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: June 2024

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Executive Summary: Air Quality in Our Area

Air Quality in Horsham District 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.

[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

Horsham District is primarily agricultural in character and does not incorporate a significant heavy industrial base or major transport hubs. Air quality in the majority of Horsham district is good however there are a few areas where elevated concentrations of pollutants occur.

The main source of air pollution locally are road traffic emissions from major roads, notably the A24, which intersects the district north – south; A264 to the north of Horsham; A272 and A281 at Cowfold; and A283 at Storrington. Two Air Quality Management Areas (AQMAs) have been declared in the district, in the village of Cowfold (Cowfold AQMA) and town centre of Storrington (Storrington AQMA), both for the exceedances of the annual mean objective for nitrogen dioxide (NO_2).

Air Quality Action Plans (AQAPs) were prepared for both AQMAs; the Storrington AQAP was submitted to Defra in 2012 and the Cowfold AQAP in 2013 and both were updated in 2020. The preparation of a district-wide AQAP is ongoing and will be published following a public consultation. The new AQAP will present and discuss the last ten years' worth of monitoring data and modelling results for future NO_2 concentrations in the AQMAs and will contain a range of schemes and measures that Horsham District Council (HDC) wishes to take forward. More information about the AQMAs can be found on HDC's Air Quality webpage[3].

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[3] https://www.horsham.gov.uk/environmental-health/air-quality

Nitrogen dioxide (NO$_2$)

- Urban background and roadside nitrogen dioxide (NO$_2$) pollution has shown an improvement in the last five years. This is believed to have been driven to a large extent by general improvements in vehicle emissions standards but also to some extent by the implemented local traffic management measures, although it is difficult to isolate the impacts of individual interventions.

- In 2023, annual mean concentrations of NO$_2$ showed a decrease of 17 per cent at urban background sites and a decrease of 9 per cent at roadside sites from 2022 levels.

- There were no days of Moderate or higher NO$_2$ pollution in Horsham in 2023.

- In 2023, as in previous years, NO$_2$ pollution tended to peak in the rush hours and during weekdays. Concentrations at continuous monitoring roadside sites in 2023 during the working week were similar to concentrations on the weekend.

Particulate matter (PM10/PM2.5)

- Horsham Parkway is the only site that has monitoring data for PM$_{10}$ for the last five years. The site has shown a slightly increase of PM$_{10}$ in the last five years.

- Storrington Automatic Urban & Rural Network (AURN) started monitoring PM$_{2.5}$ and PM$_{10}$ in 2022.

- In 2023, annual mean concentrations of PM$_{10}$ showed an increase of 7 per cent at Parkway and a decrease of 2 per cent at Storrington AURN from 2022 levels.

- In 2023 annual mean concentrations of PM$_{2.5}$ at Storrington AURN showed an increase of 5 per cent from 2022 levels.

- Storrington registered one day of 'Moderate' PM$_{2.5}$ pollution in 2023.

- There were no days of Moderate or higher PM$_{10}$ pollution in Horsham in 2023.

- In 2023, the highest concentrations of PM$_{2.5}$ at Storrington AURN tended to occur during the spring and winter months, with a peak in February, recording 12 µg/m^3.

- Domestic combustion of wood and coal in stoves and open fires is a large contributor to emissions of particulate matter both in the UK, and across Europe, and is a large contributor towards elevated concentrations in winter months and during the evenings.

Although the work under the Local Air Quality Management (LAQM) is the legal obligation of district councils, actions aimed at improving air quality most of the time require the cooperation of other departments and organisations. HDC works in cooperation with other

stakeholders, such as planning, Public Health England, West Sussex County Council (WSCC) highways, neighbouring Local Authorities, Sussex Air Quality Partnership, and the Environment Agency.

The assessment and implementation of the identified traffic management schemes is done in cooperation with WSCC as they are the authority responsible for roads and transport management. Steering groups were set up for each of the AQMAs. They have contributed to the development of the Action Plans and are the decision-making body for the action plan measures to be taken forward. The Council is consulted on planning applications for HDC Development Management and WSCC minerals and waste.

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[4] 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 most harmful to human health. The Air Quality Strategy[5] provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero[6] 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.

Horsham District Council has taken forward several measures during the recent years in pursuit of improving local air quality. The key actions undertaken in 2023 were:

- Walk to School Week 2023

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[4] Defra. Environmental Improvement Plan 2023, January 2023

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

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

- Community engagement at Storrington Annual Parish Meeting
- Replacement and refurbishment of five vehicles in HDC's waste/recycling fleet have been approved
- New rapid electric vehicle charging points installed in Storrington and Billingshurst
- Public Consultation on proposals for walking, cycling and bus improvements in Comptons Lane, Horsham
- Trafalgar Neighbourhood Council has successfully been awarded a substantial contribution from its Community Climate Fund to encourage increased use of bicycles as a means of personal transport in Horsham District
- Sussex Air was successful with a bid submitted for the 2021/2022 Air Quality Grant for a number of projects. Including:
  - A Taxi engagement study, which Horsham District Council is leading. The purpose of this project is to facilitate a transition to electric vehicles by taxi and private hire drivers
  - Improving Sussex automatic monitoring network, new $PM_{2.5}$ analyser to be installed in Storrington or Cowfold in 2024
- Conclusion of Defra's Particulate Matter research study at Storrington AURN.
- Ongoing work with Planning Policy and Development Control to ensure the impacts of new development are mitigated and/or offset
- Continuation of the monitoring programme, which includes the operation and maintenance of three air quality monitoring stations, with the data and Air Alert forecasts shared at http://www.sussex-air.net
- Attending Defra's workshops for Local Air Quality Management and Sussex Air partnership meetings. With this, we can take informed proactive actions
- Air quality promotion via website and social media

Conclusions and Priorities

A decrease in NO_2 concentrations was observed across most sites in 2023 averaging -9% relative to 2022. Long-term sites across the district have shown a continuing overall downward trend over the monitoring period, indicative of a gradual improvement in fleet emissions and traffic management related measures.

Monitoring within Storrington AQMA showed a decrease of 5% relative to 2022. Storrington worst-location, diffusion tube 47 (Storrington 19n) at the junction of Manley's Hill and School Hill, within Storrington AQMA, was the only site within the district that

measured concentrations within 10% of the annual mean NO2 objective, recording 37.0µg/m3, showing a decrease of 3% compared to 2022.

Technically, HDC could proceed to revoking the West Street/High Street part of the Storrington AQMA, which has for several years been in compliance with the annual mean objective for NO2. However, continued action aimed at reducing traffic flows and congestion on the High Street has benefited the air quality within the whole of the AQMA. As such, no changes are proposed at present and the boundaries of the Storrington AQMA can remain unchanged.

Monitoring within Cowfold AQMA showed a decrease of 4% when compared to 2022. It is expected that the Cowfold AQMA will be revoked in the coming years. It is acknowledged that the traffic volumes were significantly reduced in the pandemic, which may have invalidated the results for 2020-2021.

WHO recommended 2021 Air quality guidelines level for NO_2 annual mean is 10 µg/m3. Based on this guideline all sites in Horsham District, except for background sites, were above WHO guidelines in 2023.

Horsham took part on Defra's one-year Particulate Matter research study in 2022/23. Regarding particulate matter, automatic monitoring at the Horsham Park Way and Storrington AURN sites indicates that both the annual mean and 24-hour UK objective were complied with in 2023 and all the previous years of monitoring. Horsham Park Way PM_{10} concentrations have been relatively constant trend in the past five years.

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 sets the target to ensure that the annual mean concentration of $PM_{2.5}$ in ambient air is equal to or less than 10 micrograms per cubic metre ($µg/m^3$) by 31st December 2040. The 2040 target was achieved by Storrington AURN in 2023.

WHO recommended 2021 Air quality guidelines level for $PM_{2.5}$ and PM_{10} annual mean is 5 and $15µg/m^3$ respectively. Horsham Park Way was above WHO guidelines in 2022 for particulate matter. Storrington AURN meets the level for PM_{10}, but not for $PM_{2.5}$.

The Council's priorities for the coming year are:

- Publishing the update of the Air Quality Action Plan for Storrington and Cowfold
- Conclusion of the Defra-funded taxi engagement campaign to facilitate a transition to EV vehicles by taxi drivers

- Continued work with Planning Policy and Development Control to secure air quality mitigation from new development
- Continuation and expansion of the monitoring programme, to include monitoring for particulate matter in Cowfold
- Community engagement through participation in the Defra's funded Sussex-Air Community Engagement project
- Improvements to the air quality website and communications to make air quality information more accessible to the public
- Exploring the viability of a Smoke Control Area declaration
- Reduction in solid fuel burning
- Delivery of the HDC's vehicle replacement programme
- Expansion of Electric Vehicle and infrastructure Network
- Promotion of Public Transport usage, youth travel cards and bus passes
- Continued work with WSCC to increase the rate of active travel to and from schools
- Continued work with the steering groups on the development and implementation of AQAP measures
- Participation in the next bid for Defra's air quality funding
- Internal applications for s106 funding to facilitate the implementation of actions within the AQAP

The main challenges and barriers to implementation that HDC anticipates facing are:

- Availability of resources and funding for AQAP measures
- Challenges related to cost-effectiveness and enforcement of measures to tackle localised air pollution hotspots in rural areas where problems arose due to through traffic

Local Engagement and How to get Involved

The public can get involved by supporting behavioural change initiatives such as car sharing, walking, cycling, using public transport, joining the Car Club, buying zero-emissions vehicles for personal and commercial travel, turning liquid fuelled vehicle engine's off when stationary, minimising wood burning and only burning dry, well-seasoned wood and composting instead of having bonfires wherever possible. More

information on how to get involved can be found at Help to improve Horsham District's air quality page[7].

The air quality data monitored contributes to Sussex Air daily air pollution prediction service 'Sussex Air Quality Alert[8]. This service is free to the public and helps people with respiratory and heart conditions who may be adversely affected by air pollution. Previous qualitative survey work established that subscribers to the service value it as an important resource.

Two air quality Steering Groups have previously been established in the district: Storrington Steering Group and Cowfold Steering group. Their objective is to progress the work on the Storrington and Cowfold Action Plans. Each group is a partnership of Councillors and officers from Horsham District Council and West Sussex County Council and includes representatives from the Parish Council. For further information on the work being done, please visit the Horsham District Council website[9] or contact:

▪ Environmental Health and Licencing Department: tel. 01403 215609; email: ehl@horsham.gov.uk

▪ https://www.horsham.gov.uk/environmental-health/air-quality

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Horsham District Council with the support and agreement of the following officers and departments:

- Sussex Air
- Horsham District Council Sustainability Officer
- West Sussex County Council Transport Planning and Policy Senior Planner
- Public Health Head of Emergency Preparedness and Health Protection Nurse

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[7] https://www.horsham.gov.uk/environmental-health/air-quality/help-improve-horsham-districts-air-quality

[8] https://sussex-air.net/sussex-air-quality-service-for-sussex/

[9] https://www.horsham.gov.uk/environmental-health/air-quality

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1 Local Air Quality Management

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

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

2 Actions to Improve Air Quality

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.

A summary of AQMAs declared by Horsham District Council can be found in Table 2.1. The table presents a description of the two AQMAs that are currently designated within Horsham District 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 pertinent to the current AQMAs designations is NO_2 annual mean.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Horsham AQMA No1	Dec-10	NO_2 Annual Mean	Storrington town centre incorporating West Street, the High Street, and part of School Hill and Manleys Hill.	NO – Roads controlled by WSCC	$50.2 \mu g/m^3$ (Storrington 1,2)	$37.0 \ \mu g/m^3$ (Storrington 19n)	4 years (2019 – 2023)	Storrington Air Quality Action Plan, October 2012 (updated in 2020)	https://www.horsham.gov. uk/environmental-health/air-quality/air-quality-reports-and-assessments
Horsham Cowfold AQMA	Oct-11	NO_2 Annual Mean	Cowfold town centre incorporating The Street, part of Station Road and Bolney Road.	NO – Roads controlled by WSCC	$40.5 \mu g/m3$ (Cowfold 1,2) $45.9 \mu g/m^3$ (Cowfold 7n)	28.3 (Cowfold 7n)	5 years (2019 – 2023)	Cowfold Air Quality Action Plan, September 2013 (updated in 2020)	https://www.horsham.gov. uk/environmental-health/air-quality/air-quality-reports-and-assessments

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

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

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

Defra's appraisal of last year's ASR concluded that on the basis of the evidence provided, the conclusions reached were accepted for all sources and pollutants.

Horsham District 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. 18 measures are included within Table 2.2, with the type of measure and the progress Horsham District 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 within Table 2.2.

More detail on these measures can be found in their respective Action Plans and previous Annual Status Reports at HDC's Air Quality Reports and Assessments page. Key completed measures are:

- Promotion of Walk to School Week with the support of Environmental Health, neighbourhood wardens, parking services, Sussex police and Fire brigade
- Replace and refurbish five vehicles in HDC's waste/recycling fleet
- Improvement of electric vehicle charging network, including work with developers of new developments
- Sussex Air was successful with a bid submitted for the 2021/2022 Air Quality Grant for a number of projects. Including:
  - A Taxi engagement study, which Horsham District Council is leading. The purpose of this project is to facilitate a transition to electric vehicles by taxi and private hire drivers.
  - Improving Sussex automatic monitoring network, new $PM_{2.5}$ analyser to be installed in Cowfold in 2024
- Ongoing work with Planning Policy and Development Control to ensure the impacts of new development are mitigated and/or offset
- Continuation of the monitoring programme, which includes the operation and maintenance of three air quality monitoring stations, with the data and Air Alert forecasts shared at http://www.sussex-air.net

- Attending Defra's workshops for Local Air Quality Management and Sussex Air partnership meetings. With this, we can take informed proactive actions
- Air quality promotion via website and social media

Horsham District Council's priorities for the coming year are:

▪ Publishing the update of the Air Quality Action Plan for Storrington and Cowfold

▪ Deliver Electric Vehicle event as part of the Defra-funded taxi engagement campaign to facilitate a transition to EV vehicles by taxi drivers

▪ Continued work with Planning Policy and Development Control to secure air quality mitigation from new development

▪ Continuation and expansion of the monitoring programme, to include monitoring for particulate matter

▪ Community engagement through participation in the Defra's funded Sussex-Air Community Engagement project

▪ Improvements to the air quality website and communications to make air quality information more accessible to the public

▪ Exploring the viability of a Smoke Control Area declaration

▪ Delivery of the HDC's vehicle replacement programme

▪ Expansion of Electric Vehicle Network

▪ Continued work with WSCC to increase the rate of active travel to and from schools

▪ Continued work with the steering groups on the development and implementation of AQAP measures

▪ Participation in the next bid for Defra's air quality funding

▪ Internal applications for s106 funding to facilitate the implementation of actions within the AQAP.

Horsham District Council worked to implement these measures in partnership with the following stakeholders during 2023:

- Planning Officers
- Public Health England
- WSCC highways

- Neighbouring districts local authorities
- Sussex Air Partnership
- Environmental Agency

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Horsham District Council anticipates that further measures not yet prescribed will be helpful to accelerate the achievement of compliance and enable revocation of Storrington AQMA aside from general improvements in vehicle emissions standards. This conclusion is drawn on the basis of current monitoring results from Storrington 19n (Diffusion Tube 47) - the worst-case monitoring location in the Storrington AQMA.

The principal challenges and barriers to implementation that Horsham District Council anticipates facing are the identification of schemes that are feasible, deliverable and can generate a positive business case and having funding to pursue bigger projects. The achievement of congestion improvement measures in Storrington and Cowfold has been challenging as there are no easy solutions, and many of the solutions fall outside the power of HDC to implement.

Defra's air quality grant scheme provides funding to eligible local authorities to help improve air quality. Horsham District Council applied for a Lot 1 project for the Air Quality Grant Scheme 2023/24 - projects that will improve local air quality, especially in areas that are projected to remain in exceedance of local air quality objectives, such as for nitrogen dioxide.

> The project proposed involved a NO_2 reduction programme in the Storrington AQMA, which contains aspects of data collection and traffic profiling, air quality monitoring, and a community campaign to improve public knowledge, understanding, and awareness around air quality and climate change, and how the issues interact, and steps that individuals can take to reduce contributions and exposure to NO_2 and Particulate Matter and carbon footprint.

The air quality improvements expected from the proposed project were:

> 1. Reduce local NO_2 and PM emissions in the Storrington AQMA, where annual mean levels are still monitored above the objective level (measuring within 10% of the AQO limit (≥ 36 $\mu g/m^3$) in 2021 and 2022).

> 2. Engage with the local community about air quality and climate change, how the issues interact, and steps that individuals can take to reduce their personal air pollution emissions and carbon footprints.

3. Raise the profile of Air Quality in Horsham and share the learnings and outcomes of this project to the wider Sussex-Air councils' group.

4. Promote the 'Sussex Air Quality Alert Service' which sends free messages direct to vulnerable people informing them about air pollution levels, and the 'Sussex-Air' regional air quality resource.

After being notified about our successful application, with very high scores for deliverability, air quality benefits and social inclusivity, Defra have decided to withhold local council grants for air quality improvement projects. As a consequence, we are seeking alternative funding for the core elements of the project.

Community Engagement

Walk to School Week is a five-day challenge promoted by Living Streets to celebrate walk to school in May. Walk, cycling or scooting to school is good for:

- Physical health
- Mental health
- Local air quality
- Environment
- School Safety

Environmental Health, Parking and Neighbourhood Wardens teams met up with West Sussex Fire & Rescue Service and Sussex Police to talk with parents and pupils about the benefits of walking to school.

In 2023 the Arunside Primary School organized a walking bus and parents were advised to park a little away from the school, which reduced congestion and air pollution at the school gates and improved road safety for everyone (Figure 2.1).

Figure 2.1 – Walk to School Week 2023

In May 2023 HDC officers also participated in Storrington Annual Parish Meeting. The presentation contained information about how air pollutants are measured and monitored and where to find information; measures implemented by the Steering Group to address air quality; air quality trends in Storrington AQMA. Following the presentation members of the public expressed their concerns and there was a Q&A session. Meeting agenda, minutes and the air quality presentation are available on Storrington Parish Council website.

Horsham District's residents are currently heavily reliant on private vehicles for transport. This is largely because of the rural nature of the District, meaning amenities and services are further than 15-minutes' walk or cycle away, and due to infrequent public transport systems that are viewed as inconvenient and unreliable by local people. There is a significant need for behaviour change of local residents, for them to move towards active transport or lower carbon options. This will have a direct impact on air quality as well as the net zero efforts, abuilding demand and driving investment into public transport improvements. The Local Cycle and Walking Infrastructure Plan (LCWIP) adopted 2020, is also expected to improve active transport in and around Horsham Town but again ensuring behaviour change alongside this Strategy will be key to its success.

Promotion of Electric Vehicles

Because Horsham District relies on car transport, it will be essential to ensure that the District supports a transition to electric cars. In December 2019 WSCC approved an

Electric Vehicle (EV) Strategy for West Sussex[10]. A Task and Finish Group considered residents' opinions expressed via a resident survey asking what would help people switch to electric vehicles, and a later full consultation on the draft strategy.

Infrastructure is already being put in place to enable this transition, in March 2020 HDC approved its Electric Vehicle (EV) Charge Point Strategy which aims to enable the provision of EV infrastructure across the district. In the end of 2021, HDC and WSCC signed a contract with Connected Kerb which will enable a large scale roll out of electric vehicle charge points across the county and the Horsham District within the next decade.

For the Horsham District, this project will see thousands of charge points installed on streets, in public sector car parks and on community facilities, helping many drivers without off street parking to go electric. Over 45 charge points have already been installed in Horsham District, with works planned for an additional 28 charge points in Council car parks. In 2023, residents were asked for their comments on the proposed on-street site locations. More information can be found in HDC's electric cars and charging points page.

Horsham District council continued with the programme of fleet replacement by buying four electric vans to replace diesel vehicles in the Recycling and Waste Service (Figure 2.2).

Figure 2.2 – Electric sweepers in Horsham Town Centre

Sussex Air was successful with their bid for the 2021/2022 Air Quality Grant which included a Taxi Study. The aim of the proposed taxi engagement project is to facilitate a transition to EV vehicles by taxi drivers and it will help the district to build an infrastructure

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[10] https://www.westsussex.gov.uk/roads-and-travel/travel-and-public-transport/travelwise-sustainable-transport/electric-vehicles/#electric-vehicle-strategy

that is convenient, reliable and works for the taxi trade and will drive the progression of taxi licensing policies for EV drivers.

In 2022, two mini forums were organized in partnership with Energy Saving Trust. The first in October for licensing officers across Sussex and the second, in November, for Councillors and elected members across Sussex. EST explained how EV work, how to charge them and busted some common myths. They also covered the business case for making the switch to EVs and examined some of the EV market offerings for taxi and private hire drivers.

