Reigate & Banstead
BOROUGH COUNCIL
Banstead | Horley | Redhill | Reigate

2024 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management, as amended by the Environment Act 2021

Date: November, 2024

Information	Reigate and Banstead Borough Council Details
Local Authority Officer	Leon Hibbs
Department	Environmental Health
Address	Reigate and Banstead Borough Council Town Hall, Castlefield Road, Reigate, Surrey RH2 0HS
Telephone	01737 276403
E-mail	Leon.Hibbs@reigate-banstead.gov.uk
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Report Prepared by	Meg Saunders, Anna McMahon and Dr Clare Beattie Air Quality CONSULTANTS

Executive Summary: Air Quality in Our Area

Air Quality in Reigate and Banstead Borough Council

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year[1].

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less affluent areas are most exposed to dangerous levels of air pollution[2].

Table ES 1 provides a brief explanation of the key pollutants relevant to Local Air Quality Management and the kind of activities they might arise from.

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

Reigate and Banstead Borough is located in South East England, within the county of Surrey. To the south lies Crawley Borough, to the east Tandridge District, to the west Mole Valley District and to the north Epsom and Ewell Borough and the London Boroughs of Croydon and Sutton. The M25 runs through the borough. The main air quality issues identified are in relation to road traffic,

[1] UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.
[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

particularly within the towns of Reigate and Horley and close to major roads (the A23 Brighton Road, as it passes through the village of Hooley and Junction 8 of the M25).

There are currently nine AQMAs, of varying size, declared in the towns of Reigate, Horley, Redhill, Banstead, and in Merstham, Hooley, and along the M25 (see http://uk-air.defra.gov.uk/aqma/list for further information). A specific action plan is currently in place for the M25 and Horley, which includes emissions from Gatwick Airport, and is considered in this report. Reigate and Banstead Borough Council has prepared an updated draft Air Quality Action Plan and Strategy and Table 2.2 of the ASR outlines both local and borough wide measures from the draft plan which are currently being implemented and the further measures being developed. Reigate and Banstead Borough Council is actively working to improve air quality in its area through the implementation of these measures, as well as implementation of Surrey Local Transport Plan and through working in partnership with Planning and Public Health colleagues.

Previous ASR reports concluded that, as a whole, there appears to be a downward trend in air pollution levels, i.e. improvement in air quality throughout Reigate and Banstead, particularly when evaluated over a number of years (graphs of 3-year rolling averages are included in Appendix A of this report). This conclusion still stands. In 2023, there were no exceedances of the annual mean nitrogen dioxide objective either within, or outside of the AQMAs, with all results more than 10% below the objective (i.e. lower than 36 µg/m^3). Nitrogen dioxide concentrations continue to be below the 1-hour mean at all real time sites.

Measured concentrations of PM_{10}, $PM_{2.5}$ and benzene continue to be below the relevant air quality objectives at all locations.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan[3] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term targets for fine particulate matter ($PM_{2.5}$), the pollutant of most harm to human health. The Air Quality Strategy[4] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

[3] Defra. Environmental Improvement Plan 2023, January 2023.
[4] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023.

The Road to Zero[5] details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel and the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Reigate and Banstead Borough Council has taken forward a number of measures during the reporting year of 2023 in pursuit of improving local air quality, including increasing the availability of electric vehicle charging and bringing forward changes to layouts designed to ease congestion. In addition, the Council has been working on Gatwick Airport's development consent order (DCO) to ensure that consideration and monitoring of the impacts on air quality are incorporated into the planned airport expansion.

Conclusions and Priorities

As discussed, there were no measured exceedances of any of the short-term or annual mean air quality objectives for any of the pollutants monitored, including nitrogen dioxide, particulate matter (PM_{10} and $PM_{2.5}$) and benzene in 2023. Furthermore, no NO_2 monitors recorded annual mean concentrations greater than 90% of the objective value. In addition, measured NO_2 concentrations over the past 20 years show a downward trend overall throughout the Borough. Trends in traffic flows and concentrations within each AQMA have been summarised in greater detail in Appendix A.

Proposed developments at Gatwick Airport to bring the current emergency runway into routine operational use will result in an increase in aircraft movements which may impact on air quality, and the Council has been working to model these potential impacts as part of the airport's development consent order (DCO) process.

Given that measured pollutant concentrations within them have been well below the objectives over the past five years, seven of the nine AQMAs within Reigate and Banstead Borough Council are planned for revocation in 2024. As such a new Air Quality Action Plan has been drafted for the two remaining AQMAs (i.e. AQMA No. 3 (Horley) and AQMA No. 13 (Hooley)) which has been approved by Defra in March 2024, but is yet to go through committee.

The following three main priorities have been identified for 2024 and 2025:

i) Finalisation of various matters relating to air quality connected to Gatwick airport's DCO.

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

ii) To have in place or have a formalised agreement in place to monitor ultrafine particles in the vicinity of Gatwick airport. (Measure 4 in action plan).

iii) To have completed the transition to a new supplier for the air alert pollution warning service with minimal (if any) break in service. (Connected to measure 33 in action plan).

Local Engagement and How to get Involved

Members of the public can help improve air quality in Reigate and Banstead by travelling using sustainable transport options, such as walking, cycling, and using public transport. Car sharing is also a relatively easy way to reduce private car use (https://surrey.liftshare.com/), and, if members of the public are considering buying a car, consider a hybrid or electric vehicle as an alternative to a pure petrol or diesel vehicle.

Local Responsibilities and Commitment

This ASR was prepared by Air Quality Consultants Ltd and in collaboration with Reigate and Banstead Borough Council with the support and agreement of the following officers and departments:

- Head of Environmental Health;
- Planning Policy Lead;
- Sustainability Projects officer; and
- Surrey air alliance (partners from other local authorities in Surrey, including Surrey County Council Public Health, SCC Transport, and SCC Trading Standards)

This ASR has been approved by the Head of Environmental Health.

This ASR has not been signed off by the Director of Public Health at SCC given the council actively works with Public Health Colleagues on actions to improve air quality via the Surrey Air Alliance. This approach has been agreed by SCC and all eleven boroughs and districts.

If you have any comments on this ASR please send them to Environmental Health at:

Reigate & Banstead Borough Council, Town Hall, Castlefield Road, Reigate, Surrey, RH2 0SH.

Telephone: 01737 276000

Email: environmental.protection@reigate-banstead.gov.uk

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1 Local Air Quality Management

This report provides an overview of air quality in Reigate and Banstead Borough during 2023. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

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

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

2 Actions to Improve Air Quality

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 18 months. The AQAP should specify how air quality targets will be achieved and maintained and provide dates by which measures will be carried out.

The AQMAs declared by Reigate and Banstead Borough Council are shown in Figure 2.1 to Figure 2.7, and found in Table 2.1. The table presents a description of the nine designated AQMAs that are currently designated within Reigate and Banstead Borough Council. 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 air quality objective relevant to the current AQMA designations is annual mean nitrogen dioxide.

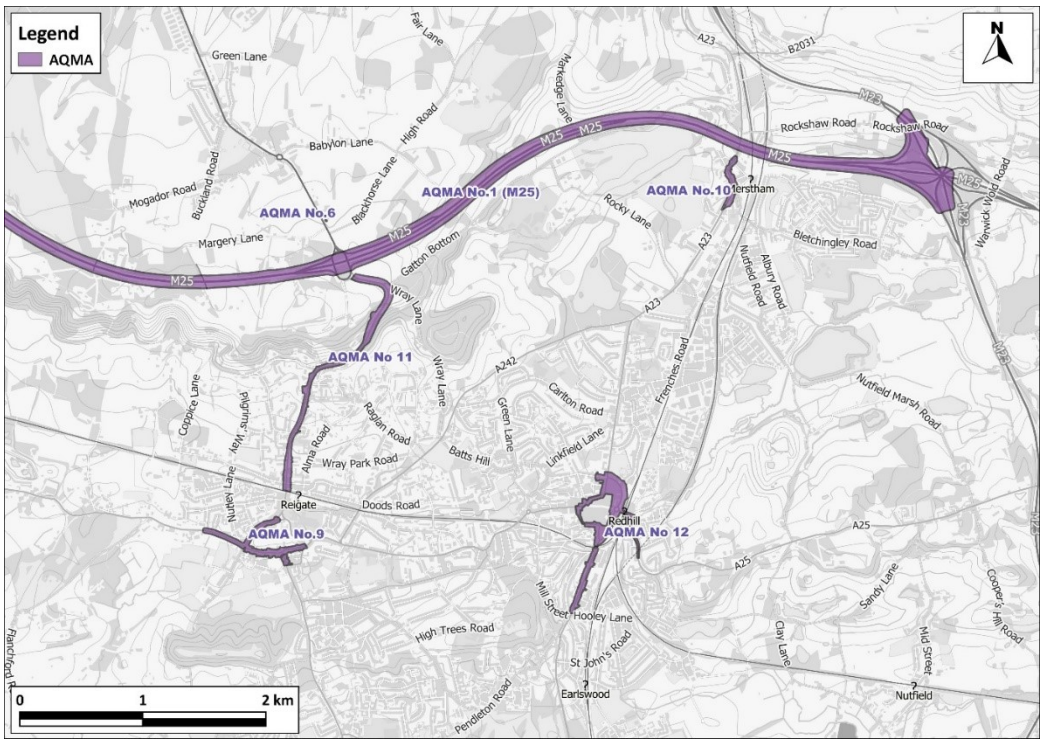

Figure 2.1: AQMAs No. 1 (M25), No. 6 (Blackhorse Lane), No. 9 (Reigate High St / West St / Bell St), No. 10 (Merstham), No. 11 (Reigate Hill) and No. 12 (Redhill)

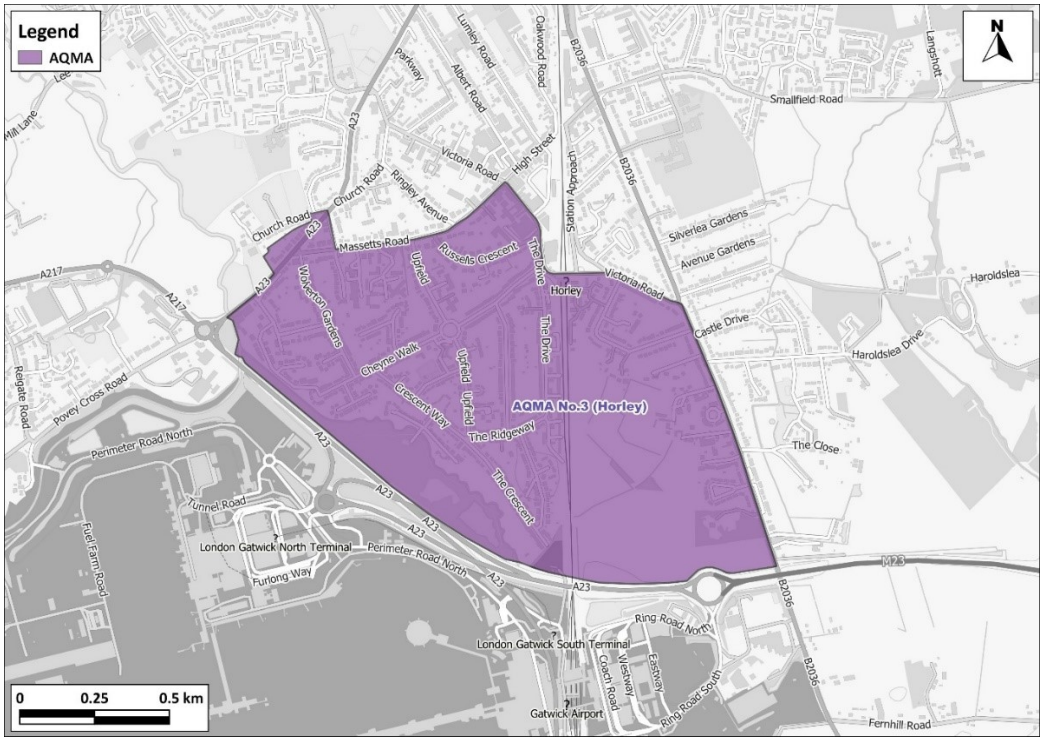

Figure 2.2: AQMA No. 3 (Horley)

Figure 2.3: AQMAs No. 1 (M25) and No. 6 (A217/Blackhorse Lane)

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Figure 2.4: AQMA No. 8 (Drift Bridge)

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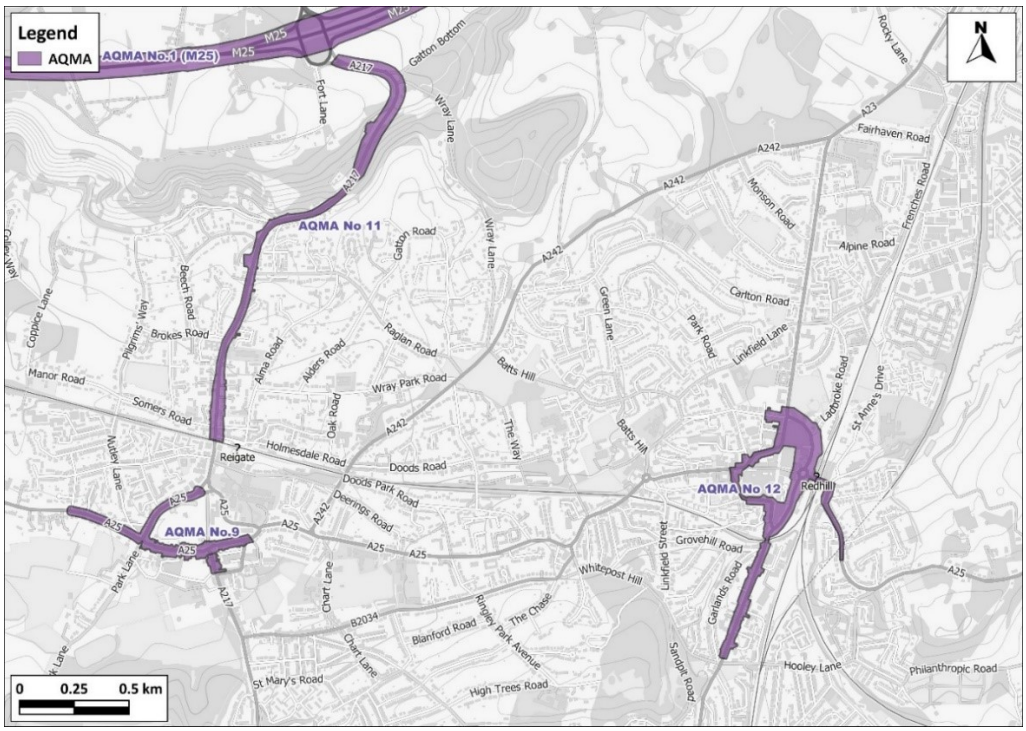

Figure 2.5: AQMAs No. 1 (M25), No. 9 (Reigate High St/ West St/ Bell St), No. 11 (Reigate Hill) and No. 12 (Redhill)

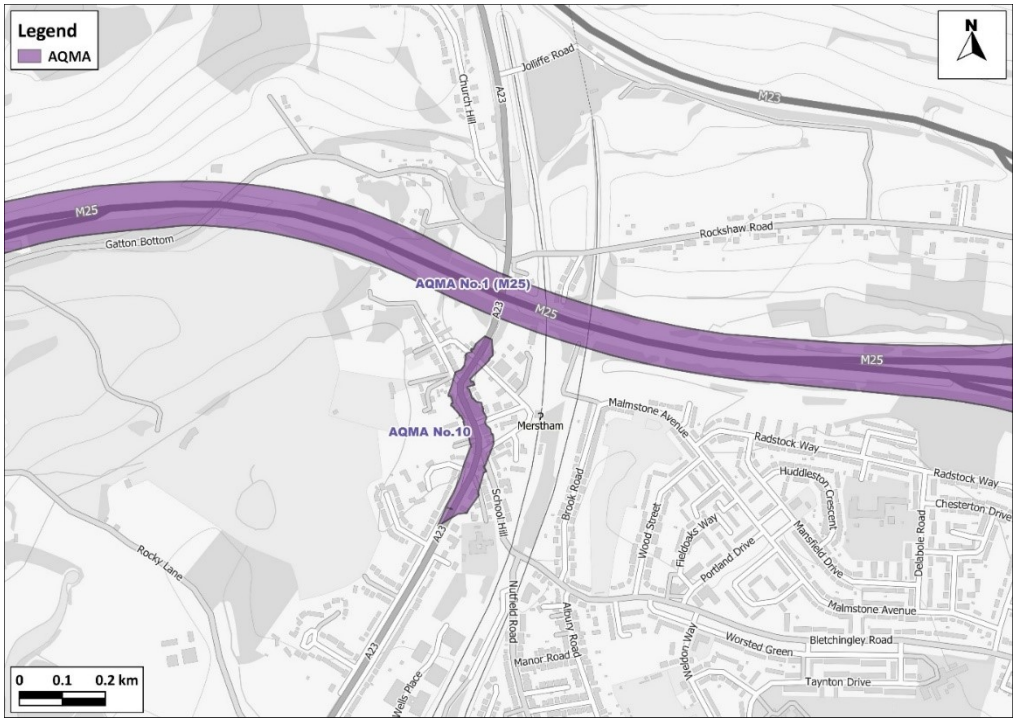

Figure 2.6: AQMAs No. 1 (M25) and No. 10 (Merstham)

Figure 2.7: AQMA No. 13 (Hooley)

To date, the Council has held back from revoking AQMAs as based on past experience if an AQMA is revoked too early it may need to be redeclared.

Therefore, before considering the revocation of an AQMA the Council is looking for the following:

i) Clear evidence of a long-term downward trend in pollutant concentrations.

ii) Ideally concentrations of nitrogen dioxide below 32 µg/m^3 (20% below the standard) for period of five years – to allow for any modelling or measurement uncertainties.

iii) No potential future plans for further development that may impact air quality within the AQMA e.g. increasing the number of road lanes, runways, or other developments that would lead to an increase in emissions of the pollutant of concern.

The Council is also mindful of the fact that the health impacts of air pollution do not stop just because a legal limit / objective level has been met, and that there are health risks associated with a consistent low level of exposure[6] as recognised by the WHO[7] in setting an annual average air

[6] Chief Medical Officers Report 2017. Recommendations 5 and 7.
[7] WHO (2021) Global air quality guidelines: particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. ISBN 978-92-4-003421-1. https://apps.who.int/iris/handle/10665/345329.

quality standard for nitrogen dioxide of 10 µg/m^3, and no more than three days per annum over 25 µg/m^3.

In the event that an AQMA is revoked monitoring will remain in place, though at some sites with a number of diffusion tubes the number of monitoring locations may be reduced. This is to ensure ongoing compliance with current and any future air quality standards, to enable ongoing trend analysis i.e. to ensure no deterioration in air quality, and to provide scientifically robust data for concerned local residents.

Once revoked the Council expects to see ongoing improvements in nitrogen dioxide concentrations, and the headroom created is not to be used by a specific industry sector to increase its pollution output.

In view of the above criteria, the Council currently plans to revoke all of the current AQMAs within the borough, with the exception of AQMA No. 3 (Horley) and AQMA No. 13 (Hooley); this work should be complete by the time of the next ASR.

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	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
No. 1: M25	30/04/2002 AQMA numbering updated 23/12/2003	Nitrogen dioxide – annual mean	The length of the M25 to a distance 30 m either side of the carriageway between Junction 7 and the point to the west of Junction 8 where the motorway meets the borough boundary.	Yes: M25	43	No measured exceedance	6 years	Action Plan for the M25 Air Quality Management Area (April 2004).	Air Quality review report - 2004: Action Plan for the M25 Air Quality Management Area
No. 3: Horley	30/04/2002 AQMA numbering updated 23/12/2003	Nitrogen dioxide – annual mean	An area of the south-west quadrant of Horley near to Gatwick airport.	Yes: Airport Way (A23)	43	No measured exceedance	4 years	Air Quality Action Plan for the Non-Airport sources of nitrogen dioxide within the Horley Air Quality Management Area (2007). Revised measures specific to the Horley AQMA in development - see measures 1 to 8.	Air Quality review report - 2007, January: Action Plan for non airport pollution within the Horley Air Quality Management Area
No. 6: A217 / Blackhorse Lane	24/05/2006	Nitrogen dioxide – annual mean	An area encompassing the house "Highlands" near the junction of the A217 Brighton Road with Margery Lane and Blackhorse Lane	No	63	No measured exceedance	6 years	As no current exceedances, under long-term monitoring with a view to revocation in 2024. Revised borough wide measures in development – see measures 13 to 35.	-

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	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
No. 8: Drift Bridge	05/11/2007	Nitrogen dioxide – annual mean	An area encompassing a couple of residential properties immediately to the north of the junction of the A240 (Reigate Road) and A2022 (Fir Tree Road).	No	48	No measured exceedances	6 years	As no current exceedances, under long-term monitoring with a view to revocation in 2025 Revised borough wide measures in development – see measures 13 to 35.	-
No. 9: Reigate High St / West St / Bell St	05/11/2007	Nitrogen dioxide – annual mean	An area encompassing Reigate High Street, the section of Church Street between the High Street and Bancroft Road, properties with a frontage to Bell Street (between the High Street and the southern end of Bancroft Road) and land and properties within 15m of either side of West Street (between High St and Evesham Rd) and along London Road (between West St and Castlefield Rd).	No	47	No measured exceedances	6 years	As no current exceedances, under long-term monitoring with a view to revocation in 2024. Revised borough wide measures in development – see measures 13 to 35.	-

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	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
No. 10: Mersthham	30/04/2008	Nitrogen dioxide – annual mean	An area encompassing all properties facing on to part of the A23 in Merstham. The area commences on London Road South (south of the junction with School Hill) and extends north along Merstham High Street and then just to the north of the junction with Station Road North.	No	52	No measured exceedances	6 years	As no current exceedances, under long-term monitoring with a view to revocation in 2025. Revised borough wide measures in development – see measures 13 to 35.	-
No. 11: Reigate Hill	24/06/2011	Nitrogen dioxide – annual mean	Properties within the area of Reigate Hill covering either partially or entirely properties between the level crossing in Reigate Town and J8 of the M25.	No	43	No measured exceedances	6 years	As no current exceedances, under long-term monitoring with a view to revocation in 2025. Revised borough wide measures in development – see measures 13 to 35.	-
No. 12: Redhill	24/06/2011	Nitrogen dioxide – annual mean	Properties within the Redhill area covering either partially or entirely Cromwell Road, Queensway, A25 Redstone Hill between the junction with the A23 and the junction with Hillfield Road, A23 between	No	48	No measured exceedances	4 years	As no current exceedances, under long-term monitoring with a view to revocation in 2025. Revised borough wide measures in development – see measures 13 to 35.	-

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	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
			the junction of Hooley Lane and Mill St and the A23 junction with Gloucester Road.						
No. 13: Hooley	04/09/2013	Nitrogen dioxide – annual mean	Properties within the Hooley area covering either partially or entirely properties of the following roads, A23 Brighton Road, Star Lane and Church Lane	Yes: Brighton Road (A23)	77	No measured exceedances	2 years	Revised measures specific to the Hooley AQMA in development – see measures 9 to 12.	-

☒ **Reigate and Banstead Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **Reigate and Banstead Borough Council confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in Reigate and Banstead

Defra's appraisal of last year's ASR concluded on the basis of the evidence provided by the local authority the conclusions reached are **accepted** for all sources and pollutants. A number of comments were made which supported the approach taken in the ASR. In addition, the following comments and recommendations were made:

- It was recommended that since AQMA 1, AQMA 8, AQMA 10 and AQMA 11 have all demonstrated compliance with the air quality objectives for several consecutive years they should be revoked, and AQMA 9 should also be considered for revocation given that it has over 3 years of compliance.
- It was stated that the seven of the nine AQMAs which do not have formal air quality action plans (AQAPs) need a formal AQAP, unless they are revoked. It was also noted that the existing AQAPs are greater than 5 years of the ASR submission year and that updated AQAPs should be produced for these AQMAs, unless they are revoked.
- In addition, a number of minor comments were made about the presentation of monitoring results, and it was suggested that a choice along with justification should be provided regarding whether a local or national adjustment factor should be used for local monitoring results. This has been addressed in Appendix C.

As noted earlier, the Council currently plans to revoke all of the current AQMAs within the borough, with the exception of AQMA No. 3 (Horley) and AQMA No. 13 (Hooley) and this work should be complete by the time of the next ASR.

Reigate and Banstead Borough Council has taken forward a number of direct measures during the current reporting year of 2023 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 35 measures are included within Table 2.2, with the type of measure and the progress the Council have made during the reporting year of 2023 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented.

More detail on these measures will be found in the new Air Quality Action Plan and Strategy for Reigate and Banstead Borough Council, the draft of which was accepted by Defra in March 2024. Key completed measures include improvements to electric vehicle (EV) charging infrastructure. For example, the initial installation works of fast 22 kW charging points in High Street Banstead Car Park are now complete and the Gridserve EV charging hub at Gatwick is now complete.

In 2023, the Surrey Air Alliance gave a briefing on air quality (17th May 2023) to the Surrey Asthma Network, including a discussion on ozone levels across the county and how this can also impact on health in addition to particulate matter and nitrogen dioxide.

The group also helped the Surrey Heartlands Children and Young People's Asthma Team at their Children and Young People's Asthma Learning Event on the 20th June 2023, with a stand demonstrating the Surrey air alert service, and other pollution services available across the UK. The event was well attended by a number of health care professionals (doctors, nurses, and pharmacists) working in asthma and respiratory medicine, and provided a key forum at which to demonstrate pollution warning services in Surrey.

The Council was also heavily involved in work on a development consent order (DCO) at Gatwick Airport in 2023 and this has continued in 2024. At present, the dispersion modelling indicates that residents on the Horley Gardens Estate within the Horley AQMA will see an increase in airport related nitrogen oxides (NOx) pollution by 2038 based on modelling at the RG1 monitoring site. The council has requested the airport model a 2047 scenario when the airport will be at full capacity but the airport has refused to do so despite the emissions inventory showing a further increase in airport emissions between 2038 and 2047.

As previously stated, RBBC's priorities for the coming year include the following:

i) Finalisation of various matters relating to air quality connected to Gatwick Airport's DCO. This is a key piece of work for the Council as modelling work completed as part of the DCO process indicates that NOx concentrations associated with airport activity between now and 2038 are forecast to rise, with the fall in airport road traffic related NOx emissions more than offset by the growth in aircraft related emissions. While the airport has not modelled NOx concentrations in 2047, airport related NOx emissions are forecast to continue to rise between 2038 and 2047.

ii) To have in place or have a formalised agreement to monitor ultrafine particles in the vicinity of Gatwick Airport (see Measure 4 in Table 2.2).

iii) To have completed the transition to a new supplier for the air alert pollution warning service with minimal (if any) break in service. (Connected to Measure 33 in Table 2.2).

RBBC worked to implement the measures in in the AQAP in partnership with the following stakeholders during 2023:

- Surrey County Council;

- Neighbouring authorities through the Surrey Air Alliance;
- National Highways; and
- Metrobus.

The principal challenges and barriers to implementation that RBBC anticipates facing include lack of funding, for example the Council is aiming to implement traffic management measures on the A23 at Hooley, and funding is currently a major barrier. Another principal challenge is sufficient officer time to implement projects.

Whilst AQMA's No. 3 (Horley) and No. 13 (Hooley) are both already compliant with the air quality objectives, the Council still considers, from a health perspective, that a general reduction in emissions of key pollutants will provide better outcomes than focussing on hotspot locations. For this reason, the measures stated above and in Table 2.2 have a wider strategic focus, and RBBC anticipates that further additional measures not yet prescribed will be required in subsequent years to work towards ongoing improvements in pollutant concentrations.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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	Installation of fast (22 kW) charging points in Central Car Park Horley.	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging.	Jan 2023	June 2025	RBBC – Policy / Projects.	RBBC	No	Funded	£50 to £100K	Planning	Across measures designed to improve EV charging infrastructure 1+ µg/m^3 and much higher as fleet goes electric.	Installation of equipment	Wider car park works underway (Apr 2024).	Forms first of the council's formal EV charging stations, which are to be rolled out to all car parks based on a priority list as and when funding becomes available.
2	Gridserve EV charging hub at Gatwick.	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging.	2020	Late 2022-revised to 2024.	Main funding: GAL GridServe RBBC / SCC LA support.	Gatwick / Private	No	Funded	£1 to £10 million private company	Implemented	1+ µg/m^3 (Across measures designed to improve EV charging infrastructure)	Completion of works and operational.	Project Complete and Site open. (Apr 2024).	Assist the airport with introductions to contacts / landowners associated with the mains grid connection. Site will accommodate 36 chargers up to 350 kW. Important for both the Horley AQMA and encouraging EV uptake amongst the local taxi fleet who operate on the airport run as lack of charging has been an issue.
3	Introduction of Hydrogen Fuel Cell buses on Fastway 20 route.	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	April 2018	Initial buses are running (Oct 2023) fully implemented end 2025.	Metrobus	GAL / Metrobus	No	Funded	£> 10 million	Implemented	<0.1 µg/m^{3}at borough level. But potentially 0.1 to 1 µg/m^3 at RB149.	Introduction of retrofitted buses.	Seven vehicles currently operating on route with further 13 due to operate once HSE sign off on hydrogen refuelling station. (Apr 2024).	Once complete 50 % of all bus movements past the RB149 site in the Horley AQMA will be via a hydrogen fuel cell bus. Project is a demonstrator for Metrobus - if operational savings as forecast the remaining high frequency bus service past RB149 is likely to also be converted to H2 fuel cell.
4	Ultrafine Particle monitoring within the vicinity of Gatwick Airport.	Other/ Public Information	Other	Dependant on funding	Equipment would be installed within 12 months of funding.	RBBC Leon Hibbs	Not yet funded	No	Unfunded	£100K to £500K	Planning	N/A	Equipment installed and then data capture > 90 %.	Still in planning phase – though funding situation will be known late Jan 2025.	Aim is to install equipment to monitor this emerging pollutant to characterise residential exposure (number and size distribution) and examine long term trends in exposure.
5	Local Forums / Policy: - AQ Working Group with GAL.	Policy Guidance and Development Control.	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality.	April 2005 and ongoing.	Ongoing.	RBBC -Env. Health. GAL. Crawley -Env. Health	RBBC / GAL / Crawley BC	No	Funded	£<10K	Implemented	1 µg/m^{3}at RB59 / RB149 – depending on schemes.	No specific measure, but will include Gatwick AQ plan implemented, and ongoing predictive modelling work.	Ongoing. Work in 2023 focused on commissioning retrospective model and inventory for 2019 to check where pollutant reductions are occurring in practice. Work due for completion late 2024.	AQ work on use of the emergency runway / DCO process resumed in Sept 2021 and continues in 2023. With extra runway 381,000 movements by 2032 compared to 284,987 in 2019. (c.33 % increase).
6	Work with National Highways Area 4 to ensure schemes to increase capacity in AQMA (e.g. GAL DCO process) fully consider air quality.	Transport Planning and Infrastructure	Other	Across the timescale of the AQAP	Ongoing	RBBC, National Highways, GAL	National Highways/ GAL	No	Unfunded	Unclear at this stage	Planning	Unclear at this stage, would work to ensure no increase in concentrations	Dependent on scheme	Initial discussions held with National Highways Area 4 Team. Highways works related to DCO still ongoing. (May 2024).	Funding likely to be greatest barrier

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7	Local Forums / Policy: - New section 106 agreement and sustainable development strategy.	Policy Guidance and Development Control.	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality.	April 2005 and ongoing.	Ongoing – current agreement ends 2024.	RBBC. GAL. Crawley BC WSCC	RBBC / GAL / Crawley BC. WSCC	No	Funded to 2024	£50K to £100K for AQ component.	Implemented	1 µg/m^3 at RB59 / RB149 – depending on schemes.	Agreement and Implementation of new agreement and strategy.	Agreement signed in 2022. New agreement due before 2025. If DCO approved s106 for AQ forms part of DCO, but no funding for capital replacement program in draft document. (May 2024).	Only if the measures in the agreement are completed by GAL, and the outcome of any studies in the agreement acted upon, will any improvement in air quality occur. Have seen improvements in AQ over past 10 years, but none due to airport itself by 2016. However, there have been airport related improvements in air quality to 2019, although these brought the airport contribution back to levels seen 15 years ago.
8	National / EU measures:- Tighter aircraft engine emissions standards.	Policy Guidance and Development Control.	Other	April 2005 and ongoing.	Ongoing.	RBBC – Env. Health. Plus GAL.	N/A	No	Funded at LA level.	£<10K to LA	Implemented	Aim is to reduce the rate of growth of aircraft emissions.	Higher standards in place and ideally an overall reduction in aircraft ground emissions.2005: 644 tonnes (aircraft ground and Auxiliary Power Unit (APU))	2010: 471 tonnes 2015:520 tonnes 2018: 649 tonnes. Originally discussed informally with DfT representative in 2007 especially the need initially for better and publicly available data on APU emissions. This has continued over the years most recently with GAL and their AQ consultants working on the DCO (2022).	APU emissions are also a source of concern, and the lack of manufacturers' data on emissions makes assessing the scale of the impact difficult. Thus in the first instance emissions testing of APUs needs to be introduced. Still limited work in this area that is in public domain (April 2022). However APU running times at Gatwick have reduced significantly since 2010. Current DCO work (to date) indicates that out to 2038 the only growing source of NOx emissions are aircraft / APUs, all other sources show declines despite significant planned growth at the airport. Tonnes Without With DCO 2029 739 (without), 783 (with). 2032 718 (without) 861 (with) 2038 717 (without) 855 (with)
9	Changes in physical road layouts to improve air quality.	Traffic Management	UTC, Congestion management, traffic reduction	Subject to funding, and availability of suitable emissions data set.	2025/26	RBBC – Env. Health, National Highways	RBBC	No	Not funded	£50K to £100K	Planning	Unknown until modelling undertaken	i) Micro-simulation scoping study. ii) implementation of scheme (if appropriate)	Ongoing - Funding sources being sought. 2018 and 2019 National Highways looking to make layout changes without AQ modelling.	Work is to focus on the A23 Hooley AQMA. Aim of the microsimulation study is to look at changes in the physical road layout especially in the vicinity of the Star Lane Junction, with a view to reducing pollution levels by moving stop start traffic away from residential properties, along with the impact of speed changes (similar study undertaken at Drift Bridge Banstead).
10	Investigation into potential gross vehicle polluters on A23 Hooley, and if in line with national 'failure' rates.	Vehicle Fleet Efficiency	Testing vehicle emissions	Oct 2023	Initial Study subject to funding 2025.	RBBC	TBC	Possible funding source	Not funded	£10 to £50K	Planning	Unknown at this stage – whole point of study.	Initial Study completed.	Initial discussion held with National Highways about principle of the investigation	Aim of the initial study is to see if the incidence of grossly polluting vehicles is greater than assumed in national figures e.g. through defeat devices / emulators. If not, then project ends at this point. If a higher incidence is found then will look to see potential level of reduction that improving this 'failure' rate could deliver and then look at routine testing / enforcement on this section of the road network.
11	Work with National Highways Area 5 team to	Traffic Management	Reduction of Speed Limits	2025	2026	National Highways	No funding identified yet, but would be	No	Unfunded	£<10K to LA	Planning phase.	Variable depending on what extent it smooths traffic	Implementation of new speed limit	Discussions held with residents; no construction required.	Funding is currently main barrier.

