedances recorded within an AQMA. Only one exceedance of NO₂ AQOs was recorded; this was at site DV30, which is slightly north of the High Street/Ladywell AQMA boundary. The NO₂ concentration recorded at Site DV30 was 40.4 µg/m³ (at a site of relevant exposure). This will be the third year an exceedance was experienced at DV30. As such the Council are considering extending the AQMA towards Victoria Crescent to include this area of exceedance."

During 2020, there were no exceedances in annual mean concentration. The concentration at DV30, has decreased to below the AQS objective and the AQMA has not been extended towards Victoria Crescent to include the area surrounding DV30.

"In 2019, a decrease in annual mean concentrations at all the diffusion tubes except DV31, where a slight increase of 0.3 µg/m³, was observed. The monitoring results in 2019 for PM₁₀ show that the daily and annual mean concentration is well below both the annual mean and 24-hour AQS objectives. The annual mean concentration for PM₁₀ has decreased from 26 µg/m³ to 22 µg/m³ between 2018 and 2019."

Annual mean concentrations at all sites have decreased during 2020 and PM₁₀ results show that the daily and annual mean concentration is below the annual mean objectives, though this is likely as a result of changes in traffic arising from the Covid-19 pandemic.

“QA/QC procedures have been applied for bias adjustment (using a national factor), distance corrections (for sites not representative of relevant exposure), and annualisation (for sites with low data capture). Screenshots and example calculations have been provided which are useful and encouraged for all future reports.”

Screenshots and example calculations have been provided again in this report.

Dover District Council has taken forward a number of direct measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 20 measures are included within Table 2.2, with the type of measure and the progress Dover District Council have made during the reporting year of 2020 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans and an update to these measures will be included in their new Action Plan to be adopted in 2021. Key completed measures are:

- Improvements to Eastern Docks Layout. Traffic Management Improvement (TMI) Project 2012-2015;
- New Dover Eastern Docks Exit Road to A20 Townwall Street; and
- Supplementary planning guidance to assist with air quality assessments of development proposals.

During 2020, the implementation of measures was impacted due to the Council's response, and changing responsibilities due to Covid-19.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Improved traffic management through junction improvements	Traffic Management	UTC, Congestion management, traffic reduction	2010	2016	KCC/Highways England/DDC	KCC/Highway Agency/DDC					0.01 µg/m³	Improvement to local traffic flows	Agreement between KCC and HA now in place to continue this scheme. Barriers now in place. Traffic lights removed.	Significant improvement in flows of HDV traffic at this location
2	Dualling of the A2 between Lydden and Dover "Growth without Gridlock"	Transport Planning and Infrastructure	Other	2015-16	Unknown – dependent on Highways England	Highways England, South East Regional Transport Board, KCC, DDC	Highways Agency, South East Regional Transport Board, KCC, DDC					20 – 25% (if fully implemented and switch of traffic loading from A20 –A2)	Improved traffic flows and increase demand through homebuilding programme in LDF	Construction implemented	Implemented through LTP414. Potential for substantial Air pollution improvements in A20 route into Dover, which is demonstrated in 2016 data. Consultation completed Jan 2017
3	Strategic Signage Improvements	Traffic Management	UTC, Congestion management, traffic reduction	2010-2011	Will not be completed due to lack of funding	Highways Agency/KCC/DDC	Highways Agency/KCC/DDC					0.01 µg/m³	More streamlined approach and possibly less queuing.	Detailed plans submitted for formal consultation. Project shelved as Budget withdrawn	Superseded by junction improvement works proposed in measure 2
4	Improvements to Eastern Docks Layout. Traffic Management Improvement (TMI) Project 2012-2015	Transport Planning and Infrastructure	Other	2009	2015	DHB	DHB					0.01 µg/m³	More streamlined approach and possibly less queuing both in and out of Port	Completed	Significant improvements to resilience of the operation of the port. Slight improvement to AQMA boundary at Eastern Dock entrance
5	New Dover Eastern Docks Exit Road to A20 Townwall Street	Traffic Management	Strategic highway improvements	HA Road Order	2009	DHB/HA	DHB/HA					0.01 µg/m³	Improved traffic flows	Completed	Some improvements in NO ₂ levels noted at entrance to docks
6	Development of a Buffer Zone	Promoting Low Emission Transport	Low Emission Zone (LEZ)	None - preliminary planning	n/a	DHB/HA	DHB/HA					n/a	Improved traffic management	None - preliminary investigations-planning requirements can NOT be met	n/a
7	Port Expansion to Western Docks	Transport Planning and Infrastructure	Other	Harbour Revision Order given to DfT March 2010	Completed 2017	DHB	DHB					n/a	Potential improvements to traffic relief routes on A20	Some western docks regeneration is underway. Includes the transformation of the Union Street and York Street roundabouts into signalised junctions.	Potential improvements to A20 Townwall St AQMA – although further modelling work necessary to look at EU Limit values. High priority measure

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
8	Transfer of Freight from Road to Rail	Freight and Delivery Management	Delivery and Service plans	DHB Report Nov 2008	2020	KCC/DDC/Dover Harbour Board/rail operators/ Seeda	KCC/DDC/Dover Harbour Board/rail operators/ Seeda					<1%	Less road vehicles– up to 120 per day	On-going	Low impact
9	Encourage Council Travel Plan opportunities and seek to facilitate uptake of sustainable modes of transport	Promoting Travel Alternatives	Workplace Travel Planning	2009	To review and consider in updated Action Plan 2021	DDC	DDC					Below annual mean AQS objectives	% modal shift to car share/public transport/walking/cycling	On-going	Quality Bus Partnership with Stagecoach in East Kent and Kent County Council. The partnership agreement, signed in April 2009, commits each party to work together towards the improvement of bus travel in Dover District.
10	Work together with KCC to encourage the uptake of Employer and School Travel Plans within the District	Promoting Travel Alternatives	School Travel Plans	On-going	To review and consider in updated Action Plan 2021	DDC/KCC	DDC/KCC					Below annual mean AQS objectives	No. of travel plans in place	On-going	Approximately 73% of primary and 89% of secondary schools in Dover District have approved school travel plans
11	Work with KCC to improve the facilities for cycling and walking within Dover	Promoting Travel Alternatives	Promotion of cycling/walking	On-going	To review and consider in updated Action Plan 2021	DDC/KCC	DDC/KCC					Below annual mean AQS objectives	%modal shift to cycling/walking , No. miles new cycle lanes/routes	On-going	Includes Dover District Cycling Plan. 2019 update DDC web published local cycle routes and intro Betteshanger cycle tracks
12	Ensure that air quality is taken into account in the planning process when located in or close to the AQMA or in areas marginally below air quality objectives	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	On-going	On-going. Planning Policy under review in 2021	DDC	DDC					Below annual mean AQS objectives	No. planning applications with air quality conditions/assessments	Planning conditions included in all major developments to install ELV charging points	Part of general and continual efforts of DDC Environmental Protection. Will apply general guidance developed as part of measure 14
13	Work together with developers to improve sustainable transport links serving new developments.	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	On-going	On-going	DDC	DDC					Below annual mean AQS objectives	No. planning applications where improvements secured	Planning conditions included in all major developments to install ELV charging points	Part of general and continual efforts of DDC Environmental Protection

