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: September 2024

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Executive Summary: Air Quality in Our Area

Air Quality in Birmingham

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

The main air quality issue in Birmingham is elevated levels of nitrogen dioxide (NO_2), particularly within the City Centre area as a result of road traffic emissions. Broadly monitoring results show that concentrations have been declining over the last 5 years, although exceedances persist at some locations. A city-wide air Quality Management Area (AQMA) was declared in 2003.

Birmingham city centre is undergoing significant regeneration with several major projects either underway or planned for the near future including at Paradise Circus, Curzon Street (HS2), and Digbeth, Smithfield. As a result the city centre area is in a near constant state of flux and as a result it is considered that the best way to address air quality issues is through the adoption of an area-based strategy, and through working in collaboration with partner organisations and interested stakeholders such as DEFRA, the West Midlands Combined Authority, the West Midlands Low Emissions Towns & Cities Partnership, WM-Air, and Highways England.

Actions to Improve Air Quality

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

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

The Road to Zero[5] details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of

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

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

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

personal travel and the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Birmingham City Council adopted a new Air Quality Action Plan in 2021. The plan sets out 7 broad actions that are being undertaken to improve air quality. However, the singular driving project that is likely to provide measurably improved air quality and be most visible to citizens is that of the Clean Air Zone (CAZ), which became operational in June 2021. In the CAZ area NO_2 concentrations have reduced by 37% compared to the 2016 baseline and vehicle compliance rates have improved significantly. We will continue to monitor and evaluate the impact of the CAZ on air quality.

Efforts to reduce traffic in the city centre have been made through the City Centre Segments measure, and work continues to improve public transport infrastructure including development of the Sprint and cross city bus networks, expansion of the Midland Metro network, and the re-opening of the Camp Hill railway line to provide new stations at Moseley, Kings Heath, and Stirchley. Birmingham City Council also continues to deliver its programme of improvements to infrastructure and services to support active travel (walking and cycling), enabling an increasing number of local trips to be made using non-motorised modes of transport. We have published a Clean Air Strategy, and this will be revised and updated in the coming year.

The City Council also maintains close working relationships with partner organisations including the other West Midlands Authorities under the aegis of the Low Emissions Towns & Cites Programme, the Combined Authority, WM-Air (in conjunction with University of Birmingham), and the public transport delivery group Transport for West Midlands, as well as continuing to lobby Government through existing routes and responding to existing or emerging consultations on air quality.

Conclusions and Priorities

Some monitoring sites located within the AQMA showed exceedances of the annual mean objective for NO_2. All of the persistent exceedances were located either within the city centre or adjoining the A4540 ring road, so future concentrations will likely be affected by the CAZ. These exceedances will be the subject of an independent study under the CAZ monitoring and evaluation programme. Non automatic monitoring results show a generally declining trend in concentrations. It is not envisaged that the AQMA will need to be amended in the coming year.

A new AQAP was published in 2021 and progress with measures are set out in this report. Birmingham City Council's priorities for 2024 are to;

- To continue with the operation and monitoring of the CAZ and in conjunction with JAQU to develop proposals to deliver compliance at all locations.
- To revise and refresh the Clean Air Strategy.
- To renew the Smoke Control Area and bring moored vessels into scope.
- To publish the BTP Delivery Plan.
- To expand the Schools Monitoring Program with aim of deploying a sensor at every school in the district.

Local Engagement and How to get Involved

Details of local consultation undertaken and how to help improve air quality can be viewed on the council's website here; https://www.birmingham.gov.uk/info/20076/pollution

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Division of Birmingham City Council with the support and agreement of officers from the following:

- Brum Breathes Program Board
- Inclusive Growth Directorate
- City Operations Directorate
- Public Health Directorate

This Annual Status Report has been approved by:

Ms Sajeela Naseer, Director – Regulation and Enforcement

Mr Philip Edwards, Assistant Director – Transport and Connectivity

Dr Justin Varney, Director of Public Health

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1 Local Air Quality Management

This report provides an overview of air quality in the Birmingham City Council area 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 Birmingham City 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 Birmingham City Council can be found in Table 2.1. The table presents a description of the 1 AQMA that is currently designated within Birmingham. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of the AQMA and also the air quality monitoring locations in relation to the AQMA. The air quality objective pertinent to the current AQMA designation is as follows:

- 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
Birmingham AQMA	10/01/2003	NO_2 Annual Mean	Whole City	NO	46	58.8	Not Compliant	Air Quality Plan 2021	See below.

Birmingham City Council's AQAP can be viewed here;

https://www.birmingham.gov.uk/info/20076/pollution/1276/air_pollution/2

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

☒ **Birmingham City Council confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in Birmingham

Defra's appraisal of last year's ASR determined that the conclusions reached in the report were accepted for all sources and pollutants, and that Birmingham City Council should continue to reference the Public Health Outcomes Framework, present pollutant trends and maintain high standards of QA/QC.

Birmingham City 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. 26 measures are included within Table 2.2, with the type of measure and the progress Birmingham City 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; Birmingham Transport Plan, Birmingham Development Plan, Clean Air Strategy, Development Management in Birmingham.

Key completed measures are:

- The operation and monitoring and evaluation of the CAZ has continued, and studies have commenced to investigate persistent exceedances of the annual mean NO_2 objective at some locations.
- An Air Quality Policy Manager has been appointed to oversee the revision of the Clean Air Strategy and progress the actions therein.
- The subscription for sensors deployed in Phase 1 of the Air Quality Monitoring in Schools project has been extended and the tender process for Phase 2 has commenced.
- The NO_2 Tranche Monitoring Program under the local air quality management function duties has continued to progress with Tranche 2 being completed in 2023.

Birmingham City Council's priorities for the coming year are as follows;

- To continue with the operation and monitoring of the CAZ and in conjunction with JAQU to develop proposals to deliver compliance at all locations.
- To revise and refresh the Clean Air Strategy.

- To renew the Smoke Control Area and bring moored vessels into scope.
- To publish the BTP Delivery Plan.
- To expand the Schools Monitoring Program with aim of deploying a sensor at every school in the district.

Birmingham City Council worked to implement the following measures in partnership with the following stakeholders during 2023:

- Transport for the West Midlands
- University of Birmingham (via WM-Air)

The principal challenges and barriers to implementation that Birmingham City Council anticipates facing are the challenges resulting from the financial pressures that the Council faces and delivering the changes required to deliver a balanced budget and become a financially stable well-run authority.

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

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(a)	Clean Air Zone Implementation & Operation	Promoting Low Emission Transport	Low Emission Zone (LEZ)	2021	2025	Birmingham City Council/JAQU	CAZ Fund	NO	Funded	£1 million - £10 million	Implementation		NO_2 concentrations at all receptor points below 40 µg/m3	Since the introduction of the scheme, the percentage of the most polluting vehicles entering the Zone has reduced from 15.2% in June 2021 to 6.6% at the end of 2022 and 4.9% at the end of 2023. Reductions in the levels of nitrogen dioxide in the Zone are reducing and continue to be monitored and reported direct to the Joint Air Quality unit and through the Air Quality Annual Status report.	
1(b)	Mobility Support	Promoting Low Emission Transport	Low Emission Zone (LEZ)	2021	2022	Birmingham City Council	CAZ Fund	NO	Funded	£1 million - £10 million	Implementation		No of exemptions issued	All temporary exemptions schemes ended May 2023.	
1(c)	Hackney Carriage & Private hire Vehicle Support	Promoting Low Emission Transport	Low Emission Zone (LEZ)	2020	2022	Birmingham City Council	CAZ Fund	NO	Funded	£1 million - £10 million	Implementation		Total value of support issued	To date this scheme has provided funding of c. £3.7m. There is a relatively even split between the funding provided to private hire and hackney carriage drivers. Compliance for each of these fleets is now at c. 98% (PHVs) and 65% HCVs.	Lack of uptake.
1(d)	HGV & Coach Compliance Fund	Promoting Low Emission Transport	Low Emission Zone (LEZ)	2021	2023	Birmingham City Council	CAZ Fund	NO	Funded	£1 million - £10 million	Implementation		total value of support issued	Ongoing. Demand for this scheme remains low as compliance for HGVs and coaches entering the CAZ is persistently above 96% and LGVs is now at 88%.	Slow uptake.
1(e)	Marketing & Engagement Campaign	Promoting Low Emission Transport	Low Emission Zone (LEZ)	2020	2022	Birmingham City Council	CAZ Fund	NO	Funded	£1 million - £10 million	Implementation		Website traffic/engagement	Series of BAU campaigns in place throughout year to support ongoing awareness of the scheme above and beyond the informational and regulatory signage scheme in place.	
1(f)	Resident Parking Schemes	Promoting Low Emission Transport	Low Emission Zone (LEZ)	2021	2022	Birmingham City Council	CAZ Revenue	NO	Funded	£1 million - £10 million	Implementation			Ongoing. Implementation now due by early 2025	Availability of resource to complete the projects.
1 (g)	Network Changes	Promoting Low Emission Transport	Low Emission Zone (LEZ)	2021	2026	Birmingham City Council	CAZ Fund	NO	Funded	£1 million - £10 million	Implementation			Changes at Suffolk Street Queensway partially implemented in 2023. Work underway to make changes permanent. Work on Dartmouth Middleway/Lister Street junction now expected to be completed in early 2025.	Full implementation of Suffolk Street Queensway changes delayed due to developments at Paradise. Responses to Great Lister Street changes under consideration.
2(a)	Midland Metro Expansion	Transport Planning and Infrastructure	Other	2016	2027	WMCA/TfWM	DfT/GBSLEP/ S106	NO	Funded	> £10 million	Implementation			Extension to city centre opened 2016. Extension to Centenary Square opened 2019. Hagley Road extension opened in June 2022. Extension to Clayton Hotel 2025. Full Digbeth Extension 2027.	
2(b)	Birmingham Transport Plan (including consideration of future role of A38 in City Centre)	Transport Planning and Infrastructure	Other	2019	2021	Birmingham City Council	Birmingham City Council	NO	Partially Funded	£1 million - £10 million	Planning			Adopted by Cabinet in October 2021.	BTP Delivery Plan to be published in 2024

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2 (c)	Rail Expansion (Camp Hill Line Extension)	Transport Planning and Infrastructure	Other	2017	2023	WMCA/BCC/DfT/Network Rail	WMCA/BCC/DfT	NO	Funded	> £10 million	Implementation	Potential to reduce up to 25% local vehicle trips		Construction of new stations commenced in 2022 with services anticipated to commence in late 2024	
2 (d)	City Segments	Transport Planning and Infrastructure	Other	2020	2022	TBC	Active Travel Tranche 2	NO	Partially Funded	£1 million - £10 million	Planning	The segments should encourage a modal shift and cycling provisions will also be provided	Air quality and traffic data changes	Completed Upper Dean Street Bus Gate in 2022, Newtown Row and Jewellery Quarter active travel measures made permanent in 2023. Implementation of Cheapside measures to commence in Summer 2024 and complete by October 2024 - this will greatly reduce private vehicle rat-running through the eastern side of the city centre.	Further progress subject to publication of the BTP Delivery Plan.
2 (e)	Sprint Bus Network	Transport Planning and Infrastructure	Bus route improvements	2019	2025	WMCA/Birmingham City Council	WMCA/Birmingham City Council	NO	Partially Funded	> £10 million	Implementation	Reduce emissions and encourage modal shift		Phase 1 A34/A45 complete in 2022 Phase 2 A34/A45 to complete in 2026 City Centre Sprint to complete in 2027	
3(a)	Business and Schools Mode Shift Stars	Promoting Travel Alternatives	Other	2015	2025	Birmingham City Council, Schools, and Businesses	Clean Air Fund Local Authority Capability Fund External recharge (occasionally)	NO	Funded	£50k - £100k	Implementation	Modal shift to more active and sustainable modes	No of new travel plans and no of plans accredited	Workplaces: 17 Modeshift Travel Plans accredited to Bronze Level. 8 Travel Plans accredited to Green Level. 113 registered on the Modeshift STARS Business Scheme, but not all actively using it. Schools: 272 registered on the scheme. 18 accredited to Green Level, 23 to Bronze, 3 to Silver,	Engagement of schools and businesses
3 (b)	Schools Monitoring Project	Promoting Travel Alternatives	School Travel Plans	2021	2023	Birmingham City Council	CAZ revenue	NO	Funded	£50k - £100k	Planning		Increased awareness of air quality around schools	Phase 1 of the schools' sensor project was launched in January 2022 and has seen an air quality sensor deployed in 69 schools along with a co-located sensor at the Ladywood air quality station. The sensors have been provided by Airly (https://airly.org/en/) and provide real time data on NO2, PM10 and PM2.5 pollutants. Phase 2 of the project will seek to offer to install an AQ sensor into every school in Birmingham and during 2023 work was underway to prepare the procurement documents in advance of open tender and a targeted engagement campaign to encourage maximum sign-up from schools to achieve full coverage across the city.	Interest from schools to participate in the project has been slower than expected.
3 (c)	Car Free School Streets	Public Information	Other	2021	2023	Birmingham City Council	Capital Programme/CAZ revenue/AFT3 (Bidding in progress)	NO	Partially Funded	£100k - £500k	Implementation	Moving pollution source away from school gate. Modal shift to more active and sustainable modes	Number of CFSS operational. Feedback from school and local residents	17 CFSS operational	School engagement. Geography/road layout. Proximity to bus routes. Enforcement.

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3 (d)	Places for People (Low Traffic Neighbourhoods)	Promoting Travel Alternatives	Other	2020	2025	Birmingham City Council	Emergency Active Travel Fund	NO	Funded	£1 million - £10 million	Implementation	Encourage active travel by reducing through traffic on residential streets		Delivered 2 low traffic neighbourhood pilots in Kings Heath and Lozells, alongside some early demonstration projects on identified streets in Bournville, Castle Vale and Moseley. These were introduced as temporary trial measures and we now have funding to make improvements, expand and make the schemes permanent.	Some schemes attracted some opposition, due to lack of consultation as schemes introduced as emergency measures during Covid-19 pandemic.
4 (a)	LPG Retrofit of 65 Hackney Cabs	Promoting Low Emission Transport	Taxi emission incentives	2014	2015	BCC & Harborne Garage	OLEV	NO	Funded	£500k - £1 million	Completed	reduction of NO2	Completion of monitoring program and development of actions to address exceedences	Programme completed 2015 with 65 Hackney Cabs retrofitted to LPG. CVRAS accreditation of LPG retrofit solution achieved 2015.	COMPLETE
4 (b)	EV Charging Strategy & Roll Out	Promoting Low Emission Transport	Public Vehicle Procurement -Prioritising uptake of low emission vehicles	2019	2032	BCC, ESB Ltd, & Private sector	OZEV	NO	Funded	£1 million - £10 million	Implementation	reduction of NO2	monitoring programme	Strategy launched Nov 2021; 286 fast (22kw) and rapid (50kw+) charge points installed by BCC and procured supplier to date.	Following COVID, Brexit, and the energy crisis the market has slowed down. The remaining 108 charging points will be delivered in line with market growth.
4 (c)	Low & Zero emission fuel strategy	Promoting Low Emission Transport	Public Vehicle Procurement -Prioritising uptake of low emission vehicles	2014	2015	BCC & Element Energy	BCC	NO	Funded	£10k - 50k	Completed	reduction of NO2 & CO2	report complete	Recommendations being delivered including EV infrastructure and hydrogen re-fuelling station operational at Tyseley Energy Park.	COMPLETE
4 (d)	Clean Air Hydrogen Bus pilot	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2020	2024	BCC, National Express	OLEV, GBSLEP, BCC & FCHJU & NX	NO	Funded	> £10 million	Implementation	reduction in NO2 & co2	monitoring programme	Delivered pilot of 20 hydrogen buses procured and operational via Bus Operator, National Express.	Pilot ongoing until 2026
5 (a)	Tranche monitoring	Traffic Management	Other	2020	2023	Birmingham City Council - Environmental Health	Internal	NO	Funded	£10k - 50k	Planning	Unknown at this stage	Completion of monitoring program and development of actions to address exceedences	Tranche 2 completed with no monitoring locations showing annual mean <40ug/m3. Tranche 3 to commence in 2024.	Sufficient staff resource to undertake monitoring

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 (a)	Clean Air Strategy	Policy Guidance and Development Control	Other policy	2019	2021	Birmingham City Council	Internal	NO	Funded	£50k - £100k	Implementation	Unknown at this stage	Actions taken on pledges and implementation of strategy	Birmingham's Clean Air Strategy was launched in January 2022 (https://www.brumbreathes.co.uk/downloads/download/41/air-quality-strategy). The strategy outlines five priorities and six pledges aimed at raising awareness and improving air quality. The strategy also includes 8 actions which include - 1: Clean Air Zone (Implementation achieved - ongoing work to monitor compliance) 2: Feedback to the strategy (ongoing) 3: Clear accessible AQ and traffic data (achieved) 4: Increased AQ monitoring (achieved) 5: AQ monitoring for schools (ongoing) 6: NRMM emissions (no progress to date) 7: Increased awareness of wood burners (limited progress to date) 8 Anti idling campaign (limited progress through "Switch Off School Streets" promotion). An update of the strategy is in progress, with a planned focus on areas of potential concern not covered by existing legislation or initiatives, including particulate matter and indoor air quality. This will be alongside plans to secure agreement to new pledges and contributions to achievement of the strategy through working with communities and anchor institutions in the city.	
6 (b)	Planning Policy	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2018	2021	Birmingham City Council	Inclusive growth revenue budget	NO	Funded		Completed	Unknown at this stage		A new planning policy relating to air quality was introduced through the adoption of the Development Management in Birmingham DPD. The DPD forms part of Birmingham's local plan and is used to in determination of planning applications. Policy DM1 'Air Quality' seeks to ensure that development proposals consider air quality and is accompanied by an appropriate scheme of mitigation where negative impacts are identified. The DPD was subject to independent examination by a Planning Inspector in November 2020 and adopted by the City Council in December 2021. Monitoring of the policy is ongoing through our Authority Monitoring Report.	Due to pressures arising around the delivery of air quality regulation, approval has been obtained to utilise CAZ Revenue funds to recruit an Environmental Protection Officer on a four-year term to support the air quality element of the planning function alongside other air quality related activities. The recruitment will be progressed in 2024.

