




# 2021 Air Quality Annual Status Report (ASR)

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

Date: June 2021

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# Executive Summary: Air Quality in Our Area

## Air Quality in Woking

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<sup>1,2</sup>.

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages<sup>3</sup>, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017<sup>4</sup>.

Woking Borough Council (WBC) has completed all past rounds of Review and Assessment. This Annual Status Report (ASR) considers all new monitoring data and assesses the data against the Air Quality Strategy Objectives (AQOs). It also considers any changes that may have an impact on air quality. Progress on measures to improve air quality are identified, as well as WBC's approach to reducing emissions and/or concentrations of fine particulates (PM<sub>2.5</sub>), which has increased focus in the ASR as a result of emerging evidence of the health impacts.

WBC has declared two AQMAs. These are the Anchor Hill AQMA and the Guildford Road AQMA (a section of Guildford Road and South of the Constitution Hill Junction). Both have been declared as a result of exceedances of the annual mean nitrogen dioxide (NO<sub>2</sub>) AQO. Further details of these AQMAs are available at [https://uk-air.defra.gov.uk/aqma/local-authorities?la\\_id=317](https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=317)

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<sup>1</sup> Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

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

<sup>3</sup> Defra. Air quality appraisal: damage cost guidance, July 2020

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

The annual average NO<sub>2</sub> concentration at all monitoring sites reduced in 2020 due to COVID-19. This could be for a number of reasons resulting from the National lockdown i.e. less people commuting and using public transport (only essential workers), more people working from home and less people travelling and using their cars for recreation/ leisure purposes.

NO<sub>2</sub> monitoring has been able to continue throughout 2020, despite lockdown, due to the Officers adhering to guidelines of lone working and working in the outdoors.

A Detailed Assessment of air quality on Anchor Hill<sup>5</sup> published in 2012 identified predicted exceedances of the annual mean nitrogen dioxide (NO<sub>2</sub>) AQO at the façade of properties at the top of Anchor Hill. Contour plots showed that concentrations at the three main housing blocks at the top of Anchor Hill exceeded the AQO or were within 10% of the AQO. Due to the historical trend of high pollution levels at this location and the modelled exceedances it was recommended that WBC declared an Air Quality Management Area (AQMA) as a result of exceedances of the annual mean NO<sub>2</sub> AQO at Anchor Hill.

Based on the results of the Anchor Hill Further Assessment in January 2015<sup>6</sup> it was recommended that the AQMA should remain in place as both monitoring and modelling results show that although in some places the AQO was being achieved, concentrations in other places were above the AQO.

An Air Quality Action Plan (AQAP) was produced for the Anchor Hill AQMA in July 2015<sup>7</sup>. The plan determined that the upgrade of traffic signals at the Anchor Hill junction is likely to improve traffic flow and reduce NO<sub>2</sub> concentrations so that the annual mean AQO is no longer exceeded in the AQMA. The progress towards compliance is currently being tracked using monitoring data collected by WBC and being reported in the ASRs. It is recommended that the AQMA will be revoked when monitoring results from three consecutive years show no exceedances of the AQO, so that a permanent improvement in air quality can be demonstrated.

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<sup>5</sup> Bureau Veritas. Woking Borough Council Anchor Hill LAQM Detailed Assessment, October 2012.

<sup>6</sup> Amec Foster Wheeler Environment & Infrastructure UK Ltd. Air quality further assessment for Woking Borough Council, May 2015.

<sup>7</sup> Amec Foster Wheeler Environment & Infrastructure UK Ltd. Woking Borough Council – Anchor Hill AQMA – Air Quality Action Plan, 2015.

NO<sub>2</sub> levels complied with the AQO at every Anchor Hill monitoring site in 2016<sup>8</sup>, 2017<sup>9</sup>, 2018<sup>10</sup>, 2019<sup>11</sup> and 2020 as shown in this report. However, in 2018 and 2019 the highest concentrations within the AQMA were 39 µg/m<sup>3</sup> and 38 µg/m<sup>3</sup> which is just below the annual mean AQO. Another factor important to note is that COVID-19 will have had an impact on the reduction of the annual average NO<sub>2</sub> concentrations at all monitoring sites. Following guidance provided by Defra<sup>12</sup> consideration of the revocation of AQMAs in WBC will not be based upon compliance being achieved in 2020. It is therefore recommended that the AQMA is maintained until a clear long-term reduction in concentration can be demonstrated.

Exceedances of the annual mean AQO for NO<sub>2</sub> were recorded between 2012 and 2015 at diffusion tubes located on Guildford Road. Additional monitoring in the area around Guildford Road commenced in 2014 and recorded exceedances of the AQO at five locations in 2015. A Detailed Assessment was carried out in November 2016 for the junction between Guildford Road, Constitution Hill and Mount Hermon Road. This assessment indicated that concentrations at some receptor locations with relevant exposure were exceeding the AQO because of road traffic emissions around Guildford Road. It was recommended that an AQMA should be declared on Guildford Road. Further monitoring was recommended around the junctions where Guildford Road meets York Road and Station Approach to confirm if the NO<sub>2</sub> annual mean AQO is exceeded where there is relevant exposure. Consequently, the Guildford Road AQMA was declared in May 2017.

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<sup>8</sup> Amec Foster Wheeler Environment & Infrastructure UK Ltd. 2017 Air Quality Annual Status Report, May 2017.

<sup>9</sup> Wood Environment & Infrastructure Solutions UK Limited. 2018 Air Quality Annual Status Report, June 2018.

<sup>10</sup> Wood Environment & Infrastructure Solutions UK Limited. 2019 Air Quality Annual Status Report, June 2019.

<sup>11</sup> Wood Environment & Infrastructure Solutions UK Limited. 2020 Air Quality Status Report, June 2020.

<sup>12</sup> Defra, 2021. COVID-19: Supplementary Guidance. Version 1.0. [Online]. Available from: <https://laqm.defra.gov.uk/documents/Covid-19%20-%20Supplementary%20Guidance%20for%20Local%20Air%20Quality%20Management%20Reporting%20in%202021%20v1.pdf>

The Local Highways team has advised that the particularly high NO<sub>2</sub> concentrations monitored in the Guildford Road area in 2015 were likely to be due to roadworks in the Town Centre causing diversions in the area, which resulted in increased traffic along Guildford Road. WBC have confirmed that there is likely to be increased development occurring in the Town Centre over the next few years and therefore concentrations around Guildford Road are likely to vary but remain high during times of traffic diversion. Annual mean NO<sub>2</sub> concentrations in Guildford Road AQMA were exceeding the AQO in 2016, 2017 2018 and 2019. However, when concentrations were calculated at the nearest locations of relevant exposure, all concentrations were below the annual mean AQO. Concentrations at all diffusion tubes in Guildford Road AQMA decreased in 2020 and were compliant with the annual mean AQO, however as there were still exceedances of the annual mean AQO (before distance correction) and COVID-19 will have had an impact on the improved concentrations during 2020, it is recommended that the AQMA remains until concentrations are comfortably below the AQO.

All areas within Woking saw an improvement with lower average levels of NO<sub>2</sub> compared to 2019 readings. The biggest impact / improvement in NO<sub>2</sub> levels seemed to be in both AQMAs, Anchor Hill and Constitution Hill / Guildford Road. There was also a much lower reading in the Victoria Way diffusion tube on average compared to last year, presumably due to less people visiting the Town and / or commuting into work.

The lowest NO<sub>2</sub> concentrations in the WBC area were monitored in rural areas and Town Centre levels were the lowest they have been in 5 years, most likely due to people not leaving their homes during lockdown and working from home.

The lowest levels of NO<sub>2</sub> were recorded between May – July 2020 and in December 2020, when the nation was in Lockdown.