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
14	Supplementary planning guidance to assist with air quality assessments of development proposals	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2007	2015	DDC/KMAQP	DDC/KMAQP					Below annual mean AQS objectives	Completion of supplementary planning guidance	Completed	Active now, with two mitigation options Update 2019, K&MAQP decision to review & update Supp Guidance Doc commencing 2020
15	Work with KCC to improve public transport services and encourage the use of more sustainable transport modes	Transport Planning and Infrastructure	Public transport improvements - interchange stations and services	On-going	On-going	DDC/KCC	DDC/KCC					Below annual mean AQS objectives	% modal shift to public transport	On-going	Part of general and continual efforts of DDC Environmental Protection
16	Local air quality monitoring within the District to ensure a high standard of data is achieved	Public Information	Other	N/A - annual	On-going	DDC	DDC					Below annual mean AQS objectives	Recorded Concentration	Completed Annually, renewed in 2018. Two automatic sites decommissioned, but more diffusion tubes added to compensate X4 Zephyr real time instruments purchased for indicative monitoring (potential traffic changes with Brexit)	General trend of reduction in concentrations monitored
17	Make details of the Action Plan measures and annual progress reports available on the Website	Public Information	Via the Internet	2008	On-going	DDC	DDC					Below annual mean AQS objectives	Availability of recently published reports on the Website	On-going	Documents freely available16. Part of general and continual efforts of DDC Environmental Protection. AQAP to be updated in 2020 after revision of AQMA boundaries. Bureau Veritas progressing, draft due in 2020
18	Work with KMAQP on promotional activities to raise the profile of air quality in Dover	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	On-going	On-going	DDC/KMAQP	DDC/KMAQP					Below annual mean AQS objectives	Number of promotional activities undertaken with the Partnership	Agreed policy to increased invited guests to Partnership meetings on AQ topics	Part of general and continual efforts of DDC Environmental Protection

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
19	Work with Kent Energy Centre to promote and implement energy efficiency measures in Dover	Promoting Low Emission Plant	Shift to installations using low emission fuels for stationary and mobile sources	On-going	On-going	DDC/Kent Energy Centre	DDC/Kent Energy Centre					Below annual mean AQS objectives	% improvement in energy efficiency, SAP rating	On-going	Dover DC as member of K&MAQP worked with KCC on Kent and Medway Energy and Low Emissions Strategy (ELES)
20	DDC Environmental Protection lobbying Council management to introduce ELV facilities	Low emission initiatives	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2018	Completed	DDC	DDC					<1%	No. of Council employees/contractors purchasing & using ELVs	Five ELV charges now installed in DDC offices car park	

Notes:

The AQAP is being updated; therefore, this table will be revised when the new AQAP has been adopted later this year.

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

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

Currently there is no monitoring of PM_{2.5} completed within Dover. However, in accordance with LAQM.TG(16), PM_{2.5} concentrations can be estimated from PM₁₀ monitoring using either a local PM₁₀ and PM_{2.5} monitoring ratio, or a nationally derived correction ratio of 0.7. As there is no local monitoring for PM_{2.5}, the nationally derived correction ratio of 0.7 was applied to the PM₁₀ concentration (22.7 µg/m³) at the automatic monitoring site Dover Centre. The estimated PM_{2.5} concentration in 2020 at the automatic monitoring site Dover Centre was 15.9µg/m³. The main sources of PM₁₀ pollutant emissions within Dover Centre are linked with port activities; regular cross-channel ships and large volumes of road traffic arising as a result of associated transport of goods along the A2 and A20 entering and leaving the town.

The Defra 2020 background maps for Dover (2018 based)⁸ show that all background concentrations of PM_{2.5} are far below the annual mean EU limit value of 25µg/m³ for PM_{2.5}. The average background concentration for Dover Centre is 9.2µg/m³. The highest background concentration is estimated to be 11.2µg/m³ within the 1 x 1km grid square with the centroid grid reference of 623500,151500. This grid square is located near Spinney Lane in Aylesham, outside of any AQMAs. There is an industrial estate within the village including a waste recycling centre on Spinney Lane. The industrial and agricultural activities in, and surrounding, the village may contribute to the PM_{2.5} concentration at this location.

⁸ Defra Background Mapping data for local authorities (2017-based), available online at <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017>

The Public Health Outcomes Framework data tool⁹ compiled by Public Health England quantifies the mortality burden of PM_{2.5} within England on a county and local authority scale. The 2019 (latest available dataset is 2019) fraction of mortality attributable to PM_{2.5} pollution in Dover is 4.9%, which is below South East region's average of 5.2% and the national average of 5.1%.

There are currently no designated smoke control areas within Dover, however information is provided within the air quality section of the Council's website available at <https://www.dover.gov.uk/Environment/Environmental-Health/Air-Quality/Home.aspx>.

It is proposed, as suggested in LAQM.TG(16) that action in relation to PM_{2.5} monitoring and reduction actions are reviewed with Kent County Council Public Health Team whilst developing the updated AQAP to consider whether any specific additional actions are required. The Council recognise the importance of considering PM_{2.5} and also that long-term exposure (over several years) to elevated concentrations of particulate matter (PM_{2.5}) at levels typically experienced in urban areas reduces life expectancy between several months and a few years. Dover Council has contributed to and supports the Kent and Medway Energy and Low Emissions Strategy, published in June 2020¹⁰. The strategy highlighted that in 2017 there were an estimated 922 deaths associated with PM_{2.5} exposure across Kent and Medway. The Kent and Medway Energy and Low Emissions Strategy has therefore included particulate matter as one of the key indicators of success across the region. Furthermore, the AQAP that is currently being developed for the Council will consider measures that specifically target PM_{2.5} concentrations.

⁹ Public Health Outcomes Framework, Public Health England. data tool available online at <https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/0/gid/1000043/pat/6/par/E12000008/ati/202/are/E06000036/cid/4/page-options/ovw-do-0>

¹⁰ https://www.kent.gov.uk/data/assets/pdf_file/0009/112401/Kent-and-Medway-Energy-and-Low-Emissions-Strategy.pdf

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

This section sets out the monitoring undertaken within 2020 by Dover District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2016 and 2020 to allow monitoring trends to be identified and discussed.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Dover District Council undertook automatic (continuous) monitoring at one site during 2020. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The <https://kentair.org.uk/data> page presents automatic monitoring results for Dover District Council, with automatic monitoring results also available through the UK-Air website .

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

Dover District Council undertook non- automatic (i.e. passive) monitoring of NO₂ at 17 sites during 2020. Table A.2 in Appendix A presents the details of the non-automatic 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 (e.g. annualisation and/or distance correction), are included in Appendix C.

Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater

than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.1.3 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40 µg/m³. Note that the concentration data presented 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 2020 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.

For the first time since the AQMA's were declared, there have been no exceedances of the NO₂ annual mean concentration. At all sites excluding DV30, the annual mean concentrations are not within 10% of the AQS objective. DV30; located adjacent to 19B High Street Dover, is the only diffusion tube monitoring site which recorded an exceedance of the AQS objective during 2019 and during 2020, this annual mean concentration decreased by 7%.

Figure A.1 illustrates how the trends in annual mean concentrations have decreased across all sites during 2020. It is likely that the reduction in traffic flows all around the UK as well as the reduction in trade due to Covid-19 restrictions, has had an impact on the NO₂ concentrations within Dover. In the High Street/Ladywell AQMA there has been a reduction of 16% in NO₂ emissions compared to 2019. In the A20 AQMA, there has also been an average reduction of 16% in annual mean concentrations. At Dover's diffusion tube sites outside of AQMA boundaries, an average reduction of 19% has been seen across sites.

Sites DV30 and DV33 were the only two sites requiring annualisation, as they both had a data capture of less than 75%.

As there have been no diffusion tube monitoring sites with an annual mean greater than 60 µg/m³, it is assumed that there have been no exceedances of the 1-hour mean objective.

3.1.4 Particulate Matter (PM₁₀)

Table A.4 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past five years with the air quality objective of 40 µg/m³.

Table A.5 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past five years with the air quality objective of 50 µg/m³, not to be exceeded more than 35 times per year.

The PM₁₀ monitoring site is located in Dover Centre within the A20 AQMA. During 2020, there have been no exceedances in PM₁₀ annual mean concentrations. The annual mean concentration has risen slightly from last years concentration of 22 µg/m³ to 22.7 µg/m³. The 24-hour mean has been greater than 50 µg/m³ once during 2020, compared to eight instances during 2019.