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
7 (a)	Industrial Emissions	Environmental Permits	Other measure through permit systems and economic instruments	2012	2030	Birmingham City Council	EH budget	NO	Funded	£50k - £100k	Implementation	N/A	Number of inspections undertaken	The inspection programme for 23/24 comprises 131 regulated facilities of which 37 had been inspected by the end of 2023.	Due to pressures arising around the delivery of air quality regulation, approval has been obtained to utilise CAZ Revenue funds to recruit an Enforcement Officer and an Environmental Protection Officer on a four-year term to support the regulation of industrial emissions function alongside other air quality related activities. The recruitment will be progressed in 2024. The remaining regulated facilities will be inspected in Q1 2024.
7 (b)	Domestic Burning	Other	Other			Birmingham City Council	EH budget	NO	Funded	£50k - £100k	Implementation	N/A	Number of complaints resolved	Birmingham City Council will be revieing it's Smoke Control Area to include canal barges and early discussions have taken place with a view to progressing the consultation and issuing the new Smoke Control Order during 2024, whilst exploring the potential for introduction of a support scheme to encourage canal boat users to switch to more sustainable forms of heating and energy usage.	Due to pressures arising around the delivery of air quality regulation, approval has been obtained to utilise CAZ Revenue funds to recruit an Enforcement Officer on a four-year term to support the delivery of a new SCO and support the enforcement via civil sanctions introduced within the Environment Act 2021, alongside other air quality related activities. The recruitment will be progressed in 2024.

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
7 (c)	Reducing Emissions from Construction	Other	Other			Birmingham City Council	EH budget	NO	Funded	£50k - £100k	Implementation	N/A	Number of complaints resolved	Where complaints are received Environmental Health will investigate and act as necessary.	This remains an ongoing action covering the regulatory aspect of construction site emissions from plant and machinery and on-site burning. The suspected increase in newer plant is expected to reduce direct NOx and PM2.5 emissions although this may be balanced by the apparent increase in construction in the Birmingham area, although none of this is quantified. Support from Defra in the form of a discreet construction-based project e.g. registration scheme would be welcomed.

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[6], local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter ($PM_{2.5}$). There is clear evidence that $PM_{2.5}$ (particulate matter smaller than 2.5 micrometres diameter) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

In 2023 monitoring for $PM_{2.5}$ was undertaken at 2 locations, BAU2 (A4540 Roadside) and BAF1 (Birmingham Ladywood). Measured annual mean concentrations at both sites are less than 10µg/m^3 and show broadly declining trends.

Using a differing approach to the measured concentrations noted above, the Public Health Outcomes Framework includes an indicator for the fraction of mortality attributable to particulate air pollution ($PM_{2.5}$). The latest (2022) value for Birmingham is 6.4%, compared to a value of 6.2% for 2021. The 2022 indicator is 5.8% for both the wider West Midlands and for England nationally.

Birmingham City Council is taking the following measures to address $PM_{2.5}$:

- The primary emission source for $PM_{2.5}$ within Birmingham is believed to be from the exhausts of road vehicles. Accordingly, action taken to reduce vehicle usage and incentivise the uptake of cleaner vehicle technology will deliver reductions in $PM_{2.5}$. The actions are set out in the AQAP and the BTP.

- The CAZ will consider the benefits that can be gained from reductions in $PM_{2.5}$ arising from reduced vehicle usage and modal shift as a consequence of the introduction of the CAZ, and improvements to public transport infrastructure.

- The Brum Breathes programme will seek to ensure that any new air pollutant for which the local authority has responsibility, including $PM_{2.5}$ will be considered holistically and built into existing work programmes and / or new work programmes developed.

- A Clean Air Strategy was published in 2022. The pledges in the CAS will help reduce $PM_{2.5}$ emissions and the health impacts on vulnerable groups. A key pledge is to

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

deliver clean air for schools and the Schools Monitoring Program has seen the installation of indicative sensors at 69 schools. It is planned to further increase the number of sensors deployed with the aim of providing one for every school in the district.

- Birmingham City Council has a Smoke Control Area (SCA) that covers the whole of the city area. Where complaints are received Environmental Health investigates and takes enforcement action where necessary. No financial penalties have been issued in 2023. It is intended in 2024 to refresh the SCA and amend it to include moored vessels. It is anticipated this revision will permit more robust enforcement in the future.
- The University of Birmingham, largely through the WM-Air project, intends to significantly increase observational capacity for particulate matter (PM) in Birmingham. Additionally, the University campus in Selly Oak is also home to one of three new Air Quality supersites which will allow the sources of PM to be quantified more effectively.

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

This section sets out the monitoring undertaken within 2023 by Birmingham City 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

In 2023 monitoring was undertaken at a total of 15 automatic monitoring sites. 14 of these sites are owned and operated by Birmingham City Council, 1 of which (Birmingham Ladywood) is affiliated to the AURN network. Monitoring was also undertaken at 1 AURN site (Birmingham A4540 Roadside). Table A.1 in Appendix A shows the details of the automatic monitoring sites. Also included in Table A.1 is the Acocks Green AURN site, which was not operational in 2023, although it is understood that it is still intended to relocate this site in the near future.

The www.birminghamairquality.co.uk page presents automatic monitoring results for Birmingham City Council, with automatic monitoring results for the AURN and Affiliated sites also available through the UK-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

Birmingham City Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 157 sites during 2023. Table A.2 in Appendix A presents the details of the non-automatic sites.

There were some changes were made to the non-automatic monitoring network in 2023. Site BHM08 is no longer accessible due to the Midland Metro extension on Broad Street. Two new sites were established on St Chads Queensway (BHM110) and Moor Street (BHM111) in order to obtain further insights into persistent exceedances of the annual mean objective in these areas. Similarly, sites BHM74, BHM83, and BHM85 were converted to triplicate sites as a result of persistent exceedances of the annual mean objective at these locations.

Action 5 (a) in Table 2.2. committed Birmingham City Council to identifying and addressing any air quality exceedances in the wider city (i.e. areas not directly affected by the Clean Air Zone). In 2023 the second Tranche of monitoring at 40 new non-automatic sites were established on key road links within the city where analysis had indicated potential exceedances of the annual mean air quality objective.

Maps showing the location of the monitoring sites are provided in Appendix D and at www.birminghamairquality.co.uk. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2023 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

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

In 2023 the annual mean concentration recorded at all automatic monitoring sites was less than 40 µgm^{-3}. The annual mean concentration exceeded 40 µgm^{-3} at 14 non-automatic monitoring sites. All of these sites are located within the existing AQMA and all but 1 within or adjacent to the CAZ. In the wider city only 1 site BHM219, located on Golden Hillock Road, showed an exceedence of the annual mean air quality objective. This site also showed a marginal exceedence in 2022. We will continue to monitor this site to establish a trend.

The automatic monitoring site BCA4 (Sutton New Hall) recorded a single hourly mean in excess of 200 µgm^{-3}. The hourly mean air quality objection was not exceeded at any other automatic monitoring site and all non-automatic monitoring sites recorded annual means less than 60 µgm^{-3}.

All automatic monitoring sites show declining concentrations when compared to 2019 where data is available and most recorded annual means for 2023 that are lower than in 2022. The majority of non-automatic monitoring sites also show declining concentrations when compared to 2019 where data is available.

No changes to the AQMA are considered necessary.

3.2.2 Particulate Matter (PM_{10})

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

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.
There were no exceedences of either the annual mean or 24-hour mean objectives for PM_{10}. Birmingham City Council does not have any AQMA's in relation to particulate matter.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.8 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years.

The annual mean concentrations of $PM_{2.5}$ were less than 10 µgm^{-3} in 2023.

3.2.4 Sulphur Dioxide (SO_2)

Table A.9 in Appendix A compares the ratified continuous monitored SO_2 concentrations for 2023 with the air quality objectives for SO_2.

There were no exceedences of any of the air quality objectives for SO_2.

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)
BAU1	Acocks Green	Urban Background	411649	282207	NO_2; PM_{10}; $PM_{2.5}$; O_3	Birmingham AQMA	Chemiluminescence, FIDAS	-	65	3.5
BAU2	Birmingham A4540 Roadside	Roadside	408588	286470	NO_2; PM_{10}; $PM_{2.5}$; O_3	Birmingham AQMA	Chemiluminescence, FIDAS	-	7	3.5
BAF1	Birmingham Ladywood	Urban Background	405653	287053	NO_2; PM_{10}; $PM_{2.5}$; O_3; SO_2	Birmingham AQMA	Chemiluminescence, FIDAS	-	6	3.5
BCA 1	Colmore Row	Roadside	406974	287101	NO_2	Birmingham AQMA	Chemiluminescence	-	3.1	1.3
BCA 2	St Chads Queensway	Kerbside	407107	287577	NO_2	Birmingham AQMA	Chemiluminescence	-	0.7	1.3
BCA 3	Lower Severn Street	Roadside	406744	286540	NO_2	Birmingham AQMA	Chemiluminescence	-	3.8	1.3
BCA 4	New Hall	Urban Background	414574	296724	NO_2	Birmingham AQMA	Chemiluminescence	-	20	2.5
BCA 5	Selly Oak (Bristol Road)	Roadside	404545	283020	NO_2	Birmingham AQMA	Chemiluminescence	-	9	2.5
BCA 6	Stratford Road	Roadside	408820	284591	NO_2	Birmingham AQMA	Chemiluminescence	-	5	2.5
BCA 7	Moor Street Queensway 2	Roadside	407402	286918	NO_2	Birmingham AQMA	Chemiluminescence	-	8.1	2.5
BCA08	New John Street West	Roadside	406738	288352	NO_2	Birmingham AQMA	Chemiluminescence	17.7	5	2.1
BCA09	Dartmouth Middleway	Roadside	407828	288067	NO_2	Birmingham AQMA	Chemiluminescence	0.5	5.8	2.3

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)
BCA10	Camp Hill	Roadside	408288	285716	NO_2	Birmingham AQMA	Chemiluminescence	-	8	2.1
BCA11	Bristol Street	Roadside	406883	285913	NO_2	Birmingham AQMA	Chemiluminescence	-	2	2.1
BCA12	Lee Bank Middleway	Roadside	406161	285844	NO_2	Birmingham AQMA	Chemiluminescence	15	4	2.3
BCA13	Ladywood Middleway	Roadside	405183	286538	NO_2	Birmingham AQMA	Chemiluminescence	22.2	1.9	2.1

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)
BHM01	Fox Green Crescent	Roadside	411211	282756	NO_2	Yes - Birmingham AQMA	0.0	9.0	No	1.8
BHM02	Langleys Road	Roadside	404082	282128	NO_2	Yes - Birmingham AQMA	0.0	8.6	No	2.1
BHM03	28 High Street	Roadside	407386	282131	NO_2	Yes - Birmingham AQMA	0.0	4.5	No	1.9
BHM04	75 High Street	Roadside	407401	282032	NO_2	Yes - Birmingham AQMA	0.0	4.5	No	2.3
BHM05	448 Stratford Road	Roadside	409103	284159	NO_2	Yes - Birmingham AQMA	3.7	4.6	No	2.2
BHM06	487 Stratford Road	Roadside	409143	284061	NO_2	Yes - Birmingham AQMA	4.6	4.6	No	2.1
BHM07	Broad Street - Brasshouse	Roadside	406113	286633	NO_2	Yes - Birmingham AQMA	-	1.0	No	2.6
BHM09	Shelley Drive	Roadside	408618	291351	NO_2	Yes - Birmingham AQMA	0.0	2.0	No	2.7
BHM10, BHM11, BHM12	Stratford Road AQ Station	Roadside	408818	284591	NO_2	Yes - Birmingham AQMA	-	5.0	No	2.5
BHM16	Childrens Hospital	Roadside	407321	287531	NO_2	Yes - Birmingham AQMA	0.0	5.1	Yes	2.5
BHM17	Tyburn (39)	Roadside	410010	289995	NO_2	Yes - Birmingham AQMA	9.9	2.6	No	2.4

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)
BHM18	Tyburn (40)	Roadside	410072	289999	NO_2	Yes - Birmingham AQMA	9.0	3.7	No	2.5
BHM19	Middleton Hall Road	Roadside	404739	279701	NO_2	Yes - Birmingham AQMA	9.0	2.7	No	2.7
BHM20	641 Bristol Road	Roadside	404448	282890	NO_2	Yes - Birmingham AQMA	2.2	5.7	No	2.6
BHM21	Lawley Middleway	Roadside	408197	287394	NO_2	Yes - Birmingham AQMA	1.0	4.7	No	2.7
BHM23	Lower Severn Street	Roadside	406743	286541	NO_2	Yes - Birmingham AQMA	1.5	2.9	No	2.7
BHM24	Great Charles Street (1)	Roadside	406621	287108	NO_2	Yes - Birmingham AQMA	0.0	4.1	No	2.7
BHM25	Watery Lane Middleway	Roadside	408586	286455	NO_2	Yes - Birmingham AQMA	16.0	2.6	No	2.6
BHM26	Nelson JI	Urban Background	405648	287041	NO_2	Yes - Birmingham AQMA	98.0	2.1	No	2.8
BHM27	Waterlinks	Roadside	407833	288046	NO_2	Yes - Birmingham AQMA	2.0	1.7	No	2.6
BHM28	Great Charles Street (2)	Roadside	406762	287329	NO_2	Yes - Birmingham AQMA	-	0.6	No	2.6
BHM31	Holiday Street	Roadside	406564	286688	NO_2	Yes - Birmingham AQMA	-	3.1	No	2.6
BHM33	Severn Street	Roadside	406701	286512	NO_2	Yes - Birmingham AQMA	-	1.2	No	2.6
BHM34	Superdrug	Urban Centre	407114	286906	NO_2	Yes - Birmingham AQMA	-	7.8	No	2.6

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)
BHM35	Café Nero	Urban Centre	407177	286996	NO_2	Yes - Birmingham AQMA	-	6.9	No	2.8
BHM36	Corporation Street Sq Peg	Roadside	407205	287065	NO_2	Yes - Birmingham AQMA	-	3.7	No	2.5
BHM37	Church Road	Roadside	405383	285315	NO_2	Yes - Birmingham AQMA	30.0	2.8	No	2.4
BHM40	Priory Queensway (1)	Roadside	407407	287092	NO_2	Yes - Birmingham AQMA	-	0.5	No	2.6
BHM41	Priory Queensway (2)	Roadside	407399	287078	NO_2	Yes - Birmingham AQMA	-	1.0	No	2.6
BHM42	MSQ - Masshouse	Roadside	407548	287107	NO_2	Yes - Birmingham AQMA	34.0	3.5	No	2.8
BHM43	Masshouse Lane - Masshouse	Roadside	407611	287110	NO_2	Yes - Birmingham AQMA	14.0	2.8	No	2.6
BHM44	Masshouse Lane - LP	Roadside	407628	287121	NO_2	Yes - Birmingham AQMA	24.0	4.7	No	2.5
BHM45	Hotel La Tour - LP	Roadside	407604	287032	NO_2	Yes - Birmingham AQMA	3.0	2.5	No	2.8
BHM46	Masshouse Lane Masshouse 2	Roadside	407547	287047	NO_2	Yes - Birmingham AQMA	1.5	3.4	No	2.8
BHM50	MSQ - No entry post	Roadside	407433	286922	NO_2	Yes - Birmingham AQMA	-	1.8	No	2.1
BHM51	Bristol Street Monaco House	Roadside	406921	285937	NO_2	Yes - Birmingham AQMA	2.0	1.9	No	2.7
BHM53	MSQ - no loading	Roadside	407350	286761	NO_2	Yes - Birmingham AQMA	-	0.6	No	2.4

