Appendix 'A'

Runnymede BOROUGH COUNCIL

AIR POLLUTION SERVICES

2022 Air Quality Annual Status Report (ASR)

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

September, 2022

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Quality Assurance

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Executive Summary: Air Quality in Our Area

Air Quality in Runnymede Borough Council's area

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 (Benedict W Wheeler, 2005) (Defra, 2006).

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion (Defra, 2013). Previous Reviews and Assessments within Runnymede Borough Council have concluded that concentrations of carbon monoxide, benzene, 1,3-butadiene, lead, sulphur dioxide and PM_{10} are compliant with the relevant national and European objectives.

Air Quality Management Areas (AQMAs) have however been declared at two locations in Runnymede Borough Council for exceedances of the annual mean nitrogen dioxide objective, namely land adjacent to the M25 and at a traffic light-controlled junction in Addlestone town centre.

Details of the current AQMAs can be found on the Defra UK Air website (www.uk-air.defra.gov.uk) or via the following link:

https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=26

The highways authorities for Runnymede are Highways England for the major strategic network roads (M25, M3) and Surrey County Council (SCC) for the other roads within the Borough. The SCC Local Transport Plan (LTP3) includes a number of supporting strategies including the Surrey Air Quality Strategy and the Surrey Climate Change Strategy.

The aim of the air quality strategy is to improve air quality in AQMAs on the county road network such that Surrey's Borough and District Councils can undeclared these areas as soon as possible.

M25

Monitoring carried out in 2013/2014 confirmed that nitrogen dioxide concentrations adjacent to the M25 AQMA in Egham at the Pooley Green railway level-crossing were above the air

quality objective at relevant locations and as a result the M25's AQMA was extended to include the area adjacent to the level-crossing. Hence, in 2015 the department's available resource for air quality at that time was dedicated to declaring an extension of the AQMA to include the area adjacent to the crossing. It had been noted from the latest annual monitoring results that the levels of nitrogen dioxide within this area had been falling in line with national trends and were thought to be consistently lower that the objective level. However, in 2019 it was discovered that the levels of nitrogen dioxide had risen back up to almost the objective level for nitrogen dioxide and hence the consideration of removing this area from the AQMA was postponed. However, in 2020 it has been discovered that in this covid hit year the levels have fallen and hence should these current levels be maintained next year then further consideration will be made to revoking this extended AQMA. In 2021, the concentration remained below the objective, but there remained some uncertainty due to Covid-19. Further consideration will be made next year to revoking this extended AQMA, should levels continue to remain below the objective.

Addlestone

There is an area associated with a four-way traffic light-controlled junction in Addlestone town centre which has been declared an AQMA. The general trend indicates a decrease in nitrogen dioxide concentrations, to below objective levels, at locations that are located on the roads leading up to the actual 4-way junction where the traffic lights are located.

However, it is interesting to note that the area immediately adjacent to the traffic light-controlled junction at the centre of the AQMA, where there is a monitor located on the façade of a residential premise, this location continues to indicate a level above the air quality objective. In 2021, the concentration was 41.0 µg/m^3.

It appears that because of the congested nature of traffic flow and the high sided building close to the road then it is proving difficult to obtain any improvements in air quality and since the problem relates specifically to road transport and highway issues then it is suggested that SCC should further consider highway improvements to this area in order to seek to achieve a reduction in nitrogen dioxide level produced by traffic on the highway.

A photograph has been provided which depicts the proximity of the diffusion tube to the façade of the building at the traffic light-controlled junction to provide an indication of the type of situation that is encountered with properties directly abutting the footway.

Figure 1 - Photograph of Monitoring Site at the AQMA Addlestone traffic light junction

Investigation for a potential AQMA at Chertsey

At a busy roadside junction controlled by traffic lights in Chertsey it has been shown that there were exceedances in the air quality objective at the kerbside, however once all the necessary correction factors had been applied then the levels at the closest residential facades were within the objective limits. The Council is attempting to keep a “watching brief” at this location however in 2018 there had been a spate of missing diffusion tubes. As a result, measures were taken such as moving some of the monitors closer to the highway and to a less prominent position then it appears that these measures have helped in providing more reliable returns of the diffusion tubes. For 2021 it is again discovered that at the facades of residential properties within the area, after making the appropriate adjustments for bias and distance, the level of nitrogen dioxide is fairly close to the prescribed objective level and hence the determination is that this area will remain under the “watching brief”.

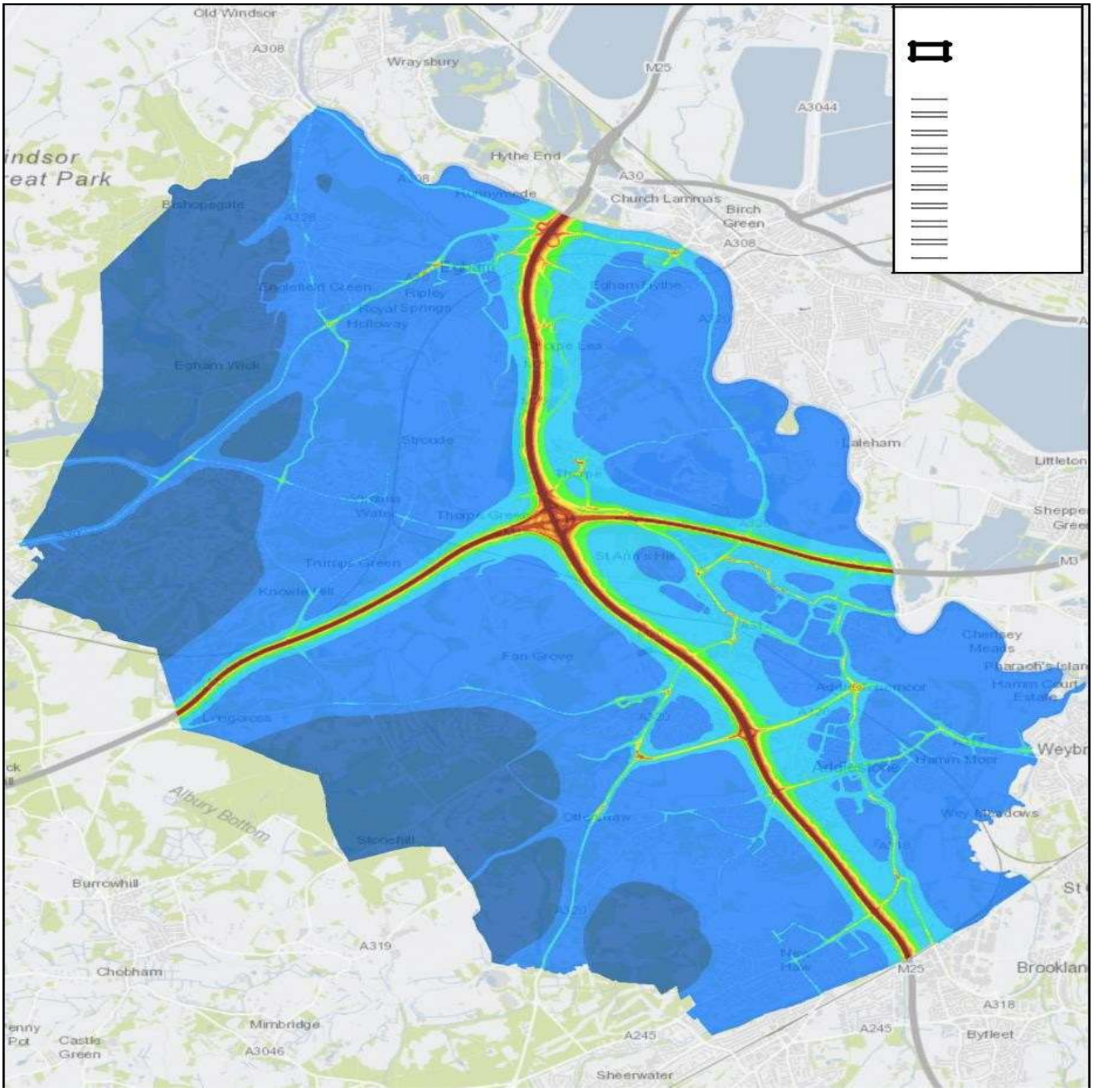
Source of Air Pollution

Road modelling of annual nitrogen dioxide levels shows the influence of road traffic on levels across the Borough, with major trunk routes such as the M25 and M3 motorways. Modelling was undertaken in association with the Council's planning department in relation to the now approved Local Plan. Further air quality modelling work has been commissioned on a county wide scale by Surrey Air Alliance.

Runnymede's modelling exercise was based on road traffic information for 2015. The modelling was done in order to consider proposed traffic pollution with regards to the future areas of development. This information was submitted to the Planning Inspector as evidence for the now approved Local Plan. The modelling has demonstrated the main source of nitrogen dioxide to originate from the road networks, see Figure 2.

Runnymede also continues to support Surrey Air Alliance (SAA), a working group of air quality officers from across the Surrey Districts and Boroughs, which is also attended by officers from Surrey County Council and Surrey Public Health. Further air quality modelling work across all of Surrey was commissioned by SAA.

Figure 2 – Predicted NO_2 Concentrations across the Borough



Aircraft; Heathrow Airport expansion

Heathrow southern runway is at its nearest point some 4 km from the boundary of Runnymede Borough Council. Parliament in 2018 passed the Airports National Policy Statement, being the policy that sets out the criteria under which consent will be given for expansion of the airport. Thereafter, Heathrow Airport commenced various discussions surrounding the expansion of the airport. A Judicial Review considered the decision regarding the Government's Airports National Policy Statement since it was suggested that the statement had not taken the Climate

Change Convention, which the Government had become a signatory to, fully into account and hence any Airport expansion should not proceed until a new Policy Statement is published by the UK Government. The matter came before the Supreme Court and they came to the view that this is not the case.

The Covid-19 pandemic had a profound impact on the aviation industry and the wider economy in 2020 and uncertainty still continues, and hence it is not currently abundantly clear as to the intensions of Heathrow with regards to expansion however it is understood that there are fresh discussions starting to take place as to resurrecting expansions plans.

In terms of air quality and over-flights within the Borough, according to information from DEFRA that once an aircraft in the process of taking off reaches an altitude of greater than 450 m, then the on-ground contribution to air quality from aircraft overhead would be negligible. Hence, in terms of aircraft taking off from Heathrow airport, and maintaining the required climb gradient then it is expected that aircraft would be above 450 m height when entering into airspace above the Borough of Runnymede and hence would produce negligible, direct, on ground air quality issues in relation to the current applicable air quality standards.

In should be noted that it has been suggested that there is to be a privately funded Heathrow Southern Railway line associated with an expanded Heathrow Airport. The proposed route of the new railway line would take it from the southern boundary to the northern boundary of the Borough and then link into Heathrow airport and hence create a railway feed from the South of the airport.

Major projects for consideration

- Heathrow Airport expansion (see above for discussion point).
- South West railway line in support of a potentially expanded Heathrow Airport. (see above for discussion point).
- Southampton to London Pipeline – Esso are proposing to replace 56 miles of the 65-mile Southampton to London Pipeline. The existing underground pipeline enters into the Borough at Longcross and leaves the Borough at Chertsey where it crosses the River Thames. The preferred route of the new pipeline was consulted on in Autumn 2018, and a Development Consent Order application was made in June 2019 and consultation over the finer detail is ongoing. The consented project could start in 2022.

https://infrastructure.planninginspectorate.gov.uk/projects/south-east/southampton- to-london-pipeline-project/

- Thames flood water relief scheme. Major engineering works at the River Thames in order to provide a series of measure that will help protect residents within the Borough from flooding. A major project of the Environment Agency and Local Authorities. Information is available from Surrey County Council here:

  https://news.surreycc.gov.uk/2021/06/10/major-river-thames-flood- alleviationproject-passes-key-milestone/

  and for the Environment Agency here:

  https://www.gov.uk/government/publications/river-thames-scheme

Executive Summary

The summary is designed to provide an overview for people who reside and work within the area of RBC as to the air quality that was present within the Borough during 2021. The report also provides detail of how the issue of air quality is being addressed within the Borough and the intentions of the Council in determining any future action.