Due to power supply problems during the spring of 2020 (March-June), data capture was lower than anticipated, with only 67.7% of the monitoring concentrations being recorded. the PM₁₀ data has been annualised in line with LAQM.TG(16).

3.1.5 Particulate Matter (PM_{2.5})

There is currently no monitoring of PM_{2.5} within Dover. However, in accordance with LAQM.TG(16), the PM_{2.5} concentrations can be estimated from PM₁₀ monitoring using either a local PM₁₀ and PM_{2.5} monitoring ratio, or a nationally derived correction ratio of 0.7. As there is no local monitoring for PM_{2.5}, the nationally derived correction ratio of 0.7 has been applied to the PM₁₀ concentration (22.7 µg/m³) at the automatic monitoring site Dover Centre. The estimated PM_{2.5} concentration in 2020 at the automatic monitoring site Dover Centre was therefore 15.9 µg/m³ in line with TG(16).

3.1.6 Sulphur Dioxide (SO₂)

There is currently no SO₂ monitoring in Dover, however historically Dover conducted SO₂ monitoring in the previously declared Eastern Docks AQMA.

The AQMA was declared for exceedances of the 15-minute SO₂ objective in the Eastern Docks area in 2002. Since this time, sulphur emissions from ferry ships using the Port of Dover have reduced. Monitoring data showed that the air quality objectives were being met at the port, with no exceedances since 2006. Residents within the AQMA were

consulted via letter in 2013 and no comments were received, the AQMA was therefore revoked in 2014 and monitoring was discontinued.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
Dover Centre	A20 Townwall Street, Dover	Roadside	632302	141465	PM ₁₀	YES – A20	TEOM	N/a	2.5	2

Notes:

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

(2) N/A if not applicable

Table A.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DV01	95 High Street, Dover, CT16 1EB	Roadside	631376	141949	NO ₂	NO	2.0	1.5	No	2.6
DV04	Car Park - Opp 2 Christchurch Way, Dover	Urban Background	630905	143362	NO ₂	NO	6.0	-	No	1.6
DV05	Bench Street, Dover	Urban Centre	631997	141296	NO ₂	YES - A20	4.0	30.0	No	3.0
DV06, DV07, DV08	Town Hall, Dover	Roadside	631597	141748	NO ₂	YES - High St/Ladywell	0.0	2.5	No	3.0
DV10	Townwall Street, Dover	Roadside	632302	141465	NO ₂	YES - A20	-	2.5	No	2.0
DV11, DV16, DV17	The Gateway	Roadside	632318	141422	NO ₂	YES - A20	0.0	12.0	No	3.0
DV12, DV18, DV19	St Martins	Roadside	631577	140468	NO ₂	YES - A20	0.0	10.0	No	3.0
DV23	126 Snargate Street, Dover, Kent, CT17 9BZ	Roadside	631727	140966	NO ₂	YES - A20	0.0	15.0	No	3.0
DV24	148 Snargate Street, Dover, Kent, CT17 9BZ	Roadside	631802	141079	NO ₂	YES - A20	0.0	10.0	No	3.0
DV25	167 Snargate Street, Dover, Kent, CT17 9BZ	Roadside	631854	141164	NO ₂	YES - A20	0.0	15.0	No	3.0
DV30	Adj 19B High St Dover	Kerbside	631550	141772	NO ₂	NO	0.0	5.0	No	2.0
DV31	3 Ladywell, Dover	Kerbside	631602	141771	NO ₂	NO	2.0	2.0	No	2.0
DV32	1 Marine Parade, Dover	Roadside	632646	141496	NO ₂	YES - A20	2.0	4.0	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DV33	24 Marine Parade, Dover	Roadside	632836	141572	NO ₂	NO	10.0	5.0	No	2.0
DV34	New Street, Sandwich	Kerbside	633088	158032	NO ₂	NO	0.0	1.0	No	2.0
DV35	42 High Street, Sandwich	Kerbside	633174	158094	NO ₂	NO	0.0	1.0	No	2.0
DV36	Sholden Primary School	Roadside	635696	152325	NO ₂	NO	0.0	2.0	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 NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
DV01	631376	141949	Roadside	90.4	90.4	30.5	33.2	31.2	30.8	25.5
DV04	630905	143362	Urban Background	92.3	92.3	16.5	17.8	16.2	15.3	12.7
DV05	631997	141296	Urban Centre	75.0	75.0	34.1	33.6	28.8	24.4	20.3
DV06, DV07, DV08	631597	141748	Roadside	100.0	100.0	44.5	45.4	40.4	39.8	33.7
DV10	632302	141465	Roadside	100.0	100.0	41.4	45.4	38.3	35.9	26.4
DV11, DV16, DV17	632318	141422	Roadside	100.0	100.0	31.6	33.2	29.9	28.1	23.1
DV12, DV18, DV19	631577	140468	Roadside	100.0	100.0	36.3	36.6	34.5	31.5	26.5
DV23	631727	140966	Roadside	100.0	100.0	36.1	38.0	34.3	31.2	25.3
DV24	631802	141079	Roadside	90.4	90.4	38.4	42.8	39.0	33.7	26.1
DV25	631854	141164	Roadside	82.7	82.7	35.1	35.4	32.6	29.3	28.9
DV30	631550	141772	Kerbside	75.0	75.0	-	40.9	40.5	40.4	35.7
DV31	631602	141771	Kerbside	100.0	100.0	-	36.7	31.2	31.5	23.5
DV32	632646	141496	Roadside	100.0	100.0	-	40.1	35.4	31.7	26.7
DV33	632836	141572	Roadside	76.9	76.9	-	37.2	37.6	35.9	28.4
DV34	633088	158032	Kerbside	100.0	100.0	-	-	-	25.9	18.7
DV35	633174	158094	Kerbside	100.0	100.0	-	-	-	16.1	13.4
DV36	635696	152325	Roadside	90.4	90.4	-	-	-	18.5	14.9

☒ Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.

☒ Diffusion tube data has been bias adjusted.

☒ 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 correction.

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the NO₂ annual mean objective of 40 µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60 µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

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

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

- (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%).

Figure A.1 – Trends in Annual Mean NO₂ Concentrations at all Monitoring Locations outside AQMAs