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)
BHM56	New Meeting Street	Urban Centre	407377	286896	NO_2	Yes - Birmingham AQMA	-	0.9	No	2.7
BHM57	Chantry Road	Roadside	407687	283370	NO_2	Yes - Birmingham AQMA	8.0	1.6	No	2.6
BHM58	Carrs Lane High Street	Urban Centre	407255	286862	NO_2	Yes - Birmingham AQMA	-	1.3	No	2.7
BHM59	Lower Bull Street corner of	Urban Centre	407278	286931	NO_2	Yes - Birmingham AQMA	-	3.5	No	2.4
BHM61	St Phillips Church yard	Urban Centre	406919	287037	NO_2	Yes - Birmingham AQMA	-	18.6	No	2.5
BHM62	Snow Hill	Urban Centre	407033	287196	NO_2	Yes - Birmingham AQMA	-	16.4	No	2.8
BHM63	Chapel Lane	Roadside	407509	287226	NO_2	Yes - Birmingham AQMA	-	0.4	No	2.4
BHM64	Stephenson Street	Roadside	406973	286751	NO_2	Yes - Birmingham AQMA	-	2.2	No	2.1
BHM65	Digbeth	Roadside	407446	286478	NO_2	Yes - Birmingham AQMA	-	1.4	No	2.3
BHM66	Newtown Middleway	Roadside	407452	288296	NO_2	Yes - Birmingham AQMA	-	1.4	No	2.4
BHM67	New John Street West (1)	Roadside	407056	288318	NO_2	Yes - Birmingham AQMA	12.0	3.9	No	2.5
BHM68	Icknield Street (1)	Roadside	405781	288131	NO_2	Yes - Birmingham AQMA	6.7	3.2	No	2.5
BHM69	Icknield Street (2)	Roadside	405806	288116	NO_2	Yes - Birmingham AQMA	-	2.5	No	2.6

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)
BHM71	Rann close	Roadside	405300	286430	NO_2	Yes - Birmingham AQMA	9.0	5.4	No	2.6
BHM72	Leyburn Road	Roadside	405285	286395	NO_2	Yes - Birmingham AQMA	-	9.3	No	2.6
BHM73	Islington Row (1)	Roadside	406038	285961	NO_2	Yes - Birmingham AQMA	-	9.3	No	2.6
BHM74A, BHM74B, BHM74C	Islington Row (2)	Roadside	406014	285936	NO_2	Yes - Birmingham AQMA	-	0.4	No	2.6
BHM75	Lee Bank MW by School	Roadside	406355	285729	NO_2	Yes - Birmingham AQMA	18.0	2.9	No	2.6
BHM76	Lee Bank MW opposite School	Roadside	406354	285676	NO_2	Yes - Birmingham AQMA	47.0	16.1	No	2.7
BHM77	Lee Bank MW - St Lukes	Roadside	406936	285461	NO_2	Yes - Birmingham AQMA	12.0	1.2	No	2.8
BHM78	Lee Bank MW - opposite St Lukes	Roadside	406912	285418	NO_2	Yes - Birmingham AQMA	11.0	3.3	No	2.8
BHM79	Alexandra Road	Roadside	407373	285211	NO_2	Yes - Birmingham AQMA	21.0	1.9	No	2.6
BHM80	Belgrave Middleway	Roadside	407385	285240	NO_2	Yes - Birmingham AQMA	-	1.6	No	2.6
BHM83A, BHM83B, BHM83C	Watery Lane (2)	Roadside	408558	286452	NO_2	Yes - Birmingham AQMA	-	2.8	No	2.9
BHM85A, BHM85B, BHM85C	Dartmouth MW (2)	Roadside	407802	288047	NO_2	Yes - Birmingham AQMA	-	2.0	No	2.5
BHM86	Ronald McDonald House	Roadside	407163	287561	NO_2	Yes - Birmingham AQMA	8.0	4.2	No	2.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
BHM87	St Chads (2)	Roadside	407162	287601	NO_2	Yes - Birmingham AQMA	-	0.6	No	2.5
BHM88	Great Charles Street (3)	Roadside	406799	287314	NO_2	Yes - Birmingham AQMA	-	0.6	No	2.6
BHM89	Great Charles Street (4)	Roadside	406594	287117	NO_2	Yes - Birmingham AQMA	45.0	3.4	No	2.6
BHM90	Lionel Street	Roadside	406626	287304	NO_2	Yes - Birmingham AQMA	-	1.2	No	2.6
BHM91	Adderley Street	Roadside	409496	287938	NO_2	Yes - Birmingham AQMA	34.0	11.5	No	2.4
BHM92	Bristol Street (2)	Roadside	406883	285916	NO_2	Yes - Birmingham AQMA	-	2.2	No	2.5
BHM93	New John Street (2)	Roadside	407052	288283	NO_2	Yes - Birmingham AQMA	-	2.6	No	2.6
BHM99	Pershore Road (Dogpool Hotel)	Roadside	405671	281935	NO_2	Yes - Birmingham AQMA	3.3	3.5	No	2.5
BHM100	Suffolk Street Queensway	Roadside	406609	286697	NO_2	Yes - Birmingham AQMA	-	0.9	No	2.4
BHM101	Belgrave Middleway/Moseley Road	Roadside	408065	285375	NO_2	Yes - Birmingham AQMA	-	1.5	No	2.5
BHM102	Lawley Middleway	Roadside	408185	287332	NO_2	Yes - Birmingham AQMA	1.1	1.0	No	2.5
BHM103	Carrs Lane	Roadside	407295	286870	NO_2	Yes - Birmingham AQMA	-	0.5	No	2.2
BHM104	Hill Street	Roadside	406848	286578	NO_2	Yes - Birmingham AQMA	-	0.5	No	2.4

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)
BHM106	Navigation Street	Roadside	406727	286645	NO_2	Yes - Birmingham AQMA	1.2	1.8	No	2.4
BHM107	Snow Hill Bridge	Roadside	406840	287540	NO_2	Yes - Birmingham AQMA	-	2.6	No	2.3
BHM108	Belgrave Middleway/Leopold Street	Roadside	408048	285406	NO_2	Yes - Birmingham AQMA	33.8	3.4	No	2.5
BHM109	Moor Street corner of	Roadside	407330	286728	NO_2	Yes - Birmingham AQMA	-	5.8	No	2.4
BHM219	Golden Hillock Road 1	Roadside	409569	284743	NO_2	Yes - Birmingham AQMA	2.8	2.4	No	2.4
BHM234	Livery Street	Roadside	406903	287264	NO_2	Yes - Birmingham AQMA	-	0.7	No	2.0
BHM236	Broad Street Canal Basin	Urban Centre	406182	286620	NO_2	Yes - Birmingham AQMA	-	-	No	2.1
BHM110	St Chads (Near AQMS)	Roadside	407106	287577	NO_2	Yes - Birmingham AQMA	-	1.0	No	2.3
BHM111	Moor Street	Roadside	407348	286722	NO_2	Yes - Birmingham AQMA	-	1.6	No	2.1
BHMPB1	Wellington Road	Roadside	406744	290838	NO_2	Yes - Birmingham AQMA	-	4.6	No	2.4
BHMPB2	Walsall Road - Seventh Trap	Roadside	406815	291239	NO_2	Yes - Birmingham AQMA	-	2.5	No	2.6
BHMPB3	Harrier Way	Roadside	406900	291234	NO_2	Yes - Birmingham AQMA	-	1.7	No	2.6
BHMPB4	Aldridge Road	Roadside	407087	291248	NO_2	Yes - Birmingham AQMA	-	1.4	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
BHMPB6	Stoneleigh Road	Roadside	407095	290751	NO_2	Yes - Birmingham AQMA	5.5	2.3	No	2.5
BHMPB7	Holford Drive	Roadside	407134	291527	NO_2	Yes - Birmingham AQMA	5.6	4.5	No	2.4
BHM250	Wheeler Street 1	Roadside	406701.6138	289361.0234	NO_2	Yes - Birmingham AQMA	2.2	0.7	No	2.4
BHM251	Wheeler Street 2	Roadside	406720.9922	289401.2757	NO_2	Yes - Birmingham AQMA	15.1	1.9	No	2.4
BHM252	Lozells Road 1	Roadside	406702.5826	289411.9286	NO_2	Yes - Birmingham AQMA	8.5	0.7	No	2.3
BHM253	Lozells Road 2	Roadside	406714.7634	289423.3069	NO_2	Yes - Birmingham AQMA	4.6	1.5	No	2.3
BHM254	Gravelly Hill 1	Roadside	410444	291176	NO_2	Yes - Birmingham AQMA	31.1	2.0	No	2.4
BHM255	Gravelly Hill 2	Roadside	410370	291018	NO_2	Yes - Birmingham AQMA	31.4	2.0	No	2.7
BHM256	Gravelly Hill 3	Roadside	410297	290893	NO_2	Yes - Birmingham AQMA	6.2	2.0	No	2.4
BHM257	Gravelly Hill 4	Roadside	410415.8167	291149	NO_2	Yes - Birmingham AQMA	9.5	2.0	No	2.2
BHM258	Tyburn Road/Holly Road	Roadside	412226	290925	NO_2	Yes - Birmingham AQMA	9.7	1.8	No	1.9
BHM259	Tyburn Road (Lidl)	Roadside	412353	291039	NO_2	Yes - Birmingham AQMA	-	4.1	No	2.4
BHM260	Chester Road 1	Roadside	413313	291562	NO_2	Yes - Birmingham AQMA	14.3	1.1	No	1.9

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
BHM261	Chester Road 2	Roadside	413341	291573	NO_2	Yes - Birmingham AQMA	11.8	1.3	No	1.9
BHM262	Chester Road 3	Roadside	413503	291430	NO_2	Yes - Birmingham AQMA	-	4.3	No	2.4
BHM263	Chester Road 4	Roadside	413454	291434	NO_2	Yes - Birmingham AQMA	-	1.7	No	2.1
BHM264	Bromford Lane 1	Roadside	412415	288419	NO_2	Yes - Birmingham AQMA	8.8	5.2	No	2.4
BHM265	Bromford Lane 2	Roadside	412433	288450.0364	NO_2	Yes - Birmingham AQMA	10.1	3.4	No	2.4
BHM266	Stechford Lane 1	Roadside	412463	288385	NO_2	Yes - Birmingham AQMA	-	4.6	No	2.4
BHM267	Stechford Lane 2	Roadside	412435	288366	NO_2	Yes - Birmingham AQMA	-	2.8	No	2.4
BHM268	Flaxley Road 1	Roadside	413228	287768	NO_2	Yes - Birmingham AQMA	26.6	2.1	No	2.4
BHM269	Flaxley Road 2	Roadside	413108	287765	NO_2	Yes - Birmingham AQMA	7.0	3.0	No	2.4
BHM270	Flaxley Road 3	Roadside	413162	287780	NO_2	Yes - Birmingham AQMA	-	2.5	No	2.4
BHM271	Station Road 1	Roadside	413012	287445	NO_2	Yes - Birmingham AQMA	-	1.9	No	2.4
BHM272	Station Road 2	Roadside	412959	287620	NO_2	Yes - Birmingham AQMA	4.0	2.0	No	2.4
BHM273	Stechford Lane 3	Roadside	412553	288072	NO_2	Yes - Birmingham AQMA	10.2	2.3	No	2.4

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)
BHM274	Stechford Lane 4	Roadside	412577	288090	NO_2	Yes - Birmingham AQMA	14.9	2.5	No	2.1
BHM275	Church Road 1	Roadside	412897	285321	NO_2	Yes - Birmingham AQMA	11.8	1.2	No	2.4
BHM276	Church Road 2	Roadside	412920	285299	NO_2	Yes - Birmingham AQMA	5.2	1.8	No	2.4
BHM277	Yardley Road 1	Roadside	412462	284469	NO_2	Yes - Birmingham AQMA	-	2.0	No	2.4
BHM278	Yardley Road 2	Roadside	412455.638	284504	NO_2	Yes - Birmingham AQMA	10.3	2.1	No	2.3
BHM279	Stockfield Road 1	Roadside	412206	284444	NO_2	Yes - Birmingham AQMA	-	0.6	No	2.4
BHM280	Stockfield Road 2	Roadside	412196	284465	NO_2	Yes - Birmingham AQMA	3.7	1.8	No	2.4
BHM281	Stockfield Road 3	Roadside	411953	284239	NO_2	Yes - Birmingham AQMA	9.7	1.8	No	2.4
BHM282	Stockfield Road 4	Roadside	411934	284269	NO_2	Yes - Birmingham AQMA	-	1.8	No	2.4
BHM283	Stratford Road 1	Roadside	409585	283267	NO_2	Yes - Birmingham AQMA	9.8	0.9	No	2.3
BHM284	Stratford Road 2	Roadside	409585	283237	NO_2	Yes - Birmingham AQMA	5.7	1.9	No	2.3
BHM285	Stratford Road 3	Roadside	409656	283038	NO_2	Yes - Birmingham AQMA	8.4	2.2	No	2.3
BHM286	Stratford Road 4	Roadside	409654	283001	NO_2	Yes - Birmingham AQMA	4.1	1.1	No	2.4

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)
BHM287	Stratford Road 5	Roadside	409729.9363	282896.1109	NO_2	Yes - Birmingham AQMA	2.6	1.1	No	2.3
BHM288	Stratford Road 6	Roadside	409765.3214	282886.7341	NO_2	Yes - Birmingham AQMA	-	0.8	No	2.3
BHM289	Stratford Road 7	Roadside	409847	282850	NO_2	Yes - Birmingham AQMA	1.1	7.7	No	2.4
BHM290	Stratford Road 8	Roadside	409825	282843	NO_2	Yes - Birmingham AQMA	10.4	2.1	No	2.3
LTNKH001S	Colmore Junior School (Howard Road)	Suburban	406905	281057	NO_2	Yes - Birmingham AQMA	3.9	12.1	No	2.1
LTNKH002S	Camp Hill Girls School (Vicarage Road)	Suburban	406855	281333	NO_2	Yes - Birmingham AQMA	0.0	4.4	No	2.2
LTMKH003S	Bishop Challenor School (Institute Road)	Suburban	407496	281731	NO_2	Yes - Birmingham AQMA	0.0	6.0	No	2.4
LTNKH004S	St Dunstans (Drayton Road)	Suburban	407585	281586	NO_2	Yes - Birmingham AQMA	0.0	8.4	No	2.2
LTNKH005S	Kings Heath Primary Road (Poplar Road)	Suburban	407597	282149	NO_2	Yes - Birmingham AQMA	0.0	14.1	No	2.1
LTNKH006S	Moseley Primary School (Oxford Road)	Suburban	407999	282809	NO_2	Yes - Birmingham AQMA	0.0	4.7	No	2.0
LTNKH007S	Wheelers Lane Primary (Wheelers Lane)	Suburban	407747	281109	NO_2	Yes - Birmingham AQMA	-	7.8	No	2.2
LTNKH008	Tenbury Road (Grove Road)	Suburban	406955	280935	NO_2	Yes - Birmingham AQMA	0.0	9.2	No	2.2
LTNKH009	All Saints Road	Suburban	407227	281328	NO_2	Yes - Birmingham AQMA	0.0	6.1	No	2.2

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
LTNKH010	Avenue Road	Suburban	406877	281694	NO_2	Yes - Birmingham AQMA	0.0	7.0	No	2.0
LTNKH011	All Saints Medical Centre (Vicarage Road)	Suburban	407310	281634	NO_2	Yes - Birmingham AQMA	0.0	16.3	No	2.3
LTNKH012	High Street (South End)	Suburban	407385	281480	NO_2	Yes - Birmingham AQMA	0.0	5.3	No	2.2
LTNKH013	Addison Road	Suburban	407499	281502	NO_2	Yes - Birmingham AQMA	0.0	2.0	No	2.1
LTNKH014	York Road	Suburban	407335	281833	NO_2	Yes - Birmingham AQMA	0.0	3.8	No	2.1
LTNKH015	Grange Nursery	Suburban	407318	282051	NO_2	Yes - Birmingham AQMA	0.0	3.6	No	2.2
LTNKH016	Valentine Road	Suburban	407488	282277	NO_2	Yes - Birmingham AQMA	0.0	6.2	No	2.2
LTNKH017	School Road	Suburban	407761	282379	NO_2	Yes - Birmingham AQMA	0.0	2.3	No	2.2
LTNKH018	Springfield Road	Suburban	407939	281645	NO_2	Yes - Birmingham AQMA	0.0	3.8	No	2.2
LTNKH019	Billesley Lane	Suburban	407977	281892	NO_2	Yes - Birmingham AQMA	0.0	6.9	No	2.2
LTNKH020	Barn Lane	Suburban	408118	281308	NO_2	Yes - Birmingham AQMA	0.0	12.0	No	2.1
LTNKH021	Springfield Rd (near Melton Rd)	Suburban	407741	281864	NO_2	Yes - Birmingham AQMA	0.0	3.5	No	2.0
LTNKH022	Valentine Road (Kings Heath Primary School)	Suburban	407598	282154	NO_2	Yes - Birmingham AQMA	0.0	2.2	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
LTNKH023	Avenue Road (NW of junction with Vicarage Road)	Suburban	407024	281528	NO_2	Yes - Birmingham AQMA	0.0	7.7	No	2.0
LTNKH024	Red Lion PH- Grove Road	Suburban	406756	281198	NO_2	Yes - Birmingham AQMA	0.0	11.2	No	2.0
LTNKH025	Vicarage Road (opposite junction with Highbury Road)	Suburban	407104	281459	NO_2	Yes - Birmingham AQMA	0.0	7.0	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 NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
BAU1	411649	282207	Urban Background	-	-	19	14	14	-	-
BAU2	408588	286470	Roadside	100	100	32	29	32	32	30
BAF1	405653	287053	Urban Background	98	98	-	15	16	17	15
BCA 1	406974	287101	Roadside	99.7	99.7	35	31.9	26.7	27.6	29
BCA 2	407107	287577	Kerbside	97	97	**51**	37.1	**40.3**	**43.2**	39.1
BCA 3	406744	286540	Roadside	98.7	98.7	**43**	23.7	26.2	29.2	26.9
BCA 4	414574	296724	Urban Background	98.3	98.3	19	11.3	12.9	16.8	12.5
BCA 5	404545	283020	Roadside	96.5	96.5	28	19	21.3	22.1	19.3
BCA 6	408820	284591	Roadside	97.2	97.2	36	18.3	24	23.1	22.8
BCA 7	407402	286918	Roadside	99.6	99.6	-	-	32	33.4	34
BCA08	406738	288352	Roadside	95.7	95.7	-	-	26.2	25.2	19.2
BCA09	407828	288067	Roadside	98.4	98.4	-	-	34.3	32.9	30.4
BCA10	408288	285716	Roadside	95.3	95.3	-	-	28.7	33.4	26.4
BCA11	406883	285913	Roadside	74.2	74.2	-	-	34.2	28.6	27.6
BCA12	406161	285844	Roadside	98.1	98.1	-	-	37.2	29.6	26
BCA13	405183	286538	Roadside	55.4	55.4	-	-	23.9	18.9	12.2

☒ **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 NO_2 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/m^3.