In 2023, two surveys – East Sussex and West Sussex – were available to gauge opinions about electric vehicles from the taxi and private hire trade across Sussex. The outcomes of the study were passed to Connected Kerb to follow on with technical and financial feasibility surveys to enable installations at the proposed sites. A summary of the results from the surveys are available on [Sussex Air Taxi Project page](#).

Storrington AQMA measures

The Storrington Air Quality Action Plan was submitted to DEFRA and published on the Council's website in October 2012. Most of the actions set out in the 2012 Plan have either been completed or retracted due to low effectiveness or because they are considered unfeasible. The most recent review of the identified measures took place in June 2022. The review note, produced by the officers of HDC and the County Council can be downloaded from the Council's website[11].

Prohibition of lorries turning right into School Hill from Manley's Hill within the Storrington AQMA

In 2022 West Sussex County Council and Storrington & Sullington Parish Council undertook a review of the 7.5T weight limit restriction on the B2139 School Hill and 283 Manley's Hill in Storrington. This restriction is marked "Except for Access" with an additional plate, where this refers solely to any side road access, delivery, or collection point between the restriction signs. The restriction has been in place since 2019 as one of

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[11] https://www.horsham.gov.uk/environmental-health/air-quality/storrington-air-quality-management

the measures implemented to improve air quality within the designated Air Quality Management Area (AQMA).

As part of this review, a CCTV traffic survey was undertaken of Goods Vehicles entering from either end of the restriction and an additional CCTV camera was located within the restriction length. After the survey, 51 letters were sent to companies that were breaching the 7.5T weight limit restriction and more signs were installed (Figure 2.3).

There are challenges with enforcement of breaches of weight restriction for HGVs accessing B2139 School Hill. Local Transport Authorities can now apply for 'Part 6' powers to enforce 'moving traffic offences' which would include Traffic Regulation Order breaches such as in relation to this weight restriction. WSCC is reviewing the practicalities of applying for these enforcement powers, including the business case for back-office arrangements for enforcement before considering what sites would be most appropriate to enforce.

Figure 2.3 – Weight restriction signs in Storrington

Review of on-street car parking and loading bay provision

Parking issues within the village have been identified as contributing to congestion within the AQMA. One issue at the western end of the village near to the Amberley Road mini-roundabout was resolved in 2019 by a Traffic Regulation Order to remove a parking bay that was causing congestion. As a result, the monitoring site Storrington 11n showed a significant decrease in NO_2 concentrations in 2019 compared to the previous year 2018.

Other parking areas have been identified as causing congestion on a regular basis. Further detailed evaluation could be considered to understand the causes of congestion through the High St/West St related to the interactions of the pedestrian crossings, junctions, parking and deliveries. The scheme could entail re-designation of on-street car

parking spaces as dedicated loading bays, to better manage arrangements for goods vehicles stopping on the carriageway.

West Sussex County Council has a programme of reviews in relation to on-street parking management it is undertaking across larger towns across West Sussex and a light touch version of this could be an avenue through which to progress this evaluation further. The purpose of this would be to consider the longer-term strategy for parking management within the village, evaluate both the current and future demands for parking space provision and investigate optimised use of available spaces and look at options for improvement.

Progression of a parking review for Storrington would be dependent on the availability of a local funding resource, as the county's current programme resources (and hence funding resources) are already allocated elsewhere.

Review two pedestrian crossings along the High Street/West Street

Both crossings have previously been upgraded to Puffin crossings (they use kerbside detectors to cancel demands on the crossing no longer required). The crossings use 'vehicle actuation' technology and were linked in 2017 during peak traffic flow times in attempt to smooth vehicle flow. The crossings do not include microprocessor technology (Microprocessor Optimised Vehicle Actuation - MOVA). This technology has the potential to enable green/red phase timings to react to periods of high air quality sensitivity and to prioritise traffic movement at peak times. To progress the scheme, a site study is needed to explore if MOVA technology is technically feasible to be delivered. However, there are doubts about how much any further benefits could be realised because of blocking back caused by the other mini-roundabout and traffic interactions along the High Street.

Working with local businesses

- Alternative Refuelling Options: Encourage provision of electric vehicle charging points at local business and public car parking spaces. Ensure compatibility of EV charging points to enable link to "Charge your Car" pay as you go network.

- Community minibus – enhance existing Storrington minibus service by replacing existing diesel fleet with Low /Zero emission vehicles. Funded by local businesses or new developments via planning contributions.

- Improve local bus service – Liaise with local PSV operators to encourage improvements in vehicles entering the AQMA to Euro IV/V standard. Consider

subsidising strategic bus services to village schools via grant funding/Section 106 contributions to address 'school-run' traffic peaks. Investigate provision of local real-time bus information at bus stops to promote use.

▪ Transport Plans/ Travel Plans: Promote to existing businesses and new developments innovative solutions: e.g. low emission incentives; driver training; car share schemes; car clubs.

▪ Freight Delivery Partnership / Fleet Operator Recognition Scheme Standard: Encourage use of WSCC advisory lorry route rather than A283 through Storrington AQMA for longer distance lorry movements; investigate opportunities for local and shared deliveries; Encourage use of low emission delivery vehicles to local stores within AQMA.

Cowfold AQMA measures

Cowfold Action Plan was submitted to DEFRA and published on the Council's website in September 2013. Similar to the Storrington Plan, most of the actions set out in the Cowfold Action Plan have either been completed or retracted due to low effectiveness or because they are deemed unfeasible. The most recent review of the identified measures took place in September 2017. The review note, produced by the officers of HDC and the WSCC can be downloaded from the Council's website[12].

Improved signage on strategic routes to discourage longer distance lorry traffic using the A272 through Cowfold

The following data is based on the maximum possible theoretical impact of installation of advisory signs for lorries on 4 route options on the A24, A272 and A23 deterring HGV traffic from taking the route through the Cowfold AQMA. An assessment of the movement of vehicles (particularly HGVs) through Cowfold was carried out in Spring 2019, based on 12-hour 0700-1900 traffic flows. Within the 12-hour flow on the A281 Cowfold High Street there was 6% HGVs of which 23% could be considered transferable movements to other routes. The conclusions were that only a small number of HGVs could potentially be re-routed away from Cowfold village centre. The survey data did not include details of the

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[12] https://www.horsham.gov.uk/environmental-health/air-quality/cowfold-air-quality-management

specific origins or destinations of these flows beyond the survey cordons located at the junctions of the A23 and A24, so not all of these candidate flows would be suitable for transfer.

Further consideration of whether this level of candidate transferrable movement is significant in air quality terms would be needed before a decision could be taken to explore this measure further, however it is noted that since the survey in 2019 there have been 5 years of compliance with the air quality objectives in Cowfold. It should also be noted that it was unclear what wording could be included on any signs so that messages would be clear and effective to drivers. Also, it could not be established that there would be sufficient controls available to agencies to enforce removal of this traffic. These issues, together with the anticipated cost of the scheme, means that the scheme has not been pursued further at this time.

Review on-street car parking and loading bay provision

This would entail potential changes to on street parking and to delivery arrangements for businesses in the centre of Cowfold. This measure was originally identified in the Action Plan in relation to delivery arrangements to the Coop before it moved to the former Old Coach House pub site. At present, there are not known to be significant on-street car parking or loading issues within Cowfold affecting air quality receptor hotspot locations through the village. Therefore, no specific action is proposed at this point in time. However, any planning applications coming forward for use of the former Coop building, as well as any continuing or emerging community concerns about on street parking or loading issues should be monitored in relation to air quality impacts.

Promotion of alternative travel options

This includes a number of measures focusing on working with local businesses, promoting electric vehicles, improving public transport, promoting travel plans, encouraging walking, and cycling, and working with schools. These schemes are being investigated through various delivery avenues and are subject to different feasibility and value for money considerations.

A27 Improvements

The Road Investment Strategy produced by DfT in March 2015 allocated a budget for the A27 schemes including the A27 Arundel bypass and A27 Worthing and Lancing improvements. The new bypass will feature approximately 8km of dual two-lane

carriageway to the south of the existing A27. Starting at Crossbush, the route will reconnect with the existing A27 in the west near the A27/A29 Fontwell (east) roundabout. This is expected to reduce traffic flows through Storrington where longer distance traffic is avoiding the A27 due to congestion. It is also expected to reduce traffic flows through Cowfold where longer distance traffic is avoiding the A27 due to congestion (for example longer distance journeys between Haywards Heath and Chichester).

Sussex Air

The Sussex Air Quality Network was established in 1995 to support the local authorities across Sussex in their duties to monitor and report air quality under the Local Air Quality Management (LAQM) framework requirements as set out under Part IV of the Environment Act 1995.

The network was developed by the Sussex Air Quality Partnership, which is made up from the Sussex local authorities and Public Health bodies. Since it was established, the Partnership has developed a comprehensive regional monitoring network, which currently (end 2023) has twelve continuous air quality monitoring stations (AQMS) in operation. The network also incorporates data from five national Automatic Urban and Rural Network (AURN) air quality monitoring stations located in Sussex: this enhances the network to a total of seventeen air quality stations across Sussex (Figure 2.4).

Figure 2.4 - Sussex Air Network

The full list of site information and all "live" and historical data is provided on the Sussex-air website: http://www.sussex-air.net.

Air Alert

The [Sussex Air Quality Alert](#) service was established over 15 years ago to provide a Sussex-wide air pollution forecasting and FREE alert service to support vulnerable persons such as those with respiratory and heart conditions and the public. The service was enhanced from March 2022 to provide a more detailed forecasting service to 32 locations across Sussex, a higher spatial resolution than the previous regional approach, which focused on three broad sub-regional areas. Local alerts in Horsham district are available for Billingshurst, Horsham, Storrington and Steyning.

The Daily Air Quality Indices (DAQI) are provided to identify where exceedances of health-based thresholds occur across the network. The system uses an index divided into four bands to provide more detail about air pollution levels in a simple way; these bandings range from Low, Moderate, High to Very High. The overall air pollution index is calculated from the highest index value of five pollutants: Nitrogen Dioxide, Sulphur Dioxide, Ozone, Carbon Monoxide and Particles < 10μm (PM_{10}).

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	Storrington Low Emission Zone feasibility Study	Traffic Management	UTC, Congestion management, traffic reduction	2012	2030	HDC / WSCC / Storrington Parish Council	Section 106	No	Partially funded	£50k - £100k	Planning	Significantly reduce levels of HGVs, achievement of annual mean air quality objective	Traffic count, measured concentration at Storrington mini roundabout	2014-16 Project Trial available at Storrington AQMA page	In 2014-16 a trial was undertaken in partnership with Siemens UK using their Greenzone low emission zone solution. It is expected that there would still remain significant challenges with the practical enforcement of any restrictions and exemptions required for local access even if previous technological issues including signal reception and data connection problems are overcome.
2	Electric vehicle charging network	Promoting Low Emission Transport	Other	2020	2031	HDC / WSCC	Connected Kerb	No	Funded	£500k - £1million	Implementation	Small initial impact on emissions but aim to facilitate the uptake of more LE vehicles.	Increase % of charging points installed on streets	Contract with Connected Kerb which will enable the large scale to roll out of thousands of public electric vehicle charge points across the district within the next decade was signed in 2021.	Over 45 on street charge points have been installed in Horsham District, with works planned for an additional 28 chargepoints in council car parks. More information available on HDC Electric cars and charging points webpage
3	Air quality and emissions mitigation guidance for Sussex	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2014	Ongoing	HDC / Sussex Air	HDC	No	Funded	<£10k	Implementation	1% in the AQMA	Reduction in emissions from transport associated with new development through mitigation and	The updated guidance (2021) has been published on HDC website and its application is tested in HDC	Sussex Air partners are reviewing the guidance.

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
													compensation. Assessment of emissions from development required with application. Scheme of mitigation required.	and neighbouring districts within Sussex. It provides advice to developers on how to address local air quality when making a planning application.	
4	Taxi Study	Promoting Low Emission Transport	Taxi emission incentives	2021	2024	HDC / WSCC / Sussex Air / Lets Experience Electric / Energy Savings Trust / Connected Kerb	Defra and LA	Yes	Funded	£10k - £50k	Implementation	Small initial impact on emissions but aim to facilitate the uptake of more LE vehicles.	Increase % of ULEV's by Taxis and private hire vehicles	Bid for the air quality grant was successful. In 2022, Energy Saving Trust's Local Government Support Team offered a mini forum for taxi licensing officers and elected members of Sussex to explain more about electric vehicles. Taxi and Private hire Survey in 2023 to gauge opinions about EV.	Taxi engagement campaign to facilitate a transition to EV vehicles by taxi drivers across Sussex. More details available on Sussex Air webpage
5	Community Engagement	Public Information	Via other mechanisms	2021	2023	HDC / Sussex Air / Sustrans	Defra and LA	Yes	Partially Funded	£10k - £50k	Implementation	No direct impact on emission reductions	Awareness raising events, attending community events with interactive stalls, online training and knowledge building events for community groups and distribution of NO2 diffusion tubes.	Air Quality Bid for the 2021-22 air quality grant was successful.	

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
6	Replacement of HDC vehicle fleet	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	2013	Ongoing	HDC	HDC	Yes	Partially Funded	£500k - £1million	Implementation	Small initial impact on emissions but aim to facilitate the uptake of more LE vehicles.	Introduction & increase % of ULEV's into Council's vehicle fleet.	Replacement of HDC Neighbourhood Wardens vehicle fleet from petrol to hybrid vehicles. Vehicles that ran on diesel were switched to sustainable-sourced Hydrogenated Vegetable Oil (HVO) fuel. All electric sweepers for Horsham's town centre.	
7	Sussex Air network and website	Public Information	Via the Internet	2012	Ongoing	Sussex Air / HDC	LA	No	Funded	£50k - £100k	Implementation	No direct impact on emission reductions but optimising use of monitoring network data	Increase access to the website	Information on how to help improve air quality, air quality projects, health advice, health effects and real time air quality information	
8	Walking and Cycling Measures	Promoting Travel Alternatives	Other	2012	Ongoing	HDC / WSCC	HDC / WSCC	No	Partially Funded	£1million - £10k million	Implementation	Their direct impact on air quality issues in the short to medium are not likely to be significant, however they form part of a wider approach of promoting a culture of using alternative travel options to single occupancy car use.	Increase in active travel	Potential WSCC Local Transport Improvement Programme (LTIP) walking and cycling path improvement identified to link Water Lane with Hurston Lane using Riverside Walk and Public Rights of Way. Horsham Town's Local Cycle and Walking Infrastructure Plans (LCWIP) identifies cycling and walking	Proposals for the Water Lane to Hurston Lane improvement require the support of local schools to progress.

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
														improvements in Horsham Town. The plan takes a long-term approach to developing cycling and walking networks across the town centre.	
9	Reduce single occupancy car use by supporting carpool and car sharing schemes, and other modes of transport.	Alternatives to private vehicle use	Car & lift sharing schemes	2023	Ongoing	HDC	LA	No	Not funded	< £10k	Planning	Their direct impact on air quality issues in the short to medium are not likely to be significant, however they form part of a wider approach of promoting a culture of using alternative travel options to single occupancy car use	Reduction in single occupancy car use		
10	AirAlert	Public Information	Via other mechanisms	2006	Ongoing	Sussex Air / HDC	Sussex Air	No	Funded	< £10k	Implementation	No direct impact on emission reductions but optimising use of monitoring network data for health associated benefits.	Increase in subscriptions to pollution alert service within Horsham District.	Health study started in 2006. Increase in subscriptions. Cold and heat alerts added to service over the recent years. In 2022 the Service was upgraded to include more areas	
11	[Storrington] Review on-street car parking and	Traffic Management	UTC, Congestion management, traffic reduction	2013	On hold	HDC/WSCC	WSCC	No	Not Funded	< £10k	On Hold	1% in the AQMA	Reduction in nitrogen dioxide concentrations in Storrington.	Some issues related to the scheme: The potential impact of	A more detailed air quality assessment of changes to and re-designation

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
	loading bay provision												Improved traffic flow / reduction in traffic congestion.	congestion related air quality issues associated with deliveries and parking is not known; Potential sensitives regarding changes to availability of parking; The need to meet the needs of local businesses requiring deliveries.	of parking-bays and loading bays could be investigated further. Progression of a review will likely require local support and identification of resource to support this.
12	[Storrington] Installation of CCTV equipment at the mini-roundabout of School Hill and Manley's Hill to enforce the weight restriction for HGVs accessing School Hill.	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2019	On going	HDC/Storrington & Sullington Parish Council	WSCC	No	Partially Funded	£50k - £100k	Implementation	1% in the AQMA	Reduction in nitrogen dioxide concentrations in Storrington. Improved traffic flow / reduction in traffic congestion.	WSCC have no powers to use ANPR cameras to issue Penalty Charge Notice and the cost estimates for CCTV ANPR camera equipment obtained in 2020 were found prohibitively high. In 2022, WSCC and the Parish Council reviewed this scheme (Storrington HGV Survey).	WSCC would have to apply for Part 6 powers and is reviewing the practicalities of applying for these enforcement powers, including the business case for back-office arrangements for enforcement before considering what sites would be most appropriate to enforce.
13	[Storrington] Freight Delivery Partnership	Promoting Low Emission Transport	Public Vehicle Procurement – Prioritising uptake of low emission vehicles	2013	Ongoing	HDC / WSCC	-	No	Not Funded	£100k - £500k	Ongoing	Unknown but expected low	Emission reductions sought through partnership working with local businesses to minimise impact of deliveries etc. on the village.	Encourage use of WSCC preferred lorry route rather than A283 through Storrington AQMA; investigate opportunities for local and shared deliveries; Encourage use of low emission	Investigate opportunities for micromobility services and the potential of a distribution centre in urban areas throughout the district.

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
														delivery vehicles to local stores within AQMA, provide links to Compressed Natural Gas refuelling strategy	
14	[Storrington] Community minibus	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	2013	Ongoing	HDC / WSCC	Section 106	No	Funded	£50k - £100k	Ongoing	1 % in the AQMA	Enhance existing Storrington minibus service by replacing existing diesel fleet with Low /Zero emission vehicles.		Liaise with local bus operators to improve the emissions standards of buses operating through the AQMA. Explore opportunities to improve and create new community-led transport schemes.
15	[Storrington] Improve bus service and information	Alternatives to private vehicle use	Other	2013	Ongoing	HDC / WSCC	HDC/WSCC	No	Not funded	£10k - £50k	Ongoing	1 % in the AQMA	Work with local bus service to utilise best available Euro standard vehicles for AQMA routes. Promote use of transport /travel plans to increase use of sustainable transport.	West Sussex Bus Service Improvement Plan	Subside strategic bus services to village schools; Investigate provision of local real-time bus information at bus stops to promote use
16	[Storrington and Cowfold] A27 Improvements (Arundel Bypass)	Traffic Management	Strategic highway improvements, Re-prioritising Road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2013	Unknown	Highways England/ WSCC	Highways England	No	Funded	> £10 million	On hold	2.5% in the AQMA	Reduction in nitrogen dioxide concentrations. Improved traffic flow / reduction in traffic congestion.	The proposed Arundel A27 bypass has been put on hold for at least two years. In March 2023, the scheme has been deferred to the next Road Investment Period (RIS 3) covering 2025-2030.	

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
17	[Storrington and Cowfold] A27 Improvements (Worthing & Lancing)	Traffic Management	Strategic highway improvements, Re-prioritising Road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2015	Unknown	Highways England/ WSCC	Highways England	No	Funded	> £10 million	Planning	2.5% in the AQMA	Reduction in nitrogen dioxide concentrations. Improved traffic flow / reduction in traffic congestion.	Highway England have been working closely with key stakeholders to identify a package of potential improvements to meet the revised objectives in the government's Road Investment Strategy 2 (RIS2): 2020 to 2025, to improve the capacity and flow of traffic on the A27 from Worthing to Lancing.	Following consultation on proposals to improve the A27 between Worthing and Lancing in Spring 2023. There is currently no solution that commands broad support, with National Highways reviewing the next steps for the scheme.
18	Strategic improvements to the A24 Worthing-Horsham corridor	Traffic Management	Strategic highway improvements, Re-prioritising Road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2015	Unknown	Highways England / WSCC	Highways England	No	Not Funded	£1 million – £10 millions	Planning	Unknown but expected low-medium	Reduction in nitrogen dioxide concentrations. Improved traffic flow / reduction in traffic congestion.	WSCC has undertaken a feasibility study of the A24 corridor between Worthing and Horsham including a package of traffic junction and sustainable transport measures. These proposals intended to encourage longer distance traffic flows to stay on the A27, A280 and A24 corridors for journeys for example to and from the south west and north east of the county, and to	This scheme is in the early stages of development and requires the further develop of designs, consultation, development of business case and securing of funding to deliver the package of measures.