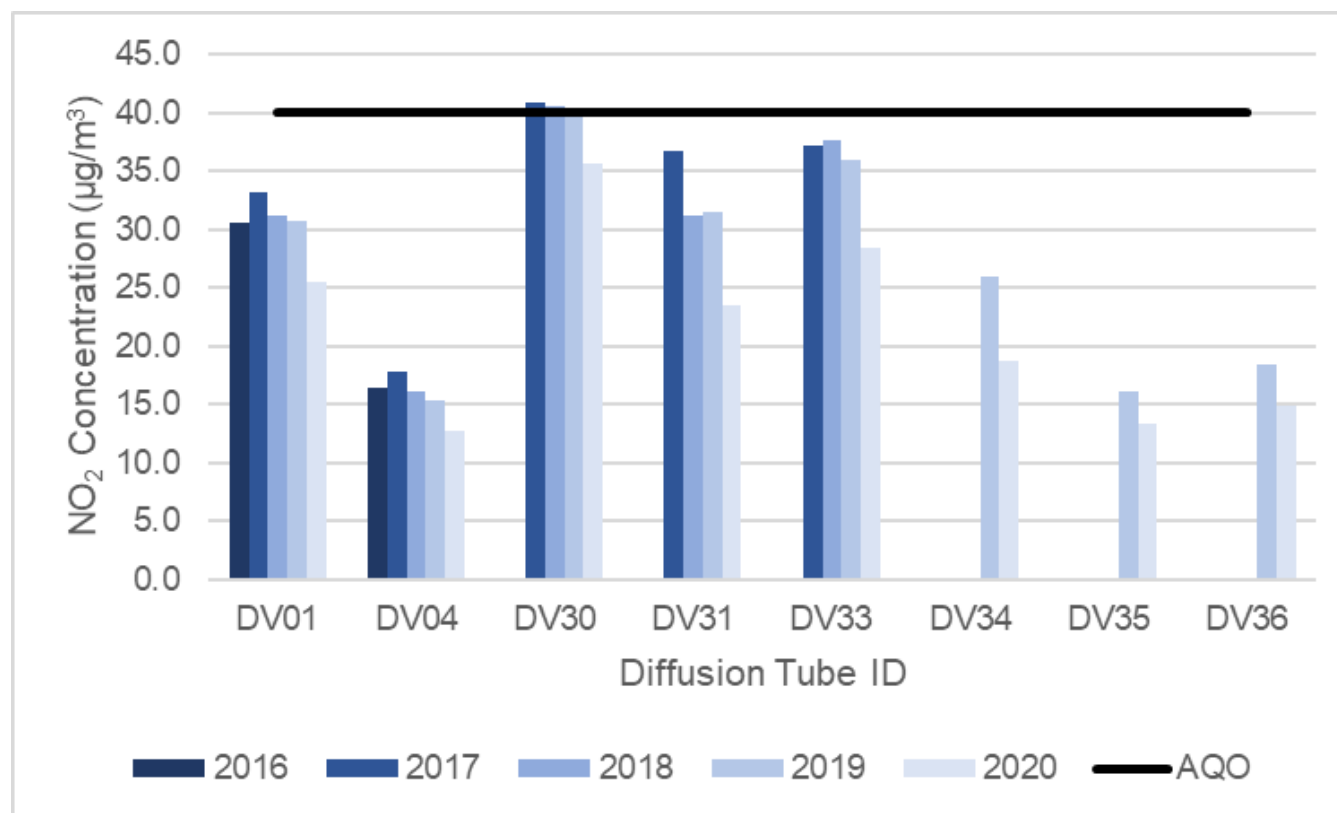


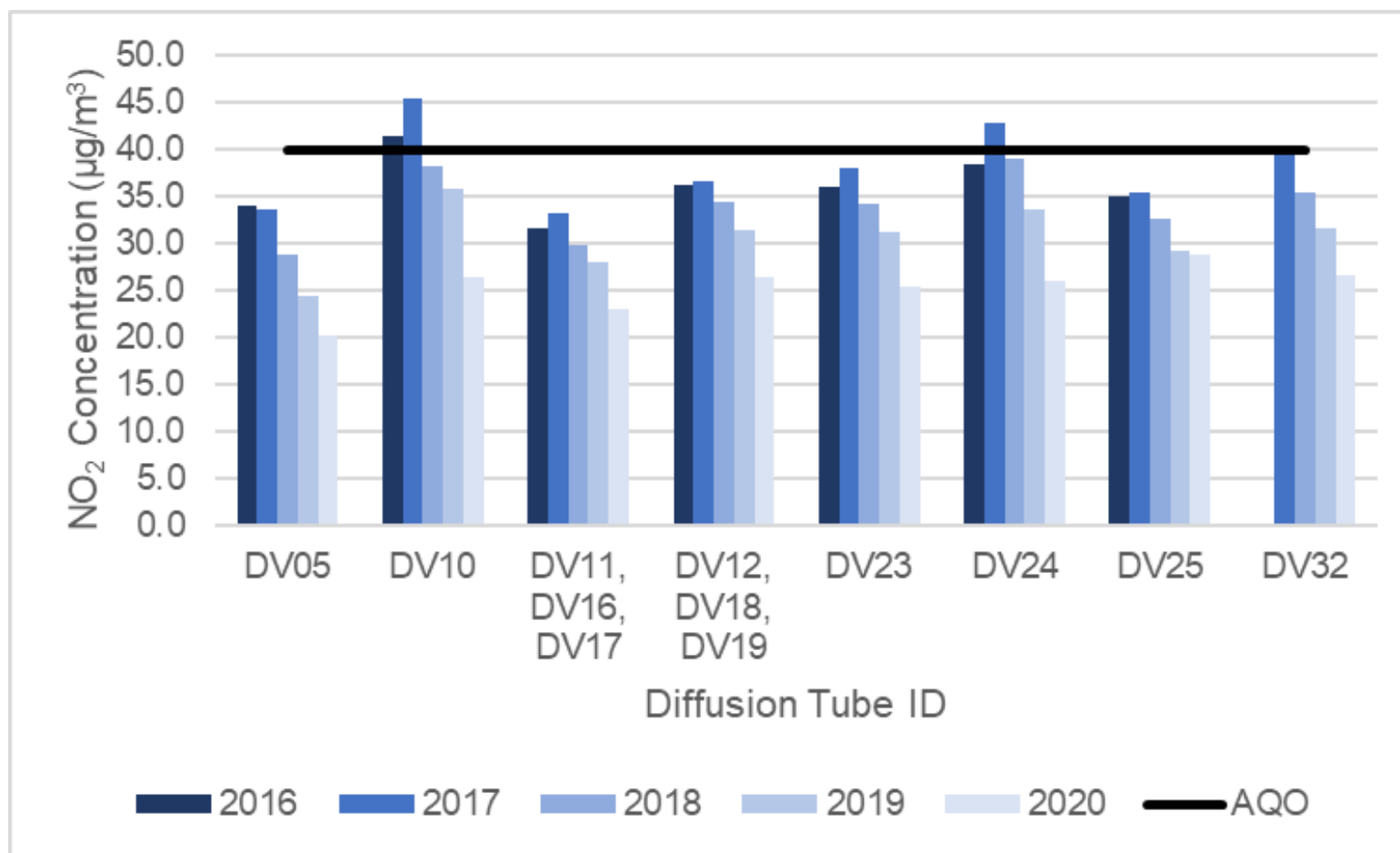
Figure A.2 – Trends in Annual Mean NO₂ Concentrations at Monitoring Locations in the A20 AQMA