The main conclusions of the report are the following:

- Nitrogen dioxide is the main air pollutant of concern within the Borough since there are small areas within the Borough where the level of nitrogen dioxide levels exceed or are close to prescribed objectives. The levels of nitrogen dioxide are in the main generated by vehicular transport and problems can occur in areas with high volumes of traffic.
- Air quality within the Borough has generally seen a slow decline in nitrogen dioxide levels across the Borough over the time period that the Council has been monitoring the levels of nitrogen dioxide with some notable exceptions.
- When directly comparing the nitrogen dioxide levels of 2019 to 2021, the air quality situation within the Borough has overall seen an improvement in air quality year on year in so much that in 2021 there was only one exceedance, and five monitors out of 33 that reported values within 10% of the objective value.
- The area which was declared as an extension to the Air Quality Management Area (AQMA) in Egham that had previous showed an indication that the situation was improving, unfortunately 2019 showed levels at the facade of residential building which have risen back up towards the objective level. However, 2020 and 2021 both showed a fall in levels and if current levels are maintained then this AQMA will be revoked.
- The difficulties that were reported last year at the area held under a “watching brief” in relation to an area adjacent to a road junction controlled by traffic lights in Chertsey due to the fact that during 2018 there was a spate of diffusion tubes going missing, prior to collection. However, it was decided to move some of the tubes to less prominent positions and in some of them were moved closer to the highway in an attempt to make the unauthorised removal more difficult.

Following the introduction of these measures, it appears that this has helped to improve the security of the tubes since all of the exposed diffusion tubes were recovered.

- In 2021, there was one notable area of concern (RY14) within the Borough where annual average nitrogen dioxide levels exceeded the national air quality objective of 40 µg/m^3. The tube is located close to a four-way traffic light-controlled junction at Addlestone, within the Addlestone AQMA. In 2021 the bias adjusted result shows that the level of nitrogen dioxide at the facade of a residential property was 41.0 µg/m^3, a reduction in the previous year of 2020 which had a result of 49.2 µg/m^3.
- RBC continues to work in close collaboration with colleagues at Surrey County Council within such networks as the Surrey Air Alliance (SAA).

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 (Defra, 2019) sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero (Defra, 2018a) 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 Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

- Consideration of how to improve air quality have been included in the Council's approved Air Quality Action Plan and this includes a raft of measures such as consideration for planning applications within or near the Borough's AQMA. Many planning applications have had conditions in relation to air quality requirements due to the fact that the development was close to or within a defined AQMA. For the full range of measures see Runnymede's Air Quality Action Plan.
- Runnymede Borough Council monitors local air quality through an extensive

diffusion tube monitoring network within the Borough.

- Runnymede Borough Council, together with the other ten Surrey Local Authorities and representatives from Surrey County Council (Public Health and Transport) have established the SAA Group which aims to coordinate certain actions to reduce air pollution within Surrey. The group has commissioning a modelling exercise of air pollution.
- Approval of the Council's Local Plan.
- Bid to Defra in 2019 for an air quality grant by Runnymede Borough Council for funding for an educational campaign to try to change drivers' behaviours toward switching their engines off at level crossings [NB Grant not awarded].
- In order to meet the Borough's development needs and growth opportunities then the Local Planning Authority has to have in place a Local Plan. The new Local Plan was adopted in July 2020. Air quality modelling work was commissioned in 2018 in relation to the proposals within the emerging plan in order to understand the potential impact that the policies and plans of the approved Local Plan would have on air quality.
- Schools Project: In Spring 2018, the SAA consortium was awarded £145,188 from the Defra's AQ Grant Fund to run an engagement and behaviour change programme at up to 40 schools across Surrey near to an AQMA (see the 2018 and 2019 Annual Status Reports for further details). The objective of the project was to give school children an increased awareness of the health impacts of poor air quality and where the Air Quality Management Areas are near their school, to understand what they could do to improve local air quality and reduce exposure, and ultimately to change behaviour. The majority of the project was run in the 2018/19 academic year with further work in 2020/21.
- Following the success of the Defra Grant Funded Surrey schools AQ programme, the Surrey Air Alliance worked with the Surrey County Council Safer Travel Team to continue the programme as a self-funded initiative by seven of the Surrey districts and boroughs, including Runnymede. This programme was for the continuance of three measures in the 2019/20

academic year: Theatre in Education, school workshops including air quality monitoring by pupils using diffusion tubes, and anti-idling events however due to the Covid -19 pandemic in 2020 it was not possible to undertake class workshops, air quality monitoring by pupils, school assemblies, anti-idling workshops or pedestrian and cycle training. The Surrey County Council Safer Travel Team continued to work with Global Action Plan who undertook the production of online materials and videos for use in the virtual classroom. Prior to the initial 2020 lockdown period Theatre in Education workshops were undertaken in several Primary Schools within the Borough. Post June 2020 online workshops and assemblies were delivered by Global Action Plan.

- From September 2021 Surrey County Council created a temporary post for a dedicated Eco Schools Engagement Officer, to encourage and promote the Eco Schools agenda in Surrey and to increase the number of Green Flag schools within the county.
- Resources will be on offer to all schools across Surrey including Modeshift STARS Travel Plans, Bikeability cycle training, Golden Boot/ Green boot Challenge, Global Action Plan resources, Anti-Idling Equipment to loan to schools and there will be a return to school/ anti idling campaign in September 2021.
- Surrey County Council have undertaken an analysis of Surrey Primary School travel and Secondary School travel based on surveys of parents/carers and pupils in Surrey undertaken in November and December 2020. The purpose of the analysis was to better understand the travel patterns of Surrey school populations in both a pre Covid- 19 landscape and during the pandemic, to understand pinch points and barriers to active travel, and to understand what might incentivise parents to favour active travel methods. By having a better understanding of these factors Surrey County Council who are the Transport Authority within Spelthorne aim to reduce congestion, improve the roads around schools and confront barriers to active travel. 13095 survey responses were received for Primary Schools and 7253 responses were received from Secondary Schools. Runnymede Council Officers continue to work with Surrey County Council to give local knowledge and local air quality expertise.

- In October 2020, the Surrey Air Alliance, applied for a Defra 2020/21 Air Quality Grant to fund a project to encourage a greater uptake of Electric Vehicles as Taxi's across 7 eligible Boroughs and Districts in Surrey. Taxis were selected as the target vehicles given the high mileage and multiple trips the vehicles make within Surreys Air Quality Management Areas and the nature of the journeys which take the vehicles into areas frequented by the members of our communities who are most sensitive to air pollution such as to hospitals, care facilities and schools. In March 2021, the project was awarded £256.686 from the Defra AQ Grant. It is since become evident that the proposed scheme which the grant was awarded for is not feasible and hence a very different scheme has been suggested. Runnymede did not support the original bid since it was evident that there were fundamental issues with the original scheme however Runnymede Council has expressed its desire to be part of the new proposal.
- In November 2018, Surrey County Council adopted an Electric Vehicle Strategy setting out how SCC will support and promote the uptake of electric vehicles in Surrey. Surrey is an area that is well-suited to adopting electric vehicles. The document will be key in ensuring a coordinated approach across the County and to place Surrey in the best possible position to bid for external funding for projects. In Autumn 2019 a funding award was made by the M3 Local Enterprise Partnership for a wide-ranging trial programme of on-street EV charging technologies by Surrey County Council in partnership with Spelthorne, Woking, Guildford and Waverley Borough Councils.
- Runnymede Council are supporting energy efficiency measures in fuel poor homes through the Energy Company Obligation (ECO) scheme. The Government launched the Green Homes Grant Local Authority Delivery Scheme in 2020 making funding available to support fuel poor and low energy inefficient homes. In partnership with other Surrey Boroughs and working with Action Surrey £6.2million was secured from the Local Authority Delivery Scheme, to support up to 600 fuel poor homes in Surrey. A second phase of funding under was released and another £3million was secured to support a

further 300 homes in Surrey. This work is currently progressing having experienced significant delays due to the Covid-19 pandemic.

- The National Clean Air Day was delayed until October 2020 due to the Covid19 pandemic. Following government restrictions promotions were predominantly pushed out via online platforms. The Surrey Air Alliance produced a short animation on good practice in using and maintaining domestic wood burning stoves.

1.1 Conclusions and Priorities

Overall, 2021 was seen as a difficult year to quantify, mostly due to the covid and its implications on travelling. There were areas that showed encouraging signs that the levels of nitrogen dioxide within the Borough decreasing however it seems that there is still one areas of concern most notably within the AQMA at Addlestone. In addition to the high-level national programmes policies and initiatives that are seeking to reduce levels of emissions there is sterling work being undertaken across the County due to the concerted effort of the SAA in such areas as schools air quality projects.

RBC have also joined the Air Alert scheme and hence provides this valuable service to people who have a need to know about poor air quality days. Currently there are over 1,000 residents within Surrey's air alert scheme.

1.2 Local Engagement and How to get Involved

There is continual interest in air quality locally from Councillors, residents' groups, consultants and individual residents. Information is displayed on the Councils web site to promote special events such as clean air day and Air Alert. Information such as the following:

- Clean air day

  As most air pollution of concern in the district is related to traffic, there are some easy changes we can make to all do our bit to reduce emissions:

  1. Do you need to take the car? – consider alternatives to using your car; public transport, walking or cycling will help reduce emissions. For timetables, guides and maps visit the Travel Smart in Surrey

website:

www.travelsmartsurrey.info/

There is also information there on car sharing and car clubs.

Research has indicated that levels of air quality pollutants inside vehicles, even with the windows shut, can lead to higher exposure than pedestrians and cyclists on the same streets. So, by walking or cycling you could reduce your exposure and improve your fitness and health.

2. Need to take the car? – Think about how you drive. Small changes improving your driving style can save lots of fuel, significantly reduce wear and tear, and improve the life of your vehicle:
   - Regular maintenance improves fuel efficiency by as much as 10% plus underinflated tyres increase rolling resistance, further increasing fuel consumption.
   - Reduce excess weight and wind resistance (caused by roof racks, open windows and boot clutter);
   - Reduce engine idling – a modern engine is designed to be used 'from cold'. Warming up an engine whilst stationary wastes fuel and leads to undue engine wear.
   - Avoid aggressive acceleration and braking – aggressive driving can raise fuel consumption by 37%;
   - Change up gears as soon as possible.
   - Review trip data after a journey to learn how to improve driving style, or to reinforce eco-driving lessons already learnt. A number of apps and satnavs can help with this. Only use such tools when it is safe and legal to do so.
3. Thinking about changing your car or van? – consider an ultra-low emission vehicle such as a plug-in electric or hybrid vehicle. More options are becoming available each year, technology is improving the range of vehicles, running and servicing costs are much lower, and

grants are available to help towards their purchase.

- Air Alert

The Council has recently subscribed to Air Alert and has invited people suffering from asthma, chronic obstructive pulmonary disease (COPD) or a respiratory condition to sign-up for AirAlert, a free service provided by the Council to help those with respiratory conditions manage their health when air quality is poor. While air pollution levels in Runnymede are generally “Low”, on ~20 days per year pollution levels are reached that are capable of causing short term health symptoms for people with pre-existing respiratory conditions.