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	implement 30 mph speed limit on A23 at Hooley						internal NH funding					flow. Not designed to reduce traffic or improve fleet		Consulting with Surrey County Council, then need to apply for funding. On going (Apr 2024)	
12	Work with National Highways to explore schemes on the A23, such as traffic management measures to improve flow past properties	Traffic Management	Strategic highway improvements	2024	Depends on whether schemes identified but to take place across the timescale of this plan	RBBC and National Highways	No funding identified, but funding could be available though NH Environment fund or Defra AQ Grant	Potential for looking at feasibility of measures	Not funded	£10K - £50K for initial feasibility work	Planning phase	Unknown, would undertake feasibility work to look at target pollutant reductions	Feasibility work undertaken	Initial discussion held with National Highways	Funding. See also Action 9 as a project under consideration.
13	Trial of rapid charging points (50 kWh) for electric vehicles.	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Oct 2015	Oct 2018. Extended to Oct 2025 (using new kit installed 2021)	RBBC – Env. Health	OLEV / Sussex Air	No	Funded	£10 - £50K	Implemented	Across measures designed to increase EV infrastructure 1+ $\mu g/m^3$and much higher as fleet goes electric.	Steady growth in number of charges and kWh of electricity supplied.	Jan – June '20 total charges 287. (5,269 kWh). Jan – June 21 total charges 28 (404.7 kwh). Jan – June 22 total charges 731 (14,942 kwh). Jan – June 23 total charges 702 (15,400 kwh). Jan – 31 May 24 total charges 529 (12,186 kwh)	Trial project to look at demand for rapid electric vehicle charging in the borough, and how this changes with time.to understand the practicalities and costs of running such equipment. Ultimately aim is to see if one or more rapid chargers are needed in the borough. Between 2017 and 2020 three new rapids opened in the vicinity of the current unit. Low usage for 2021 due to site works. In period July to Sept 21 (3 months) 189 charges 3,171 kWh. Significant growth in 2022 reflects increase in EVs in the road fleet and larger batteries in the vehicles. Figure for 2023 suggest a plateau, which may reflect increasing reliability of surrounding chargers. Figures for 2024 are missing all of June 24 but suggest interpretation of 2023 figures is correct i.e. have reached a plateau.
14	Trial of destination charging of electric vehicles using fast (7 -22 kWh) chargers.	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2017	End 2027	RBBC – Env. Health	RBBC / Gatwick	No	Funded	£10 - £50K	Implemented	1+ $\mu g/m^3$ across measures designed to increase EV infrastructure	Installation of charge points. Steady growth in number of charges and kWh of electricity supplied.	Victoria Road car park (22kW) installed April 2018. Reigate Town Hall installed Aug 2018. Victoria Road Extension March 2020. Banstead High Street due to go live end 2024 / Q1 2025/ (see 15).	Complementary project to rapid charging project, to look at demand and usage pattern of destination chargers and gain practical experience of running such equipment including costs. Demand at Victoria Road was such that additional two sockets installed Match 2020. Usage Victoria Road: July to Dec 2020: 10,073kWh (431 sessions) July to Dec 2021: 8,740 kWh (406 sessions) with 1 post down) July to Dec 2022: 42,053 kWh (1,817 sessions) July to Dec 2023: 47,734 kWh. (2,530 sessions)
15	Installation of fast (22kW) charging points in High St Banstead car park	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging.	Jan 2021	Nov 2024	RBBC – Env. Health	RBBC	No	Part Funded	£50 to £100K	Implemented	Across measures designed to increase EV infrastructure 1+ $\mu g/m^3$ and much higher as fleet goes electric. Note this is to feed into future work.	Installation of equipment	Equipment installed – awaiting legal work prior to grid connection. On going (Apr 2024).	Initial works complete now waiting on legal. Final completion Banstead due 2024/25.

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16	On street charge point provision.	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging.	Oct 2023	2029+ (speed of roll out depending on funding).	SCC / RBBC	SCC / RBBC/ Private funding	No	Not funded in full but SCC have private sector partner.	£1 to £10 million	Implemented	1+ µg/m^3 (Across measures designed to increase EV infrastructure)	Increasing number of on street charging sites installed and operational.	Ongoing project suppliers appointed by SCC 2023. 4 sockets installed Church St. Reigate in early 2024.	This is the installation phase following on from work in late 2021 to draw up a priority list of areas where charging is needed on street in the borough as there is no off road parking, and feasible to go on street. The study also took account of socio-economic factors so areas are not left behind, and to examine council car parks that might be prioritised for overnight charging by local residents with no off road or no charging point.
17	Implementation of the A23 (Redhill to Horley) Design Code.	Traffic Management	UTC, Congestion management, traffic reduction	Oct 2023	Consulted on in 2023	RBBC	TBC	No	Funding will follow agreement on the code.	£> 10 million	Planning	Variable but in places over 1 µg/m^3, depending on scheme.	Implementation and build out of code.	Code currently subject to consultation (Nov 2023). Work on going (Apr 24).	Aside from wider pavements / cycleways to encourage walking / cycling for shorter trips, this has the impact of moving the road away from the residential houses facing onto the road in some cases by several metres hence potentially some significant falls in pollutant exposure.
18	'High Quality Bus Corridors' (Bus priority routes) within borough.	Transport Planning and Infrastructure	Bus route improvements	April 2024	April 2025 onwards	SCC / RBBC – Planning Policy (Peter Boarder, SCC Alison Houghton / David Ligertwood)	SCC	No	Partially funded	£> 10 million	Planning (Para 3.1.1 appendix A Surrey Enhanced partnership plan for buses August 2022).	Variable but up to 1 µg/m^3, depending on scheme, and buses operating on that route.	Completion of Redhill to Salfords route	Planning underway (2023) for Redhill to Horley. Still ongoing Apr 2024.	Surrey Enhanced partnership plan for buses was produced in August 2022 and details the following: Junction improvements, bus lanes, intelligent bus priority at traffic signals, bus friendly traffic management for the following sites: A23 from Gatwick, Horley, Redhill, Merstham; A217 Gatwick, Horley, Reigate; Services: Fastway 20, 100, 315, 400, 420, 422, 424, 430, 435, 460.
19	Upgrade of bus fleet to Euro VI or zero emission vehicles.	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	August 2022	April 2026 (provisional)	SCC / Metrobus	SCC Private	No	Partially funded	£> 10 million	Planning	Variable but up to 1 µg/m^3, depending on scheme, and buses operating on that route.	% of vehicles that are Euro VI or zero emission	In planning stage.	Surrey Enhanced partnership plan for buses published August then November 2022. Statement on p9 for higher specification buses. Current (as of Oct 2021) fleet: Zero Emission: 16 (2.3% of fleet) Euro VI: 349 (49.4% of fleet)
20	Electrification of the council's vehicle fleet.	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	April 2018	Late 2029/30 (staged approach).	RBBC – Fleet Anthony Hathaway / RBBC - Env Health Leon Hibbs	RBBC	No	Funded	£> 10 million	Implemented	<0.1 µg/m^3 at borough level. Project also for CO_2 savings.	Change in fleet from Diesel / Petrol to Electric	In Progress. Pool cars and car sized van fleet replaced 2019 to 2022. Work on larger van fleet replacement has begun.	Initial bin lorry purchase 2024/25. Heavy EV charging infrastructure design 2024/5 (provisional). Vehicle Programme replacement (indicative): 2024/25 2 (non refuse) 2025/26 14 (non refuse) 2026/27 18 (non refuse) 2027/28 13 (non refuse) 9 (Refuse) 2028/29 9 (non refuse) 9 (Refuse) 2029/30 8 (non refuse) 4 (Refuse)
21	Maintain current taxi licensing regime.	Promoting Low Emission Transport	Taxi Licensing conditions	April 2015	Ongoing	RBBC Licensing.	RBBC	No	Funded	<£10K	Implemented	<0.1 µg/m^3	Taxi standards maintained	Ongoing	Current scheme means that entire taxi fleet is replaced every 9 years, with majority replaced within 7 years. Important in wider AQ context as fleet has grown two fold since 2005 from c.500 to 928 (Apr. 2023) with further significant growth in the past year to 1305 (June 2024).

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22	Encourage EV uptake via taxi licensing regime.	Promoting Low Emission Transport	Taxi emission incentives	April 2019	Ongoing	RBBC Licensing.	RBBC	No	Funded	<£10K	Implemented	<0.1 µg/m^3 at borough level.	Number of pure EVs in the taxi fleet.	EV Introduction day held	First phase of the work completed in 2020 with agreement for 5 dedicated pure electric taxi licences. Then work with Energy Saving Trust in Oct 21 saw 30 drivers take part in an EV 'intro' day, with a further 12 test driving vehicles. EST said that was very good turnout for this type of event. Aim is to get EVs into the local fleet so drivers can assess the practical benefits and issues with EV taxi ownership and share with other drivers. To date (June 24) only two of the five plates have been taken up.
23	EV Taxi trial project.	Promoting Low Emission Transport	Taxi emission incentives	April 2023	2024/25	SAA / SCC / RBBC for local aspect	DEFRA	Yes	Funded	£10 to £50K	Planning	<0.1 µg/m^3 at borough level	No. of vehicles taken up by drivers	Funding in place (July 21), however following project delays SCC withdrew project funding (Nov 2023) – awaiting final approval from DEFRA. (Apr 2024)	Final form of the project will essentially enable taxi drivers to lease an EV for private hire or Hackney carriage work at a discounted rate. Seven boroughs in Surrey (including RBBC) involved. Project intended to help the 'early adopter' drivers so that they are able to feedback to other drivers the good and bad aspects of EV taxi ownership.
24	Continued Promotion of Surrey Car Share / Lift Share.	Alternatives to private vehicle use	Car Clubs	Apr 2015	Ongoing	SCC –contact Heidi Auld.	SCC	No	Funded	<£10K	Implemented	<0.1 µg/m^3	Steady growth in number of participants. (1300 users at start of 2006).	On going. Currently 3207 (2023) active members.4809 (2020) 4979 (2017) 3500 (2011)	Measurable improvements in air quality unlikely in the short medium term unless significant increase in users. Surrey scaled back promotion after closure of travelSMART (June 2017), thus possible explanation for limited growth to 2020.
25	Promotion of cycling within schools.	Promoting Travel Alternatives	Promotion of cycling	Sept 2015	Subject to funding will be ongoing.	Sustrans SE / RBBC Sustainability.	RBBC / SCC	No	Funded	£10 to £50K	Implemented	<0.1 µg/m^3	Continuation of existing promotional work and training.	On going.	Existing programme is well established. Main need is to keep programme running as new children start and others leave. Promotional work also done on cycling under the R&Be active scheme. 31 schools involved in the SCC program in 2019 with between 2 and 6 days per school per term.
26	Promotion of Active Travel (schools and businesses).	Promoting Travel Alternatives	Promotion of cycling / walking.	Has operated for a number of years but new post created Oct 2023.	Subject to funding will be ongoing.	RBBC Sustainability	RBBC	No	Funded	£50K to £100K	Implemented	<0.1 µg/m^3	Number of businesses and schools spoken to in first instance, and then movement from vehicles to 'active' travel.	Appointment to post Q3 2023.	
27	Promotion of low NOx boilers, ground and air source heat pumps.	Promoting Low Emission Plant	Emission control equipment for small and medium sized stationary combustion sources / replacement of combustion sources.	Ongoing since April 2015, and originally June 2005	Ongoing.	RBBC Leon Hibbs	RBBC	No	Funded	<£10K	Implemented	<0.1 µg/m^{3}at borough level but potentially up to 1 µg/m^3 locally.	Measure adopted by developers through planning process.	Ongoing.	Low NOx technology is considered to be technology where NOx emissions are less than 40 mg/kWh (dry gas and 0% O_2). The council is aware of developments (in the city of London) where ultra-low NOx appliances (less than 15 mg/kWh NOx emissions) have been installed. The use of ultra-low NOx technology is therefore actively encouraged. Aim is to minimise growth in background pollution / reduce if possible. Increasingly seeing air source

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															equipment specified in commercial sector, less so in small scale residential developments.
28	Fit out of council estate with solar and battery storage as appropriate.	Promoting Low Emission Plant	Emission control for small and medium sized stationary combustion sources / replacement of combustion sources.	Oct 2023	Ongoing. Roll out across the estate as and when funding permits.	RBBC Sustainability	RBBC	No	Funded in part	£> 10 million	Implemented	<0.1 µg/m^{3}at borough level but potentially up to 1 µg/m^3 locally.	Steady growth in number of properties upgraded.	Ongoing.	Priory Park Pavilion due for battery and solar installation 2024/25, along with 7 residential properties (solar) that the council owns (2024/25).
29	Discourage use of biomass / wood burning stoves, where grid gas is available.	Promoting Low Emission Plant	Other	April 2020	Ongoing.	RBBC Leon Hibbs	RBBC	No	Funded	<£10K	Implemented	<0.1 µg/m^3 at borough level.	No specific measure – impact conveyed via talks, planning, and calls regarding smoke control areas.	Ongoing. Number of conversations with local residents on wood burning in general and also residents who have a wood burning stove.	Use of biomass in a commercial setting considered on merits i.e. setting / nearby receptors.
30	Road going construction vehicles to meet the London Low Emission Zone standards, and for projects over 6 months non-road mobile machinery (NRMM) equipment must as a minimum meet Stage IV requirements from 2024, and stage V from 2030.	Promoting Low Emission Plant	Other	Oct 2023	Ongoing	RBBC – Env. Health	No funding needed at this stage	No	Funded	<£10K	Planning – implemented once action plan agreed.	Variable depending on project size and duration.	Policy implemented.	Ongoing. Current DCO work likely to see Stage V adopted from 2025 (May 2024)	Where a development / construction project exceeds 6 months duration (either as a single phase or a number of phases in combination) road going construction vehicles must meet the London Low Emission Zone standards – and for NRMM equipment this must meet London's 'Low Emission Zone' for NRMM standards with equipment as a minimum meeting Stage IV requirements from 2024, and stage V from 2030.
31	Promotion of tree planting within the Borough.	Other	Other	Oct 2023	Ongoing	RBBC	Not funded	No	Unfunded at this stage.	-	Planning	1 hectare of woodland in RBBC removes 7kg of $PM_{2.5.}$	Area of additional woodland planed.	Ongoing.	Tree planting can have an important role in removing pollution. In RBBC 1 ha of tree planting would remove around 7kg of $PM_{2.5}$ per annum based on Centre for Ecology and Hydrology calculator. See: https://shiny-apps.ceh.ac.uk/pollutionremoval/
32	Continue to Work with Surrey Air Alliance on Surrey-wide Projects.	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies.	April 2015	Ongoing	RBBC Leon Hibbs	Districts and Boroughs in Surrey	No	Funded (staff time)	-	Implemented	Variable depending on project.	Projects in progress	Ongoing.	Group works on various AQ projects including working with the Surrey Heartlands Children and Young People's Asthma Team in 2022 to date on their project to develop an Asthma care bundle.
33	Air Pollution Warning Service for vulnerable groups.	Public Information	Via other mechanisms	April 2015 started. Oct 2013	Ongoing – subject to funding.	RBBC – Env. Health	RBBC and other boroughs in the service.	No	Funded	<£10K	Implemented	n/a	Steady growth in number of participants (original target was up to a total of 1000 users).	Ongoing. Currently 1046 active users (June 2024)	Service for pollutants either compliant with LAQM standards (PM_{10}) or outside the regime (O_3), but which reach levels capable of having an acute health impact. Founding East Surrey boroughs joined by Woking and Spelthorne in April 2015, and Runnymede in Dec 2019. Work in 2024 /25 to move

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															to new supplier of air alert service.
34	Production of borough-wide mapping of $PM_{2.5}$ and NO_2 including health impact assessment.	Policy Guidance and Development Control	Other	April 2017	2025/26	RBBC – Env. Health	RBBC and other Surrey Boroughs.	No	Funded	£10 to £50K	Implemented	n/a	Production of map and health calculations	First model of borough produced in 2019. Modelling to be updated in 2025 (baseline 2024).	Mapping is to be used as a policy tool to quantify changes in health impact of pollution on residents with time, and inform county health funding priorities. Also used to inform action planning, if appropriate, at a local level.
35	Monitoring.	Other / Public information	Other	Ongoing	Ongoing	RBBC Leon Hibbs	RBBC / GAL	No	Funded. Horley funding subject to GAL extension beyond 2024.	£50K to £100K	Implemented	N/A	Data capture > 90 %.	Ongoing. Data capture consistently in excess of 90 %. Data capture at RG1 89.9% in 2023 due to building demolition works.	Sites are important for examining trends in measured pollutant concentrations, compliance monitoring, informing the pollution warning service, and also model validation.

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[8], local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter ($PM_{2.5}$). There is clear evidence that $PM_{2.5}$ (particulate matter smaller than 2.5 micrometres in (aerodynamic) diameter) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

The Council began monitoring $PM_{2.5}$ at the RG1 site in September 2022 as discussed in Section 3.2.3.

While the Council did not monitor $PM_{2.5}$ directly using an approved measurement technique before 2022, long-term monitoring of PM_{10} concentrations suggests that levels have been falling over a number of years. While $PM_{2.5}$ levels may not correlate precisely with PM_{10} concentrations there is no reason to suspect that residents' exposure to $PM_{2.5}$ over the past 10 years has not reduced.

The Council's borough wide modelling work examining residents' exposure to $PM_{2.5}$ (and other pollutants) was reported on in the 2020 ASR. This work clearly showed that, unlike nitrogen dioxide, road traffic is responsible for a relatively small component of residents' exposure to $PM_{2.5}$ – up to 14 % but typically under 10 %, and that in the traffic derived fraction the bulk of the exposure is from a combination of brake, tyre and road wear rather than exhaust emissions.

While the focus of the Council's current work in relation to air quality is around vehicle electrification given the significant benefits in NOx reduction, the removal of combustion derived particulates, and the potential reduction in brake wear via regenerative braking, the Council is mindful of the potential increase in emissions from increased tyre and road wear given at present, on average, electric vehicles are heavier than the petrol / diesel equivalent.

[8] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023.

Ultrafine Particles in the Vicinity of Gatwick

Globally airports have been identified as a significant source of ultrafine particulate pollution[9,10] i.e. particles that are under 0.1 µm in aerodynamic diameter. A large proportion of these particles are generated during take-off and studies at Los Angeles Airport (LAX) have shown the resulting 'spike' in ultrafine particles can be detected at least 600 m from the airport.

Research over the past 10 to 15 years has continually indicated that the finer combustion derived particle fractions, including particles under 0.1 µm in (aerodynamic) diameter, tend to have the largest biological effects and as initial 'look / see' study by the Council in late 2011 indicated a significant source of ultrafine particles in the vicinity of Gatwick Airport the Council has since sought academic partners to look at ultrafine particle concentrations in the vicinity of Gatwick in greater detail.

Work with King's College, Imperial College, and Leicester University during 2018 and 2019 to better characterise the impact of ultrafine particles on local residents was reported on in the 2020 ASR. However, the key findings from this work were:

- When winds were off-airport (i.e. a wind direction away from airport), residential exposure (350 m from A23 / 610 m from the airport) was far higher than measured 1.5 m from a six lane road in central London, although the average exposure i.e. over the duration of the study was lower than the roadside site;
- The average exposure at the RG1 site was around double the average exposure at a London background site;
- There was preliminary evidence that residents closer to the airport than the RG1 site e.g. RG6 site were exposed, on average (not just when winds were off-airport), to levels seen at Marylebone Road.

In 2021, the WHO released updated guidelines[11] in relation to ultrafine particles. While they have been unable to give a numerical standard (due in part to the lack of monitoring) for researchers to use, they have defined what can be considered high and low values:

[9] Atmospheric Environment 45 (2011) pp.6526 – 6533.
[10] Atmospheric Environment 50 (2012) pp.328 – 337.
[11] WHO (2021) Global air quality guidelines: particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulphur dioxide and carbon monoxide. ISBN 978-92-4-003421-1.https://apps.who.int/iris/handle/10665/345329.

- High concentrations – more than 10,000 particles/cm^3 (24-hour mean) or more than 20,000 particles/cm^3 (1-hour);
- Low concentrations – less than 1,000 particles/cm^3 (24-hour mean).

Applying the new WHO guidelines to the 2018 and 2019 data gives the results presented in Table 2.3.1.

Table 2.3.1 - RG1 Ultrafine Particle Counts Measured in 2018 and 2019 – Comparison to WHO Guidelines

	2018 Data	2019 Data
No. of days in a period	84	205
No. of days with daily average over 10,000 counts / cm^3 (days HIGH)	46	73
% of days over 10,000 counts / cm^3	54.8 %	35.6%
No. of days with minimum of 1 hour over 20,000 counts / cm^3	53	110
% of days with minimum of 1 hour over 20,000 counts / cm^3	63.1 %	53.6 %
No. of days over 10,000 counts / cm^3 or minimum 1 hr greater than 20,000 counts / cm^3	57	114
% of days over 10,000 counts / cm^3 or minimum 1 hr greater than 20,000 counts / cm^3	67.8 %	55.6 %
No. of days with daily average under 1,000 counts / cm^3 (days LOW)	0	0

While the data in Table 2.3.1 does not cover a full calendar year it does suggest that for around 50 % of the time residents in the vicinity of RG1 are exposed to ultrafine particle concentrations that are classed as high either on a daily or hourly basis by the WHO.

If the data for the 2019 period is broken down by daily average wind direction (Table 2.3.2) then it is clear that the high pollution days are occurring when winds are coming from the general direction of the airport, with the 21 days of westerly winds all occurring when winds are from the SW to WSW (effectively off-airport).

Table 2.3.2 - Distribution of High Ultrafine Particle Concentrations at RG1 by Wind direction in 2019 Data

Wind Direction	Days	No. Days with Daily Average over 10,000 particles / cm^3	No. Days with min. of 1 hour over 20,000 particles / cm^3
North	13	0	1
East	43	1	5
South (from the airport)	66	51	56
West	83	21	48

To put the Horley figures into a wider context, the RG1 site can be compared to both the London background site (Honor Oak) and the roadside site at Marylebone Road. As daily and hourly values are being examined the comparison is based only on days in 2019 when data from all three sites were available (Table 2.3.3).

Table 2.3.3 – Comparison of London Background and Roadside Monitoring to Residential Monitoring in Horley using WHO Guidelines.

Site	Distance from Source	Days of Valid Data Capture	Mean Particle Count (Particles / cm^3)	Days 'High' (daily mean)	No. of hours 'High' in period	No. Days with min. of 1 hour 'High'
London – Background (Honor Oak)	n/a	89	4,261	4	0	0
RG1 Horley	350 m A23 / 610 m Airport	89	8,846	29	216	46
London – Marylebone Road	1.5 m	89	9,686	39	111	36

Table 2.3.3 indicates that residential exposure at RG1 to 'High' days of ultrafine pollution is much higher than the London background site (Honor Oak), but lower than that seen 1.5 m from a busy road (Marylebone Road) in central London.

However, it also shows that the hourly exposure to 'High' pollution at RG1 either as the total number of hours of exposure, or the number of days with a minimum of 1 hour of 'High' pollution exposure is much higher than that seen at Marylebone Road.

Given the RG1 site is located in a residential estate, around 350 m from the nearest main road, and a significant number of houses are closer to the source of ultrafine pollution than the RG1 site, it suggests that ultrafine particles in the vicinity of Gatwick are far higher than could be considered ideal.

To date no additional work has been undertaken in this area as the airport feels unable to fund an ultrafine particle monitoring program, despite this being in line with the recommendations of the Government's air quality expert group (AQEG)[12].

However, the council is looking at other potential projects in this area with academic partners, which will be reported on in due course.

2.4 Health Impact of Air Pollution in the Borough

Historically the council has focused much of its air quality work on local hot spots that have been declared AQMAs, although within the past five years the general approach has been to focus on measures that have air quality benefits across the borough e.g. electric vehicle charging infrastructure trials.

While it is important to focus on localised hot spots where a straight forward solution is possible e.g. realignment of a road in relation to houses so that in effect the houses are moved away from the road to meet the air quality standards, it is also important to realise that while the majority of the borough meets the relevant air quality standards there is still a health cost associated with the lower levels of pollution that exist across the borough.

As reported on in the 2020 ASR the most recent borough (and county) wide modelling[13] examined the current health costs of air pollution (nitrogen dioxide and particulate matter) across the borough to inform future policy at the Council around reducing residents' exposure to air pollution.

[12] AQEG Ultrafine Particles (UFP) in the UK. – July 2018. pp.11, and pp.94 Section 7.1 Paragraph 2.
[13] CERC 2018 Detailed air quality modelling and source apportionment for Surrey Local Authorities.

The work suggests, that in 2017, air pollution across the borough had an economic cost of £37 to £45 million with the number of life years lost in the region of 880 to 1060 years.

The health impact is a function of both the pollution levels and the number of people affected. The borough had the third highest average nitrogen dioxide exposure in Surrey and the 6th highest $PM_{2.5}$ exposure, but as a consequence of its relatively large population, compared to the other Surrey boroughs, Reigate and Banstead suffers from the largest health impact / cost in Surrey.

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

This section sets out the monitoring undertaken within 2023 by Reigate and Banstead Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2019 and 2023 to allow monitoring trends to be identified and discussed. When looking at the data from 2020 to 2023 it is important to keep in mind the impact of COVID from March 2020.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Reigate and Banstead Borough Council undertook automatic (continuous) monitoring at four sites during 2023 (RG1, RG3, RG6 and RG7). Table A.1 in Appendix A shows the details of the automatic monitoring sites. National monitoring results for the AURN site RG1 (Horley) are available at https://uk-air.defra.gov.uk/networks/network-info?view=aurn. The other three sites are not AURN but are operated to AURN standards. RG1 and RG3 (Poles Lane, between Crawley and Gatwick Airport) are operated by ERG at Imperial College and RG6 (Horley South East)) and RG7 (Hooley) is operated by Ricardo. Data from all four automatic monitoring sites are available at Reigate and Banstead Borough Council - Air Quality monitoring service (airqualityengland.co.uk).

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Reigate and Banstead Borough Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 139 sites, four of which contain three co-located monitors (“triplicates”), during 2023. 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_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. 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 2023 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

Automatic monitoring results indicate that for both the annual mean and 1-hour mean objectives there were no breaches at any of the monitoring locations in 2023.

There were no measured exceedances of the annual mean nitrogen dioxide objective at diffusion tube monitoring sites in 2023 and no results were over 36 µg/m^3 and thus no sites required distance correcting. All relevant objectives were met within the Borough.

3.2.2 Particulate Matter (PM_{10})

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 40µg/m^3.

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.
There have been no exceedances of either PM_{10} objective in any of the years monitored.

3.2.3 Particulate Matter ($PM_{2.5}$)

The Council began monitoring $PM_{2.5}$ at the RG1 site in September 2022 using a FIDAS instrument for the purposes of compliance monitoring and to examine long term background trends in this pollutant. Data management is via the Environmental Research Group (ERG) at Imperial College, with QA/QC of the instrument by the National Physical Laboratory (NPL). The mean $PM_{2.5}$ concentration for 2023 was 8.3 µg/m^3 with data capture of 91.3%.

3.2.4 Sulphur Dioxide (SO_2)

No SO_2 monitoring was undertaken by Reigate and Banstead Borough Council in 2023.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
RG1	RG1 – Michael Crescent, Horley	Suburban	528208	142337	NO_2, PM_{10}, $PM_{2.5}$	Y (AQMA No. 3)	Chemiluminescence (NO_2), TEOM (PM_{10}), FIDAS ($PM_{2.5}$)	0.0	19.1	3.5
RG3	RG3 - Poles Lane Pumping Station, Crawley	Rural	526421	139639	NO_2, PM_{10}, ozone (not reported in this report)	N	Chemiluminescence, TEOM	>50.0	12.6	2.0
RG6	RG6 – 106 The Crescent, Horley	Suburban	528592	141831	NO_2	Y (AQMA No. 3)	Chemiluminescence	0.0	0.7	1.5
RG7	RG7 Hooley Real-time Site Garages 55-57 Brighton Road, Hooley	Roadside	528804	156435	NO_2	Y (AQMA No. 13)	Chemiluminescence	1.7	2.0	1.5

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. Note the nearest 'road' at RG1 and RG6 are residential housing estate roads carrying no more than 500 vehicles a day. RG3 is down a dead-end country lane with no more than 100 vehicles a day. All three sites RG1, RG3, and RG6 designed to look at airport emissions.