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
														avoid use of less suitable routes such as the B2139/A283 through Amberley and Storrington.	

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[13], 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 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 sets the target to ensure that the annual mean concentration of PM$_{2.5}$ in ambient air is equal to or less than 10 micrograms per cubic metre (μg/m^3) by 31st December 2040. Additionally, the Environmental Improvement Plan 2023 for England set interim targets that by January 2028, the annual average of 12μg/m^3 for PM2.5 is not exceeded at any monitoring station.

In support of these national targets local authorities are encouraged to review and assess PM2.5 and take actions where possible to reduce the sources and emissions of these particulates. These are national targets and are non-binding targets for local authorities.

The Environment Act 2021 established a legally binding duty on Government to set an annual mean target on the level of fine particulate matter (PM$_{2.5}$), in addition to a longer-term target, by 31st October 2022 for England. The Act states:

> "Whilst the responsibility for meeting the PM$_{2.5}$ targets sits with national government; local authorities have a role to play in delivering reductions in PM$_{2.5}$."

> and

> "Local authorities in England will need to work towards reducing PM$_{2.5}$ in their area. Action to tackle PM$_{10}$/NOx can be expected to contribute towards this."

The district reported a population-weighted concentration of 6.8μg/m^3 in 2021, the latest dataset made available at the time of writing the latest available data (Figure 2.5). PM$_{2.5}$ levels are used to calculate an indicator in the Public Health Outcomes Framework

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

(PHOF) – Fraction of Mortality Attributable to Particulate Matter Pollution[14]. This indicator is calculated for each local authority in England, and it intended to enable Directors of Public Health to prioritise action on air quality in their local area. The estimated fraction of mortality attributable to long term exposure to current (2022) levels of anthropogenic $PM_{2.5}$ was 4.6% in Horsham District (Figure 2.6).

Figure 2.5 - Air pollution: fine particulate matter (new method - concentrations of total PM2.5) for Horsham

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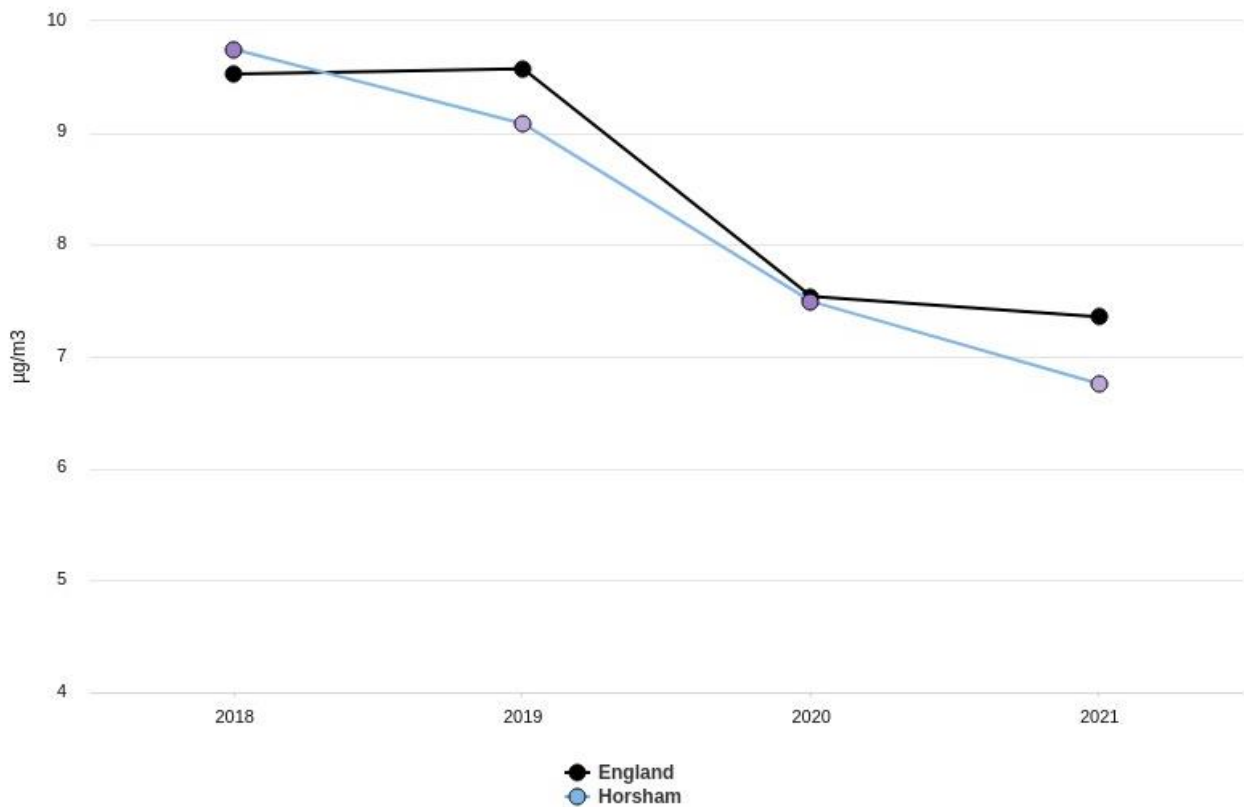
14

https://fingertips.phe.org.uk/search/air%20pollution#page/4/gid/1/pat/15/par/E92000001/ati/501/are/E0700027/iid/93861/age/230/sex/4/cat/-1/ctp/-1/yrr/1/cid/4/tbm/1/page-options/tre-ao-0_tre-do-1

Figure 2.6 - Fraction of mortality attributable to particulate air pollution (new method) for Horsham
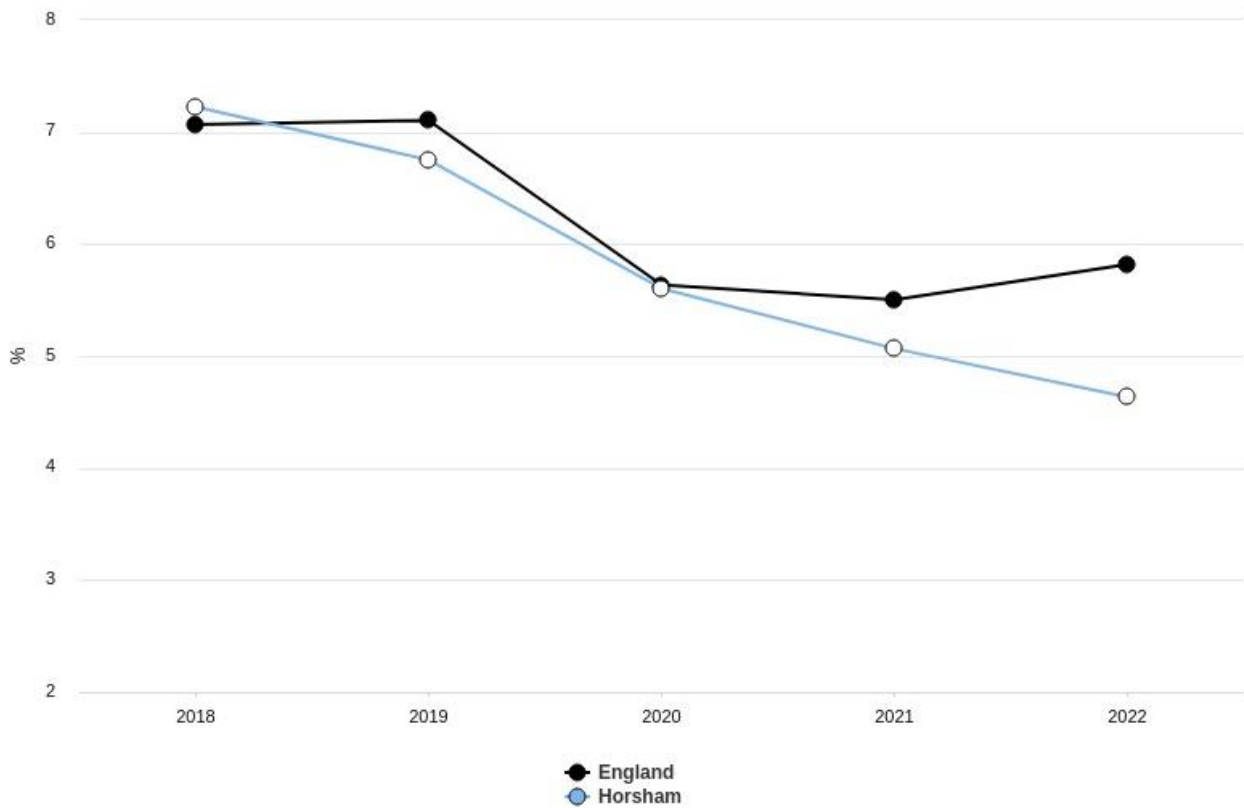
The PM$_{2.5}$ point sources in Horsham District identified in the National Atmospheric Emission Inventory (Figure 2.7) are:

- Biffa Waste Services Ltd
- UK Waste Management Ltd.
- Viridor Waste Disposal Ltd
- Wienerberger Limited
- Ambion Brick Co Ltd
- Baggeridge Brick Plc
- Ibstock Brick Ltd

Figure 2.7 - UK Emissions Interactive Map
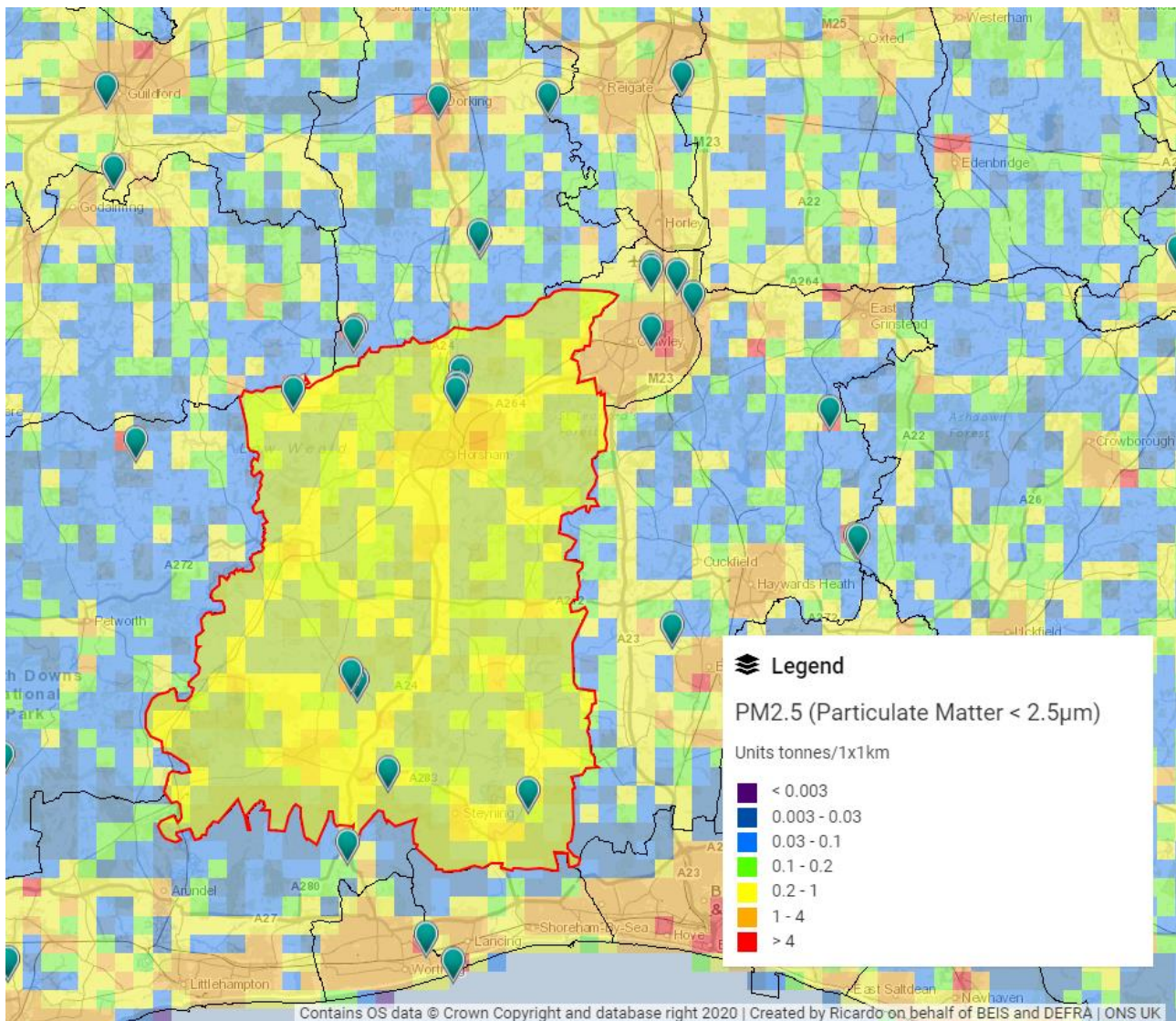
In agreement with the principles of the Air Quality and Emissions Mitigation Guidance for Sussex (2021) all new developments are required to implement mitigation/offsetting measures commensurate with their size/predicted emissions of NO_2 and $PM_{2.5}$.

Research has shown that wood burning is a large contributor to primary emissions of $PM_{2.5}$. Unsurprisingly, solid fuel burning has had a significant contribution to the concentrations of $PM_{2.5}$ in the South East region. That contribution has been quantified by King's College at 6 to 9% annually, averaged across urban areas. In 2018 HDC was successful in securing Defra's funding towards the Clean Burn Sussex project, aimed at the promotion of least polluting fuels and stoves. The project was a collaboration of 15 authorities in Sussex to raise awareness about domestic burning and promote better burning methods and choices. A dedicated website for clean burning (https://sussex-

air.net/clean-burn/) has been in operation from November 2019. Summary findings from the project are available for view on the website.

$PM_{2.5}$ has not been monitored in the district for the past several years, but in the first quarter of 2022, Horsham District was chosen by Defra to take part in a Particulate Matter study with a duration of one year. Three new PM analysers were installed in Storrington station in March 2022 for scientific research purpose, which includes a BAM 1020, a Palas Fidas 200 and a PM reference method. These analysers provided data for both PM_{10} and $PM_{2.5}$. After the study was concluded, Horsham was able to keep the Palas Fidas 200 at Storrington AURN. Data is available on Sussex Air website[15].

Sussex air was successful on 2021-22 Defra's Air Quality Grant and additional particulate monitoring will be installed across Sussex, including Horsham District, to further enhance the database and provide a more detailed and substantive understanding of particulate concentrations across the region. This data will be used in our public engagement projects and is available on Sussex-Air website.

Horsham District Council is taking the following measures to address $PM_{2.5}$:

- Expand $PM_{2.5}$ monitoring across the district
- Review of Air Quality and Emissions Mitigation Guidance for Sussex.

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[15] https://sussex-air.net/

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

This section sets out the monitoring undertaken within 2023 by Horsham District 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.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Horsham District Council undertook automatic (continuous) monitoring at 3 sites during 2023. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The page 40 presents automatic monitoring results for Horsham District Council, with automatic monitoring results also available through the UK-Air and Sussex Air website.

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

3.1.2 Non-Automatic Monitoring Sites

Horsham District Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 42 sites during 2022 with 49 diffusion tubes. 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.

All diffusion tubes have relevant exposure within 10m of the kerbside, except for tubes:

- 9 (Horsham 6N) – receptor at Rusper Road located 11m from kerbside

- 10 (Horsham 7N) – receptor at Warnham Road located 12m from kerbside

- 23 (N. Horsham 3N) – receptor 200m from kerbside

- 38 (Storrington 14) – receptor at Washington Road located 19m from kerbside

Triplicate tubes have been maintained at all three automatic analyser sites:

- HO2 Horsham Park Way (junction of Park Street and Park Way in Horsham)

- HO4 Storrington AURN (junction of Manley's Hill and Meadowside in Storrington)

- HO5 Cowfold (Bolney Road/The Street, Cowfold)

Diffusion tube changes in the past 5 years:

- DT (13, 14) - Storrington 1,2 at *Manley's Hill, Storrington* used to be duplicate from 2008 until 2018. From 2019 the location is monitored with a single tube (DT 13 – Storrington 1)

- In 2019, DT14 was moved to *Old Queen's Head, East Street, Horsham* (Horsham 11n), where it monitored nitrogen dioxide for a year.

- In 2020, DT14 was moved to *Oakfield Road, Cowfold* (Cowfold 9n). As the site had overhanging trees, the diffusion tube was re-deployed further up the road (Cowfold 9n.1) in 2023.

- Horsham monitored *Swan Corner, Station Road in Pulborough* (Pulborough 1) from 2008 until 2019.

- In 2020, DT 26 was moved on to *Albany House, Bishopric, Horsham* (Horsham 12). As the site had overhanging trees, the diffusion tube was re-deployed further down the road (Horsham 12.1) in 2023.

- HDC monitored *45, Gorings Mead in Horsham* (Horsham 4n) from 2008 until 2022.

- In 2022, DT 04 was moved to *3, Chesmeer Way in Broadbridge Heath* (Broadbridge Heath 1)

- Horsham 9n was installed behind a traffic sign and there were concerns regarding the flow around the inlet sampling probe. In 2023 the DT48 was installed in a nearby location (Horsham 9n.1)

- HDC monitored *Home Farm, Langhurstwood Road in the North of Horsham* (N. Horsham 1n) from 2008 until 2022.

- In 2022, DT 23 was moved to *Rusper Road Roundabout* (N. Horsham 3n)

In the end of January 2023 part of the A29 Pulborough was closed because an embankment collapsed. Road closures and diversion routes have been put in place. Following residents' concerns with air quality impacts on the diversion routes, HDC carried out a short term (3-month – April, May and June 2023) diffusion tube survey using tubes placed along the relevant traffic routes (diffusion tubes A29_1, A29_2, A29_3, A29_4, A29_5), including those being used as unofficial diversions past St Mary's school. After the landslide, traffic signs were put in place, and a diffusion tube was deployed on London Road, Pulborough.

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.

All Sussex-Air network sites were compliant with the relevant air quality objectives and standards for NO$_2$ long term and short-term objectives. The annual mean concentrations for NO$_2$ have showed a general downward or levelling-off trend between 2019 and 2023.

In 2023 there were no monitoring sites where the annual mean NO$_2$ objective was exceeded in the district. But one site (47 – Storrington 19n) located within the Storrington AQMA, measured concentrations within 10% of the annual mean objective (i.e. 36µg/m³ or more). Which demonstrates that Storrington AQMA is still required.

Figure A.1 to Figure A.5 in Appendix A: Monitoring Results show the trends in annual mean NO$_2$ concentrations measured at the diffusion tube and continuous monitoring sites in the district over the monitoring period 2019-2023. The results of diffusion tube monitoring overall indicate a decrease of 9% in NO$_2$ concentrations at roadside locations in 2023 as compared to the previous year. All the long-term sites show a continuing overall

downward trend in measured concentrations of NO_2 over the last five years, which applies both to roadside and background locations. This can be attributed to decreasing background concentrations and is also indicative of a gradual improvement in fleet emissions.

Horsham Town Sites

Data capture was good (above 75%) for all sites during 2023.

Horsham town sites showed a stabilisation in the annual mean concentration for NO_2 in 2023 in relation to 2022. The highest annual mean NO_2 concentration of 26.2µg/m³ was recorded at monitoring site 23 (N. Horsham 3N), located on Rusper road roundabout.

The analysis of hourly mean concentrations at monitoring station HO2 (Figure A.6) by day of the week indicates that the highest concentrations were recorded during morning and afternoon traffic peaks throughout the working week from Monday to Friday. The highest average monthly concentrations in the year were recorded in January and February, of 24.5 and 21.1µg/m^3, respectively.

Cowfold Sites

Data capture was good (above 75%) all Cowfold sites during 2023.

Cowfold sites showed a decrease of 4% in 2023 in relation to 2022, the same decrease was measured in sites located within the AQMA. There wasn't any breach of annual mean NO_2 objective in the past five years, although site 37 (Cowfold 7n) reached a concentration of 36.1µg/m³ in 2019, which is within 10% of the annual mean objective.

The analysis of hourly mean concentrations at monitoring station HO4 (Figure A.6) by day of the week indicates that the highest concentrations were recorded during morning and afternoon traffic peaks throughout the working week from Monday to Friday. The highest month average concentrations in the year were recorded in July (35.8µg/m^3).