The 2020 ASR determined that monitoring and analysis of concentrations at all locations included in the monitoring programme should continue, with specific consideration on Anchor Hill and Guildford Road.

## **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 Strategy<sup>13</sup> sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero<sup>14</sup> 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.

Work with the Surrey Air Alliance continues and AQ initiatives and projects continue to be delivered on a local level, including the progression of the taxi licensing condition initiative and purchasing of EV taxi's for Surrey following a successful funding bid.

Town Centre works have also continued. The Victoria Square Arch development is coming up imminently, with the demolition of the Triangle site on Guildford Road already underway. Completion of the pedestrian and cycle footbridge on Chobham Road took place in the early part of 2020, which has created improved connectivity, with a view to encouraging more people to use the footpath for commuting into Woking.

WBC has declared two AQMAs at Anchor Hill and Guildford Road as a result of exceedance of the annual mean NO<sub>2</sub> AQO. Although monitoring results indicate that the NO<sub>2</sub> AQO are not exceeded at relevant locations in the AQMAs, these remain the main priority locations for improving air quality.

The priorities for WBC following this ASR are as follows:

- Continue monitoring of NO<sub>2</sub> at locations of relevant exposure to confirm if concentrations remain below the annual mean AQO; and in the Anchor Hill and Guildford Road AQMAs until a clear long-term reduction in concentration can be demonstrated.

## Local Engagement and How to get Involved

The following sources of information are available on WBC's website for improving air quality in the borough and seeking further information:

- List of AQMAs in the borough: <https://www.woking.gov.uk/airquality>

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<sup>13</sup> Defra. Clean Air Strategy, 2019

<sup>14</sup> DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018



- The Air Quality Action Plan for the Anchor Hill AQMA:  
<https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/Woking%20Borough%20Council%20AQAP%20Anchor%20Hill.pdf>
- The Air Quality Action Plan for the Guildford Road AQMA:  
[https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/WBC\\_Guildford%20Rd\\_AQAP%20final%20report.pdf](https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/WBC_Guildford%20Rd_AQAP%20final%20report.pdf)
- airAlert service warning local residents who have respiratory problems when the air pollution in Woking is going to be high. This is a free subscription service which individuals, who suffer from asthma, COPD, emphysema or other respiratory illnesses, can sign up to in order to receive either an email, text message or voicemail giving an advanced warning of high pollution levels:  
<http://airalert.info/Surrey/Default.aspx>



## Other additional information

- Healthy Surrey provide some useful links and tips on steps you can take to improve air quality for you and your family. See here:  
<https://www.healthysurrey.org.uk/community-health/air-quality>
- Surrey County Council's Low Emissions Transport Strategy, which sets out Surrey's ambition to work with partners to reduce polluting emissions from transport in the County for the benefit of everyone who lives or works in Surrey. See here:  
<https://www.surreycc.gov.uk/roads-and-transport/policies-plans-consultations/transport-plan/surrey-transport-plan-strategies/low-emissions-transport-strategy>

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# 1 Local Air Quality Management

This report provides an overview of air quality in the area administered by Woking Borough Council (WBC) 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 (AQOs) are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by WBC to improve air quality and any progress that has been made.

The statutory AQOs applicable to LAQM in England are presented in Table E.1 (Appendix E).

## 2 Actions to Improve Air Quality

### 2.1 Air Quality Management Areas

AQMAs are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an AQAP within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by WBC can be found in Table 2.1. The table presents a description of the two AQMAs that are currently designated within WBC. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The AQO pertinent to the current AQMA designations is the NO<sub>2</sub> annual mean AQO.

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
AQMA for Anchor Hill	01/02/2014	NO <sub>2</sub> Annual Mean	A small area covering a 4-way junction at the top of a steep hill.	NO	41.5	28.4	Anchor Hill Air Quality Action Plan 2015*	<a href="https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/Woking%20Borough%20Council%20AQAP%20Anchor%20Hill.pdf">https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/Woking%20Borough%20Council%20AQAP%20Anchor%20Hill.pdf</a>
Guildford Road AQMA	15/05/2017	NO <sub>2</sub> Annual Mean	AQMA incorporates a small section of Guildford Road to the south of Constitution Hill junction and to the north of the Junction with Ashdown Close.	NO	42.2 (modelled)	34.1	Guildford Road AQMA Air Quality Action Plan 2017	<a href="https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/WBC_Guildford%20Rd_AQAP%20final%20report.pdf">https://www.woking.gov.uk/sites/default/files/documents/environmentalservices/WBC_Guildford%20Rd_AQAP%20final%20report.pdf</a>

WBC confirm the information on UK-Air regarding their AQMA(s) is up to date

WBC confirm that all current AQAPs have been submitted to Defra

\*This AQAP is currently undergoing the final consultation phase and is awaiting approval from Defra.

## 2.2 Progress and Impact of Measures to address Air Quality in WBC

WBC 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. 12 measures are included within Table 2.2, with the type of measure and the progress WBC 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 WBC's Anchor Hill AQAP and Guildford Road AQAP, as well as in the Surrey Transport Plan: Air Quality Strategy<sup>15</sup>.

In 2019 The Surrey Air Alliance (SAA) commissioned a detailed dispersion modelling and sources apportionment<sup>16</sup> study by Cambridge Environmental Research Consultants (CERC). The model was commissioned to identify sources of key pollutants and help develop target measures to reduce pollution from the relevant sources.

Key completed measures are:

- Installation of a Microprocessor Optimised Vehicle Actuation (MOVA) system in August 2016 at the junction between Anchor Hill and High Street. This measure is expected to have had an impact on NO<sub>2</sub> levels from road traffic in the Anchor Hill AQMA.
- Infrastructure to support the use of hybrid/electric vehicles.
- Surrey-wide public awareness campaign of air quality from Domestic Wood Burning.

WBC expects the following measures to be completed over the course of the next reporting year:

- Progression of anti-idling at schools: A transformation grant will be used to progress anti-idling campaign in schools.

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<sup>15</sup> Surrey County Council. Surrey Transport Plan Air Quality Strategy, January 2016.

<sup>16</sup> CERC, 2019. Detailed air quality modelling and source apportionment Woking Borough Council. Final report. Prepared for Surrey Local Authorities. [Online]. Available at: [https://www.guildford.gov.uk/media/32331/Detailed-air-quality-report/pdf/FM1183\\_Surrey\\_CERC\\_Guildford\\_19Nov19.pdf?m=637296299125670000](https://www.guildford.gov.uk/media/32331/Detailed-air-quality-report/pdf/FM1183_Surrey_CERC_Guildford_19Nov19.pdf?m=637296299125670000)

- Project to encourage a greater uptake of Electric Vehicles amongst Taxi Drivers to be implemented late 2021.
- Further development of the Borough's infrastructure, to support the use of hybrid / electric vehicles, including installation of EV on-street charging points in late 2021 as part of the On-Street Electric Vehicle Charging Point (EVCP) pilot project.

WBC's priorities for the coming year, which both involve working closely with Surrey County Council (SCC), include a prioritised programme of infrastructure improvements for future investment in the Local Walking and Cycling Infrastructure Plan (LWCIP) for Woking and continued work to help deliver Surrey's Electric Vehicle strategy and an On-Street Electric Vehicle Charging Point (EVCP) project

WBC has joined the recently convened EV Strategy Forum being led by Surrey County Council. The aim of this forum is to work together to deliver a consistent strategy across the county to provide the necessary EV infrastructure for Surrey residents to help meet common climate targets and facilitate a shift to zero emission transport in line with the Government's Road to Zero Strategy which bans the sale of petrol and diesel vehicles from 2030.