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB1	Boots, 34 – 36 High Street, Reigate, RH2 9AT	Roadside	525246	150252	NO_2	Y (AQMA No.9)	0.0	5.1	N	3.1
RB3	Nr Ambulance Station, The Horseshoe, Banstead	Urban background	524944	159630	NO_2	N	24.4	0.7	N	3.0
RB8	Rear of Boots, Reigate	Urban background	525246	150286	NO_2	N	0.0	39.2	N	3.7
RB9	Back of 63, St Mary's Road, Reigate	Urban background	525750	149677	NO_2	N	0.0	24.9	N	2.5
RB11	Outside 38, Riverside, Horley	Suburban	528104	142226	NO_2	Y (AQMA No. 3)	0.0	1.4	N	3.0
RB12	Horley Police Station, Massetts Road, Horley	Roadside	528424	142934	NO_2	Y (AQMA No. 3)	5.5	0.4	N	2.9
RB13	Public Car Park, off Massetts Road, Horley	Other	528362	142983	NO_2	N	0.0	30.0	N	2.9

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB17	11, Sylvan Way, Redhill	Urban background	528511	149715	NO_2	N	4.5	1.7	N	2.9
RB18	60, Brook Road, Merstham	Urban background	529263	153156	NO_2	N	6.3	1.3	N	3.0
RB19	Village Hall, Station Road, Merstham	Suburban	529067	153375	NO_2	N	9.0	0.7	N	2.9
RB20	Corner of London Road, Merstham	Roadside	529026	153420	NO_2	Y (AQMA No. 10)	20.2 (Nearest relevant exposure is on opposite side of the road) (Difference between the distance of the site to the kerb and the receptor to the kerb is 2.9 m)	2.6	N	2.9
RB21	Opposite Drift Bridge Hotel, Reigate Road, Banstead	Roadside	523198	160095	NO_2	N	13.7	1.7	N	2.9

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB22	Opposite 2 Grey Alders, Banstead	Suburban	523260	160111	NO_2	N	13.2 (Nearest relevant exposure is on opposite side of the road) (Difference between the distance of the site to the kerb and the receptor to the kerb is 5.0 m)	1.1	N	2.9
RB23	Outside Warren Mead School, Roundwood Way, Banstead	Urban background	523612	159906	NO_2	N	9.5	2.3	N	2.7
RB24	Horley Air Monitoring Station	Background	528208	142337	NO_2	Y (AQMA No. 3)	0.0	19.1	Y	3.5
RB25	Horley Air Monitoring Station	Background	528208	142337	NO_2	Y (AQMA No. 3)	0.0	19.1	Y	3.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB26	Horley Air Monitoring Station	Background	528208	142337	NO_2	Y (AQMA No. 3)	0.0	19.1	Y	3.5
RB27	White Lodge, Sturts Lane, WHO	Roadside (Near M25)	521873	153896	NO_2	Y (AQMA No. 1)	0.0	5.6	N	3.0
RB29	April Cottage, Sturts Lane, WHO	Roadside (Near M25)	521921	153937	NO_2	N	0.0	11.7	N	3.0
RB30	Linden Lea, Chequers Lane, WHO	Roadside (Near M25)	522112	153728	NO_2	Y (AQMA No. 1)	0.0	18.9 (27.5 m from the M25)	N	3.0
RB31	Margery Hall, Reigate Hill	Roadside (Near M25)	525506	152366	NO_2	N	0.0	19.5	N	3.0
RB33	Rose Cottage, Margery Grove, KT20 7EZ	Roadside (Near M25)	524081	152580	NO_2	N	0.0	0.0	N	3.0
RB34	Stagholt, Merrywood Grove	Roadside (Near M25)	524177	152393	NO_2	N	0.0	45.6	N	3.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB36	Old Church House, Gatton Bottom	Roadside (Near M25)	528887	153760	NO_2	N	0.0	74.8 (Distance from the M25, closest road is a very minor access road)	N	3.0
RB37	14 Ashcombe Road, Merstham	Roadside (Near M25)	529217	153605	NO_2	N	0.0	12.0	N	3.0
RB39	17 Ashcombe Road, Merstham	Roadside (Near M25)	529205	153572	NO_2	N	0.0	10.9 (32.3 m from the M25)	N	3.0
RB40	Dilkusha, Shepherds Hill	Roadside (Near M25)	529252	154291	NO_2	N	0.0	15.0	N	3.0
RB43	Glade House, Quality Street, Merstham	Roadside (Near M25)	528797	153612	NO_2	N	0.0	52.4	N	3.0
RB44	Outside Gunshop, 45 Church St, Reigate	Roadside	525532	150316	NO_2	Y (AQMA No. 9)	0.0	14.6	N	3.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB45	Outside Anglian Windows Church Street, Reigate	Roadside	525431	150270	NO_2	Y (AQMA No. 9)	2.4	0.1	N	3.0
RB46	Outside Gerrards Menswear, 5 High Street, Reigate	Roadside	525346	150241	NO_2	Y (AQMA No. 9)	2.1	0.4	N	3.0
RB47	Outside Nationwide, 78 High Street, Reigate	Roadside	525114	150276	NO_2	Y (AQMA No. 9)	2.0	0.5	N	3.0
RB49	Highlands, Brighton Road	Roadside (Near A217)	525705	152947	NO_2	Y (AQMA No. 6)	6.1	2.0	N	3.0
RB50	Yew Cottage, Brighton Road	Roadside (Near A217)	525700	152964	NO_2	N	0.0	24.0	N	3.0
RB51	Outside 17 Wolverton Gardens, Horley	Suburban	527873	142606	NO_2	Y (AQMA No. 3)	0.0	15.1	N	3.5
RB52	Outside 20 Wolverton Gardens, Horley	Suburban	527892	142463	NO_2	Y (AQMA No. 3)	0.0	13.7	N	3.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB53	Outside 66 / 68 Cheyne Walk, Horley	Suburban	528030	142373	NO_2	Y (AQMA No. 3)	0.0	4.3	N	3.5
RB54	Outside 7 / 9 Crescent Way, Horley	Suburban	528112	142321	NO_2	Y (AQMA No. 3)	0.0	4.2	N	3.5
RB55	Outside 40a Crescent Way, Horley	Suburban	528254	142196	NO_2	Y (AQMA No. 3)	0.0	1.1	N	3.5
RB56	Outside 8 / 10 The Crescent, Horley	Suburban	528386	142080	NO_2	Y (AQMA No. 3)	0.0	2.6	N	3.5
RB57	Outside 29 / 31 The Crescent, Horley	Suburban	528499	141953	NO_2	Y (AQMA No. 3)	0.0	2.6	N	3.5
RB58	Outside 39 / 41 The Crescent, Horley	Suburban	528538	141897	NO_2	Y (AQMA No. 3)	0.0	2.6	N	3.5
RB59	Outside 92 / 94 The Crescent, Horley	Suburban	528602	141789	NO_2	Y (AQMA No. 3)	0.0	2.2	N	3.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB60	Outside 120 / 122 The Crescent, Horley	Suburban	528607	141910	NO_2	Y (AQMA No. 3)	0.0	2.8	N	3.5
RB61	Outside 79 / 81 The Crescent, Horley	Suburban	528578	142006	NO_2	Y (AQMA No. 3)	0.0	1.0	N	3.5
RB64	Outside 16 / 22 The Drive, Horley	Suburban	528608	142432	NO_2	Y (AQMA No. 3)	0.0	1.6	N	3.5
RB65	Outside 4 / 6 The Drive, Horley	Suburban	528581	142635	NO_2	Y (AQMA No. 3)	0.0	16.8	N	3.5
RB66	Outside 3a / 3b Fairfield Avenue, Horley	Suburban	528499	142512	NO_2	Y (AQMA No. 3)	0.0	18.5	N	3.5
RB68	Outside 57 Fairfield Avenue, Horley	Suburban	528505	142246	NO_2	Y (AQMA No. 3)	0.0	18.5	N	3.5
RB69	Outside 61 Upfield, Horley	Suburban	528335	142224	NO_2	Y (AQMA No. 3)	0.0	14.0	N	3.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB70	Outside 58 / 60 Upfield, Horley	Suburban	528360	142384	NO_2	Y (AQMA No. 3)	0.0	17.8	N	3.5
RB72	Outside 25 / 27 Upfield, Horley	Suburban	528220	142583	NO_2	Y (AQMA No. 3)	0.0	19.2	N	3.5
RB73	Outside 9 / 11 Upfield, Horley	Suburban	528172	142679	NO_2	Y (AQMA No. 3)	0.0	17.8	N	3.5
RB74	On Green, 30a / 30b Meadowcroft Close, Horley	Suburban	529149	141953	NO_2	Y (AQMA No. 3)	0.0	15.1	N	3.5
RB75	On Roundabout, The Coronet, Horley	Suburban	529203	142192	NO_2	Y (AQMA No. 3)	0.0	12.4	N	3.5
RB76	33 Limes Avenue, Horley	Suburban	528958	142468	NO_2	Y (AQMA No. 3)	0.0	20.7	N	3.5
RB77	Layby at Entrance to Staffords Place, Horley	Suburban	528789	142570	NO_2	Y (AQMA No. 3)	0.0	13.0	N	3.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB78	Outside 74 The Crescent, Horley	Suburban	528553	141857	NO_2	Y (AQMA No. 3)	0.0	2.7	Y	3.5
RB81	Outside Flying Scud Public House, Brighton Road, Redhill	Roadside (A23 AQMA)	527594	149236	NO_2	N	0.0	5.5	N	3.5
RB82	Outside 1 Deans Lane, Hooley	Suburban (A23 AQMA)	528770	155797	NO_2	N	0.0	18.3	N	3.5
RB95	Flat 1, Tasboro House, Rushworth Road	Roadside	525382	150639	NO_2	N	0.0	5.9	N	2.0
RB98	16 / 17 Woodroyd Gardens	Suburban	527931	142231	NO_2	Y (AQMA No. 3)	0.0	1.0	N	2.0
RB99 [2]	Poles Lane Pumping Station, Cawley	Rural / Other	526421	139639	NO_2	N	0.0	12.4	Y	2.0
RB100 [2]	Poles Lane Pumping Station, Cawley	Rural / Other	526421	139639	NO_2	N	0.0	12.4	Y	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB101 [2]	Poles Lane Pumping Station, Cawley	Rural / Other	526421	139639	NO_2	N	0.0	12.4	Y	2.0
RB102 [2]	In Field near Bridleway, Hathersham Farm, Horley	Rural / Other	530936	144278	NO_2	N	>50.0	19.1	N	2.0
RB104	ASK, High Street, Reigate	Roadside	525204	150254	NO_2	Y (AQMA No. 9)	0.0	4.9	N	2.0
RB105	Finishing Touch, High Street, Reigate	Roadside	525203	150239	NO_2	Y (AQMA No. 9)	0.0	2.8	N	2.0
RB106	Outside Crossways, Fir Tree Road, Banstead	Roadside	523250	160056	NO_2	Y (AQMA No. 8)	5.0	2.1	N	2.0
RB107	Sussex Blinds, 29 Church Street	Roadside	525467	150292	NO_2	Y (AQMA No. 9)	0.6	2.3	N	2.0
RB109	Male Territory, 27a Bell Street, Reigate	Roadside	525387	150178	NO_2	Y (AQMA No. 9)	0.0	3.6	N	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB110	204 London Road North opposite RB20	Roadside	529016	153439	NO_2	Y (AQMA No. 10)	0.0	4.3	N	2.0
RB111	Knotts Pine, 1 West Street, Reigate	Roadside	525031	150291	NO_2	Y (AQMA No. 9)	0.0	4.3	N	2.0
RB113	Opposite Newbury Road	Roadside	524795	150404	NO_2	Y (AQMA No. 9)	0.0	2.1	N	2.0
RB114	Outside 87, West Street, Reigate	Roadside	524368	150477	NO_2	N	5.9	1.7	N	2.0
RB115	Outside 36, West Street, Reigate	Roadside	524751	150428	NO_2	Y (AQMA No. 9)	0.0	0.6	N	2.0
RB116	Outside 12, West Street, Reigate	Roadside	525022	150317	NO_2	Y (AQMA No. 9)	0.0	2.3	N	2.0
RB117	Crossway House, 8 London Road, Reigate	Roadside	525076	150327	NO_2	Y (AQMA No. 9)	0.0	2.9	N	2.0
RB118	8 Burlington Place, Reigate	Roadside	525151	150467	NO_2	Y (AQMA No. 9)	0.0	14.2	N	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB120	Outside 21 Redstone Hill, Redhill	Roadside	528196	150421	NO_2	Y (AQMA No. 12)	9.7	2.2	N	2.0
RB121	Opposite Ladbrook Grove, Redhill	Kerbside	528092	150786	NO_2	Y (AQMA No. 12)	N/A	1.5	N	2.0
RB122	Roundabout sign 5158 near carpark, Marketfield Way, Redhill	Roadside	528013	150475	NO_2	N (AQMA No. 12)	>50	2.9	N	2.0
RB123	Outside Age Concern Cromwell Road, Redhill	Kerbside	527838	150474	NO_2	N (AQMA No. 12)	0.9	0.5	N	2.0
RB124	Outside 22 High Street, Merstham	Roadside	529013	153285	NO_2	Y (AQMA No. 10)	1.3	1.8	N	2.0
RB125	Opposite Reigate Hill Close, Reigate Hill	Roadside	525589	151655	NO_2	N (AQMA No. 11)	4.7	2.7	N	2.0
RB136	Outside 45 Brighton Road, Hooley	Roadside	528810	156474	NO_2	Y (AQMA No. 13)	4.9	1.0	N	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB137	Opposite 23 Brighton Road, Hooley	Roadside	528831	156648	NO_2	Y (AQMA No. 13)	21.3 (Nearest relevant exposure is on opposite side of the road, relevant exposure is closer to the kerb than the monitoring site) (Difference between the distance of the site to the kerb and the receptor to the kerb is 0.4 m)	6.0	N	2.0
RB140	Flat 2, 45 Ladbrook Grove, Redhill	Roadside	528122	150799	NO_2	Y (AQMA No. 12)	0.2	7.2	N	2.0
RB141	Near roundabout outside 105 Station Road, Redhill	Roadside	527373	150596	NO_2	N	1.9	2.7	N	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB145	Outside Brewers, 33 Brighton Road, Redhill	Kerbside	527852	150158	NO_2	Y (AQMA No. 12)	3.3	2.2	N	2.0
RB146	Opposite ESSO Garage, Brighton Road, Hooley	Kerbside	528759	156277	NO_2	Y (AQMA No. 13)	21.0	3.2	N	2.0
RB147	Halfway down footpath by the side of 92 / 92b Brighton Road, Hooley	Background	528732	156407	NO_2	N	26.3 (Relevant exposure is closer to the kerb than the monitoring site. Relevant exposure approximately 24.8m from the kerb.)	51.0	N	2.0
RB148	17 Star Cottages, Brighton Road, Hooley	Kerbside	528855	156674	NO_2	Y (AQMA No. 13)	5.5	1.0	N	2.5
RB149	6 Brighton Road, Horley	Roadside	527737	142710	NO_2	Y (AQMA No. 3)	4.0	2.8	N	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB150	8 Elvington Lodge, Reigate Hill	Roadside	525397	150867	NO_2	Y (AQMA No. 11)	13.3	3.4	N	2.0
RB151	Between 83 and 85 Victoria Road, Horley	Roadside	528502	142952	NO_2	Y (AQMA No. 3)	0.0	1.8	N	2.5
RB152	A23 south of New Battlebridge Lane	Roadside	528599	152439	NO_2	N	27.6 (Nearest relevant exposure is on opposite side of the road) (Difference between the distance of the site to the kerb and the receptor to the kerb is 7.8 m)	1.6	N	2.5
RB153	1 Horley Road junction with Three Arch Road	Roadside	527837	148046	NO_2	N	6.7	2.9	N	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB167	Queensway, Redhill	Roadside	527830	150643	NO_2	Y (AQMA No. 12)	0.0	3.1	N	3.0
RB174	Opposite 37 Brighton Road, Horley	Roadside	527852	142841	NO_2	Y (AQMA No. 3)	2.3	3.0	N	2.0
RB175	23 Brighton Road, Horley	Roadside	527955	142999	NO_2	N	12.1	2.8	N	2.5
RB176	15 Brighton Road, Horley	Roadside	527765	142777	NO_2	Y (AQMA No. 3)	0.0	10.2	N	2.0
RB177	11 Brighton Road, Horley	Roadside	527754	142762	NO_2	Y (AQMA No. 3)	0.0	8.6	N	2.0
RB178	RG6 co-location, 110 The Crescent, Horley	Suburban	528592	141831	NO_2	Y (AQMA No. 3)	0.0	0.5 (from very quiet road, measuring emissions from Gatwick Airport)	Y	1.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB179	RG6 co-location, 110 The Crescent, Horley	Suburban	528592	141831	NO_2	Y (AQMA No. 3)	0.0	0.5 (from very quiet road, measuring emissions from Gatwick Airport)	Y	1.5
RB180	RG6 co-location, 110 The Crescent, Horley	Suburban	528592	141831	NO_2	Y (AQMA No. 3)	0.0	0.5 (from very quiet road, measuring emissions from Gatwick Airport)	Y	1.5
RB181	Outside 10D Brighton Road Hooley	Roadside	528852	156724	NO_2	Y (AQMA No. 13)	15	2.3	N	2.3
RB182	10D Brighton Road Hooley	Roadside	528835	156728	NO_2	Y (AQMA No. 13)	0	18.7	N	2

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB183	58B Brighton Road Hooley	Roadside	528813	156580	NO_2	Y (AQMA No. 13)	0	7.8	N	2.4
RB184	Lattice Wood Hooley News 66 Brighton Road Hooley	Roadside	528807	156555	NO_2	Y (AQMA No. 13)	0	7.2	N	2.4
RB186	Adjacent to 72 Brighton Road	Roadside	528790	156500	NO_2	Y (AQMA No. 13)	In line with building facade to A23 i.e. 10.3 m from edge of A23. 1.5 m from kerb of Star Lane., Tube to house 3.4 m (house 4.9 m from kerb)	10.3	N	2.3
RB187	74 Brighton Road Hooley	Roadside	528789	156488	NO_2	Y (AQMA No. 13)	0	10.2	N	1.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB188	76 Brighton Road Hooley	Roadside	528792	156478	NO_2	Y (AQMA No. 13)	0	5.1	N	1.6
RB189	78 Brighton Road Hooley	Roadside	528789	156465	NO_2	Y (AQMA No. 13)	0	5.6	N	1.8
RB190	80B Brighton Road Hooley	Roadside	528788	156460	NO_2	Y (AQMA No. 13)	0	5.7	N	1.9
RB191	82 Brighton Road Hooley	Roadside	528785	156448	NO_2	Y (AQMA No. 13)	0	6.2	N	2
RB192	84 Brighton Road Hooley	Roadside	528784	156442	NO_2	Y (AQMA No. 13)	0	6.2	N	1.9

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB193	86 Brighton Road Hooley	Roadside	528782	156430	NO_2	Y (AQMA No. 13)	0	6.1	N	2
RB194	Outside 96 Brighton Road	Kerbside	528779	156381	NO_2	Y (AQMA No. 13)	25	1	N	2.5
RB195	Outside flats 102 Brighton Road	Kerbside	528772	156349	NO_2	Y (AQMA No. 13)	17	Note 0.6 m to kerb but once layby included (2.8m) total 3.4m to road edge	N	2.3
RB196	TopMarks Tyres 75 Brighton Road Hooley	Roadside	528797	156331	NO_2	Y (AQMA No. 13)	0	16.8	N	2
RB197	Drainpipe 67 Brighton Road Hooley	Roadside	528795	156373	NO_2	Y (AQMA No. 13)	0	6.5	N	1.9

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB198	65 Brighton Road Hooley	Roadside	528796	156379	NO_2	Y (AQMA No. 13)	0	6.3	N	2
RB199	63A Brighton Road Hooley	Roadside	528800	156390	NO_2	Y (AQMA No. 13)	0	8.1	N	2
RB200	Outside 59 Brighton Road	Roadside	528799	156409	NO_2	Y (AQMA No. 13)	4.4	3.6	N	2.6
RB201	Flat 1, 55 Brighton Road Hooley	Roadside	528804	156414	NO_2	Y (AQMA No. 13)	0	7.1	N	1.9
RB202	53 Brighton Road Hooley	Roadside	528808	156444	NO_2	Y (AQMA No. 13)	0	4.9	N	1.9

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB203	51 Brighton Road Hooley	Roadside	528809	156454	NO_2	Y (AQMA No. 13)	0	4.4	N	2.1
RB204	49 Brighton Road Hooley	Roadside	528810	156457	NO_2	Y (AQMA No. 13)	0	4.5	N	1.8
RB205	47 Brighton Road Hooley	Roadside	528812	156466	NO_2	Y (AQMA No. 13)	0	4	N	1.9
RB206	45 Brighton Road Hooley	Roadside	528816	156477	NO_2	Y (AQMA No. 13)	0	5.9	N	1.9
RB207	43 Brighton Road Hooley	Roadside	528818	156486	NO_2	Y (AQMA No. 13)	0	6.1	N	1.9

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB208	Outside 41 Brighton Road	Roadside	528825	156526	NO_2	Y (AQMA No. 13)	2.9	1.1	N	2.7
RB209	39 Brighton Road Hooley	Roadside	528833	156547	NO_2	Y (AQMA No. 13)	0	7.7	N	1.9
RB210	37 Brighton Road Hooley	Roadside	528833	156555	NO_2	Y (AQMA No. 13)	0	6.7	N	1.8
RB211	33 Brighton Road Hooley	Roadside	528839	156577	NO_2	Y (AQMA No. 13)	0	7.3	N	1.7
RB212	29 Brighton Road Hooley	Roadside	528840	156582	NO_2	Y (AQMA No. 13)	0	7.5	N	1.9

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB213	27 Brighton Road Hooley	Roadside	528845	156604	NO_2	Y (AQMA No. 13)	0	7.5	N	1.9
RB214	25 Brighton Road Hooley	Roadside	528848	156617	NO_2	Y (AQMA No. 13)	0	7.3	N	2
RB215	21 Brighton Road Hooley	Roadside	528853	156646	NO_2	Y (AQMA No. 13)	0	6.5	N	2
RB216	15 Brighton Road Hooley	Roadside	528862	156690	NO_2	Y (AQMA No. 13)	0	5.1	N	1.9
RB217	Flat 2, 9-11 Brighton Road Hooley	Roadside	528866	156712	NO_2	Y (AQMA No. 13)	0	3.4	N	1.9

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB218	7 Brighton Road Hooley	Kerbside	528869	156737	NO_2	Y (AQMA No. 13)	4	0.5	N	2
RB219	5 Brighton Road Hooley	Roadside	528877	156744	NO_2	Y (AQMA No. 13)	0	7.2	N	1.8
RB223	RG7 Hooley Real time Site Garages 55-57 Brighton Road Hooley	Roadside	528804	156435	NO_2	Y (AQMA No. 13)	1.7	2	Y	1.5
RB224	RG7 Hooley Real time Site Garages 55-57 Brighton Road Hooley	Roadside	528804	156435	NO_2	Y (AQMA No. 13)	1.7	2	Y	1.5
RB225	RG7 Hooley Real time Site Garages 55-57 Brighton Road Hooley	Roadside	528804	156435	NO_2	Y (AQMA No. 13)	1.7	2	Y	1.5
Benzene										

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [(2)]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RB1	Boots, 34 – 36 High Street, Reigate, RH2 9AT	Roadside	525246	150252	Benzene	Y (AQMA No. 9)	0.0	5.1	N	3.1
RB11	Outside 38, Riverside, Horley	Suburban	528104	142226	Benzene	Y (AQMA No. 3)	0.0	1.4	N	3.0
RB20	Corner of London Road, Merstham	Roadside	529026	153420	Benzene	Y (AQMA No. 10)	20.2 (Nearest relevant exposure is on opposite side of the road) (Difference between the distance of the site to the kerb and the receptor to the kerb is 2.9 m)	2.6	N	2.9

Notes:

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

(2) N/A if not applicable.

Trends in Traffic and Annual Mean NO_2 Concentrations in AQMAs

AQMA No. 1: M25

The M25 AQMA consists of the length of the M25 to a distance of 30 m either side of the carriageway between Junction 7 and the point of the west of Junction 8 where the motorway meets with the borough boundary.

There are two nitrogen dioxide diffusion tube monitoring sites located within the M25 AQMA, and seven nitrogen dioxide diffusion tube monitoring sites located in close proximity (i.e. within 50 m) to the M25 AQMA. Measured pollutant concentrations at all monitoring sites both within and up to 50 m distance from the AQMA have generally been decreasing since 2004 and were below the relevant air quality objectives in this reporting period (see Figure A.1).

Figure A.2 below shows traffic flows between Junction 7 and Junction 8, and between Junction 8 and Junction 9 of the M25 motorway within the M25 AQMA, from 2002 to 2023. The traffic volumes were relatively stable between 2002 and 2010 on both sections of the M25. On the Junction 7 – Junction 8 section, traffic volumes decreased between 2011 and 2014, then kept increasing sharply until 2017 and has been slowly decreasing since. The Junction 8 – Junction 9 section has followed a similar trend albeit a year later than the neighbouring M25 section. Overall, traffic volumes between Junction 7 and Junction 8 have decreased since the early 2000s and increased between Junction 8 and Junction 9.

There was a sharp decrease in traffic volumes on the M25 in 2020 as a result of changing travel patterns due to the COVID-19 pandemic. Traffic flows subsequently increased in 2021, 2022 and 2023, but have remained below those in recent years before the pandemic.

In view of the air quality objectives being met, the relatively low concentrations measured at relevant receptors for a number of years, and the long-term downward trend, the Council is currently planning to revoke the M25 AQMA before the next ASR.

Figure A.1: Three Year Rolling Mean Nitrogen Dioxide Concentrations - M25 AQMA

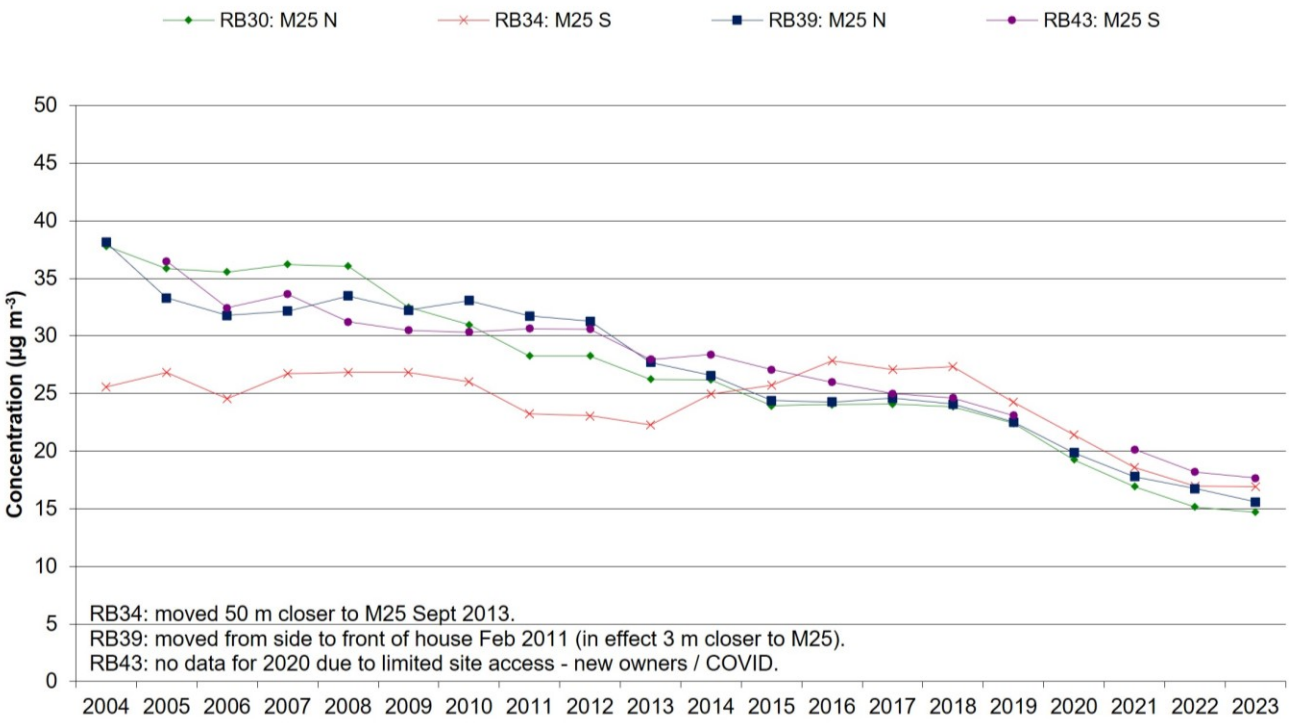
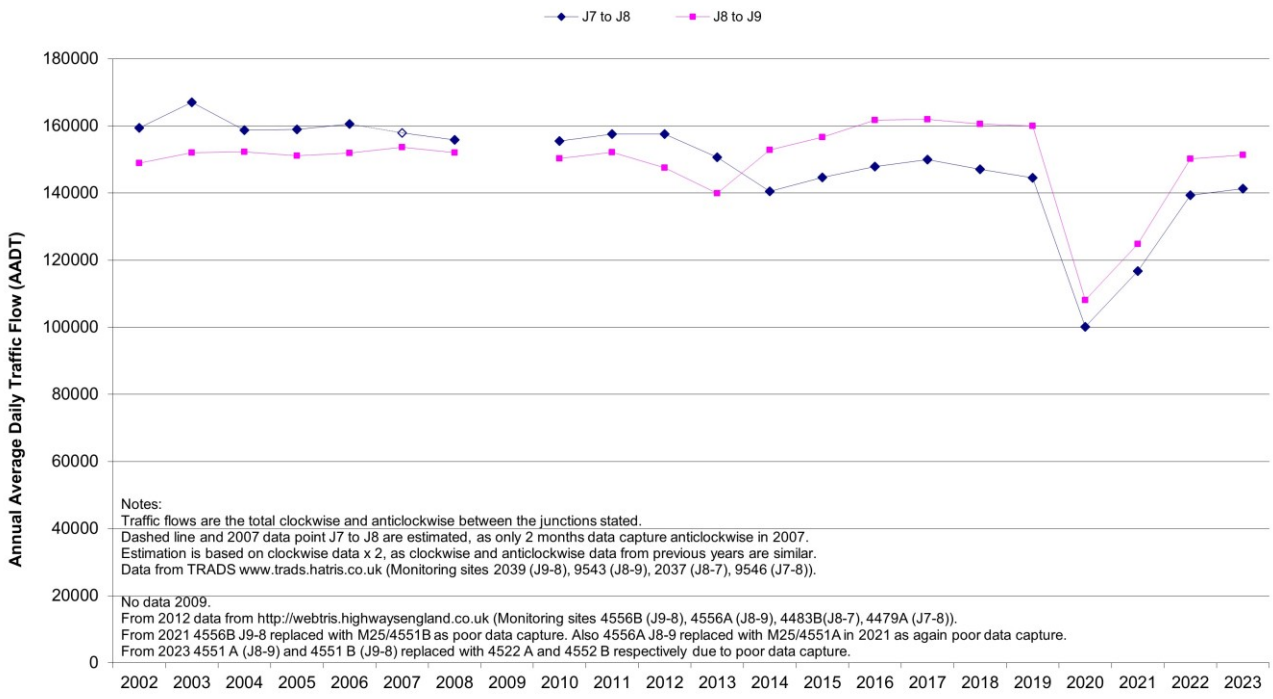


Figure A.2: Annual Mean Daily Traffic Flow within the M25 AQMA



AQMA No. 3: Horley

The Horley AQMA covers an area of the southwest quadrant of Horley near to Gatwick Airport. The following monitoring sites are located within the AQMA:

- 38 diffusion tubes which monitor nitrogen dioxide concentrations;
- One diffusion tube which monitors benzene concentrations;
- One automatic monitoring site (RG1) which monitors nitrogen dioxide, PM_{10} and $PM_{2.5}$ (from September 2022) concentrations; and
- One automatic monitoring site (RG6) which monitors nitrogen dioxide concentrations.