In the end of June 2023, Bureau Veritas, responsible for data collection and ratification for locally managed monitoring stations, reported data connections issues with Cowfold NOx analyser, followed by a large difference between NO/NOx in the end of July that led to replacement of the analyser in August. There were concerns that the automatic data recorded during this period was not representative. The analyser was recording very high concentrations that were not compatible with the co-located diffusion tubes and with the trends observed in all other tubes in Cowfold and traffic count data. When data for this

period (11/06/2023 - 19/08/2024) is discarded, the highest month average concentrations in the year is in March (31.3µg/m^3), and the annual mean concentration is 22.6µg/m^3.

It is expected that the Cowfold AQMA will be revoked in the coming years. However, pollutant concentrations may vary significantly from one year to the next, and the Local Air Quality Management Technical Guidance (TG-22) states that the revocation of an AQMA should be considered following three consecutive years of compliance with the relevant objective as evidenced through monitoring. Although pandemic impacted levels of NO$_2$ in 2020 and 2021, in the past five years all monitoring sites have shown a downward trend.

Storrington Sites

Data capture was good (above 75%) for most sites during 2023.

Storrington sites showed a decrease of 4% in 2023 in relation to 2022 and the sites located within the AQMA, a 5% decrease. Whilst the AQMA encompasses the whole High Street in the town centre, in the recent years the only area in exceedance of the annual mean objective for NO2 has been the mini roundabout of Manley's Hill and School Hill, as shown by the results at site 47 (Storrington 19). Site 47 and site 13 (Storrington 1) recorded the highest annual mean NO2 levels for the year (37.0ug/m³ and 32.9µg/m³), these are the only sites that have reported values within 10% of the annual mean objective or higher in the past five years.

The analysis of hourly mean concentrations at monitoring station HO5 (Figure A.6) by day of the week indicates that the highest concentrations were recorded during morning and afternoon traffic peaks throughout the working week from Monday to Friday. The highest concentration in the year was recorded in February (22.6µg/m^3).

Pulborough sites

In the end of January 2023 an embankment collapsed and there was a landslide on the A29 in Pulborough. Road closures and diversion routes have been put in place. Following residents' concerns with air quality impacts on the diversion routes, HDC carried out a short term (3-month – April, May and June 2023) diffusion tube survey using tubes placed along the relevant traffic routes (Table 3.1), including those being used as unofficial diversions past St Mary's school.

Table 3.1 - Details of Non-Automatic Monitoring Sites – A29 Pulborough exercise

Diffusion Tube ID	Location (Address)	Reason for monitoring
A29_1	57 Glebelands	Through route for buses
A29_2	Rectory Ln & St Mary's Cl	Diversion route - a number of properties are very close to the kerb
A29_3	St Mary's School	Diversion route
A29_4	The Courtyard Bed and Breakfast, Broomer's Hill	Alternative route (potential baseline)
A29_5	17 The Moat	Background

Figure 3.1 - Trends in Annual Mean NO$_2$ Concentrations: Pulborough
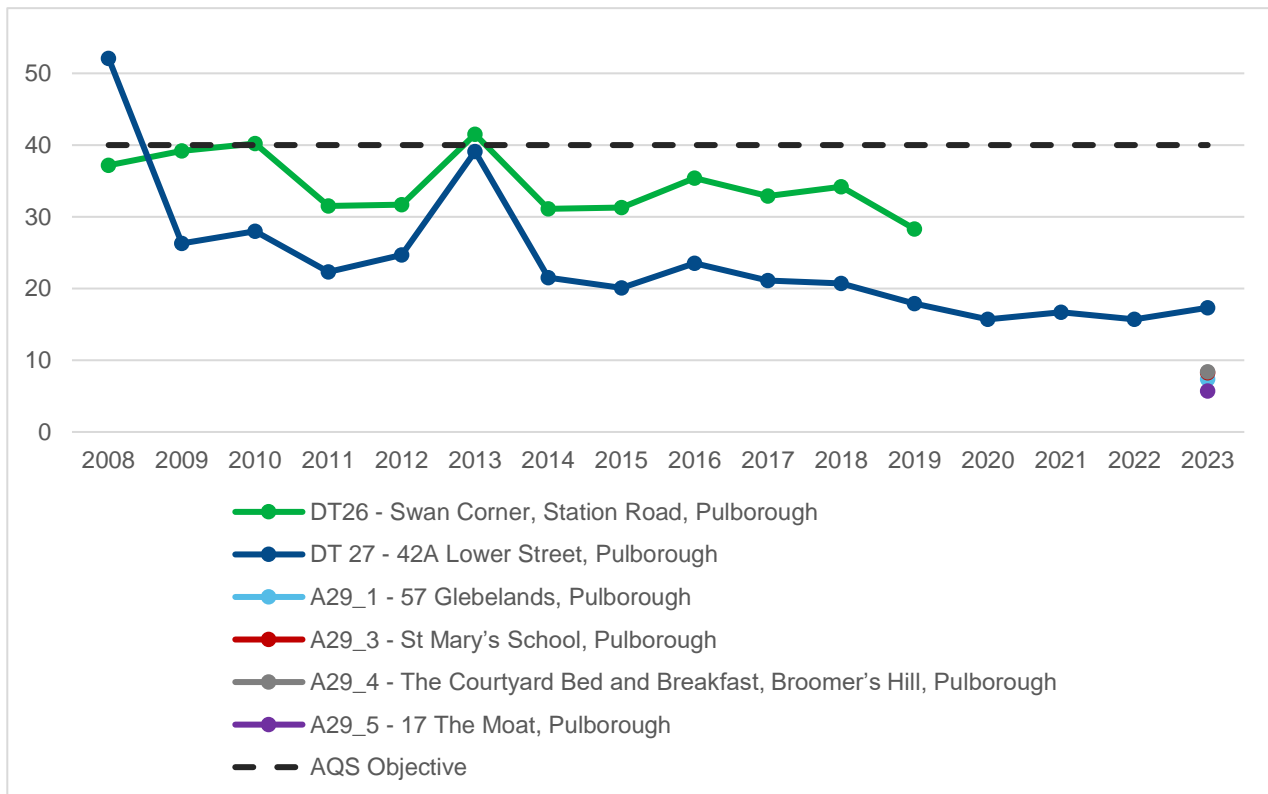
All additional monitoring concentrations were well below the Air Quality Objective for NO$_2$, and it is believed that there was no adverse impact of the A29 road closure on air quality in the area (Figure 3.1).

The long-term monitoring sites in Pulborough have shown an overall decreasing trend in NO$_2$ concentrations. This is believed to have been driven to a large extent by general improvements in vehicle emissions standards but also to some extent by the implemented local traffic management measures, although it is difficult to isolate the impacts of individual interventions.

Emission from diesel vehicles – until Euro VI (which came onto the market in 2014) – emitted approximately 3 times more NOx than petrol cars. It is from 2017, and really

2020, when Euro 6d diesels became available, that big improvements in NO_2 levels were perceived. Euro 6d vehicles require Real Driving Emissions (RDE) measurements from both gasoline and diesel vehicles, increasing the effectiveness of legislation in driving down real-world emissions.

Meteorology also plays a significant role in creating, dispersing, and transporting pollutants across regions. Relative humidity and sunlight are involved in the production of ozone (O_3) and nitrogen oxides (NOx). Likewise, windspeed has been shown to impact the transport of pollutants; in the United Kingdom, particulate matter shows to have strong correlation with seasonal winds, anticyclonic conditions, and long-range transport from continental Europe[16].

Remaining Sites

The monitoring sites in the towns of Billingshurst, Henfield, Southwater and Steyning have remained below the objective in the past five years. The concentrations measured in 2023 were all below 20ug/m3.

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.

An automatic TEOM particulate monitor has been permanently located at Park Way in Horsham town centre for over twenty years, giving 15-minute measurements of particulate matter concentrations. In the end of April 2022 three particulate matter analysers were installed in Storrington as part of Defra's Particulate Matter research study, in 2023 we were able to keep Fidas analyser after the one year study in Storrington. Details of data collections and ratification are presented in Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC.

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[16] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9347540/

Data capture was above 75% at Park Way (HO2) and Storrington (HO4) sites in 2023 and no annualisation has been required.

Automatic monitoring of PM10 at Horsham Park Way (HO2) and Storrington (HO4) site indicated that both the annual and daily mean objectives for PM_{10} were complied with in 2023 and in the previous five years of monitoring. The annual mean PM_{10} concentration recorded in 2023 at Horsham showed an increase of 6% in relation to the previous year, and a decrease of 2% at Storrington AURN. Data shows a levelling off in annual mean concentrations of PM_{10} over the period of 2019 to 2023 across Sussex.

The analysis of hourly mean concentrations at monitoring station HO2 and HO4(Figure A.6) indicates that PM_{10} concentrations were greater in the late evening compared to other times of the day. The highest concentrations in the year were recorded in June (27 $\mu g/m^3$) at Horsham and February (20 $\mu g/m^3$) at Storrington.

WHO recommended 2021 Air quality guidelines level for PM_{10} annual mean is 15$\mu g/m^3$. Horsham Park Way (HO2) has exceeded the 15$\mu g/m^3$ annual mean for coarse particulate matter (PM_{10}) recommended by WHO, but Storrington AURN (HO4) meets the level for PM_{10}.

3.2.3 Particulate Matter (PM2.5)

In the end of April 2022 three particulate matter analysers were installed in Storrington (HO4) as part of Defra's Particulate Matter research study, details of data collections and ratification are presented in Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC.

Data capture was above 75% at Storrington (HO4) in 2023 and no annualisation has been required. Table A.8 in Appendix A presents the ratified and adjusted monitored PM2.5 annual mean concentrations for the past five years. The annual mean concentrations of PM2.5 at Horsham Park Way (HO2) were estimated from the PM_{10} measurements, as per method described in Box 7.7 of Technical Guidance TG (22).

Monitoring data across Sussex shows a levelling off in annual mean concentrations of PM2.5 over the period of 2019 to 2023. The analysis of hourly mean concentrations at the monitoring station Storrington AURN (HO4), Figure A.9 indicates that the highest concentrations in the year were recorded in January and February 11 and 12 $\mu g/m^3$, respectively.

With regard to the fine particulates 2040 target annual mean, estimated concentrations at Horsham Park Way (HO2) sites was above the annual mean 10µg/m³ limit. The 2040 target is not exceeded at Storrington AURN (HO4).

The estimated concentrations of $PM_{2.5}$ at Horsham Park Way (HO2) and Storrington (HO5) were above the WHO-recommended guideline value of 5µg/m³ taken as annual mean 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)
HO2	Horsham Park Way	Roadside	517485	130590	NO_2, PM_{10}	No	Chemiluminescence (APNA-370); TEOM	8.9	1.5	3
HO4	Storrington AURN	Roadside	509083	114198	NO_2, PM_{10}, $PM_{2.5}$	No	Chemiluminescence (Thermo 32i) until May 2023. In the end of May 2023, a Chemiluminescence (T200) was installed; FIDAS200	9.6	4.6	3.3
HO5	Cowfold	Roadside	521356	122553	NO_2	Yes. Cowfold AQMA	Chemiluminescence (ML9841B)	4	6.5	2

Notes:

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

(2) N/A if not applicable

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
Billingshurst Sites										
28	Billingshurst 1	Roadside	508649	125857	NO2	No	1.0	1.5	No	2.2
Broadbridge Heath Sites										
4	Broadbridge_Heath 1	Roadside	514596	130556	NO2	No	1.0	1.8	No	2.3
Cowfold Sites										
14	Cowfold 9n.1	Roadside	521626	122471	NO2	No	7.0	1.5	No	2.2
12, 20	Cowfold 2	Roadside	521324	122610	NO2	Yes, Cowfold AQMA	2.5	1.7	No	2.7
21	Cowfold 3	Roadside	521267	122677	NO2	Yes, Cowfold AQMA	9.7	2.0	No	2.7
22	Cowfold 4	Roadside	521311	122704	NO2	No	9.3	2.0	No	2.4
35	Cowfold 5n	Roadside	521070	122706	NO2	Yes, Cowfold AQMA	23.0	3.6	No	2.5
36	Cowfold 6n	Roadside	521309	122248	NO2	No	3.0	1.8	No	2.2
37	Cowfold 7n	Roadside	521460	122473	NO2	Yes, Cowfold AQMA	2.0	1.1	No	2.2
43	Cowfold 8n	Urban Background	521411	122667	NO2	No	7.0	0.3	No	2.0
44, 45, 46	Cowfold AU C	Roadside	521356	122552	NO2	Yes, Cowfold AQMA	20.0	6.5	Yes	2.0
Henfield Sites										
2	Henfield 1n	Roadside	521492	115907	NO2	No	0.0	2.0	No	2.0
Horsham Sites										
1	Horsham 1N	Roadside	517489	130607	NO2	No	3.5	2.0	No	2.2
3	Horsham 3N	Urban Background	516008	130480	NO2	No	7.6	1.5	No	2.9
5, 6, 7	Park Way	Roadside	517489	130580	NO_2	No	8.9	1.5	Yes	3.0
8	Horsham 5N	Roadside	518239	131137	NO2	No	9.6	1.4	No	2.4
9	Horsham 6N	Roadside	518654	132482	NO2	No	11.2	1.5	No	2.6
10	Horsham 7N	Roadside	516952	132215	NO2	No	12.0	2.0	No	2.2
11	Horsham 8N	Roadside	516646	130221	NO2	No	8.0	1.6	No	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)
23	N. Horsham 3N	Roadside	518845	133461	NO2	No	200.0	1.5	No	2.3
24	N. Horsham 2N	Roadside	517476	134013	NO2	No	5.5	1.0	No	2.8
26	Horsham 12.1	Roadside	516853	130621	NO2	No	9.0	1.5	No	2.3
48	Horsham 9N.1	Roadside	518118	131161	NO2	No	1.0	1.5	No	2.0
Pulborough Sites										
27	Pulborough 2	Roadside	505288	118630	NO$_2$	No	1.8	1.5	No	3.0
Pulb_29	Pulborough 3	Roadside	504878	118932	NO2	No	7.0	1.8	No	1.8
A29_1	A29_Pulborough1	Roadside	505825	118857	NO2	No	6.0	0.8	No	2.2
A29_2	A29_Pulborough2	Roadside	505349	118755	NO2	No	3.0	0.5	No	1.7
A29_3	A29_Pulborough3	Roadside	505320	119002	NO2	No	5.0	2.0	No	1.8
A29_4	A29_Pulborough4	Rural	506351	118728	NO2	No	6.0	1.6	No	2.0
A29_5	A29_Pulborough5	Urban Background	505407	118854	NO2	No	3.0	1.5	No	2.0
Southwater Sites										
49	Southwater 1	Roadside	515639	126599	NO$_2$	No	1.0	1.5	No	2.0
Steyning Sites										
25	Steyning 4N	Kerbside	517642	111169	NO$_2$	No	1.5	0.9	No	2.7
Storrington Sites										
13	Storrington 1	Roadside	508960	114270	NO$_2$	Yes, Storrington AQMA	2.5	1.1	No	3.0
15	Storrington 3	Roadside	508935	114297	NO$_2$	Yes, Storrington AQMA	0.0	1.2	No	2.0
16	Storrington 4	Roadside	508832	114272	NO$_2$	Yes, Storrington AQMA	2.8	2.2	No	3.0
17	Storrington 5	Roadside	508742	114288	NO$_2$	Yes, Storrington AQMA	1.9	1.9	No	3.5
18	Storrington 6	Roadside	508396	114449	NO$_2$	No	7.7	1.9	No	2.4
19	Storrington 7	Roadside	508338	114374	NO$_2$	No	6.7	1.6	No	3.0
29, 30, 31	Storrington 8, 9,10 AURN	Roadside	509083	114198	NO$_2$	No	9.6	4.6	Yes	3.3

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)
32	Storrington 13n	Roadside	508675	114306	NO_2	Yes, Storrington AQMA	0.5	3.0	No	2.2
33	Storrington 12n	Roadside	508598	114323	NO_2	Yes, Storrington AQMA	7.0	2.3	No	2.6
34	Storrington 11n	Roadside	508511	114365	NO_2	Yes, Storrington AQMA	1.0	3.0	No	3.0
38	Storrington 14n	Roadside	509319	114160	NO_2	No	20.0	0.9	No	2.6
39	Storrington 16n	Roadside	508966	114356	NO_2	No	0.0	1.3	No	2.6
40	Storrington 15n	Roadside	509103	114532	NO_2	No	12.0	1.7	No	2.2
41	Storrington 17n	Urban Background	508677	114149	NO_2	No	1.0	1.5	No	2.2
42	Storrington 18n	Roadside	508215	114348	NO_2	No	5.0	1.9	No	2.2
47	Storrington 19n	Roadside	508945	114268	NO_2	Yes, Storrington AQMA	0.0	1.0	No	2.0

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results: Automatic Monitoring (µg/m³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
HO2	517485	130590	Roadside	100	99.1	24.4	18.8	21.1	17.7	16.2
HO4	509083	114198	Roadside	100	90.4	22	17.4	20.1	17.6	17.4
HO5	521356	122552	Roadside	100	79.5	23.6	23.4	20.3	21.0	24.6

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

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

☒ **Where exceedances of the NO₂ annual mean objective occur at locations not representative of relevant exposure, the fall-off with distance concentration has been calculated and reported concentration provided in brackets for 2023.**

Notes:

The annual mean concentrations are presented as µg/m³.

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

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.4 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
Billingshurst Sites										
28	508649	125857	Roadside	100	73.4	26.2	23.8	22.2	20.3	19.7
Broadbridge Heath										
4	514596	130556	Roadside	100	99.7	-	-	-	-	10.2
Cowfold Sites										
14 (Cowfold 9N)	521584	122457	Roadside	N/A	N/A	-	19.3	18.3	18.7	-
14	521626	122471	Roadside	100	99.7	-	-	-	-	18.2
12, 20	521324	122610	Roadside	100	99.7	31.6	26.8	26.5	26.4	24.1
21	521267	122677	Roadside	100	99.7	30.7	24.6	26.5	25.5	24.1
22	521311	122704	Roadside	100	99.7	26.8	22.5	22.2	20.3	19.5
35	521070	122706	Roadside	100	99.7	22.5	20.4	21.3	20.3	18.7
36	521309	122248	Roadside	100	99.7	23.5	21.7	20.5	20.3	19.6
37	521460	122473	Roadside	100	99.7	36.1	30.2	31.2	31.7	28.3
43	521411	122667	Urban Background	100	99.7	11.6	10.9	10.5	10.3	8.9
44, 45, 46	521356	122552	Roadside	100	99.7	23.6	19.2	19.9	20.0	17.5
Henfield Sites										
2	521492	115907	Roadside	100	99.7	22.2	19.9	20.9	18.2	18.2
Horsham Sites										
14 (Horsham 11n)	517672	517672	Roadside	N/A	N/A	26.6	-	-	-	-
1	517489	130607	Roadside	100	99.7	26.4	21.6	23.2	22.6	20.9
3	516008	130480	Urban Background	100	99.7	12.5	9.5	9.9	8.8	7.6
4 (Horsham 4n)	517680	130069	Urban Background	N/A	N/A	10.2	9.1	9.0	8.7	-
5, 6, 7	517489	130580	Roadside	100	99.7	22.1	18.4	19.9	19.6	17.0
8	518239	131137	Roadside	100	99.7	25.2	21.0	22.7	21.6	20.4
9	518654	132482	Roadside	100	99.7	21.5	18.2	19.5	17.6	15.0
10	516952	132215	Roadside	100	99.7	23.0	18.6	19.4	18.9	16.6
11	516646	130221	Roadside	100	99.7	21.9	19.1	20.7	19.9	18.7
23 (N. Horsham 1n)	517702	133570	Roadside	100	99.7	19.3	16.8	17.6	13.9	-

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
23	518845	133461	Roadside	100	99.7	-	-	-	-	26.2
24	517476	134013	Roadside	100	89.3	17.3	15.8	14.6	14.1	14.1
26 (Horsham 12)	*516909*	*130755*	*Roadside*	*N/A*	*N/A*	-	*30.5*	*33.4*	*29.7*	-
26	516853	130621	Roadside	100	99.7	-	-	-	-	20.1
48	518054	131155	Roadside	100	99.7	26.5	22.1	23.3	24.1	20.3
Pulborough Sites										
26 (Pulborough 1)	*504584*	*118568*	*Kerbside*	*N/A*	*N/A*	*28.3*	-	-	-	-
27	505288	118630	Roadside	100	99.7	17.9	15.7	16.7	16.1	15.8
Pulb_29	504878	118932	Roadside	33	33.0	-	-	-	-	14.7
A29_1	505825	118857	Roadside	25	25.0	-	-	-	-	8.1
A29_2	505349	118755	Roadside	25	0.0	-	-	-	-	-
A29_3	505320	119002	Roadside	25	25.0	-	-	-	-	9.1
A29_4	506351	118728	Rural	25	25.0	-	-	-	-	9.2
A29_5	505407	118854	Urban Background	25	25.0	-	-	-	-	6.3
Southwater Sites										
49	515639	126599	Roadside	100	99.7	23.5	21.1	21.7	19.4	19.0
Steyning Sites										
25	517642	111169	Kerbside	100	91.2	20.1	16.2	19.0	18.5	18.2
Storrington Sites										
13	508960	114270	Roadside	100	99.7	38.9	31.6	34.3	32.9	32.9
15	508935	114297	Roadside	100	99.7	28.3	23.3	24.8	23.7	21.8
16	508832	114272	Roadside	100	99.7	29.7	25.5	25.9	26.7	24.5
17	508742	114288	Roadside	100	99.7	23.3	18.7	19.9	19.0	19.2
18	508396	114449	Roadside	100	99.7	18.8	14.8	17.1	17.4	17.9
19	508338	114374	Roadside	100	99.7	18.4	15.6	17.6	17.7	18.8
29, 30, 31	509083	114198	Roadside	100	82.7	22.9	20.5	21.7	21.7	19.8
32	508675	114306	Roadside	100	99.7	25.6	21.4	23.1	23.0	21.1
33	508598	114323	Roadside	100	99.7	26.0	20.0	23.0	22.4	20.9
34	508511	114365	Roadside	100	99.7	29.8	25.0	26.5	25.9	24.8
38	509319	114160	Roadside	100	99.7	33.4	27.8	25.8	26.3	23.5
39	508966	114356	Roadside	100	99.7	21.6	18.9	19.2	18.4	17.5
40	509103	114532	Roadside	100	99.7	16.9	14.9	15.4	14.6	14.7

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
41	508677	114149	Urban Background	100	99.7	11.2	9.8	10.0	9.6	8.2
42	508215	114348	Roadside	100	99.7	16.0	13.4	18.1	15.4	13.7
47	508945	114268	Roadside	100	80.5	47.7	38.4	39.6	38.1	37.0

☒ **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 $\mu g/m^3$.