People who register for the free service receive an email, text or voicemail message, informing them the day before of an expected elevation of air pollution in their area. This enables them to make choices about what they do and how they manage their medication, so they can stay in control of their own health.

Health advice in the AirAlert message is approved by UK experts and varies according to a simple air pollution index (low, moderate, high and very high). The index is based on the levels of five pollutants (nitrogen dioxide, sulphur dioxide, ozone, carbon monoxide and particles). For more information on the AirAlert service visit www.airalert.info/Surrey to register. For residents without internet access, please phone 01784 446 251 to sign up.

A survey of AirAlert users showed that 88% of survey respondents found AirAlert a useful or very useful service, and two thirds had recommended it to someone else. They found the service helped them manage their symptoms and reduce their exposure to air pollution. They also reported increased confidence to participate in social and recreational activities.

In addition to the phone/ email service, users of AirAlert and any other interested resident can also download the airAlert app to a Smartphone (android and iOS) from Google Play or the App Store.

It is envisaged that Air Alert will be a valuable addition to the promulgation of information to a receptive audience.

If you have any queries on the AQMA or the local air quality management process, please contact us using the details below:

Email: lucy.hawkings@runnymede.gov.uk

Phone: 01932 838383

Write to: Civic Centre, Station Road, Addlestone, Surrey KT15 2AH

Further information on air quality in the UK, including the latest news, air quality monitoring results and forecasts, can be obtained by visiting the Defra website at:

https://uk-air.defra.gov.uk/

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1 Local Air Quality Management

This report provides an overview of air quality in Runnymede Borough Council (RBC) during 2021. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and amendments through the Environment Act 2021 along with 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 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 RBC to improve air quality and any progress that has been made. Local Authorities in England are expected to report on nitrogen dioxide (NO_2), particulate matter (PM_{10}) and sulphur dioxide (SO_2) as standard within their ASRs. The Government does not expect local authorities to report annually on benzene, 1,3-butadiene, carbon monoxide and lead as objectives for these pollutants have been met for several years.

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

A summary of AQMAs declared by RBC can be found in Table2.1, which presents a description of the two AQMAs that are currently designated within RBC. Maps of the AQMA locations are provided in Appendix D. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO_2 annual mean.

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
AQMA M25	Declared 3/12/2001 Amended 20/10/2015	NO_2 Annual Mean	M25	Entire length of M25 within the Borough and an extended area in December 2016 to include area in Egham near to railway crossing	Yes	<40	µg/m³	26.2	µg/m³	AQAP	April 2014	https://www.runnymede.gov.uk/CHttpHandler.ashx?id=5497&p=0
AQMA Addlestone town	Declared 4/7/2008	NO_2 Annual Mean	Addlestone	Addlestone	Yes	<40	µg/m³	**40.1**	µg/m³	AQAP	April 2014	https://www.runnymede.gov.uk/CHttpHandler.ashx?id=5497&p=0

Note: The NO_2 concentrations shown in the table above are from the monitoring sites, within the AQMAs, where the highest concentration was reported in the year of declaration and the current year. The maximum concentration will not necessarily be at the same monitoring site for both years. In 2021, the greatest exceedance was at Site RY14 in the Addlestone.

☒ **RBC confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **RBC confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in the RBC

Defra acknowledged the receipt of last year's ASR however there was no appraisal or further comment made in relation to the content of the report.

Details of the Council's Air Quality Action Plan 2014 can be found at:

https://www.runnymede.gov.uk/CHttpHandler.ashx?id=5497&p=0

Key completed measures are:

- Consider planning applications near to or within the designated AQMAs to ensure that suitable measures are adopted in relation to air quality.
- Supporting SCC with plans and funding bids to assist with improving air quality within the Borough.
- Maintain a strong presence within Surrey Air Alliance group.
- Joining the AirAlert scheme.

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

- Highway infrastructure improvements – Liaison with agencies with responsibilities for transportation networks within AQMAs to deal with: (i) improving the road layout and flow of traffic within AQMA and (ii) ensuring that any temporary road works to roads adjacent or within the AQMA's have strict conditions applied to any permit to minimise additional congestion within the AQMA.
- Attempted to maintain a close "watching brief" on the nitrogen dioxide levels at Bridge Road /Weir Road Chertsey but has been hampered due to missing tubes.
- Consider unification of an emissions policy for taxi licencing within all of Surrey to ensure continuity of approach to this matter.
- In Spring 2018, the SAA consortium obtained £145,188 from the Defra AQ Grant Fund to run an engagement and behaviour change programme at up to 40 schools across Surrey within 2km of an Air Quality Management Area.
- The project has run throughout the 2018/19 academic year and some activities continued into the 2019/20/21 academic years. Since schools were selected which were close to Air Quality Management Areas the aim of the project was to give the

pupils attending these school an increased awareness of the health impacts of poor air quality and, to understand what was possible to do to improve local air quality and reduce exposure, and ultimately to change behaviour.

Schools within RBC took part in one or more of the measures on offer, which included:

- Media Campaign – a multi-media campaign using bespoke positive messages aimed at primary school children and their parents using posters on bus backs and ad-shells at bus stops, publications such as Primary Times and Surrey Matters, digital media e.g. electronic newsletters, Facebook, Twitter, and radio advertising.
- Theatre in Education – A bespoke theatre production designed for year 5 pupils to raise awareness of the health issues associated with poor air quality. The drama production also explored sustainable modes of transport.
- Bikeability Learn to Ride – subsidised scheme (on top of the cycle training already offered by Surrey County Council) to help over 2,500 trainee pupils ride without stabilisers.
- School Lessons and resources – a specialist provider produced toolkits and resources for both Primary and Secondary Schools and delivered workshops and whole school assemblies either in person or on line. The workshops included practical exercises in exposing nitrogen dioxide diffusion tubes to investigate pollutant levels with distance from school drop-off zones.
- Modeshift Stars – extra assistance to schools to help them gain accreditation under the ModeShift Stars scheme.
- The programme hosts an Air Quality Summit to further disseminate the messages and successes of the project across school representatives from across the County. The Summit will be a networking opportunity for Eco Co-ordinators from schools across the county. Workshops and presentations will be provided by the London Sustainability Exchange on their school workshops and resource toolkits; a research fellow from the University of Surrey's Global Centre for Clean Air Research; a showcase school from the programme on their experiences; Living Streets and the SAA air quality modelling work.
- In June each year Surrey County Council host a sustainable travel challenge called the Golden Boot. As part of the air quality schools programme it is proposed to include

an air quality theme to the challenge, with a rebrand and upgrade. A Green Boot challenge will be introduced since it will be a more accessible scheme than the Golden Boot scheme. However, it is perceived that if the Green Boot scheme is a success then schools may go onto undertake the Golden Boot challenge.

The introduction of a new Runnymede Air Quality Action Plan: The old Action Plan is now some seven years' old and it is recommended that such documents are updated within such periods. Hence the updated Action Plan will set out measures to help Runnymede reduce concentrations of NO_2 in line with the Air Quality Standards objectives.

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	AirAlert	Public Information	via other mechanisms	2018	On-going	LA's in Surrey	RBC	No	-	-	Implementation	Protection of public health by providing air quality information to vulnerable residents	Uptake by residents, Reduced hospital admissions	Publicised on Council's website and via Council's publication.	Hard to reach residents
2	Working In Partnership with neighbouring authorities -	Policy, Guidance and Development Control	Regional Groups programmes to develop area wide strategies to reduce emissions and improve air quality	2015	On-going	LA's in Surrey	RBC	No	-	-	Implementation	Protection of public health. Successful project implementation	Informed decision making	Officers actively participate in Surrey AQ Officers working group (Surrey Air Alliance).	-
3	Surrey-wide Air Quality Modelling	Policy, Guidance and Development Control	Other policy	2017	2020	LA's in Surrey	RBC	No	-	-	Completed	Scientific information to inform policy	Receipt of Surrey-wide air quality	Publication 2020	-
4	Runnymede Cycleways - upgrading existing routes	Transport Planning and Infrastructure	Cycle network LCWIP	2018	2021	Surrey County Council	partnership	No	-	-	Implementation	Improvement s to active travel infrastructure facilitating more non car journeys	Increased uptake in cycle journeys made.	-	-
5	Land Use Planning	Policy, Guidance and Development Control	Air Quality Planning and Policy Guidance	2020	Ongoing	RBC	RBC	No	-	-	Planning	Reduced vehicle emissions, heat and energy plant emissions and construction dust emissions.	Measured concentration of NO2 at diffusion tube monitoring locations.	Policy EE2 requires consideration of air quality. Assessments include construction phase impacts. Mitigation measures enforced by condition or requirement for Construction Environmental Management or Dust Management Plans.	-
6	Alternatives to private vehicle at Thorpe Park	Alternatives to private vehicle use	Rail based Park & Ride	2005	Ongoing	Surrey County Council and Merlin	Thorpe Park	No	-	-	Implementation	Improved connectivity to Thorpe Park from the rail network.	Reduced congestion on Borough roads, reduced emissions.	Rail & Ride service provided during theme park season.	-
7	Encourage adoption minimum emissions standards into taxi licensing procedures	Promoting Low Emission Transport	Taxi Licensing conditions/incentives	2016	2020/21	Runnymede Borough Council	Reduce tailpipe emissions in AQMA	-	-	-	-	-	-	Air Quality officers representing the borough/district councils have suggested taxi licencing authorities for County wide policy on emissions	-
8	Permitted premises	Environmental Permits	Other measure through permit systems & economic instruments	-	-	Runnymede Borough Council	-	-	-	-	-	-	Ensuring that all permitted process operate within control limits	-	-
9	Air Quality Action Plan produced and approved by committee	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	-	2014	Runnymede Borough Council	-	-	-	AQAP Published	-	2014	-	-	County with 2 tier authority

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

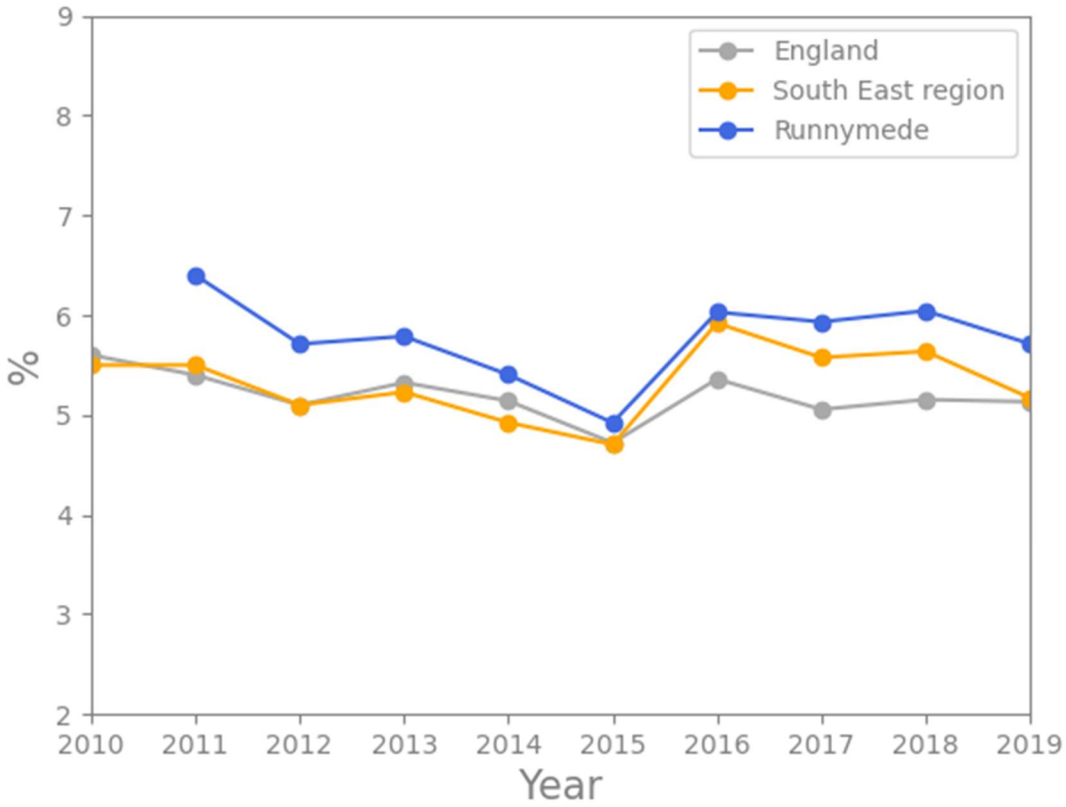
As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5 µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health,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

The air quality modelling works indicates that levels of $PM_{2.5}$ are likely to be higher closer to the motorway road network and the strategic road network.