Monitoring of nitrogen dioxide is also undertaken by the council at a further site (RG3), which is located to the southwest of Gatwick Airport in Crawley. One diffusion tube (RB149) located along Brighton Road, near to the boundary, but within the AQMA, measured exceedances of the nitrogen dioxide annual mean objective between 2017 and 2019, but when distance corrected fell below the objective in 2018. Site RB149 also measured exceedances from 2014 to 2015 (not distance corrected). There does, however appear to be a long-term downward trend at this location and data for the most recent years of 2022 and 2023 has been more than 10% below the objective. Measured pollutant concentrations at all of the other monitoring sites were below the relevant air

quality objectives in the reporting period (Figure A.3). There were no measured exceedances in 2023.

While the overall trend in nitrogen dioxide concentrations is downwards in the vicinity of Gatwick Airport, it is also possible to examine the trend in ‘airport concentrations’ using data selected based on wind direction. These ‘airport concentrations’ (Figure A.4), which also include a road traffic component from the A23 Airport Way, have been calculated by subtracting pollutant concentrations measured upwind of the airport, from those on the other side when the winds are from the South West (i.e. RG6 (previously RG2) minus RG3). As can be seen from Figure A.4, while the underlying trend in concentrations in Horley is downwards (Figure A.3), there is a different pattern in these airport sources. While there has been a reduction in these airport sources since 2016, it is worth noting that this airport component is unchanged on 10 years ago. A sharp decrease was seen in 2020 and continued in 2021, as a result of changing travel behaviour (including a significant decrease in number of flights), as a result of the COVID-19 pandemic, returning to higher concentrations in 2022 and 2023 (but still below pre-pandemic values).

Figure A.5 shows annual mean traffic flows along the M23 Gatwick Spur. Over the last 20 years, seven years had no available traffic data and no strong trends have been observed. However, traffic numbers did drop dramatically as a result of COVID-19 and did not return to pre-pandemic levels by 2022. There was no available data for the year 2023. Figure A.6 shows traffic flows along the A23 in Horley. These data show the annual mean daily traffic flows between 2016 and 2023 have remained relatively static excluding the sharp decrease as a result of the COVID-19 pandemic changing travel behaviour, resulting in lower flows in 2020 and 2021. Flows post-pandemic have increased again with values recorded in 2023 reaching levels similar to 2019. Despite the relatively stable traffic flows on A23, the annual mean nitrogen dioxide concentrations have generally been decreasing, as discussed above and seen in Figure A.3.

Figure A.3: Three Year Rolling Mean Nitrogen Dioxide Concentrations- Horley AQMA.

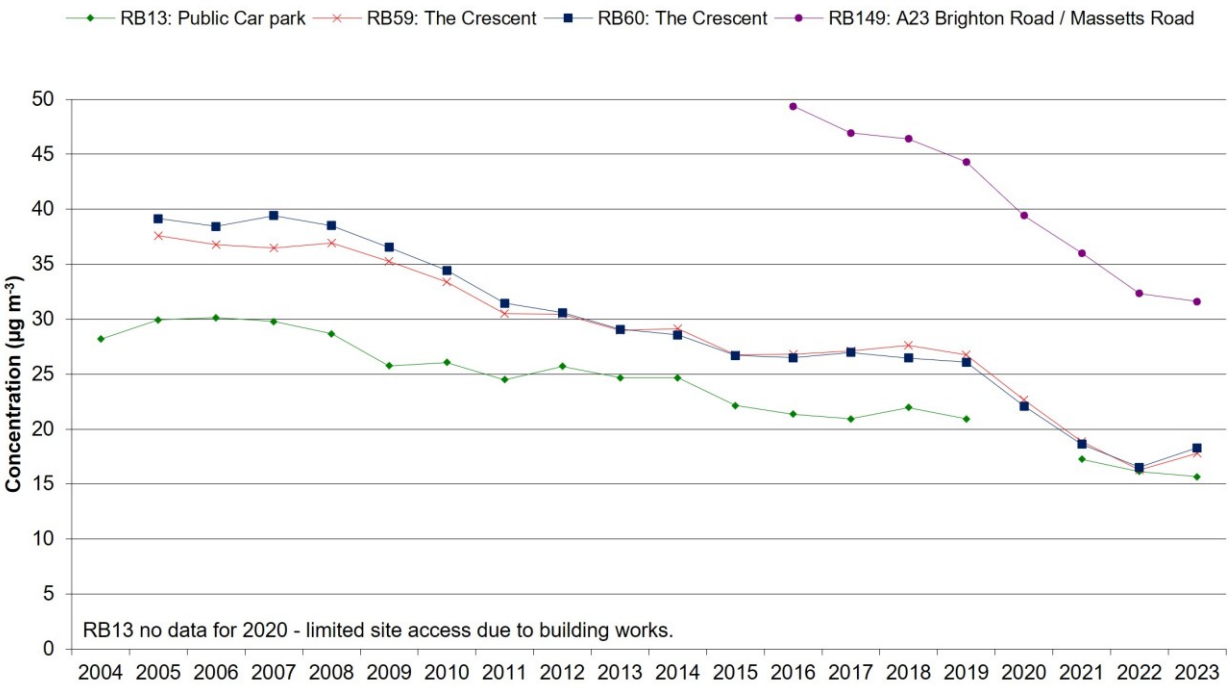


Figure A.4: Trends in Airport Related Nitrogen Dioxide - RG6 (previously RG2) minus RG3 when wind on 202 to 248 degrees - Mean of hourly values.

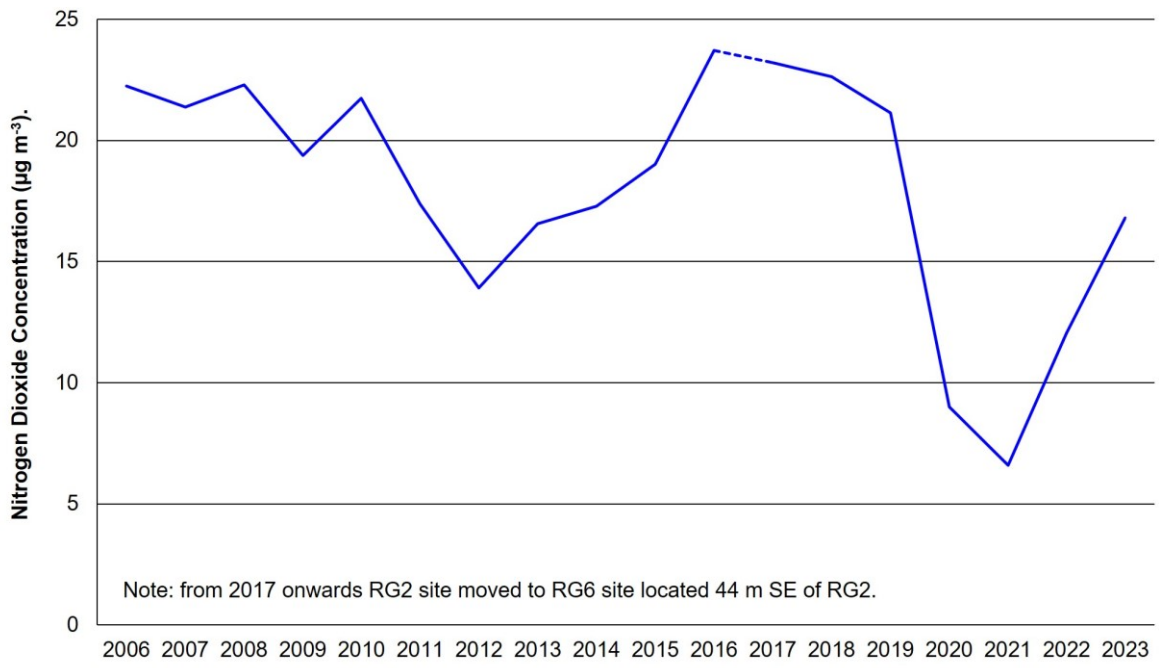


Figure A.5: Annual Mean Daily Traffic Flows - M23 Gatwick Spur.

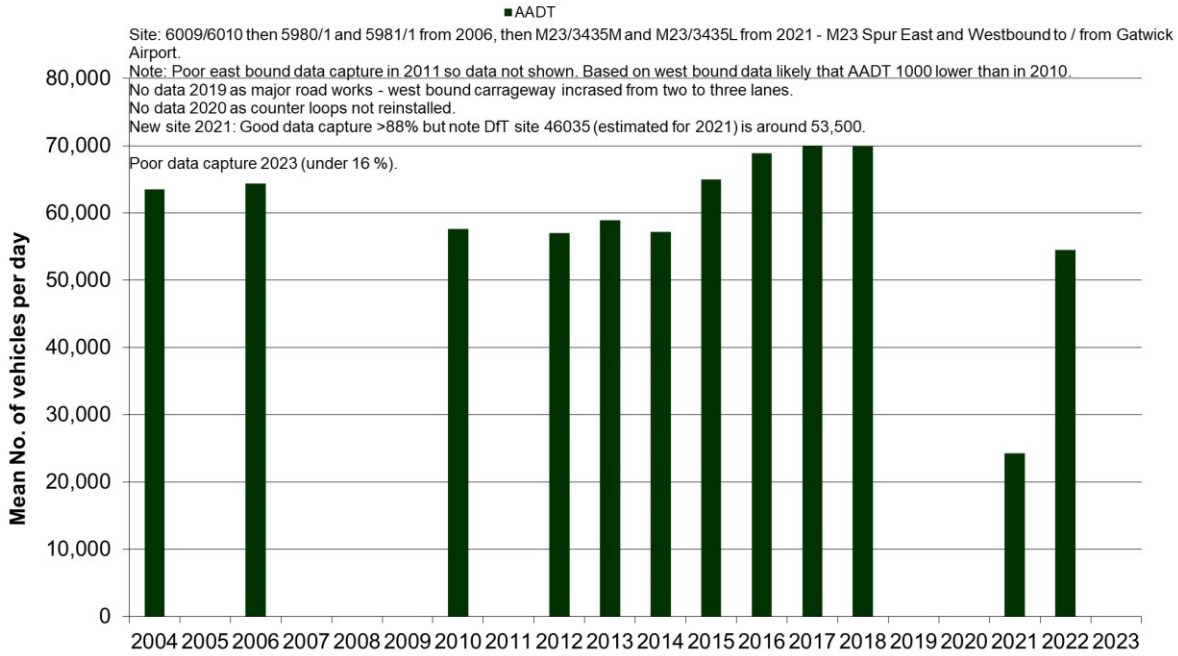
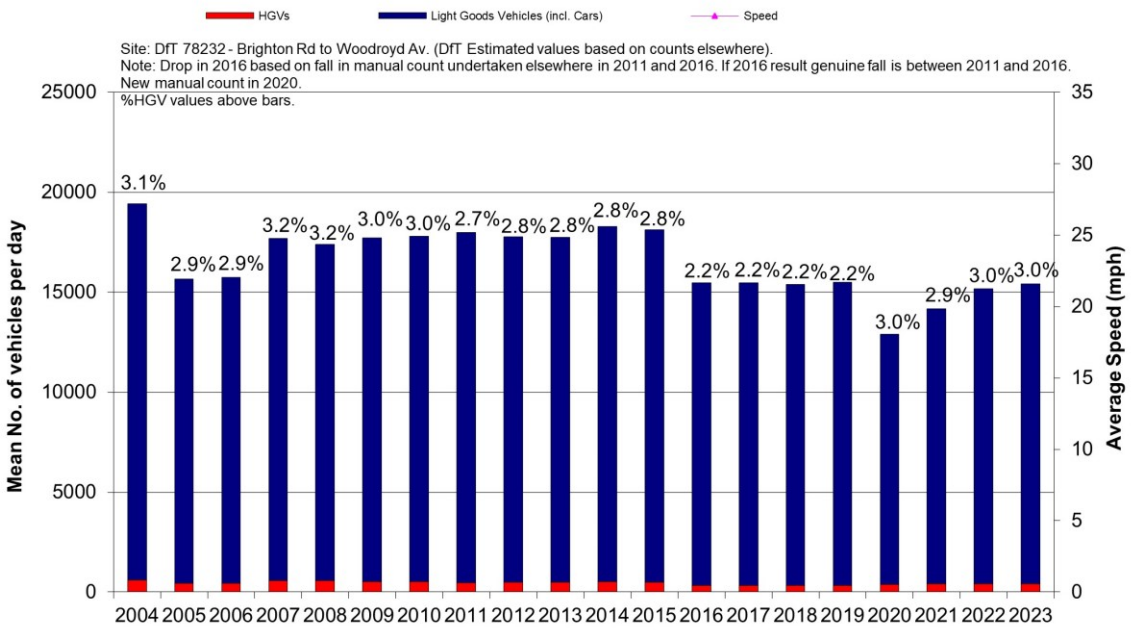


Figure A.6: Annual Mean Daily Traffic Flows - A23 Horley.



AQMA No. 6: A217/Blackhorse Lane

The A217 / Blackhorse Lane AQMA covers an area encompassing one property near the junction of the A217 Brighton Road with Margery Lane and Blackhorse Lane.

Nitrogen dioxide monitoring takes place at one diffusion tube monitoring site, located within the AQMA (RB49) and one site located aproximately 15 m to the north of the AQMA (RB50). Measured concentrations at one of the monitoring sites (RB49) exceeded the annual mean nitrogen dioxide objective from 2004 – 2017, before falling below the objective during 2018 and 2019; monitoring site RB50 did not breach the objective in any of the years presented. Both monitoring sites show an overall decreasing trend in concentrations (Figure A.7). There were no measured exceedances in 2023. No data was collected from RB50 in 2021 due to the nearby refurbishment of a house. The tube has been back in position from 2022 to 2023.

Figure A.8 shows traffic flows along the A217, near to Blackhorse Lane, in close proximity to Blackhorse Lane AQMA. The data suggest a gradual overall decrease in annual mean daily traffic flows over the period monitored. As expected, there was a increase in traffic in 2021, due to removal of restrictions put in place during the COVID-19 pandemic and a greater increase has been seen in 2023 bringing traffic levels back up to a similar level as was seen in 2015 to 2016.

Figure A.7: Three Year Rolling Mean Nitrogen Dioxide Concentrations - Blackhorse Lane AQMA.

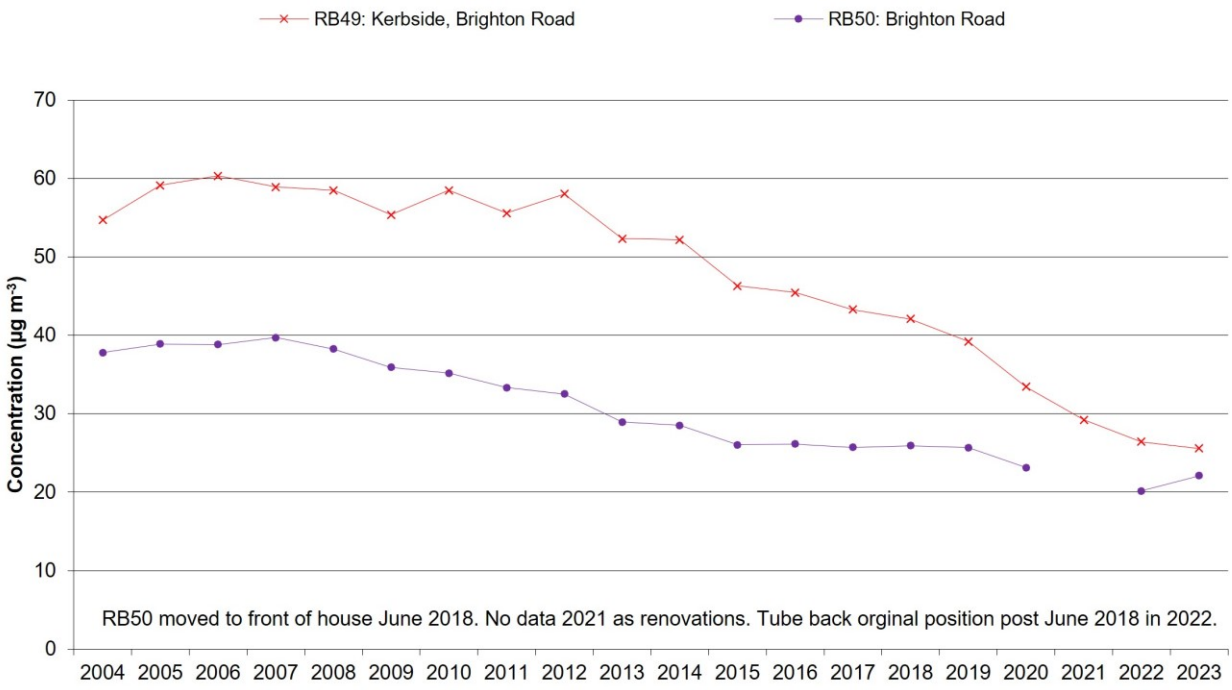
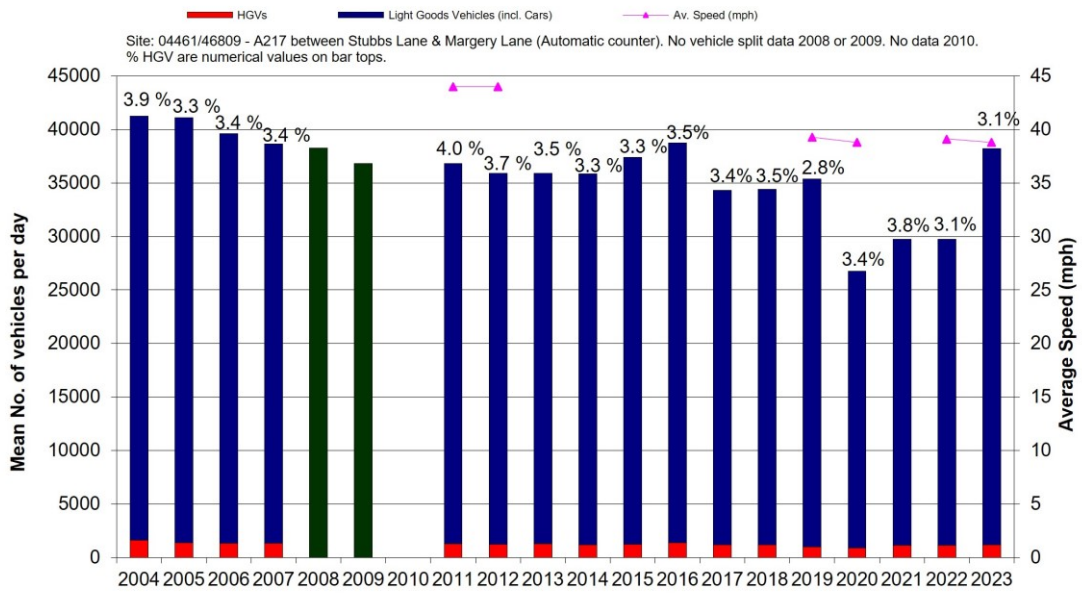


Figure A.8: Annual Mean Daily Traffic Flows - A217 Blackhorse Lane.



AQMA No. 8: Drift Bridge

The Drift Bridge AQMA covers an area encompassing two residential properties immediately to the north of the junction of the A240 (Reigate Road) and A2022 (Fir Tree Road).

Nitrogen dioxide diffusion tube monitoring takes place at one diffusion tube adjacent to the southeast corner of the AQMA. There are further two diffusion tubes monitoring sites within 50 m of the AQMA and another one approximately 400 m to the east of the AQMA. Nitrogen dioxide concentrations at all of these monitoring sites have overall been decreasing during the monitoring period presented and have been below the air quality objectives since 2015 (Figure A.9).

Figure A.10 below shows traffic flows at three sites near to Drift Bridge AQMA. Two (Sites A and B) are located along the A240 and one (Site C) is located along the A2022. Data from all three sites suggest an overall decrease in traffic flows over the past 20 years, despite some fluctuations.

Figure A.9: Three Year Rolling Mean Nitrogen Dioxide Concentrations - Banstead Background Site and in the vicinity of the Drift Bridge AQMA.

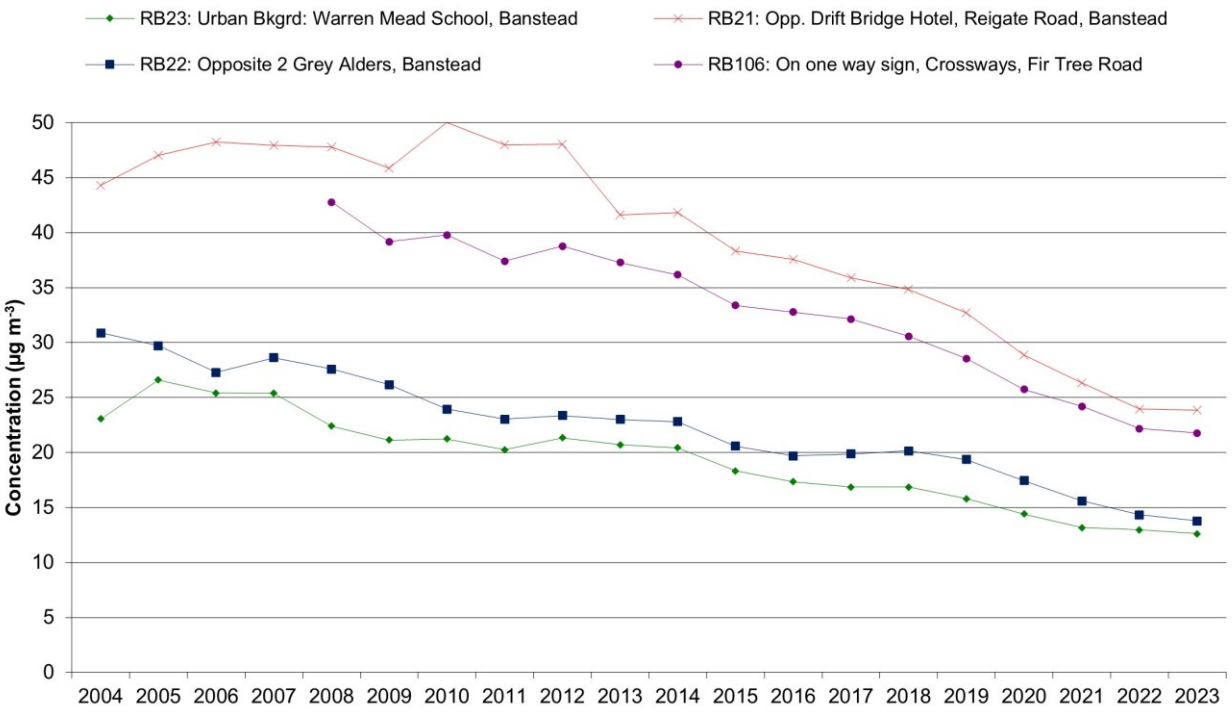
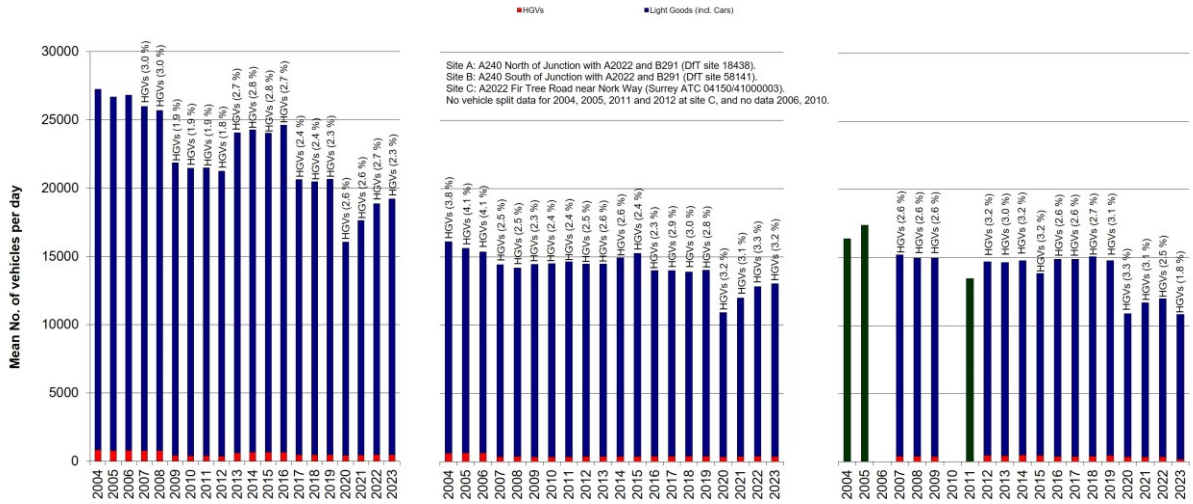


Figure A.10: Annual Mean Daily Traffic Flows - Drift Bridge, Banstead.



AQMA No. 9: Reigate High Street/ West Street/ Bell Street

The Reigate High Street / West Street / Bell Street AQMA covers an area encompassing Reigate High Street, the section of Church Street between the High Street and Bancroft Road, properties with a frontage to Bell Street (between the High Street and the southern end of Bancroft Road) and land and properties within 15 m of either side of West Street (between High Street and Evesham Road) and along London Road (between West Street and Castlefield Road).

Nitrogen dioxide monitoring is undertaken at 15 diffusion tube monitoring sites within the AQMA. Measured concentrations of nitrogen dioxide at all monitoring sites have been steadily decreasing from their peak in 2008 and were below the relevant air quality objectives from 2019 to 2023 (Figure A.11).

Figure A.12 below shows traffic flows along Reigate High Street. Monitor 1 suggests a weak trend of reducing annual mean daily traffic flows from 2004 to 2013, and a weak trend of increasing annual mean daily traffic flows from 2013 to 2016. From 2016 traffic flows decreased again to around 2012-2013 levels. Monitor 2 suggests a weak trend of reducing annual mean daily traffic flows from 2004 to 2010 and subsequent increasing between 2010 and 2012. Between 2012 and 2018 the traffic flows changed only marginally year on year, however in 2019 the observed traffic flows were the highest since the monitoring begun. A sharp decrease is seen at both monitors in 2020, followed by an increase in 2021 and 2022 when traffic data were approaching 2019 levels. This increase has since levelled off in 2023.

Figure A.11: Three Year Rolling Mean Nitrogen Dioxide Concentrations - Reigate High Street and West Street AQMA.

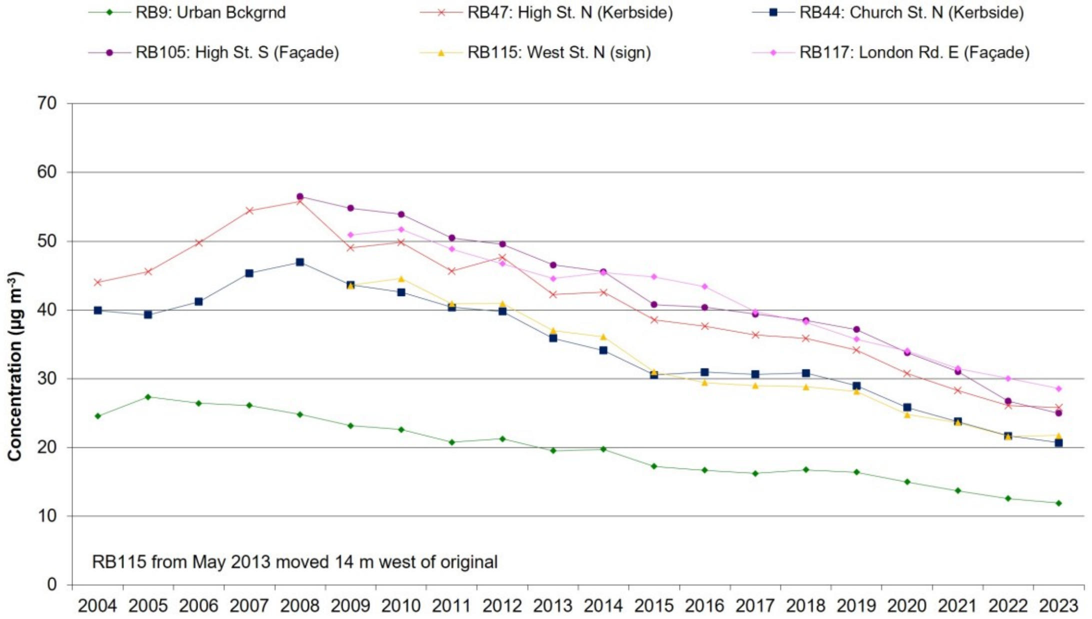
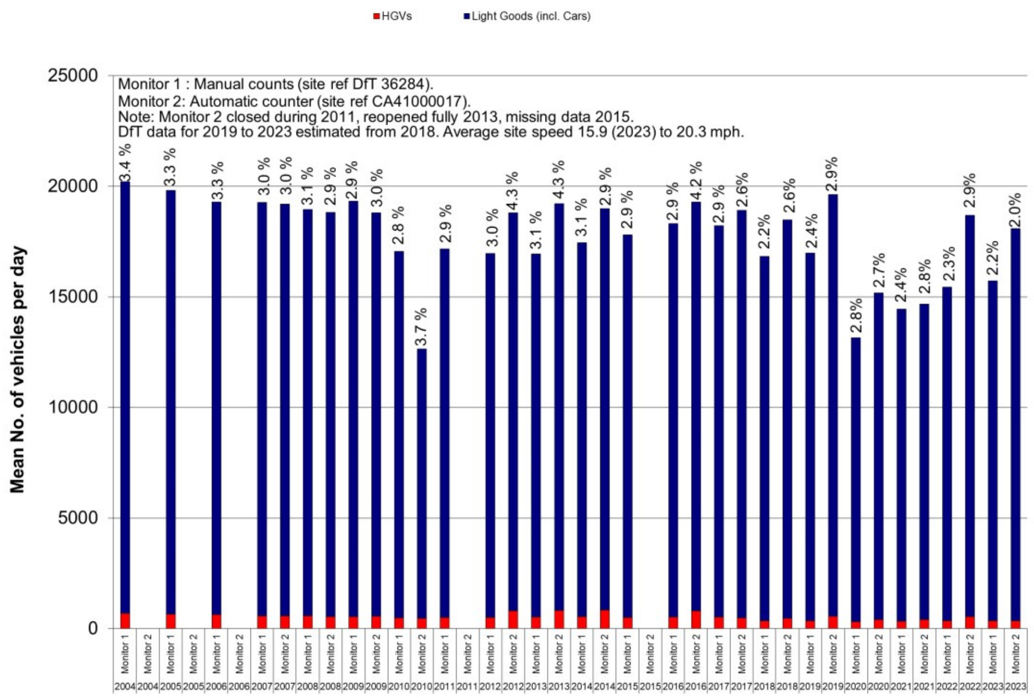


Figure A.12: Annual Mean Daily Traffic Flows on Reigate High Street.



