



# 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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## Executive Summary: Air Quality in Our Area

### Air Quality in Chichester District

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<sup>1,2</sup>.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion<sup>3</sup>.

Air quality in the majority of Chichester district is good however there are a few areas where elevated concentrations of pollutants occur. The main pollutant of concern in relation to statutory air quality standards is nitrogen dioxide (NO<sub>2</sub>) for which the key source is road traffic, particularly on roads in and adjacent to Chichester city and in the centre of Midhurst. Concentrations of NO<sub>2</sub> have shown a slight decrease over the last few years however there are still hotspots in Chichester and Midhurst where exceedances of the national air quality Objective for NO<sub>2</sub> occur. The hotspots in Chichester are within Air Quality Management Areas (AQMAs) and in Midhurst a new AQMA was recently declared in Rumbolds Hill. The AQMA locations are as follows:

- Stockbridge roundabout at the junction of the A27 and A286
- Orchard Street, Chichester
- St Pancras, Chichester
- Rumbolds Hill, Midhurst.

Our current Air Quality Action Plan (AQAP) was adopted in 2015 and is currently being reviewed, see <https://www.chichester.gov.uk/pollutioncontrolairquality>

The revised AQAP will incorporate the outcomes of the air quality modelling that was commissioned during 2019 and a longer review of the monitoring data.

Air quality is recognised by the Council as an important public health issue but not one we can improve on our own. We are working actively with other services in the Council and with partners at West Sussex County Council (WSCC) notably the Public Health team and Highways, Transport and Planning Colleagues and through WSCC's Inter Authority Air Quality Group (IAAQG). CDC is also a member of the Sussex Air Quality Partnership (SAQP) known as 'Sussex Air' and we play an active role in this group.

We have been working with neighbouring authorities and WSCC to produce a Local Cycling and Walking Infrastructure Plan (LCWIP) for Chichester and contracted a

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<sup>1</sup> Environmental equity, air quality, socioeconomic status and respiratory health, 2010

<sup>2</sup> Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

<sup>3</sup> Defra.abatement cost guidance for valuing changes in air quality, May 2013

consultancy in April 2019 to assist with this project (funded by a grant award from the WSCC pooled business rates fund). The draft report is complete and it is intended that it will go out for public consultation in September 2020 before adoption early in 2021. LCWIPs are a new strategic approach to identifying cycling and walking improvements required at the local level. They enable a long-term approach to developing networks and routes and form a vital part of the Government's strategy to increase the number of trips made on foot or bicycle.

We continue to work with our planning policy team and continue to contribute to the review of the Chichester Local Plan. A supplementary Planning Guidance note is being developed to provide clarity to the interpretation of air quality policies in the draft revised Local Plan. This work has been undertaken in collaboration with colleagues in SAQP.

## **Actions to Improve Air Quality**

Key completed actions during 2019 are as follows:

- Chichester District Council (CDC) installed eighteen electric vehicle charging points across Chichester District within its car parks. These are publicly available and are publicised on our website, see <https://www.chichester.gov.uk/electricparking>
- CDC has been a member of a Pan-West Sussex group of authorities contributing to the WSCC Local Cycling and Walking Infrastructure Plan (LCWIP) and two of the routes that feature within the WSCC Plan are strategic routes that terminate in Chichester city. This work will continue during 2020 and it is intended that a joint methodology for prioritisation of LCWIP routes will be developed as part of this group for use by each district and borough.
- CDC commissioned consultants to produce a Chichester LCWIP in April 2019 and the report has been drafted and is due to be completed in June 2020 and consulted on in September 2020.
- CDC commissioned consultants to undertake air quality modelling in order to inform the revised AQAP. This work has included source apportionment and scenario testing in order to help prioritise actions within the revised AQAP. This work is on-going.
- CDC has bid for additional funds from the WSCC pooled business rates fund in order to contribute to work on its revised AQAP.

## **Conclusions and Priorities**

The 2019 monitoring of NO<sub>2</sub> and PM<sub>10</sub> shows no exceedances of Air Quality Standards at any of the real-time monitoring stations. There are two diffusion tube locations where the UK's NO<sub>2</sub> air quality Objective of 40µg/m<sup>3</sup> was equalled or exceeded, namely:

- St Pancras, within the St Pancras AQMA, Chichester
- Rumbolds Hill, Midhurst within the recently declared Rumbolds Hill AQMA.

These locations were also highlighted last year as places where the Objective was exceeded. Additional diffusion monitoring tubes were deployed near these locations during 2018 and 2019 in order to supplement the data and to enable a better understanding of the spatial extent of pollution in these areas.

All other diffusion tube monitoring locations outside of AQMAs are compliant with the NO<sub>2</sub> Objective and annual concentrations measured were generally similar or lower than values in 2018.

It is not intended to revoke any of the AQMAs at this time. We have a watching brief on the monitoring data for the Orchard Street AQMA where the results show there is the possibility of undeclaring this AQMA in the future.

## Local Engagement and How to get Involved

The public can get involved by supporting behavioural change initiatives (eg joining the Car Club, car sharing and walking, cycling, using public transport, turning their vehicle's engine off when stationary, minimising wood burning and only burning dry, well-seasoned wood and composting instead of having garden bonfires wherever possible). Further information can be obtained by emailing: [airquality@chichester.gov.uk](mailto:airquality@chichester.gov.uk)

The Chichester and District Cycle Forum provides information on local cycling opportunities and campaigns on behalf of cyclists. The Forum is open to the public and further information can be obtained by emailing [cycle@chichester.gov.uk](mailto:cycle@chichester.gov.uk)

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# 1 Local Air Quality Management

This report provides an overview of air quality in Chichester District 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 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 Chichester District Council to improve air quality and any progress that has been made.

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



## 2 Actions to Improve Air Quality

### 2.1 Air Quality Management Areas

Air Quality Management Areas (AQMA) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMA declared by Chichester District Council can be found in Table 2.1. Further information related to declared or revoked AQMA, including maps of AQMA boundaries is available online at

<https://www.chichester.gov.uk/pollutioncontrolairquality>

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

Monitoring data for our Orchard Street, Chichester AQMA indicates that air quality there is compliant with all Objectives. As such we have a watching brief over the next year with a view to the possibility of undeclaring this AQMA.

We have declared a new AQMA at Rumbolds Hill, Midhurst. A revised AQAP is currently being drafted which will include actions that are relevant to Midhurst.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration	Now			Name	Date of Publication	Link
Stockbridge Roundabout AQMA	24-08-06	NO2 Annual Mean	Chichester	An area encompassing the Stockbridge Roundabout at the junction of the Chichester bypass (A27) and Stockbridge Road (A286)	YES	44.9	µg/m3	33	µg/m3	CDC AQAP	2015	<a href="https://www.chichester.gov.uk/pollutioncontrol">https://www.chichester.gov.uk/pollutioncontrol</a>
Orchard Street AQMA	17-05-07	NO2 Annual Mean	Chichester	An area along Orchard Street, Chichester at the eastern end of the street where it meets Northgate	NO	40.7	µg/m3	30	µg/m3	CDC AQAP	2015	as above
St Pancras AQMA	17-05-07	NO2 Annual Mean	Chichester	An area along St Pancras, Chichester between Eastgate Square and New Park Road. Note St Pancras forms a street canyon in this section.	NO	48.3	µg/m3	42	µg/m3	CDC AQAP	2015	as above
Rumbolds Hill AQMA	17-Jan-20	NO2 Annual Mean	Midhurst	An area along Rumbolds Hill, Midhurst between the A272 at its southern end and the junction of North Street (A286) and Knockhundred Row at its northern	NO	42	µg/m3	40	µg/m3	CDC AQAP	2015	as above

				end.									
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☒ Chichester District Council confirms 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 Chichester District

Defra's appraisal of last year's ASR and our response is shown in the table below:

Defra's comment	CDC response
The 2018 monitoring indicated that two sites were exceeding the annual mean Objective NO <sub>2</sub> concentration. Of these sites, one is within the St Pancras AQMA and one site at Rumbolds Hill, Midhurst, is not within a current AQMA. Exceedances have been measured at Rumbolds Hill over the past 3 years and the Council plans to declare the area an AQMA in 2019	An AQMA has since been declared at Rumbolds Hill and further details are given in Table 2.1
The Council has commissioned detailed air quality modelling of discrete areas of Chichester and Midhurst in 2019 and the modelling will be reported in next year's ASR.	The modelling is reported in this year's ASR, see below, and has informed the necessity (and extent) of the Rumbolds Hill AQMA and any amendments or additional AQMAs in Chichester.
Defra suggested that Section 2.3 could make reference to the Public Health Outcomes Framework, and the local indicator for PM <sub>2.5</sub> in the district	Additional information has been added to Section 2.3 as suggested.
Defra noted the local bias adjustment factor used by the Council has decreased from 0.93 in 2017 to 0.85 in 2018. Should local factors continue to decrease, the Council may wish to consider using the national factor, if deemed more appropriate.	This year's local bias adjustment factor is 0.84 which is only a marginal decrease from last year therefore CDC will continue to use the local bias adjustment factor.

Chichester District 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.

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

- Installation of eighteen EV charging points across the District including at Chichester and Midhurst where the AQMAs are located.
- Detailed modelling of air quality in Chichester and Midhurst has been carried out and the result of this work is being used to develop actions within the revised Air Quality Action Plan.

- A Local Cycling and Walking Infrastructure Plan (LCWIP) has been drafted and will be finalised during 2020. We have worked in partnership with West Sussex County Council (WSCC) and other districts and boroughs in the county on aspects of this work and it is intended that a county-wide prioritisation framework will be developed in 2020 in order to rank our schemes against other schemes within the county to inform future infrastructure planning.
- We continue our partnership working with Sussex Air, IAAQG and Chichester and District Cycle Forum.

Chichester District Council (CDC) expects the following measures to be completed over the course of the next reporting year:

- To complete the air quality modelling
- To produce and consult on the revised Air Quality Action Plan
- To finalise the Supplementary Policy Document on air quality to enable the air quality impact of new development to be properly considered during the planning process
- To expand the Car Club in Chichester city (which was originally set up using Defra funding). We hope to let a tender for an additional car to be put in place during 2021.
- To support our partners particularly WSCC with respect to prioritising routes in the WSCC and CDC LCWIP documents.

CDC's priorities for the coming year are:

- To complete the revised Air Quality Action Plan
- To finalise the Local Cycling and Walking Infrastructure Plan (LCWIP) and work the planning policy team to enable the routes to be prioritised within the Council's infrastructure business plan.

The principal challenges and barriers to implementation that CDC anticipates facing are:

- The impact of the Covid 19 outbreak on resources within CDC and the local economy
- Availability of funding for infrastructure projects

Progress on the following measures has been slower than expected due to:

- Staff have been working remotely since March 2020 due to the Covid 19 outbreak and all communications since that time have been 'virtual'. Resources in some teams have been redeployed which has delayed some work streams.