It is well established that $PM_{2.5}$ exposure can have a significant impact on human health including premature mortality and the Public Health Outcomes Framework uses this parameter is an indicator of the fraction of mortality attributable to particulate air pollution. Although levels of particulate matter (PM_{10} and $PM_{2.5}$) within the Borough are within air quality objectives, it is recognised that action to reduce particulate emissions will benefit public health.

The Public Health Outcomes Framework data tool (Public Health England, 2019) compiled by the UK Health Security Agency (UKSHA) (formerly Public Heath England) quantifies the mortality burden of $PM_{2.5}$ within England on a county and local authority scale. The latest available data shows that the 2019 fraction of mortality attributable to $PM_{2.5}$ pollution in Runnymede is 5.7%, which is above the South East's average of 5.2% and the national average of 5.1%.

Figure 3 – Public Health Framework D01 Fraction of all-cause adult mortality attributable to anthropogenic particulate air pollution



RBC is taking the following measures to address $PM_{2.5}$:

- The Council requires developments that trigger an Air Quality Assessment to assess the impact of construction dust emissions and the Local Planning Authority applies planning conditions to the developments requiring the developer to follow best practice guidance to mitigate dust impacts.
- The Council will investigate and take enforcement action where open burning of commercial waste as a source of $PM_{2.5}$ is sufficiently evidenced.
- The Council will investigate and take enforcement action where dust emissions can be sufficiently evidenced as to constitute a statutory nuisance.
- The Council has written to the Secretary of State for Business expressing concern surrounding small particulates in relation to the subsides that are provided by the Government for biomass fuel.
- Promoting low emission transport and provision of charging points and hydrogen refilling stations.
- Surrey County Council's Transportation plans and strategies.

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

3.1 Summary of Monitoring Undertaken

This section sets out the monitoring undertaken within 2021 by RBC and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2017 and 2021 to allow monitoring trends to be identified and discussed.

3.1.1 Automatic Monitoring Sites

RBC does not undertake automatic (continuous) monitoring within the Borough.

3.1.2 Non-Automatic Monitoring Sites

RBC undertook non- automatic (i.e. passive) monitoring of NO_2 at 38 sites during 2021 using diffusion tubes as supplied by Lambeth Scientific Services. Of these, 33 sites had greater than 25% data capture and their results are presented, and 5 sites included only one month of monitoring and their results are not presented due to the data capture being too low. Details of the non-automatic sites are set out in Appendix A.

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 (Defra, 2022), 'annualisation' (where the data capture falls below 75%, but above 25%), and distance correction (Defra, 2022). Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.2 in Appendix A compares the adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40 µg/m^3. Note that the concentration data presented in Table A.2 represent the concentrations at the locations of the monitoring sites, 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 the NO_2 diffusion tubes, the full 2021 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.

Monitoring of NO_2 in 2021 has shown that:

- The annual mean NO_2 objective of 40 µg/m^3 was exceeded at one monitoring location in 2021 (RY14 - 41.0 µg/m^3 within the Addlestone AQMA);
- Five monitors measured NO_2 concentrations within 10% of the NO_2 objective (36 – 40 µg/m^3); RY23 (37.7 µg/m^3), RY26 (36.0 µg/m^3), RY45 (37.9 µg/m^3), RY56 (39.6 µg/m^3) and RY58 (39.7 µg/m^3). These diffusion tubes (excluding RY26) are located in Chertsey at the junction of Bridge Rd and Weir Rd. RY26 is located to the north of the borough at a location where queueing can occur due to a railway level crossing in close proximity to the diffusion tube.
- previous research carried out on behalf of Defra and the devolved administrations (2022) identified that exceedences of the 1-hour mean NO_2 objective are unlikely to occur where annual mean concentrations are below 60 µg/m^3. Since the highest measured annual mean concentration was 41.0 µg/m^3, it is considered highly unlikely that the 1-hour mean NO_2 objective was exceeded within the district in 2021;
- the number of exceedances of the annual mean NO_2 objective in the AQMA has varied over the period of 2017 – 2021 (three exceedances in 2017, four exceedances in 2018, seven exceedances in 2019, three in 2020 and one in 2021).
- the trend analysis for the last five years indicates an overall downward trend in annual mean NO_2 concentrations throughout the district. This is most likely due to vehicle emission improvements. A graph showing NO_2 concentrations over the last five years is presented in Figure A.1 in Appendix A; and
- monitoring of NO_2 will continue at all sites throughout 2022. The next air quality monitoring update will be provided in RBC's next ASR, due June 2023.

3.2.2 Particulate Matter (PM_{10})

PM_{10} is not currently monitored within the RBC area. However, modelling work for levels of particulate matter within the Borough has ascertained that particulate matter levels do not exceed air quality objectives.

3.2.3 Particulate Matter ($PM_{2.5}$)

$PM_{2.5}$ is not currently monitored within the RBC area. However, modelling work for levels of particulate matter within the Borough has ascertained that particulate matter levels do not exceed current air quality target levels.

3.2.4 Sulphur Dioxide (SO_2)

Sulphur dioxide is not currently monitored within the RBC area as it has previously been established that levels of sulphur dioxide do not exceed air quality objectives.

Appendix A Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
RY1	Civic Centre, Station Road, Addlestone	Roadside	505098	164624	NO_2	Y	12.5	2.1	N	2.5
RY4	Riverside ,Pitson Close, Addlestone	Urban Background	505727	164624	NO_2	N	12.1	4.3	N	2.0
RY8	Ongar Place First School, Milton Road, Addlestone	Suburban (near to M25)	504316	163955	NO_2	Y	34.8	21.1	N	1.9
RY14	1 High Street, Addlestone	Roadside	504993	164606	NO_2	Y	0.1	1.1	N	2.5
RY19	78 Woodham Lane, New Haw	Roadside	505227	162699	NO_2	Y	9.7	1.0	N	2.0
RY21	London Street/Heriot Rd Chertsey	Roadside	504263	166945	NO_2	N	12.6	0.7	N	1.5
RY23	37 Bridge Rd, Chertsey	Roadside	504878	166790	NO_2	N	14.2	1.1	N	2.0
RY25	1 Pooley Green Rd, Egham	Roadside	501748	171349	NO_2	N	10.1	13.7	N	2.4
RY26	19, Vicarage Road, Egham	Roadside	501717	171382	NO_2	N	10.7	1.5	N	2.5
RY39	Chobham Lane, Longcross,	Roadside	498902	166242	NO_2	N	n/a	2.3	N	2.1
RY40	Homewood Park, Stonehill Road	Urban Background	502072	165098	NO_2	N	n/a	98.7	N	2.5
RY43	New Court Chertsey Road Addlestone	Roadside	504999	165305	NO_2	N	22.4	2.1	N	2.3

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
RY45	27/29 Weir Rd Chertsey	Roadside	504879	166762	NO_2	N	4.2	1.1	N	2.3
RY53	1-22 Wyvern Place, High St, Addlestone	Roadside	504963	164784	NO_2	Y	3.7	3.1	N	2.0
RY54	23 Brighton Rd, Addlestone	Roadside	505072	164478	NO_2	Y	2.9	1.4	N	2.3
RY55	158 Station Rd, Addlestone	Roadside	505529	164784	NO_2	N	2.4	0.4	N	1.8
RY56	34/36 Bridge Rd Chertsey	Roadside	504947	166753	NO_2	N	7.2	0.6	N	2.3
RY57	29 Bridge Rd, Cherstey	Roadside	504823	166823	NO_2	N	1.9	0.9	N	2.5
RY58	39 Weir Road. Chertsey	Roadside	504895	166774	NO_2	N	12.9	0.5	N	2.3
RY59	Bus shelter Chertsey Rd Addlestone	Roadside	504950	165139	NO_2	N	16.5	5.2	N	2.3
RY60	Renaissance flats, High Street Addlestone	Roadside	504965	164807	NO_2	Y	0.7	3.0	N	2.0
RY61	Pine Court, Addlestone	Roadside	504910	164558	NO_2	N	4.7	1.0	N	2.3
RY62	26/28 Brighton Road Addlestone	Roadside	505080	164439	NO_2	N	4.3	1.4	N	2.3
RY63	Garfield Road, (sign) Addlestone	Roadside	505250	164520	NO_2	N	19.8	0.6	N	2.0
RY64	Garfield Road, Hampshire Court Addlestone	Roadside	505258	164394	NO_2	N	8.0	2.8	N	2.3
RY65	268 Station Road Addlestone	Roadside	505706	164952	NO_2	N	10.9	1.7	N	2.0
RY67	A320 roundabout Ottershaw	Roadside	502241	163885	NO_2	N	18.3	2.1	N	2.3
RY68	Addlestonemoor roundabout	Roadside	504967	165747	NO_2	N	8.6	2.0	N	2.5

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
RY69	New Haw Road	Roadside	505363	163912	NO_2	N	4.4	1.5	N	1.5
RY70	Chertsey Lane Thorpe	Roadside	503411	171077	NO_2	N	9.0	2.4	N	2.2
RY71	185 Church Road adjacent to M25	Intermediate	504212	164259	NO_2	Y	2.2	20.3	N	2.0
RY72	Albany Place Egham adj to M25	intermediate	501585	171489	NO_2	N	4.5	52.7	N	2.0
RY73	Byfleet and New Haw Station	Roadside	505800	162303	NO_2	N	9.5	3.0	N	2.0

Notes:

(1) 0 m 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_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3) (4)				
							2017	2018	2019	2020	2021
RY1	505098	164624	Roadside	Diffusion Tube	50	50	29.8	29.1	30.8	24.3	27.4
RY4	505727	164624	Urban B/G	Diffusion Tube	100	100	17.8	20.2	19.4	14.8	15.0
RY8	504316	163955	Suburban (near to M25)	Diffusion Tube	92	92	20.5	22.5	20.5	17.4	18.2
RY14	504993	164606	Roadside	Diffusion Tube	100	100	**48.7**	**45.5**	**48.3**	**49.2**	**41.0**
RY19	505227	162699	Roadside	Diffusion Tube	100	100	31.5	32.3	32.1	28.4	26.2