AQMA No. 10: Merstham

The Merstham AQMA covers an area encompassing all properties facing on to part of the A23 in Merstham. The AQMA runs from London Road South (south of the junction with School Hill) and extends north along Merstham High Street and then just to the north of the junction with Station Road North.

Nitrogen dioxide monitoring takes place at three diffusion tube sites located within the Merstham AQMA (RB20, 110 and 124), and at one further site just outside the AQMA (RB19). Benzene monitoring takes place at one diffusion tube site located within the AQMA (note: the AQMA was declared for exceedances of the annual mean nitrogen dioxide objective). Measured concentrations of all pollutants at all locations have been below the relevant air quality objectives since 2016 (Figure A.13). There has been an overall decrease in the measured annual mean nitrogen dioxide concentrations at these locations during the monitoring period presented. In addition, the measured Benzene concentration at RB20 was well below the objective in 2023.

Figure A.14 presents traffic flows along the A23 as it passes through Merstham. The traffic flow was largely stable between 2005 and 2016 before a substantial drop in 2017. By 2019 the traffic flows increased to the previous levels, however, there is a weak decreasing trend in average traffic speed in recent years. A sharp decrease is seen in 2020 as a result of changing travel behaviour as a result of the COVID-19 pandemic, which is reflected in a decrease in concentrations in this year.

Traffic has rebounded in 2021, 2022 and 2023 compared to 2020 (although levels have decreased slightly from 2021 to 2023), with no associated increase in nitrogen dioxide concentrations.

Figure A.13: Three Year Rolling Mean Nitrogen Dioxide Concentrations - Merstham AQMA.

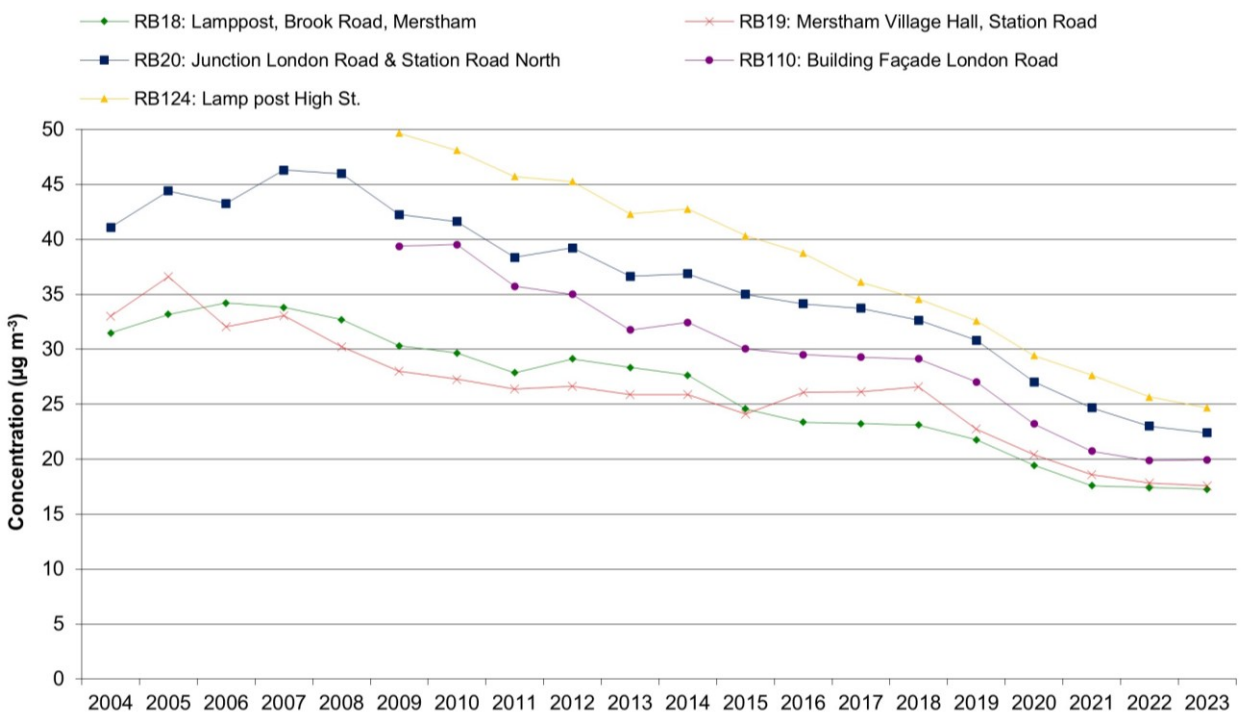
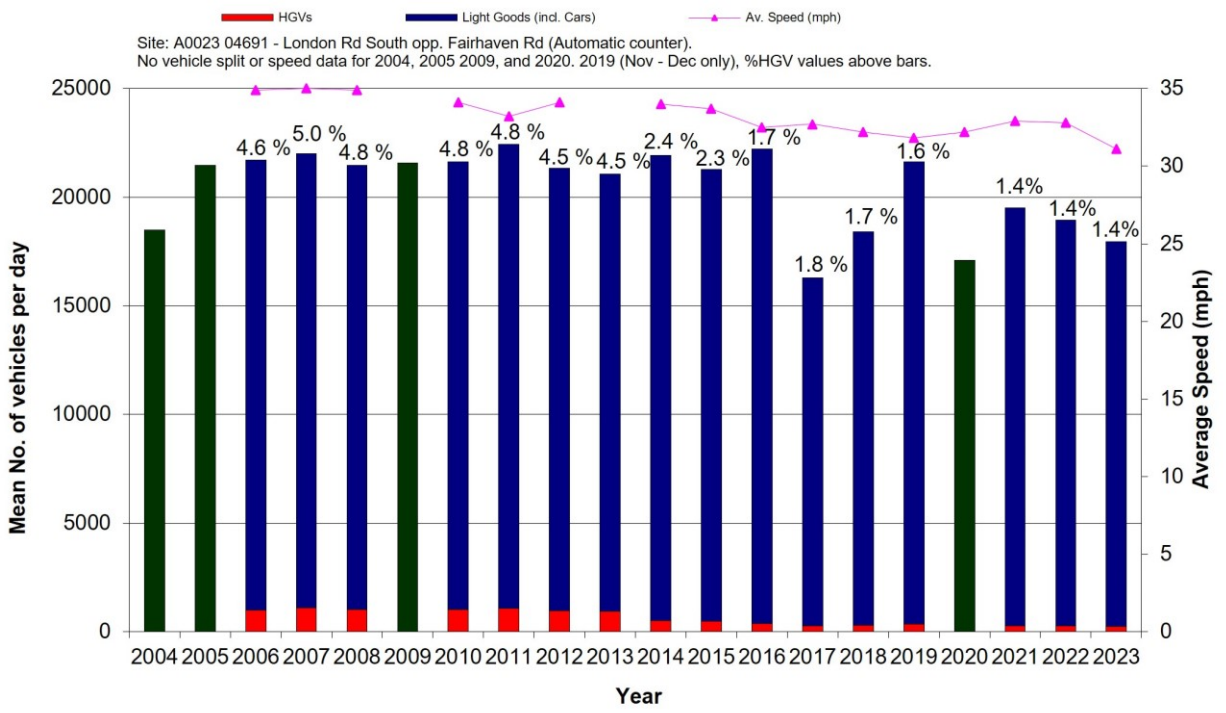


Figure A.14: Annual Mean Daily Traffic Flows - A23 Merstham.



AQMA No. 11: Reigate Hill

The Reigate Hill AQMA includes properties with the area of Reigate Hill between the level crossing Reigate Town and J8 of the M25.

Nitrogen dioxide diffusion tube monitoring takes place at two locations within the AQMA. Concentrations at both of these monitoring sites were below the relevant air quality objectives throughout the 2017-2023 period (Figure A.15).

Figure A.16 shows the traffic flows along the A217 south of Raglan Road. The observed traffic flows in 2019 are the highest recorded to date, however due to large gaps in the data it is not possible to infer any trends in the recent years. A sharp decrease is seen in 2020 as a result of changing travel behaviour as a result of the COVID-19 pandemic, which is reflected in a decrease in concentrations in this year. Traffic data for 2021, 2022 and 2023 show increasing traffic in comparison with 2020, but not back to 2019 levels.

Figure A.15: Three Year Rolling Mean Nitrogen Dioxide Concentrations - Reigate Hill AQMA.

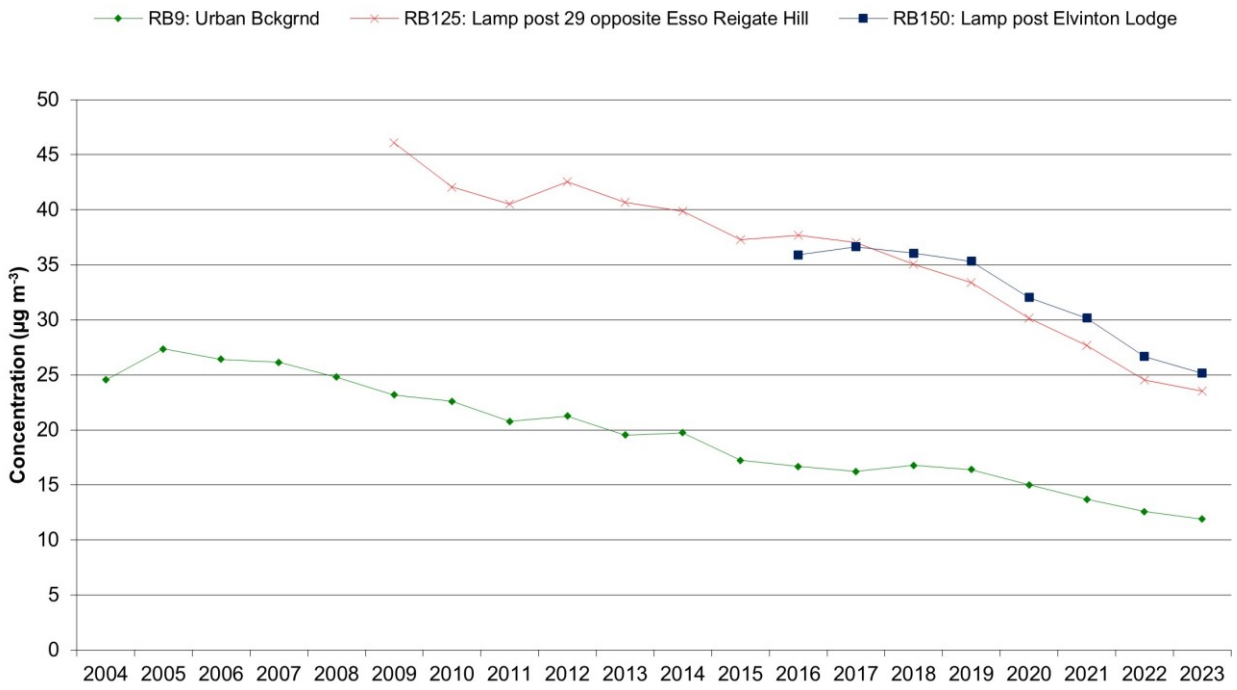
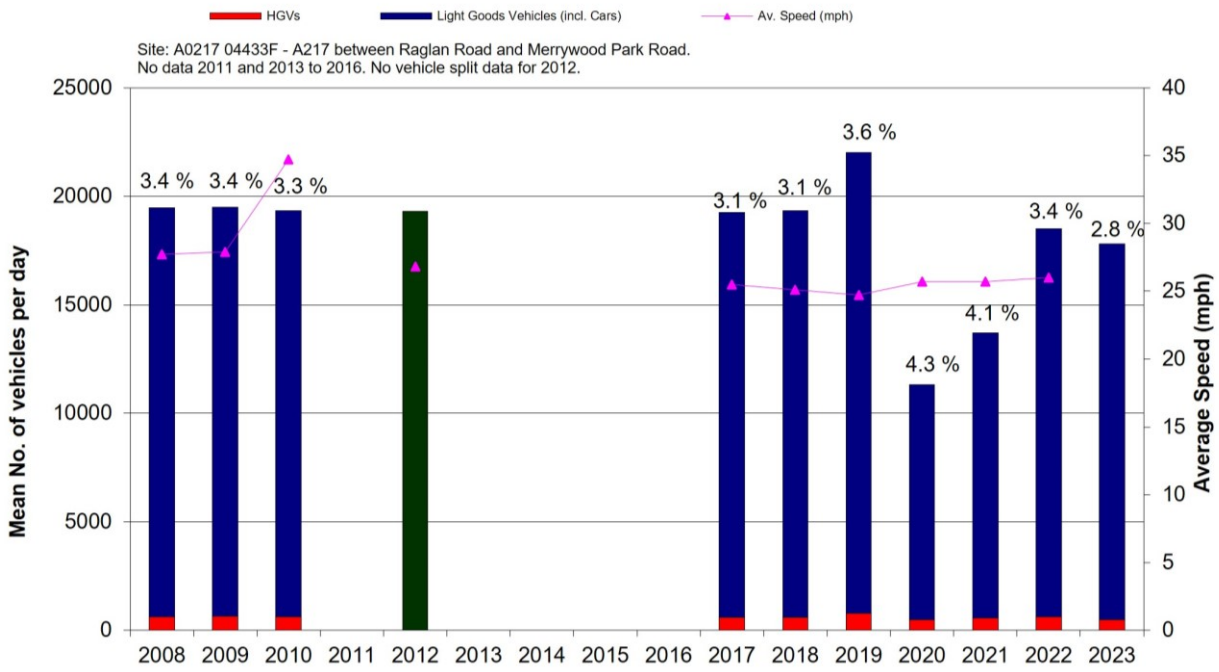


Figure A.16: Annual Mean Daily Traffic Flows - A217 Reigate Hill - South of Raglan Road



AQMA No. 12: Redhill

The Redhill AQMA covers properties within the Redhill area covering either partially or entirely Cromwell Road, Queensway, the A25 Redstone Hill between the junction with the A23 and the junction with Hillfield Road, the A23 between the junction of Hooley Lane and Mill St, and the A23 junction with Gloucester Road.

Nitrogen dioxide diffusion tube monitoring takes place at five sites located within the Redhill AQMA. Measured concentrations at each of these monitoring sites, where there is relevant exposure, was below the relevant air quality objective in the 2016-2023 period (see Figure A.17).

Figure A.18 shows traffic flows along the A23, south of Redhill. Data for 2018-2020 at this site are unavailable. Data from the previous years suggest that both traffic flows and average speeds remained relatively stable between 2006 and 2017, and data from the years 2021-2023 suggest that traffic flows have declined since 2017.

Figure A.17: Three Year Rolling Mean Nitrogen Dioxide Concentrations - Redhill AQMA.

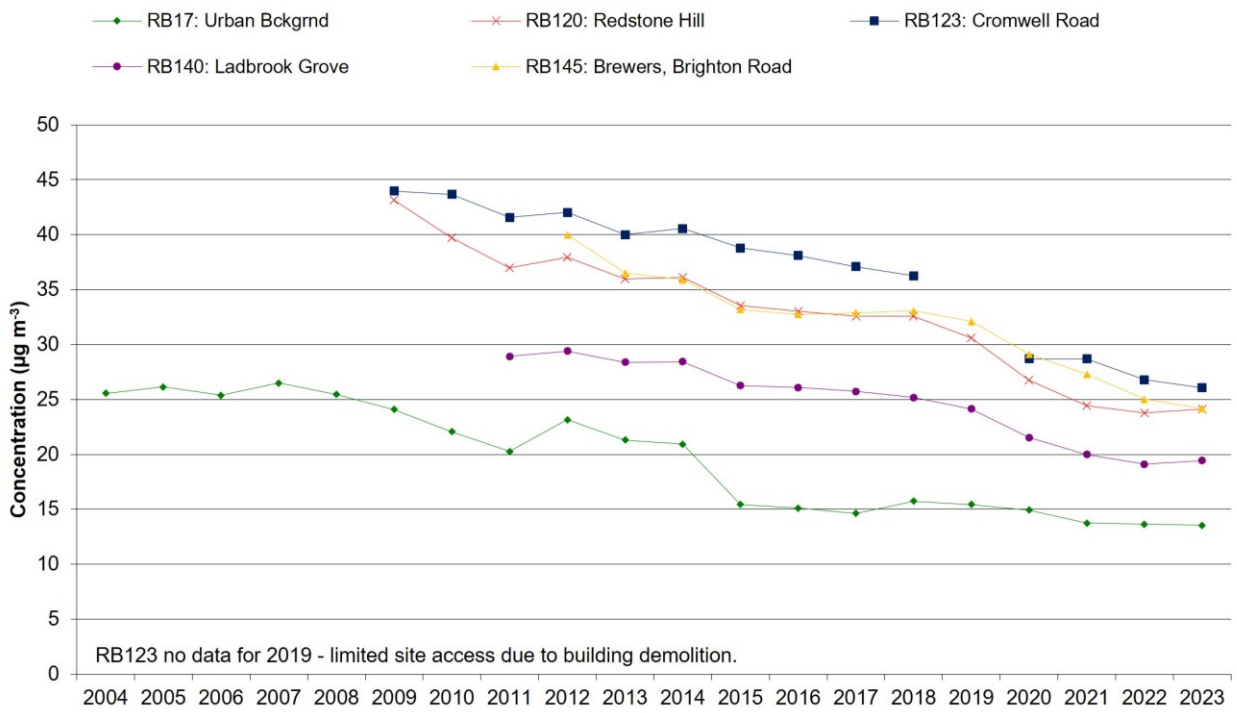
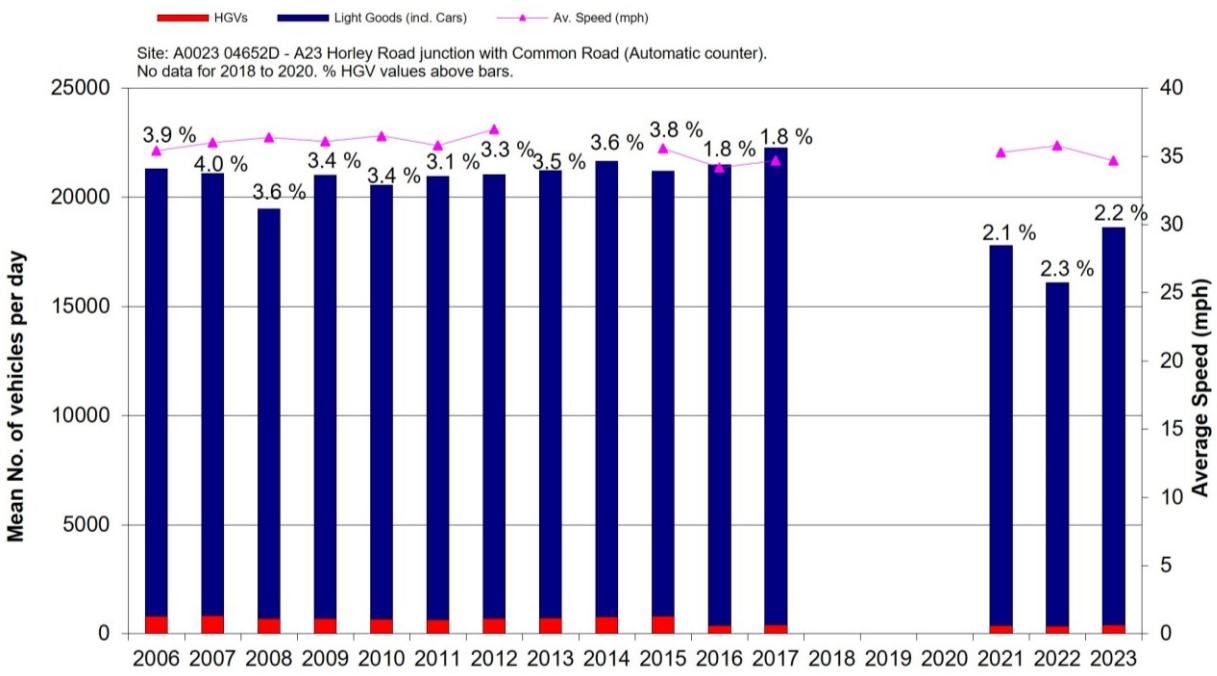


Figure A.18: Annual Mean Daily Traffic Flows - A23 South of Redhill.



AQMA No. 13: Hooley

The Hooley AQMA covers properties within the Hooley area covering either partially or entirely properties along the A23 Brighton Road, Star Lane, Forge Bridge Lane and Church Lane.

Nitrogen dioxide monitoring sites within the Hooley AQMA increased in 2018 with the addition of an extra 42 diffusion tubes and by an additional automatic monitoring site (RG7). The purpose of the additional monitoring is to provide a detailed data set for model validation and in response to the concerns of local residents regarding National Highways' plans for road expansion in the area. Measured concentrations at a number of the diffusion tube sites within the Hooley AQMA exceeded the annual mean nitrogen dioxide objective in the majority of years reported. In 2019, numbers of tubes exceeding had reduced, but still included RB148, 181, 205, 208, 212, 217, 218 and 219. Of these, RB148, 181 and 208 and 218 were distance corrected. All of the sites which were distance corrected fell below the objective at sites of relevant exposure. There are, however, also sites at relevant locations (RB181, 205, 212, 217, 219) which were also exceeding the annual mean objective in 2019. Exceedances of the annual mean objective were also noted at RG7 up to and including in the year 2021. There was one exceedance at site RB148 in 2021 and 2022, which when distance corrected was well below the annual mean objective, with no exceedances at any other monitoring sites in this year and 2023.

The monitoring data show a downward trend from 2011 to 2023 at all sites (see Figure A.19).

Figure A.20 below shows traffic flows along the A23, in Hooley. These data suggest very slightly increasing annual mean daily traffic flows from 2004 to 2008, following which there is a significant decrease in 2009. Between 2009 and 2013 flows are relatively stable, increasing marginally to 2015 and staying relatively stable since then. Data for 2020 and 2021 are not available. 2022 and 2023 data are similar to pre-pandemic levels.

Figure A.21 below shows that the concentrations measured at the borough background sites have been below the objective since 2004 and have gradually reduced over the past 20 years.

Figure A.19: Three Year Rolling Mean Nitrogen Dioxide Concentrations - Hooley AQMA.

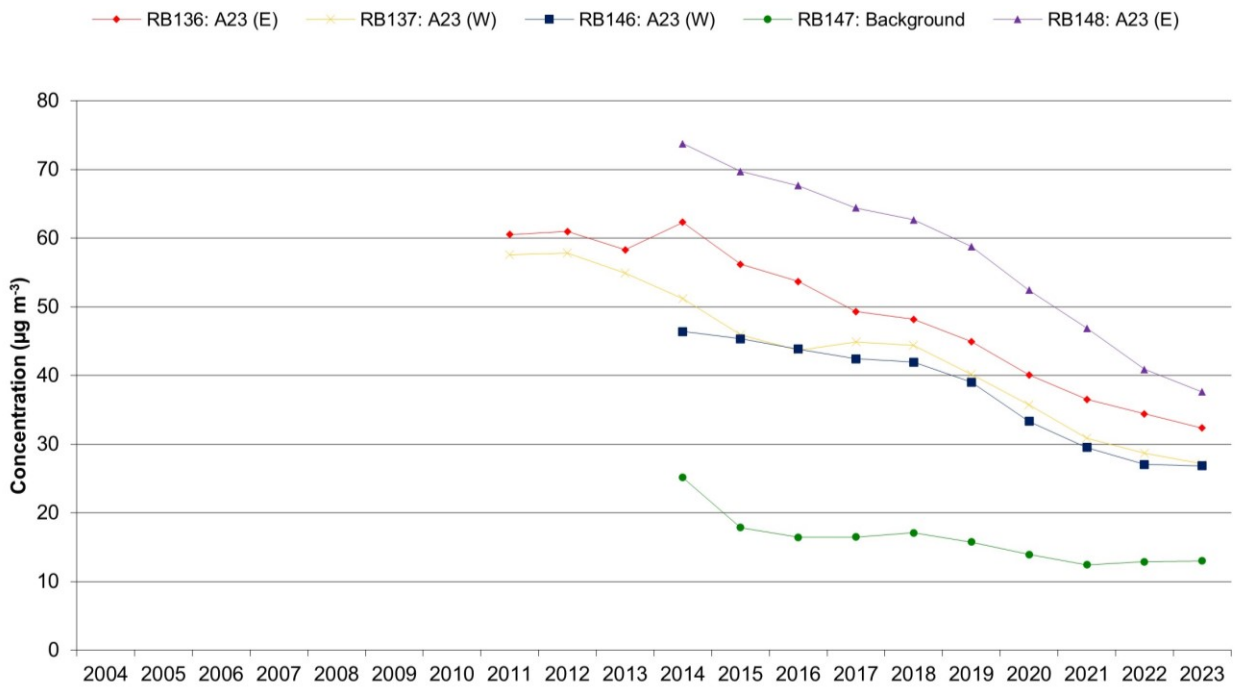


Figure A.20: Annual Mean Daily Traffic Flows - A23 Hooley.

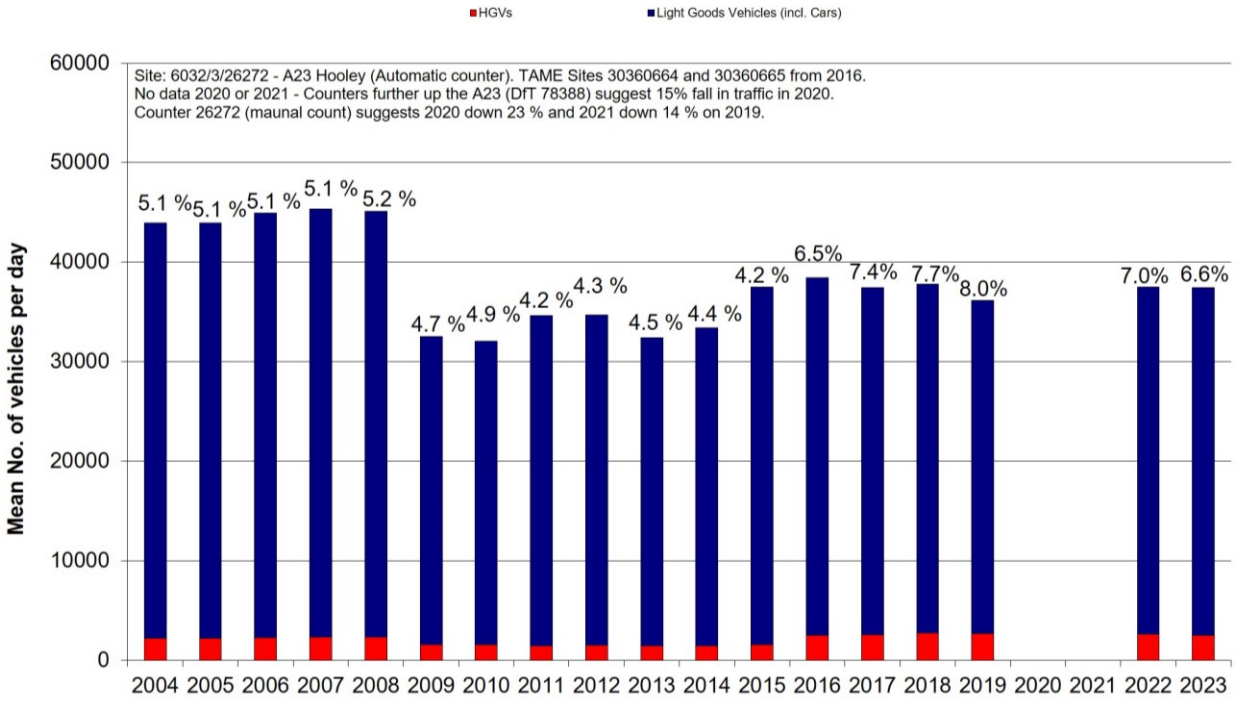


Figure A.21: Three Year Rolling Mean Nitrogen Dioxide Concentrations - Borough Background Site

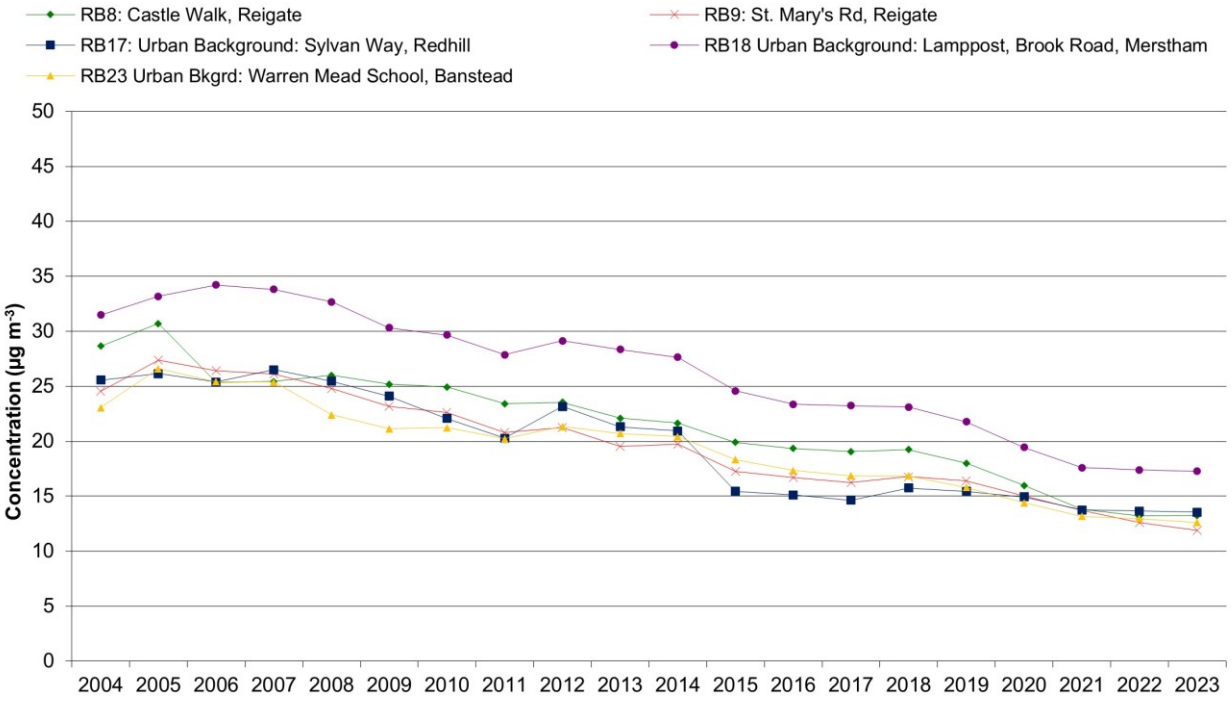


Table A.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
RG1	528208	142337	Suburban	89.9	89.9	19.1	13.1	15.4	16.8	15.6
RG3	526421	139639	Rural	98.0	98.0	15.1	9.7	9.7	11.7	10.6
RG6	528592	141831	Suburban	98.9	98.9	24.2	14.6	13.8	17.2	18.2
RG7	528804	156436	Roadside	86.5	86.5	**45.0**	37.6	**41.0**	34.6	26.5

☒ **No annualisation was required (ie all data capture above 75%)**

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

Notes:

The annual mean concentrations are presented as µg/m^3.

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

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%).