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

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	Set up Air Quality Working Group	Promoting Travel Alternatives	Other	Dec-08	CDC	CDC	2 meetings per year	N/A	12 meetings held to date	Ongoing	Part of West Sussex Air Quality group led by Public Health since 2018
2	Cleaner vehicles	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2011	WSCC/CDC	WSCC/CDC	No. of electric vehicle recharging points		Installed a total of 18 recharging points in Chichester district having secured funding in 2019 from OLEV. Part of regional network of rapid charging points through Sussex-air project.	Completed	Funding was complicated by the need to make charging points cost neutral as far as possible
3	Planning policy	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	ongoing	CDC	CDC	No. of planning conditions imposed on planning consultations		Sussex-air produced Planning Guidance and Low Emissions Strategy and in discussion with CDC Policy Planners regarding adopting LES approach. Sussex-air has reviewed its guidance in 2019	2019-20	WSCC revised parking standards in March 2019 which are also applied as conditions where applicable
4	Cycling and walking initiatives	Promoting Travel Alternatives	Promotion of cycling	2010	CDC/WSCC	CDC/WSCC	% increase in cycling		Similar levels of cycling from 2018-2019 on most routes. LCWIP for Chichester City drafted and WSCC have produced strategic LCWIP.	Chichester LCWIP to be completed June 2020	Prioritisation of LCWIP routes across West Sussex to be delivered as part of partnership between WSCC and districts and boroughs in the County in 2020
5	Car Clubs	Alternatives to private vehicle use	Car Clubs	2011	CDC/WSCC	CDC/Car Club Operator	Utilisation rate of cars to be 20%		6 cars now available to book, development worker employed 2014-16 to promote Club, utilisation rate increasing throughout 2019 and ranged from 11 - 20% depending on car location.	ongoing	Pre Covid 19 outbreak we were planning that a new car would be introduced to the fleet during 2020
6	School travel plans	Promoting Travel Alternatives	School Travel Plans	2009/10	WSCC/CDC	WSCC	% children travelling to school by sustainable means		During 2017/18 Living Streets project engaged with 5 primary schools in the District to support Walk to School scheme (WOW)	Mar-20	

									and engaged students and staff at Chichester University (2 year project)		
7	WSCC and CDC travel plans	Promoting Travel Alternatives	Workplace Travel Planning	2011/12	WSCC/CDC	WSCC/CDC	% WSCC and CDC staff travelling by sustainable means		WSCC grey fleet business mileage was 5.75 million miles below 6.0 million miles target. Easit scheme at WSCC and CDC to encourage rail use. Cycle to work scheme at CDC	Ongoing	Includes 21,462 miles using electric pool cars (4 available at WSCC)
8	Business travel plans	Promoting Travel Alternatives	Workplace Travel Planning	2009	WSCC	WSCC	Travel Plan implemented within target time period		Over 43 Travel Plans submitted since 2009 and Travel Plan group set up attended by large organisations to work on joint measures.	Ongoing	Additional 8 plans during 2019
9	Residential travel plans	Promoting Travel Alternatives	Personalised Travel Planning	2009	WSCC	WSCC	Travel Plan implemented within target time period		Over 34 Travel Plans have been submitted since 2009	Ongoing	Additional 4 plans during 2019
10	TravelWise/ smarter choices	Public Information	Via the Internet	2009	WSCC/CDC	WSCC	No. of users of WSCC car share database for PO19 area		Steady increase in number of users of database for 2019	Ongoing	1879 journeys into PO19 area using car share scheme in 2019
11	Cycle route information	Promoting Travel Alternatives	Promotion of cycling	2009	CDC	CDC	No. of maps sold through Tourist Information or other outlets.		5 route leaflets have been produced so far and over 1400 copies have been sold to date. 47 leaflets sold in 2019	Ongoing	47 maps sold in 2019
12	Cycle journey planning	Public Information	Via the Internet	2011	WSCC	WSCC	No. of journeys planned on website		Web link available on WSCC and CDC websites	Ongoing	4354 journeys planned 2019-20
13	Public transport infrastructure	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	2011-15	WSCC	WSCC	Increase in use of public transport		RTPI displays installed at key locations across City	Ongoing	8 RTPI displays installed in 2018-19 and 12 more planned for 2020.
14	Cleaner buses	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2009	WSCC	WSCC	% of Euro 5 buses		Two Euro 6 double deckers added to fleet in 2019. Emissions retrofitting project ongoing for 2020 for five Euro 4 and three Euro 3 buses	Ongoing	retrofitting will upgrade to Euro 6 emissions standard
15	Licensing requirement for taxis	Promoting Low Emission Transport	Taxi Licensing conditions	2011	CDC	CDC	No. of Euro 4 vehicles		For vehicles 5 years and over, MOT and fitness test required every 6 months	Ongoing	



16	Forecasting , monitoring and public information	Public Information	Via other mechanisms	2008	SAQP	SAQP	No. of people registered to receive alerts		Over 1161 subscribers registered across Sussex	Ongoing	inc of 154 subscribers during 2019
17	AQ monitoring and traffic monitoring	Traffic Management	UTC, Congestion management, traffic reduction	2008	CDC/WSCC	CDC/ WSCC	Reduction in traffic volumes		Traffic flows between 2018 - 2019 have reduced by 3% in the Orchard St AQMA however the data was incomplete in the other two AQMAs so the flows could not be compared.	Ongoing	
18	A27 by-pass improvements	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	post 2025	HE	HE	Reduction in congestion		HE re-consulted during 2017 on options for improving A27 around Chichester however no option chosen	2025	No funds allocated for A27 improvements at the present time.
19	Variable message signing (VMS) on A27	Traffic Management	UTC, Congestion management, traffic reduction	pilot by 2020	HE	HE	No. of warnings made per year		HE decision awaited	Ongoing	Awaiting outcome of A27 improvements decision
20	Park and ride schemes in and around City	Alternatives to private vehicle use	Bus based Park & Ride	post 2020	CDC/WSCC	CDC/ WSCC	Reduce traffic in City centre by 3%		Linked to A27 improvements that have not yet been brought forward	Ongoing	
21	Speed limit changes - 20 mph as part of school safety zone	Traffic Management	Reduction of speed limits, 20mph zones	2012/13	WSCC	WSCC	Reduction in traffic queues within Orchard St AQMA area		Signs installed around schools and on nearby residential streets	Completed	Reductions in NO2 within AQMA could be achieved through smoothing of traffic flow
22	Blanket 20mph scheme on residential streets	Traffic Management	Reduction of speed limits, 20mph zones	2013/14	WSCC	WSCC	Reduced speed on residential streets		WSCC contracted officer to promote 20mph and work with schools and community and CDC hosted officer and provided support	Completed	Roads monitored before and after implementation and speed reductions achieved on some roads
23	MOVA traffic signal optimisation	Traffic Management	UTC, Congestion management, traffic reduction	2010	WSCC	WSCC	Reduction in traffic queues within AQMAs		2 new Puffins to replace existing crossings implemented	Completed	Improves emissions by eliminating ghost users and reducing red time

## 2.3 PM<sub>2.5</sub> – 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<sub>2.5</sub> (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM<sub>2.5</sub> has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Data from the Public Health Outcomes Framework indicates that the ‘fraction of mortality attributable to particulate air pollution’ was 5.0 % for Chichester district (2018 data). This compares to the National average for England of 5.2% and the range across districts and boroughs within West Sussex of 5.0 – 5.8%.

Chichester District Council is taking the following measures to address PM<sub>2.5</sub>:

- Measure 15 – taxi licensing conditions – since 2011 we have required vehicles that are 5 years old and over to have MOT and fitness tests every 6 months. The taxi licensing policy is currently under review and air quality considerations will be considered as part of the review.
- Measure 14 – cleaner buses – fleet managers report that upgrades to the fleet are ongoing in order to introduce cleaner buses. WSCC continues to engage with them to promote any funding opportunities that may enable upgrades to the fleet.
- Measure 2 – cleaner vehicles – we have installed electric vehicle charging points across the district and have a procurement policy to encourage the use of electric vehicles where the business case is favourable.

We have been working in partnership with West Sussex Public Health and WSCC to run an anti-idling campaign outside schools and at level crossings across West and East Sussex. Signs have been placed at suitable locations with anti-idling messages to raise awareness about this issue.

Where considered appropriate we have recommended that construction environmental management plans (CEMP) are put in place at new developments which include dust control strategies.

During 2019 we publicised the air quality impacts of burning wet wood in domestic fireplaces and wood burning stoves and provided public information to enable people to procure seasoned wood that has a moisture content of below 20%.

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

### 3.1 Summary of Monitoring Undertaken

#### 3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Chichester District Council undertook automatic (continuous) monitoring at 4 sites during 2019 (note one site, CI5 was commissioned in February 2019 therefore data for a full year is not yet available). Table A.1 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 how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

#### 3.1.2 Non-Automatic Monitoring Sites

Chichester District Council undertook non- automatic (passive) monitoring of NO<sub>2</sub> at 18 sites during 2019 (note at some locations there are co-located tubes). Table A.2 in Appendix A shows the details of the sites. A new site was added in November 2019, data from this site will be reported in next year's ASR.

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.

## 3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias<sup>4</sup>, "annualisation" (where the data capture falls below 75%), and distance correction<sup>5</sup>. Further details on adjustments are provided in Appendix C.

#### 3.2.1 Nitrogen Dioxide (NO<sub>2</sub>)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past 5 years with the air quality objective of 40µg/m<sup>3</sup>. Note that the concentration data 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).

<sup>4</sup> <https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html>

<sup>5</sup> Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

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<sub>2</sub> hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m<sup>3</sup>, not to be exceeded more than 18 times per year.

Data in Table A.3 indicates that there has been a decrease in the NO<sub>2</sub> annual mean concentration at the Stockbridge monitoring station (from 29 to 28µg/m<sup>3</sup>) and the air quality objective was not exceeded. The results at this location have been broadly similar for the past five years, ranging from 28 - 34µg/m<sup>3</sup> and since 2015 have shown a downward trend. The monitoring station is not within the AQMA and does not represent a location of relevant exposure however it is the only suitable long term location available for the real-time monitoring near the Stockbridge AQMA. There are three co-located diffusion tubes at the monitoring station and the 2019 annual means for these tubes were all 28µg/m<sup>3</sup>. As noted for the monitoring station the air quality objective was not exceeded. Results for the Claremont Court diffusion tube location (which is within the Stockbridge AQMA) show no change from 2018 to 2019 at 33 µg/m<sup>3</sup> (as an average of two co-located tubes). Results at Claremont Court have ranged from 33 – 42µg/m<sup>3</sup> over the last five years so monitoring will be continued at this location to determine the long term trend within this AQMA.

At the Orchard Street monitoring station the NO<sub>2</sub> annual mean concentration was 21 µg/m<sup>3</sup>. Results at this monitoring station have ranged from 21 - 29µg/m<sup>3</sup> over the last five years and the air quality objective has never been exceeded. It should be noted that the analyser at the monitoring station was replaced in September 2016 due to a fault with the previous analyser, therefore we do not have a full year's data for 2016 or any data for 2015. A diffusion tube has been co-located at the monitoring station for two years and the annual mean for this tube was 20µg/m<sup>3</sup>. At another nearby diffusion tube location the annual mean was 30µg/m<sup>3</sup> (average of the two co-located tubes). The results at this diffusion tube location have ranged from 30 - 38µg/m<sup>3</sup> over the last five years. Both the monitoring station and the diffusion tubes are located within the AQMA and represent relevant exposure. We will continue monitoring at Orchard Street however there remains the possibility of undeclaring the AQMA in the future.