Guidance for developers on EV infrastructure can be found within WBC's Climate Change Supplementary Planning Document on page 66 of the linked guidance:

<https://www.woking2027.info/supplementary/climatechangespd/climatechangespd.pdf>

The principal challenges and barriers to implementation that WBC anticipates facing are Staff resource; funding for infrastructure improvements, Funding identified as part of the Woking Integrated Transport Project and electrical grid capacity could be a barrier for any new developments incorporating EV charging infrastructure.

WBC anticipates that the measures stated above and in Table 2.2 will achieve compliance in Anchor Hill AQMA and Guildford Road AQMA.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, WBC anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of Anchor Hill AQMA and Guildford Road AQMA.



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	Urban Traffic Management and Control (UTMC)	Traffic Management	UTC, Congestion Management, Traffic Reduction	2015	Completed	SCC / WBC						Y	Restrain or reduce traffic volumes in AQMA	MOVA installed and in operation since August 2016 at the busy junction in the Anchor Hill AQMA.	
2	New and/or improved cycle lane and track.	Transport Planning & Infrastructure	Cycle Network	2008 - 2011	Summer 2019. Ongoing.	SCC / WBC		N/A				Y	Restrain or reduce traffic volumes in AQMA	The Business Case for the Woking Strategic Transport Project (WSTP), led by SCC, incorporating walking and cycling schemes linked to the Town Centre was submitted at the end of August 2018. A funding decision from the LEP was expected imminently (late March / April 2019). In collaboration with Department for Transport and Woking Borough Council, Surrey County Council completed the Woking town Local Walking and Cycling Infrastructure Plan (LWCIP) in March 2020.	Barriers identified include: Staff resource; funding for infrastructure improvements
3	Cycle parking	Transport Planning & Infrastructure	Cycle Network	2008 - 2011	01/11/2019	SCC / WBC	N/A	N/A	N/A	N/A	N/A	Y	Restrain or reduce traffic volumes in AQMA	Various improvements have been made under Cycle Woking 2008 – 2011. In 2015 the Cycle Hub was installed at Woking station providing storage for over 200 cycles and encouraging cycle / rail integration. A new cycle storage compound was implemented at Brookwood station in 2016. These storage facilities have been funded by Department for Transport. Funding was secured by South West Trains together with WBC S106 funding contributions.  Approximately 20 cycle stands are to be reinstated around the Town Centre.	
4	Cycle infrastructure and storage improvement	Transport Planning & Infrastructure	Cycle Network	N/a	2022 On-going	WBC/SCC	N/A	N/A	N/A	N/A	N/A	Y	Restrain or reduce traffic volumes in AQMA	Work started in 2020 on the resurfacing and creation of combined pedestrian/cycle path and creation of soft landscaping on Chertsey Road. Completion of the pedestrian and cycle footbridge on Chobham Road took place in the early part of 2020, which has created improved connectivity, with a view to encouraging more people to use the footpath for commuting into Woking.	Funding identified as part of the Woking Integrated Transport Project
5	Infrastructure to support the use of hybrid/electric vehicles	Traffic Management	Other	2021 - 2023	On-going	SCC / WBC	LEP bid (enterprise M3)		GRANTED			Y	Reduce tailpipe emissions in AQMA	The Council currently has 22 EV charging points across Town Centre car parks. These electric vehicle charging points are in specifically marked bays and the majority offer immediate access to charging on a plug and go basis. The Shoppers' Yellow car park is operated via the Charge Your Car (CYC) Scheme which is a subscription-based service. WBC has implemented various policies and strategies supportive of this measure in the area. A highlight would be the financial incentive for using a low emission vehicle in the area by applying a 50% discount on parking season tickets for those driving vehicles in band A. Successful funding bid to support installation of 80 on street EV charging bays across Guildford, Spelthorne, Woking and Waverley in the next 2 years. Sites have been selected and consultation and installations started during summer 2020.	Potential barriers identified includes the town centre charging point capacity and the electrical grid capacity since an increase in uptake of EV's would place additional demand on the existing electricity network.
6	Car clubs	Alternatives to private vehicle use	Car Clubs	N/a	Ongoing	SCC / WBC						Y	Restrain or reduce traffic volumes in AQMA	WBC has a car club arrangement with Enterprise Rent A Car Ltd for staff business use, namely the Car Club scheme. The scheme comprises two low emission vehicles available for hires for up to four hours.  Enterprise also operates Surrey County Council's car club scheme that is also available for the	

														public. In Woking, there are four cars available in Guildford Road (one car), Goldsworth Road (one car) and at Quadrant Court (two cars).
7	Workplace travel planning	Promoting Travel Alternatives	Personalised Travel Planning	N/a	Ongoing	SCC / WBC						Y	Restrain or reduce traffic volumes in AQMA	The Council has its own Staff Transport Plan including various initiatives to encourage alternative modes of transport to the car. Criteria has been applied to lease cars in order to lower emissions and air pollution associated with this fleet. In October 2018, it was agreed that diesel vehicles will no longer qualify as part of the Council's lease car scheme recognising research and Government policy that finds that diesel cars are more polluting in terms of NO <sub>x</sub> and PM. The CO <sub>2</sub> threshold for lease cars was increased slightly to 135g/km to enable a wider choice of petrol vehicle within the lease car fleet. Environmental standards also apply to cash alternative vehicles. Details are available via Ewokplus. For staff that need to undertake business mileage but do not own a car that fits the Council's environmental criteria, cars can be hired through the car club operated by Enterprise Rent A Car Ltd.
8	Differential parking charges	Traffic Management	Emission based parking or permit charges	N/a	Ongoing	SCC / WBC						Y	Reduce tailpipe emissions in AQMA	Differential parking charges are applied in WBC. The cost of a season ticket is based on a vehicle's CO <sub>2</sub> emission rating (determined by the Vehicle Certification Agency). A 50% discount is applied for vehicles that produce the lowest emissions (CO <sub>2</sub> band A) and a 25% discount for band B vehicles. Those with a band G rating (the highest band) pay a 25% surcharge.
9	Encourage boroughs and districts to consider adopting minimum emissions standards or vehicle age restrictions into taxi licensing procedures.	Promoting Low Emission Transport	Taxi Licensing conditions	2014	Ongoing	SCC / WBC	Defra Air Quality Grant 2020-21	Y	GRANTED			Y	Reduce tailpipe emissions in AQMA	With effect from the 4th of January 2014, WBC have required all Private Hire Vehicles and all non-wheelchair compliant Hackney Carriages to meet the Euro Emissions V Criteria. There are at least 540 private hire vehicles in Woking – all of which are at least Euro Emissions V. Some are Euro Emissions VI. Our policy is stating that as Euro Emissions VI is to be applied to manufacturers from September 2014, it will therefore apply to new and renewal vehicles presented to Woking Borough Council from 20th of January 2022. With effect from the 20th of January 2022 there will be no Euro Emissions V vehicles licenced by WBC. SAA have submitted a bid on 14 Oct 2020 around the promotion of EV Taxis. The bid has been successful and will be match funded using SCC transformation grant and officer time.
10	AQ initiatives / awareness raising through SAA. Continuing to build on the schools programme to promote behaviour change for improved air quality and more active travel.	Awareness raising / comms	increased awareness of the health impact of poor air quality	2020	Ongoing	SCC/ WBC	Programme initially funded by Defra, taken forward by D&Bs							Schools programme curtailed due to lockdown, but the final two theatre events were due to be adapted and completed virtually.
11	Transformation Grant will be used to progress anti-idling campaign in schools	Traffic Management	Traffic reduction	2020	on-going (2021-2022)	SCC /WBC	SCC Transformation Grant	N/A	Y					Transformation Grant will be used to progress anti-idling campaign outside schools.
12	Improved awareness of AQ from Domestic Wood Burning.	Domestic Wood Burning	Other	2020	2020	SCC /WBC	SCC		COMPLETED					Surrey-wide public awareness campaign for the Clean Air Day in Oct/Nov 2020, including a short animation video about domestic burning of solid fuels and wood

## 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.

WBC does not monitor PM<sub>2.5</sub>, however a PM<sub>2.5</sub> dispersion modelling exercise funded by the SCC has been carried out to gain a better understanding of the current situation; The modelling exercise was undertaken by Cambridge Environmental Research Consultants (CERC). The dispersion modelling report<sup>16</sup> aimed to find and prioritise actions in local pollution hotspots and the findings demonstrated that the annual mean concentrations are below 25µgm<sup>-3</sup> in Surrey.