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	NO_2 Annual Mean Concentration (µg/m³) (3) (4)				
							2017	2018	2019	2020	2021
RY21	504263	166945	Roadside	Diffusion Tube	92	92	31.5	33.4	34.3	24.7	26.9
RY23	504878	166790	Roadside	Diffusion Tube	92	92	33.8	**47.5**	**56.4**	**41.6**	37.7
RY25	501748	171349	Roadside	Diffusion Tube	92	92	28.5	33.5	31.6	25.4	22.4
RY26	501717	171382	Roadside	Diffusion Tube	83	83	36.7	36.5	**45.7**	38.2	36.0
RY39	498902	166242	Roadside	Diffusion Tube	83	83	23.9	28.4	26	22.5	20.8
RY40	502072	165098	Urban B/G	Diffusion Tube	100	100	16.5	18.1	14.9	12.7	12.0
RY43	504999	165305	Roadside	Diffusion Tube	100	100	26.7	36.9	38.4	29.4	28.1
RY45	504879	166762	Roadside Moved	Diffusion Tube	100	100	32.5	36	37.7	39.4	37.9
RY53	504963	164784	Roadside	Diffusion Tube	92	92	32.2	35.8	40.8	34	31.5
RY54	505072	164478	Roadside	Diffusion Tube	92	92	28.1	29.6	32.4	26.9	26.2
RY55	505529	164784	Roadside	Diffusion Tube	92	92	28.7	32.7	34.4	26.3	25.1
RY56	504947	166753	Roadside	Diffusion Tube	83	83	**43**	**40.9**	**46**	33.4	39.6
RY57	504823	166823	Roadside	Diffusion Tube	100	100	**42**	30.5	35.3	24.3	22.7
RY58	504895	166774	Roadside moved	Diffusion Tube	100	100	34.9	**52**	**43.6**	36.7	39.7
RY59	504950	165139	Roadside	Diffusion Tube	100	100	30.3	34.7	33.8	36.3	26.5
RY60	504965	164807	Roadside	Diffusion Tube	83	83	28.9	33.3	32.9	28.3	25.9
RY61	504910	164558	Roadside	Diffusion Tube	100	100	30.1	30.1	29.1	23	24.1
RY62	505080	164439	Roadside	Diffusion Tube	83	83	31.3	32.8	32.1	27.7	29.9

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2021 (%) (2)	NO_2 Annual Mean Concentration (µg/m³) (3) (4)				
							2017	2018	2019	2020	2021
RY63	505250	164520	Roadside	Diffusion Tube	100	100	30.8	21.6	25.5	20.7	20.5
RY64	505258	164394	Roadside	Diffusion Tube	100	33	22.4	24.1	26.5	16.5	16.7
RY65	505706	164952	Roadside	Diffusion Tube	83	83	22.4	26.7	32.2	21.5	28.5
RY67	502241	163885	Roadside	Diffusion Tube	75	75	-	-	**44.2**	**45.4**	35.9
RY68	504967	165747	Roadside	Diffusion Tube	92	92	-	-	38	27.8	26.3
RY69	505363	163912	Roadside	Diffusion Tube	92	92	-	-	32	26.4	23.1
RY70	503411	171077	Roadside	Diffusion Tube	100	100	-	-	25.1	19.3	20.4
RY71	504212	164259	Intermediate	Diffusion Tube	83	83	-	-	-	25.6	24.2
RY72	501585	171489	intermediate	Diffusion Tube	100	100	-	-	-	18.2	20.0
RY73	505800	162303	Roadside	Diffusion Tube	100	58	-	-	-	-	29.4

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

☒ **Annualisation has been conducted where data capture is <75% and above 25%**

Notes:

Exceedances of the NO_2 annual mean objective of 40 µg/m³ are shown in **bold**.

NO_2 annual means exceeding 60 µg/m³, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

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

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

(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG22 if valid data capture for the full calendar year is less than 75% and above 25%. 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_2 Concentrations for RBC

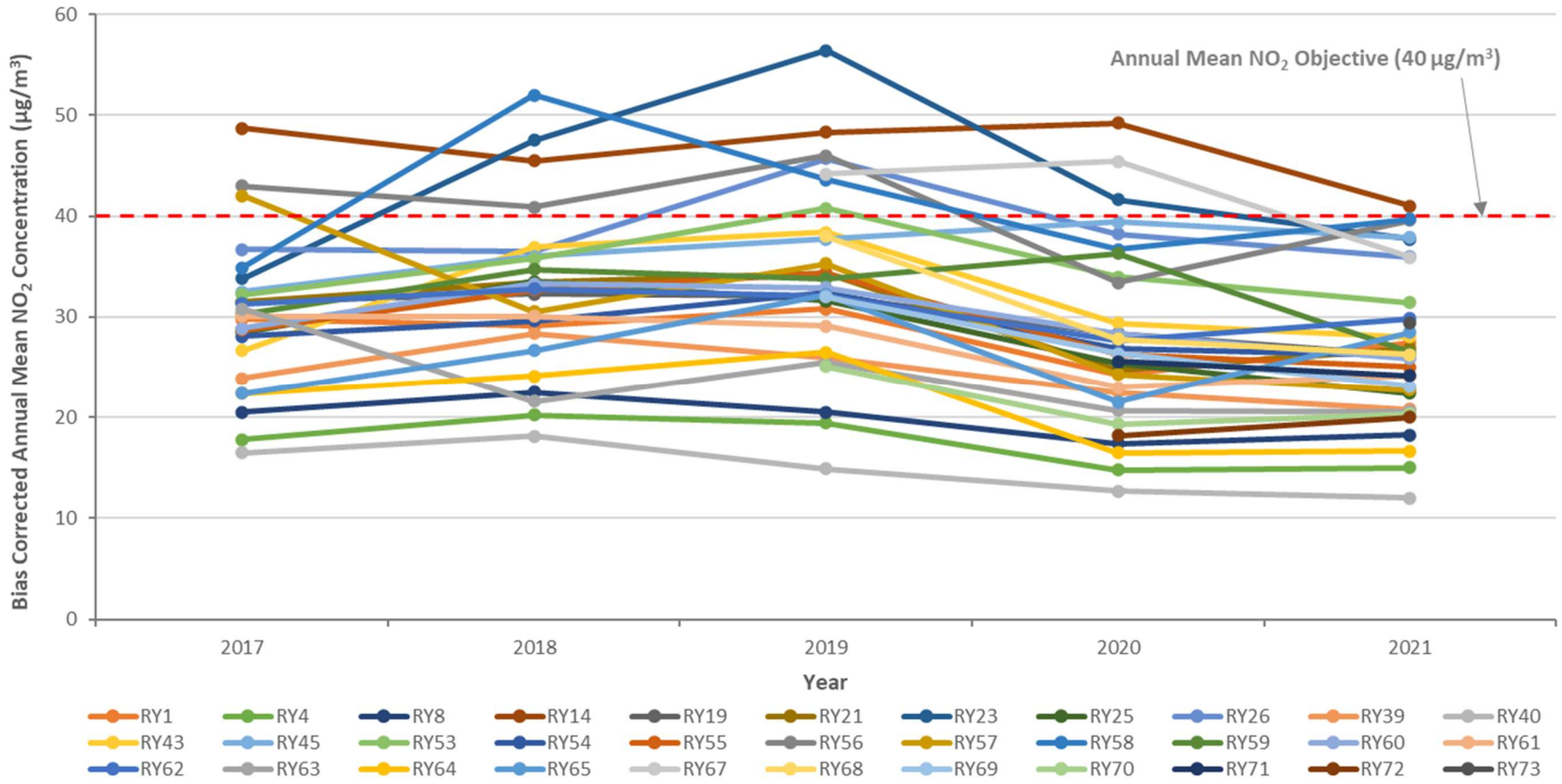


Figure A.2 – Trends in Annual Mean NO_2 Concentrations for M25 AQMA

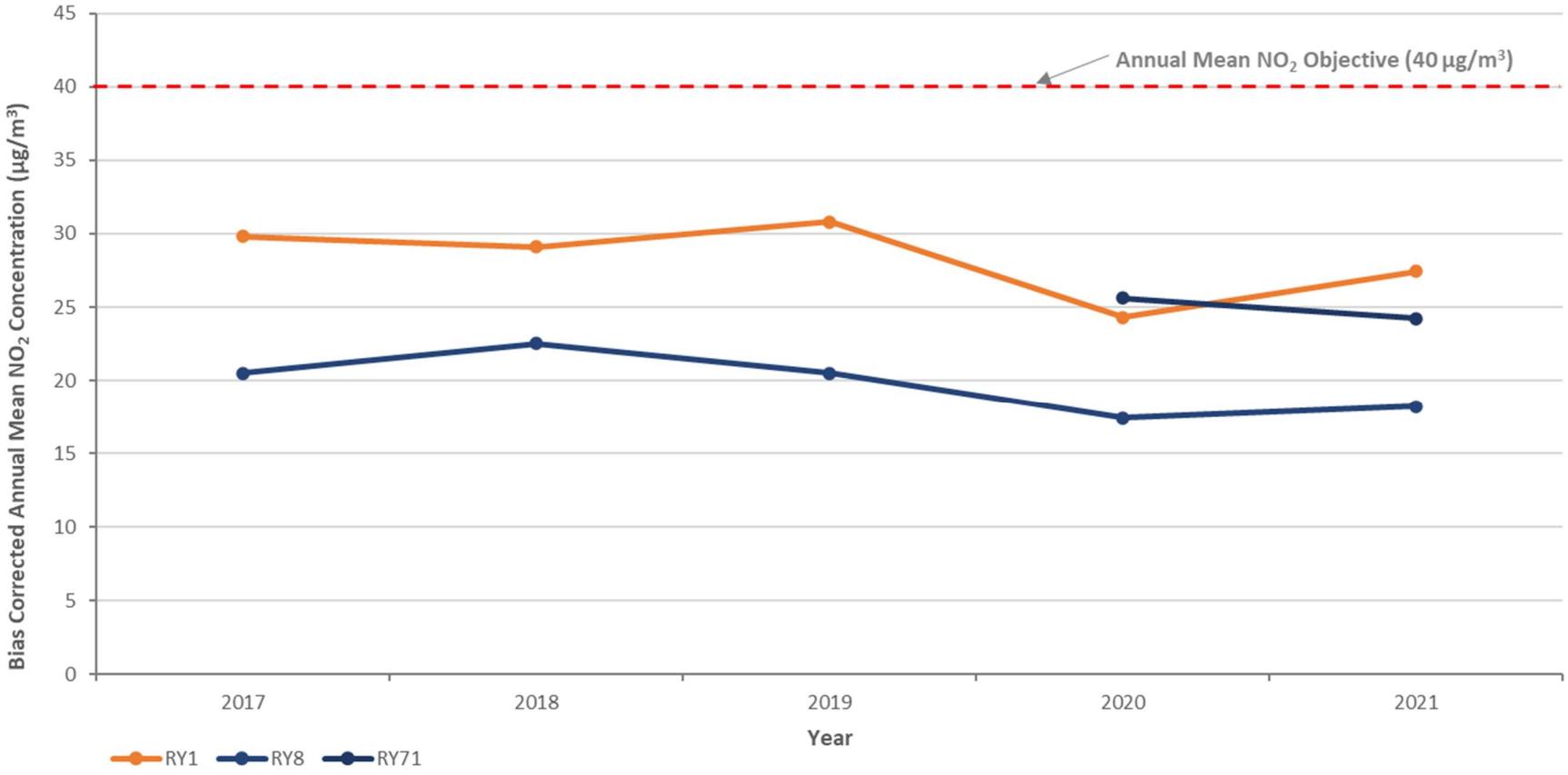
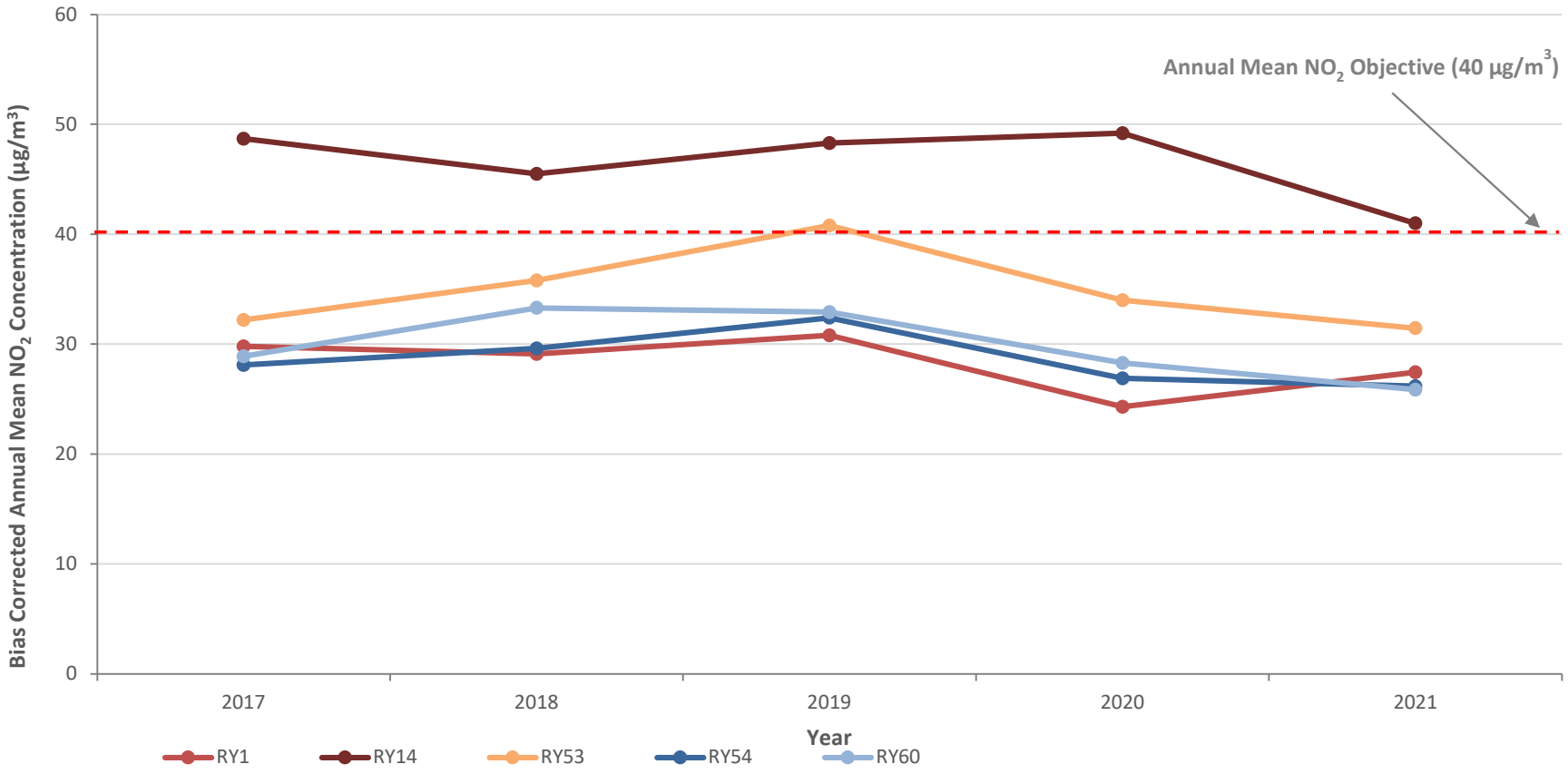