Exceedances of the NO_2 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.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

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

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

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

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2023 (%) [2]	2019	2020	2021	2022	2023
BHM01	411211	282756	Roadside	32.7	32.7	15.1	12.7	14.7	14.3	12.1
BHM02	404082	282128	Roadside	90.4	90.4	14.4	12.0	12.9	11.8	13.0
BHM03	407386	282131	Roadside	90.4	90.4	28.8	26.4	29.2	27.5	24.8
BHM04	407401	282032	Roadside	100	100.0	33.0	27.8	27.9	27.8	24.1
BHM05	409103	284159	Roadside	82.7	82.7	34.0	29.3	31.3	29.2	29.3
BHM06	409143	284061	Roadside	100	100.0	39.2	34.5	34.7	33.7	31.5
BHM07	406113	286633	Roadside	82.7	82.7	31.0	23.7	22.7	24.5	25.5
BHM09	408618	291351	Roadside	90.4	90.4	34.8	22.2	20.2	20.6	26.7
BHM10, BHM11, BHM12	408818	284591	Roadside	73.1	73.1	31.5	26.1	27.3	26.7	28.8
BHM16	407321	287531	Roadside	84.6	84.6	**40.8**	34.7	32.7	31.5	29.2
BHM17	410010	289995	Roadside	100	100.0	34.0	30.4	30.5	29.1	28.3
BHM18	410072	289999	Roadside	90.4	90.4	35.3	31.3	32.5	30.9	29.7
BHM19	404739	279701	Roadside	90.4	90.4	38.2	32.9	34.3	32.7	30.6
BHM20	404448	282890	Roadside	100	100.0	30.4	22.2	23.8	23.9	22.7
BHM21	408197	287394	Roadside	82.7	82.7	**48.5**	37.4	39.8	38.3	39.5
BHM23	406743	286541	Roadside	100	100.0	39.6	34.4	37.0	30.7	28.8
BHM24	406621	287108	Roadside	100	100.0	37.8	33.0	31.8	31.0	30.5
BHM25	408586	286455	Roadside	92.3	92.3	38.0	36.0	37.9	34.2	36.1
BHM26	405648	287041	Urban Background	75	75.0	22.9	16.9	17.9	17.6	16.5
BHM27	407833	288046	Roadside	90.4	90.4	34.7	30.7	32.0	30.1	27.2
BHM28	406762	287329	Roadside	90.4	90.4	**44.7**	38.5	39.3	35.6	37.2
BHM31	406564	286688	Roadside	100	100.0	35.1	28.3	31.1	30.9	28.0
BHM33	406701	286512	Roadside	100	100.0	36.1	26.9	29.2	29.3	28.5
BHM34	407114	286906	Urban Centre	100	100.0	26.3	23.2	23.0	22.2	21.4
BHM35	407177	286996	Urban Centre	100	100.0	28.3	24.2	26.1	24.0	23.7
BHM36	407205	287065	Roadside	15.4	15.4	31.9	28.6	29.0	22.4	-

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
BHM37	405383	285315	Roadside	73.1	73.1	26.3	20.4	23.7	21.0	21.3
BHM40	407407	287092	Roadside	100	100.0	**47.4**	**43.8**	**50.0**	**50.0**	**51.5**
BHM41	407399	287078	Roadside	92.3	92.3	**50.4**	**41.8**	**50.9**	35.0	38.9
BHM42	407548	287107	Roadside	100	100.0	39.8	32.3	32.8	32.3	31.2
BHM43	407611	287110	Roadside	100	100.0	39.5	32.5	32.7	31.0	32.3
BHM44	407628	287121	Roadside	57.7	57.7	39.0	30.3	32.4	30.2	29.8
BHM45	407604	287032	Roadside	100	100.0	35.5	39.4	**40.7**	32.4	36.9
BHM46	407547	287047	Roadside	100	100.0	**50.0**	**42.3**	**50.3**	**47.3**	**58.8**
BHM50	407433	286922	Roadside	100	100.0	**44.7**	**41.1**	**41.1**	36.8	**41.4**
BHM51	406921	285937	Roadside	100	100.0	35.4	27.6	31.2	30.7	30.8
BHM53	407350	286761	Roadside	73.1	73.1	**50.0**	**46.6**	**51.5**	**44.2**	**51.5**
BHM56	407377	286896	Urban Centre	92.3	92.3	33.3	27.1	28.9	28.9	29.4
BHM57	407687	283370	Roadside	100	100.0	28.1	20.5	22.1	21.3	19.4
BHM58	407255	286862	Urban Centre	100	100.0	36.6	28.8	34.4	31.0	29.8
BHM59	407278	286931	Urban Centre	75	75.0	37.2	30.0	34.0	34.8	33.1
BHM61	406919	287037	Urban Centre	100	100.0	29.7	25.8	23.5	23.0	23.3
BHM62	407033	287196	Urban Centre	100	100.0	33.4	26.4	27.2	27.5	28.1
BHM63	407509	287226	Roadside	34.6	34.6	28.4	25.0	25.5	24.0	21.6
BHM64	406973	286751	Roadside	63.5	63.5	33.6	32.9	34.8	-	30.8
BHM65	407446	286478	Roadside	82.7	82.7	37.0	29.7	31.9	28.8	30.8
BHM66	407452	288296	Roadside	80.7	80.8	33.2	29.2	30.4	30.2	26.5
BHM67	407056	288318	Roadside	84.6	84.6	31.8	24.9	28.2	27.1	26.4
BHM68	405781	288131	Roadside	92.3	92.3	32.4	29.6	33.8	30.8	27.8
BHM69	405806	288116	Roadside	100	100.0	37.6	27.5	30.7	34.1	33.1
BHM71	405300	286430	Roadside	50	50.0	25.4	21.2	22.3	21.6	19.1
BHM72	405285	286395	Roadside	100	100.0	22.8	17.5	19.3	18.7	17.3
BHM73	406038	285961	Roadside	90.4	90.4	-	-	30.3	31.8	31.4
BHM74A, BHM74B, BHM74C	406014	285936	Roadside	100	100.0	**52.6**	**43.0**	**45.2**	**46.0**	**44.1**
BHM75	406355	285729	Roadside	100	100.0	34.0	29.2	32.1	30.9	32.8
BHM76	406354	285676	Roadside	100	100.0	24.8	20.5	22.9	21.2	20.1
BHM77	406936	285461	Roadside	92.3	92.3	30.6	26.4	29.6	26.5	26.1

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
BHM78	406912	285418	Roadside	57.7	57.7	31.7	25.3	28.6	26.4	24.5
BHM79	407373	285211	Roadside	59.6	59.6	27.7	22.0	26.0	24.5	25.3
BHM80	407385	285240	Roadside	82.7	82.7	35.5	25.9	30.0	30.1	24.5
BHM83A, BHM83B, BHM83C	408558	286452	Roadside	100	100.0	**61.0**	**50.6**	**52.0**	**55.5**	**48.8**
BHM85A, BHM85B, BHM85C	407802	288047	Roadside	100	100.0	**48.0**	**40.6**	**46.0**	38.7	36.7
BHM86	407163	287561	Roadside	90.4	90.4	33.7	28.7	33.2	32.4	27.9
BHM87	407162	287601	Roadside	92.3	92.3	**59.6**	**46.5**	**48.6**	**46.2**	**41.7**
BHM88	406799	287314	Roadside	92.3	92.3	**58.1**	**50.6**	**50.2**	**48.4**	**44.2**
BHM89	406594	287117	Roadside	100	100.0	39.4	32.7	33.2	32.6	33.0
BHM90	406626	287304	Roadside	100	100.0	27.2	21.4	24.4	21.9	22.1
BHM91	409496	287938	Roadside	32.7	32.7	27.1	24.4	27.4	26.2	23.3
BHM92	406883	285916	Roadside	100	100.0	**40.2**	31.4	35.4	34.9	33.2
BHM93	407052	288283	Roadside	90.4	90.4	**41.0**	**44.5**	36.4	36.7	34.6
BHM99	405671	281935	Roadside	100	100.0	**40.0**	32.1	36.1	32.4	31.3
BHM100	406609	286697	Roadside	92.3	92.3	-	-	36.3	37.2	35.6
BHM101	408065	285375	Roadside	75	75.0	-	-	-	33.7	29.8
BHM102	408185	287332	Roadside	65..4	65.4	-	-	-	**55.8**	**45.5**
BHM103	407295	286870	Roadside	92.3	92.3	-	-	**55.1**	**47.3**	**44.6**
BHM104	406848	286578	Roadside	92.3	92.3	-	-	33.9	32.6	30.2
BHM106	406727	286645	Roadside	92.3	92.3	-	-	30.8	28.3	32.2
BHM107	406840	287540	Roadside	92.3	92.3	-	-	**47.3**	**43.9**	**42.9**
BHM108	408048	285406	Roadside	50	50.0	-	-	-	30.1	30.6
BHM109	407330	286728	Roadside	100	100.0	-	-	-	**49.3**	**51.1**
BHM219	409569	284743	Roadside	34.6	34.6	-	-	-	**40.2**	**45.4**
BHM234	406903	287264	Roadside	75	75.0	-	-	-	31.1	32.5
BHM236	406182	286620	Urban Centre	40.4	40.4	-	-	-	22.1	21.2
BHM110	407106	287577	Roadside	92.3	92.3	-	-	-	-	39.6
BHM111	407348	286722	Roadside	42.3	42.3	-	-	-	-	**53.2**
BHMPB1	406744	290838	Roadside	100	100.0	-	25.6	28.0	25.0	24.6

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
BHMPB2	406815	291239	Roadside	100	100.0	-	19.4	21.3	19.9	20.6
BHMPB3	406900	291234	Roadside	90.4	90.4	-	26.0	32.6	34.9	34.5
BHMPB4	407087	291248	Roadside	67.3	67.3	-	32.5	35.5	**41.1**	31.6
BHMPB6	407095	290751	Roadside	100	100.0	-	30.8	32.1	29.7	30.1
BHMPB7	407134	291527	Roadside	100	100.0	-	-	28.3	26.4	27.1
BHM250	406702	289361	Roadside	31.5	82.7	-	-	-	-	31.5
BHM251	406721	289401	Roadside	90.9	84.6	-	-	-	-	27.3
BHM252	406703	289412	Roadside	81.8	75.0	-	-	-	-	30.2
BHM253	406715	289423	Roadside	100	92.3	-	-	-	-	30.9
BHM254	410444	291176	Roadside	100	92.3	-	-	-	-	28.8
BHM255	410370	291018	Roadside	100	92.3	-	-	-	-	29.2
BHM256	410297	290893	Roadside	90.9	84.6	-	-	-	-	37.3
BHM257	410416	291149	Roadside	81.8	75.0	-	-	-	-	32.5
BHM258	412226	290925	Roadside	100	92.3	-	-	-	-	24.1
BHM259	412353	291039	Roadside	100	92.3	-	-	-	-	26.5
BHM260	413313	291562	Roadside	90.9	82.7	-	-	-	-	24.2
BHM261	413341	291573	Roadside	100	92.3	-	-	-	-	27.9
BHM262	413503	291430	Roadside	90.9	84.6	-	-	-	-	31.8
BHM263	413454	291434	Roadside	100	92.3	-	-	-	-	27.6
BHM264	412415	288419	Roadside	90.9	82.7	-	-	-	-	30.7
BHM265	412433	288450	Roadside	100	92.3	-	-	-	-	34.1
BHM266	412463	288385	Roadside	90.9	84.6	-	-	-	-	28.6
BHM267	412436	288366	Roadside	100	92.3	-	-	-	-	31.0
BHM268	413228	287768	Roadside	100	92.3	-	-	-	-	26.7
BHM269	413108	287765	Roadside	90.9	84.6	-	-	-	-	24.6
BHM270	413162	287781	Roadside	100	92.3	-	-	-	-	27.6
BHM271	413012	287446	Roadside	72.7	65.4	-	-	-	-	28.7
BHM272	412959	287620	Roadside	81.8	75.0	-	-	-	-	27.9
BHM273	412553	288072	Roadside	100	92.3	-	-	-	-	36.0
BHM274	412577	288090	Roadside	100	92.3	-	-	-	-	31.8
BHM275	412897	285321	Roadside	100	92.3	-	-	-	-	27.1
BHM276	412920	285299	Roadside	100	92.3	-	-	-	-	28.7
BHM277	412463	284470	Roadside	100	92.3	-	-	-	-	19.4

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
BHM278	412456	284504	Roadside	81.8	75.0	-	-	-	-	21.0
BHM279	412206	284444	Roadside	90.9	84.6	-	-	-	-	23.2
BHM280	412196	284465	Roadside	90.9	84.6	-	-	-	-	32.7
BHM281	411954	284239	Roadside	100	92.3	-	-	-	-	24.1
BHM282	411935	284269	Roadside	90.9	82.7	-	-	-	-	26.0
BHM283	409585	283267	Roadside	100	92.3	-	-	-	-	26.2
BHM284	409585	283237	Roadside	100	92.3	-	-	-	-	27.8
BHM285	409656	283038	Roadside	90.9	82.7	-	-	-	-	27.8
BHM286	409654	283001	Roadside	72.7	65.4	-	-	-	-	30.2
BHM287	409729	282896	Roadside	100	92.3	-	-	-	-	30.1
BHM288	409765	282886	Roadside	100	92.3	-	-	-	-	26.6
BHM289	409847	282850	Roadside	100	92.3	-	-	-	-	25.6
BHM290	409825	282843	Roadside	100	92.3	-	-	-	-	20.2
LTNKH001S	406905	281057	Suburban	100	92.3	-	-	14.5	13.5	12.3
LTNKH002S	406855	281333	Suburban	100	92.3	-	-	14.4	13.7	13.0
LTMKH003S	407496	281731	Suburban	100	92.3	-	-	16.5	16.0	15.2
LTNKH004S	407585	281586	Suburban	100	92.3	-	-	12.6	12.2	11.6
LTNKH005S	407597	282149	Suburban	100	92.3	-	-	13.8	13.4	12.1
LTNKH006S	407999	282809	Suburban	81.8	75.0	-	-	13.8	12.9	12.9
LTNKH007S	407747	281109	Suburban	100	92.3	-	-	12.7	12.2	11.0
LTNKH008	406955	280935	Suburban	100	92.3	-	-	13.3	12.5	11.3
LTNKH009	407227	281328	Suburban	100	92.3	-	-	12.6	12.2	11.2
LTNKH010	406877	281694	Suburban	100	92.3	-	-	19.7	18.3	16.6
LTNKH011	407310	281634	Suburban	100	92.3	-	-	16.0	14.9	14.5
LTNKH012	407385	281480	Suburban	100	92.3	-	-	27.2	25.8	24.8
LTNKH013	407499	281502	Suburban	100	92.3	-	-	17.5	16.3	15.5
LTNKH014	407335	281833	Suburban	100	92.3	-	-	15.0	15.0	13.4
LTNKH015	407318	282051	Suburban	100	92.3	-	-	14.3	13.7	12.8
LTNKH016	407488	282277	Suburban	100	92.3	-	-	16.3	17.4	16.1
LTNKH017	407761	282379	Suburban	100	92.3	-	-	14.9	13.8	12.7
LTNKH018	407939	281645	Suburban	100	84.6	-	-	26.1	25.1	23.6
LTNKH019	407977	281892	Suburban	100	92.3	-	-	15.8	15.4	14.6
LTNKH020	408118	281308	Suburban	100	92.3	-	-	16.5	16.4	15.1

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
LTNKH021	407741	281864	Suburban	100	92.3	-	-	17.2	17.2	16.5
LTNKH022	407598	282154	Suburban	100	100.0	-	-	16.1	16.2	14.0
LTNKH023	407024	281528	Suburban	100	100.0	-	-	18.8	17.8	16.9
LTNKH024	406756	281198	Suburban	100	100.0	-	-	18.5	18.5	17.4
LTNKH025	407104	281459	Suburban	100	100.0	-	-	18.7	19.3	17.7