Exceedances of the NO_2 annual mean objective of $40\mu g/m^3$ are shown in **bold**.

NO_2 annual means exceeding $60\mu g/m^3$, 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%).

Figure A.1 – Trends in Annual Mean NO₂ Concentrations: Horsham and Broadbridge Heath
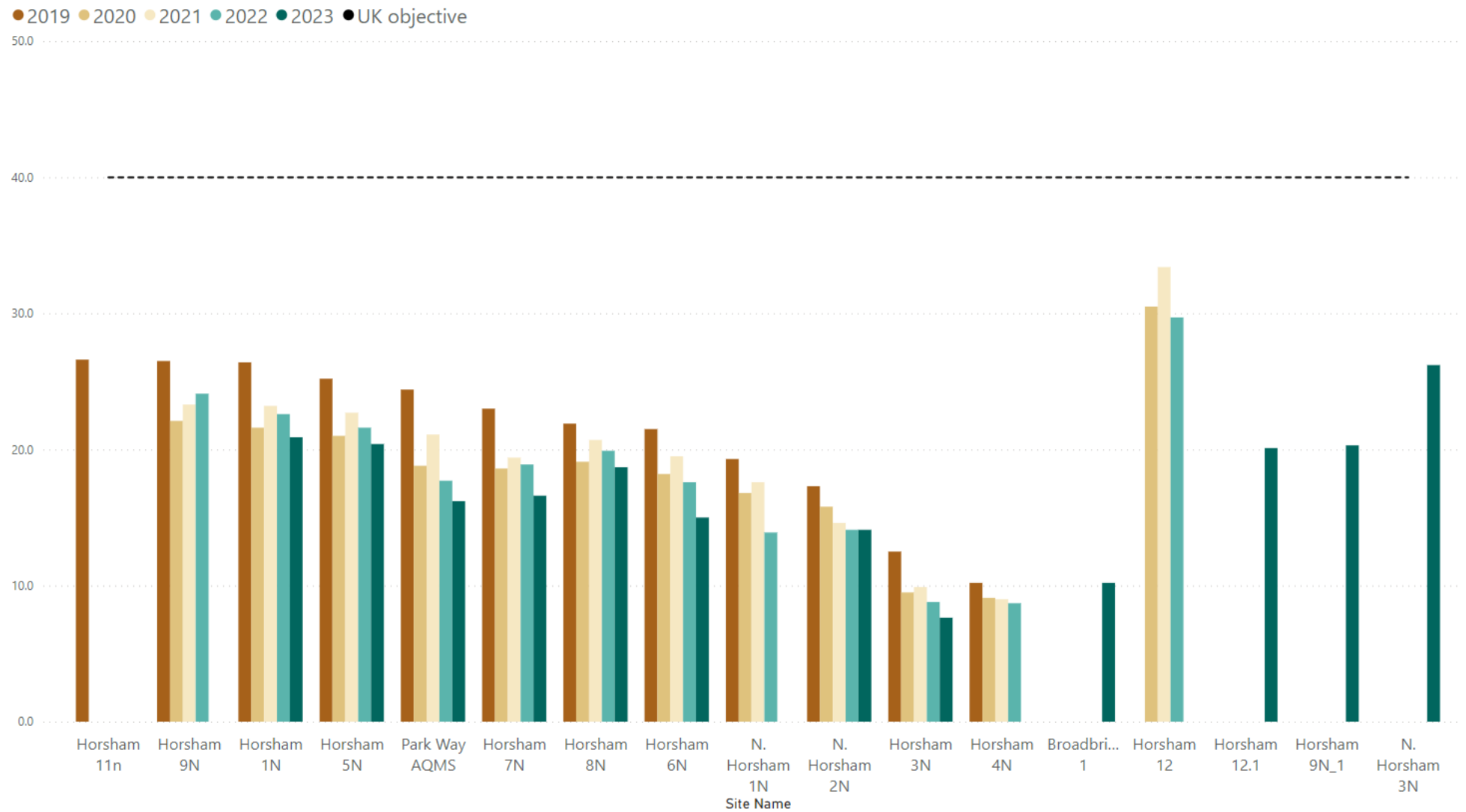
Figure A.2 – Trends in Annual Mean NO$_2$ Concentrations: Cowfold

● 2019 ● 2020 ● 2021 ● 2022 ● 2023 ● UK objective
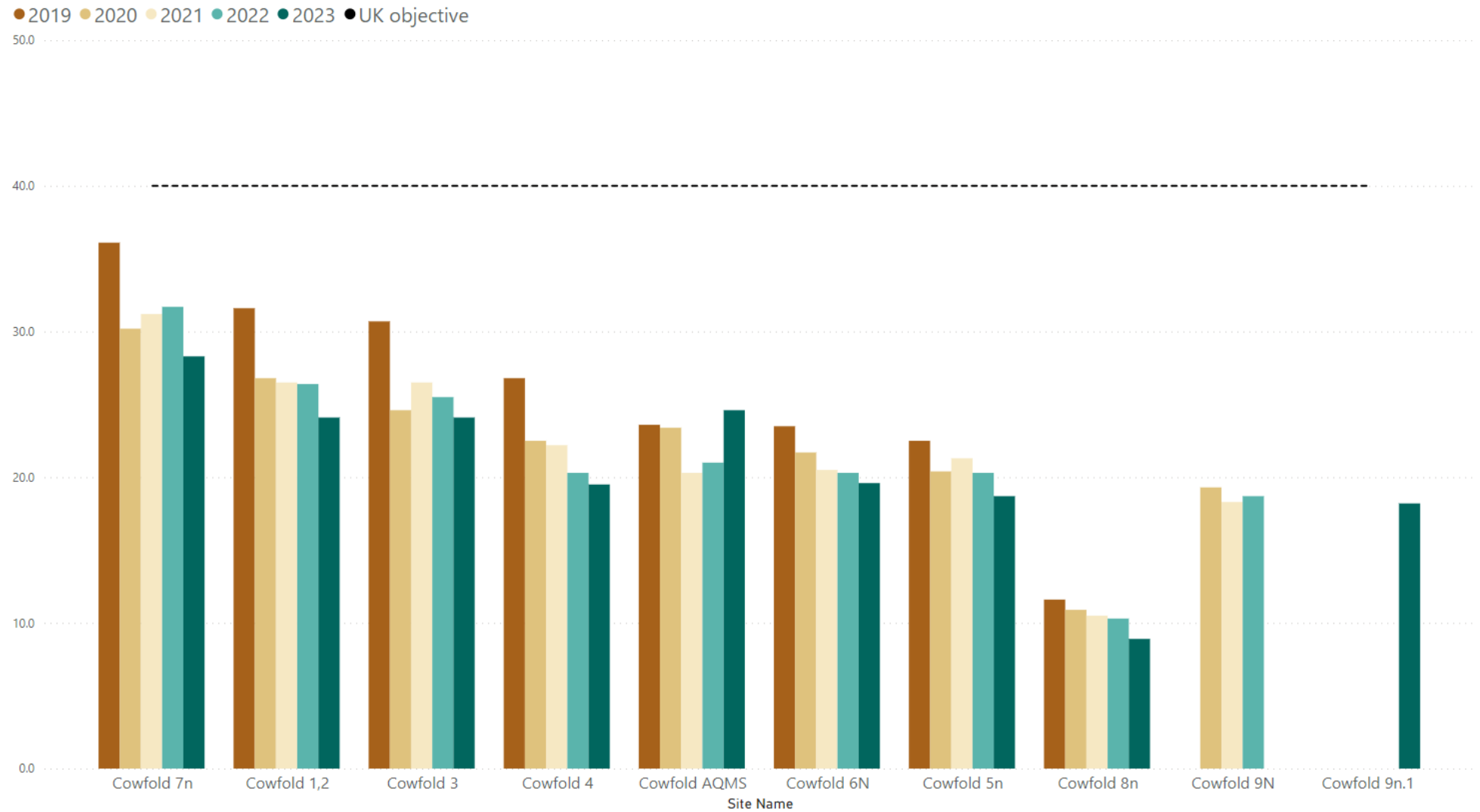
Figure A.3 – Trends in Annual Mean NO$_2$ Concentrations: Storrington

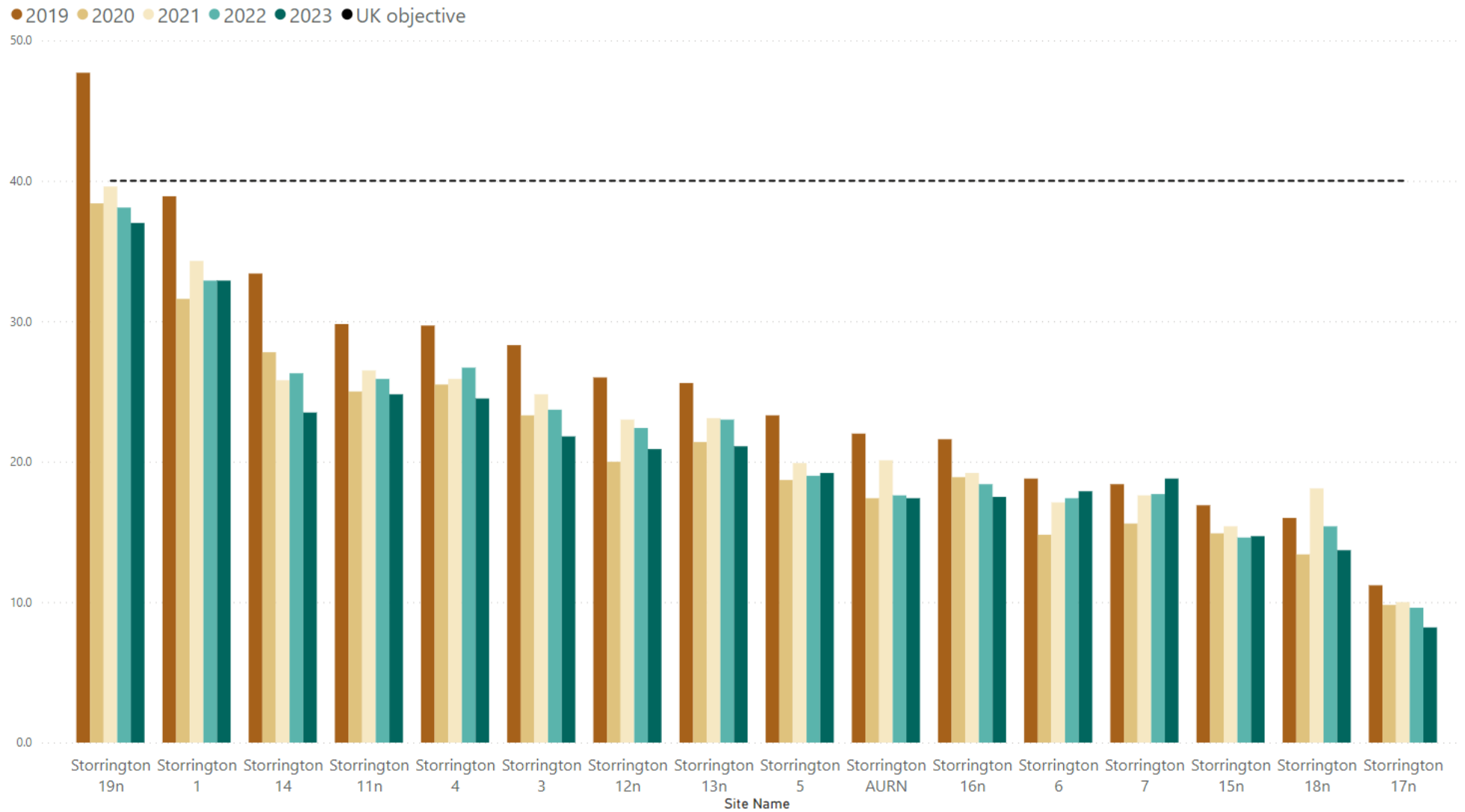● 2019 ● 2020 ● 2021 ● 2022 ● 2023 ● UK objective

Figure A.4 – Trends in Annual Mean NO₂ Concentrations: Pulborough
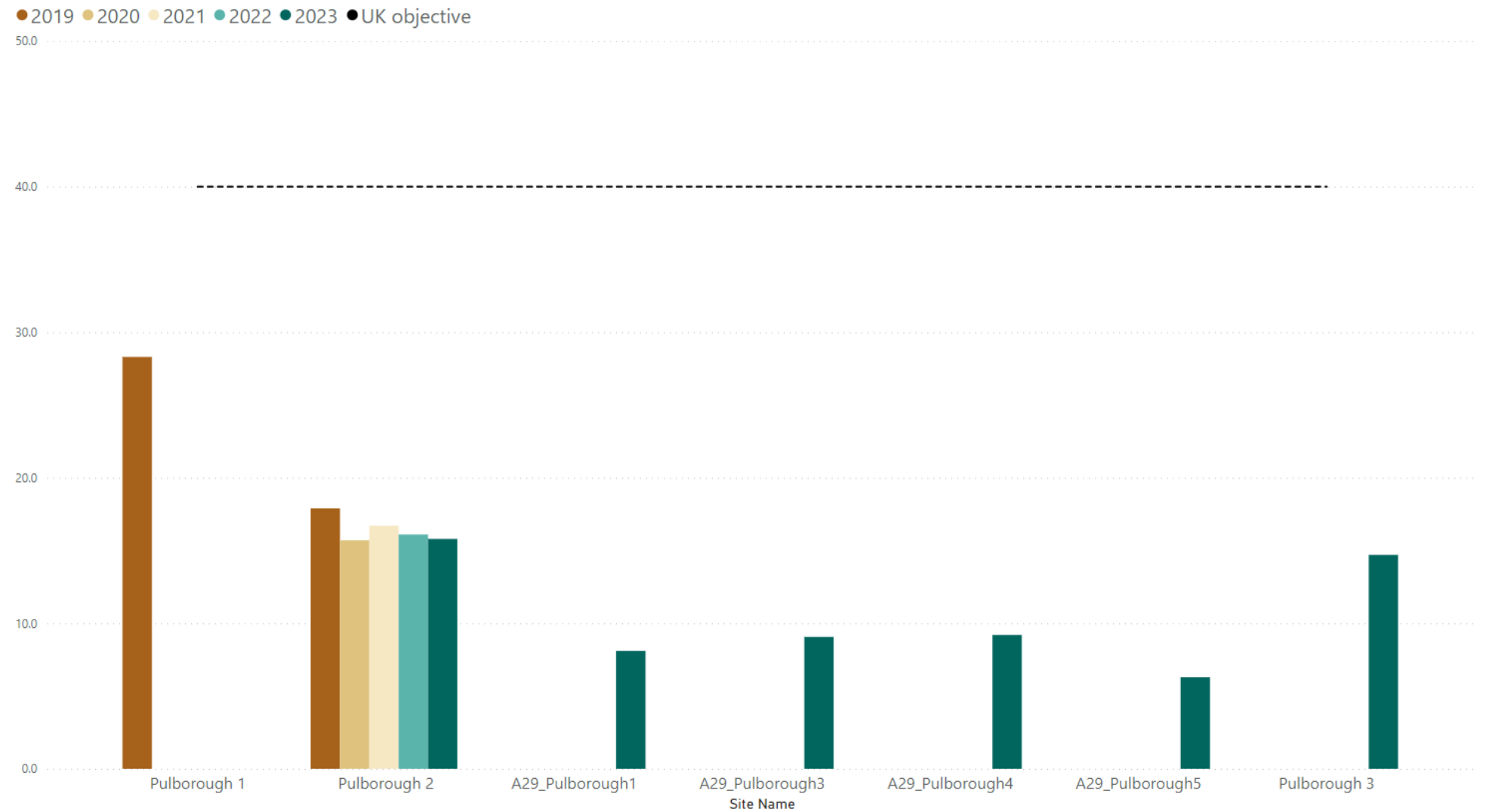
Figure A.5 – Trends in Annual Mean NO$_2$ Concentrations: Henfield, Steyning, Billingshurst, Southwater
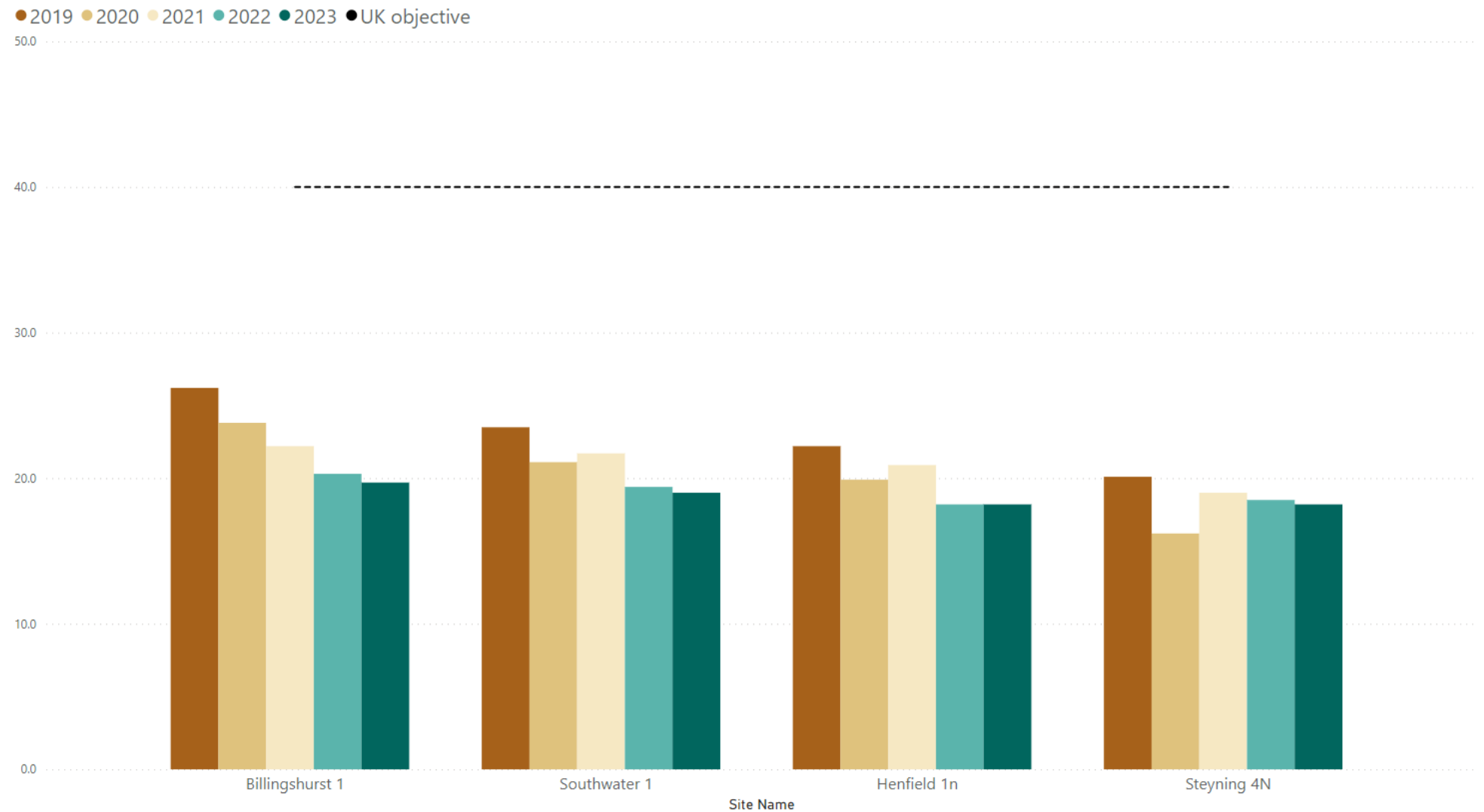
● 2019 ● 2020 ● 2021 ● 2022 ● 2023 ● UK objective

Table A.5 – 1-Hour Mean NO$_2$ Monitoring Results, Number of 1-Hour Means > 200µg/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
HO2	517489	130580	Roadside	100	98.4	0	0	0	0 (66.3)	0
HO4	509083	114198	Roadside	100	90.4	0	0	0	0 (77.2)	0
HO5	521356	122552	Roadside	100	90.6	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 (200µg/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%).