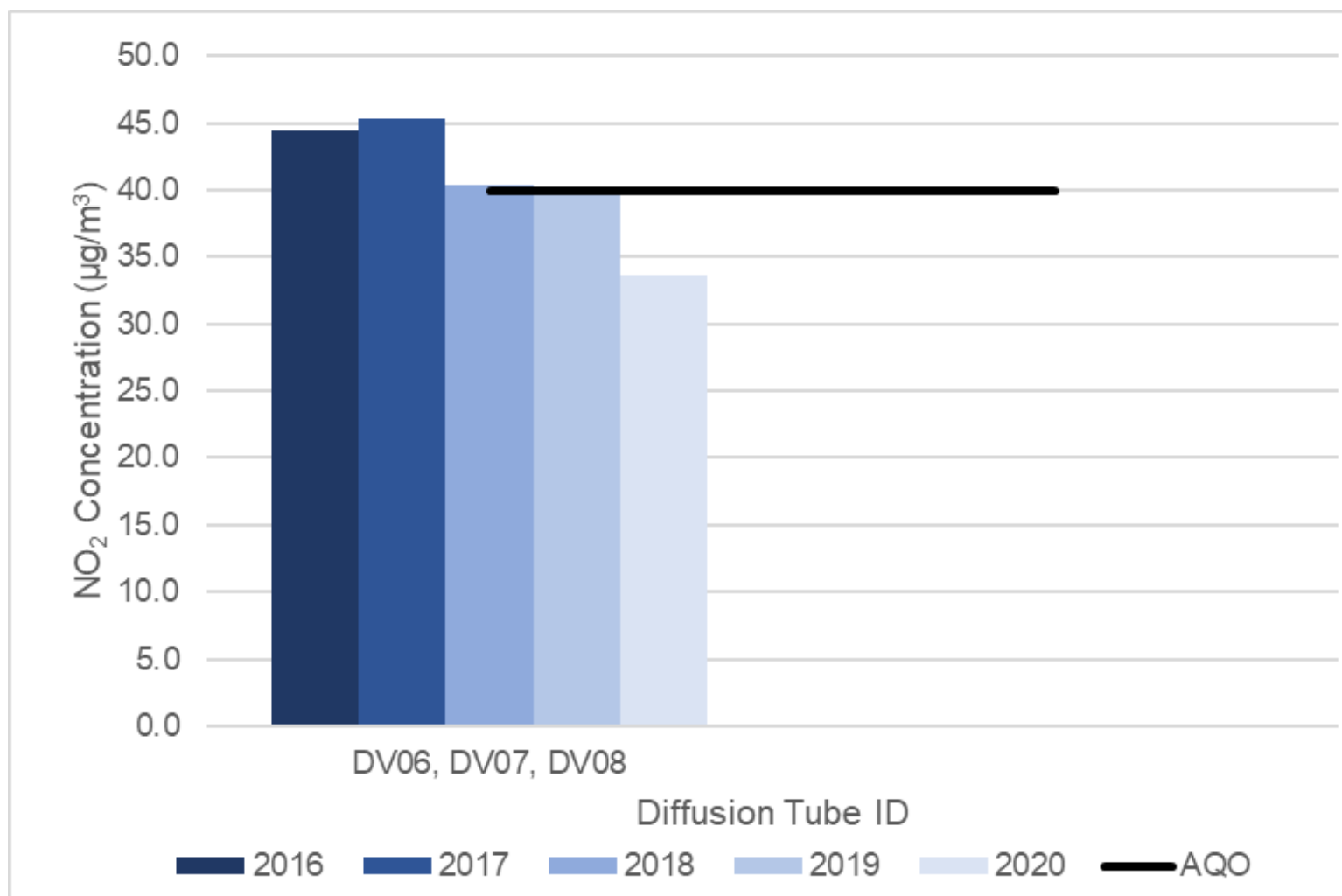
Figure A.3 – Trends in Annual Mean NO₂ Concentrations at the Monitoring Location in the Ladywell/High Street AQMA

Table A.4 – Annual Mean PM₁₀ Monitoring Results (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
Dover Centre	632302	141465	Roadside	67.7	67.7	26.0	27.0	26.0	22.0	22.7

 **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the PM₁₀ annual mean objective of 40 µg/m³ are shown in **bold**.

All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

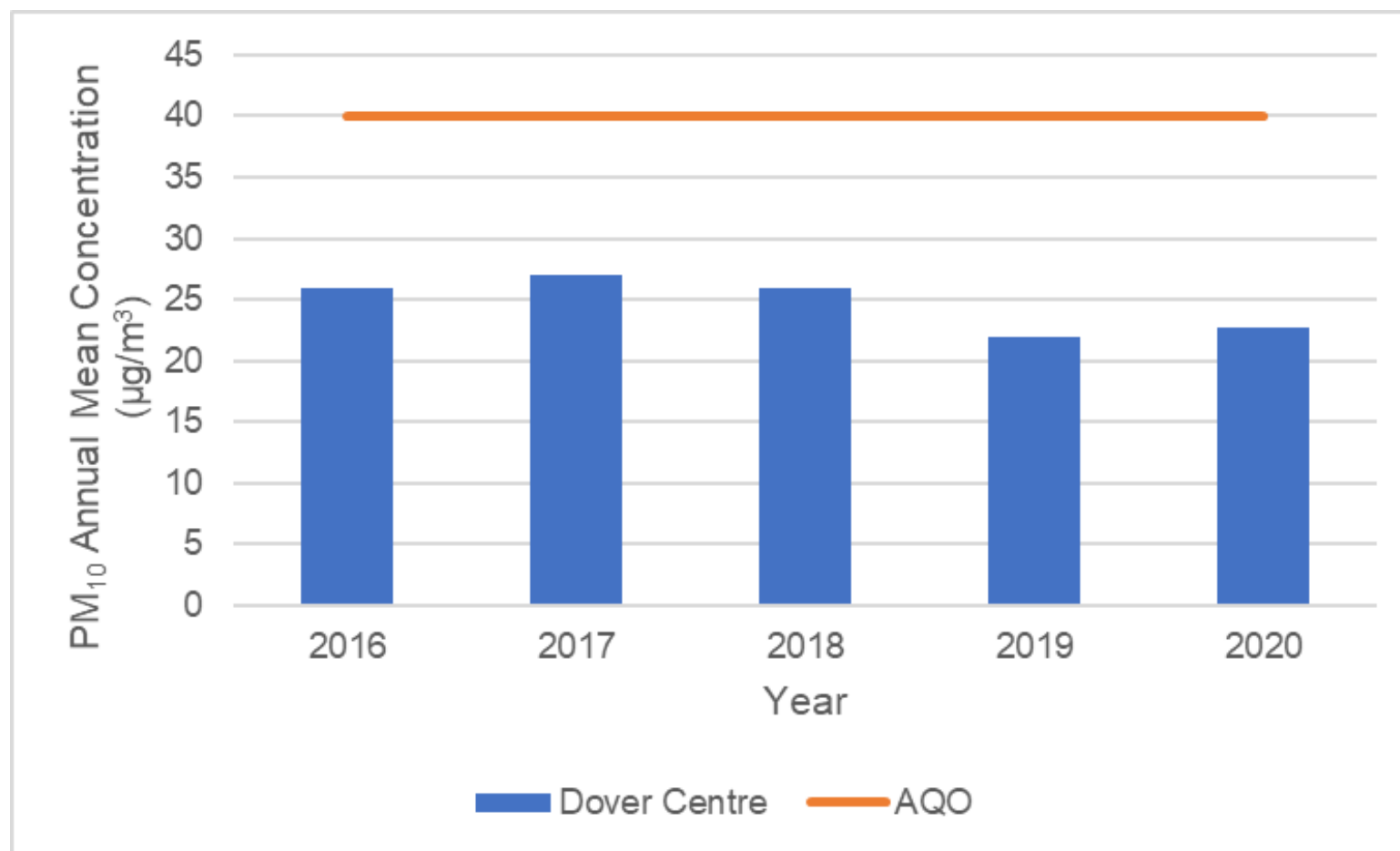
Figure A.5 – Trends in Annual Mean PM₁₀ Concentrations at Dover Centre

Table A.5 – 24-Hour Mean PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50 µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
Dover Centre	632302	141465	Roadside	67.7	67.7	10	20	7	8	1

Notes:

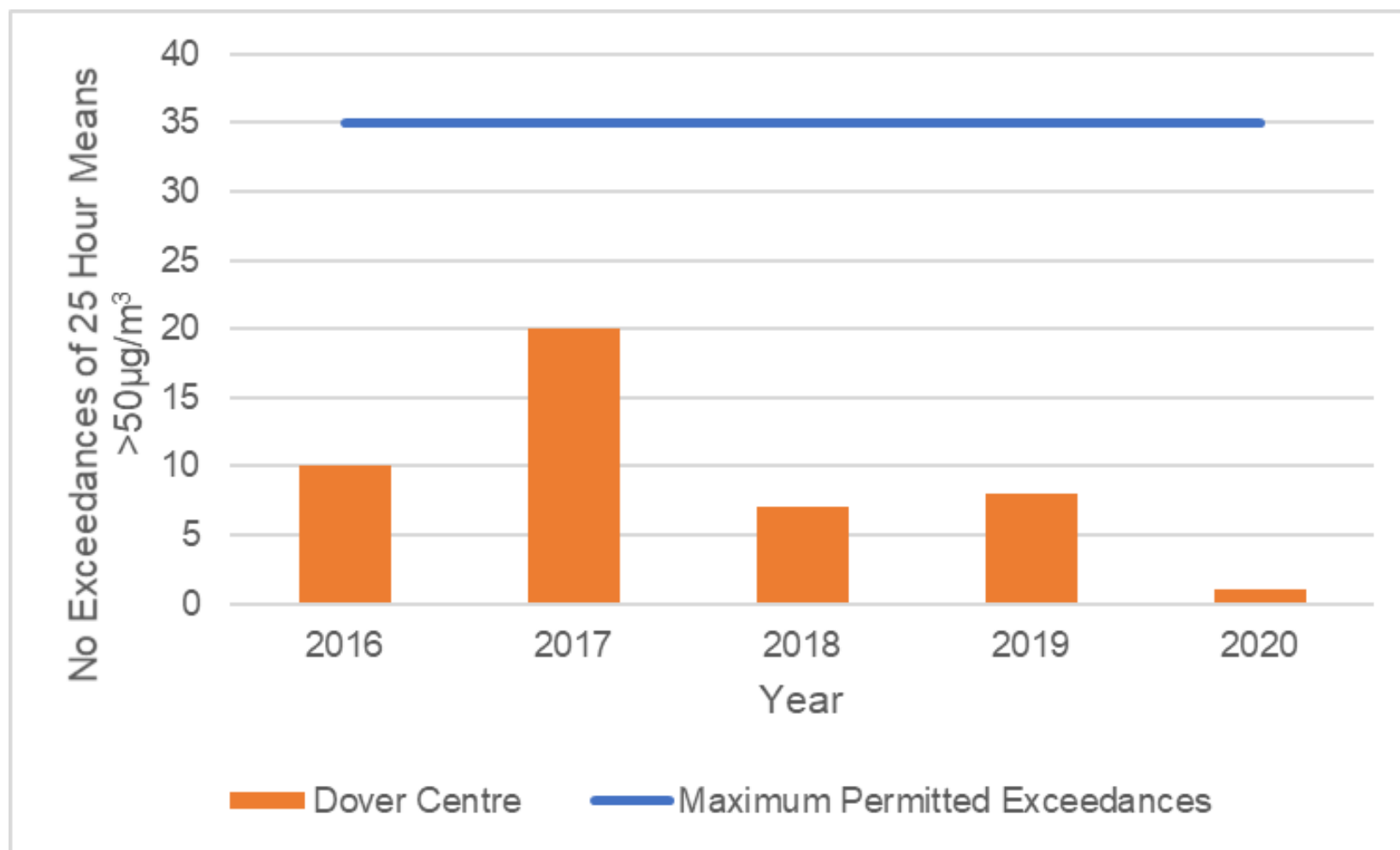
Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50 µg/m³ have been recorded.

Exceedances of the PM₁₀ 24-hour mean objective (50 µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

(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%).

Figure A.6 – Trends in Number of 24-Hour Mean PM₁₀ Results > 50 µg/m³

Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO₂ 2020 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr*	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DV01	631376	141949	38.5	32.8	17.7	31.2		33.6	25.1	-	32.2	30.8	37.4	54.3	33.5	25.5		
DV04	630905	143362	18.2	17.3	8.5	16.8		17.2	-	17.8	16.5	12.2	23.9	19.4	16.8	12.7		
DV05	631997	141296	33.5	32.1	-	-		34.1	27.9	34.9	29.2	1.5	31.5	20.9	26.7	20.3		
DV06	631597	141748	56.5	46.0	31.3	39.4		48.1	42.2	55.8	43.4	43.1	49.7	45.4	-	-		Triplicate Site with DV06, DV07 and DV08 - Annual data provided for DV08 only
DV07	631597	141748	64.6	53.0	16.0	35.5		42.8	34.7	50.1	40.2	58.5	39.4	44.4	-	-		Triplicate Site with DV06, DV07 and DV08 - Annual data provided for DV08 only
DV08	631597	141748	56.9	51.7	31.2	3.7		41.5	37.5	51.5	52.1	-	57.0	32.4	44.3	33.7		Triplicate Site with DV06, DV07 and DV08 - Annual data provided for DV08 only
DV10	632302	141465	44.0	38.1	22.8	34.2		38.5	28.5	34.6	36.9	25.6	41.8	38.7	34.7	26.4		
DV11	632318	141422	34.5	33.9	22.0	26.9		34.5	20.4	46.3	27.7	33.4	36.7	28.7	-	-		Triplicate Site with DV11, DV16 and DV17 - Annual data provided for DV17 only
DV16	632318	141422	35.3	33.1	20.0	25.8		35.0	24.8	34.4	28.4	25.8	36.9	28.4	-	-		Triplicate Site with DV11, DV16 and DV17 - Annual data provided for DV17 only
DV17	632318	141422	36.3	33.1	22.5	28.0		35.1	24.9	34.9	26.7	30.5	37.6	28.4	30.4	23.1		Triplicate Site with DV11, DV16 and DV17 - Annual data provided for DV17 only
DV12	631577	140468	40.2	38.9	18.2	36.4		39.5	34.6	36.9	38.7	30.4	34.9	29.7	-	-		Triplicate Site with DV12, DV18 and DV19 - Annual data provided for DV19 only
DV18	631577	140468	39.2	35.0	28.2	31.7		40.0	35.6	40.4	33.7	30.7	38.8	28.1	-	-		Triplicate Site with DV12, DV18 and DV19 - Annual data provided for DV19 only
DV19	631577	140468	40.7	34.5	23.2	38.5		43.8	30.9	42.8	37.6	31.8	36.6	31.2	34.9	26.5		Triplicate Site with DV12, DV18 and DV19 - Annual data provided for DV19 only
DV23	631727	140966	38.5	33.1	16.3	32.6		43.6	28.4	39.2	36.3	29.8	37.4	32.2	33.3	25.3		
DV24	631802	141079	46.4	43.2	21.0	34.2		37.1	28.1	37.5	33.1	-	33.8	29.4	34.3	26.1		
DV25	631854	141164	39.8	38.5	16.3	-		49.0	33.1	44.2	39.7	33.8	47.8	37.5	38.0	28.9		
DV30	631550	141772	59.4	55.9	-	39.4		51.0	42.6	56.4	-	-	49.6	42.8	48.3	35.7		
DV31	631602	141771	38.7	32.1	8.7	30.5		33.1	26.3	39.0	33.8	25.9	39.1	32.5	30.9	23.5		
DV32	632646	141496	38.9	37.1	23.1	32.4		43.8	30.1	45.3	37.9	27.6	42.5	31.0	35.1	26.7		
DV33	632836	141572	43.1	-	-	39.7		-	32.8	50.6	38.1	31.0	35.3	36.9	38.7	28.4		
DV34	633088	158032	31.3	24.4	9.7	21.1		23.0	16.9	28.1	27.4	23.8	37.4	29.9	24.6	18.7		
DV35	633174	158094	25.2	18.5	9.2	17.9		18.0	11.8	20.9	19.0	14.5	19.8	19.1	17.7	13.4		
DV36	635696	152325	28.9	23.3	14.4	16.6		22.0	15.4	-	24.2	20.3	25.5	10.9	19.6	14.9		

*Monitoring results were exposed for two periods over April and May 2020 as a result of Covid-19 but have been retained following review against data throughout the rest of the year.

- ☒ All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.
- ☒ Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.
- ☐ Local bias adjustment factor used.
- ☒ National bias adjustment factor used.
- ☒ Where applicable, data has been distance corrected for relevant exposure in the final column.
- ☒ Dover District Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

Exceedances of the NO₂ annual mean objective of 40 µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60 µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Dover District Council During 2020

There were new pollution sources during 2020, however, the Council are aware of plans by Defra to introduce a new Border Facility ([White Cliffs Border Facility](#) – Guston), which may impact on local HGV traffic (A2/A20).