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
RB1	525246	150252	Roadside	100.0	100.0	29.5	21.5	21.4	22.7	20.6
RB3	524944	159630	Urban background	100.0	100.0	16.1	11.7	13.6	14.7	11.9
RB8	525246	150286	Urban background	84.6	84.6	17.2	11.5	12.4	15.4	12.1
RB9	525750	149677	Urban background	100.0	100.0	16.2	12.2	12.4	12.9	10.4
RB11	528104	142226	Suburban	100.0	100.0	21.3	14.6	15.0	18.2	16.4
RB12	528424	142934	Roadside	100.0	100.0	25.8	20.7	19.7	20.2	20.4
RB13	528362	142983	Other	82.7	82.7	19.8	13.3	14.6	17.6	14.9
RB17	528511	149715	Urban background	90.4	90.4	16.0	12.3	12.6	15.7	12.4
RB18	529263	153156	Urban background	100.0	100.0	20.8	15.3	16.3	20.2	15.4
RB19	529067	153375	Suburban	100.0	100.0	21.6	16.3	17.5	19.3	16.0
RB20	529026	153420	Roadside	100.0	100.0	29.4	21.1	23.1	24.4	19.8
RB21	523198	160095	Roadside	100.0	100.0	31.5	22.3	24.7	24.4	22.7
RB22	523260	160111	Suburban	100.0	100.0	18.7	13.7	14.1	15	12.4
RB23	523612	159906	Urban background	100.0	100.0	15.0	11.9	12.4	14.4	11.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
RB24	528208	142337	Background	100.0	100.0	21.8	14.2	13.7	16	14.5
RB25	528208	142337	Background	100.0	100.0	21.2	13.4	14.0	16.5	15.4
RB26	528208	142337	Background	100.0	100.0	21.7	15.0	13.8	16.1	15.4
RB24, RB25, RB26	528208	142337	Background	100.0	100.0	-	-	-	-	15.1
RB27	521873	153896	Roadside (Near M25)	100.0	100.0	21.0	16.3	16.6	17.1	15.6
RB29	521921	153937	Roadside (Near M25)	100.0	100.0	20.5	14.3	14.6	17.5	13.2
RB30	522112	153728	Roadside (Near M25)	100.0	100.0	21.0	14.6	15.0	15.7	13.5
RB31	525506	152366	Roadside (Near M25)	100.0	100.0	13.8	9.8	11.9	13.2	9.7
RB33	524081	152580	Roadside (Near M25)	65.4	65.4	18.9	13.1	13.3	14	12.3
RB34	524177	152393	Roadside (Near M25)	100.0	100.0	22.3	15.3	17.9	17.4	15.6
RB36	528887	153760	Roadside (Near M25)	100.0	100.0	20.2	14.4	15.0	17.6	13.2
RB37	529217	153605	Roadside (Near M25)	100.0	100.0	21.0	16.0	16.7	17.8	15.1
RB39	529205	153572	Roadside (Near M25)	100.0	100.0	20.4	16.8	15.8	17.3	13.7

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
RB40	529252	154291	Roadside (Near M25)	100.0	100.0	19.1	13.2	14.3	15.9	12.4
RB43	528797	153612	Roadside (Near M25)	100.0	100.0	22.2	14.9	18.3	18.3	16.8
RB44	525532	150316	Roadside	90.4	90.4	27.7	21.0	22.2	21.4	18.7
RB45	525431	150270	Roadside	92.3	92.3	29.4	19.6	20.5	22.6	19.6
RB46	525346	150241	Roadside	100.0	100.0	33.2	22.0	25.0	25.8	24.1
RB47	525114	150276	Roadside	90.4	90.4	32.8	24.3	27.2	26.3	24.1
RB49	525705	152947	Roadside (Near A217)	100.0	100.0	36.1	24.6	26.5	27.6	22.7
RB50	525700	152964	Roadside (Near A217)	100.0	100.0	26.2	18.2	-	21.8	22.7
RB51	527873	142606	Suburban	100.0	100.0	20.7	13.1	15.1	18.1	15.6
RB52	527892	142463	Suburban	100.0	100.0	24.6	16.1	16.4	19.2	17.2
RB53	528030	142373	Suburban	100.0	100.0	25.6	16.3	16.5	18.3	18.7
RB54	528112	142321	Suburban	92.3	92.3	22.9	15.0	16.0	17.5	16.6
RB55	528254	142196	Suburban	100.0	100.0	23.6	16.0	16.0	20.2	17.9
RB56	528386	142080	Suburban	100.0	100.0	24.7	14.6	15.0	19.1	17.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
RB57	528499	141953	Suburban	100.0	100.0	24.6	15.2	14.5	18.7	19.4
RB58	528538	141897	Suburban	100.0	100.0	25.9	15.6	15.8	20.4	19.3
RB59	528602	141789	Suburban	82.7	82.7	26.0	15.3	15.1	18.3	20.2
RB60	528607	141910	Suburban	100.0	100.0	26.1	15.0	14.4	19.8	20.8
RB61	528578	142006	Suburban	100.0	100.0	23.1	15.6	13.8	19.6	19.5
RB64	528608	142432	Suburban	100.0	100.0	23.1	15.0	15.5	17.1	18.1
RB65	528581	142635	Suburban	57.7	57.7	23.1	16.4	17.5	18.8	16.7
RB66	528499	142512	Suburban	100.0	100.0	21.6	14.4	15.3	18.1	15.4
RB68	528505	142246	Suburban	100.0	100.0	24.0	14.8	14.6	18.6	17.5
RB69	528335	142224	Suburban	100.0	100.0	25.2	16.2	16.0	18.7	19.6
RB70	528360	142384	Suburban	100.0	100.0	23.7	14.2	15.4	17.2	17.1
RB72	528220	142583	Suburban	100.0	100.0	23.6	15.7	15.3	22.8	16.5
RB73	528172	142679	Suburban	100.0	100.0	21.5	15.4	15.3	17.4	16.2
RB74	529149	141953	Suburban	92.3	92.3	21.2	14.3	13.3	16.5	16.7

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
RB75	529203	142192	Suburban	100.0	100.0	22.3	14.5	14.2	17	18.5
RB76	528958	142468	Suburban	92.3	92.3	19.9	13.4	12.9	16.3	15.9
RB77	528789	142570	Suburban	100.0	100.0	19.7	13.7	13.4	16.1	15.9
RB78	528553	141857	Suburban	100.0	100.0	25.0	15.9	14.9	19.9	20.4
RB81	527594	149236	Roadside (A23 AQMA)	100.0	100.0	2.2	24.0	24.0	22.9	21.5
RB82	528770	155797	Suburban (A23 AQMA)	100.0	100.0	2.0	22.4	21.9	20.4	18.8
RB95	525382	150639	Roadside	90.4	90.4	22.0	14.4	16.9	17.9	16.0
RB98	527931	142231	Suburban	100.0	100.0	24.2	15.9	17.1	18.8	18.5
RB99	526421	139639	Rural / Other	100.0	100.0	13.8	9.3	10.0	14.2	11.6
RB100	526421	139639	Rural / Other	100.0	100.0	13.8	9.0	10.6	12.9	11.4
RB101	526421	139639	Rural / Other	92.3	92.3	14.9	9.2	10.1	13	11.3
RB99, RB100, RB101	526421	139639	Rural / Other	100.0	100.0	-	-	-	-	11.4
RB102	530936	144278	Rural / Other	100.0	100.0	19.3	13.6	15.9	17.4	16.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
RB104	525204	150254	Roadside	100.0	100.0	33.9	24.5	26.9	24.2	22.9
RB105	525203	150239	Roadside	100.0	100.0	37.5	28.5	26.6	24.7	23.8
RB106	523250	160056	Roadside	100.0	100.0	28.6	20.5	23.0	22.5	19.9
RB107	525467	150292	Roadside	100.0	100.0	25.0	18.5	20.8	22.1	18.2
RB109	525387	150178	Roadside	100.0	100.0	29.8	20.1	22.2	21.5	21.1
RB110	529016	153439	Roadside	100.0	100.0	24.7	17.5	19.6	22.1	18.2
RB111	525031	150291	Roadside	100.0	100.0	27.2	23.1	23.0	24.1	21.3
RB113	524795	150404	Roadside	100.0	100.0	23.0	16.6	18.8	17.1	15.8
RB114	524368	150477	Roadside	100.0	100.0	21.8	17.8	16.8	17.2	15.8
RB115	524751	150428	Roadside	90.4	90.4	27.7	20.1	22.7	21.7	21.2
RB116	525022	150317	Roadside	100.0	100.0	30.7	21.2	23.0	23.8	21.7
RB117	525076	150327	Roadside	100.0	100.0	35.8	29.5	28.5	31.4	25.9
RB118	525151	150467	Roadside	100.0	100.0	32.1	25.7	27.3	28.6	22.8
RB120	528196	150421	Roadside	100.0	100.0	27.4	21.1	24.3	25.5	22.8

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
RB121	528092	150786	Kerbside	55.8	55.8	39.9	29.1	29.3	33.2	28.9
RB122	528013	150475	Roadside	25.0	25.0	30.7	23.3	-	-	24.9
RB123	527838	150474	Kerbside	100.0	100.0	33.6	23.6	33.4	23	22.0
RB124	529013	153285	Roadside	100.0	100.0	31.5	24.6	26.1	25.7	22.2
RB125	525589	151655	Roadside	82.7	82.7	33.5	24.8	24.2	24.1	22.4
RB136	528810	156474	Roadside	90.4	90.4	39.5	34.3	36.0	33.2	29.0
RB137	528831	156648	Roadside	100.0	100.0	35.2	28.5	28.4	28.6	24.7
RB140	528122	150799	Roadside	100.0	100.0	24.3	17.4	17.9	21.7	19.0
RB141	527373	150596	Roadside	100.0	100.0	21.8	15.6	17.8	21.1	16.5
RB145	527852	150158	Kerbside	92.3	92.3	31.7	24.5	25.3	24.9	22.6
RB146	528759	156277	Kerbside	100.0	100.0	35.8	23.5	28.8	28.4	23.5
RB147	528732	156407	Background	100.0	100.0	13.8	10.9	12.5	15.1	11.5
RB148	528855	156674	Kerbside	100.0	100.0	**54.2**	**43.0**	**42.5**	36.4	34.2
RB149	527737	142710	Roadside	92.3	92.3	**43.5**	30.9	33.0	32.5	29.5

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
RB150	525397	150867	Roadside	100.0	100.0	35.3	27.3	27.3	24.8	23.5
RB151	528502	142952	Roadside	100.0	100.0	33.5	22.7	26.3	24.9	23.2
RB152	528599	152439	Roadside	100.0	100.0	32.4	24.3	23.8	24.9	22.0
RB153	527837	148046	Roadside	100.0	100.0	25.4	19.9	20.8	22.8	20.4
RB167	527830	150643	Roadside	100.0	100.0	24.3	17.9	20.7	20.9	17.2
RB174	527852	142841	Roadside	100.0	100.0	29.1	19.1	21.4	23.2	21.0
RB175	527955	142999	Roadside	100.0	100.0	29.8	22.2	22.5	21.2	21.3
RB176	527765	142777	Roadside	100.0	100.0	25.4	17.3	19.3	20.2	18.3
RB177	527754	142762	Roadside	90.4	90.4	25.1	16.6	18.4	19.8	19.0
RB178	528592	141831	Suburban	100.0	100.0	24.0	13.6	13.7	16.5	18.0
RB179	528592	141831	Suburban	100.0	100.0	23.2	13.4	13.8	16.9	17.6
RB180	528592	141831	Suburban	100.0	100.0	23.1	13.8	14.0	17.1	17.2
RB178, RB179, RB180	528592	141831	Suburban	100.0	100.0	-	-	-	-	17.6
RB181	528852	156724	Roadside	92.3	92.3	**46.5**	39.0	35.9	32.6	27.7

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
RB182	528835	156728	Roadside	100.0	100.0	24.0	19.6	20.3	19.6	15.4
RB183	528813	156580	Roadside	100.0	100.0	37.0	28.5	29.1	28.4	22.2
RB184	528807	156555	Roadside	100.0	100.0	33.7	24.8	25.8	24.6	21.2
RB186	528790	156500	Roadside	92.3	92.3	31.3	24.3	25.6	24.1	18.9
RB187	528789	156488	Roadside	100.0	100.0	27.0	20.1	21.6	19.4	17.6
RB188	528792	156478	Roadside	92.3	92.3	29.0	22.1	23.2	22.4	18.8
RB189	528789	156465	Roadside	100.0	100.0	30.0	21.0	22.7	21.4	19.8
RB190	528788	156460	Roadside	100.0	100.0	29.1	21.3	22.2	21.3	18.0
RB191	528785	156448	Roadside	100.0	100.0	27.3	20.3	21.6	21.8	17.9
RB192	528784	156442	Roadside	100.0	100.0	27.1	19.4	21.2	20.4	18.6
RB193	528782	156430	Roadside	100.0	100.0	24.2	17.7	19.9	19	16.1
RB194	528779	156381	Kerbside	92.3	92.3	30.7	22.0	25.5	23.5	20.4
RB195	528772	156349	Kerbside	100.0	100.0	34.2	24.7	27.5	26	22.6
RB196	528797	156331	Roadside	100.0	100.0	25.2	19.2	20.5	19.2	16.7

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
RB197	528795	156373	Roadside	100.0	100.0	32.9	25.1	26.9	22.8	21.7
RB198	528796	156379	Roadside	59.6	59.6	38.8	26.6	29.9	27.1	21.8
RB199	528800	156390	Roadside	92.3	92.3	31.8	23.9	25.3	22.5	20.3
RB200	528799	156409	Roadside	100.0	100.0	39.4	31.4	30.4	29.2	24.2
RB201	528804	156414	Roadside	100.0	100.0	34.0	25.2	26.5	23.9	19.0
RB202	528808	156444	Roadside	100.0	100.0	37.7	29.6	32.2	28.8	23.3
RB203	528809	156454	Roadside	92.3	92.3	39.2	30.3	30.5	27.9	23.6
RB204	528810	156457	Roadside	100.0	100.0	39.3	30.4	29.6	27.3	23.1
RB205	528812	156466	Roadside	100.0	100.0	**42.2**	32.7	32.7	32.8	24.8
RB206	528816	156477	Roadside	100.0	100.0	33.1	26.6	30.5	23.8	20.8
RB207	528818	156486	Roadside	100.0	100.0	37.3	26.1	26.9	26.5	22.2
RB208	528825	156526	Roadside	100.0	100.0	**50.3**	36.0	34.9	32.8	29.4
RB209	528833	156547	Roadside	100.0	100.0	27.8	21.4	22.3	19.2	16.4
RB210	528833	156555	Roadside	100.0	100.0	36.3	28.5	28.2	28.1	22.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
RB211	528839	156577	Roadside	100.0	100.0	37.0	29.5	30.6	28.6	23.6
RB212	528840	156582	Roadside	100.0	100.0	**40.6**	30.1	29.9	27.6	23.3
RB213	528845	156604	Roadside	92.3	92.3	37.9	28.0	27.3	29	23.6
RB214	528848	156617	Roadside	65.4	65.4	33.5	22.4	25.2	22.7	20.4
RB215	528853	156646	Roadside	100.0	100.0	27.6	22.6	22.3	23.2	17.8
RB216	528862	156690	Roadside	92.3	92.3	39.3	39.9	35.4	30.3	26.0
RB217	528866	156712	Roadside	100.0	100.0	**45.2**	33.8	35.5	30.2	26.6
RB218	528869	156737	Kerbside	92.3	92.3	**40.7**	33.3	33.3	27.5	26.4
RB219	528877	156744	Roadside	100.0	100.0	**40.6**	33.8	30.3	26.3	23.5
RB223	528804	156435	Roadside	100.0	100.0	**42.3**	32.9	33.1	30.4	27.4
RB224	528804	156435	Roadside	100.0	100.0	36.5	32.5	35.4	31.1	26.5
RB225	528804	156435	Roadside	100.0	100.0	38.7	32.3	34.3	30.7	26.0
RB223, RB224, RB225	528804	156435	Roadside	100.0	100.0	-	-	-	-	26.6

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**
☒ **Diffusion tube data has been bias adjusted.**
☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes:

The annual mean concentrations are presented as µg/m^3.
Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.
NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 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%).

Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200 µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
RG1	528208	142337	Suburban	89.9	89.9	0	0	0	0	0
RG3	526421	139639	Rural	98.0	98.0	0	0	0	0	0
RG6	528592	141831	Suburban	98.9	98.9	0	0	0	0	0
RG7	528804	156436	Roadside	86.5	86.5	0	0	0	0	0

Notes:
Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m^3 have been recorded.
Exceedances of the NO_2 1-hour mean objective (200 µg/m^3 not to be exceeded more than 18 times/year) are shown in bold.
If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table A.6 – Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
RG1	528208	142337	Suburban	89.5	89.5	15.9	15.1	15.2	14.3	11.9
RG3	526421	139639	Rural	95.7	95.7	-	-	-	15	12.4

Notes:
The annual mean concentrations are presented as $\mu g/m^3$.
Exceedances of the PM_{10} annual mean objective of $40\mu g/m^3$ are shown in bold.
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50 µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
RG1	528208	142337	Suburban	90.3	89.5	0	0	1	0	0
RG3	526421	139639	Rural	95.7	95.7	-	-	-	0	0

Notes:
Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m^3 have been recorded.
Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in bold.
If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
RG1	528208	142337	Suburban	90.1	90.1	-	-	-	-	8.2

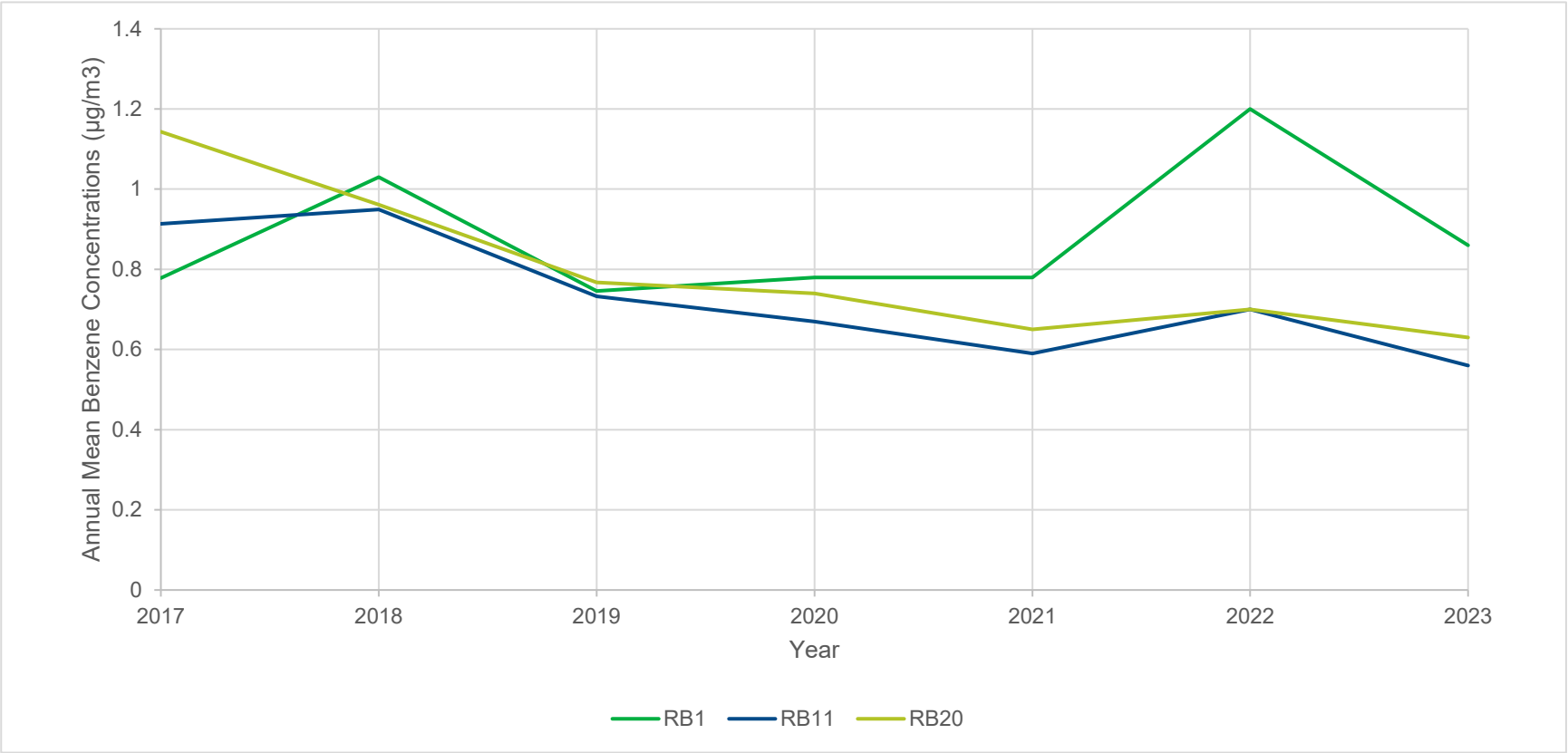
Notes:
The annual mean concentrations are presented as µg/m^3.
All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table A.9 – Annual Mean Benzene Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	Annual Mean Benzene Concentrations				
						2019	2020	2021	2022	2023
RB1	525246	150252	Roadside	100	100	0.7	0.8	0.8	1.2	0.9
RB11	528104	142226	Suburban	100	100	0.7	0.7	0.6	0.7	0.6
RB20	529026	153420	Roadside	100	100	0.8	0.7	0.7	0.7	0.6

Notes:
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.22 – Trends in Annual Mean Benzene Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO_2 2023 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
RB1	525246	150252	31.0	32.0	27.0	31.0	29.0	27.0	21.0	23.0	29.0	26.0	28.0	18.0	26.8	20.6	-	
RB3	524944	159630	24.0	20.0	16.0	17.0	12.0	14.0	12.0	12.0	14.0	15.0	17.0	13.0	15.5	11.9	-	
RB8	525246	150286	20.0	20.0	14.0	15.0	-	13.0	-	11.0	17.0	16.0	17.0	14.0	15.7	12.1	-	
RB9	525750	149677	17.0	19.0	14.0	14.0	10.0	10.0	11.0	9.0	15.0	15.0	17.0	11.0	13.5	10.4	-	
RB11	528104	142226	26.0	24.0	23.0	19.0	12.0	17.0	21.0	18.0	26.0	25.0	22.0	23.0	21.3	16.4	-	
RB12	528424	142934	33.0	31.0	27.0	25.0	19.0	25.0	23.0	21.0	31.0	31.0	28.0	24.0	26.5	20.4	-	
RB13	528362	142983	26.0	26.0	-	18.0	13.0	15.0	-	15.0	22.0	25.0	17.0	17.0	19.4	14.9	-	
RB17	528511	149715	26.0	23.0	-	14.0	12.0	15.0	13.0	12.0	15.0	16.0	18.0	13.0	16.1	12.4	-	
RB18	529263	153156	28.0	28.0	18.0	21.0	13.0	19.0	14.0	13.0	23.0	23.0	24.0	16.0	20.0	15.4	-	
RB19	529067	153375	29.0	26.0	21.0	21.0	17.0	19.0	14.0	15.0	24.0	23.0	25.0	16.0	20.8	16.0	-	
RB20	529026	153420	35.0	34.0	24.0	28.0	21.0	25.0	17.0	22.0	30.0	28.0	29.0	16.0	25.8	19.8	-	
RB21	523198	160095	37.0	39.0	32.0	32.0	30.0	32.0	21.0	24.0	31.0	27.0	29.0	20.0	29.5	22.7	-	
RB22	523260	160111	25.0	22.0	17.0	17.0	12.0	16.0	10.0	12.0	15.0	16.0	18.0	13.0	16.1	12.4	-	
RB23	523612	159906	23.0	18.0	14.0	16.0	11.0	13.0	10.0	10.0	14.0	14.0	17.0	12.0	14.3	11.0	-	
RB24	528208	142337	25.0	21.0	20.0	18.0	11.0	10.0	22.0	18.0	12.0	25.0	24.0	20.0	18.8	14.5	-	
RB25	528208	142337	25.0	25.0	20.0	19.0	11.0	16.0	21.0	17.0	18.0	25.0	23.0	20.0	20.0	15.4	-	
RB26	528208	142337	25.0	22.0	19.0	19.0	11.0	14.0	21.0	16.0	22.0	25.0	24.0	22.0	20.0	15.4	-	
RB24, RB25, RB26	528208	142337	25.0	22.7	19.7	18.7	11.0	13.3	21.3	17.0	17.3	25.0	23.7	20.7	19.6	15.1	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
RB27	521873	153896	25.0	25.0	20.0	22.0	12.0	19.0	18.0	18.0	25.0	19.0	22.0	19.0	20.3	15.6	-	
RB29	521921	153937	22.0	21.0	16.0	20.0	12.0	14.0	13.0	15.0	22.0	17.0	18.0	16.0	17.2	13.2	-	
RB30	522112	153728	21.0	21.0	15.0	19.0	13.0	16.0	15.0	15.0	24.0	19.0	19.0	14.0	17.6	13.5	-	
RB31	525506	152366	17.0	16.0	12.0	13.0	13.0	14.0	10.0	12.0	13.0	10.0	14.0	8.0	12.7	9.7	-	
RB33	524081	152580	-	20.0	-	15.0	-	-	13.0	13.0	20.0	17.0	16.0	14.0	16.0	12.3	-	
RB34	524177	152393	26.0	24.0	19.0	22.0	24.0	23.0	15.0	20.0	22.0	19.0	20.0	9.0	20.3	15.6	-	
RB36	528887	153760	21.0	23.0	16.0	16.0	10.0	22.0	16.0	12.0	20.0	18.0	18.0	14.0	17.2	13.2	-	
RB37	529217	153605	25.0	24.0	19.0	20.0	12.0	13.0	19.0	18.0	22.0	20.0	23.0	21.0	19.7	15.1	-	
RB39	529205	153572	23.0	23.0	17.0	19.0	11.0	17.0	15.0	14.0	21.0	20.0	19.0	15.0	17.8	13.7	-	
RB40	529252	154291	21.0	23.0	14.0	15.0	11.0	14.0	17.0	12.0	19.0	17.0	18.0	13.0	16.2	12.4	-	
RB43	528797	153612	25.0	26.0	17.0	23.0	21.0	22.0	29.0	22.0	25.0	17.0	22.0	13.0	21.8	16.8	-	
RB44	525532	150316	30.0	30.0	24.0	24.0	24.0	22.0	20.0	19.0	29.0	25.0	-	20.0	24.3	18.7	-	
RB45	525431	150270	-	26.0	27.0	28.0	19.0	22.0	21.0	18.0	34.0	32.0	32.0	21.0	25.5	19.6	-	
RB46	525346	150241	37.0	34.0	29.0	32.0	24.0	31.0	30.0	28.0	36.0	34.0	33.0	28.0	31.3	24.1	-	
RB47	525114	150276	36.0	41.0	30.0	37.0	28.0	33.0	22.0	-	30.0	32.0	34.0	22.0	31.4	24.1	-	
RB49	525705	152947	30.0	34.0	29.0	31.0	22.0	28.0	30.0	24.0	39.0	34.0	30.0	23.0	29.5	22.7	-	
RB50	525700	152964	38.0	33.0	28.0	31.0	22.0	20.0	19.0	21.0	30.0	31.0	36.0	45.0	29.5	22.7	-	
RB51	527873	142606	26.0	25.0	16.0	20.0	13.0	18.0	18.0	15.0	24.0	24.0	24.0	20.0	20.3	15.6	-	
RB52	527892	142463	27.0	26.0	24.0	22.0	14.0	17.0	20.0	17.0	26.0	26.0	28.0	22.0	22.4	17.2	-	
RB53	528030	142373	26.0	26.0	23.0	24.0	15.0	18.0	22.0	20.0	30.0	32.0	29.0	26.0	24.3	18.7	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
RB54	528112	142321	26.0	24.0	21.0	21.0	-	18.0	21.0	15.0	24.0	20.0	25.0	23.0	21.6	16.6	-	
RB55	528254	142196	27.0	25.0	23.0	23.0	12.0	20.0	23.0	21.0	29.0	28.0	26.0	23.0	23.3	17.9	-	
RB56	528386	142080	29.0	26.0	23.0	23.0	13.0	18.0	16.0	20.0	26.0	31.0	26.0	29.0	23.3	17.9	-	
RB57	528499	141953	29.0	25.0	25.0	22.0	12.0	21.0	22.0	22.0	33.0	31.0	30.0	30.0	25.2	19.4	-	
RB58	528538	141897	29.0	27.0	20.0	23.0	13.0	21.0	24.0	21.0	32.0	30.0	29.0	32.0	25.1	19.3	-	
RB59	528602	141789	28.0	28.0	25.0	22.0	13.0	-	-	22.0	33.0	31.0	29.0	31.0	26.2	20.2	-	
RB60	528607	141910	31.0	28.0	25.0	23.0	14.0	23.0	31.0	24.0	32.0	33.0	31.0	30.0	27.1	20.8	-	
RB61	528578	142006	31.0	27.0	23.0	22.0	14.0	20.0	28.0	21.0	31.0	29.0	27.0	31.0	25.3	19.5	-	
RB64	528608	142432	30.0	25.0	22.0	20.0	13.0	23.0	23.0	19.0	30.0	26.0	26.0	25.0	23.5	18.1	-	
RB65	528581	142635	25.0	27.0	22.0	21.0	-	-	-	-	-	25.0	25.0	24.0	24.1	16.7	-	
RB66	528499	142512	26.0	24.0	21.0	17.0	14.0	11.0	16.0	14.0	25.0	26.0	21.0	25.0	20.0	15.4	-	
RB68	528505	142246	27.0	25.0	20.0	20.0	13.0	18.0	26.0	18.0	28.0	29.0	23.0	26.0	22.8	17.5	-	
RB69	528335	142224	27.0	24.0	23.0	24.0	17.0	18.0	27.0	22.0	34.0	31.0	29.0	30.0	25.5	19.6	-	
RB70	528360	142384	26.0	24.0	23.0	20.0	13.0	16.0	20.0	18.0	27.0	28.0	27.0	25.0	22.3	17.1	-	
RB72	528220	142583	24.0	25.0	19.0	19.0	14.0	17.0	21.0	17.0	28.0	27.0	25.0	22.0	21.5	16.5	-	
RB73	528172	142679	27.0	24.0	20.0	21.0	13.0	18.0	17.0	16.0	25.0	24.0	25.0	22.0	21.0	16.2	-	
RB74	529149	141953	-	24.0	20.0	19.0	13.0	18.0	25.0	21.0	26.0	25.0	24.0	24.0	21.7	16.7	-	
RB75	529203	142192	30.0	23.0	22.0	21.0	13.0	20.0	27.0	22.0	27.0	28.0	27.0	28.0	24.0	18.5	-	
RB76	528958	142468	22.0	23.0	18.0	25.0	-	17.0	19.0	16.0	22.0	22.0	24.0	20.0	20.7	15.9	-	
RB77	528789	142570	27.0	22.0	19.0	19.0	14.0	15.0	20.0	19.0	23.0	24.0	24.0	22.0	20.7	15.9	-	
RB78	528553	141857	32.0	27.0	23.0	23.0	17.0	22.0	29.0	25.0	31.0	31.0	30.0	28.0	26.5	20.4	-	