At the Westhampnett Road monitoring station the NO<sub>2</sub> annual mean concentration was 27µg/m<sup>3</sup>. This monitoring station was commissioned in February 2019 so a full year's data is not available for 2019. The nearest diffusion tube to the monitoring station is located east of the monitoring station but also on Westhampnett Road. The annual mean at this location has ranged from 27 - 31µg/m<sup>3</sup> over the last five years. Neither the monitoring station nor the diffusion tube are located within an AQMA however they are sited on a busy arterial route into Chichester which is also used by a large number of pedestrians.

At two of the diffusion tube locations, the air quality objective of 40µg/m<sup>3</sup> was equalled or exceeded, namely:

- St Pancras, within the St Pancras AQMA

- Rumbolds Hill, Midhurst – within the Rumbolds Hill AQMA declared in January 2020

At two other locations, the diffusion tube annual means were close to the air quality objective. At the Nag's Head, Chichester the annual mean was  $37\mu\text{g}/\text{m}^3$  (this tube is within the St Pancras AQMA) and at the Nat West Bank site, Midhurst the annual mean was also  $37\mu\text{g}/\text{m}^3$ . This tube is within the newly declared Rumbolds Hill AQMA. Monitoring will continue at the Midhurst monitoring locations to determine the ongoing trend within this AQMA.

The data for the Stockbridge AQMA (eg the Claremont Court diffusion tubes) indicates that the  $\text{NO}_2$  concentration has stayed the same from 2018 to 2019 at  $33\mu\text{g}/\text{m}^3$ . Results at Claremont Court have ranged from 33 –  $42\mu\text{g}/\text{m}^3$  over the last five years so monitoring will be continued at this location to determine the long term trend within this AQMA.

The data for the St Pancras AQMA (eg the St Pancras tubes and the Nag's Head tube) indicates the air quality objective continues to be exceeded so monitoring will continue at these locations to establish the ongoing trend. The diffusion tube data within The Hornet, near the St Pancras AQMA (eg The Hornet tubes and the Sussex Cleaners tube) was compliant with the air quality objective.

The data for the Orchard Street AQMA (eg the co-located tube and the tube at 174 Orchard Street) indicates that the air quality objective has not been exceeded for the last five years. We intend to maintain a watching brief at this location to determine the need to undeclare this AQMA in the future.

At all the other diffusion tube monitoring sites the  $\text{NO}_2$  concentration has decreased from 2018 to 2019 (with the exception of Arthur Purchase in Chichester where the concentration has remained the same) and all sites were compliant with the air quality objective.

From Table A.4 there have been no exceedances of the  $\text{NO}$  1-hour mean concentration at the Stockbridge, Orchard Street or Westhampnett Road monitoring stations for the last five years. The DEFRA guidance suggests that the 1-hour mean objective is unlikely to be breached unless the annual mean concentration is  $60\mu\text{g}/\text{m}^3$  or above.

### 3.2.2 Particulate Matter ( $\text{PM}_{10}$ )

Table A.5 in Appendix A compares the ratified and adjusted monitored  $\text{PM}_{10}$  annual mean concentrations for the past 5 years with the air quality objective of  $40\mu\text{g}/\text{m}^3$ .

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

From Table A.5, the annual mean concentration (19µg/m<sup>3</sup> in 2019) has varied over the last five years from a maximum of 21µg/m<sup>3</sup> (2015) to 18µg/m<sup>3</sup> (2018) and is compliant with the air quality objective of 40µg/m<sup>3</sup>. In addition the number of PM<sub>10</sub> daily mean concentrations exceeding the Objective has varied over the last five years from a maximum of 3 in 2015 to zero in 2019. The air quality objective (50µg/m<sup>3</sup> not to be exceeded more than 35 times per year) has therefore been met for the last five years.

### 3.2.3 Particulate Matter (PM<sub>2.5</sub>)

Using the methodology stated in Chapter 7 of the Technical Guidance LAQM TG16 sections 7.107-7.111, the estimated PM<sub>2.5</sub> concentration in Chichester is 13.3µg/m<sup>3</sup>. This compares to 10µg/m<sup>3</sup> measured at two other Sussex sites (Worthing and Eastbourne).

### 3.2.4 Ozone (O<sub>3</sub>)

Chichester District Council has been monitoring ozone in the rural village of Lodsworth for over ten years. Ozone concentrations can become elevated when nitrogen dioxide and volatile organic compounds react in the presence of strong sunlight. CDC monitors this pollutant due to its importance with regard to public health and to provide information to the Sussex-air, air-Alert public information system (see Table 2.2 Measure no. 16).

The Table below compares the ratified and adjusted monitored O<sub>3</sub> concentrations and indicates that the number of exceedances of the running 8 hour mean (of 100µg/m<sup>3</sup> or 50 ppb) was ten for 2019 and has fluctuated over the last five years from seven in 2015 to thirty six in 2018.

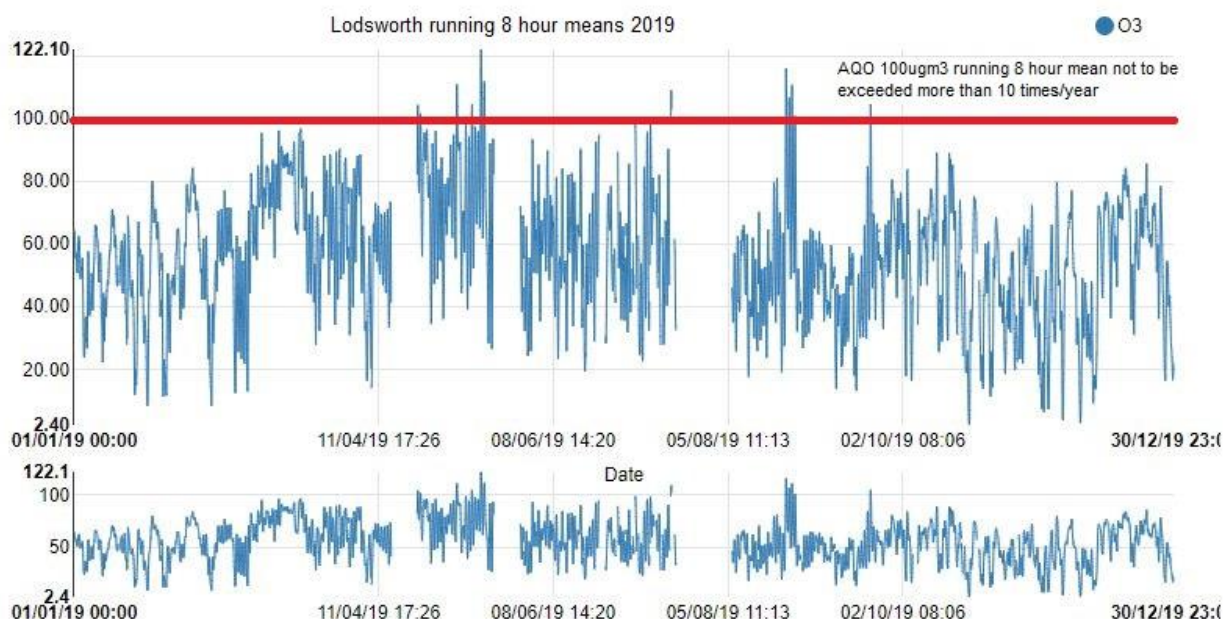
Site ID	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2019 (%) <sup>(2)</sup>	O <sub>3</sub> - No more than 10 days where maximum rolling 8 hr mean >= 100 µg/m <sup>3</sup>				
				2015	2016	2017	2018	2019
AR1	Rural (Lodsworth)		88	7	16	15	36	10

(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%).

The latest data shows that the Objective was achieved in 2019 as there were ten exceedances of the running 8 hour mean during the year, see below.





Comparison to the DEFRA banding below shows that in 2019 at Lodsworth there were 10 days when 'moderate pollution' occurred and no days when 'high pollution' occurred, see box for health messages of DEFRA pollution bands.

### Health messages of the DEFRA Pollution Bands

Pollution band and numerical index	Health messages for at-risk groups*
1 – 3 (low)	Enjoy your usual outdoor activities.
4 – 6 (moderate)	Adults and children with lung problems, and adults with heart problems, who experience symptoms, should consider reducing strenuous physical activity, particularly outdoors.
7 – 9 (high)	Adults and children with lung problems, and adults with heart problems, should reduce strenuous physical exertion, particularly outdoors, and particularly if they experience symptoms. People with asthma may find they need to use their reliever inhaler more often. Older people should also reduce physical exertion.
10 (very high)	Adults and children with lung problems, adults with heart problems, and older people, should avoid strenuous physical activity. People with asthma may find they need to use their reliever inhaler more often.
*Adults and children with heart or lung problems are at greater risk of symptoms.	

NB. Local authorities are no longer obliged to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is an issue. National monitoring results are available at <https://uk-air.defra.gov.uk/data/>



## 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?	Monitoring Technique	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Inlet Height (m)
CI1	Stockbridge	Suburban	485881	103791	NO <sub>2</sub> ; PM <sub>10</sub>	NO	chemilumin- escent/TEOM	25	26	3
CI4	Orchard Street	Roadside	485982	105221	NO <sub>2</sub>	YES (Orchard St AQMA)	Chemiluminescent	9.8	3.75	2
AR1	Lodsworth	Rural	492396	123248	O <sub>3</sub>	NO	UV	n/a	n/a	2.1
CI5	Westhampnett Road	Roadside	487212	105372	NO <sub>2</sub>	NO	Chemiluminescent	11.8	4.2	1.9

**Notes:**

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

(2) N/A if not applicable

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

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?	Height (m)
1	Kings Ave/Southbank Jct	Roadside	485776	103961	NO2	N	11	2.25	NO	3
2	Claremont Court	Roadside	485772	103847	NO2	Y (Stockbridge roundabout AQMA)	0	7.5	NO	3
3	Cabin	Suburban	485880	103791	NO2	N	25	26	YES	2.7
4	Cabin	Suburban	485880	103791	NO2	N	25	26	YES	2.7
5	Cabin	Suburban	485880	103791	NO2	N	25	26	YES	2.7
6	Stockbridge Road South	Roadside	485696	103731	NO2	N	14	2	NO	2.85
7	Cleveland Rd	Urban Background	486953	104414	NO2	N	18	1.8	NO	2.8
8	Westhampnett Road	Roadside	487341	105474	NO2	N	3	1.65	NO	2.85
9	Hornet	Roadside	486502	104795	NO2	N	0	1.8	NO	3.1
10	St Pancras	Roadside	486533	104860	NO2	Y (St Pancras AQMA)	0	2	NO	3
11	Arthur Purchase	Urban Background	486082	105026	NO2	N	0	6	NO	2.7
12	174 Orchard St	Roadside	485914	105185	NO2	Y (Orchard St AQMA)	0	2	NO	2.65
14	Rumbolds Hill,	Roadside	488561	121479	NO2	Y	0.5	1.5	NO	3.4