Figure A.6 – Monitoring Results: NO₂ Concentrations trends (ug/m3) at HO2 Horsham Park Way, HO4 Storrington AURN and HO5 Cowfold in 2023
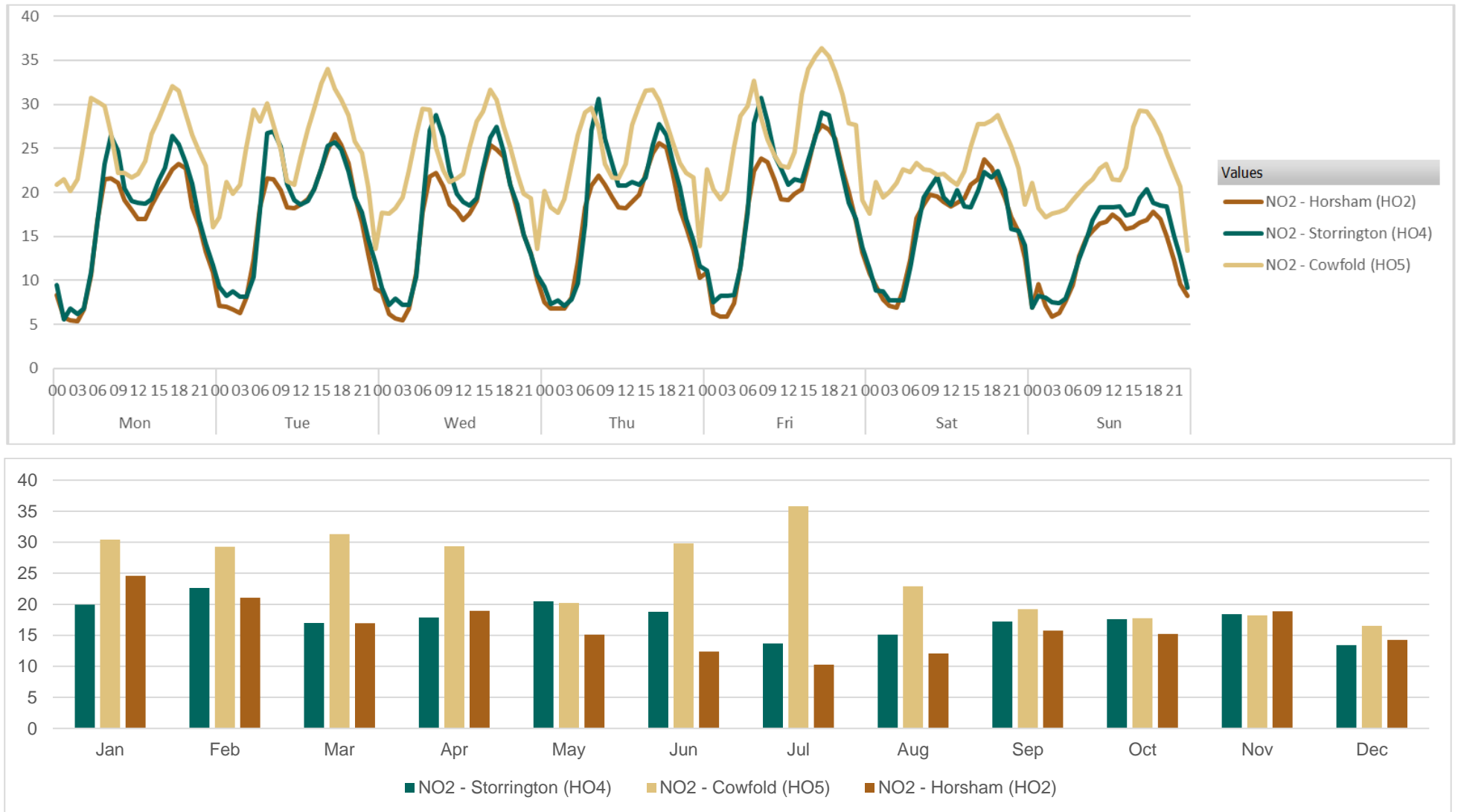
Table A.6 – Annual Mean PM$_{10}$ Monitoring Results (µg/m^3)

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
HO2	517489	130580	Roadside	100	98.1	19.3	15.7	17.5	19.3	20.5
HO4	509083	114198	Roadside	100	96.3	-	-	-	14.0	13.7

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

Notes:

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

Exceedances of the PM$_{10}$ annual mean objective of 40µg/m^3 are shown in **bold**.

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%).
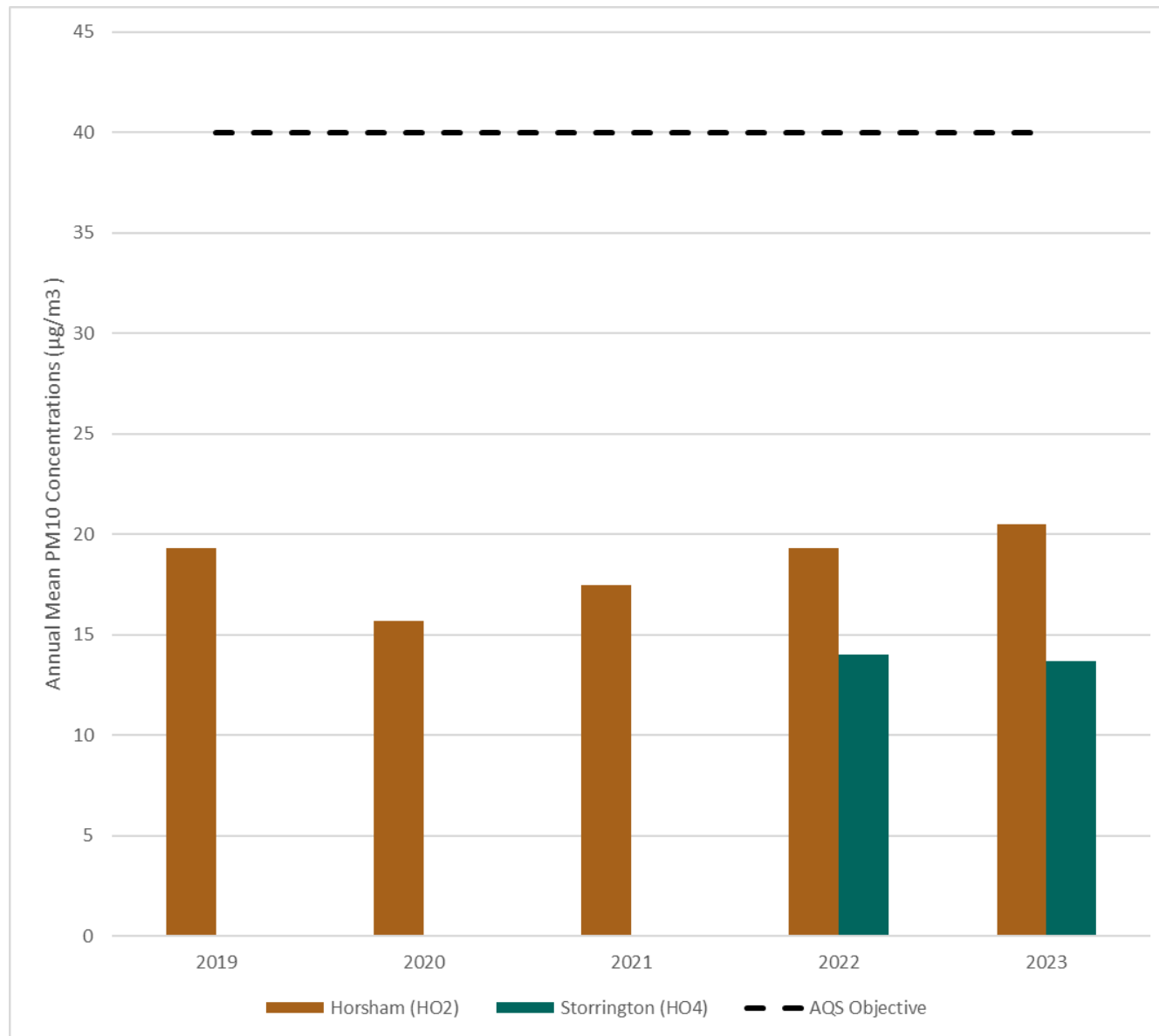
Figure A.7 – Trends in Annual Mean PM$_{10}$ Concentrations

Table A.7 – 24-Hour Mean PM$_{10}$ Monitoring Results, Number of PM$_{10}$ 24-Hour Means > 50µg/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
HO2	517489	130580	Roadside	100	98.1	5	0	0	0	0
HO4	509083	114198	Roadside	100	96.3	-	-	-	0 (21.5)	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
HO2*	517489	130580	Roadside	100	98.1	13.5	11	12.3	13.1	14.6
HO4	509083	114198	Roadside	100	96.3	-	-	-	7.3	7.7

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

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%).

*PM2.5 values for HO2 were estimated from the PM10 data using a nationally derived correction multiplying ratio of 0.7 (2019-2021), national factor 6.4 (2022), national factor 5.9 (2023)

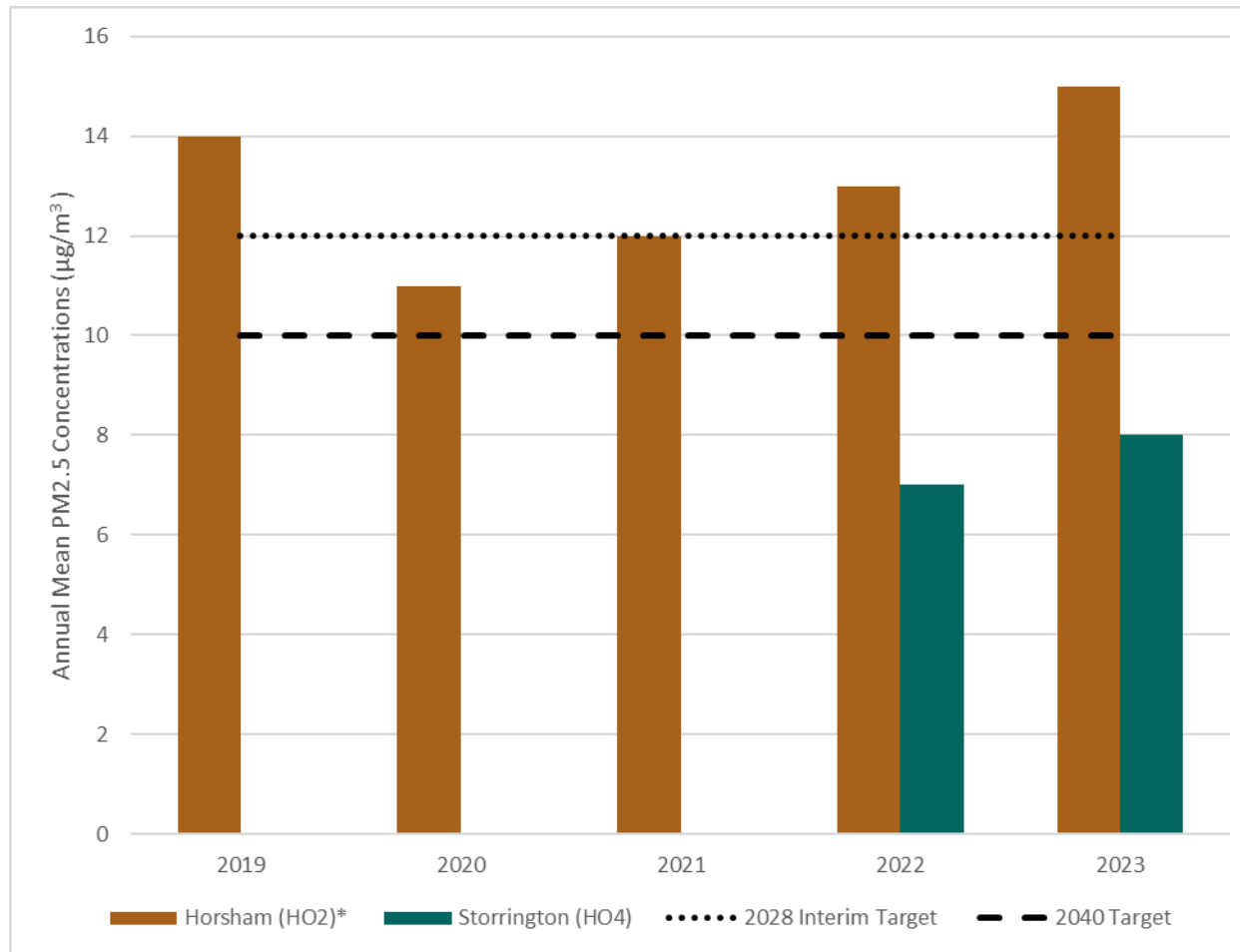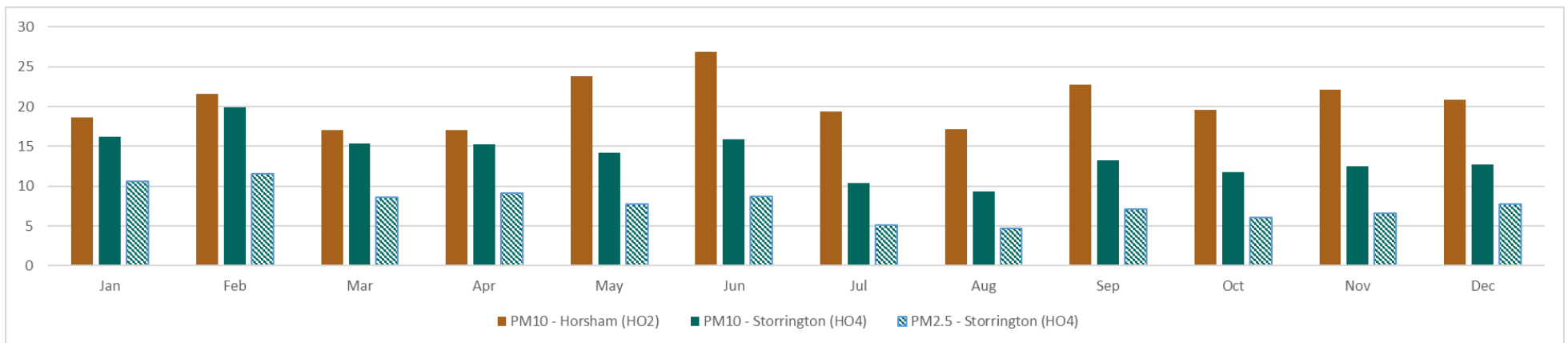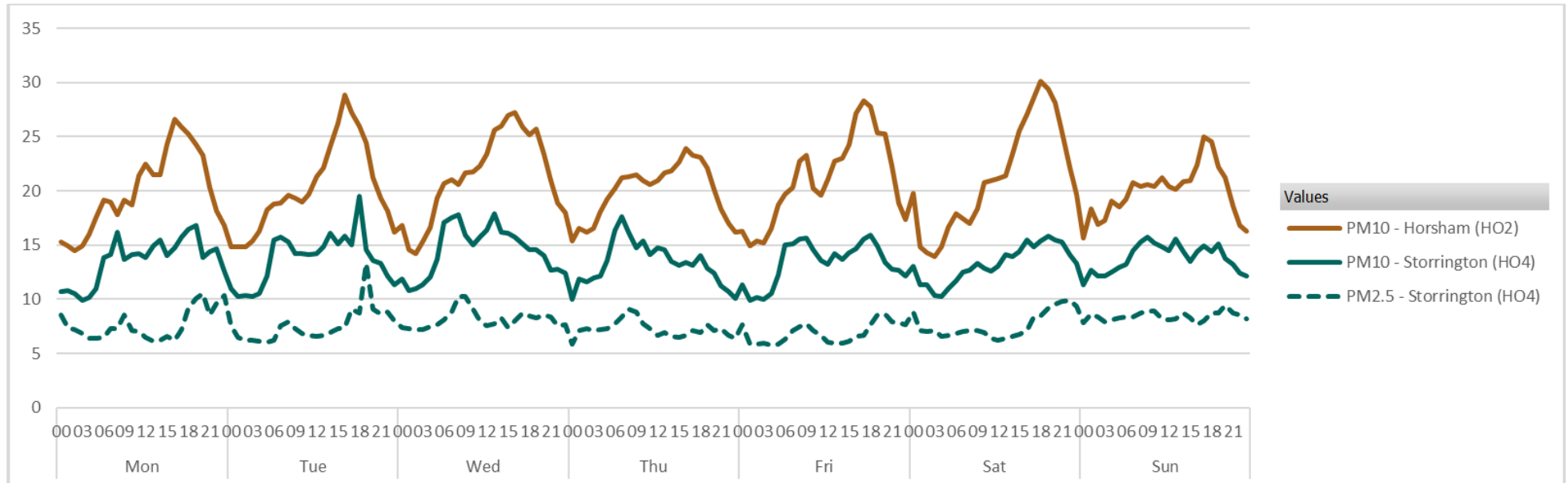**Figure A.8 – Trends in Annual Mean PM$_{2.5}$ Concentrations**

Figure A.9 – Monitoring Results: PM$_{10}$ and PM$_{2.5}$ Concentrations trends (ug/m3) at HO2 Horsham Park Way, HO4 Storrington AURN in 2023

Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO₂ 2023 Diffusion Tube Results (µg/m³)

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 <(0.80)>	Comment
Billingshurst Sites																	
28	508649	125857	34.9	34.2	27.2	22.1	21.0		16.6	16.8	24.9			24.2	24.7	19.7	-
Broadbridge Heath																	
4	514596	130556	21.1	18.4	13.7	11.4	14.9	10.8	6.1	8.6	10.6	12.9	14.8	10.3	12.8	10.2	-
Cowfold Sites																	
12	521324	122610	30.9	34.5	34.4	31.6	24.2	25.5	24.5	26.6	33.2	32.8	30.7	25.6	-	-	Duplicate Site with 12 and 20 - Annual data provided for 20 only
14	521626	122471	30.5	31.6	23.7	16.6	26.4	20.2	17.7	19.1	21.0	22.1	26.4	18.6	22.8	18.2	
20	521324	122610	38.5		34.9	31.4	23.4	27.7	25.9	24.9	36.7	35.2	32.8	23.6	30.2	24.1	Duplicate Site with 12 and 20 - Annual data provided for 20 only
21	521267	122677	39.4	29.2	31.3	31.1	23.8	27.2	26.0	27.2	34.7	30.8	34.5	26.7	30.2	24.1	
22	521311	122704	34.3	29.7	26.4	26.2	20.4	19.5	19.4	20.2	25.6	23.0	24.0	25.3	24.5	19.5	
35	521070	122706	30.1	28.9	23.1	20.1	16.1	19.9	22.5	21.6	23.8	27.0	26.5	21.9	23.5	18.7	
36	521309	122248	35.4	33.1	24.9	20.9	18.7	18.3	21.5	19.0	26.5	26.2	28.0	22.8	24.6	19.6	
37	521460	122473	44.6	45.6	39.8	30.6	35.7	33.4	28.9	29.7	37.8	38.7	31.8	29.2	35.5	28.3	
43	521411	122667	13.2	15.6	11.9	10.1	6.1	8.9	8.6	9.3	11.6	11.3	15.1	11.7	11.1	8.9	
44	521356	122552	30.2	29.8	23.8	21.4	16.9	18.4	14.2	20.4	25.7	22.2	27.6	17.1	-	17.5	Triplicate Site with 44, 45 and 46 - Annual data provided for 46 only
45	521356	122552	28.5	11.0	24.8	22.2	20.7	16.4	19.2	20.5	25.6	25.5	25.3	18.4	-	-	Triplicate Site with 44, 45 and 46 - Annual data provided for 46 only
46	521356	122552	25.4	18.6	25.3	22.7	17.8	17.6	19.5	20.8	28.2	24.4	23.5	17.9	21.9	18.2	Triplicate Site with 44, 45 and 46 - Annual data provided for 46 only
Henfield Sites																	
2	521492	115907	34.5	32.8	26.6	22.0	15.2	18.1	17.4	16.2	25.0	22.9	25.2	17.4	22.8	18.2	
Horsham Sites																	
1	517489	130607	36.7	31.3	28.8	31.0	23.0	21.3	18.3	21.5	28.8	23.5	27.2	23.5	26.2	20.9	
3	516008	130480	13.9	9.7	11.8	9.2	9.1	7.7	5.2	7.0	9.6	10.2	11.5	8.7	9.5	7.6	
5	517489	130580	24.3	29.3	20.2	22.6	19.6	17.4	15.4	18.8	22.9	23.4	23.5	16.2	-	-	Triplicate Site with 5, 6 and 7 - Annual data provided for 7 only
6	517489	130580	29.0	31.0	24.2	21.7	19.5	16.1	16.3	18.6	23.9	22.9	25.3	19.3	-	-	Triplicate Site with 5, 6 and 7 - Annual data provided for 7 only
7	517489	130580	29.7	30.1	25.3	18.7	15.9	15.3	11.8	19.3	22.7	16.0	23.5	18.2	21.3	17.0	Triplicate Site with 5, 6 and 7 - Annual data provided for 7 only