Figure A.3 – Trends in Annual Mean NO_2 Concentrations for Addlestone AQMA



Appendix B Full Monthly Diffusion Tube Results for 2021

Table B.1 - NO_2 Monthly Diffusion Tube Results - 2021

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m³)														
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
															Raw Data	Bias Adjusted (0.86) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
RY1	505098	164624	27	28	-	-	-	20	36	16	-	-	31	-	25.7	27.4	26.2
RY4	505727	164624	16	16	16	13	12	15	13	12	14	22	20	20	15.8	15.0	15.0
RY8	504316	163955	19	22	22	24	15	-	18	14	23	14	20	20	19.2	18.2	18.2
RY14	504993	164606	108	38	42	37	35	30	39	26	42	33	43	44	43.1	**41.0**	**41.0**
RY19	505227	162699	34	29	27	27	28	25	26	15	31	28	30	31	27.6	26.2	23.6
RY21	504263	166945	28	30	27	35	27	27	28	20	-	25	34	29	28.3	26.9	24.4
RY23	504878	166790	45	48	32	39	34	40	39	29	49	38	45	-	39.7	37.7	26.2
RY25	501748	171349	26	25	24	-	19	21	20	17	26	23	31	27	23.5	22.4	22.7
RY26	501717	171382	39	36	38	38	38	40	36	24	43	-	-	45	37.9	36.0	30.5
RY39	498902	166242	35	26	-	17	18	19	19	16	25	24	22	-	21.9	20.8	
RY40	502072	165098	13	16	14	13	11	11	11	11	15	10	15	13	12.7	12.0	
RY43	504999	165305	36	28	32	34	15	30	27	22	33	29	34	32	29.5	28.1	22.2
RY45	504879	166762	40	41	39	41	34	43	37	26	49	36	47	45	39.9	37.9	31.1
RY53	504963	164784	34	33	30	38	30	-	34	21	39	31	36	36	33.1	31.5	28.8
RY54	505072	164478	32	27	27	28	22	25	25	19	36	25	37	-	27.6	26.2	23.6
RY55	505529	164784	28	-	24	31	24	22	21	18	34	25	35	28	26.4	25.1	21.9
RY56	504947	166753	35	35	36	39	35	36	-	62	-	59	35	41	41.7	39.6	28.8

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m³)														
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
															Raw Data	Bias Adjusted (0.86) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
RY57	504823	166823	29	23	19	25	22	23	23	16	27	21	21	36	23.9	22.7	21.3
RY58	504895	166774	45	42	42	46	39	44	41	29	48	38	40	46	41.8	39.7	26.2
RY59	504950	165139	31	28	25	30	27	24	26	19	35	27	32	30	27.9	26.5	23.9
RY60	504965	164807	31	28	26	23	24	-	25	32	23	-	29	32	27.2	25.9	25.9
RY61	504910	164558	28	29	24	25	21	26	22	17	31	21	33	28	25.4	24.1	22.1
RY62	505080	164439	60	28	31	-	-	26	22	19	32	27	35	34	31.4	29.9	25.5
RY63	505250	164520	26	23	19	20	16	18	19	22	22	19	30	26	21.6	20.5	17.3
RY64	505258	164394	22	22	22	17	-	-	-	-	-	-	-	-	20.5	16.7	16.3
RY65	505706	164952	50	24	25	27	19	-	18	18	24	-	70	27	30.0	28.5	22.6
RY67	502241	163885	45	42	34	-	34	35	37	30	48	-	36	-	37.8	35.9	23.8
RY68	504967	165747	40	29	25	25	23	29	24	19	31	26	35	-	27.7	26.3	24.2
RY69	505363	163912	29	26	30	27	22	22	23	3	28	24	34	-	24.3	23.1	20.7
RY70	503411	171077	33	23	21	22	18	18	21	17	17	10	29	29	21.4	20.4	20.3
RY71	504212	164259	33	15	27	25	-	25	-	15	26	25	29	32	25.5	24.2	24.2
RY72	501585	171489	20	28	16	22	18	21	20	16	26	20	23	23	21.0	20.0	20.0
RY73	505800	162303	-	-	-	-	-	31	29	14	36	29	39	26	29.0	29.4	26.1

No local bias adjustment factor used

National bias adjustment factor used

Annualisation has been conducted where data capture is <75% and above 25%

Where applicable, data has been distance corrected for relevant exposure in the final column

Notes:
Exceedances of the NO_2 annual mean objective of 40 µg/m^3 are shown in **bold**.
NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

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

New or Changed Sources Identified Within RBC During 2021

RBC has not identified any new sources relating to air quality within the reporting year of 2021.

Additional Air Quality Works Undertaken by RBC During 2021

RBC has not completed any additional works within the reporting year of 2021.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes used by RBC during 2021 were supplied and analysed by Lambeth Scientific Services Ltd. The analysis procedures are compliant with the Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance for users and laboratories (Defra, 2008).

The laboratory is UKAS accredited and participates in the AIR-PT Scheme, a continuation of the Workplace Analysis Scheme for Proficiency (WASP) for NO_2 tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations are reported to a high level of accuracy. The lab follows the procedures set out in the Harmonisation Practical Guidance. For the periods of January 2021 to February 2021, May to June 2021, July to August 2021 and September to October 2021 the percentage of results submitted by Lambeth Scientific Services Ltd to the AIR PT scheme that were deemed to be satisfactory was 100% for rounds AR042 andAR043, and 75% for rounds AR045 and AR046, respectively. Further information is available here:

https://laqm.defra.gov.uk/wp-content/uploads/2022/07/LAQM-NO2-Performance-data_Up-to-June-2022_V2.1.pdf

Monitoring has been completed in close adherence with the 2021 Diffusion Tube Monitoring Calendar.

Diffusion Tube Bias Adjustment

Diffusion tube monitoring results should be corrected for bias, which represents the overall tendency of diffusion tubes to under or over-read relative to reference chemiluminescence analysers.

Local Diffusion Tube Bias Adjustment

A local bias adjustment factor could not be calculated as no reference equivalent automatic (continuous) monitoring was undertaken by RBC.

National Diffusion Tube Bias Adjustment

A database of national bias adjustment factors determined from Local Authority co-location studies throughout the UK has been collated by the Local Air Quality Management Helpdesk. Using orthogonal regression, combined bias adjustment factors have been calculated for each laboratory, year and preparation method combination for which data are available. For Lambeth Scientific Services Ltd, using a preparation method of 50% triethanolamine (TEA) solution, the national bias adjustment factor is 0.95, which has been based on 9 colocation studies as shown in Figure C.1.

Figure C.1 – National Bias Adjustment Factor

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 06/22

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of September 2022

LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List

If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List

If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List

If a year is not shown, we have no data[2]

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[2] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
Lambeth Scientific Services	50% TEA in acetone	2021	R	Elmbridge Borough Council	11	27	26	2.9%	P	0.97
Lambeth Scientific Services	50% TEA in acetone	2021	R	Elmbridge Borough Council	12	27	25	8.7%	G	0.92
Lambeth Scientific Services	50% TEA in acetone	2021	UB	Spelthorne Borough Council	12	19	19	0.9%	G	0.99
Lambeth Scientific Services	50% TEA in acetone	2021	UB	Spelthorne Borough Council	11	23	23	-2.4%	G	1.02
Lambeth Scientific Services	50% TEA in acetone	2021	KS	Marylebone Road Intercomparison	11	46	42	8.2%	G	0.92
Lambeth Scientific Services	50% TEA in acetone	2021	SU	Reigate and Banstead BC	11	16	15	2.5%	G	0.98
Lambeth Scientific Services	50% TEA in acetone	2021	B	Reigate and Banstead BC	12	11	10	18.8%	G	0.84
Lambeth Scientific Services	50% TEA in acetone	2021	SU	Reigate and Banstead BC	12	15	14	12.5%	G	0.89
Lambeth Scientific Services	50% TEA in acetone	2021	R	Reigate and Banstead BC	11	38	40	-4.6%	G	1.05
Lambeth Scientific Services	50% TEA in acetone	2021		Overall Factor[3] (9 studies)				Use		0.95

Diffusion Tube Bias Adjustment Choice

RBC does not undertake any reference equivalent automatic monitoring and is thus unable to calculate a local bias adjustment factor. The national bias adjustment factor of 0.95 has therefore been used.

The bias adjustment factors for previous years were 0.93 in 2017, 1.04 in 2018, 0.92 in 2019, and 0.95 in 2020.