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	Midhurst					(Rumbolds Hill AQMA)				
15	Sussex Cleaners	Roadside	486575	104799	NO2	N	0	1.82	NO	2.95
16	Nag's Head	Roadside	496495	104845	NO2	Y (St Pancras AQMA)	0	2.38	NO	3.23
17	Orchard St cabin	Roadside	485982	105221	NO2	Y (Orchard St AQMA)	9.8	3.75	YES	1.95
18	Midhurst Stationery	Roadside	488545	121434	NO2	Y (Rumbolds Hill AQMA)	1.8	0.62	NO	2.79
19	Nat West Bank	Roadside	488583	121512	NO2	Y (Rumbolds Hill AQMA)	9.9	1.07	NO	2.97
20	Nationwide	Roadside	488605	121538	NO2	Y (Rumbolds Hill AQMA)	0.5	2.15	NO	2.7
21	British Heart Foundation	Roadside	488636	121613	NO2	N	0	3.8	NO	2.79

## 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<sub>2</sub> Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2019 (%) <sup>(2)</sup>	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3) (4)</sup>				
							2015	2016	2017	2018	2019
CI1	485881	103791	Suburban	Automatic		97	34	34	33	29	28
CI4	485982	105221	Roadside	Automatic		100	x	29	23	22	21
CI5	487212	105372	Roadside	Automatic		88	x	x	x	x	27
1	485776	103961	Roadside	Diffusion Tube		100	30	33	29	27	25
2	485772	103847	Roadside	Diffusion Tube		100	<b>42</b>	<b>42</b>	39	33	33
3	485880	103791	Suburban	Diffusion Tube		100	34	34	33	29	28
4	485880	103791	Suburban	Diffusion Tube		100	34	33	32	30	28
5	485880	103791	Suburban	Diffusion Tube		100	34	35	34	29	28
6	485696	103731	Roadside	Diffusion Tube		100	<b>41</b>	<b>43</b>	36	34	33
7	486953	104414	Urban Background	Diffusion Tube		56	17	18	16	15	14
8	487341	105474	Roadside	Diffusion Tube		100	30	31	30	29	27
9	486502	104795	Roadside	Diffusion Tube		100	<b>40</b>	<b>41</b>	38	36	34
10	486533	104860	Roadside	Diffusion Tube		100	<b>46</b>	<b>51</b>	<b>44</b>	<b>45</b>	<b>42</b>
11	486082	105026	Urban Background	Diffusion Tube		100	18	20	18	17	17
12	485914	105185	Roadside	Diffusion Tube		100	33	38	33	33	30

14	488561	121479	Roadside	Diffusion Tube		92	<b>48</b>	<b>51</b>	<b>49</b>	<b>42</b>	<b>40</b>
15	486575	104799	Roadside	Diffusion Tube		100	x	x	x	32	31
16	496495	104845	Roadside	Diffusion Tube		100	x	x	x	38	37
17	485982	105221	Roadside	Diffusion Tube		92	x	x	x	22	20
18	488545	121434	Roadside	Diffusion Tube		92	x	x	x	28	26
19	488583	121512	Roadside	Diffusion Tube		92	x	x	x	37	37
20	488605	121538	Roadside	Diffusion Tube		92	x	x	x	38	33
21	488636	121613	Roadside	Diffusion Tube		92	x	x	x	27	24

☒ 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<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> 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) 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.

Figure A.1 – Trends in Annual Mean NO<sub>2</sub> Concentrations at Stockbridge, Orchard St and Westhampnett Rd monitoring stations

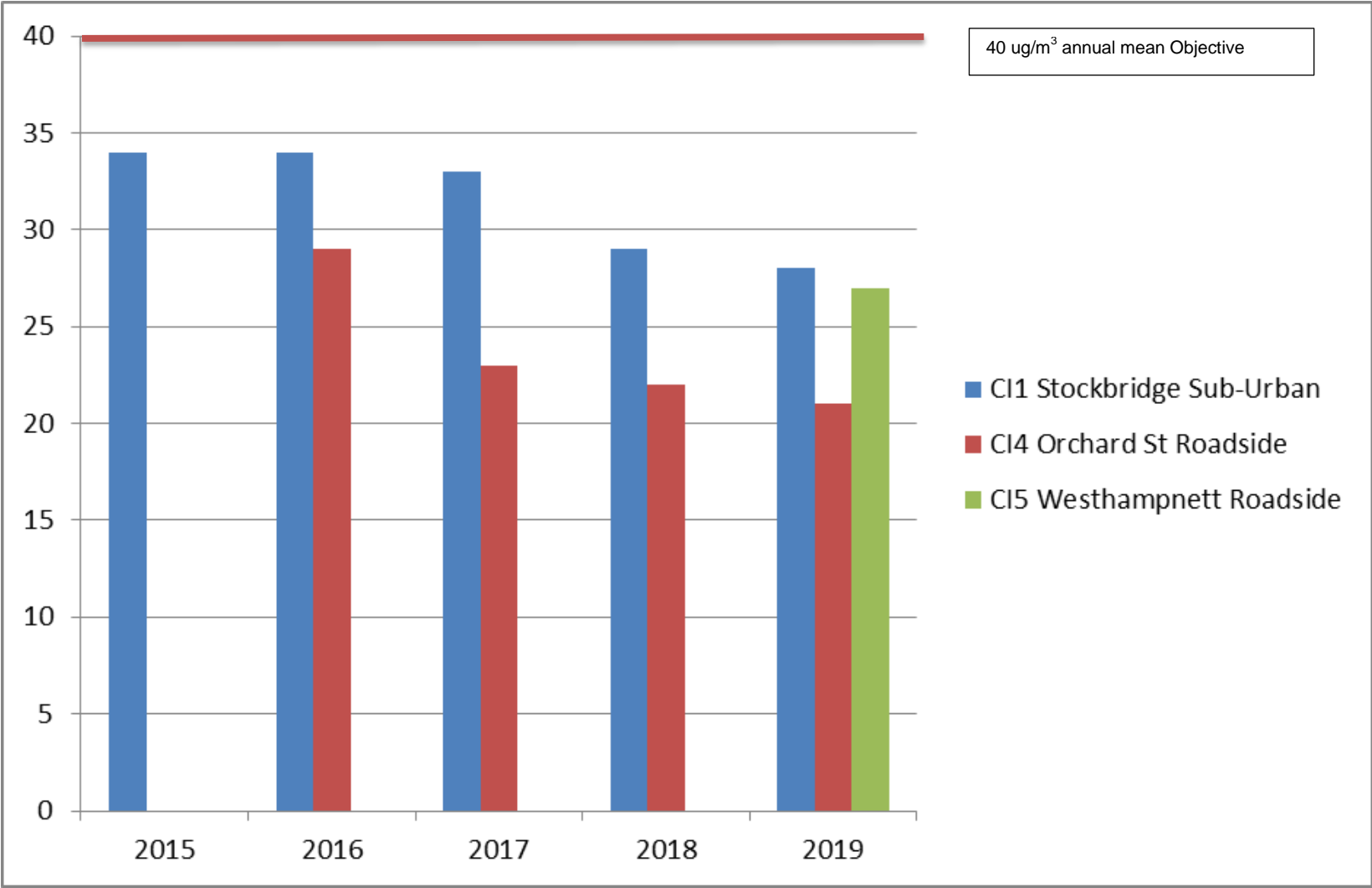


Table A.4 – 1-Hour Mean NO<sub>2</sub> Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2019 (%) <sup>(2)</sup>	NO <sub>2</sub> 1-Hour Means > 200µg/m <sup>3</sup> <sup>(3)</sup>				
							2015	2016	2017	2018	2019
CI1	485881	103791	Suburban	Automatic		97	0	0	0	0	0
CI4	485982	105221	Roadside	Automatic		100	x	0	0	0	0
CI5	487212	105372	Roadside	Automatic		88	x	x	x	x	0

**Notes:**

Exceedances of the NO<sub>2</sub> 1-hour mean objective (200µg/m<sup>3</sup> 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 99.8<sup>th</sup> percentile of 1-hour means is provided in brackets.

Figure A.2 – Trends in Number of NO<sub>2</sub> 1-Hour Means > 200µg/m<sup>3</sup>