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

☒ **Diffusion tube data has been bias adjusted.**

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

Notes:

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

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

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

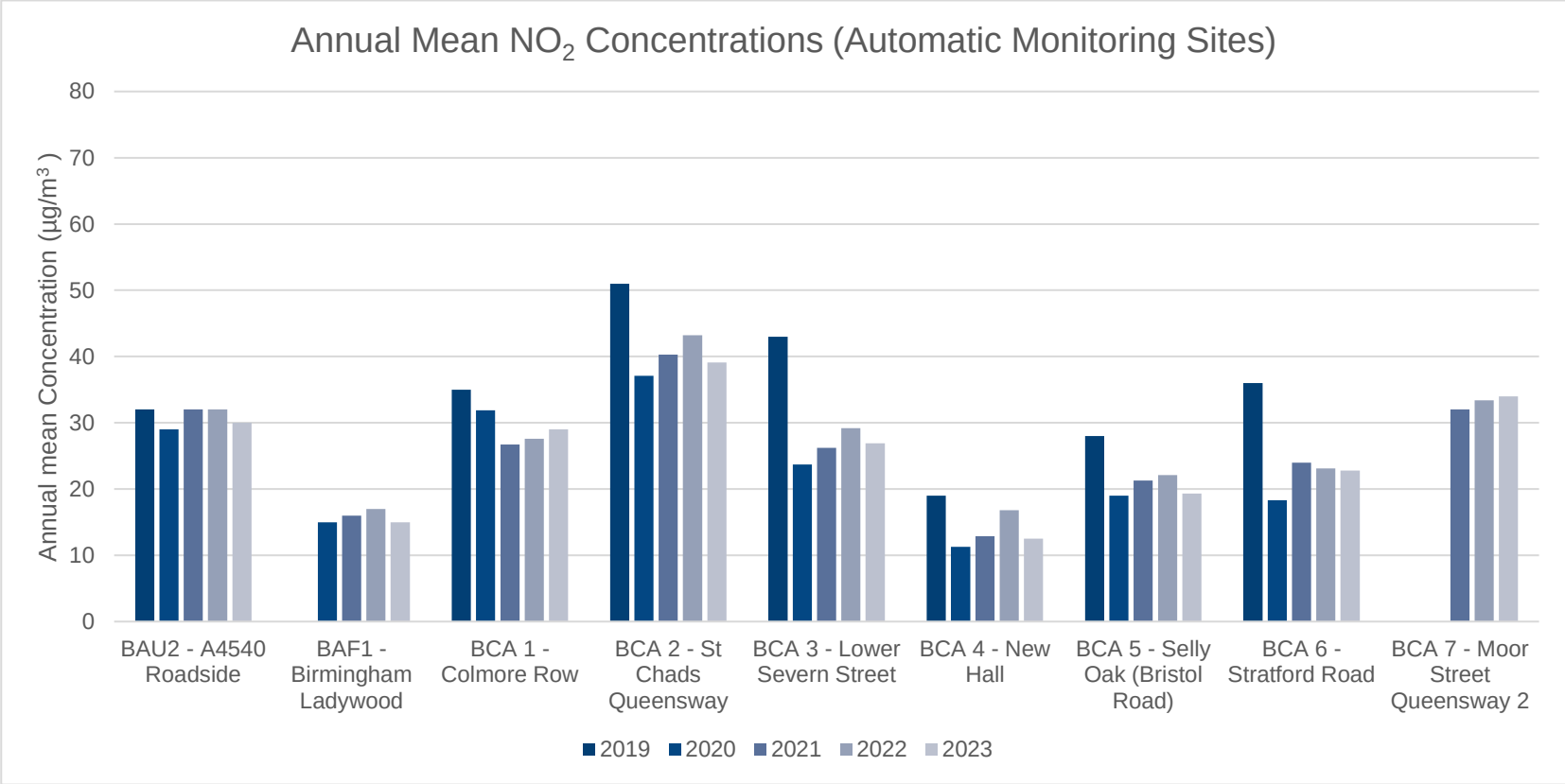
Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

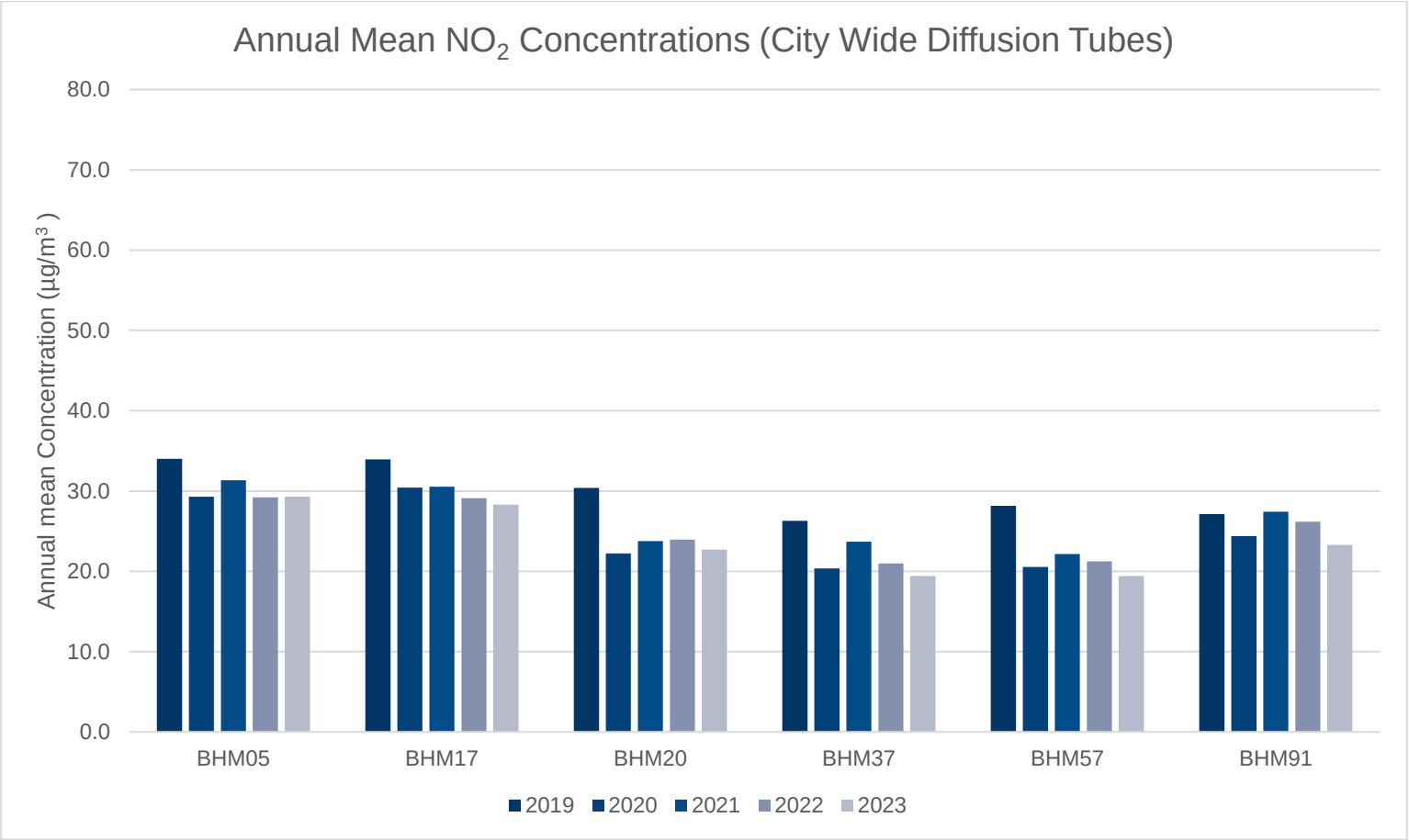
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

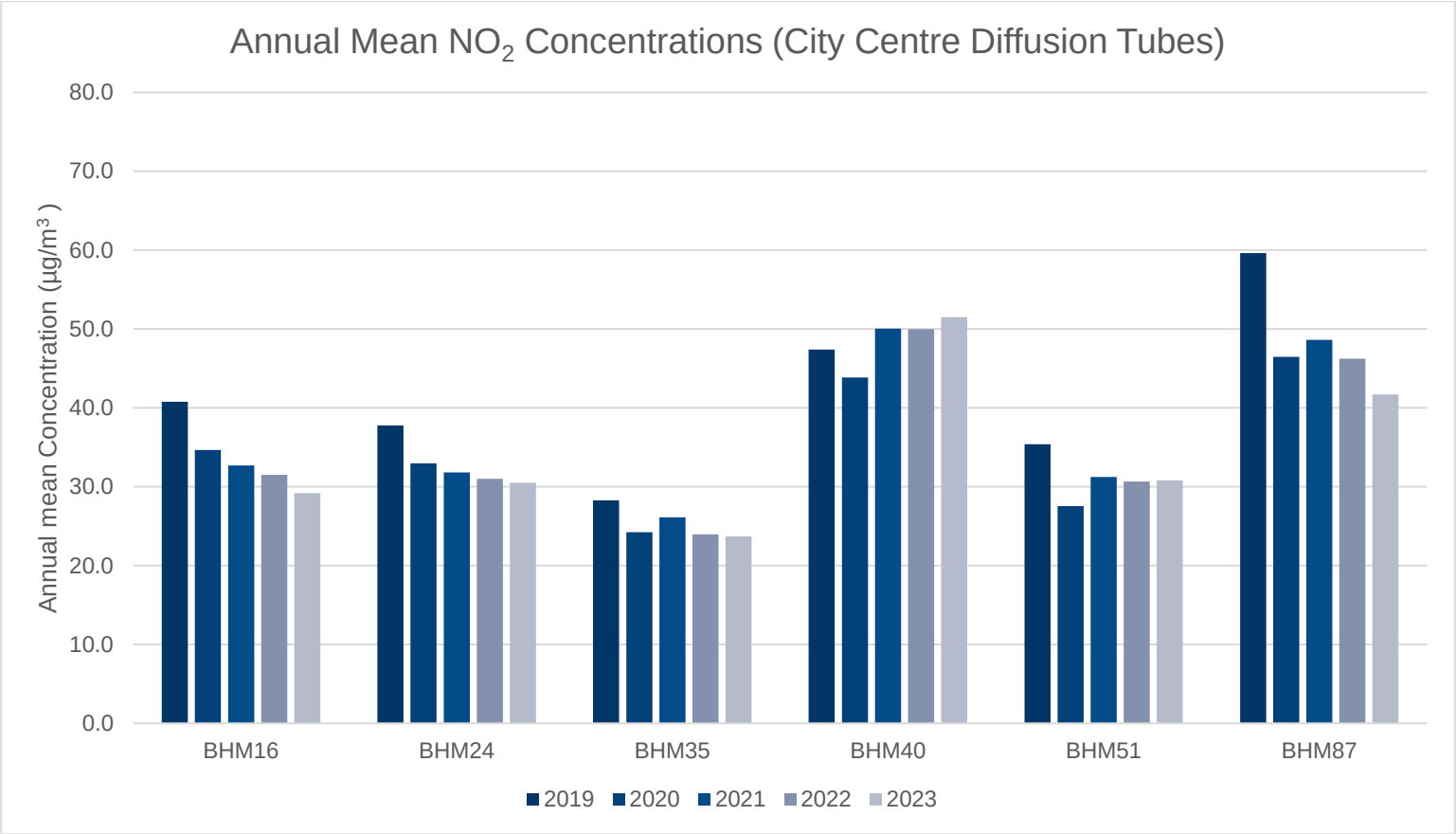
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

Figure A.1 – Trends in Annual Mean NO_2 Concentrations




Annual Mean NO2 Concentrations (City Wide Diffusion Tubes)
Annual mean Concentration (µg/m3)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
BHM05
BHM17
BHM20
BHM37
BHM57
BHM91
2019
2020
2021
2022
2023


Annual Mean NO2 Concentrations (City Centre Diffusion Tubes)
Annual mean Concentration (µg/m3)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
BHM16
BHM24
BHM35
BHM40
BHM51
BHM87
2019
2020
2021
2022
2023

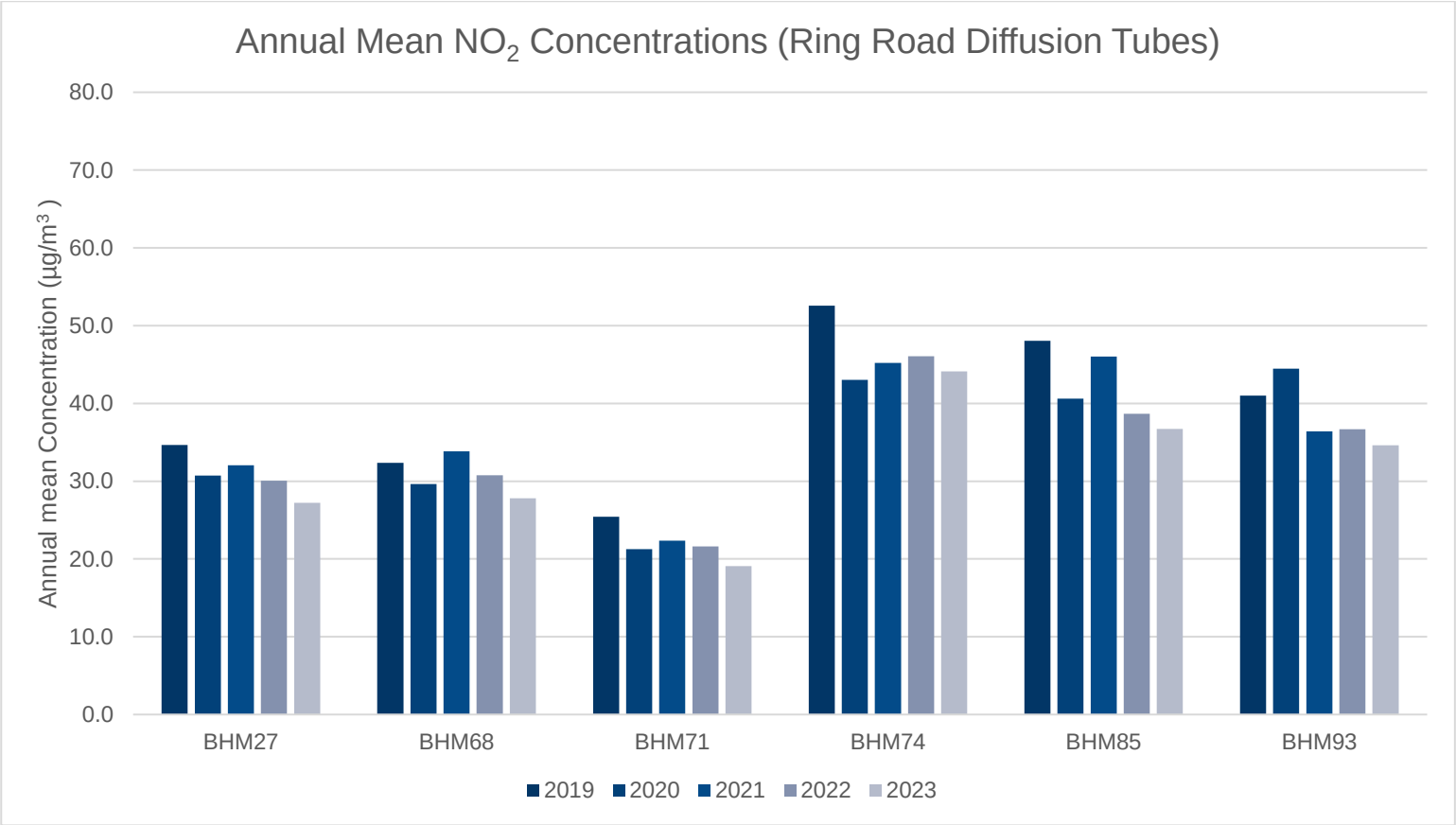

Annual Mean NO2 Concentrations (Ring Road Diffusion Tubes)
Annual mean Concentration (µg/m3)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
BHM27
BHM68
BHM71
BHM74
BHM85
BHM93
2019
2020
2021
2022
2023

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
BAU1	411649	282207	Urban Background	-	-	0	0	0	0	0
BAU2	408588	286470	Roadside	100	100	0	0	0	0	0
BAF1	405653	287053	Urban Background	98	98	0	0	0	0	0
BCA 1	406974	287101	Roadside	99.7	99.7	0	0	0	0	0
BCA 2	407107	287577	Kerbside	97	97	0	0	0	9	0
BCA 3	406744	286540	Roadside	98.7	98.7	0	2	0	0	0
BCA 4	414574	296724	Urban Background	98.3	98.3	0	0	0	0	1
BCA 5	404545	283020	Roadside	96.5	96.5	0	0	0	0	0
BCA 6	408820	284591	Roadside	97.2	97.2	0	0	0	0	0
BCA 7	407402	286918	Roadside	99.6	99.6	-	-	0	0	0
BCA08	406738	288352	Roadside	95.7	95.7	-	-	0	0	0
BCA09	407828	288067	Roadside	98.4	98.4	-	-	0	0	0
BCA10	408288	285716	Roadside	95.3	95.3	-	-	0	**0 (155.4)**	0
BCA11	406883	285913	Roadside	74.2	74.2	-	-	0	0	**0 (83.4)**
BCA12	406161	285844	Roadside	98.1	98.1	-	-	0	0	0
BCA13	405183	286538	Roadside	55.4	55.4	-	-	0	0	**0 (78.6)**

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%).