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RB81	527594	149236	36.0	36.0	27.0	31.0	23.0	28.0	19.0	18.0	33.0	30.0	33.0	22.0	28.0	21.5	-	
RB82	528770	155797	24.0	27.0	26.0	30.0	21.0	32.0	20.0	20.0	26.0	24.0	25.0	18.0	24.4	18.8	-	
RB95	525382	150639	27.0	28.0	-	21.0	17.0	16.0	19.0	16.0	23.0	22.0	25.0	15.0	20.8	16.0	-	
RB98	527931	142231	28.0	28.0	22.0	23.0	17.0	17.0	26.0	21.0	27.0	28.0	28.0	24.0	24.1	18.5	-	
RB99	526421	139639	17.0	20.0	15.0	17.0	14.0	17.0	13.0	10.0	15.0	16.0	16.0	11.0	15.1	11.6	-	
RB100	526421	139639	16.0	18.0	15.0	11.0	12.0	22.0	15.0	14.0	14.0	15.0	15.0	11.0	14.8	11.4	-	
RB101	526421	139639	15.0	15.0	14.0	16.0	13.0	20.0	16.0	14.0	-	14.0	15.0	10.0	14.7	11.3	-	
RB99, RB100, RB101	526421	139639	16.0	17.7	14.7	14.7	13.0	19.7	14.7	12.7	14.5	15.0	15.3	10.7	14.9	11.4	-	
RB102	530936	144278	21.0	27.0	21.0	23.0	17.0	22.0	17.0	17.0	26.0	23.0	21.0	15.0	20.8	16.0	-	
RB104	525204	150254	33.0	38.0	28.0	33.0	27.0	36.0	24.0	20.0	36.0	27.0	33.0	22.0	29.8	22.9	-	
RB105	525203	150239	21.0	40.0	29.0	35.0	28.0	32.0	30.0	25.0	29.0	39.0	35.0	28.0	30.9	23.8	-	
RB106	523250	160056	27.0	30.0	30.0	28.0	24.0	28.0	17.0	19.0	28.0	26.0	34.0	20.0	25.9	19.9	-	
RB107	525467	150292	28.0	30.0	21.0	23.0	20.0	23.0	19.0	19.0	28.0	24.0	31.0	18.0	23.7	18.2	-	
RB109	525387	150178	28.0	31.0	24.0	33.0	27.0	29.0	23.0	26.0	33.0	31.0	27.0	17.0	27.4	21.1	-	
RB110	529016	153439	29.0	29.0	22.0	26.0	19.0	20.0	20.0	18.0	29.0	26.0	29.0	17.0	23.7	18.2	-	
RB111	525031	150291	33.0	34.0	26.0	31.0	25.0	28.0	24.0	21.0	31.0	29.0	29.0	21.0	27.7	21.3	-	
RB113	524795	150404	26.0	23.0	17.0	23.0	17.0	19.0	18.0	15.0	23.0	23.0	26.0	17.0	20.6	15.8	-	
RB114	524368	150477	23.0	25.0	20.0	20.0	14.0	19.0	15.0	16.0	24.0	24.0	31.0	16.0	20.6	15.8	-	
RB115	524751	150428	34.0	35.0	26.0	27.0	20.0	25.0	24.0	22.0	34.0	32.0	-	24.0	27.5	21.2	-	
RB116	525022	150317	23.0	37.0	27.0	29.0	30.0	34.0	25.0	25.0	34.0	29.0	24.0	21.0	28.2	21.7	-	
RB117	525076	150327	26.0	37.0	31.0	42.0	35.0	46.0	26.0	32.0	43.0	40.0	23.0	23.0	33.7	25.9	-	

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RB118	525151	150467	31.0	33.0	28.0	30.0	24.0	32.0	27.0	30.0	39.0	33.0	26.0	23.0	29.7	22.8	-	
RB120	528196	150421	29.0	36.0	28.0	35.0	28.0	31.0	22.0	24.0	34.0	31.0	34.0	24.0	29.7	22.8	-	
RB121	528092	150786	48.0	49.0	38.0	-	29.0	-	40.0	-	-	28.0	-	40.0	38.9	28.9	-	
RB122	528013	150475	-	-	-	-	-	-	-	-	33.0	43.0	32.0	--	36.0	24.9	-	
RB123	527838	150474	30.0	28.0	27.0	31.0	22.0	25.0	22.0	26.0	41.0	36.0	31.0	24.0	28.6	22.0	-	
RB124	529013	153285	34.0	40.0	24.0	33.0	29.0	28.0	23.0	19.0	36.0	29.0	32.0	20.0	28.9	22.2	-	
RB125	525589	151655	37.0	34.0	-	30.0	19.0	28.0	25.0	25.0	35.0	-	32.0	26.0	29.1	22.4	-	
RB136	528810	156474	42.0	49.0	37.0	41.0	36.0	-	32.0	32.0	42.0	37.0	37.0	29.0	37.6	29.0	-	
RB137	528831	156648	30.0	36.0	40.0	38.0	30.0	42.0	32.0	26.0	32.0	27.0	27.0	26.0	32.2	24.7	-	
RB140	528122	150799	28.0	26.0	24.0	24.0	17.0	22.0	22.0	21.0	31.0	31.0	25.0	25.0	24.7	19.0	-	
RB141	527373	150596	28.0	26.0	22.0	24.0	17.0	22.0	15.0	11.0	27.0	22.0	25.0	18.0	21.4	16.5	-	
RB145	527852	150158	39.0	39.0	31.0	30.0	24.0	29.0	24.0	24.0	-	32.0	34.0	17.0	29.4	22.6	-	
RB146	528759	156277	35.0	38.0	32.0	39.0	26.0	33.0	23.0	20.0	35.0	30.0	32.0	23.0	30.5	23.5	-	
RB147	528732	156407	18.0	19.0	13.0	28.0	10.0	12.0	9.0	10.0	15.0	16.0	19.0	11.0	15.0	11.5	-	
RB148	528855	156674	48.0	56.0	42.0	47.0	35.0	45.0	43.0	35.0	49.0	49.0	48.0	37.0	44.5	34.2	-	
RB149	527737	142710	44.0	47.0	36.0	43.0	-	39.0	34.0	36.0	43.0	25.0	43.0	32.0	38.4	29.5	-	
RB150	525397	150867	32.0	35.0	31.0	29.0	22.0	33.0	29.0	27.0	32.0	35.0	34.0	27.0	30.5	23.5	-	
RB151	528502	142952	38.0	30.0	29.0	29.0	20.0	25.0	27.0	26.0	37.0	35.0	36.0	30.0	30.2	23.2	-	
RB152	528599	152439	28.0	33.0	27.0	29.0	30.0	32.0	22.0	23.0	37.0	30.0	31.0	21.0	28.6	22.0	-	
RB153	527837	148046	32.0	29.0	25.0	27.0	24.0	27.0	23.0	24.0	33.0	29.0	26.0	20.0	26.6	20.4	-	
RB167	527830	150643	28.0	22.0	21.0	21.0	18.0	21.0	17.0	19.0	29.0	27.0	27.0	19.0	22.4	17.2	-	

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RB174	527852	142841	30.0	29.0	23.0	28.0	21.0	19.0	26.0	24.0	33.0	32.0	40.0	22.0	27.3	21.0	-	
RB175	527955	142999	28.0	31.0	30.0	27.0	20.0	25.0	25.0	23.0	33.0	34.0	33.0	23.0	27.7	21.3	-	
RB176	527765	142777	30.0	27.0	23.0	23.0	17.0	20.0	22.0	19.0	23.0	30.0	28.0	23.0	23.8	18.3	-	
RB177	527754	142762	28.0	28.0	25.0	25.0	19.0	-	22.0	19.0	21.0	34.0	27.0	23.0	24.6	19.0	-	
RB178	528592	141831	23.0	26.0	21.0	21.0	17.0	19.0	25.0	24.0	29.0	29.0	22.0	25.0	23.4	18.0	-	
RB179	528592	141831	22.0	25.0	21.0	19.0	13.0	21.0	26.0	21.0	29.0	27.0	26.0	24.0	22.8	17.6	-	
RB180	528592	141831	28.0	25.0	20.0	18.0	12.0	18.0	28.0	22.0	24.0	27.0	23.0	24.0	22.4	17.2	-	
RB178, RB179, RB180	528592	141831	24.3	25.3	20.7	19.3	14.0	19.3	26.3	22.3	27.3	27.7	23.7	24.3	22.9	17.6	-	
RB181	528852	156724	43.0	36.0	40.0	38.0	30.0	35.0	-	34.0	31.0	39.0	37.0	33.0	36.0	27.7	-	
RB182	528835	156728	25.0	22.0	18.0	22.0	16.0	20.0	15.0	17.0	30.0	19.0	21.0	15.0	20.0	15.4	-	
RB183	528813	156580	33.0	32.0	30.0	32.0	25.0	32.0	24.0	19.0	30.0	31.0	34.0	24.0	28.8	22.2	-	
RB184	528807	156555	32.0	33.0	27.0	32.0	30.0	29.0	23.0	22.0	32.0	25.0	27.0	19.0	27.6	21.2	-	
RB186	528790	156500	-	30.0	26.0	32.0	25.0	17.0	21.0	16.0	35.0	27.0	28.0	13.0	24.5	18.9	-	
RB187	528789	156488	23.0	28.0	22.0	26.0	22.0	24.0	18.0	18.0	35.0	20.0	22.0	16.0	22.8	17.6	-	
RB188	528792	156478	-	24.0	24.0	28.0	24.0	25.0	21.0	18.0	36.0	24.0	24.0	21.0	24.5	18.8	-	
RB189	528789	156465	22.0	29.0	24.0	28.0	26.0	27.0	23.0	21.0	41.0	25.0	26.0	17.0	25.8	19.8	-	
RB190	528788	156460	29.0	28.0	24.0	27.0	23.0	25.0	18.0	17.0	28.0	22.0	22.0	18.0	23.4	18.0	-	
RB191	528785	156448	26.0	27.0	23.0	28.0	22.0	26.0	17.0	17.0	30.0	23.0	24.0	17.0	23.3	17.9	-	
RB192	528784	156442	22.0	35.0	24.0	28.0	23.0	25.0	18.0	23.0	27.0	23.0	24.0	18.0	24.2	18.6	-	
RB193	528782	156430	22.0	23.0	20.0	24.0	22.0	24.0	17.0	15.0	28.0	20.0	22.0	14.0	20.9	16.1	-	
RB194	528779	156381	29.0	28.0	26.0	31.0	26.0	26.0	-	19.0	28.0	30.0	29.0	20.0	26.5	20.4	-	

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RB195	528772	156349	34.0	34.0	29.0	33.0	26.0	32.0	27.0	23.0	37.0	30.0	30.0	17.0	29.3	22.6	-	
RB196	528797	156331	21.0	27.0	22.0	27.0	23.0	22.0	19.0	18.0	22.0	22.0	24.0	13.0	21.7	16.7	-	
RB197	528795	156373	30.0	35.0	30.0	35.0	29.0	27.0	21.0	22.0	35.0	30.0	27.0	18.0	28.3	21.7	-	
RB198	528796	156379	27.0	28.0	36.0	36.0	-	-	-	24.0	-	32.0	32.0	-	30.7	21.8	-	
RB199	528800	156390	28.0	33.0	29.0	30.0	24.0	28.0	21.0	24.0	-	27.0	28.0	19.0	26.5	20.3	-	
RB200	528799	156409	38.0	39.0	36.0	37.0	30.0	32.0	28.0	23.0	27.0	32.0	33.0	23.0	31.5	24.2	-	
RB201	528804	156414	24.0	33.0	27.0	29.0	22.0	25.0	18.0	18.0	25.0	29.0	27.0	19.0	24.7	19.0	-	
RB202	528808	156444	24.0	41.0	32.0	37.0	29.0	41.0	26.0	24.0	26.0	28.0	33.0	23.0	30.3	23.3	-	
RB203	528809	156454	28.0	-	33.0	36.0	30.0	34.0	28.0	26.0	27.0	38.0	34.0	23.0	30.6	23.6	-	
RB204	528810	156457	30.0	37.0	29.0	36.0	29.0	33.0	27.0	28.0	24.0	33.0	31.0	24.0	30.1	23.1	-	
RB205	528812	156466	25.0	42.0	35.0	40.0	33.0	38.0	29.0	27.0	22.0	33.0	37.0	26.0	32.3	24.8	-	
RB206	528816	156477	31.0	32.0	28.0	22.0	22.0	36.0	24.0	23.0	31.0	28.0	29.0	19.0	27.1	20.8	-	
RB207	528818	156486	27.0	37.0	30.0	31.0	27.0	32.0	26.0	22.0	31.0	30.0	32.0	22.0	28.9	22.2	-	
RB208	528825	156526	38.0	46.0	42.0	39.0	33.0	39.0	37.0	33.0	41.0	39.0	40.0	32.0	38.3	29.4	-	
RB209	528833	156547	22.0	27.0	23.0	25.0	20.0	21.0	17.0	14.0	21.0	23.0	24.0	19.0	21.3	16.4	-	
RB210	528833	156555	26.0	32.0	30.0	34.0	22.0	31.0	25.0	27.0	30.0	30.0	32.0	24.0	28.6	22.0	-	
RB211	528839	156577	30.0	36.0	33.0	32.0	25.0	33.0	25.0	25.0	37.0	34.0	34.0	24.0	30.7	23.6	-	
RB212	528840	156582	13.0	34.0	33.0	34.0	29.0	31.0	34.0	27.0	35.0	36.0	31.0	26.0	30.3	23.3	-	
RB213	528845	156604	29.0	38.0	31.0	-	28.0	33.0	28.0	24.0	37.0	35.0	33.0	22.0	30.7	23.6	-	
RB214	528848	156617	30.0	30.0	-	26.0	21.0	27.0	-	21.0	27.0	28.0	-	-	26.3	20.4	-	
RB215	528853	156646	30.0	28.0	26.0	24.0	18.0	21.0	20.0	18.0	22.0	24.0	27.0	20.0	23.2	17.8	-	

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RB216	528862	156690	33.0	38.0	34.0	36.0	27.0	47.0	33.0	25.0	-	42.0	33.0	24.0	33.8	26.0	-	
RB217	528866	156712	29.0	39.0	33.0	39.0	30.0	38.0	34.0	32.0	41.0	39.0	36.0	25.0	34.6	26.6	-	
RB218	528869	156737	38.0	41.0	34.0	35.0	30.0	35.0	-	27.0	38.0	34.0	40.0	25.0	34.3	26.4	-	
RB219	528877	156744	31.0	35.0	33.0	32.0	26.0	32.0	28.0	26.0	35.0	33.0	33.0	22.0	30.5	23.5	-	
RB223	528804	156435	35.0	34.0	37.0	42.0	35.0	39.0	32.0	28.0	50.0	35.0	37.0	24.0	35.7	27.4	-	
RB224	528804	156435	33.0	38.0	37.0	35.0	33.0	41.0	29.0	26.0	42.0	37.0	37.0	26.0	34.5	26.5	-	
RB225	528804	156435	29.0	41.0	40.0	34.0	31.0	39.0	29.0	25.0	41.0	35.0	33.0	28.0	33.8	26.0	-	
RB223, RB224, RB225	528804	156435	32.3	37.7	38.0	37.0	33.0	39.7	30.0	26.3	44.3	35.7	35.7	26.0	34.6	26.6	-	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1.**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **Local bias adjustment factor used.**

☒ **Reigate and Banstead Borough Council confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**.

Notes:

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

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

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 Reigate and Banstead During 2023

Reigate and Banstead has not identified any new sources relating to air quality within the reporting year of 2023.

Additional Air Quality Works Undertaken by Reigate and Banstead During 2023

Reigate and Banstead has not completed any additional works within the reporting year of 2023. Work is ongoing in relation to the DCO Application at Gatwick Airport.

QA/QC of Diffusion Tube Monitoring

Reigate and Banstead Borough Council use nitrogen dioxide diffusion tubes prepared and analysed by Lambeth Scientific Services, using the 50% TEA in acetone method. Monitoring has been completed in adherence with the 2023 Diffusion Tube Monitoring Calendar. Lambeth Scientific Services take part in the analytical proficiency testing scheme (AIR-PT), formerly known as the WASP operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). During 2023, 0% of samples were determined to be satisfactory in the 1st quarter, 75% of samples were determined to be satisfactory in the 2nd quarter, 50% of samples were determined to be satisfactory in the 3rd quarter and 0% of samples were determined to be satisfactory in the 4th quarter.

The AIR-PT results for 2023 have been raised with Lambeth Scientific Services and they have provided assurance that their analytical procedures are in accordance with DEFRA guidance. Along with continuous monitoring of their procedures, remedial action is being put in place by Lambeth Scientific Services to ensure that a higher percentage of test samples are considered satisfactory in future rounds of the AIR-PT scheme.

Given the AIR-PT 1st and 4th quarter results for 2023, further investigation into the reliability of the diffusion tube monitoring results for 2023 has been undertaken. Diffusion tube precision and accuracy reflects the handling of tubes in the field, and a laboratory's performance or consistency in preparing and analysing tubes.

The 'Precision and Accuracy' webpage[14] on DEFRA's LAQM website reports good/bad precision results from co-location studies in 2023; all three co-location studies using diffusion tubes prepared and analysed by Lambeth Scientific Services in 2023 had 'Good' diffusion tube precision, and the Council's own co location studies its sites showed overall similar good precision.

QA/QC of the raw diffusion tube data was also undertaken to remove any erroneous values from the data and did not highlight any clear overall issues with the dataset. Furthermore, the diffusion tube results have been bias adjusted in order to remove bias and improve their accuracy, in accordance with DEFRA's LAQM TG(22). Overall, it has therefore been considered appropriate to report the diffusion tube results from the 1st and 4th quarter of 2023 in this ASR rather than removing these results and annualising the data.

Reigate and Banstead Borough Council also use diffusion tubes prepared and analysed by Lambeth Scientific Services to monitor benzene. AIRBTX Analysis was undertaken using a passive sampling method.

[14] Defra. Precision and Accuracy. Available at: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/precision-and-accuracy/

Diffusion Tube Annualisation

Six diffusion tubes have lower than 75% data capture in 2023 (RB33, RB65, RB121, RB122, RB198 and RB214). Annualisation has been undertaken using the approach detailed within Box 7-10 within LAQM (TG22). The factor applied to diffusion tube results are detailed in Table C.1.

Table C.1 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor RG1	Annualisation Factor RG6	Annualisation Factor RG3	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
RB33	0.9616	0.9286	1.0969	0.9957	16.0	15.9
RB65	0.8525	0.9175	0.9291	0.8997	24.1	21.7
RB121	0.9314	0.9581	1.0144	0.9680	38.9	37.6
RB122	0.8247	0.8617	1.0100	0.8988	36.0	32.4
RB198	0.8863	0.9393	0.9440	0.9232	30.7	28.4
RB214	1.0501	1.0303	0.9440	1.0081	26.3	26.5

Note data in the above table has not been bias adjusted.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2024 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.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Reigate and Banstead Borough Council have applied a local bias adjustment factor of 0.77 to the 2023 monitoring data. A summary of bias adjustment factors used by Reigate and Banstead Borough Council over the past five years is presented in Table C.2.

Since the locally derived bias adjustment factor has been used over the past five years in favour of the national adjustment factors, it is considered that the more consistent approach is to continue using the local bias factor in order better assess trends in the data. Additionally, the local adjustment factor was very similar to the national bias adjustment factor which was 0.80 in 2023 (Spreadsheet version 06/24, Lambeth Scientific Services based on 11 studies), which suggests that the local factor is not anomalous.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	Local	-	0.77
2022	Local	-	0.84
2021	Local	-	0.90
2020	Local	-	0.91
2019	Local	-	0.87

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3
Periods used to calculate bias	9	12	11
Bias Factor A	0.81 (0.72 - 0.93)	0.8 (0.74 - 0.88)	0.7 (0.59 - 0.86)
Bias Factor B	23% (7% - 39%)	25% (14% - 36%)	42% (17% - 68%)
Diffusion Tube Mean (µg/m^3)	20.0	22.9	14.9
Mean CV (Precision)	3.5%	7.6%	8.6%
Automatic Mean (µg/m^3)	16.2	18.3	10.5
Data Capture	99%	99%	99%
Adjusted Tube Mean (µg/m^3)	16 (14 - 19)	18 (17 - 20)	10 (9 - 13)

Notes:

A combined local bias adjustment factor of 0.77 has been used to bias adjust the 2023 diffusion tube results.

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure are estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. However, in 2023 no diffusion tube measured NO_2 concentrations were above 90% of the annual mean objective and thus no diffusion tube NO_2 monitoring locations within Reigate and Banstead Borough required distance correction.

QA/QC of Automatic Monitoring

The NOx analyser at RG1 is also part of the Automatic Urban and Rural Network (AURN); and in 2023 had data verification and ratification undertaken by Imperial ERG and bi-annual QA / QC audits undertaken by NPL. Data for RG3 was ratified and verified by Imperial ERG to AURN standards. Data for RG6 and RG7 switched to ratification and verification by Ricardo (also to AURN standards) from 1st August 2023. Data management for RG1 and RG3 also switched to Ricardo from 1st January 2024. QA/QC audits in 2023 were carried out by NPL. Data are available at Reigate and Banstead Borough Council - Air Quality monitoring service (airqualityengland.co.uk).

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

The RG1 automatic monitoring station PM_{10} analyser (TEOM) was joined in May 2022 with a Palas Fidas, and $PM_{2.5}$ monitoring began formally in September 2022. The RG3 automatic monitoring station PM_{10} analyser (TEOM) commenced in May 2021. Where necessary, data have been adjusted.

Automatic Monitoring Annualisation

All automatic monitoring locations within Reigate and Banstead Borough Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure can be estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. No automatic NO_2 monitoring locations within Reigate and Banstead required distance correction during 2023.

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

Figure D.1 – Maps of Non-Automatic Monitoring Sites

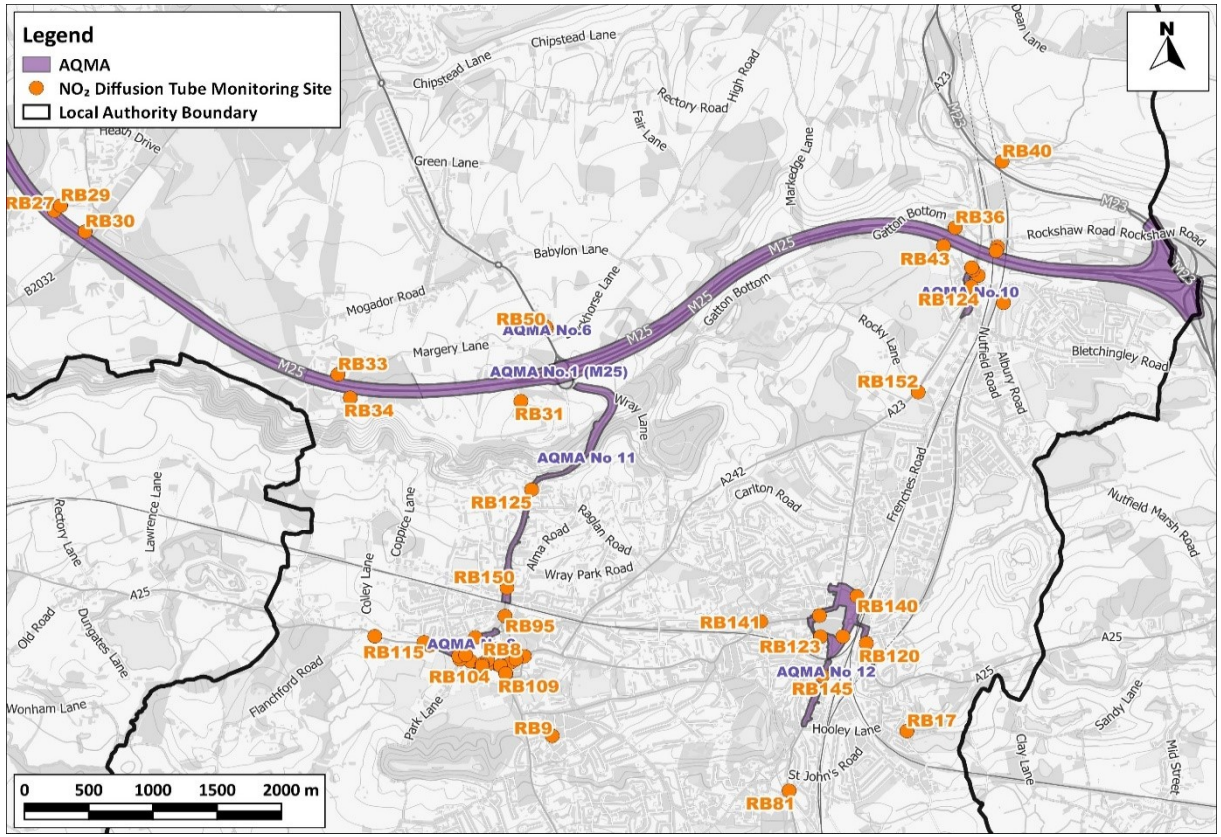

Figure D.1.1 AQMA No. 1 (M25), AQMA 6 (A217 / Blackhorse Lane), AQMA 10 (Merstham), AQMA No. 11 (Reigate Hill), AQMA No. 12 (Redhill), Nitrogen Dioxide Diffusion Tube Monitoring Site Locations Within and Close to AQMA No. 1 and the Local Authority Boundaries.

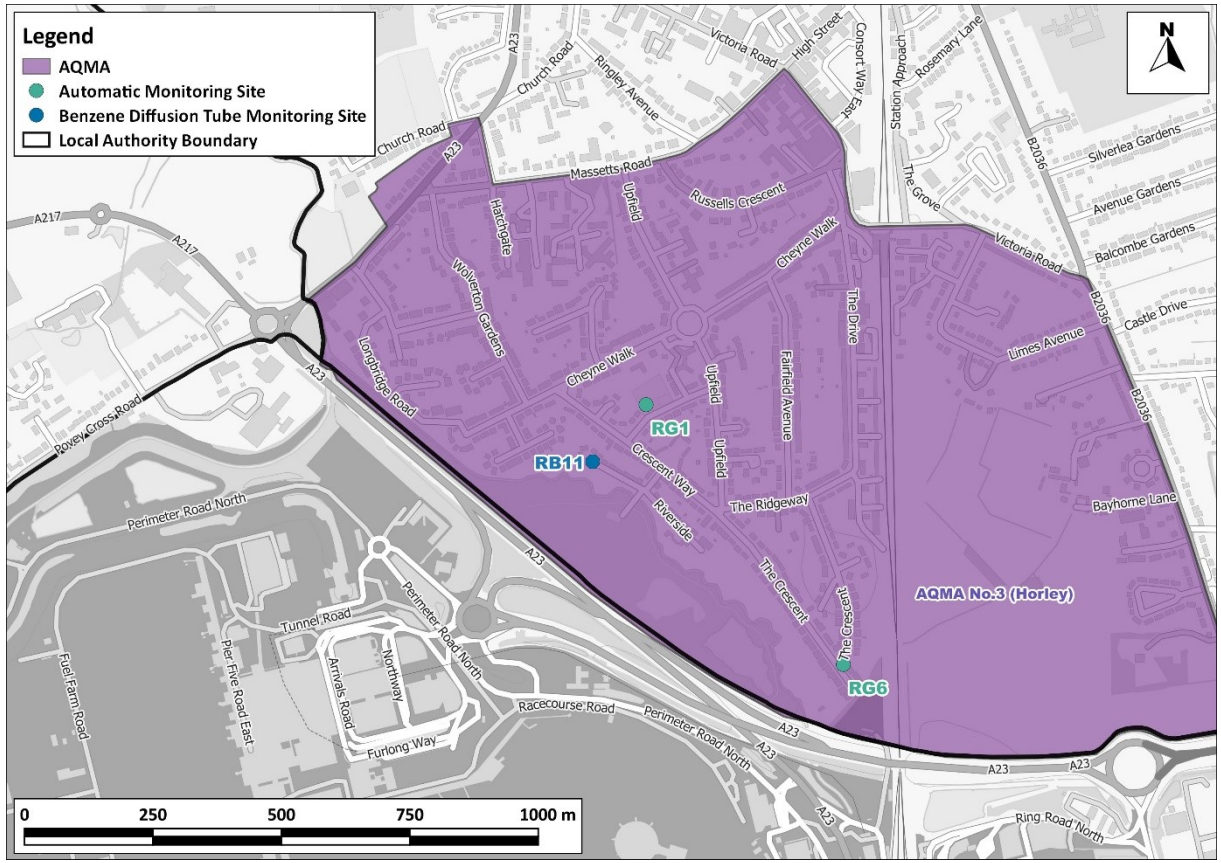

Figure D.1.2 AQMA No. 3 (Horley), Automatic Monitoring Sites and Benzene Diffusion Tube Monitoring Site Locations Within the AQMA and Local Authority Boundaries.

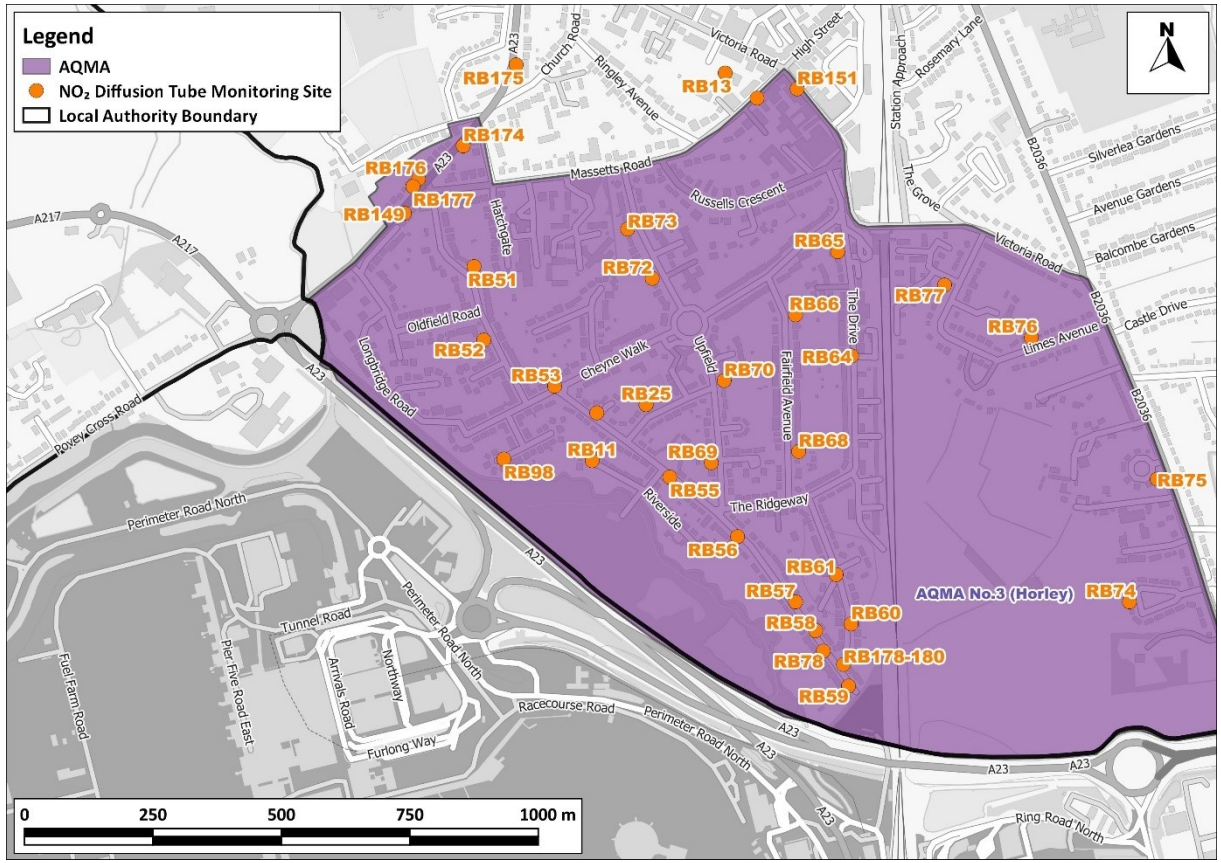

Figure D.1.3 AQMA No. 3 (Horley), Nitrogen Dioxide Diffusion Tube Monitoring Site Locations Within and Close to the AQMA and Local Authority Boundaries.