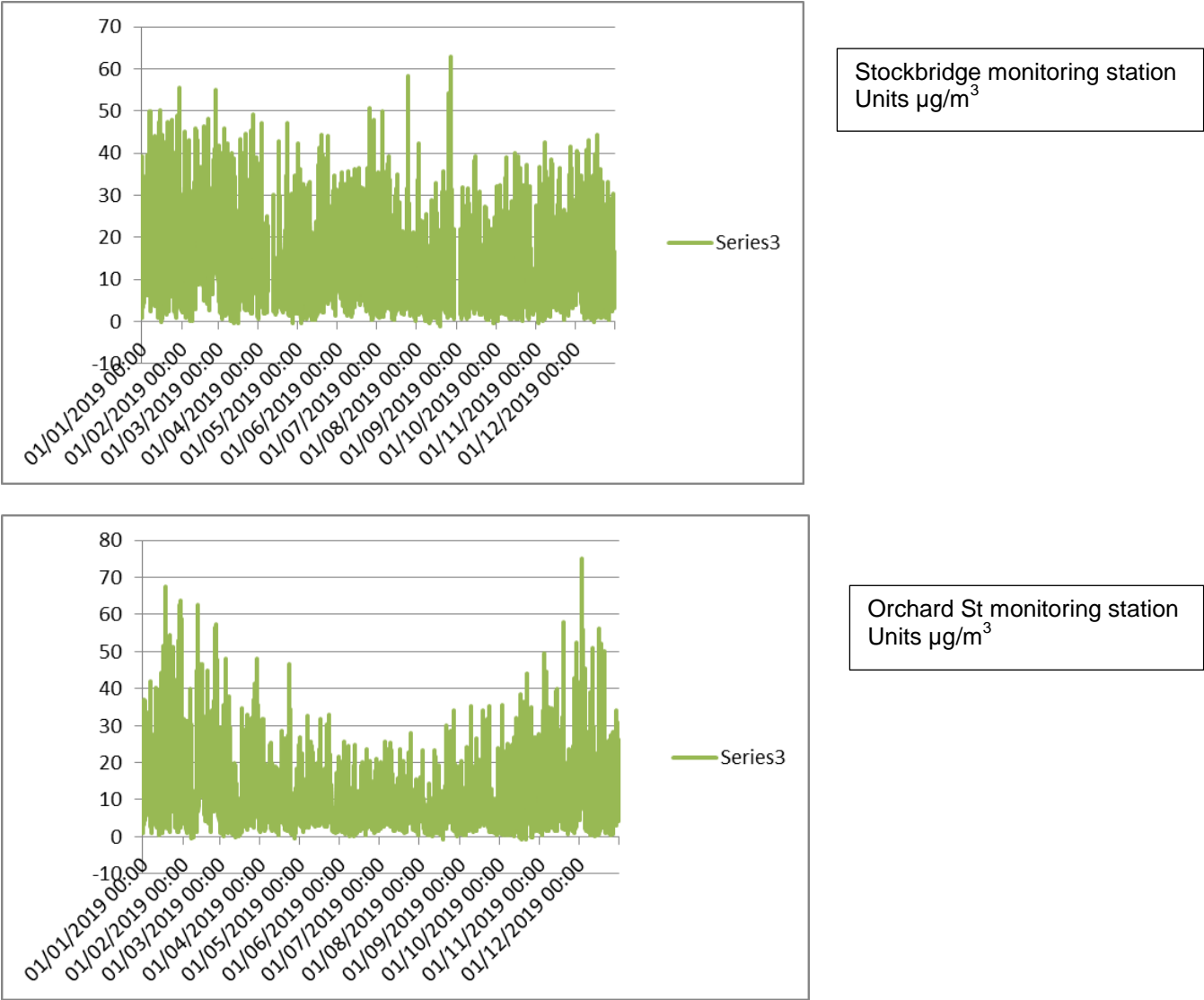




Figure A.3 – Trends in NO<sub>2</sub> diffusion tubes 2015 - 2019

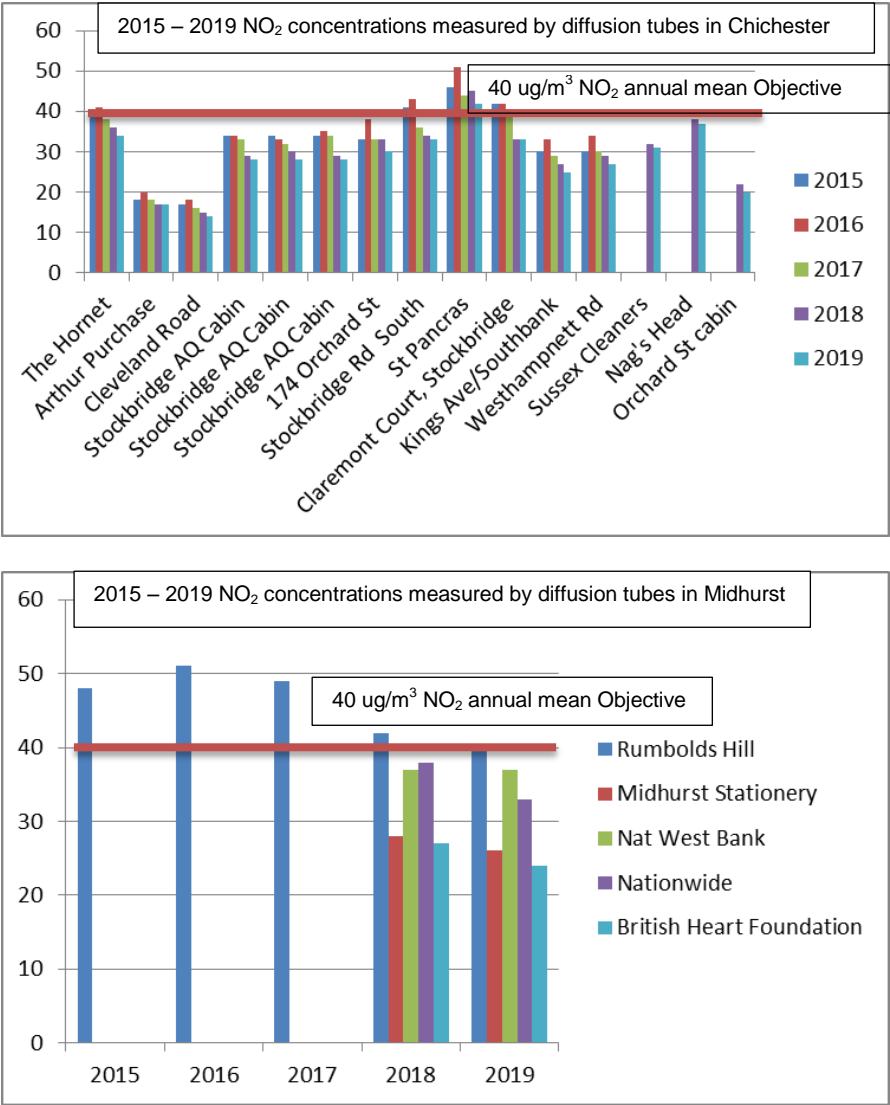


Table A.5 – Annual Mean PM<sub>10</sub> Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2019 (%) <sup>(2)</sup>	PM <sub>10</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)</sup>				
						2015	2016	2017	2018	2019
CI1	485881	103791	Suburban		99	21	20	19	18	19

**Notes:**

Exceedances of the PM<sub>10</sub> annual mean objective of 40µg/m<sup>3</sup> 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.4 – Trends in Annual Mean PM<sub>10</sub> Concentrations

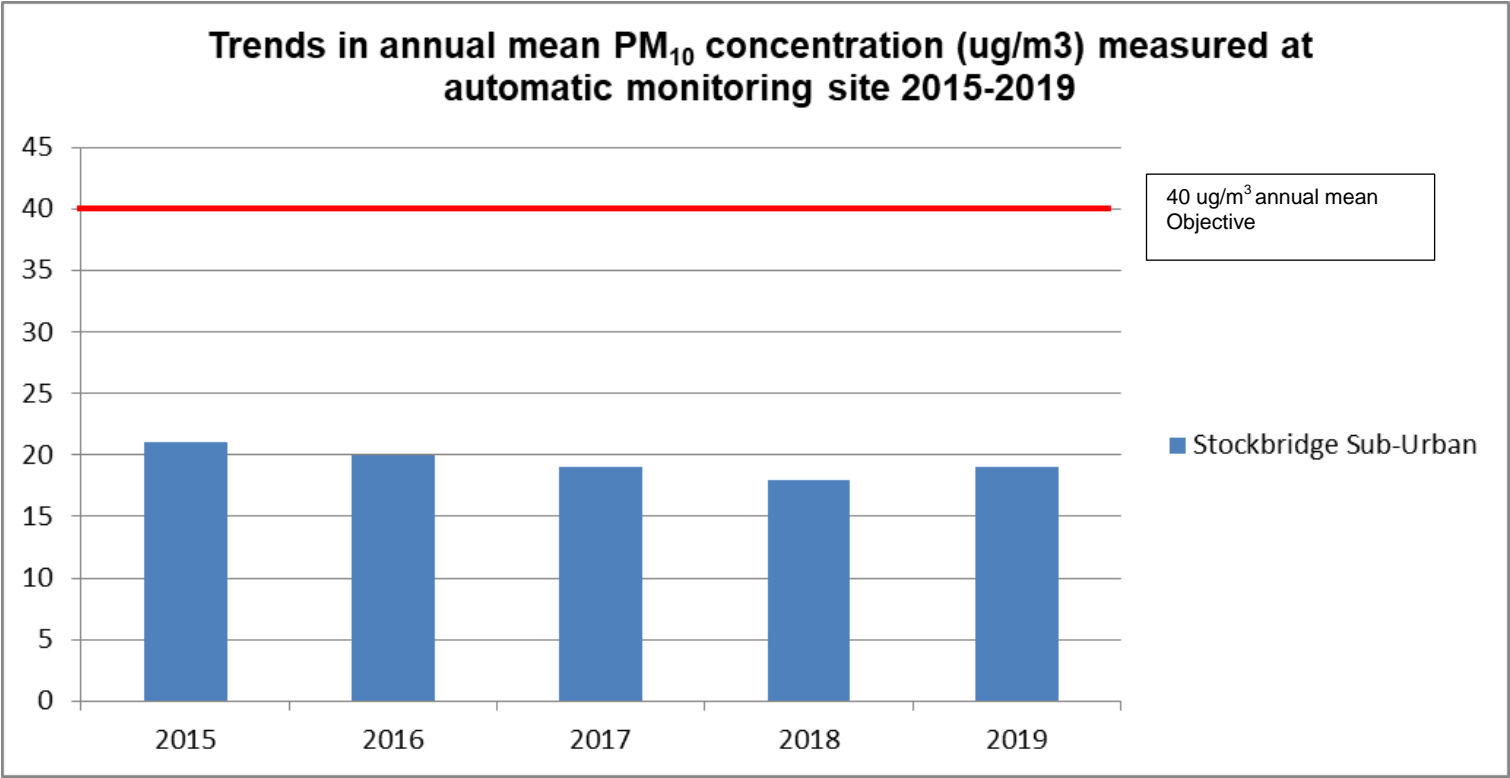


Table A.6 – 24-Hour Mean PM<sub>10</sub> Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2019 (%) <sup>(2)</sup>	PM <sub>10</sub> 24-Hour Means > 50µg/m <sup>3</sup> <sup>(3)</sup>				
						2015	2016	2017	2018	2019
CI1	485881	103791	Suburban		99	3	2	1	0	0