Additional Air Quality Works Undertaken by Dover District Council During 2020

The Council applied for OLEV (Office for Low Emission Vehicles) grant funding in late 2020 and now have 19 proposed sites for EV charging points. At the 19 sites, there is a proposed total of 53 charging sockets on 42 charging units across the district in off street (car parks) and on street locations.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes are supplied and analysed by SOCOTEC Didcot, formerly called Environmental Scientifics Group (ESG) Didcot utilising the 50% triethanolamine (TEA) in acetone preparation method. A bias adjustment of 0.76 for the year 2020 (based on 24 studies) has been derived from the national bias adjustment calculator, as shown in Figure C.1. The figure of 0.76 has increased slightly from last year (0.75).

SOCOTEC Didcot is a UKAS accredited laboratory and participates in the AIR-PT Scheme for NO₂ tube analysis and the Annual Field Intercomparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre.

In the 2020 AIR-PT results, AIR-PT AR036 (January – February 2020) and AR040 (September – October 2020) SOCOTEC scored 100%. The AIR-PT rounds AR037 (May – June 2020), AR039 (July – August 2020) were cancelled due to the COVID-19 pandemic. The percentage score reflects the results deemed to be satisfactory based upon the z-

score of $< \pm 2$. Additionally, the precision of the NO₂ diffusion tubes supplied by SOCOTEC Didcot has been classified as 'good' for all observations in 2020. This precision reflects the laboratory's performance and consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field. Further information on the precision summary results can be found on the [LAQM website](#).

Due to Covid-19 restrictions, diffusion tube monitoring was disrupted due to Covid-19 and monitoring was not changed directly in line with the LAQM monitoring calendar. Diffusion tubes went on 1/4/2020 and were not then changed until 3/6/2020. The results for April in Table B.2 above are therefore inclusive of greater than the recommended 5 weeks exposure. These have been reviewed for inclusion and it has been determined that the results are still appropriate to be used for determining the annual average.

Diffusion Tube Annualisation

Annualisation was required for only two non-automatic monitoring sites during 2020; DV30 and DV33. The annualisation was carried out by calculating an annualisation factor using background concentrations from the three closest background monitoring sites to Dover; Canterbury, Rochester Stoke and Thurrock. Details of the calculations are provided in Table C.3.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2020 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Dover District Council have applied a national bias adjustment factor of 0.76 to the 2020 monitoring data. A summary of bias adjustment factors used by Dover District Council over the past five years is presented in Table C.2.

Figure C.1 – Bias Adjustment Factor

National Diffusion Tube Bias Adjustment Factor Spreadsheet				Spreadsheet Version Number: 06/21						
Follow the steps below in the correct order to show the results of relevant co-location studies				This spreadsheet will be updated at the end of Sept 2021 LAQM Helpdesk Website						
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods										
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet										
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.										
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.				Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.						
Step 1:	Step 2:	Step 3:	Step 4:							
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor ³ shown in blue at the foot of the final column.							
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data ²	If you have your own co-location study then see footnote ⁶ . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953							
Analysed By ¹	Method To make your co-location, choose a method from the year-up list	Year To make your co-location, choose a year from the year-up list	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision ⁵	Bias Adjustment Factor (A) (Cm/Dm)
SOCOTEC Didcot	50% TEA in acetone	2020		Overall Factor ³ (24 studies)				Use	0.76	

Table C.2 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	06/21	0.76
2019	National	03/20	0.75
2018	National	03/19	0.76
2017	National	03/18	0.77
2016	National	03/17	0.77

NO₂ Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO₂ monitoring locations within Dover District Council required distance correction during 2020.

QA/QC of Automatic Monitoring

Dover District Council's 2020 automatic air quality monitoring site's data has been ratified by Air Quality Data Management (AQDM) to the LAQM.TG(16) standards. The instruments used to validate the data undergo regular calibrations. For LAQM reporting, the EU Reference Equivalent PM₁₀ has been calculated by running the Volatile Correction Model (VCM) on the TEOM data.

PM₁₀ Monitoring Adjustment

The Council undertook monitoring of PM₁₀ based on TEOM analysers at one location during 2019. TEOMs collect particles on a small oscillating filter. The change in oscillation frequency of the filter is proportional to the change in PM₁₀ and PM_{2.5} concentrations. TEOMs are operated at 50°C and as such lose volatile components of the PM₁₀ and PM_{2.5}. Therefore, the monitoring results have been corrected using the Volatile Correction Model¹¹. The monitoring results are downloaded as gravimetric equivalent from the Kentair website¹². The website managers of the Kentair website are responsible for the PM₁₀ adjustment.

Automatic Monitoring Annualisation

Annualisation was required for Dover District Council's one automatic monitoring location since data capture was less than 75% but greater than 25%. The PM₁₀ data has been annualised in line with the methodology described in LAQM.TG(16).

¹¹ <https://www.volatile-correction-model.info>

¹² <http://www.kentair.org.uk/>

Table C.3 – Annualisation Summary (concentrations presented in $\mu\text{g}/\text{m}^3$)

Site ID	Annualisation Factor Canterbury	Annualisation Factor Rochester Stoke	Annualisation Factor Thurrock	Annualisation Factor Southend-on-Sea	Average Annualisation Factor	Raw Data Simple Annual Mean ($\mu\text{g}/\text{m}^3$)	Annualised Data Simple Annual Mean ($\mu\text{g}/\text{m}^3$)	Comments
DV30	1.0082	0.9651	0.9950	-	0.9894	49.6	49.1	
DV33	1.0096	0.9644	0.9797	-	0.9846	38.4	37.8	
Dover Centre	-	1.112	1.087	1.068	1.089	20.9	22.7	