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
BAU1	411649	282207	Urban Background	-	-	**11**	**13**	**12**	**-**	**-**
BAU2	408588	286470	Roadside	100	100	15	14	15	16	15
BAF1	405653	287053	Urban Background	97	97	15	12	12	13	11

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

Notes:

The annual mean concentrations are presented as $\mu g/m^3$.

Exceedances of the PM_{10} annual mean objective of 40$\mu g/m^3$ are shown in **bold**.

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.2 – Trends in Annual Mean PM_{10} Concentrations

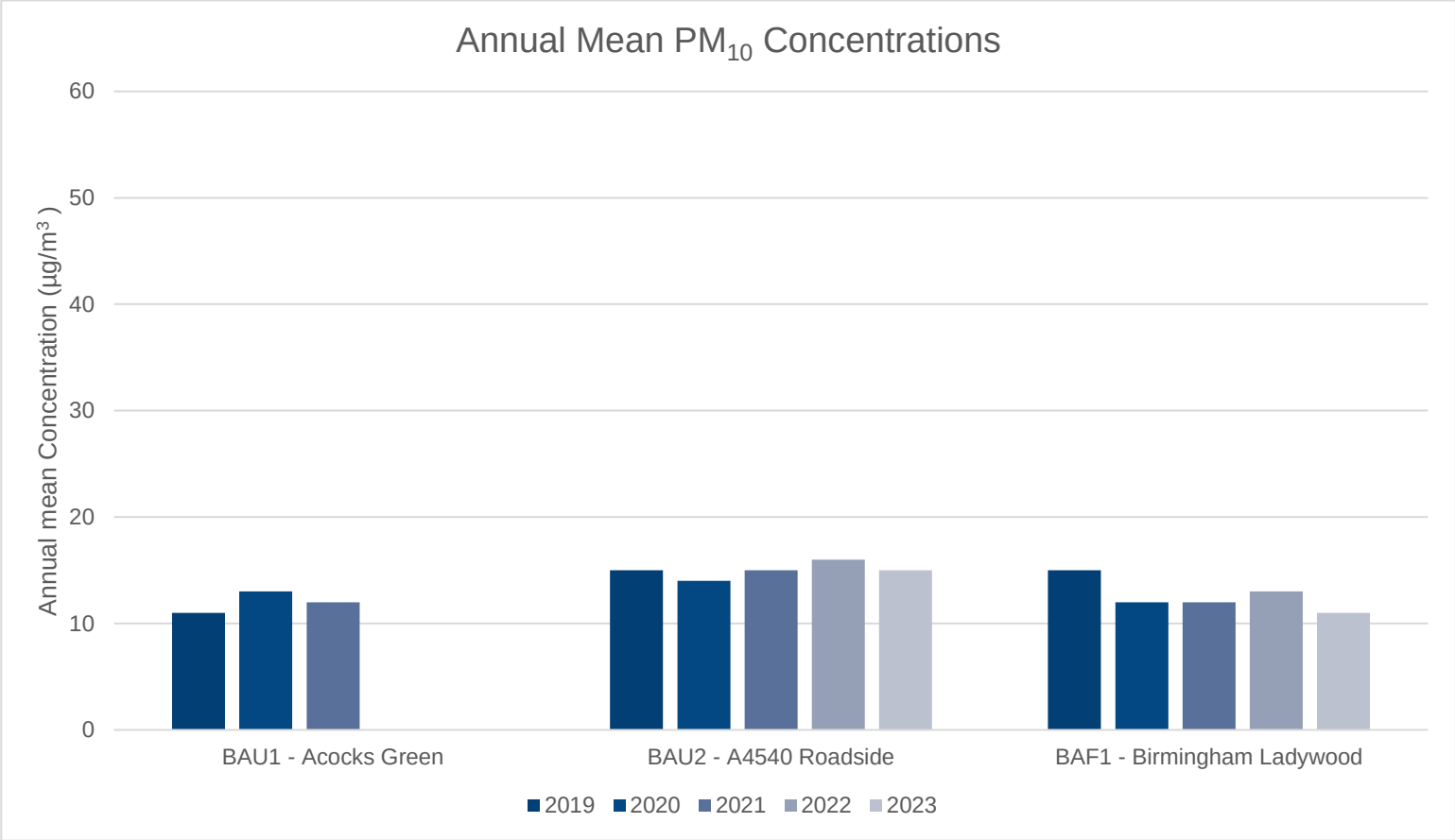


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

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
BAU1	411649	282207	Urban Background	-	-	0	3	0	-	-
BAU2	408588	286470	Roadside	100	100	9	2	2	4	0
BAF1	405653	287053	Urban Background	97	97	6	1	1	2	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 ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
BAU1	411649	282207	Urban Background	-	-	9	8	8	-	-
BAU2	408588	286470	Roadside	100	100	10	8	9	9	8
BAF1	405653	287053	Urban Background	97	97	10	7	7	8	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 $\mu g/m^3$.

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%).

Figure A.3 – Trends in Annual Mean $PM_{2.5}$ Concentrations

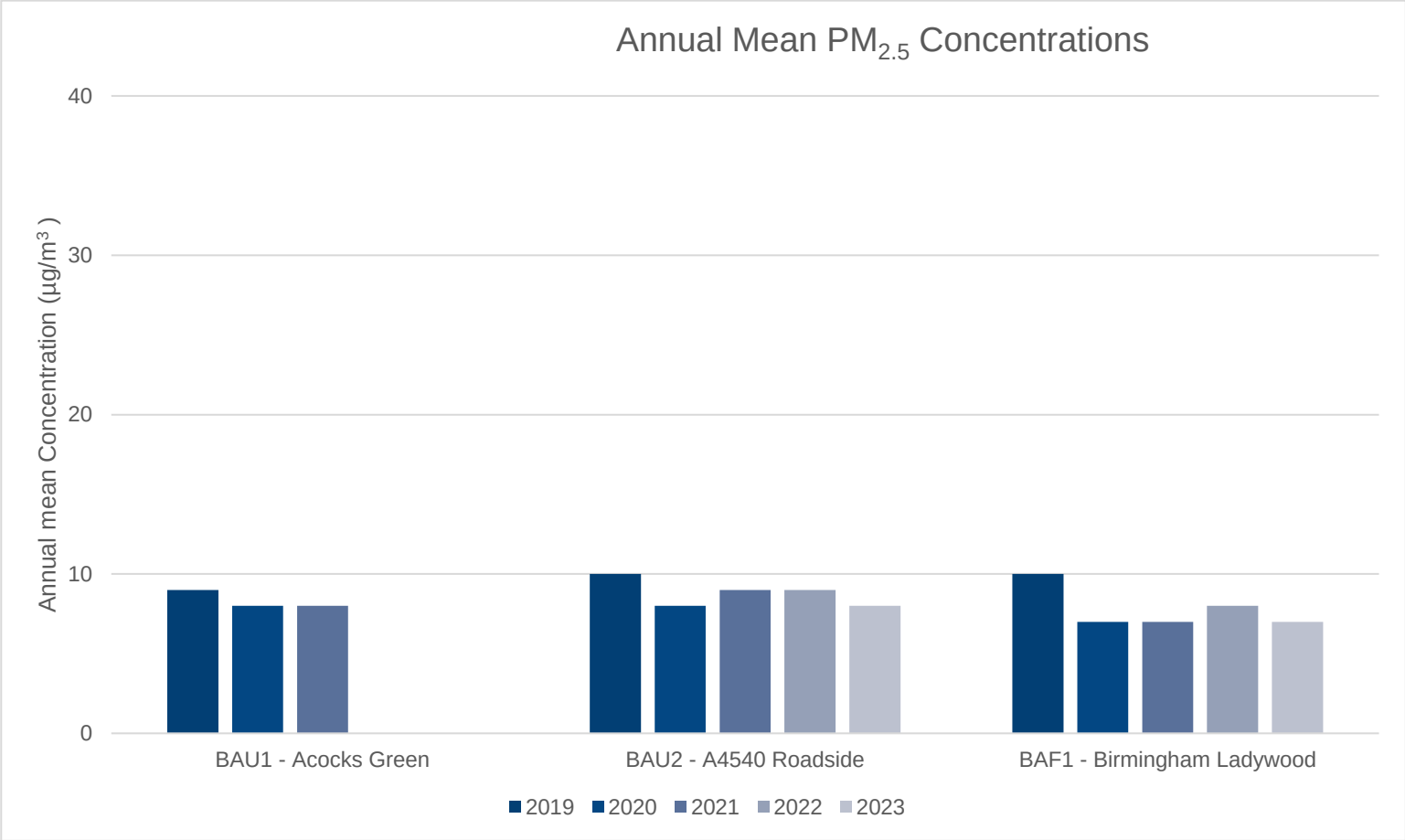


Table A.9 – SO_2 2023 Monitoring Results, Number of Relevant Instances

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)	Number of 15-minute Means > 266µg/m³	Number of 1-hour Means > 350µg/m³	Number of 24-hour Means > 125µg/m³
BAF1	405653	287053	Urban Background	51	51	0 (3)	0 (2)	0 (1)

Notes:

Results are presented as the number of instances where monitored concentrations are greater than the objective concentration.

Exceedances of the SO_2 objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year).

If the period of valid data is less than 85%, the relevant percentiles are 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%).

Appendix B: Full Monthly Diffusion Tube Results for 2023

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

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
BHM01	411211	282756	21.1	20.6	16.2	15.6	-	-	-	-	-	-	-	-	18.4	12.1	-	
BHM02	404082	282128	18.2	18.7	14.7	13.4	12.5	-	9.8	14.3	15.7	20.2	25.1	14.6	16.1	13.0	-	
BHM03	407386	282131	37.1	30.5	-	30.2	27.8	23.6	25.5	30.4	33.3	33.4	37.2	28.4	30.7	24.8	-	
BHM04	407401	282032	35.0	34.4	32.7	34.1	27.3	23.5	25.2	28.8	32.6	35.8	28.9	18.5	29.7	24.1	-	
BHM05	409103	284159	36.3	39.8	34.5	42.9	43.6	36.1	24.9	33.5	31.8	38.3	-	-	36.2	29.3	-	
BHM06	409143	284061	42.0	47.7	39.5	40.0	34.0	32.5	33.4	36.9	38.5	42.9	42.4	37.6	38.9	31.5	-	
BHM07	406113	286633	36.7	39.7	-	46.8	23.2	25.2	20.2	23.3	30.1	-	39.3	30.1	31.4	25.5	-	
BHM09	408618	291351	40.5	39.7	31.9	31.2	21.4	-	27.8	30.5	33.5	34.2	38.4	33.5	32.9	26.7	-	
BHM10	408818	284591	37.7	40.1	35.9	36.4	30.6	-	-	-	36.1	36.8	39.2	29.1	35.8	25.5	-	Triplicate Site with BHM10, BHM11 and BHM12
BHM11	408818	284591	34.9	38.1	-	35.5	31.5	-	-	-	35.8	37.6	40.6	30.1	35.5	25.3	-	Triplicate Site with BHM10, BHM11 and BHM12
BHM12	408818	284591	35.7	37.6	35.9	37.4	31.3	-	-	-	-	35.6	38.7	31.5	35.6	28.8	-	Triplicate Site with BHM10, BHM11 and BHM12
BHM16	407321	287531	41.0	41.3	36.1	40.6	30.2	28.5	31.4	31.2	39.1	-	40.8	-	36.0	29.2	-	
BHM17	410010	289995	41.8	42.5	34.4	33.7	28.2	29.0	27.0	33.6	32.5	37.8	41.0	37.4	34.9	28.3	-	
BHM18	410072	289999	44.5	43.5	-	38.3	32.4	28.8	30.1	31.2	35.5	40.4	45.8	33.4	36.7	29.7	-	
BHM20	404448	282890	31.7	35.2	27.7	28.2	26.7	23.9	18.8	25.5	29.8	31.3	33.9	23.9	28.0	22.7	-	
BHM21	408197	287394	56.9	54.7	42.4	45.8	37.8	41.0	-	-	52.0	53.8	55.2	48.3	48.8	39.5	38.6	
BHM23	406743	286541	41.4	41.3	35.4	41.3	36.5	36.0	25.7	29.8	35.0	35.0	36.4	33.0	35.6	28.8	-	
BHM24	406621	287108	45.1	44.8	36.2	46.5	36.8	33.6	30.1	31.7	41.0	43.7	44.1	17.9	37.6	30.5	-	
BHM25	408586	286455	48.3	49.7	40.3	43.7	37.1	38.2	34.7	43.0	48.2	48.5	58.8	-	44.6	36.1	29.3	
BHM26	405648	287041	23.9	22.4	20.1	20.1	-	-	11.6	15.7	-	24.9	27.3	17.7	20.4	16.5	-	
BHM27	407833	288046	39.4	38.6	35.7	35.8	31.3	26.9	23.0	-	32.0	36.9	40.0	29.7	33.6	27.2	-	
BHM28	406762	287329	39.0	50.1	-	55.5	48.1	45.6	38.0	38.9	49.4	56.2	46.6	37.4	45.9	37.2	-	
BHM31	406564	286688	34.7	35.2	32.7	44.9	39.1	38.8	22.2	29.4	35.9	37.3	36.6	28.8	34.6	28.0	-	
BHM33	406701	286512	36.8	39.9	34.8	40.2	35.9	33.1	25.7	30.8	37.4	39.0	36.3	31.8	35.1	28.5	-	
BHM34	407114	286906	32.6	28.3	25.9	27.2	21.2	18.9	18.1	21.4	29.7	30.8	34.8	28.3	26.4	21.4	-	
BHM35	407177	286996	35.5	33.4	27.6	31.7	25.2	24.1	18.6	23.1	29.0	35.5	37.3	29.9	29.2	23.7	-	
BHM36	407205	287065	-	-	-	38.0	34.9	-	-	-	-	-	-	-	-	-	-	