**Notes:**

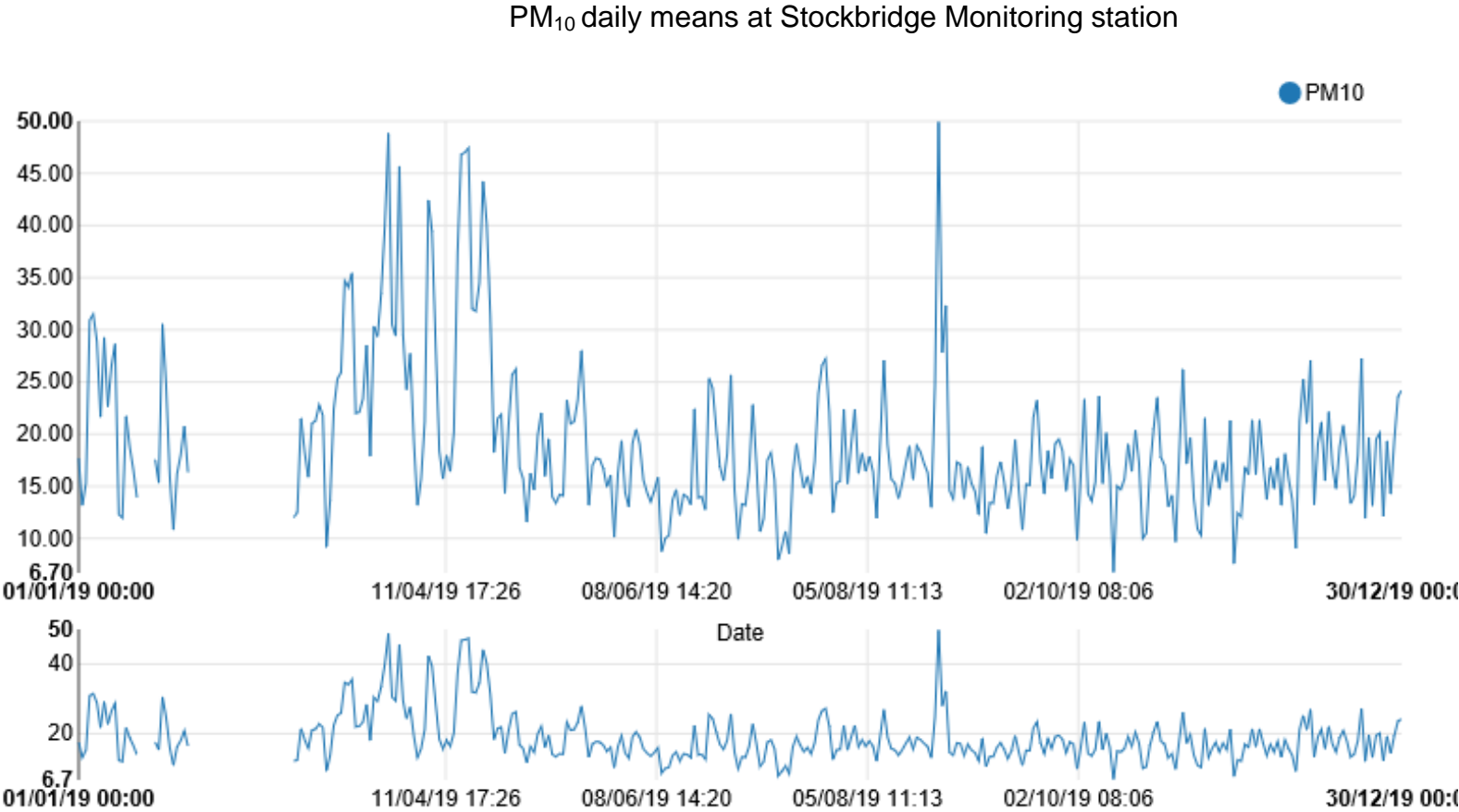
Exceedances of the PM<sub>10</sub> 24-hour mean objective (50µg/m<sup>3</sup> not to be exceeded more than 35 times/year) are shown in **bold**.

(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 90.4<sup>th</sup> percentile of 24-hour means is provided in brackets.

Figure A.5 – Trends in Number of 24-Hour Mean PM<sub>10</sub> Results >50µg/m<sup>3</sup>



Units are µg/m<sup>3</sup> – no exceedances of Objective (50µg/m<sup>3</sup>) during 2019

## Appendix B: Full Monthly Diffusion Tube Results for 2019

Table B.1 - NO<sub>2</sub> Monthly Diffusion Tube Results - 2019

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )														
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
															Raw Data	Bias Adjusted (0.84) and Annualised <sup>(1)</sup>	Distance Corrected to Nearest Exposure <sup>(2)</sup>
1	485776	103961	36.7	36.9	28.8	31.1	28.1	29.8	31.2	31.1	30.2	13.5	36.7	29.8	30.3	25.4	-
2	485772	103847	43.1	43.2	33.9	41.5	38.3	41.5	41.2	39.1	40.5	35.0	39.6	40.8	39.8	33.3	-
2a	485772	103847	42.6	45.6	35.8	39.4	41.3	43.2	41.8	43.0	37.4	37.8	37.2	35.4	40.0	33.5	-
3	485880	103791	38.1	39.2	41.2	22.3	26.6	34.9	32.0	39.4	31.2	29.5	31.8	33.3	33.3	27.8	-
4	485880	103791	37.7	41.5	38.1	25.8	24.6	32.2	34.3	39.3	32.6	30.7	30.6	38.0	33.8	28.2	-
5	485880	103791	42.1	43.1	40.0	17.7	28.5	36.4	34.4	36.1	37.5	33.2	30.3	21.2	33.4	27.9	-
6	485696	103731	55.9	52.3	32.4	44.2	34.4	24.7	43.8	37.0	44.2	30.1	42.5	31.6	39.4	33.0	-
7	486953	104414	25.6	A	A	19.5	12.3	12.4	11.6	A	12.2	13.2	A	A	15.2	14.0	-
8	487341	105474	38.9	38.7	32.0	36.2	26.6	28.1	32.8	31.3	30.7	31.3	33.8	26.7	32.3	27.0	-
9	486502	104795	51.4	47.6	36.9	46.4	37.3	32.8	36.6	34.7	44.1	41.8	44.9	39.9	41.2	34.4	-
9a	486502	104795	52.8	48.7	37.9	41.2	36.6	29.5	37.0	36.1	46.0	39.3	49.1	36.3	40.9	34.2	-
10	486533	104860	48.0	59.7	46.1	52.6	48.0	51.9	55.3	48.6	45.7	45.1	51.2	50.2	50.2	<b>42.0</b>	-
10a	486553	104860	54.5	59.4	46.8	49.9	48.6	53.2	54.8	53.6	45.5	41.0	49.0	48.1	50.4	<b>42.1</b>	-
11	486082	105026	26.2	31.8	17.2	20.7	14.5	15.6	15.5	15.0	16.8	19.1	24.9	23.7	20.1	16.8	-
12	485914	105185	40.3	51.7	29.2	40.5	29.7	33.3	34.4	30.6	29.3	30.6	36.2	37.2	35.2	29.5	-

12a	485914	105185	40.1	55.6	31.7	41.5	28.8	31.3	34.9	31.3	28.9	31.6	41.6	35.7	36.1	30.2	-
14	488561	121479	59.8	54.9	A	43.4	45.8	46.8	50.6	43.6	49.3	A	44.1	38.2	47.7	39.8	-
14a	488561	121479	57.1	50.7	A	43.2	43.2	50.3	50.8	43.8	50.1	42.2	47.2	36.2	46.8	39.1	-
15	486575	104799	38.2	45.6	38.1	36.3	31.5	37.0	37.4	38.5	34.4	37.3	39.4	37.9	37.6	31.5	-
16	496495	104845	51.7	49.1	44.9	44.5	42.4	38.3	39.9	39.8	43.6	44.9	49.4	46.4	44.6	37.3	-
17	485982	105221	31.3	A	25.4	26.3	17.3	18.9	19.8	18.7	19.4	22.6	30.7	26.9	23.4	19.5	-
18	488545	121434	40.6	37.9	A	30.3	30.9	27.8	32.9	26.6	30.3	27.9	34.2	26.0	31.4	26.3	-
19	488583	121512	49.8	49.9	A	42.2	39.9	49.1	46.2	43.7	45.9	41.4	40.5	41.2	44.5	37.2	33.3
20	488605	121538	41.3	48.0	A	48.9	37.0	41.9	43.6	31.7	36.5	37.0	45.4	28.0	39.9	33.4	-
21	488636	121613	28.8	34.1	A	33.7	26.6	27.9	29.8	25.5	23.0	22.9	37.0	23.5	28.4	23.8	-

☒ Local 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<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 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

### Significant changes to sources

No significant changes were noted to sources of pollution. Additional diffusion tube monitoring commenced at the end of 2019, the results of which will be reported in next year's ASR.

### Detailed dispersion modelling/monitoring campaigns in the District

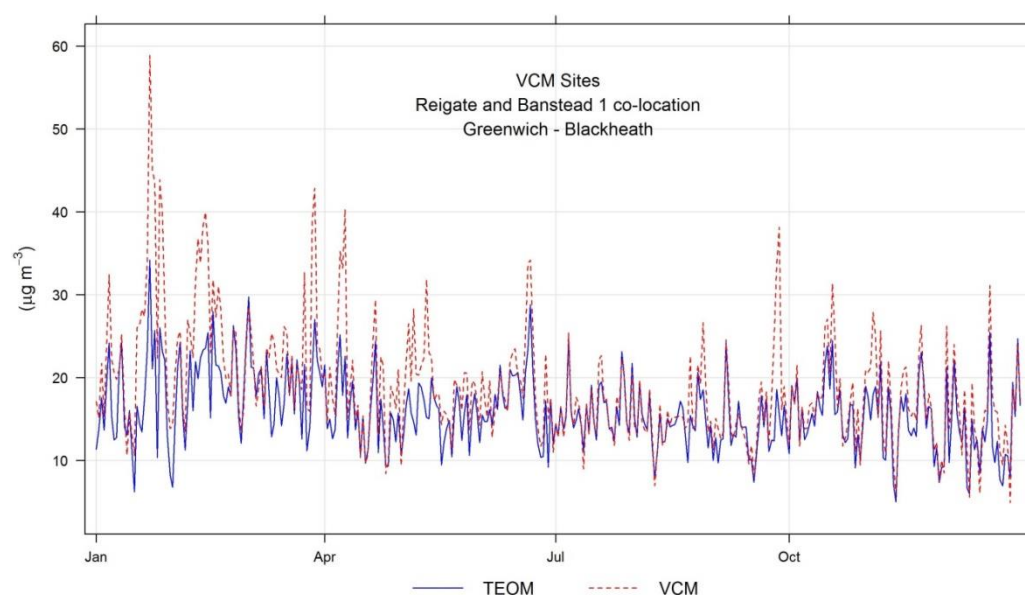
A contract was let in early 2019 to model air quality in discrete locations in Chichester and one location in Midhurst. The results of this work have resulted in an Air Quality Management Area (AQMA) being declared in Rumbolds Hill, Midhurst. The results of the source apportionment will be used in the review of the Air Quality Action Plan in order to prioritise the actions put forward to improve air quality.

### Additional Evidence gathered

None noted.

### QA/QC of Automatic Monitoring

All sites are visited by an officer for calibration and filter changes on a bi-monthly basis. CDC has a service agreement with a third party who provides site maintenance, auditing, regular inspections and 48-hour callout response if problems are encountered at the sites. Data is downloaded from all sites twice daily by the ERG<sup>6</sup> and is available to download online<sup>7</sup>. CDC has a contract with ERG to calibrate and ratify all real time data collected. ERG applies a VCM correction to the PM<sub>10</sub> data and a screen shot of the correction is shown below. The graph shows the CDC TEOM data in blue and the VCM correction is shown as a dotted red line.



<sup>6</sup> The Environmental Research Group (ERG), part of the School of Biomedical and Health Sciences at King's College London, a leading provider of air quality information and research in the UK.

<sup>7</sup> [www.sussex-air.net](http://www.sussex-air.net)



For more information please contact the ERG helpdesk<sup>8</sup>.

### QA/QC Diffusion Tube Data

Chichester District Council uses Gradko Environmental for supplying and analysing the diffusion tubes. The tube preparation method is 50% TEA/Acetone and ANA UKAS Method GLM 7 and GLM 9. CDC uses a local bias adjustment factor.

### Factor from Local Co-location Studies

Three diffusion tubes are co-located with the Stockbridge monitoring station. These are used to calculate a bias-correction for the NO<sub>2</sub> diffusion tubes. The automatic monitoring station's data is quality assured by ERG. The annual average concentrations from the three co-located tubes are compared to the annual average real time data derived concentration for the same period. A factor can then be derived to correct all other diffusion tube data. The 'bias correction' calculation is as per the table below.