The report also evaluated public health impact of air quality. Areas near major roads have the highest levels of pollution and health impacts.

The results have been published as a map and is hosted on the SCC website here:

<https://surreycc.maps.arcgis.com/apps/webappviewer/index.html?id=43910ffb100248ed972115b7a9b49d20>

WBC does not have PM<sub>2.5</sub> specific measures, but implementations of traffic reduction measures as detailed in Table 2.2 will have a beneficial impact on PM<sub>2.5</sub> concentrations across the borough.

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

This section sets out the monitoring undertaken within 2020 by WBC 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.

### 3.1 Summary of Monitoring Undertaken

#### 3.1.1 Automatic Monitoring Sites

WBC does not undertake any automatic (continuous) monitoring.

#### 3.1.2 Non-Automatic Monitoring Sites

WBC undertook non-automatic (i.e. passive) monitoring of NO<sub>2</sub> at 34 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.

### 3.2 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.

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

Table A.1 and Table A.2 in Appendix A compare the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>. 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.

There were no exceedances of the annual mean NO<sub>2</sub> AQO reported during 2020. All areas saw an improvement with lower average concentrations of NO<sub>2</sub> compared to 2019 readings. WBC conclude in **Appendix F: Impact of COVID-19 upon LAQM** that this could be for a number of reasons associated with the COVID-19 pandemic; i.e. less people commuting (only essential workers), more people working from home, less people using public transport, less people travelling and using their cars for recreation/ leisure purposes during the national lockdown. Therefore, WBC have not decided to make any changes to existing AQMAs.

### 3.2.2 Particulate Matter (PM<sub>10</sub>)

WBC does not undertake any PM<sub>10</sub> monitoring.

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

WBC does not undertake any PM<sub>2.5</sub> monitoring.

### 3.2.4 Sulphur Dioxide (SO<sub>2</sub>)

WBC does not undertake any SO<sub>2</sub> monitoring.

## Appendix A: Monitoring Results

Table A.1 – 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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
BD	Bitterne Drive	Roadside	498025	158949	NO <sub>2</sub>	NO	6.0	2.0	NO	2.5
TW	Tresta Walk	Roadside	498435	159451	NO <sub>2</sub>	NO	9.5	1.5	NO	2.7
AH	Anchor Hill 1	Kerbside	496618	158699	NO <sub>2</sub>	YES	69.0	1.0	NO	2.7
AH2	Anchor Hill 2	Roadside	496615	158696	NO <sub>2</sub>	YES	0.0	5.0	NO	2.4
AH3	Anchor Hill 3	Roadside	496646	158750	NO <sub>2</sub>	NO	0.0	5.0	NO	2.8
AH4	Anchor Hill 4	Roadside	496679	158767	NO <sub>2</sub>	NO	6.0	2.0	NO	2.5
AH5	Anchor Hill 5	Roadside	496594	158698	NO <sub>2</sub>	YES	0.0	5.0	NO	2.6
AH6	Anchor Hill 6	Roadside	496586	158686	NO <sub>2</sub>	NO	0.0	2.0	NO	2.7
LGR	Lower Guildford Rd	Roadside	496601	158668	NO <sub>2</sub>	YES	0.0	3.0	NO	2.6
BR	Bagshot Road	Kerbside	495821	157793	NO <sub>2</sub>	NO	15.0	1.0	NO	2.6
BR1	Bagshot Road	Roadside	495852	157188	NO <sub>2</sub>	NO	21.0	1.5	NO	2.6
GR	Goldsworth Road	Kerbside	499952	158545	NO <sub>2</sub>	NO	6.0	1.0	NO	2.6
YR	York Road	Kerbside	500450	158278	NO <sub>2</sub>	NO	12.0	1.0	NO	2.6
YR1	York Road	Kerbside	500447	158256	NO <sub>2</sub>	NO	18.0	1.0	NO	2.8
LTK	Constitution Hill 1	Kerbside	500437	158120	NO <sub>2</sub>	NO	3.0	1.0	NO	2.5
LT1	Constitution Hill 1	Kerbside	500453	158100	NO <sub>2</sub>	NO	15.0	1.0	NO	2.8
CH	Constitution Hill 4	Roadside	500417	158102	NO <sub>2</sub>	YES	4.0	1.5	NO	2.7
CH2	Constitution Hill 5	Kerbside	500367	158073	NO <sub>2</sub>	YES	12.0	1.0	NO	2.3
CH3	Constitution Hill 6	Roadside	500330	158012	NO <sub>2</sub>	YES	14.0	1.5	NO	2.5
CH4	Constitution Hill 7	Kerbside	500332	157983	NO <sub>2</sub>	NO	17.0	1.0	NO	2.6
RC	Rosebery Crescent	Kerbside	500946	157110	NO <sub>2</sub>	NO	10.0	1.0	NO	-
LD	Lincoln Drive	Kerbside	503244	159659	NO <sub>2</sub>	NO	12.0	1.0	NO	2.7

PR	Dartnell Avenue (previously Parvis Road)	Kerbside	504926	161063	NO <sub>2</sub>	NO	12.0	1.0	NO	2.3
M25	M25	Other	505611	161180	NO <sub>2</sub>	NO	N/A	N/A	NO	2.6
TC	The Cedars	Roadside	506731	161229	NO <sub>2</sub>	NO	24.0	4.0	NO	2.9
CR	Church Road	Kerbside	506401	160504	NO <sub>2</sub>	NO	6.0	1.0	NO	2.5
WL	Woodham Lane	Kerbside	502854	161062	NO <sub>2</sub>	NO	31.0	1.0	NO	2.7
MR	Monument Road	Roadside	501611	159645	NO <sub>2</sub>	NO	4.0	2.0	NO	2.4
MR2	Monument Road	Roadside	501613	159646	NO <sub>2</sub>	NO	18.0	2.0	NO	2.7
OR	Oriental Road	Roadside	501679	159148	NO <sub>2</sub>	NO	26.0	3.0	NO	2.5
VW	Victoria Way	Kerbside	500510	159030	NO <sub>2</sub>	NO	N/A	1.0	NO	2.5
VW2	Victoria Way 2	Roadside	500281	158827	NO <sub>2</sub>	NO	N/A	8.0	NO	2.7
VW3	Victoria Way 3	Roadside	500270	158731	NO <sub>2</sub>	NO	N/A	3.0	NO	2.7
VW4	Victoria Way 4	Roadside	500425	158584	NO <sub>2</sub>	NO	N/A	5.5	NO	2.5

**Notes:**

- (1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).
- (2) N/A if not applicable

Table A.2 – Annual Mean NO<sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m<sup>3</sup>)