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 <(0.80)>	Comment
8	518239	131137	36.9	37.9	24.8	24.0	30.4	22.6	15.6	20.2	23.9	23.7	29.9	16.2	25.5	20.4	
9	518654	132482	30.3	13.6	22.2	17.7	18.0	15.7	12.3	14.7	21.1	19.4	24.5	16.0	18.8	15.0	
10	516952	132215	29.9	31.9	23.4	20.0	18.1	17.3	13.4	16.3	20.8	21.4	25.8	12.0	20.9	16.6	
11	516646	130221	32.3	31.6	28.6	21.5	21.7	18.7	14.1	17.0	25.0	24.8	26.9	19.0	23.4	18.7	
23	518845	133461	42.8	33.5	35.8	33.3	23.0	31.7	28.2	28.1	41.1	31.3	34.6	29.9	32.8	26.2	
24	517476	134013	25.7	24.3	18.2	24.2	15.7	13.9	13.3	14.5	17.4	11.9		15.8	17.7	14.1	
26	516853	130621	32.2	33.2	23.7	28.0	29.5	22.0	12.7	21.4	25.2	27.2	27.1	19.8	25.2	20.1	
48	518118	131161	37.6	35.1	24.6	14.6	17.5	20.5	21.5	20.4	28.9	28.3	32.2	23.4	25.4	20.3	
Pulborough Sites																	
27	505288	118630	33.2	34.7	24.6	20.7	13.9	15.0	11.0	13.6	17.4	20.4	18.0	14.9	19.8	15.8	
A29_1	505825	118857				9.0	8.5	7.2							8.2	8.1	
A29_2	505349	118755														-	
A29_3	505320	119002				10.0	9.6	8.1							9.2	9.1	
A29_4	506351	118728				10.9	8.1	9.2							9.4	9.2	
A29_5	505407	118854				7.1	5.1	7.0							6.4	6.3	
Pulb_29	504878	118932									20.5	20.4	20.5	17.3	19.7	14.7	
Southwater Sites																	
49	515639	126599	34.5	32.4	23.3	23.3	20.4	19.7	16.9	18.2	26.3	24.5	27.5	18.7	23.8	19.0	
Steyning Sites																	
25	517642	111169	33.1	22.0	25.3	21.8	20.1	18.2		20.6	23.7	23.7	23.1	19.7	22.8	18.2	
Storrington Sites																	
13	508960	114270	44.5	48.2	41.1	44.5	38.3	42.2	29.7	43.5	47.4	40.6	45.0	29.7	41.2	32.9	
15	508935	114297	38.3	12.6	25.8	29.9	28.7	26.4	23.4	25.7	30.9	29.0	31.8	25.4	27.3	21.8	
16	508832	114272	23.3	35.5	33.7	36.1	24.8	26.8	27.2	29.7	38.4	32.1	34.8	25.9	30.7	24.5	
17	508742	114288	33.0	29.3	27.8	25.5	26.7	23.1	16.3	19.6	22.9	22.9	23.8	17.3	24.0	19.2	
18	508396	114449	29.8	31.0	23.7	22.5	16.8	15.6	15.3	19.0	25.8	23.7	26.3	19.7	22.4	17.9	
19	508338	114374	26.8	25.6	19.2	21.7	22.3	20.3	19.9	19.1	24.5	41.8	24.5	17.5	23.6	18.8	
29	509083	114198	29.2	30.9	27.4	26.9			21.5	23.2					-	-	Triplicate Site with 29, 30 and 31 - Annual data provided for 31 only
30	509083	114198			19.6	27.3			21.8	22.4	28.1	26.2	21.2	19.2	-	-	Triplicate Site with 29, 30 and 31 - Annual data provided for 31 only
31	509083	114198	23.5		23.4	23.9			23.0	23.1	27.4	26.0	26.1	17.6	24.8	19.8	Triplicate Site with 29, 30 and 31 - Annual data provided for 31 only

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 <(0.80)>	Comment
32	508675	114306	35.7	37.4	26.6	27.6	26.0	29.1	15.7	23.1	29.4	27.1	20.0	19.1	26.4	21.1	
33	508598	114323	35.3	38.6	27.9	30.5	20.4	21.7	15.8	19.5	30.4	30.7	21.4	21.7	26.2	20.9	
34	508511	114365	38.5	37.9	34.0	34.5	30.7	27.9	26.0	25.8	35.2	30.4	28.6	23.6	31.1	24.8	
38	509319	114160	39.1	20.5	28.6	35.1	23.9	25.8	23.0	31.9	39.6	29.2	31.3	25.8	29.5	23.5	
39	508966	114356	25.1	26.3	23.9	24.3	18.2	20.3	15.6	17.9	28.2	22.8	22.7	17.6	21.9	17.5	
40	509103	114532	25.2	24.8	19.5	16.8	16.0	14.0	15.1	14.8	19.8	19.4	20.4	15.9	18.5	14.7	
41	508677	114149	17.2	13.6	12.3	11.9	10.3	9.4	6.9	7.5	11.1	10.1	4.6	8.9	10.3	8.2	
42	508215	114348	23.2	23.5	15.2	17.2	10.4	14.0	12.1	15.3	22.2	20.3	19.3	13.9	17.2	13.7	
47	508945	114268	50.9	49.5	38.2	42.9	39.0	44.2	51.6		58.0	47.3		41.8	46.3	37.0	

☒ **All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.**

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

☒ **Local bias adjustment factor used.**

☐ **National bias adjustment factor used.**

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

☒ **Horsham District Council confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Horsham District Council During 2023

Horsham District Council has not identified any new sources relating to air quality within the reporting year of 2023.

Additional Air Quality Works Undertaken by Horsham District Council During 2023

Horsham District Council undertook a monitoring exercise in Pulborough within the reporting year of 2023 to establish the relative impact of the A29 road closure on air quality in the area. More information is available on page 35 in this report.

QA/QC of Diffusion Tube Monitoring

HDC followed the Defra Diffusion Tube Deployment Calendar in 2023. The diffusion tubes are sourced from Sototec in Didcot using the 50% TEA in acetone preparation method. The national bias adjustment factor was obtained from Defra national bias adjustment factor database (spreadsheet version number 03/24 published in March 2024) based on 28 co-location studies. The bias adjustment factor given for this methodology was 0.77.

Laboratories participate in two QA/QC schemes. The new AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) is run by LGC and supported by the Health & Safety Laboratory. The other scheme is a monthly field intercomparison Exercise operated by the National Physics Laboratory (NPL). Defra advises that local authorities should use diffusion tubes supplied by laboratories that have demonstrated satisfactory performance under the QA/QC schemes.

Socotec is a UKAS accredited laboratory and participates in both QA/QC schemes described above. The list of those laboratories which have performed satisfactorily in the AIR-PT scheme is provided to local authorities on the LAQM Support website[17]. In the

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[17] https://laqm.defra.gov.uk/air-quality/air-quality-assessment/qa-qc-framework/

latest available AIR-PT results Socotec have scored 100% in round AR059 (September to October 2023). The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$.

Diffusion Tube Annualisation

Annualisation (short to long term data adjustment) is required for any site with data capture less than 75% but greater than 25%. Annualisation was required for DT28 (Billingshurst 1), as the site was missing data for June, October and November 2023. Annualisation was also required for Pulb_29, as this site started being monitored in September, following a resident complain regarding increased idling traffic. All sites from Pulborough exercise were also annualised, as they only had three months of monitored data.

Table C.1 – Annualisation Summary (concentrations presented in µg/m³)

Diffusion Tube ID	Annualisation Factor Chichester CI1	Annualisation Factor Brighton - BH0	Annualisation Factor Horley	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m3)	Annualised Data Simple Annual Mean (µg/m3)
28	0.9984	0.9900	0.9968	0.9951	24.7	-
A29_1	1.2045	1.1232	1.3706	1.2327	8.2	10.1
A29_3	1.2045	1.1232	1.3706	1.2327	9.2	11.4
A29_4	1.2045	1.1232	1.3706	1.2327	9.4	11.6
A29_5	1.2045	1.1232	1.3706	1.2327	6.4	7.9
Pulb_29	0.9368	1.0002	0.8775	0.9382	19.7	18.5

Table C.2 – Details of sites used for Annualisation Summary

Site Name	Site Type	Data capture
Horley	AURN - Suburban Industrial	90%
BH0 - Brighton Preston Park	AURN - Urban Background	99%
CI1 - Chichester	Locally Managed - Suburban	91%

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 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.

Horsham District Council have applied a local bias adjustment factor of 0.80 to the 2023 monitoring data. A summary of bias adjustment factors used by Horsham District Council over the past five years is presented in Table C.3.

Table C.3 – Bias Adjustment Factor

Monitoring Year	Local or National	Adjustment Factor
2023	Local (Storrington, Cowfold, Park Way)	0.80
2022	Local (Cowfold)	0.80
2021	Local (Storrington, Cowfold, Park Way)	0.83
2020	Local (Storrington, Cowfold, Park Way)	0.74
2019	Local (Storrington, Cowfold, Park Way)	0.81

Table C.4 – Local Bias Adjustment Calculation

	Local Bias Adjustment HO2 – Park Way	Local Bias Adjustment HO4 - Storrington	Local Bias Adjustment HO5 - Cowfold
Periods used to calculate bias	12	8	9
Bias Factor A	0.76 (0.71 - 0.82)	0.69 (0.63 - 0.77)	1 (0.82 - 1.28)
Bias Factor B	32% (22% - 41%)	44% (29% - 60%)	0% (-22% - 22%)
Diffusion Tube Mean ($\mu g/m^3$)	21.3	23.8	23.4
Mean CV (Precision)	8.9%	7.6%	6.2%
Automatic Mean ($\mu g/m^3$)	16.2	16.5	22.5
Data Capture	99%	99%	95%
Adjusted Tube Mean ($\mu g/m^3$)	16 (15 - 17)	16 (15 - 18)	23 (18 - 29)

Notes:

A combined local bias adjustment factor of 0.80 has been used to bias adjust the 2023 diffusion tube results.

Table C.5 – National Diffusion Tube Bias Adjustment Factors Spreadsheet

National Diffusion Tube Bias Adjustment Factor Spreadsheet

Spreadsheet Version Number: 03/24

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

This spreadsheet will be updated at the end of June 2024
LAQM Helpdesk Website

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

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

Analysed By[1]	Method	Year	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) ($\mu g/m^3$)	Automatic Monitor Mean Conc. (Cm) ($\mu g/m^3$)	Bias (B)	Tube Precision	Bias Adjustment Factor (A) (Cm/Dm)
SOCOTEC Didcot	50% TEA in acetone	2023	UB	City Of York Council	11	15	12	27.9%	G	0.78
SOCOTEC Didcot	50% TEA in acetone	2023	R	City Of York Council	11	22	17	26.8%	G	0.79
SOCOTEC Didcot	50% TEA in acetone	2023	R	City Of York Council	9	22	17	33.7%	G	0.75
SOCOTEC Didcot	50% TEA in acetone	2023	R	City Of York Council	10	31	25	26.1%	G	0.79
SOCOTEC Didcot	50% TEA in acetone	2023	UB	Gravesham Borough Council	12	19	15	25.6%	G	0.80
SOCOTEC Didcot	50% TEA in acetone	2023	UB	Gravesham Borough Council	12	23	19	18.4%	G	0.84
SOCOTEC Didcot	50% TEA in acetone	2023	R	Ipswich Borough Council	9	26	20	33.0%	G	0.75
SOCOTEC Didcot	50% TEA in acetone	2023	R	Ipswich Borough Council	12	36	27	34.3%	G	0.74
SOCOTEC Didcot	50% TEA in acetone	2023	R	North East Lincolnshire Council	12	43	26	61.9%	G	0.62
SOCOTEC Didcot	50% TEA in acetone	2023	UB	North East Lincolnshire Council	10	13	10	29.1%	G	0.77
SOCOTEC Didcot	50% TEA in acetone	2023	R	North East Lincolnshire Council	11	24	21	18.0%	G	0.85
SOCOTEC Didcot	50% TEA in acetone	2023	R	Cardiff Council / Shared Regulatory Services	11	41	34	22.2%	G	0.82
SOCOTEC Didcot	50% TEA in acetone	2023	UB	Torfaen County Borough Council	11	12	9	43.9%	G	0.70
SOCOTEC Didcot	50% TEA in Acetone	2023	R	East Suffolk Council	12	29	21	38.9%	G	0.72
SOCOTEC Didcot	50% TEA in acetone	2023	R	Wrexham County Borough Council	11	17	14	25.2%	G	0.80
SOCOTEC Didcot	50% TEA in Acetone	2023	R	Horsham District Council	12	21	17	23.5%	G	0.81
SOCOTEC Didcot	50% TEA in Acetone	2023	R	Horsham District Council	10	25	17	43.5%	G	0.70
SOCOTEC Didcot	50% TEA in Acetone	2023	R	Horsham District Council	10	23	24	-5.4%	G	1.06
SOCOTEC Didcot	50% TEA in acetone	2023	UI	North Lincolnshire Council	10	14	11	26.2%	G	0.79
SOCOTEC Didcot	50% TEA in acetone	2023	R	Bridgend Council	11	32	27	20.8%	G	0.83
SOCOTEC Didcot	50% TEA in acetone	2023	R	Cambridge City Council	12	22	18	24.8%	G	0.80
SOCOTEC Didcot	50% TEA in acetone	2023	R	Leeds City Council	10	39	29	32.3%	G	0.76
SOCOTEC Didcot	50% TEA in acetone	2023	KS	Leeds City Council	10	30	20	48.9%	G	0.67
SOCOTEC Didcot	50% TEA in acetone	2023	R	Leeds City Council	12	25	19	30.0%	G	0.77
SOCOTEC Didcot	50% TEA in acetone	2023	UC	Leeds City Council	11	26	19	40.0%	G	0.71
SOCOTEC Didcot	50% TEA in acetone	2023	KS	Marylebone Road intercomparison	11	53	38	41.4%	G	0.71
SOCOTEC Didcot	50% TEA in acetone	2023	R	Vale Of White Horse District Council	10	22	18	21.2%	G	0.83
SOCOTEC Didcot	50% TEA in acetone	2023	UB	Wirral Council	11	15	13	16.7%	G	0.86
SOCOTEC Didcot	50% TEA in acetone	2023		**Overall Factor[3] (28 studies)**					**Use**	**0.77**

NO₂ 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 has been estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO_2 monitoring locations within Horsham District required distance correction during 2023.

QA/QC of Automatic Monitoring

Data collection and ratification for the HO2 Horsham Park Way and HO5 Cowfold monitoring stations is undertaken by Bureau Veritas through a contract with Sussex Air Partnership. For more information, please visit the Sussex Air Quality Partnership website at http://www.sussex-air.net. The operation and data management for both stations are

carried out to the AURN standards, however, the data quality could be further improved if independent inter calibrations site audits were carried out (which are requirement for AURN sites).

HO4 Storrington AURN monitoring station is an AURN site. A number of organisations are involved in the day-to-day running of the network. Currently, the role of Central Management and Co-ordination Unit (CMCU) for the whole AURN is contracted to Bureau Veritas, whilst Quality Assurance and Quality Control (QA/QC) activities are contracted to Ricardo Energy & Environment. The responsibility for operating individual monitoring sites is assigned to local organisations, such as local authority Environmental Health Officers with relevant experience in the field. Calibration gases for the network are supplied by BOC Limited and are provided with a UKAS certificate of calibration by Ricardo Energy & Environment.

Calibrations and checks at all stations are undertaken every two or four weeks by an in-house Local Site Operator and the analysers are maintained under contract with instrument suppliers/manufacturers for all three stations.

All data presented within this ASR have been previously ratified.

Live and historic data is available at Sussex-Air and UK-Air website.

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

Particulate data is corrected to gravimetric equivalent measurement values. All corrections are applied for the instrument type and size fraction measured. No Volatile Correction Method (VCM) was used across Sussex TEOM sites.

Automatic Monitoring Annualisation

All automatic monitoring locations within Horsham District recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data.

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 has been estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, automatic annual mean NO_2 concentrations corrected for distance are presented in Table A.3.

No automatic NO_2 monitoring locations within Horsham District required distance correction during 2023.