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 <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
BHM37	405383	285315	28.0	44.6	-	26.6	25.1	21.2	12.3	16.8	23.9	-	-	17.4	24.0	21.3	-	
BHM40	407407	287092	73.2	65.0	60.8	66.3	51.3	58.5	53.9	65.1	63.2	71.0	74.3	59.8	63.5	**51.5**	-	
BHM41	407399	287078	68.1	54.7	40.8	50.2	44.1	41.5	39.3	41.6	44.4	47.1	56.2	-	48.0	38.9	-	
BHM42	407548	287107	49.5	44.1	39.8	42.2	33.3	29.3	26.0	29.7	37.4	42.9	48.1	40.2	38.6	31.2	-	
BHM43	407611	287110	51.1	46.1	37.2	37.0	30.2	33.0	31.2	31.7	41.7	47.5	51.6	40.9	39.9	32.3	-	
BHM44	407628	287121	50.4	45.9	-	-	-	-	28.0	30.8	-	44.0	45.2	36.8	40.2	29.8	-	
BHM45	407604	287032	58.2	49.3	44.5	37.8	33.0	37.0	40.1	37.9	48.6	51.2	58.7	50.9	45.6	36.9	35.0	
BHM46	407547	287047	77.5	71.6	62.2	33.2	69.0	66.3	62.6	72.2	91.1	89.3	102.6	74.3	72.7	**58.8**	**55.7**	
BHM50	407433	286922	56.8	56.8	50.0	51.4	40.7	45.0	43.0	43.5	55.3	60.7	59.0	51.1	51.1	**41.4**	-	
BHM51	406921	285937	34.2	41.8	37.6	46.3	40.1	39.2	24.8	33.6	44.9	42.5	40.8	30.6	38.0	30.8	-	
BHM53	407350	286761	81.2	74.0	62.0	71.3	-	-	56.7	-	77.0	73.8	78.1	65.9	71.1	**51.5**	-	
BHM56	407377	286896	44.0	41.1	34.5	40.7	29.7	30.2	26.7	32.1	-	42.9	42.5	35.3	36.3	29.4	-	
BHM57	407687	283370	25.7	26.8	25.5	27.0	23.5	22.9	12.5	18.0	23.5	27.2	37.7	16.9	23.9	19.4	-	
BHM58	407255	286862	41.7	40.8	34.5	40.2	36.3	35.5	25.2	28.2	35.2	42.5	43.0	38.5	36.8	29.8	-	
BHM59	407278	286931	49.4	43.0	40.1	45.7	36.7	40.3	34.1	40.4	-	-	-	37.9	40.8	33.1	-	
BHM61	406919	287037	37.5	32.9	30.8	29.9	25.7	23.4	19.8	21.7	26.9	30.5	35.7	30.7	28.8	23.3	-	
BHM62	407033	287196	47.0	38.2	33.8	36.8	32.5	28.7	23.1	28.1	32.7	37.8	42.3	34.6	34.6	28.1	-	
BHM63	407509	287226	38.3	-	-	-	-	-	-	22.2	-	-	34.5	26.7	30.4	21.6	-	
BHM64	406973	286751	42.7	40.5	-	42.9	-	-	35.2	-	42.8	44.8	49.1	44.5	42.8	30.8	-	
BHM65	407446	286478	43.6	40.3	34.7	44.4	41.1	-	-	30.8	33.6	39.0	40.9	31.1	38.0	30.8	-	
BHM66	407452	288296	43.3	23.7	-	37.3	11.4	30.7	24.4	-	38.0	41.8	43.3	33.7	32.8	26.5	-	
BHM67	407056	288318	38.0	-	29.8	36.8	28.2	28.0	-	28.0	33.2	38.7	37.4	27.5	32.6	26.4	-	
BHM68	405781	288131	38.6	39.4	35.8	36.8	30.3	31.7	28.1	29.4	38.7	-	39.7	29.7	34.4	27.8	-	
BHM69	405806	288116	47.6	45.7	40.5	44.3	43.6	38.9	29.4	41.3	37.4	43.9	45.6	32.2	40.9	33.1	-	
BHM71	405300	286430	29.5	30.9	24.0	24.9	20.3	16.3	-	-	-	-	-	-	24.3	19.1	-	
BHM72	405285	286395	25.0	25.6	23.0	23.6	20.2	18.4	12.2	17.9	20.4	24.5	28.2	17.7	21.4	17.3	-	
BHM73	406038	285961	47.2	43.9	38.8	40.4	31.6	32.1	30.2	-	38.0	40.5	46.7	36.6	38.7	31.4	-	
BHM74A	406014	285936	58.4	59.2	55.1	64.7	58.7	62.4	42.7	31.5	53.2	54.2	57.4	43.9	-	-	-	Triplicate Site with BHM74A, BHM74B and BHM74C - Annual data provided for BHM74C only
BHM74B	406014	285936	-	58.2	51.6	60.2	60.2	60.6	42.2	50.6	50.4	58.8	55.4	44.5	-	-	-	Triplicate Site with BHM74A, BHM74B and BHM74C - Annual data provided for BHM74C 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 <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
BHM74C	406014	285936	-	57.8	57.9	64.0	62.6	61.3	44.1	54.7	51.1	56.5	55.8	42.3	54.4	**44.1**	-	Triplicate Site with BHM74A, BHM74B and BHM74C - Annual data provided for BHM74C only
BHM75	406355	285729	49.8	48.8	35.3	39.3	34.6	32.0	26.2	51.5	39.2	42.7	47.5	38.5	40.4	32.8	-	
BHM76	406354	285676	28.5	27.9	26.1	26.1	29.3	26.5	13.0	21.9	22.8	28.4	30.0	17.4	24.8	20.1	-	
BHM77	406936	285461	37.1	38.1	33.5	-	28.3	30.2	23.4	27.9	34.1	36.0	36.9	28.3	32.2	26.1	-	
BHM78	406912	285418	36.6	-	-	-	-	-	23.4	26.3	32.5	35.2	36.8	29.2	31.4	24.5	-	
BHM79	407373	285211	27.5	29.3	30.7	35.6	35.7	30.8	-	24.6	-	-	-	-	30.6	25.3	-	
BHM80	407385	285240	44.2	44.8	35.4	33.7	27.2	27.4	14.3	-	25.5	-	31.8	18.2	30.3	24.5	-	
BHM83A	408558	286452	75.2	73.1	66.1	60.5	62.9	60.6	50.2	53.0	64.7	56.7	69.2	-	-	-	-	Triplicate Site with BHM83A, BHM83B and BHM83C - Annual data provided for BHM83C only
BHM83B	408558	286452	71.7	72.3	71.3	60.5	58.4	58.3	54.2	53.3	65.9	72.7	49.8	51.3	-	-	-	Triplicate Site with BHM83A, BHM83B and BHM83C - Annual data provided for BHM83C only
BHM83C	408558	286452	65.8	62.7	55.9	55.7	53.7	52.3	44.8	58.8	56.1	64.1	73.3	45.0	60.2	**48.8**	-	Triplicate Site with BHM83A, BHM83B and BHM83C - Annual data provided for BHM83C only
BHM85A	407802	288047	53.0	54.0	50.9	53.5	43.7	40.1	34.2	53.7	12.4	53.8	47.6	37.0	-	-	-	Triplicate Site with BHM85A, BHM85B and BHM85C - Annual data provided for BHM85C only
BHM85B	407802	288047	52.5	51.9	49.7	47.5	40.1	38.3	38.7	48.0	43.4	48.9	49.1	40.7	-	-	-	Triplicate Site with BHM85A, BHM85B and BHM85C - Annual data provided for BHM85C only
BHM85C	407802	288047	47.5	51.0	48.2	46.1	41.2	37.5	36.0	39.8	48.8	51.5	53.3	48.2	45.3	36.7	-	Triplicate Site with BHM85A, BHM85B and BHM85C - Annual data provided for BHM85C only
BHM86	407163	287561	39.7	41.9	-	36.8	31.9	29.6	26.0	29.5	35.6	40.3	34.9	33.1	34.5	27.9	-	
BHM87	407162	287601	57.0	63.3	53.7	54.5	50.1	44.1	42.2	48.3	57.7	-	53.2	42.2	51.5	**41.7**	-	
BHM88	406799	287314	49.6	56.9	54.8	68.7	58.9	60.8	45.4	48.4	63.4	-	49.1	44.3	54.6	**44.2**	-	
BHM89	406594	287117	49.5	50.4	37.1	39.2	39.2	34.4	34.1	34.9	39.8	41.8	45.1	43.0	40.7	33.0	-	
BHM90	406626	287304	28.4	30.7	26.1	31.3	23.5	22.4	23.8	23.9	31.2	33.9	32.6	20.2	27.3	22.1	-	
BHM91	409496	287938	39.3	-	31.9	27.0	25.0	-	-	-	-	-	-	-	30.8	23.3	-	
BHM92	406883	285916	44.1	49.7	40.1	40.5	41.7	34.3	35.4	36.6	41.4	44.9	46.8	35.9	40.9	33.2	-	
BHM93	407052	288283	52.3	48.8	41.8	47.3	39.0	36.8	33.0	-	42.6	46.6	47.0	34.2	42.7	34.6	-	
BHM99	405671	281935	43.3	50.6	34.4	38.3	35.0	35.5	31.7	31.9	41.3	41.9	45.3	34.7	38.7	31.3	-	
BHM100	406609	286697	49.3	51.9	42.9	47.0	41.7	38.4	33.0	38.9	49.1	-	49.2	42.3	44.0	35.6	-	

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BHM101	408065	285375	37.3	44.1	36.7	33.9	32.8	28.8	-	30.9	43.9	42.8	-	-	36.8	29.8	-	
BHM102	408185	287332	75.4	73.8	63.3	57.3	53.5	-	-	-	-	64.5	71.3	60.9	65.0	**45.5**	**42.1**	
BHM103	407295	286870	61.0	63.0	56.2	-	49.4	51.8	42.8	57.5	47.3	61.8	63.6	51.3	55.1	**44.6**	-	
BHM104	406848	286578	34.5	38.6	38.1	45.1	37.0	38.9	27.6	30.9	40.8	-	41.9	37.2	37.3	30.2	-	
BHM106	406727	286645	37.7	71.7	34.9	42.4	40.1	39.0	29.7	34.6	37.7	-	36.8	32.7	39.8	32.2	-	
BHM107	406840	287540	49.4	51.6	56.0	64.4	54.0	56.2	47.5	48.0	59.2	-	51.8	44.2	52.9	**42.9**	-	
BHM108	408048	285406	38.9	42.5	39.9	44.9	29.8	37.6	-	-	-	-		-	38.9	30.6	-	
BHM109	407330	286728	71.7	67.3	58.2	67.6	46.1	67.8	59.1	59.2	58.3	69.3	70.5	62.6	63.1	**51.1**	-	
BHM219	409569	284743	-	-	47.7	51.3	-	-	45.8	41.3	-	-	-	-	46.5	**45.4**	**40.4**	
BHM234	406903	287264	35.6	41.2	37.3	46.6	38.8	-	-	35.5	43.0	-	46.0	36.9	40.1	32.5	-	
BHM236	406182	286620	30.6	-	-	-	20.3	19.7	15.4	-	25.8	-	-	-	22.3	21.2	-	
BHM110	407106	287577	50.7	51.4	44.0	57.6	47.8	46.8	41.6	55.2	51.4	-	47.5	43.4	48.9	39.6	-	
BHM111	407348	286722	-	-	57.8	61.6	44.3	61.2	-	-	-	-	-	57.5	56.5	**53.2**	-	
BHMPB1	406744	290838	35.5	36.1	31.2	32.5	23.7	24.7	21.1	29.3	31.6	35.5	34.4	28.2	30.3	24.6	-	
BHMPB2	406815	291239	31.3	28.7	23.6	26.8	20.7	20.7	16.5	26.3	26.4	29.9	30.7	23.2	25.4	20.6	-	
BHMPB3	406900	291234	55.6	50.8	38.0	38.0	33.1	34.9	32.8	-	45.3	44.5	53.0	43.0	42.6	34.5	-	
BHMPB4	407087	291248	-	-	-	34.6	31.0	32.9	27.5	40.1	39.4	32.0	44.7	-	35.3	31.6	-	
BHMPB6	407095	290751	46.5	42.2	33.4	47.3	38.3	38.1	24.4	32.1	34.7	35.0	43.1	30.3	37.1	30.1	-	
BHMPB7	407134	291527	41.4	37.7	32.6	31.5	27.1	26.4	23.5	33.8	33.9	42.7	39.9	30.6	33.4	27.1	-	
BHM250	406702	289361	-	42.4	-	35.9	34.4	33.3	33.3	38.6	39.7	45.5	47.8	37.6	38.8	31.5	-	
BHM251	406721	289401	-	43.9	33.0	29.1	-	26.7	26.7	33.2	32.8	36.7	41.4	33.7	33.7	27.3	-	
BHM252	406703	289412	-	-	-	36.5	32.2	36.1	36.1	38.7	40.9	40.9	41.7	32.8	37.3	30.2	-	
BHM253	406715	289423	-	42.9	38.8	36.3	32.4	34.8	34.8	39.4	38.7	43.3	42.6	35.5	38.1	30.9	-	
BHM254	410444	291176	-	42.9	39.1	30.3	30.2	29.7	29.7	41.7	37.4	36.9	40.5	32.4	35.5	28.8	-	
BHM255	410370	291018	-	43.2	37.7	35.8	31.6	33.0	33.0	33.5	37.6	34.8	44.7	31.6	36.1	29.2	-	
BHM256	410297	290893	-	52.9	48.9	44.8	40.2	41.5	41.5	47.6	-	40.4	56.0	46.3	46.0	37.3	31.8	
BHM257	410416	291149	-	42.5	44.6	34.1	28.6	-	-	33.1	52.7	50.9	42.2	32.9	40.2	32.5	-	
BHM258	412226	290925	-	35.7	32.0	32.3	21.9	24.5	24.5	26.8	29.6	34.6	36.2	29.0	29.7	24.1	-	
BHM259	412353	291039	-	37.2	36.9	32.9	21.3	27.5	27.5	28.0	38.2	40.0	37.5	32.7	32.7	26.5	-	
BHM260	413313	291562	-	34.4	-	33.4	30.5	26.1	26.1	28.7	26.0	33.8	34.5	24.5	29.8	24.2	-	
BHM261	413341	291573	-	42.5	35.6	34.5	28.9	28.0	28.0	32.6	34.2	39.1	42.3	33.5	34.5	27.9	-	

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BHM262	413503	291430	-	-	30.8	38.3	39.6	38.9	38.9	39.9	39.9	44.7	48.3	33.1	39.2	31.8	-	
BHM263	413454	291434	-	48.7	41.8	28.9	22.4	24.8	24.8	29.3	34.4	35.5	40.4	44.1	34.1	27.6	-	
BHM264	412415	288419	-	42.3	-	40.1	37.3	37.2	37.2	38.1	34.6	41.2	39.5	30.9	37.8	30.7	-	
BHM265	412433	288450	-	48.4	36.6	40.0	35.7	38.2	38.2	41.3	47.1	47.7	48.7	41.4	42.1	34.1	-	
BHM266	412463	288385	-	42.1	39.5	34.0	-	30.1	30.1	33.8	33.3	37.6	39.9	33.1	35.3	28.6	-	
BHM267	412436	288366	-	46.9	35.9	37.3	35.9	34.5	34.5	36.8	35.0	41.7	43.6	38.7	38.3	31.0	-	
BHM268	413228	287768	-	37.7	32.4	33.4	28.5	30.8	30.8	33.4	29.6	36.7	36.3	32.4	32.9	26.7	-	
BHM269	413108	287765	-	34.3	30.7	30.4	-	25.6	25.6	30.9	26.9	33.3	36.4	30.1	30.4	24.6	-	
BHM270	413162	287781	-	39.8	31.8	34.3	30.2	28.9	28.9	32.8	33.9	36.6	42.4	34.8	34.0	27.6	-	
BHM271	413012	287446	-	44.6	-	32.5	27.1	-	-	38.8	37.1	36.2	46.3	33.6	37.0	28.7	-	
BHM272	412959	287620	-	41.1	39.6	-	26.2	24.8	24.8	-	37.7	38.8	44.1	33.0	34.4	27.9	-	
BHM273	412553	288072	-	51.3	46.7	44.3	42.9	41.0	41.0	37.5	44.3	46.5	51.7	42.2	44.5	36.0	28.1	
BHM274	412577	288090	-	44.3	38.9	37.6	33.4	35.6	35.6	43.0	41.6	43.0	43.2	36.3	39.3	31.8	-	
BHM275	412897	285321	-	38.4	31.4	32.8	30.7	27.3	27.3	38.3	30.6	37.9	38.9	33.7	33.4	27.1	-	
BHM276	412920	285299	-	45.8	35.5	34.4	34.8	31.8	31.8	31.9	32.3	37.3	40.8	33.1	35.4	28.7	-	
BHM277	412463	284470	-	29.7	23.4	19.4	18.3	18.0	18.0	33.5	21.5	26.4	30.5	24.9	23.9	19.4	-	
BHM278	412456	284504	-	33.0	-	22.4	24.0	22.7	22.7	23.8	24.5	27.3	32.7	-	25.9	21.0	-	
BHM279	412206	284444	-	38.2	29.1	23.5	24.1	27.1	27.1	24.0	28.0	29.8	35.2	-	28.6	23.2	-	
BHM280	412196	284465	-	50.3	42.7	38.0	39.6	42.5	42.5	28.5	33.9	40.8	45.1	-	40.4	32.7	-	
BHM281	411954	284240	-	42.7	34.3	30.2	31.8	24.4	24.4	37.4	28.3	30.4	10.2	34.0	29.8	24.1	-	
BHM282	411935	284270	-	38.8	-	30.5	25.5	27.1	27.1	30.9	33.5	37.2	40.7	29.4	32.1	26.0	-	
BHM283	409585	283267	-	35.6	34.6	36.1	28.9	30.5	30.5	33.4	27.6	33.9	36.7	28.2	32.3	26.2	-	
BHM284	409585	283237	-	41.5	33.4	33.1	30.3	33.5	33.5	31.0	29.1	35.4	39.7	36.6	34.3	27.8	-	
BHM285	409656	283038	-	41.3	-	35.9	37.5	32.0	32.0	33.8	30.0	33.5	37.3	29.9	34.3	27.8	-	
BHM286	409654	283001	-	43.6	39.8	35.4	30.8	-	-	31.2	37.2	37.6	-	36.1	36.5	30.2	-	
BHM287	409730	282896	-	42.1	37.8	35.4	29.1	36.3	36.3	36.4	37.4	39.4	40.5	38.9	37.2	30.1	-	
BHM288	409765	282887	-	39.8	33.3	33.0	28.6	30.8	30.8	38.1	25.9	33.4	37.5	30.5	32.9	26.6	-	
BHM289	409847	282850	-	37.0	31.6	30.1	30.8	31.2	31.2	31.3	29.8	30.5	34.9	29.4	31.6	25.6	-	
BHM290	409825	282843	-	30.3	24.3	25.4	25.3	23.6	23.6	29.6	20.7	21.3	29.3	21.4	25.0	20.2	-	
LTNKH001S	406905	281057	18.8	18.5	14.1	15.6	12.1	12.5	9.2	16.7	11.6	15.8	22.7	-	15.2	12.3	-	
LTNKH002S	406855	281333	23.7	20.2	14.6	15.1	12.1	11.5	9.5	14.7	14.3	17.9	22.9	-	16.0	13.0	-	