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 2020 (%) <sup>(2)</sup>	2016	2017	2018	2019	2020
BD	498025	158949	Roadside	100	100.0	18	15.6	16.1	14.4	11.0
TW	498435	159451	Roadside	92.3	92.3	-	13.3	16.2	12.7	11.2
AH	496618	158699	Kerbside	100	100.0	36	34.6	39	38	28.4
AH2	496615	158696	Roadside	90.4	90.4	34.9	31.6	31.2	30.9*	25.7
AH3	496646	158750	Roadside	100	100.0	23.3	22.5	23.9	23	18.8
AH4	496679	158767	Roadside	100	100.0	31.6	27.3	28.6	22	23.0
AH5	496594	158698	Roadside	100	100.0	29.4	26.3	31.1	25.7	20.2
AH6	496586	158686	Roadside	83.8	83.8	34.7	29.2	34	37.2*	20.1
LGR	496601	158668	Roadside	100	100.0	26.2	23.7	27	26.7	21.6
BR	495821	157793	Kerbside	100	100.0	28.4	24.5	28.5	26.8	24.0
BR1	495852	157188	Roadside	59.6	59.6	24.4	22.8	26.5	21.6	23.0*
GR	499952	158545	Kerbside	100	100.0	27.3	26	26.2	25.1	21.0
YR	500450	158278	Kerbside	100	100.0	-	23.9	30	27.5	22.0
YR1	500447	158256	Kerbside	92.3	92.3	-	25	31.2	29.5	23.6
LTK	500437	158120	Kerbside	100	100.0	23.6	24.3	28.3	28.5	27.9
LT1	500453	158100	Kerbside	100	100.0	33.9	33.9	35	23.7	15.0
CH	500417	158102	Roadside	100	100.0	<b>43.3</b>	36.5	<b>41.8</b>	37.2	26.8
CH2	500367	158073	Kerbside	100	100.0	<b>47.6</b>	<b>41.3</b>	<b>43.5</b>	<b>40</b>	34.1
CH3	500330	158012	Roadside	90.4	90.4	<b>45.4</b>	<b>41</b>	38.6	35.2*	31.7
CH4	500332	157983	Kerbside	100	100.0	<b>40</b>	37.6	38.5	34.3	28.6
RC	500946	157110	Kerbside	80.5	80.5	16.6	18	18	15	11.9
LD	503244	159659	Kerbside	100	100.0	18.7	16.7	22.3	17.9	12.4
PR	504926	161063	Kerbside	100	100.0	25.9	22.2	26.5	22.2	18.5
M25	505611	161180	Other	100	100.0	<b>51.4</b>	<b>42.2</b>	<b>53.9</b>	<b>46.7</b>	37.0
TC	506731	161229	Roadside	100	100.0	29.9	26.3	31.3	26.2	23.8
CR	506401	160504	Kerbside	100	100.0	-	20.7	22.9	19.6	15.2
WL	502854	161062	Kerbside	100	100.0	30.5	23.5	25	21.9	18.0
MR	501611	159645	Roadside	100	100.0	37.8	31.3	31.6	30.7	23.4
MR2	501613	159646	Roadside	84.6	84.6	32.5	28	37	28.6	23.4
OR	501679	159148	Roadside	100	100.0	27.6	25.2	27.7	22.7	19.9
VW	500510	159030	Kerbside	93.4	93.4	35.7	31.2	35.9	34.9	28.2
VW2	500281	158827	Roadside	100	100.0	-	18	27.9	24.1	19.5
VW3	500270	158731	Roadside	65.4	65.4	-	19.8	26.8	27.1	19.8*
VW4	500425	158584	Roadside	100	100.0	-	23.4	32.8	28	22.2



- ☒ 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  $\mu\text{g}/\text{m}^3$ .

Exceedances of the  $\text{NO}_2$  annual mean objective of  $40\mu\text{g}/\text{m}^3$  are shown in **bold**.

$\text{NO}_2$  annual means exceeding  $60\mu\text{g}/\text{m}^3$ , indicating a potential exceedance of the  $\text{NO}_2$  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%).

\*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.

Figure A.1 – Trends in Annual Mean NO<sub>2</sub> Concentrations within Guildford Road AQMA