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

Figure D.1 – Map of Horsham and Broadbridge Heath Monitoring Sites

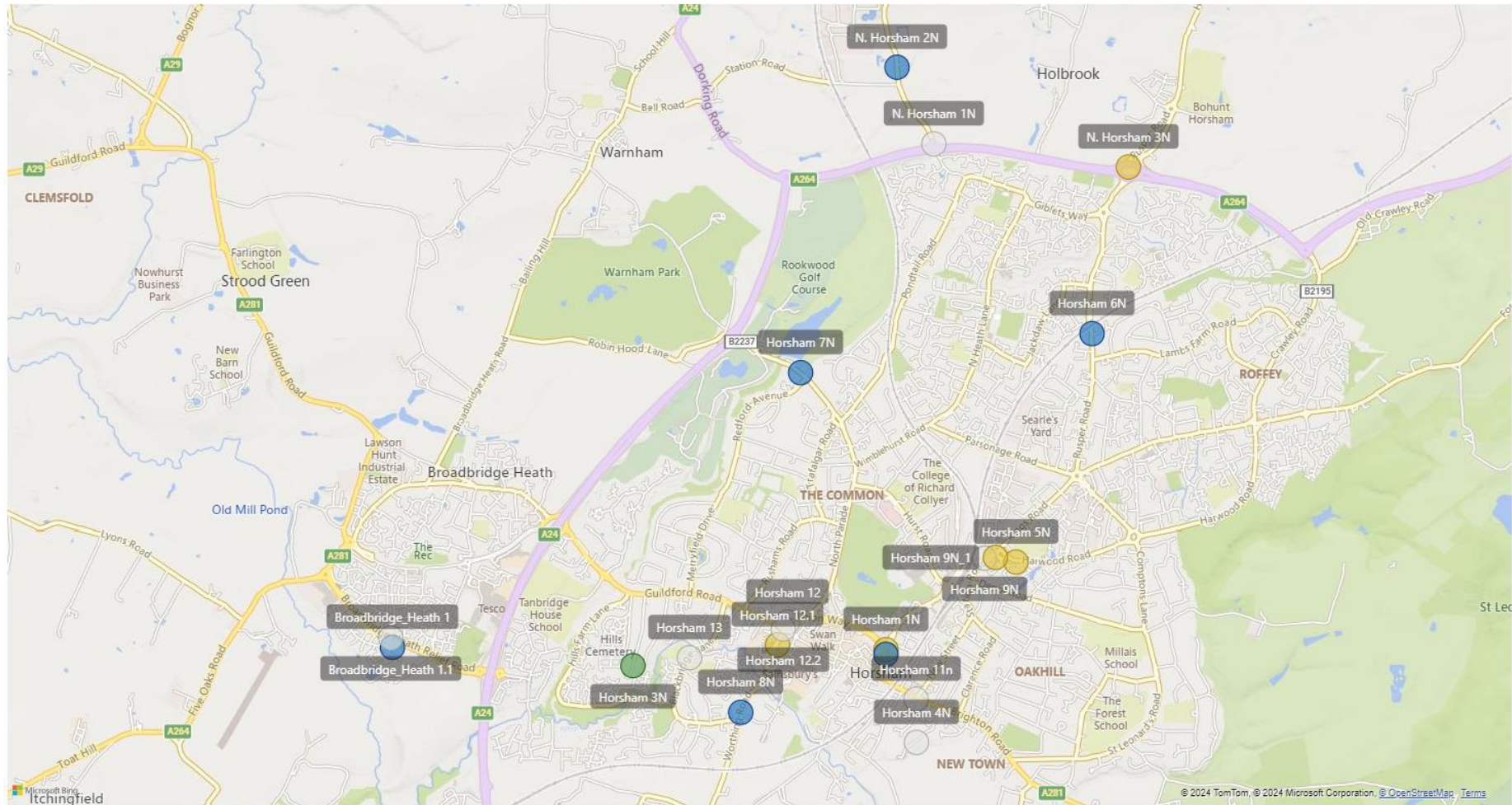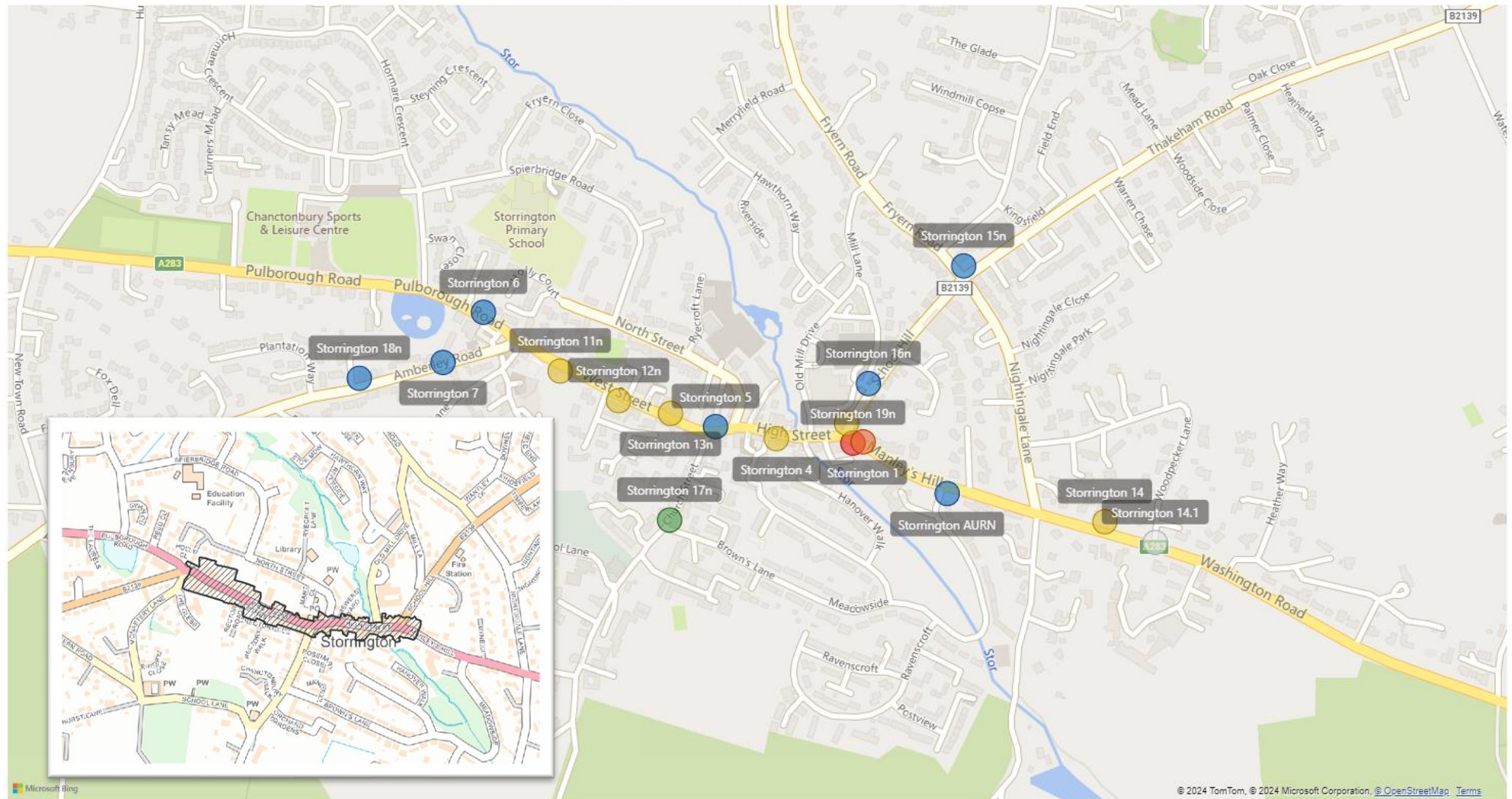NO2 Concentration 2023 ● 10.0 - 20.0 ● 20.0 - 30.0 ● below 10.0 ● not active

Figure D.2 – Map of Storrington Monitoring Sites

Figure D.3 – Map of Cowfold Monitoring Sites
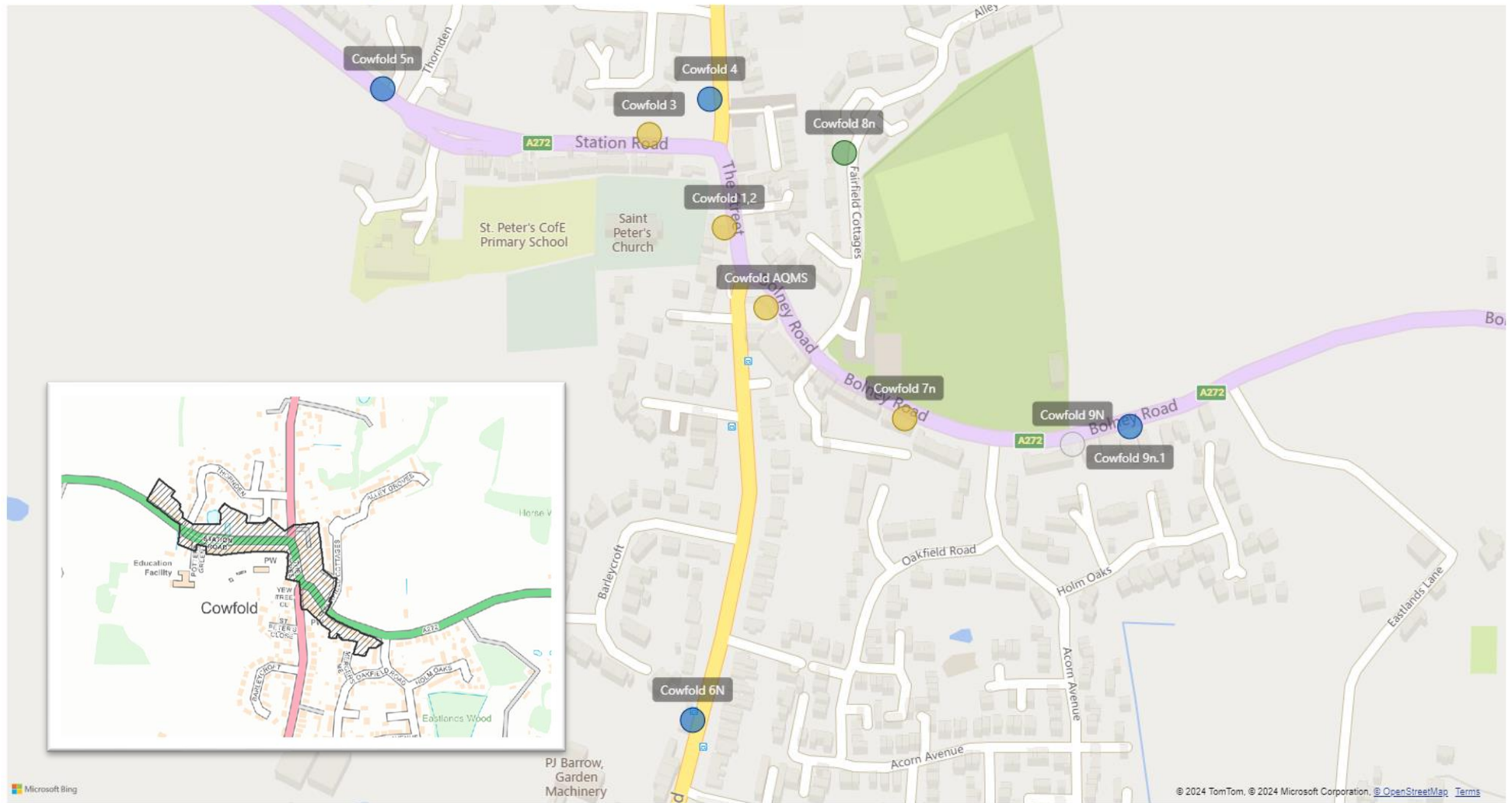
Figure D.4 – Map of Henfield and Steyning Monitoring Sites
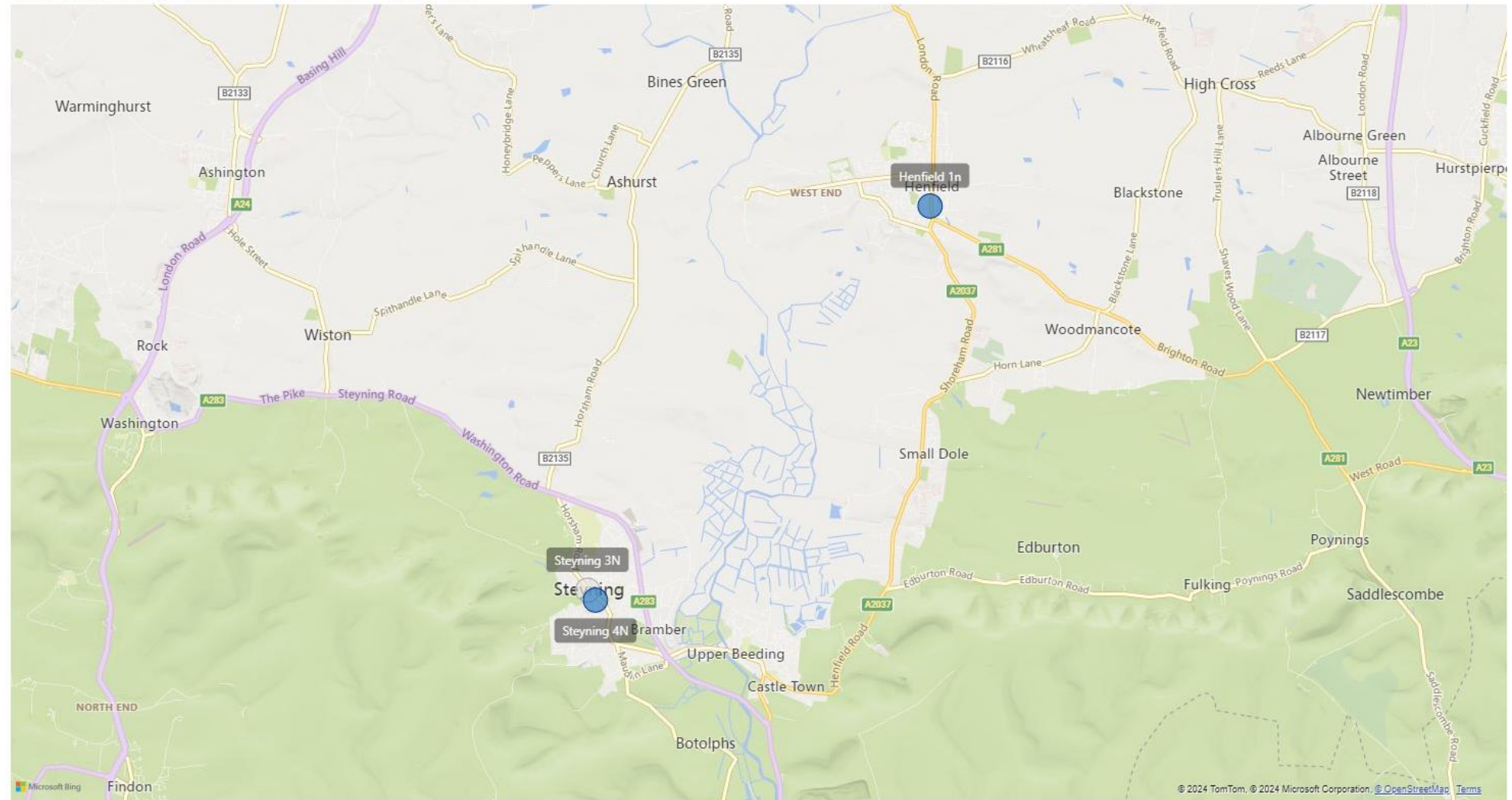
Figure D.5 – Map of Pulborough Monitoring Sites
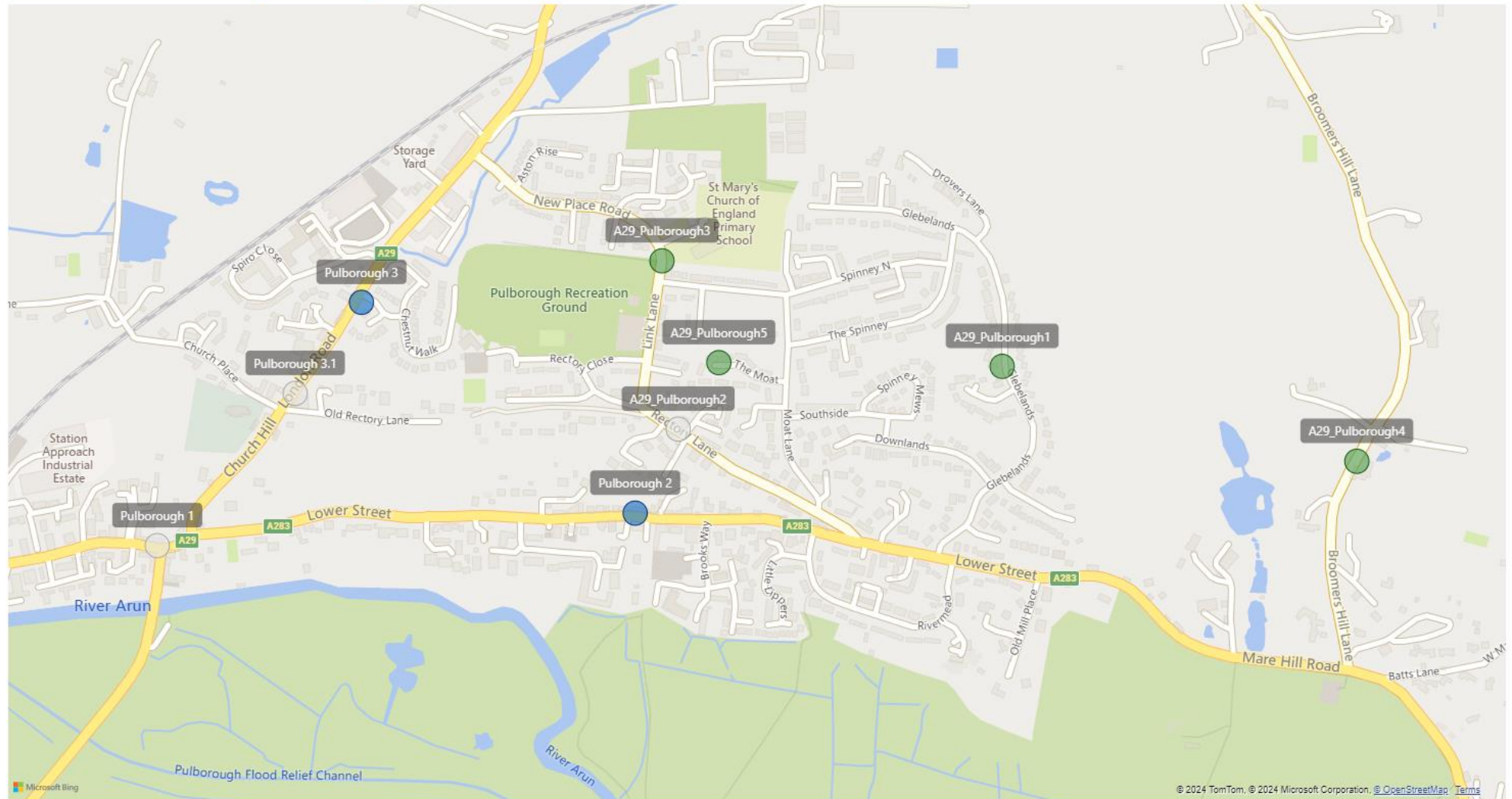
Figure D.6 – Map of Billingshurst and Southwater Monitoring Sites
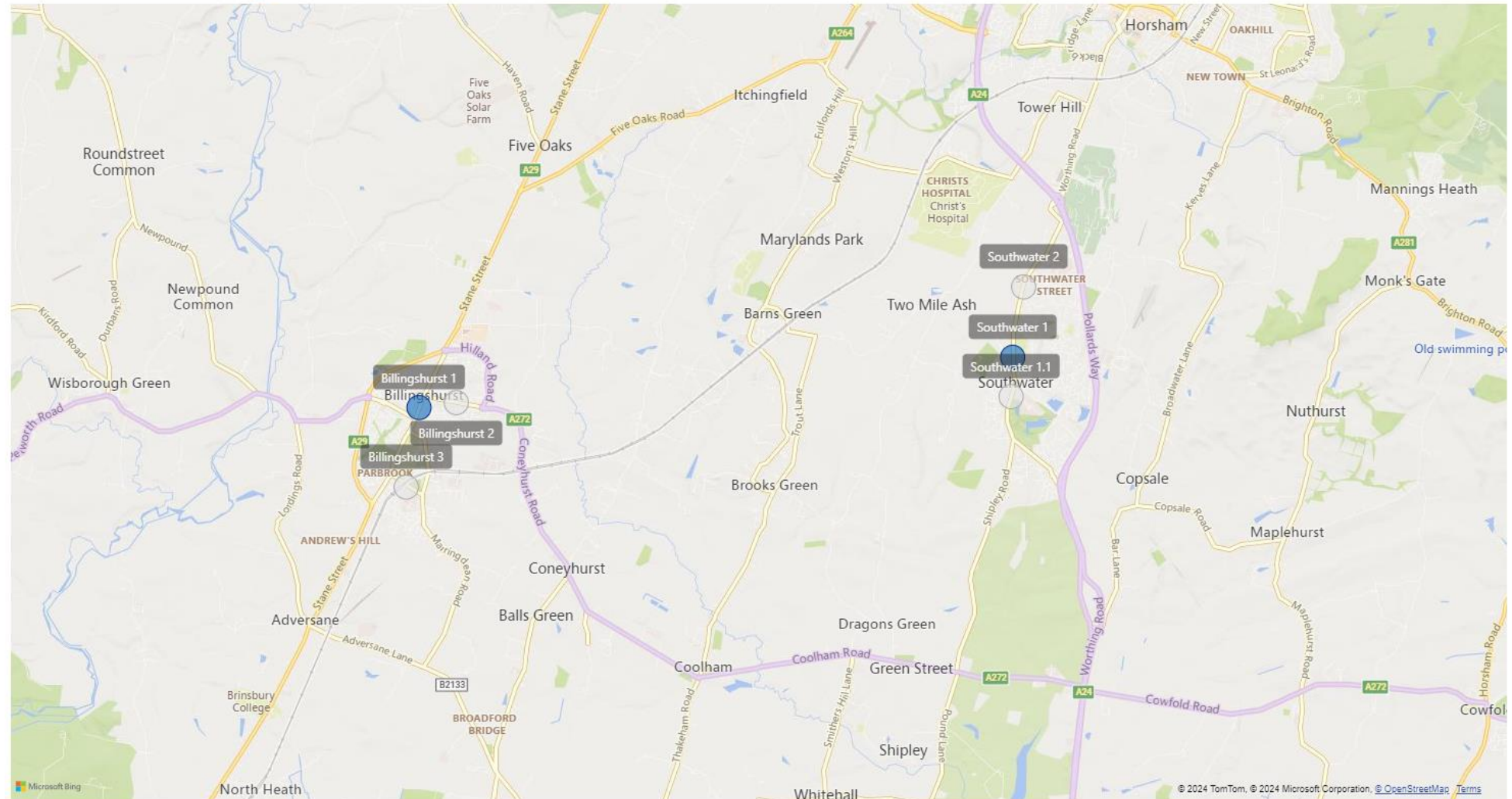
Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[18]

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

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[18] 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
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.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.