Annual mean (automatic monitor) <sup>a,b,c</sup>	= 28µg/m <sup>3</sup>
Annual average mean (NO <sub>2</sub> diffusion tubes) <sup>d</sup>	= 33.5 µg/m <sup>3</sup>
Correction factor calculation	= 28/33.5 = 0.84

<sup>a</sup> 1<sup>st</sup> January 2019 – 31st December 2019

<sup>b</sup> Real-time data capture for 2019 = 100%

<sup>c</sup> All data ratified by Environmental Research Group

<sup>d</sup> Diffusion tube data capture for the period Jan - Dec = 100%

### QA/QC of Diffusion Tube Monitoring

CDC has confirmed by checking the web site provided that Gradko Environmental uses the AIR NO<sub>2</sub> Proficiency Testing scheme for quality control. The result for 2019 was Satisfactory (Z score +/- 2) for 95% of results submitted. For more information please contact Gradko Environmental<sup>9</sup>.


### Distance calculations for roadside diffusion sites where monitoring is not carried out at a location of relevant exposure

Using the NO<sub>2</sub> fall off with distance calculator on the LAQM website, the following sites have had a distance calculation applied:

<sup>8</sup> Contact ERG on 020 7848 4022

<sup>9</sup> Contact Gradko on 01962 860331

## Nat West Bank, Midhurst



Enter data into the pink cells

<b>Step 1</b>	How far from the KERB was your measurement made (in metres)?	1.07	metres
<b>Step 2</b>	How far from the KERB is your receptor (in metres)?	2.13	metres
<b>Step 3</b>	What is the local annual mean background NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	10.574	µg/m <sup>3</sup>
<b>Step 4</b>	What is your measured annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	37	µg/m <sup>3</sup>
<b>Result</b>	The predicted annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> ) at your receptor	33.3	µg/m <sup>3</sup>

### Annualisation of diffusion tube results

Where data capture is less than 75% the diffusion tube means have been annualised. The tube at Cleveland Road (site ID 7) required annualisation – this was carried out in accordance with Box 7.10 in LAQM TG16, see table below. A background diffusion site with more than 85% data capture was chosen (Arthur purchase site ID 11, see Table B1).

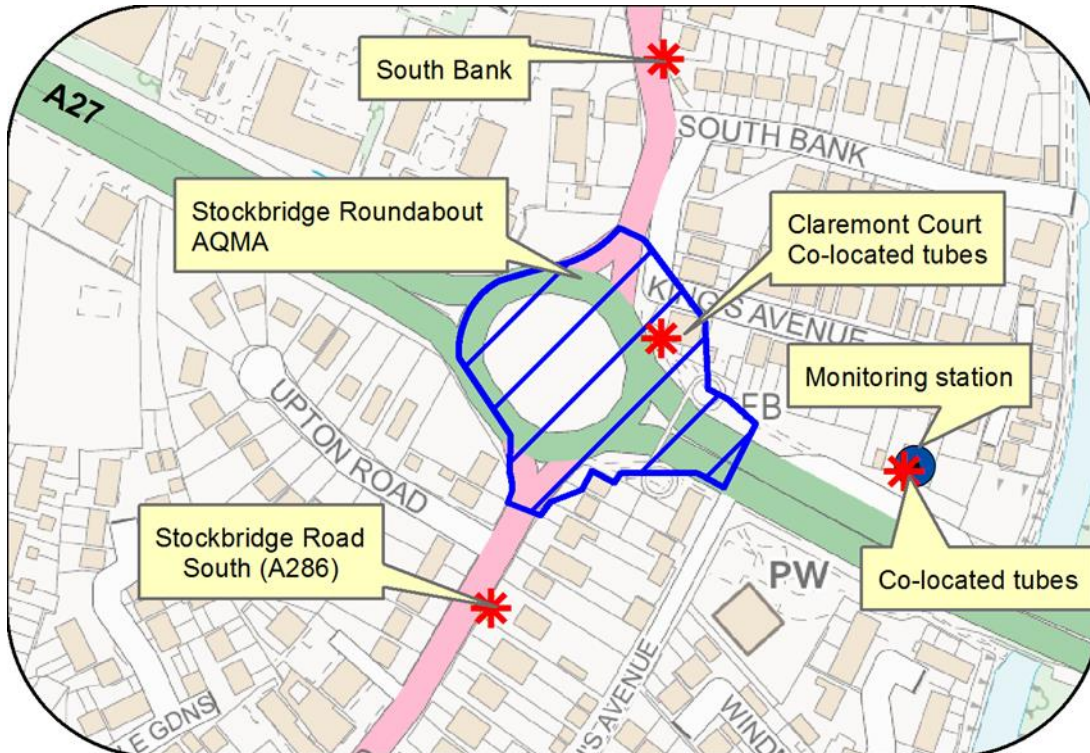
Monitoring period	Arthur Purchase (B1)	Cleveland Road (D1)	B1 when D1 is available
January	26.20	25.55	26.2
February	31.85		
March	17.19		
April	20.67	19.49	20.67
May	14.52	12.31	14.52
June	15.55	12.38	15.55
July	15.54	11.56	15.54
August	14.95		
September	16.82	12.22	16.82
October	19.10	13.22	19.10
November	24.95		
December	23.71		
Average	20.1 (Am)	15.2 (M)	18.34 (Pm)

Ratio of annual mean to period mean  $R = Am/Pm = 20.1/18.34 = 1.096$   
 Annualised average for Cleveland Road site D1 =  $M \times R = 15.2 \times 1.096 = 16.65$

Applying the bias correction of 0.84 annualised mean for Cleveland Road is:  
 $16.65 \times 0.84 = 14$

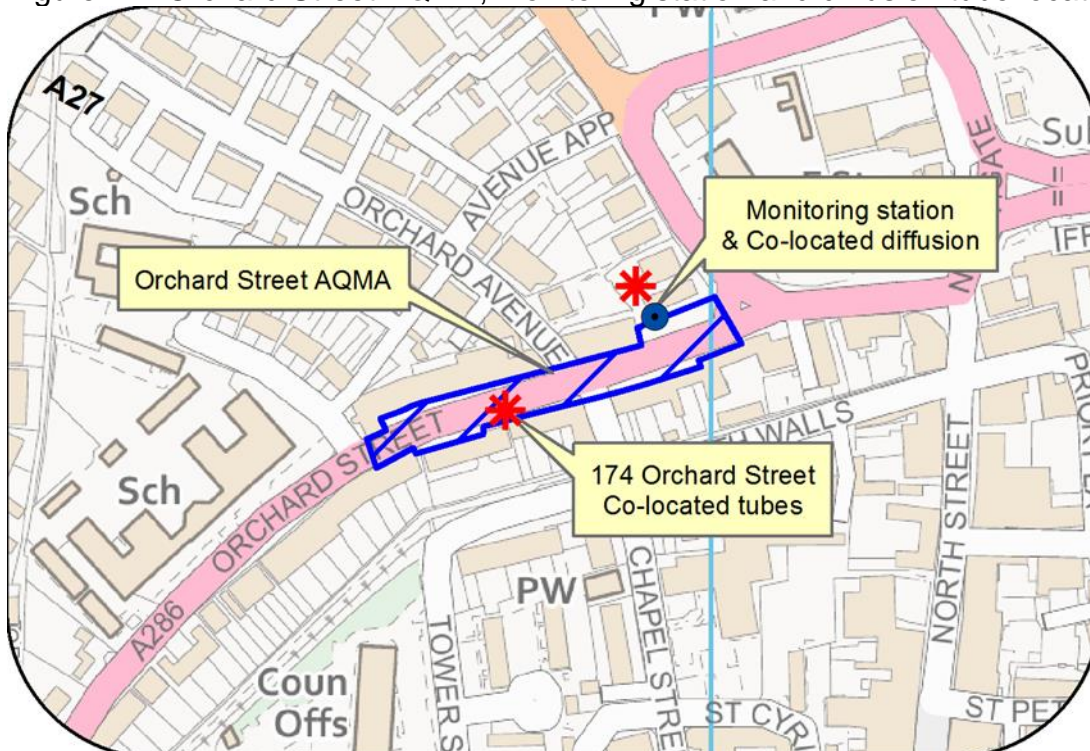
## Appendix D: Maps of Monitoring Locations and AQMAs

Figure D.1 Stockbridge Roundabout AQMA, monitoring station and diffusion tube locations



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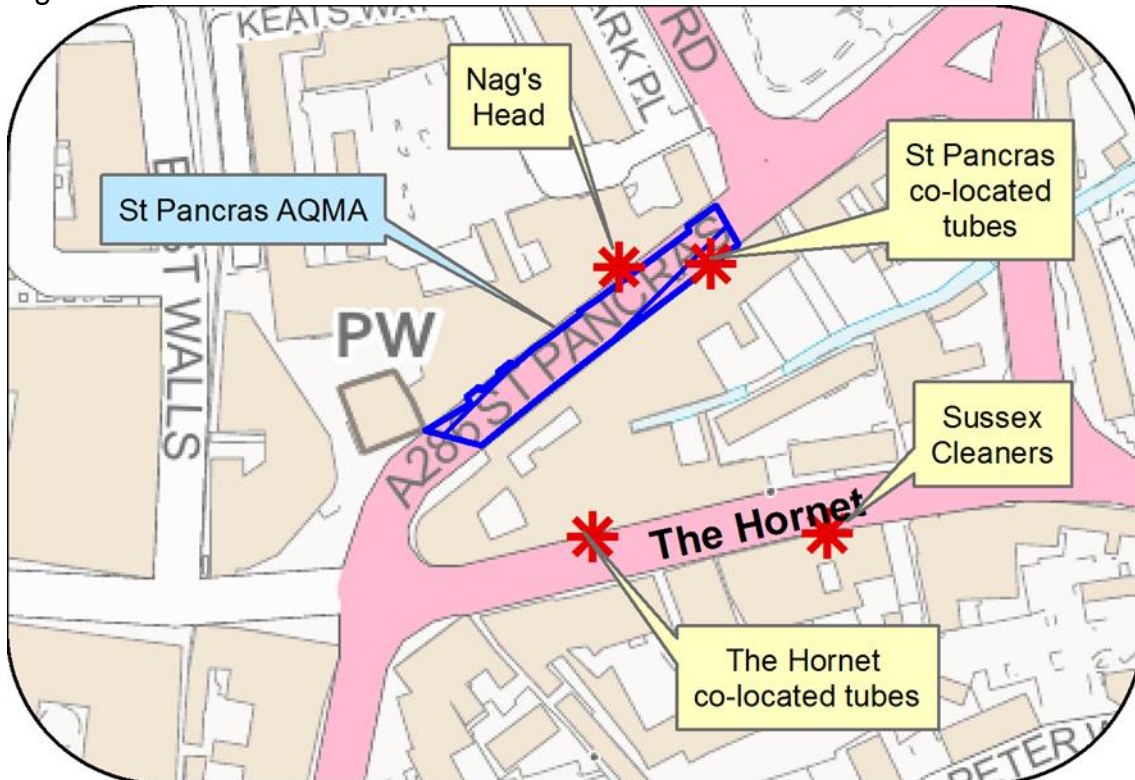
Figure D.2 Orchard Street AQMA, monitoring station and diffusion tube locations