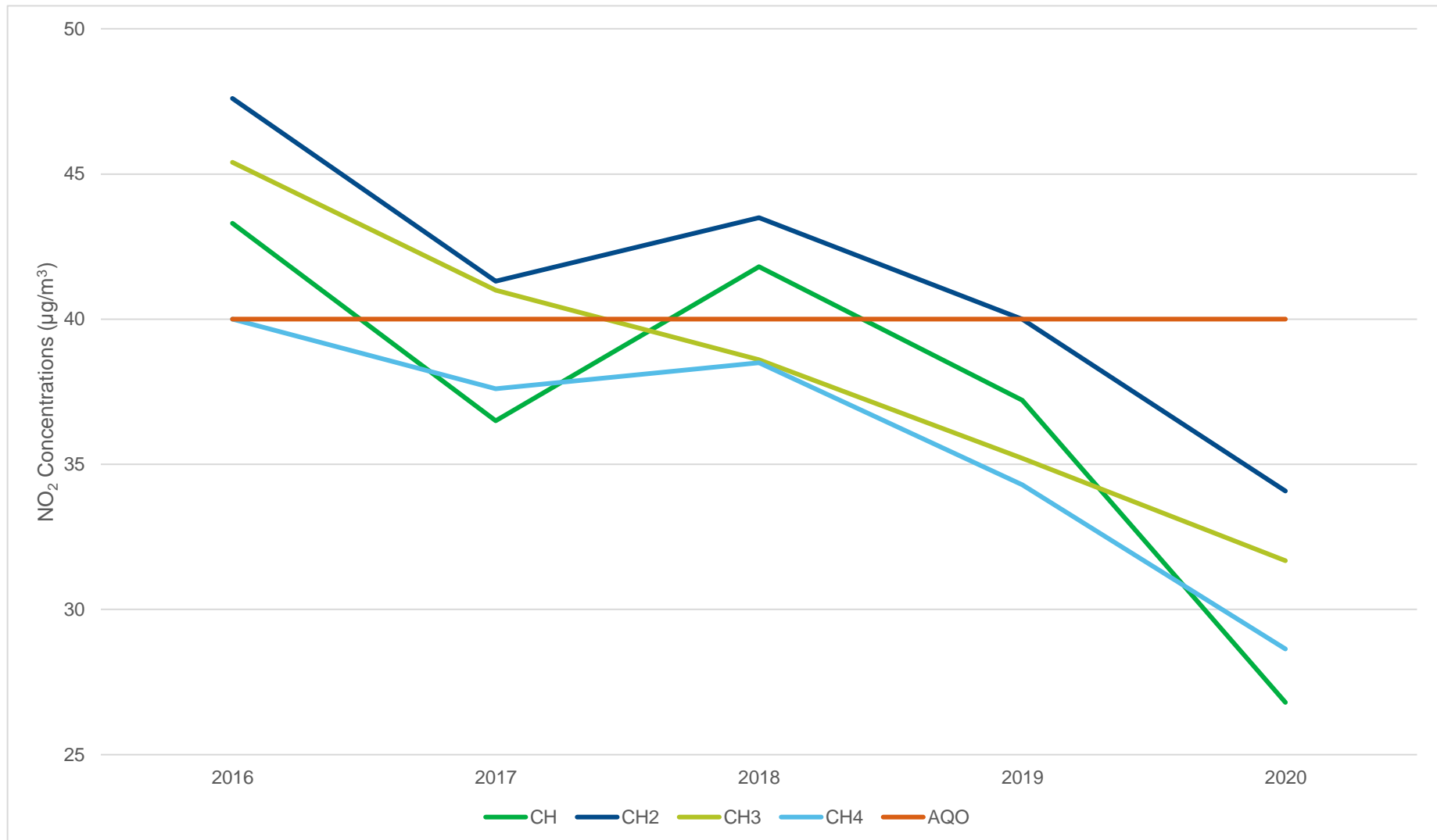
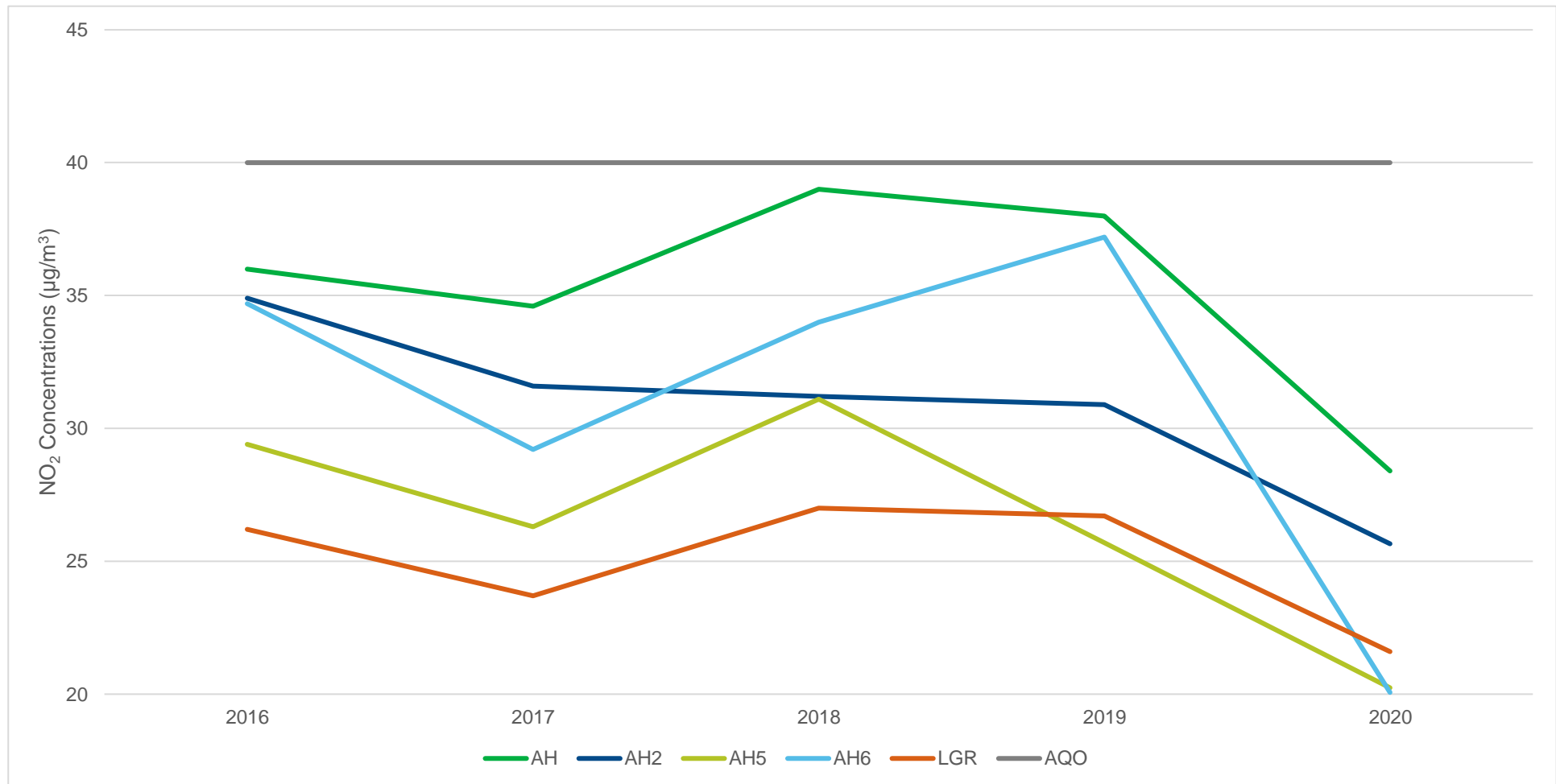


Figure A.2 – Trends in Annual Mean NO<sub>2</sub> Concentrations within Anchor Hill AQMA



## Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO<sub>2</sub> 2020 Diffusion Tube Results (µg/m<sup>3</sup>)

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 (0.96)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
BD	498025	158949	16.0	11.0	9.0	9.0	5.0	8.0	7.0	10.0	14.0	11.0	21.0	16.0	11.4	11.0	-	
TW	498435	159451	15.0	12.0	10.0	9.0	5.0	-	7.0	10.0	14.0	12.0	20.0	14.0	11.6	11.2	-	
AH	496618	158699	46.0	30.0	21.0	18.0	14.0	22.0	21.0	38.0	35.0	39.0	41.0	30.0	29.6	28.4	-	
AH2	496615	158696	43.0	32.0	23.0	18.0	14.0	24.0	18.0	-	35.0	32.0	36.0	19.0	26.7	25.7	-	
AH3	496646	158750	30.0	25.0	19.0	16.0	11.0	17.0	13.0	19.0	23.0	20.0	28.0	14.0	19.6	18.8	-	
AH4	496679	158767	23.0	18.0	15.0	10.0	14.0	25.0	19.0	28.0	34.0	34.0	38.0	29.0	23.9	23.0	-	
AH5	496594	158698	27.0	21.0	20.0	16.0	13.0	18.0	14.0	22.0	23.0	23.0	30.0	26.0	21.1	20.2	-	
AH6	496586	158686	-	25.0	-	15.0	11.0	16.0	16.0	22.0	29.0	17.0	33.0	25.0	20.9	20.1	-	
LGR	496601	158668	28.0	20.0	19.0	14.0	12.0	20.0	14.0	21.0	26.0	27.0	43.0	26.0	22.5	21.6	-	
BR	495821	157793	37.0	23.0	18.0	15.0	12.0	22.0	15.0	26.0	28.0	46.0	35.0	23.0	25.0	24.0	-	
BR1	495852	157188	-	-	-	-	-	21.0	14.0	22.0	23.0	35.0	27.0	22.0	23.4	23.0	-	
GR	499952	158545	31.0	23.0	18.0	14.0	11.0	19.0	15.0	21.0	25.0	21.0	40.0	24.0	21.8	21.0	-	
YR	500450	158278	36.0	23.0	19.0	13.0	12.0	19.0	15.0	23.0	28.0	25.0	36.0	26.0	22.9	22.0	-	
YR1	500447	158256	31.0	25.0	19.0	14.0	10.0	20.0	-	24.0	26.0	46.0	35.0	20.0	24.5	23.6	-	
LTK	500437	158120	38.0	25.0	20.0	14.0	11.0	19.0	18.0	32.0	33.0	62.0	34.0	43.0	29.1	27.9	-	
LT1	500453	158100	25.0	18.0	15.0	11.0	7.0	11.0	11.0	13.0	19.0	16.0	22.0	19.0	15.6	15.0	-	
CH	500417	158102	39.0	25.0	26.0	19.0	14.0	28.0	17.0	35.0	34.0	33.0	36.0	29.0	27.9	26.8	-	
CH2	500367	158073	50.0	40.0	34.0	24.0	17.0	31.0	25.0	45.0	43.0	37.0	46.0	34.0	35.5	34.1	-	
CH3	500330	158012	49.0	38.0	30.0	17.0	18.0	28.0	26.0	-	41.0	37.0	44.0	35.0	33.0	31.7	-	
CH4	500332	157983	41.0	31.0	28.0	17.0	18.0	26.0	24.0	34.0	39.0	30.0	41.0	29.0	29.8	28.6	-	
RC	500946	157110	18.0	15.0	13.0	8.0	-	8.0	20.0	11.0	15.0	11.0	5.0	-	12.4	11.9	-	
LD	503244	159659	18.0	16.0	14.0	9.0	6.0	11.0	9.0	11.0	14.0	12.0	20.0	15.0	12.9	12.4	-	
PR	504926	161063	25.0	20.0	18.0	15.0	11.0	21.0	14.0	21.0	21.0	20.0	26.0	19.0	19.3	18.5	-	
M25	505611	161180	46.0	38.0	38.0	25.0	23.0	37.0	28.0	47.0	47.0	44.0	50.0	40.0	38.6	37.0	-	
TC	506731	161229	28.0	23.0	24.0	24.0	19.0	25.0	19.0	25.0	30.0	25.0	35.0	21.0	24.8	23.8	-	
CR	506401	160504	25.0	20.0	11.0	11.0	8.0	13.0	11.0	17.0	19.0	18.0	17.0	20.0	15.8	15.2	-	
WL	502854	161062	25.0	22.0	18.0	14.0	9.0	15.0	13.0	19.0	20.0	20.0	34.0	16.0	18.8	18.0	-	
MR	501611	159645	36.0	29.0	23.0	15.0	13.0	20.0	18.0	25.0	29.0	25.0	34.0	26.0	24.4	23.4	-	
MR2	501613	159646	30.0	22.0	17.0	16.0	15.0	26.0	-	32.0	-	23.0	33.0	30.0	24.4	23.4	-	
OR	501679	159148	27.0	21.0	22.0	15.0	11.0	20.0	14.0	23.0	27.0	23.0	30.0	16.0	20.8	19.9	-	
VW	500510	159030	38.0	30.0	29.0	-	16.0	30.0	22.0	33.0	36.0	31.0	37.0	21.0	29.4	28.2	-	
VW2	500281	158827	28.0	22.0	19.0	16.0	13.0	20.0	11.0	20.0	26.0	18.0	30.0	21.0	20.3	19.5	-	
VW3	500270	158731	27.0	21.0	20.0	19.0	12.0	18.0	14.0	25.0	-	-	-	-	19.5	19.8	-	
VW4	500425	158584	35.0	30.0	19.0	15.0	12.0	19.0	17.0	25.0	32.0	22.0	30.0	22.0	23.2	22.2	-	