Diffusion Tube Annualisation

LAQM.TG22 states that for those nitrogen dioxide diffusion tube sites with fewer than nine months' worth of data (but more than three months in total), it is necessary to perform annualisation, to adjust short-term measurements to represent annual mean concentrations.

Data capture for 2021 was between 25- 75% at three sites, data for these sites have been annualised following the methodology set out in LAQM.TG22.

For the periods where diffusion tube data is available, period mean concentrations have been calculated from four AURN background automatic monitoring stations; London Hillingdon and Reading New Town. Ratios have been derived by comparing these period mean concentrations with annual mean concentrations from the automatic monitoring stations. The short-term concentrations have then been multiplied by the ratio to obtain annualised annual mean concentrations. The calculations are presented in Table C.3.

Table C.3 – Diffusion Tube Annualisation

Diffusion Tube ID	Period Mean (µg/m³)			Annual Mean (µg/m³)		Ratio		Average Ratio	Diffusion Tube Annualised Mean (µg/m³)	Diffusion Tube Bias Adjusted Mean (µg/m³)
	Diffusion Tube	Automatic Monitor		Automatic Monitor		Automatic Monitor				
		London Hillingdon	Reading New Town	London Hillingdon	Reading New Town	London Hillingdon	Reading New Town			
RY1	25.7	23.4	16.6	25.0	19.7	1.07	1.18	1.12	28.9	27.4
RY64	20.5	27.4	24.7	25.0	19.7	0.91	0.80	0.85	17.5	16.7
RY73	29.0	24.3	17.8	25.0	19.7	1.03	1.10	1.07	30.9	29.4

Distance Correction

Where monitoring sites are not representative of public exposure it is important to consider concentrations at locations of relevant exposure, e.g. if monitoring is located at roadside or kerbside, the concentrations at the façade of nearest properties set back further from the road should be considered.

Distance correction has been carried out using Defra's NO_2 fall off with distance calculator, following the approach set out in Paragraphs 7.82-7.85 of LAQM.TG22.

Local annual mean background NO_2 concentrations have been derived from Defra's latest national pollution maps which cover the whole country on a 1x1 km grid for each year from 2018 to 2030. Concentrations for 2021 have been used, to coincide with the monitoring results considered in this report.

The distance corrected annual mean concentrations for relevant monitoring sites are presented in Table C.2. Where monitoring sites were within approximately 1 m of relevant exposure, it was considered that they were representative of likely human exposure. As such, distance correction has not been undertaken for these sites.

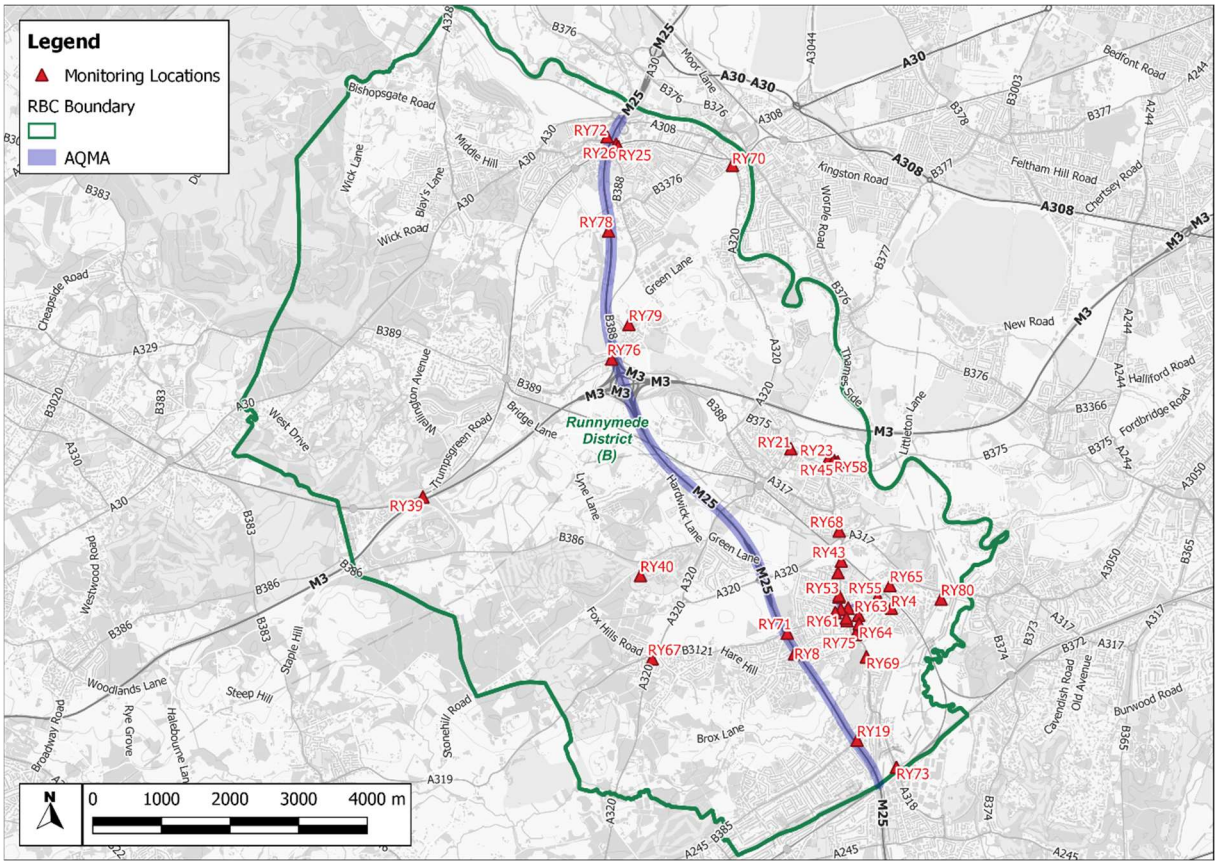
Table C.2 – Distance Correction of Annual Mean NO_2 Concentrations

Diffusion Tube ID	Distance from Monitor to Kerb of Nearest Road (m)	Distance from Relevant Exposure to Kerb of Nearest Road (m)	Background Annual Mean (µg/m³)	Measured Annual Mean (µg/m³)	Distance Corrected Annual Mean (µg/m³)
RY1	2.12	3.33	15.5	27.4	26.2
RY19	1.03	10.63	20.6	26.2	23.6
RY21	0.73	2.6	16.6	26.9	24.4
RY23	1.06	15.28	16.6	37.7	26.2
RY25	13.7	23.3	24.0	22.4	22.7
RY26	1.5	12.1	24.0	36.0	30.5
RY43	2.1	18.1	16.5	28.1	22.2
RY45	1.14	5.36	16.6	37.9	31.1
RY53	3.07	6.78	18.6	31.5	28.8
RY54	1.39	4.31	15.5	26.2	23.6
RY55	0.4	2.73	15.5	25.1	21.9
RY56	0.6	7.8	16.6	39.6	28.8
RY57	0.87	2.76	16.6	22.7	21.3
RY58	0.47	13.1	16.6	39.7	26.2
RY59	5.2	12.3	16.5	26.5	23.9

RY61	0.98	5.7	18.6	24.1	22.1
RY62	1.349	5.64	15.5	29.9	25.5
RY63	0.622	20.38	15.5	20.5	17.3
RY64	2.8	10.82	15.5	16.7	16.3
RY65	1.7	12.66	15.5	28.5	22.6
RY67	2.1	20.47	13.5	35.9	23.8
RY68	2.03	4.91	16.5	26.3	24.2
RY69	1.45	5.82	15.1	23.1	20.7
RY70	2.4	11.5	20.2	20.4	20.3
RY73	2.97	12.49	20.6	29.4	26.1

Appendix D Map(s) of Monitoring Locations and AQMAs

Figure D.1 – Map of Monitoring Locations within RBC



Contains OS data © Crown copyright and database right (2022).

Figure D.2 – Map of Addlestone AQMA Boundary and surrounding area monitoring locations

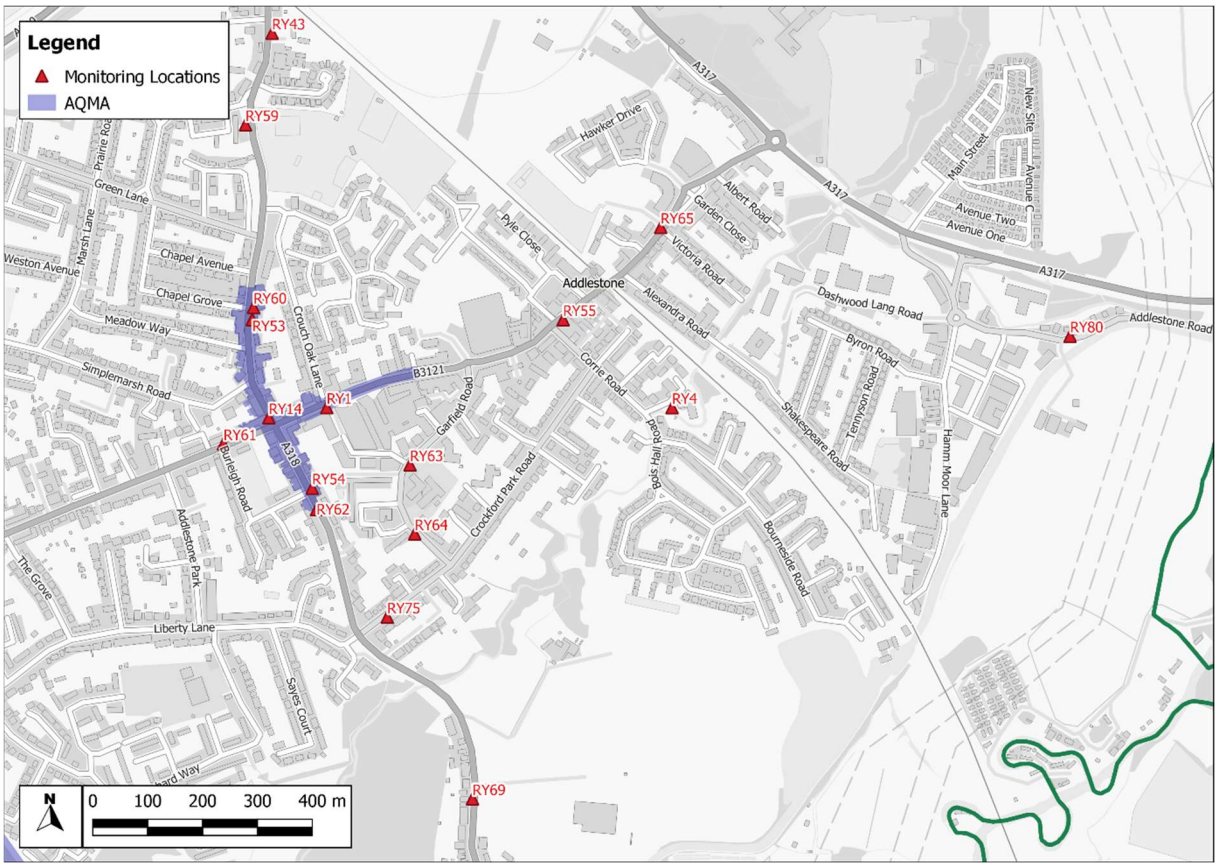


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Figure D.3 – Map of Monitoring Locations within Chertsey and the Surrounding area