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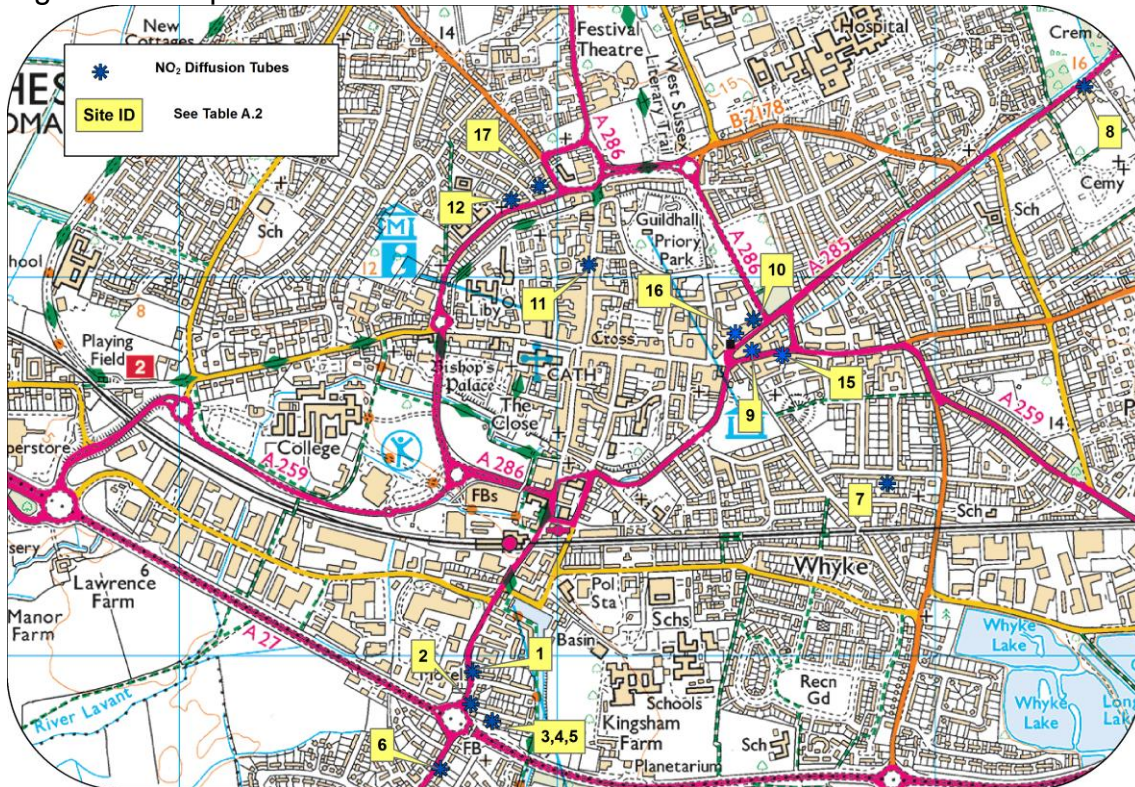


Figure D.3 St Pancras AQMA and diffusion tube locations



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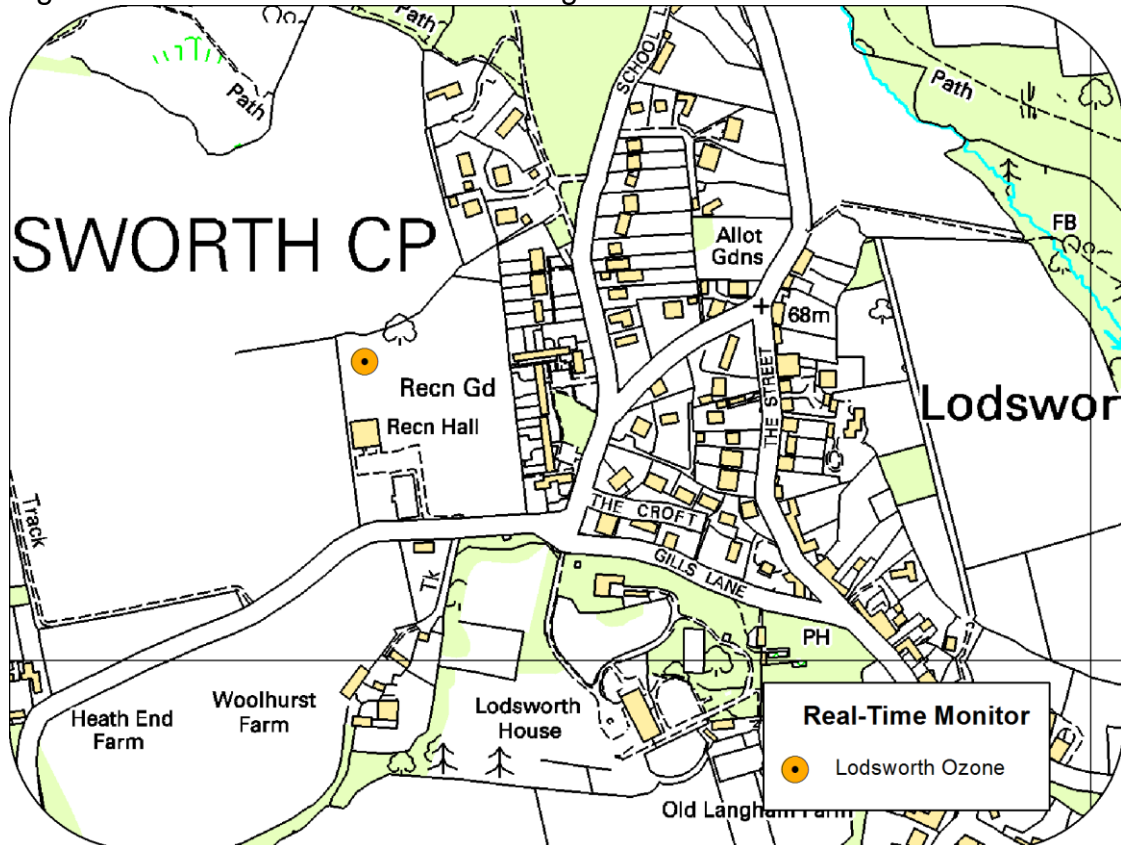
Figure D.4 Map of diffusion tube sites in Chichester



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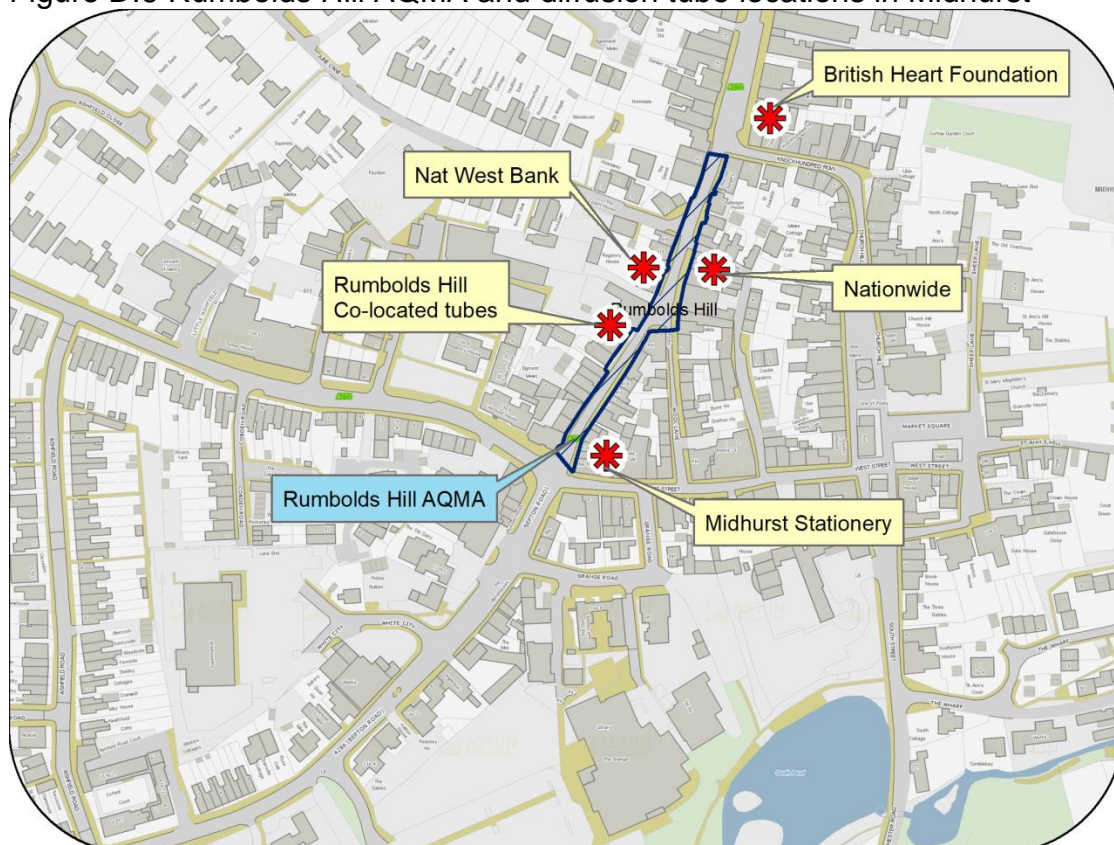


Figure D.5 Location of ozone monitoring station in Lodsworth



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Figure D.6 Rumbolds Hill AQMA and diffusion tube locations in Midhurst



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Figure D.7 Westhampnett Road, Chichester monitoring station and diffusion tube location



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## Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective <sup>10</sup>	
	Concentration	Measured as
Nitrogen Dioxide (NO <sub>2</sub> )	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m <sup>3</sup>	Annual mean
Particulate Matter (PM <sub>10</sub> )	50 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m <sup>3</sup>	Annual mean
Sulphur Dioxide (SO <sub>2</sub> )	350 µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean

<sup>10</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## 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
CCTV	Closed circuit television
CDC	Chichester District Council
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
EV	Electric vehicle
FDMS	Filter Dynamics Measurement System
HE	Highways England
IAAQG	Inter Authority Air Quality Group
LAQM	Local Air Quality Management
LES	Low Emissions Strategy
MOVA	Microprocessor Optimised Vehicle Actuation
NHS	National Health Service
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
OLEV	Office of Low Emission Vehicles
O <sub>3</sub>	Ozone



PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
RTPI	Real Time Passenger Information
SAQP	Sussex Air Quality Partnership
SO <sub>2</sub>	Sulphur Dioxide
UTC	Urban Transport Controls
VCM	Volatile correction measurement
VMS	Variable message signing
WSCC	West Sussex County Council

## **References**

Towards Better Air Quality: an Air Quality Action Plan for Chichester District Council  
2015-20 produced by Chichester District Council

West Sussex Walking and Cycling Strategy 2016 – 2026 produced by WSCC

Draft West Sussex Local Cycling and Walking Infrastructure Plan (LCWIP) December  
2019