- All erroneous data has been removed from the NO<sub>2</sub> 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
- WBC confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System

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**.

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 WBC during 2020

WBC has identified the following development proposals as sources which could have an impact on the local air quality in the area:

- PLAN/2019/0452 and PLAN/2019/1176 - Woking FC/ Kingfield (Currently at planning inquiry following refusal)
- PLAN/2020/0568 - Land to the North & South of Goldsworth Road. Demolition of all existing buildings and redevelopment of the site for a phased mixed-use scheme, comprising 929 residential units (Class C3).
- PLAN/2020/1201 - Church Street West -. Demolition of Church Gate, Premier House.
- PLAN/2018/0374 - Sheerwater Regeneration. Leisure Centre phase nearing completion, application for discharge of conditions under consideration. Purple Phase nearing completion and Red Phase demolition and preparatory work has started.
- PLAN/2021/0359 - Buckinghams, Albert House, Albert Drive. Erection of part five storey, part four storey building containing 29 apartments with car parking, cycle storage, landscaping and associated works following demolition of an existing building in use as a car sales and MOT and servicing centre.
- PLAN2020/0244 - Technology House (48-54 Goldsworth Road). Prior Approval for a Proposed Change of Use of a building from Office Use (Class B1(a)) to a Dwellinghouse (Class C3) to provide 42 one-bed apartments.

### QA/QC of Diffusion Tube Monitoring

The diffusion tubes for 2020 were supplied by Lambeth Scientific Services and prepared using a 50% triethanolamine (TEA)/Acetone method.

## Diffusion Tube Annualisation

Results were annualised in line with guidance included in Box 7.9 and 7.10 of the LAQM.TG(16) for monitoring sites BR1 and VW3 as data capture was below 75%.

Data from Spelthorne Sunbury Cross and Chilbolton Observatory automatic monitoring stations were used to derive the adjustment factors. Both monitors are in background locations and had a data capture above 85% in 2020. They are both managed by the Automatic Urban and Rural Network (AURN), and ratified data was downloaded from the Air Quality England website<sup>17</sup>. Table C.2 details the calculations used to derive the annualisation factors for BR1 and VW3. The calculations led to the use of annualisation factors of 1.02 and 1.06 for BR1 and VW3 respectively.

## Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2021 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<sub>x</sub>/NO<sub>2</sub> continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

WBC have applied a national bias adjustment factor of 0.96 to the 2020 monitoring data. A summary of bias adjustment factors used by WBC over the past five years is presented in Table C.1.

**Table C.1 – Bias Adjustment Factor**

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
<b>2020</b>	National	03/21	0.96
<b>2019</b>	National	09/20	0.85
<b>2018</b>	National	06/19	1.03
<b>2017</b>	National	09/18	0.90

<sup>17</sup> <https://www.airqualityengland.co.uk/>

2016	National	06/17	0.94
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### **NO<sub>2</sub> 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 NO<sub>2</sub> concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO<sub>2</sub> monitoring locations within WBC required distance correction during 2020.



**Table C.2 – Annualisation Summary (concentrations presented in  $\mu\text{g}/\text{m}^3$ )**

Site ID	Annualisation Factor Speltthorne Sunbury Cross	Annualisation Factor Chilbolton Observatory	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
BR1	1.0067	1.0409	1.0238	23.4	24.0	
VW3	1.0718	1.0397	1.0558	19.5	20.6	