Appendix D: Maps of Monitoring Locations and AQMAs

Figure D.1 – Monitoring Locations: A20 AQMA West



Figure D.1 - Monitoring Locations: A20 AQMA East

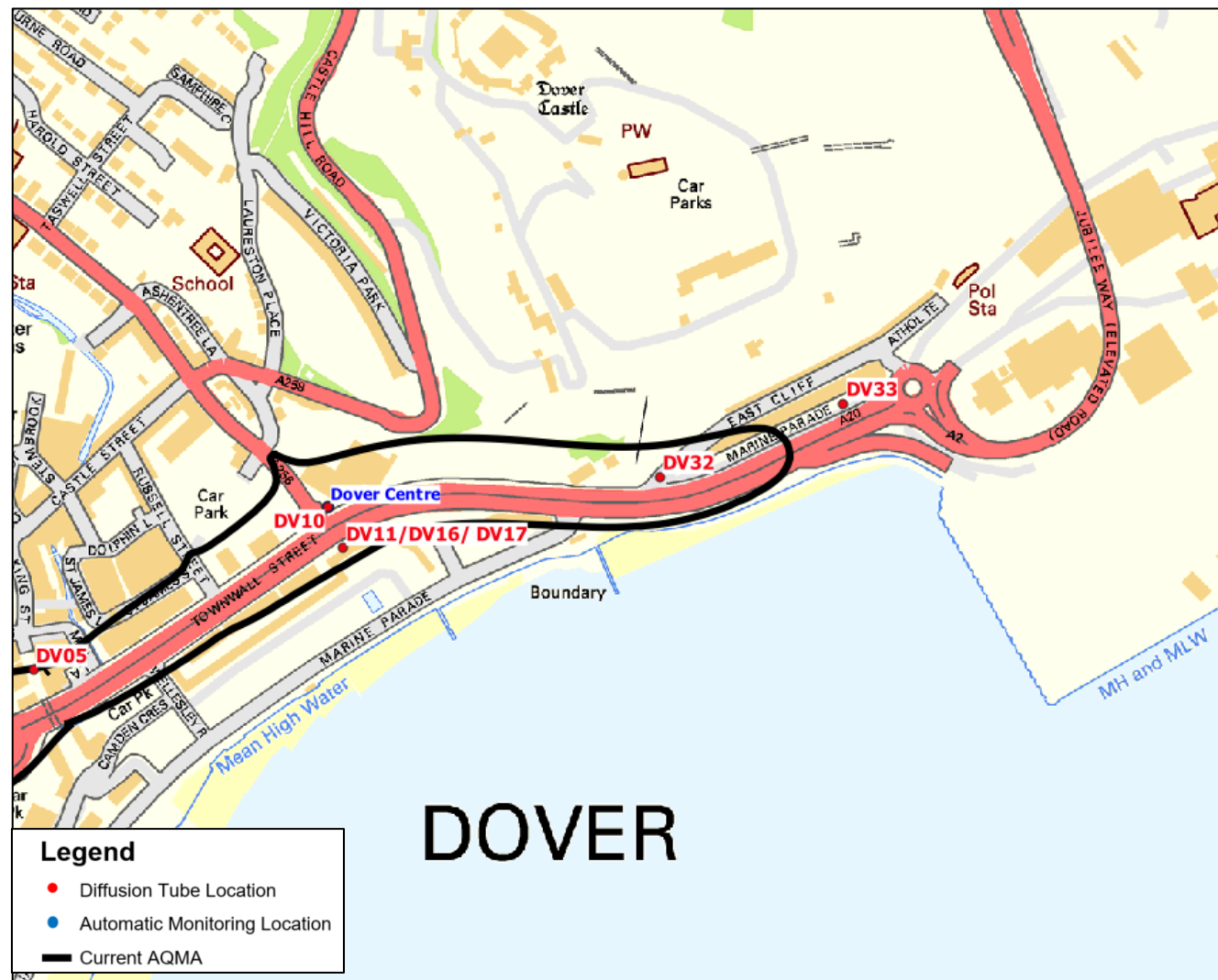


Figure D.2 - Monitoring Locations: High Street AQMA

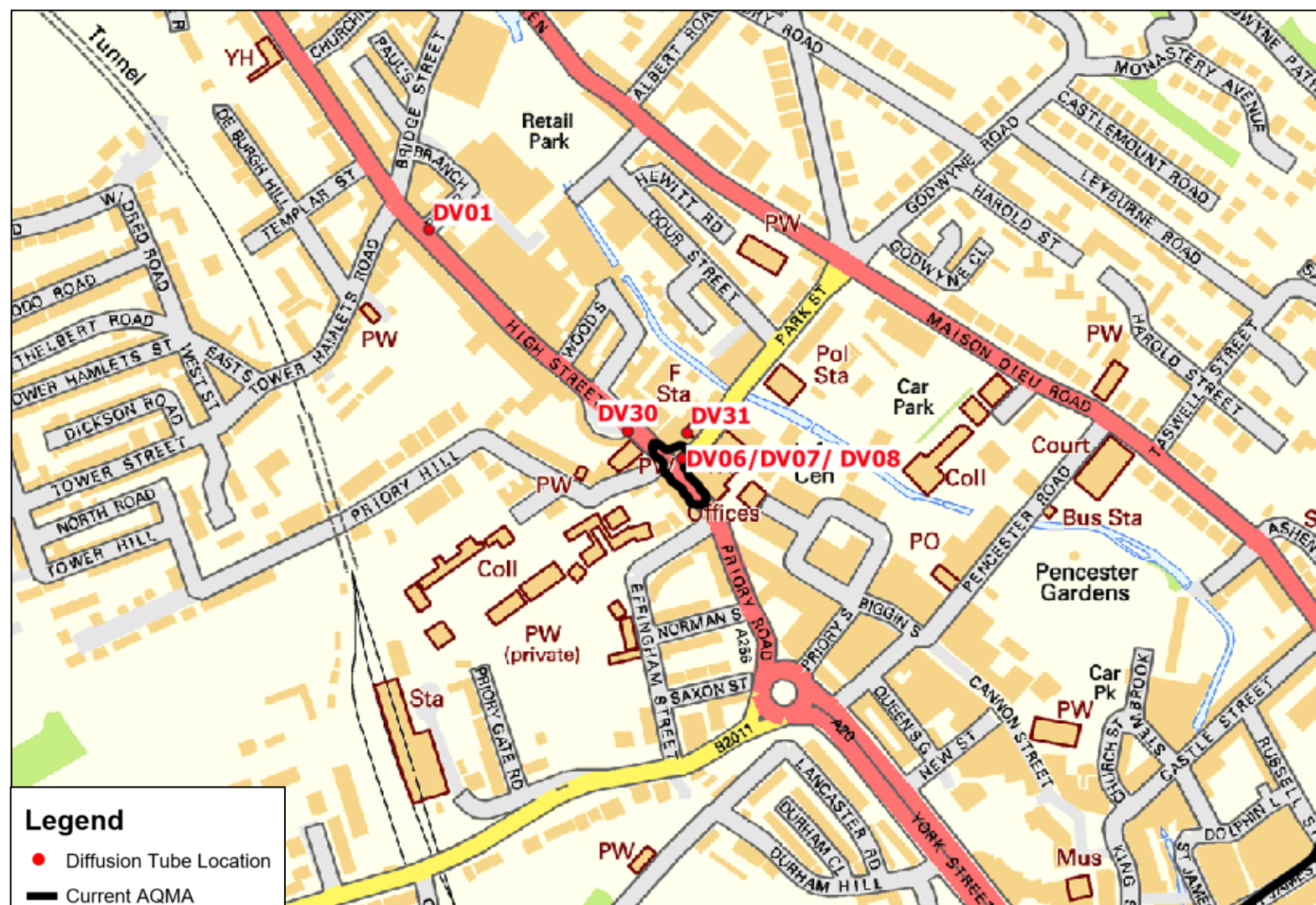


Figure D.3 - Monitoring Locations: Buckland Valley



Figure D.4 - Monitoring Locations: Sandwich



Figure D.5 - Monitoring Locations: Sholden



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England¹³

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO ₂)	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
Particulate Matter (PM ₁₀)	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
Sulphur Dioxide (SO ₂)	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO ₂)	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

¹³ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO₂) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data¹⁴ suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)¹⁵ has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO₂ annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

¹⁴ Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

¹⁵ Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

represents an absolute reduction of between 10 to 20 $\mu\text{g}/\text{m}^3$ if expressed relative to annual mean averages. During this period, changes in $\text{PM}_{2.5}$ concentrations were less marked than those of NO_2 . $\text{PM}_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that $\text{PM}_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5 $\mu\text{g}/\text{m}^3$ lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of COVID-19 on Air Quality within Dover District Council

During 2020, traffic flows within the district were impacted by Covid-19 and Brexit uncertainty. The Council don't hold traffic counts however, there was an evident reduction in traffic numbers on both the A20 and A2 routes.

Manston airfield was used as a temporary holding area for southbound HGVs in late 2020 resulting in a high number of HGVs accessing the Port via the A256 from Thanet.

Opportunities Presented by COVID-19 upon LAQM within Dover District Council

No LAQM related opportunities have arisen as a consequence of COVID-19 within Dover District Council.

Challenges and Constraints Imposed by COVID-19 upon LAQM within Dover District Council

Although passive diffusion tube monitoring was not severely impacted by Covid-19, one changeover was missed during May 2020 causing no data to be collected for that month resulting in a **small** impact in line with Table F.1. The Council continued membership of K&MAQP, part of the K&MAQN contract renewal group and continued contract renewal for their new network managers; Ricardo AEA.

Table F 1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: Large
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

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	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 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

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Dover District Council Annual Status Report. July 2020.
- Dover District Council Appraisal. August 2020.