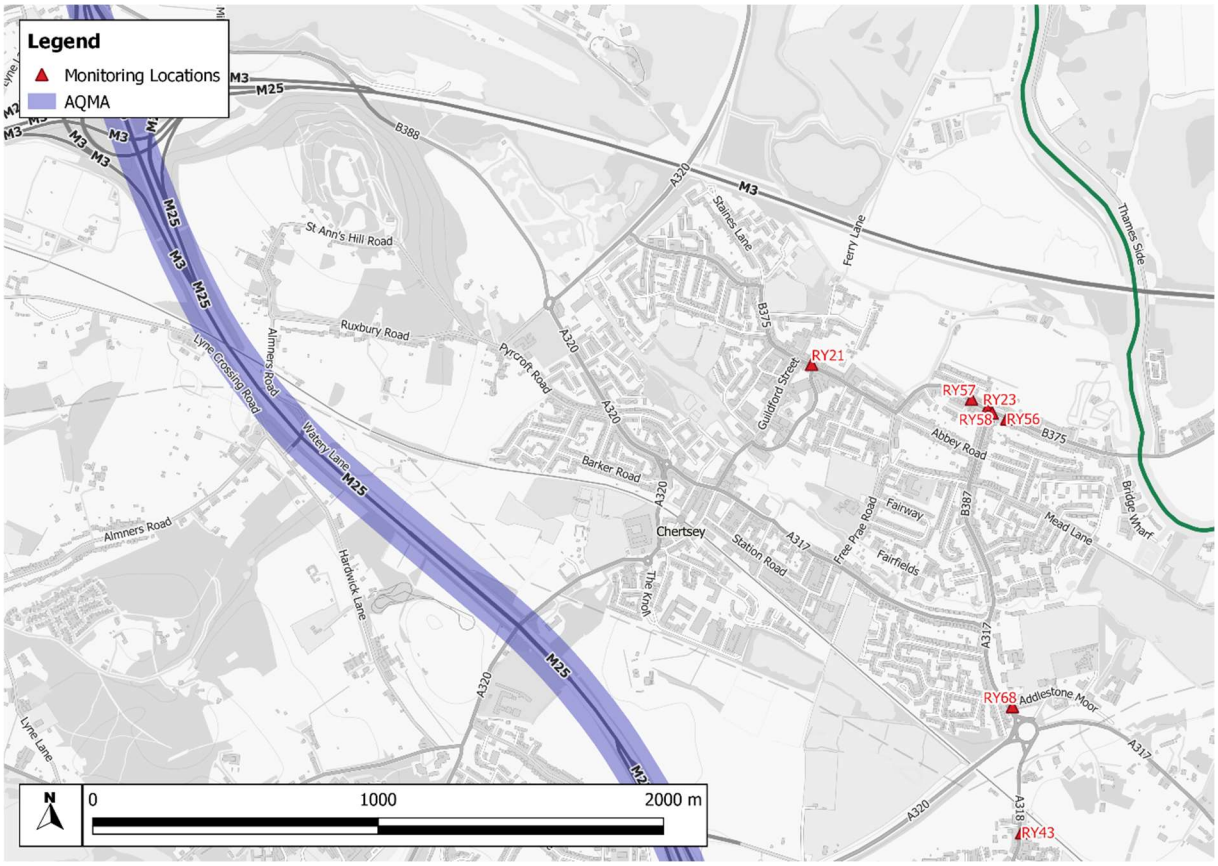

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Figure D.4 – Map of Monitoring Locations within southern extent of the M25 AQMA and surrounding area monitoring locations

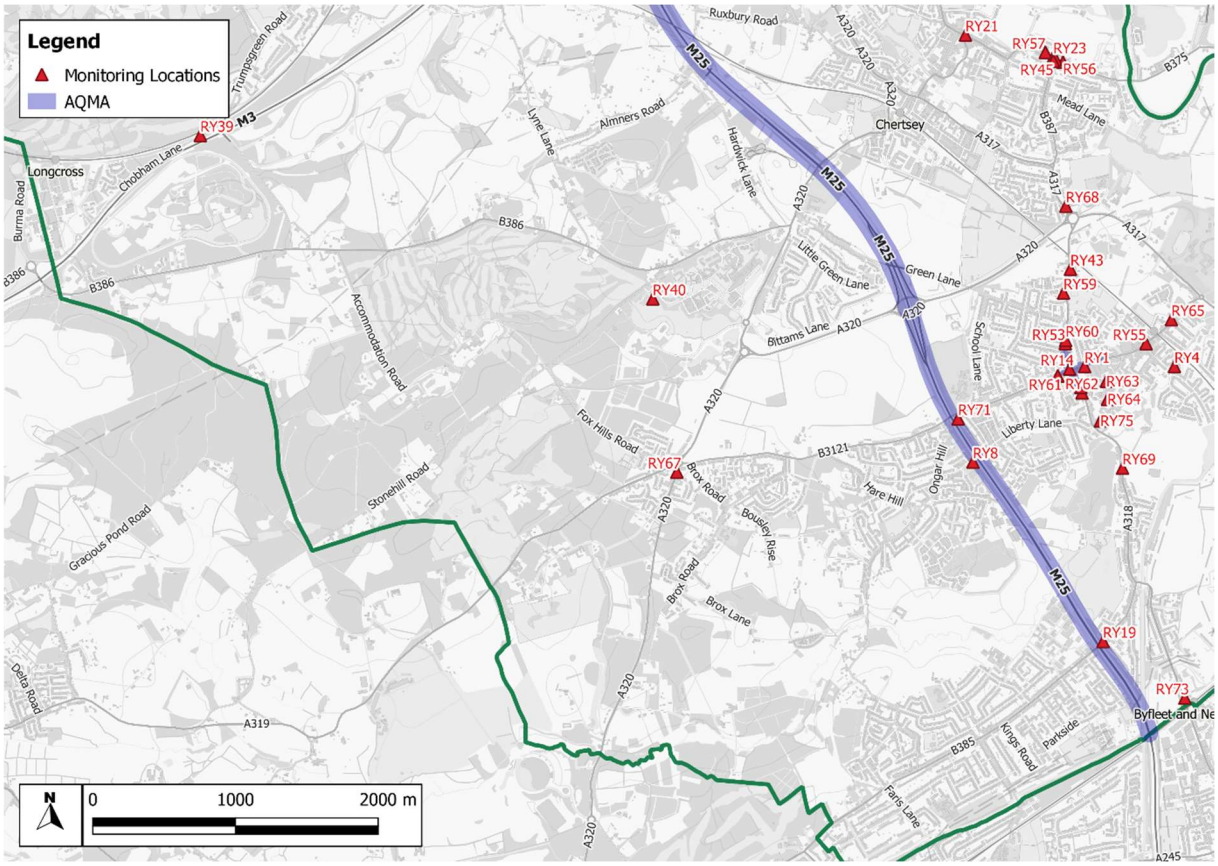

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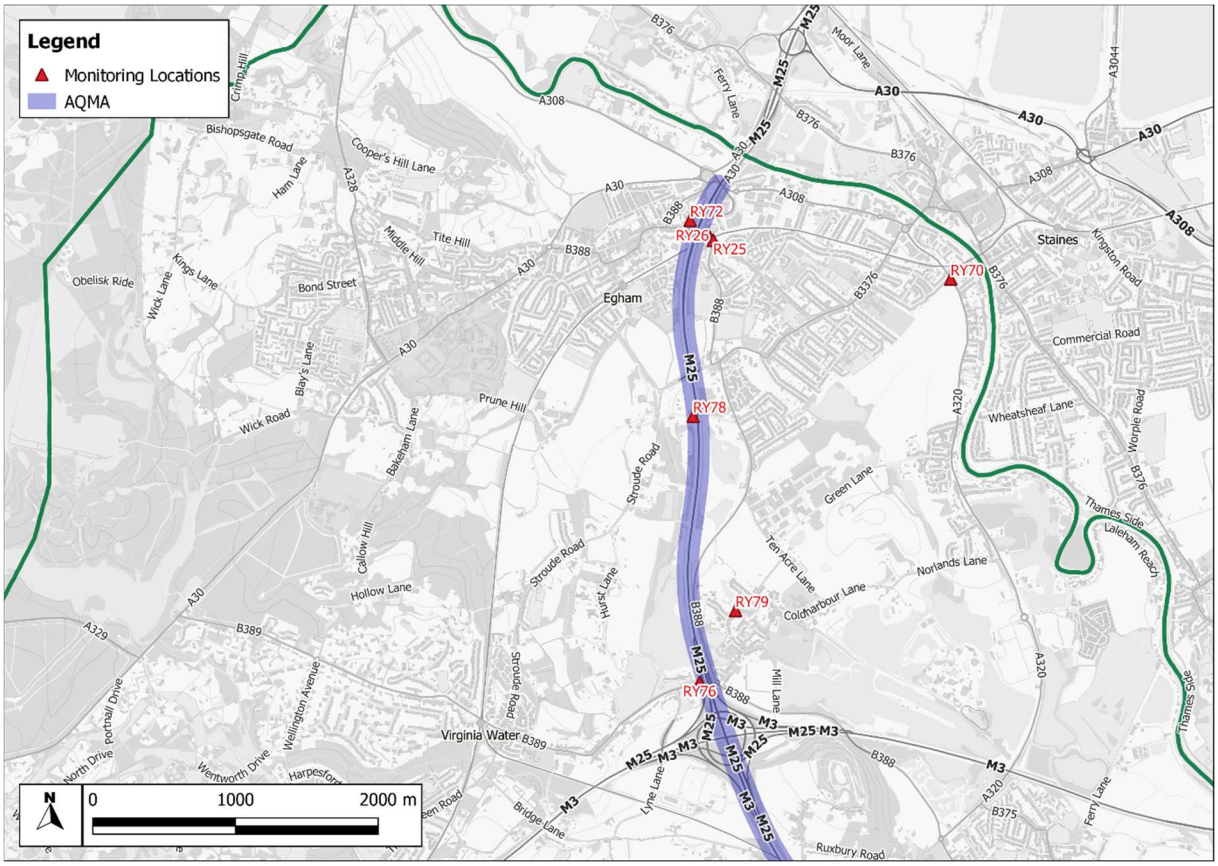
Figure D.5 – Map of Monitoring Locations within the Northern M25 AQMA extent and surrounding area



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Appendix E 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 ASRs. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 and 2021 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_2) is considered unlikely. At the beginning of 2021, 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 national lockdown, marked reductions in vehicle traffic were observed, with Department for Transport (DfT) data (Prime Minister's Office, 2020) suggesting vehicle traffic returned to pre COVID-19 levels by May 2021.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG, 2020) has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO_2 annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which represents an absolute reduction of between 10-20 µg/m^3 if expressed relative to annual mean averages. During this period, changes in $PM_{2.5}$ concentrations were less marked than those of NO_2. $PM_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have

detailed that $PM_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5 µg/m^3 lower relative to those that would be expected under business-as-usual conditions. The restriction in 2021 was to a lesser extent and will have resulted in reduced changes from typical conditions compared to 2020. 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 RBC

During 2021, RBC continued to distribute, collect and monitor their diffusion tube network.

Of the data collected, a trend of an average reduction of 1.8% in annualised and bias corrected NO_2 concentrations across the diffusion tube network was observed in 2021 when effects of COVID-19 were present to varying degrees. Diffusion tubes within and outside the AQMAs observed average reductions of 3.9% and 1.2%, respectively, in 2021.

Opportunities Presented by COVID-19 upon LAQM within RBC

RBC did not implement any specific measures in response to the COVID-19.

Challenges and Constraints Imposed by COVID-19 upon LAQM within RBC

Overall, RBC found it challenging to progress the planned measures set out in Table 2.2 due to COVID-19.

Appendix F Summary of Air Quality Objectives in England

Table F.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[1]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

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

Appendix G Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
$\mu g/m^3$	Microgrammes of pollutant per cubic metre

Appendix H References

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