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

Figure D.1 – WBC 2020 diffusion tube monitoring locations

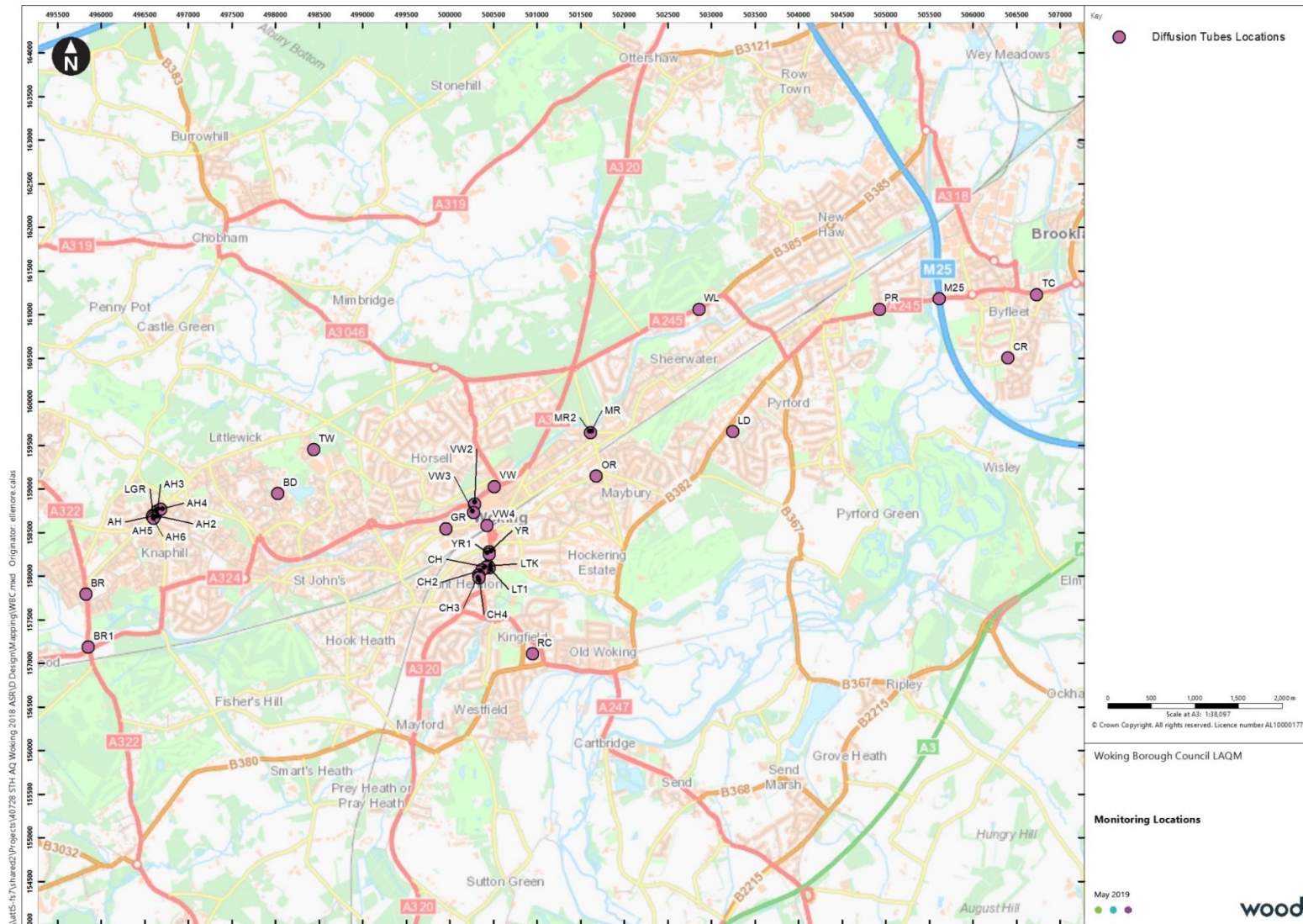


Figure D.2 – Anchor Hill AQMA and diffusion tube monitoring locations

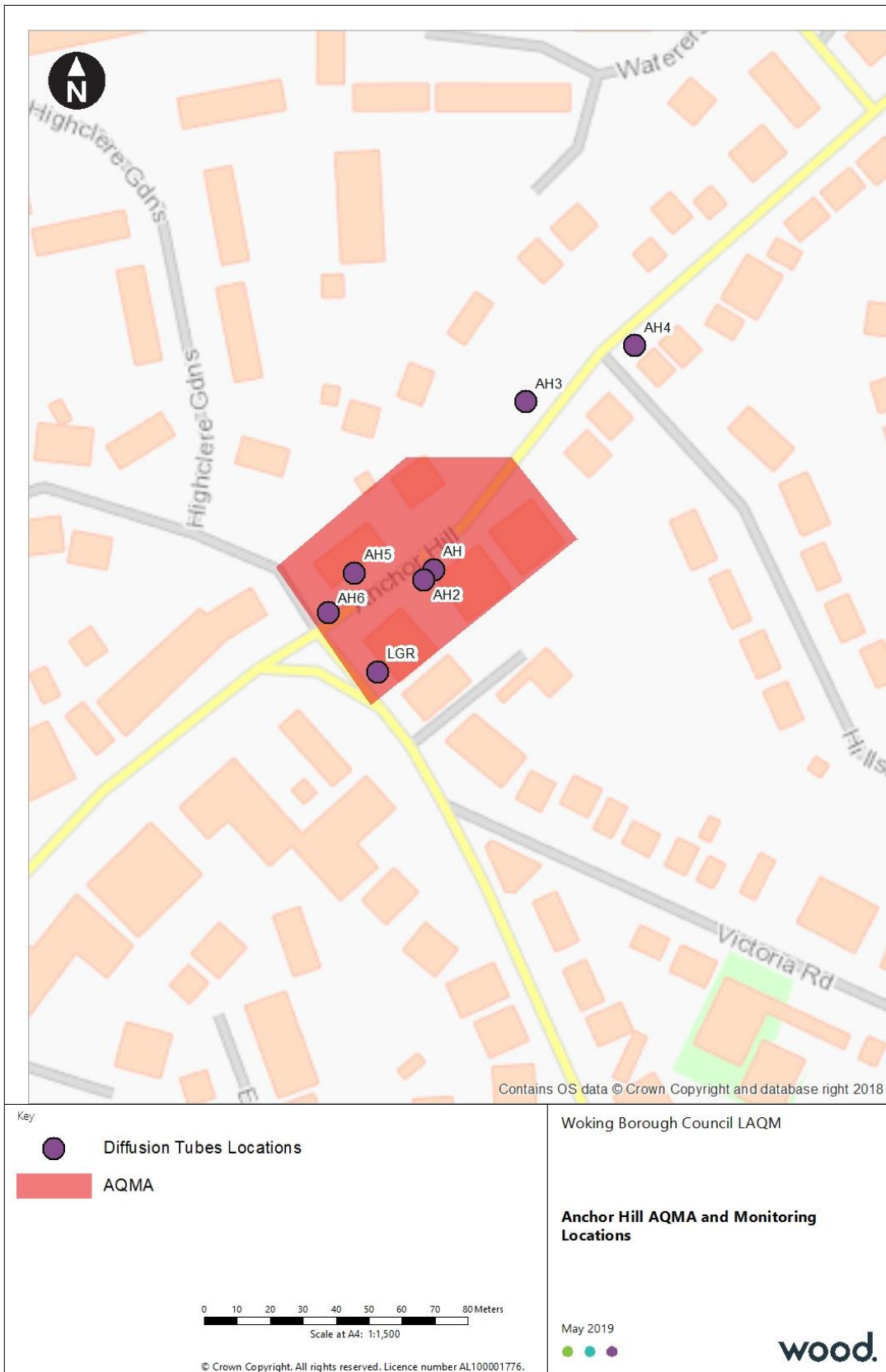


Figure D.3 – Guildford Road AQMA and diffusion tube monitoring locations



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

**Table E.1 – Air Quality Objectives in England<sup>18</sup>**

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

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<sup>18</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## 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 (NO<sub>2</sub>) 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) data<sup>19</sup> 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<sub>x</sub>), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)<sup>20</sup> has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO<sub>2</sub> annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

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<sup>19</sup> Prime Minister's Office, COVID-19 briefing on the 31<sup>st</sup> of May 2020

<sup>20</sup> 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 20µg/m<sup>3</sup> if expressed relative to annual mean averages. During this period, changes in PM<sub>2.5</sub> concentrations were less marked than those of NO<sub>2</sub>. PM<sub>2.5</sub> 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 PM<sub>2.5</sub> concentrations during the initial lockdown period are of the order 2 to 5µg/m<sup>3</sup> 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 Woking**

The annual average of all the monitoring sites in Woking has reduced this year due to COVID-19. This could be for a number of reasons; i.e. less people commuting (only essential workers), more people working from home, less people using public transport, less people travelling and using their cars for recreation/ leisure purposes during the National lockdown. See Section 2 for conclusions of results.

## **Opportunities Presented by COVID-19 upon LAQM within Woking**

A positive air quality related local action undertaken by WBC during the pandemic has been to engage with the residents in asking them to refrain from having bonfires.

## **Challenges and Constraints Imposed by COVID-19 upon LAQM within Woking**

WBC would have benefitted from national guidance and advice, regarding encouraging people not to use transport, or not to commute to and from work from home etc.

No challenges or constraints relating to LAQM have arisen during 2020 as a consequence of COVID-19 within WBC.

**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 <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm 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
SO <sub>2</sub>	Sulphur Dioxide

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