Figure D.1.2 AQMA No. 6 (A217 / Blackhorse Lane) and Nitrogen Dioxide Diffusion Tube Monitoring Site Locations Within and Close to the AQMA.

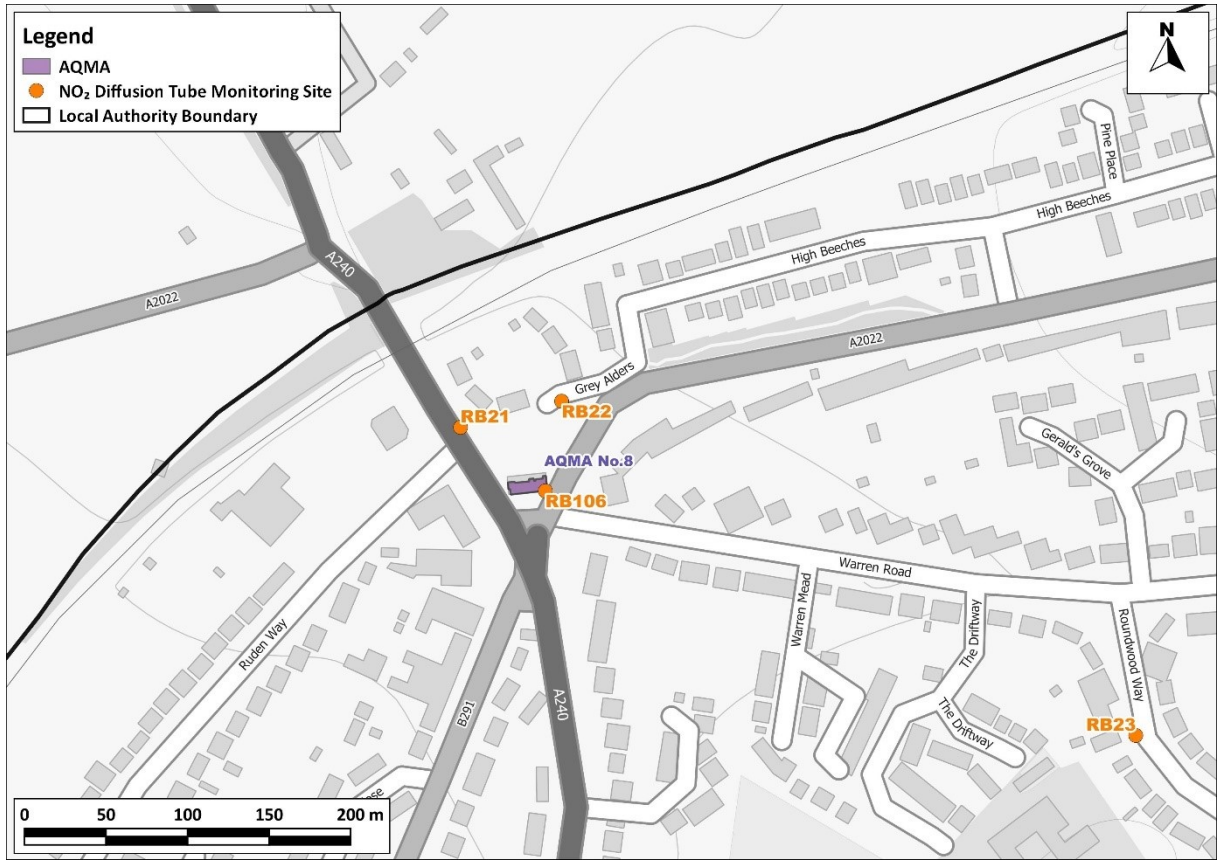

Figure D.1.3 AQMA No. 8 (Drift Bridge) and Nitrogen Dioxide Diffusion Tube Monitoring Site Locations Within and Close to the AQMA.

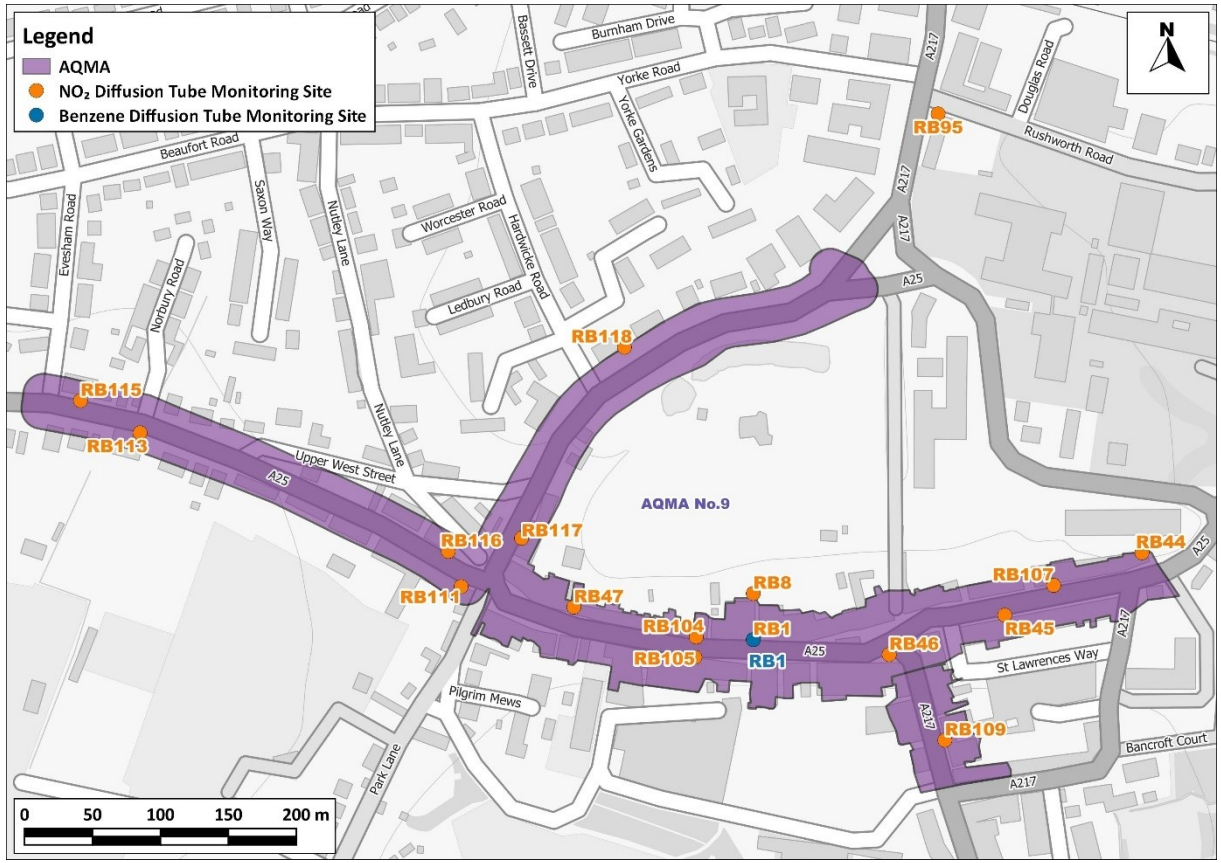

Figure D.1.4 AQMA No. 9 (Reigate High Street / West St / Bell St) and Nitrogen Dioxide or Benzene Diffusion Tube Monitoring Site Locations Within and Close to the AQMA.

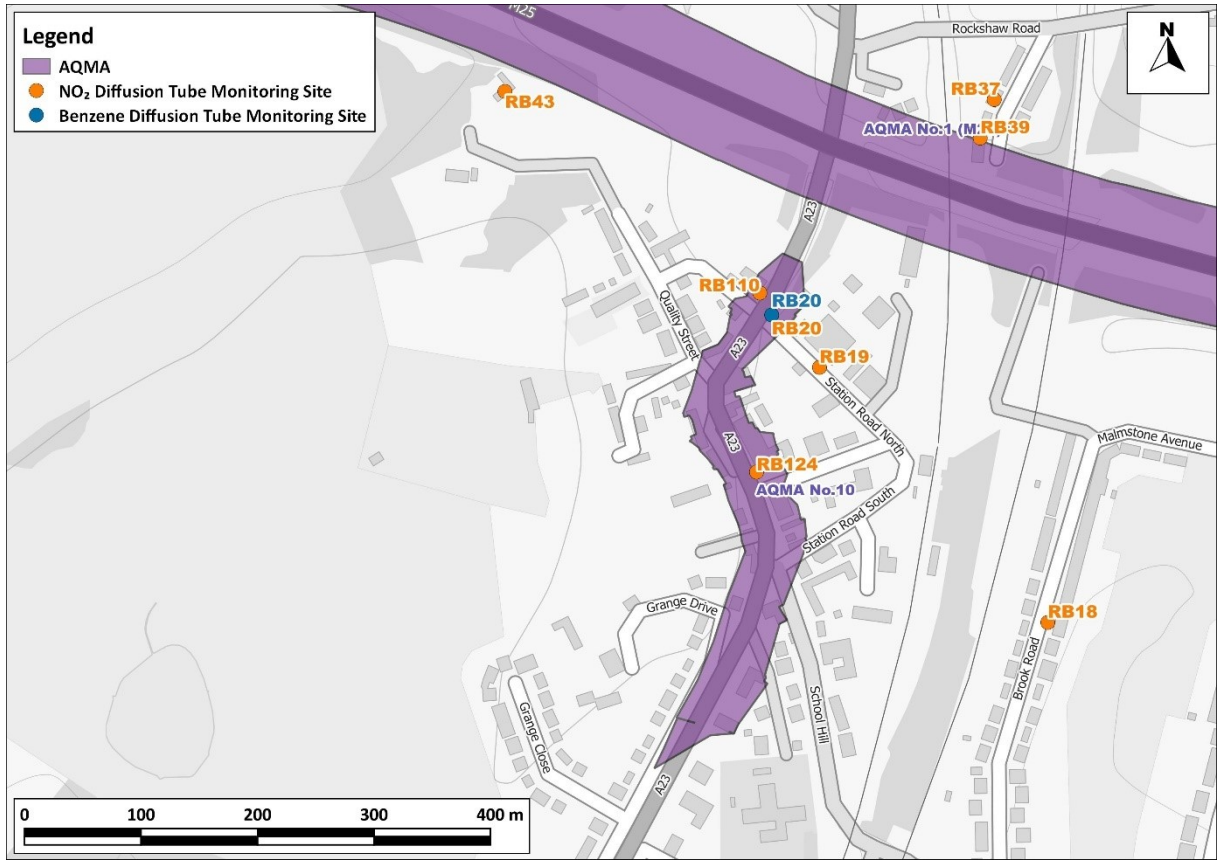

Figure D.1.5 AQMA No. 10 (Merstham) and Nitrogen Dioxide or Benzene Diffusion Tube Monitoring Site Locations Within and Close to the AQMA Benzene.

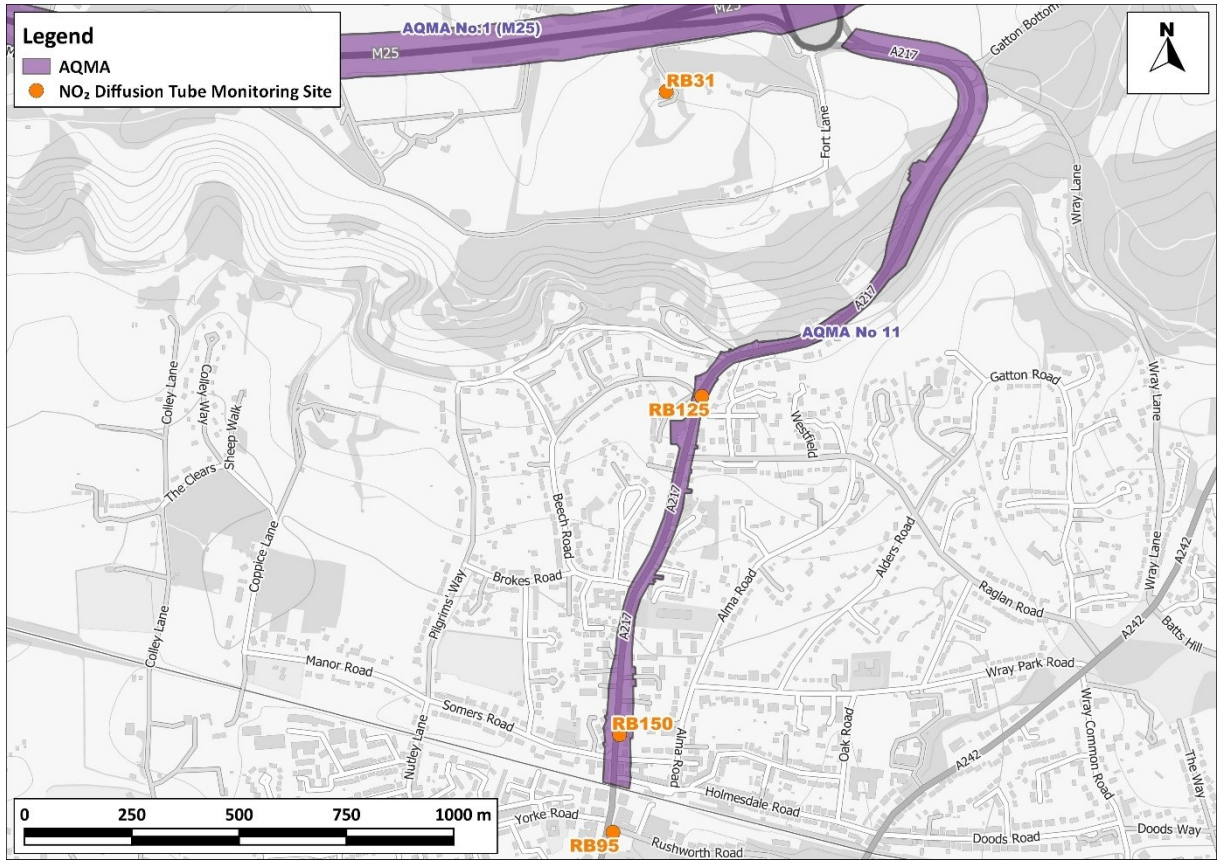

Figure D.1.6 AQMA No. 11 (Reigate Hill), AQMA No. 1(M25) and Diffusion Tube Monitoring Site Locations Within and Close to AQMA No. 11.

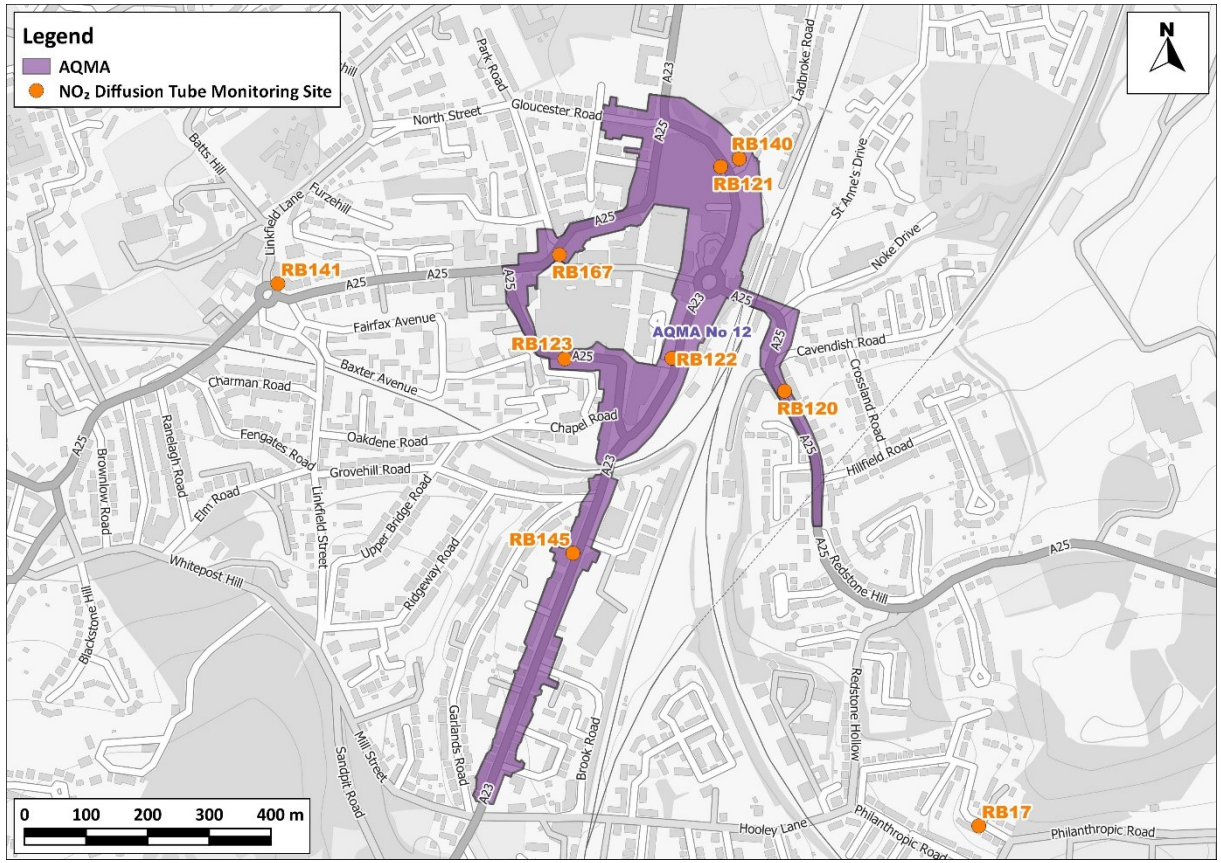

Figure D.1.7 AQMA No. 12 (Redhill) and Diffusion Tube Monitoring Site Locations Within and Close to the AQMA.

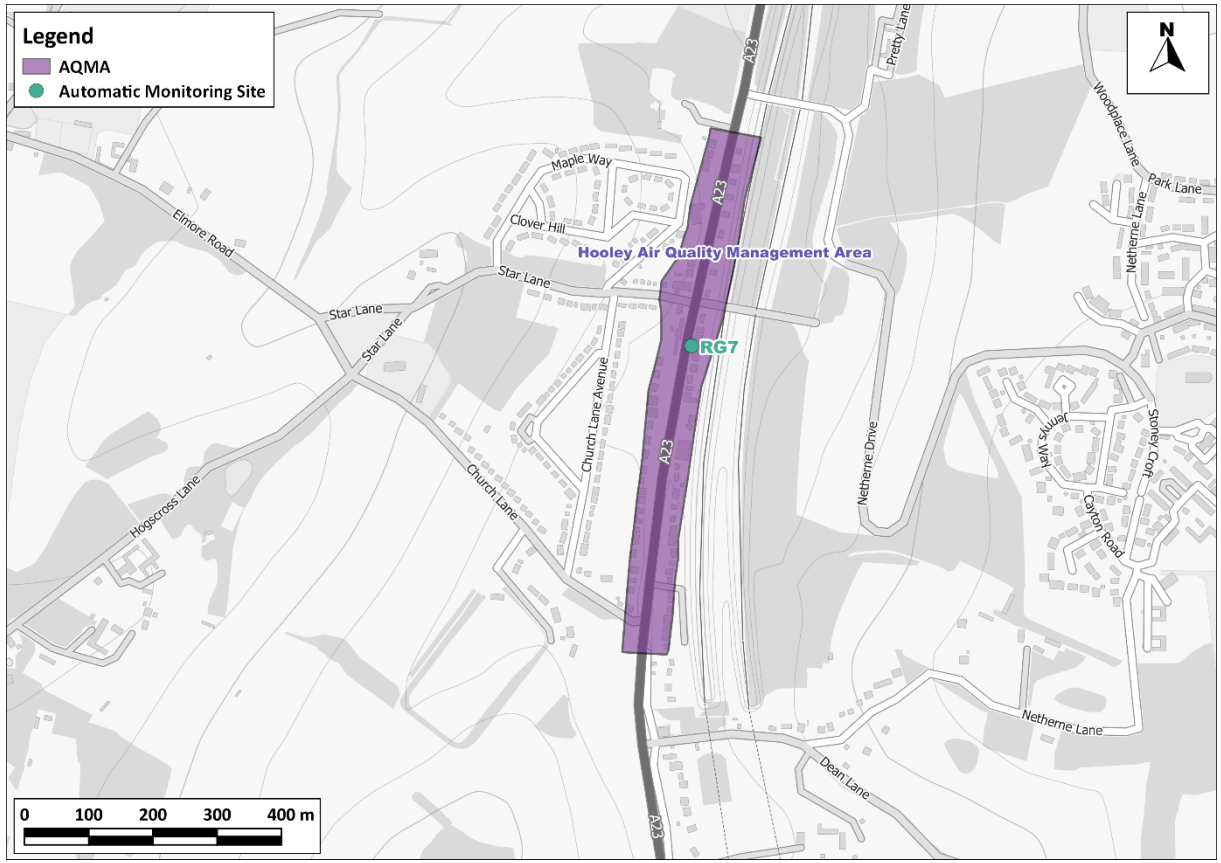

Figure D.1.8 AQMA No. 13 (Hooley) and Automatic Monitoring Site Location Within the AQMA.

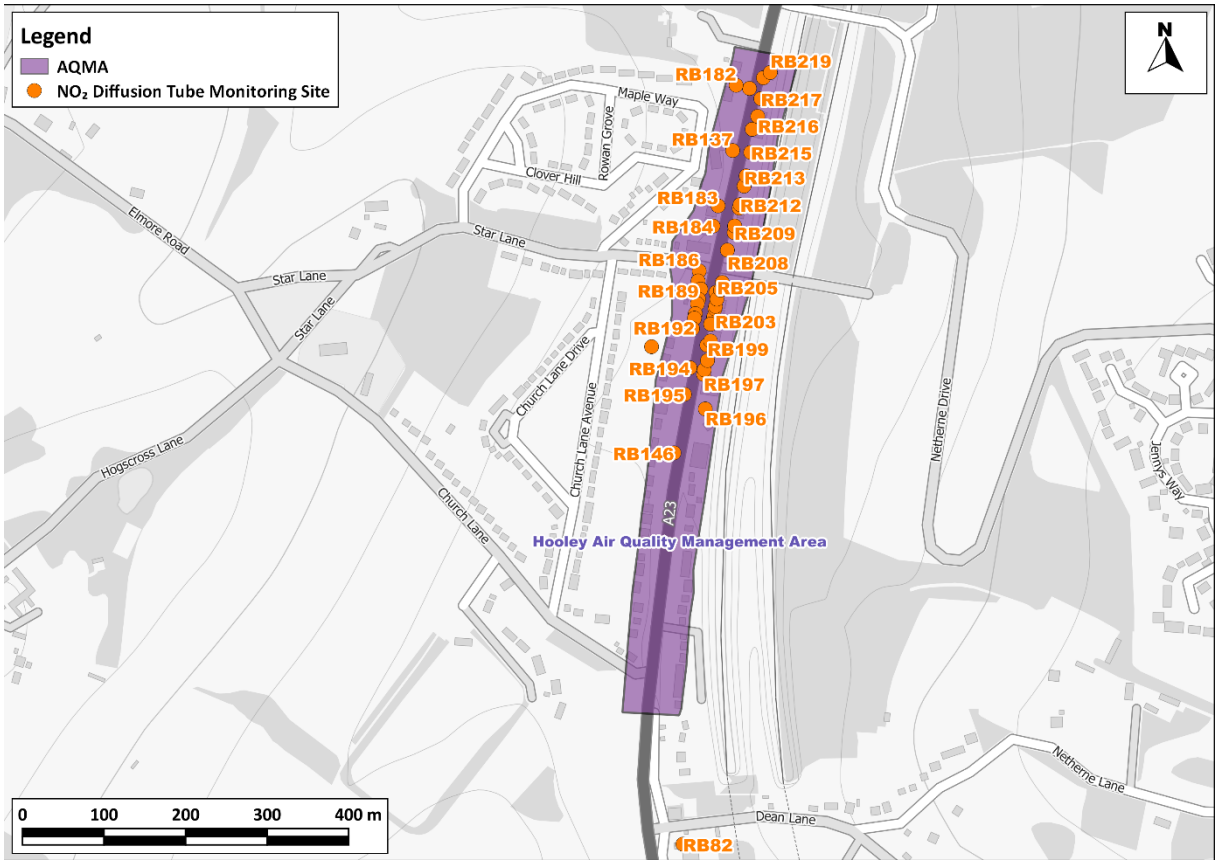

Figure D.1.9 AQMA No. 13 (Hooley) and Diffusion Tube Monitoring Site Locations Within and Close to the AQMA.

Figure D.1.10 Automatic Monitoring Site and Nitrogen Dioxide Diffusion Tube Monitoring Site Locations (South of London Gatwick Airport, Crawley Borough).

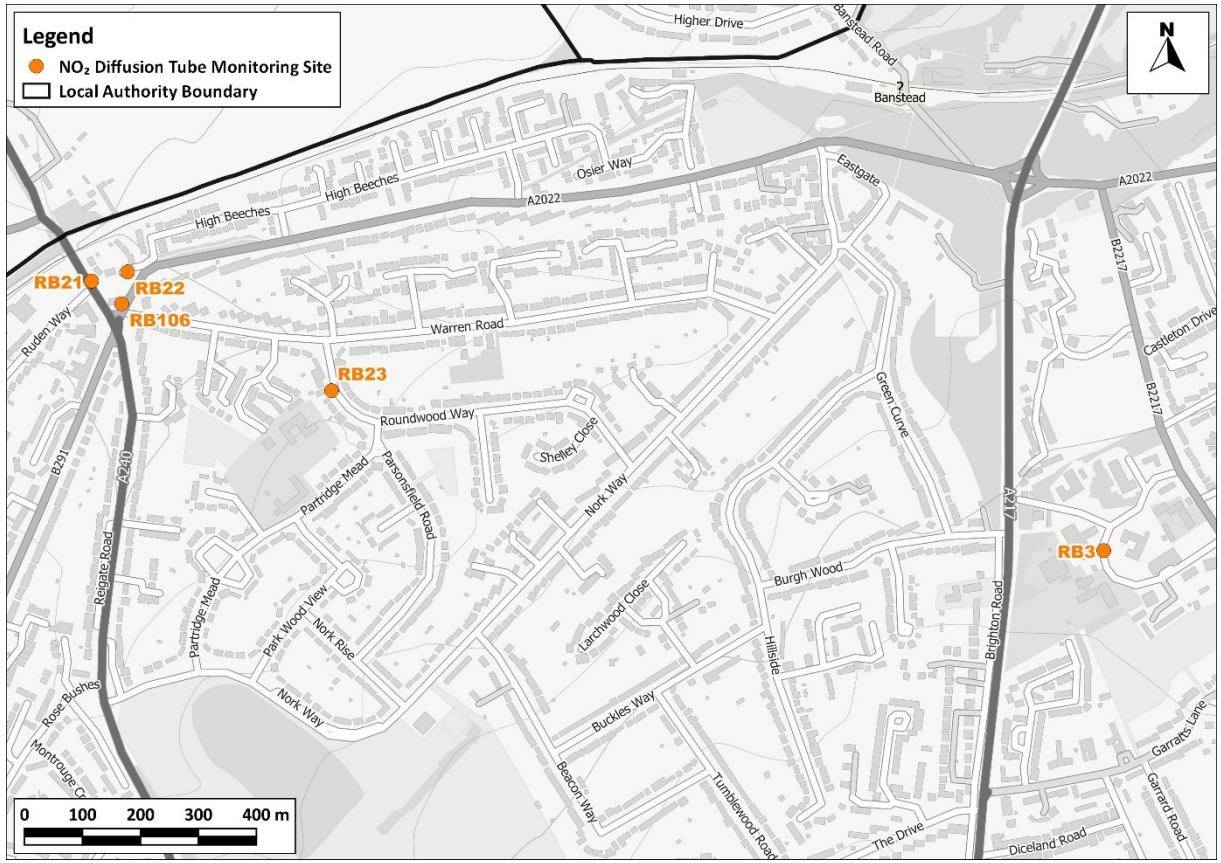

Figure D.1.11 Nitrogen Dioxide Diffusion Tube Monitoring Site Locations (Banstead) and Local Authority Boundaries.

Figure D.1.12 Nitrogen Dioxide Diffusion Tube Monitoring Site Location (M23, Tandridge District).

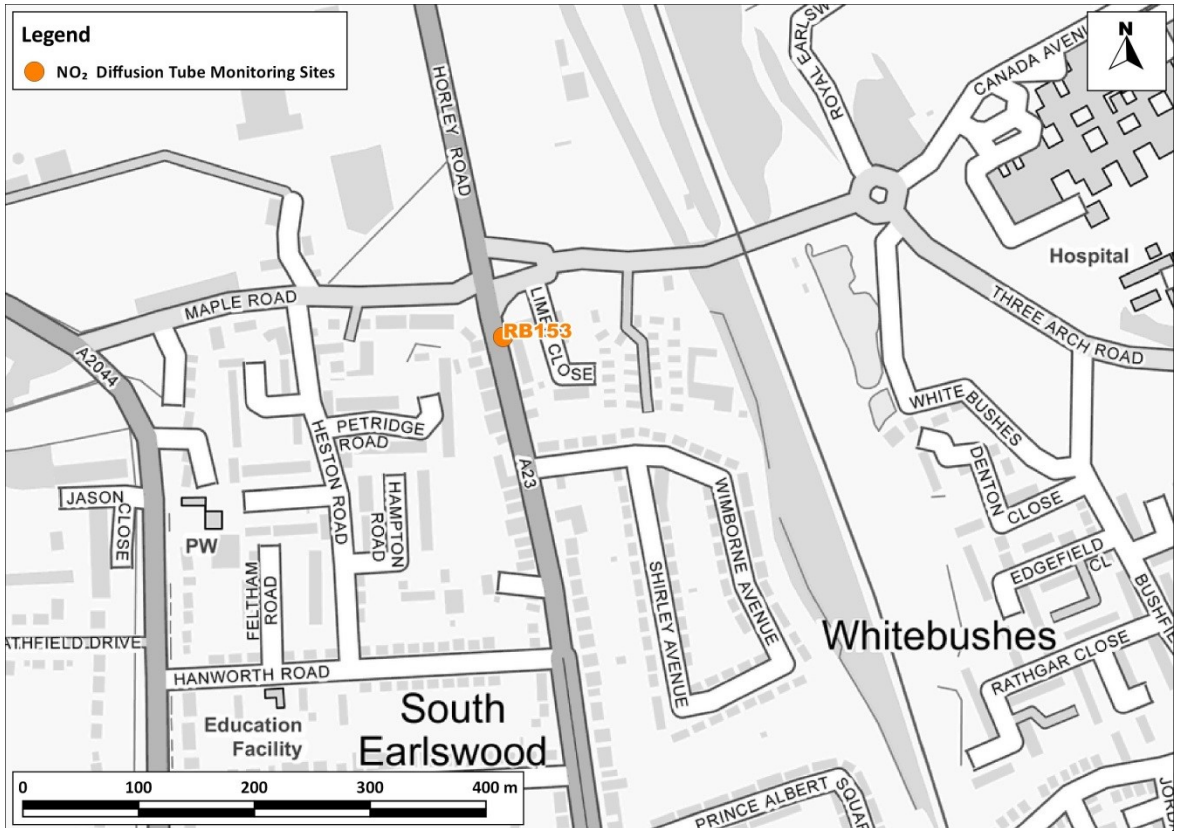

Figure D.1.13 Nitrogen Dioxide Diffusion Tube Monitoring Site Location (South Earlswood).

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[15]

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

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

Glossary of Terms

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

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Chemical hazards and poisons report: Issue 28. June 2022. Published by UK Health Security Agency
- Air Quality Strategy – Framework for Local Authority Delivery. August 2023. Published by Defra.