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 <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
LTMKH003S	407496	281731	27.8	20.9	17.8	17.9	15.1	13.1	12.3	17.5	16.0	20.7	27.0	-	18.7	15.2	-	
LTNKH004S	407585	281586	20.3	17.9	13.5	12.6	10.9	9.5	8.0	13.0	11.7	17.1	22.2	-	14.3	11.6	-	
LTNKH005S	407597	282149	19.8	19.6	15.5	14.0	12.0	9.9	8.5	14.0	12.6	16.1	23.0	-	15.0	12.1	-	
LTNKH006S	407999	282809	18.2	16.8	15.4	15.3	14.5	11.7	-	-	11.0	18.3	22.5	-	16.0	12.9	-	
LTNKH007S	407747	281109	20.2	17.8	13.3	12.0	10.8	8.4	7.4	12.8	11.0	15.3	20.5	-	13.6	11.0	-	
LTNKH008	406955	280935	16.6	17.4	14.3	13.5	11.4	9.1	7.8	12.6	10.9	16.1	23.6	-	13.9	11.3	-	
LTNKH009	407227	281328	19.4	17.5	13.6	13.7	10.9	9.2	7.3	12.7	10.6	15.6	21.2	-	13.8	11.2	-	
LTNKH010	406877	281694	24.0	21.6	18.1	21.8	19.4	17.0	13.4	21.4	17.9	22.6	27.7	-	20.4	16.6	-	
LTNKH011	407310	281634	21.1	20.9	17.4	17.3	15.1	14.3	12.1	17.2	16.2	21.0	24.1	-	17.9	14.5	-	
LTNKH012	407385	281480	29.6	35.2	29.5	35.0	30.1	26.7	21.2	30.0	27.7	34.4	37.3	-	30.6	24.8	-	
LTNKH013	407499	281502	24.4	24.1	19.3	18.1	15.3	14.2	12.6	18.1	15.9	20.5	27.7	-	19.1	15.5	-	
LTNKH014	407335	281833	20.1	21.4	16.0	17.5	14.0	12.6	9.5	14.4	14.1	19.8	22.9	-	16.6	13.4	-	
LTNKH015	407318	282051	18.7	20.6	15.1	17.7	13.1	11.6	8.1	15.0	12.1	18.9	22.9	-	15.8	12.8	-	
LTNKH016	407488	282277	25.0	25.1	19.2	19.5	15.9	13.5	14.3	19.2	18.5	21.3	27.7	-	19.9	16.1	-	
LTNKH017	407761	282379	20.2	20.1	15.2	15.4	12.2	10.3	8.8	14.2	12.5	17.6	25.8	-	15.7	12.7	-	
LTNKH018	407939	281645	36.4	36.7	25.8	29.6	-	21.4	22.2	26.5	28.0	29.5	35.0	-	29.1	23.6	-	
LTNKH019	407977	281892	22.2	22.9	16.0	19.5	14.9	14.6	10.6	17.5	15.8	19.2	24.5	-	18.0	14.6	-	
LTNKH020	408118	281308	21.7	24.9	18.6	17.8	14.5	13.5	11.1	17.9	16.8	21.6	27.0	-	18.7	15.1	-	
LTNKH021	407741	281864	24.8	24.1	20.2	19.5	-	13.5	13.3	19.9	19.1	23.0	26.7	19.3	20.3	16.5	-	
LTNKH022	407598	282154	9.3	23.2	17.9	18.4	15.6	13.2	11.4	17.6	15.4	20.8	27.1	18.0	17.3	14.0	-	
LTNKH023	407024	281528	22.5	24.3	18.7	23.0	20.9	18.8	13.0	20.8	18.6	23.4	28.2	18.8	20.9	16.9	-	
LTNKH024	406756	281198	26.0	23.1	19.6	22.1	20.7	18.3	16.4	24.3	20.0	22.2	27.5	18.2	21.5	17.4	-	
LTNKH025	407104	281459	24.0	23.0	23.2	24.5	21.2	19.6	14.1	21.8	18.8	24.8	27.6	19.3	21.8	17.7	-	

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

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

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

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

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

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Birmingham During 2023

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

Additional Air Quality Works Undertaken by Birmingham City Council During 2023

Action 5 of the 2021 AQAP committed Birmingham City Council to identifying whether there are any pollution "hotspot" locations where NO_2 concentrations may exceed the annual mean air quality objective, so that specific actions could be targeted to reduce emissions.

Currently there are a limited number of monitoring locations outside of the city centre area. Accordingly it was currently unclear whether there may be locations exceeding the air quality objectives outside of the CAZ area. It was therefore proposed that work be undertaken to identify any such areas. BCC devised a methodology for this work, which will be undertaken within the resources available to the City Council (i.e. without any additional modelling at this stage). This became known as NO_2 Tranche Monitoring.

A geographic information system (GIS) approach was used to identify road links where the traffic flow was greater than 25,000 AADT and there was residential exposure within 20 metres of the centreline of the road. The location of the residential exposure was based on address point data from the Local Land and Property Gazetteer (LLPG), which does not largely represent building facades. This information was then overlaid on an existing local air quality model displaying concentrations of nitrogen dioxide (NO_2) in micrograms per cubic metre (μgm^{-3}).

A desktop exercise was undertaken to identify three tranches of sites that could be assessed on a hierarchical basis, with tranche one representing the highest risk.

- Tranche one comprised sites where there are roads with greater than 25,000 AADT, with relevant exposure within 20 metres, and the existing model indicated concentrations above 40 μgm^{-3}.
- Tranche two comprised sites where there are roads with greater than 25,000 AADT, with relevant exposure within 20 metres, and the existing model indicated concentrations between 36 and 40 μgm^{-3}.
- Tranche three comprised sites where the existing model indicated concentrations above 40 μgm^{-3} but the roads have less than 25,000 AADT, or there is no relevant exposure within 20 metres.

Monitoring of Tranche 1 sites was completed in 2022 and reported in last year's ASR. In Tranche 2 links on the following roads were identified for a monitoring program in 2023.

- Lozells Road (B4144)
- Wheeler Street (B4515)
- Tyburn Road (A38)
- Chester Road (A453)
- Gravelly Hill North (A5127)
- Stratford Road (A34)
- Stockfield Road (A4040)
- Stoney Lane (A4040)
- Station Road (A4040)
- Bromford Lane/Stechford Lane (A4040)

A map showing the road links identified is presented in Appendix D. Diffusion tubes were deployed at each site and monitoring was undertaken from January 2023 to December 2023. The monitoring results were then annualised (where necessary) and bias corrected. The monitoring locations are presented in Appendix D. The results are presented in Tables A.4. and B.1.

All monitoring locations in Tranche 2 showed NO2 annual means less than 40 µg/m^3 indicating that the air quality objective is not being breached at these locations.

However the site BHM256, located on Gravelly Hill North, recorded an annual mean of 39.1 µg/m^3 which is very close to the limit value. The tube at the nearby site BHM257 also showed an annual mean that was close to the limit value. It has therefore been decided to continue monitoring at sites these 2 sites for the duration of 2024, to assess whether there is any change in the concentrations. Monitoring at the remaining Tranche 2 sites has ceased.

QA/QC of Diffusion Tube Monitoring

Birmingham City Council uses diffusion tubes obtained from and analysed by Gradko International Limited who hold UKAS accreditation. The preparation of the tubes is 20% TEA in water and are analysed to an in-house method. Gradko participate in the AIR NO^2 Proficiency Testing Scheme. Monitoring has been largely carried out in accordance with the 2023 Diffusion Tube Monitoring Calendar.

Diffusion Tube Annualisation

Annualisation was required for 21 diffusion tubes sites. Annualisation was carried by comparison with the automatic monitoring sites at Birmingham Ladywood, Coventry Allesley, Leamington Spa, and Walsall Woodlands. Calculations were carried out using the Diffusion Tube Data Processing Tool spreadsheet. The results of the annualisation calculations are presented in Table C.1.

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

Site ID	Annualisation Factor Birmingham Ladywood	Annualisation Factor Coventry Allesley	Annualisation Factor Leamington Spa	Annualisation Factor Walsall Woodlands	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
BHM01	0.8604	0.8155	0.7925	0.7970	0.8164	18.4	15.0
BHM10	0.8871	0.8932	0.8696	0.8685	0.8796	35.8	31.5
BHM11	0.8871	0.8932	0.8696	0.8685	0.8796	35.5	31.2
BHM12	0.8871	0.8932	0.8696	0.8685	0.8796	35.6	31.3
BHM37	1.1024	1.0950	1.0959	1.0961	1.0973	24.0	26.3
BHM44	0.9412	0.9192	0.8794	0.9241	0.9160	40.2	36.8
BHM53	0.9125	0.9017	0.8780	0.8887	0.8952	71.1	63.6
BHM63	0.9084	0.8883	0.8234	0.8822	0.8756	30.4	26.6
BHM64	0.9035	0.8992	0.8644	0.8802	0.8868	42.8	38.0
BHM71	0.9954	0.9550	0.9678	0.9585	0.9692	24.3	23.6
BHM78	0.9636	0.9695	0.9453	0.9761	0.9636	31.4	30.3
BHM79	1.0300	1.0118	1.0285	1.0181	1.0221	30.6	31.3
BHM91	0.9509	0.9368	0.9362	0.9194	0.9358	30.8	28.8

Site ID	Annualisation Factor Birmingham Ladywood	Annualisation Factor Coventry Allesley	Annualisation Factor Leamington Spa	Annualisation Factor Walsall Woodlands	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
BHM102	0.8814	0.8775	0.8468	0.8521	0.8644	65.0	56.2
BHM108	0.9954	0.9550	0.9678	0.9585	0.9692	38.9	37.7
BHM219	1.1682	1.1951	1.2553	1.1970	1.2039	46.5	56.0
BHM236	1.1767	1.1332	1.1828	1.1955	1.1720	22.3	26.2
BHM111	1.1468	1.1724	1.2024	1.1285	1.1625	56.5	65.6
BHMPB4	1.0502	1.1175	1.1478	1.1079	1.1059	35.3	39.0
BHM271	0.9332	0.9876	0.9620	0.9458	0.9572	37.0	35.4
BHM286	0.9919	1.0404	1.0499	1.0076	1.0224	36.5	37.3

N.B. Diffusion tubes BHM37 and BHM53 have been annualised using the Diffusion Tube Data Processing tool as this calculates data capture rates based on the number of days covered. However as the results are available for 9 individual months it could be considered that data capture was ≥75%, in which case annualisation would not have been required. Either approach is permitted in LAQM.TG(22).

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 NOx/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Birmingham City Council have applied a national bias adjustment factor of 0.81 to the 2023 monitoring data. A local bias adjustment factor of 0.69 was also derived. However this was not used to correct the data due to the poor data capture for the triplicate tubes.

A summary of bias adjustment factors used by Birmingham City Council over the past five years is presented in

Table C.2.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	National	03/24	0.81
2022	National	03/23	0.83
2021	National	06/22	0.84
2020	National	03/21	0.81
2019	Local	-	0.80

Table C.3 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	8				
Bias Factor A	0.69 (0.66-0.73)				
Bias Factor B	44% (47% 52%)				
Diffusion Tube Mean (µg/m^3)	36				
Mean CV (Precision)	2%				
Automatic Mean (µg/m^3)	25.0				
Data Capture	99%				
Adjusted Tube Mean (µg/m^3)	23 (23 – 26)				

The local bias adjustment factor was calculated using the tool available from the LAQM website (https://laqm.defra.gov.uk/).

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 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.

Table C.4 – Non-Automatic NO_2 Fall off With Distance Calculations (concentrations presented in µg/m^3)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
BHM21	4.7	5.7	39.5	23.0	*38.6*	*Predicted concentration at Receptor within 10% the AQS objective.*
BHM25	2.6	18.6	36.1	22.2	29.3	
BHM45	2.5	5.5	36.9	26.9	35.0	
BHM46	3.4	4.9	58.8	26.9	**55.7**	*Predicted concentration at Receptor above AQS objective.*
BHM102	1.0	2.1	45.5	23.0	**42.1**	*Predicted concentration at Receptor above AQS objective.*
BHM219	2.4	5.2	45.4	19.1	**40.4**	*Predicted concentration at Receptor above AQS objective.*
BHM256	2.0	8.2	37.3	20.8	31.8	
BHM273	2.3	12.5	36.0	16.6	28.1	

QA/QC of Automatic Monitoring

Data collection and LSO duties for all Birmingham City Council operated sites is undertaken by council staff. Birmingham City Council uses the Airviro software developed by Apertum to collect the data. The software polls the analysers and collects the raw 15-minute data which is then stored in a database. Analysers are calibrated on a monthly basis and QA/QC and servicing is provided every 6 months by We Care For Air Limited who hold the relevant certifications as required by TG16. The data is ratified in-house using the Airviro functionality. Live and historic data can be viewed at www.birminghamairquality.co.uk.

The Birmingham A4540 Roadside and Birmingham Acocks Green sites are in the AURN network and LSO services are provided by Ricardo on behalf of Bureau Veritas.

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

The type of PM_{10}/$PM_{2.5}$ monitor(s) utilised within the Birmingham City Council area do not require the application of a correction factor.

Automatic Monitoring Annualisation

Data capture from the automatic monitoring sites BCA11 (Bristol Street) and BCA13 (Ladywood Middleway) were below 75%. The data was therefore annualised following the procedure set out in Table 7-9 in TG22. Data from AURN sites at Birmingham Ladywood, Walsall Woodlands, Coventry Allesley, and Leamington Spa was used to perform the annualisation calculations. The annualisation factors are summarised in the table below.

Site ID	Annualisation Factor Birmingham Ladywood	Annualisation Factor Coventry Allesley	Annualisation Factor Leamington Spa	Annualisation Factor Walsall Woodlands	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
BCA11	0.9264	0.9122	0.9013	0.8986	0.9096	30.3	27.6
BCA13	1.0272	0.9783	0.9786	0.9764	0.9901	12.3	12.2

All other automatic monitoring locations within the Birmingham City Council area recorded data capture of greater than 75% therefore annualisation was not required.

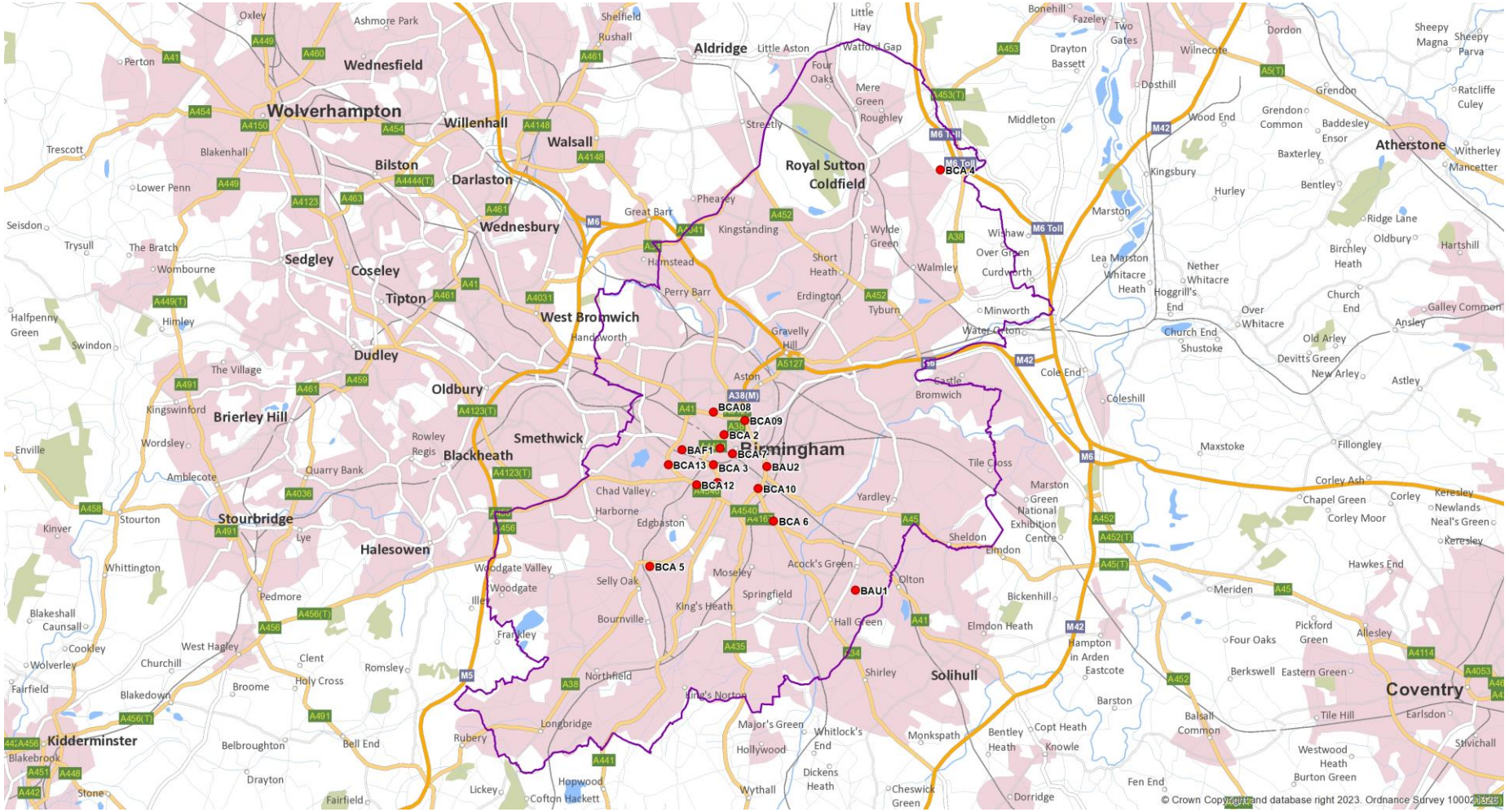
NO_2 Fall-off with Distance from the Road

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.

Fall-off with distance calculations were not required for any automatic monitoring sites.

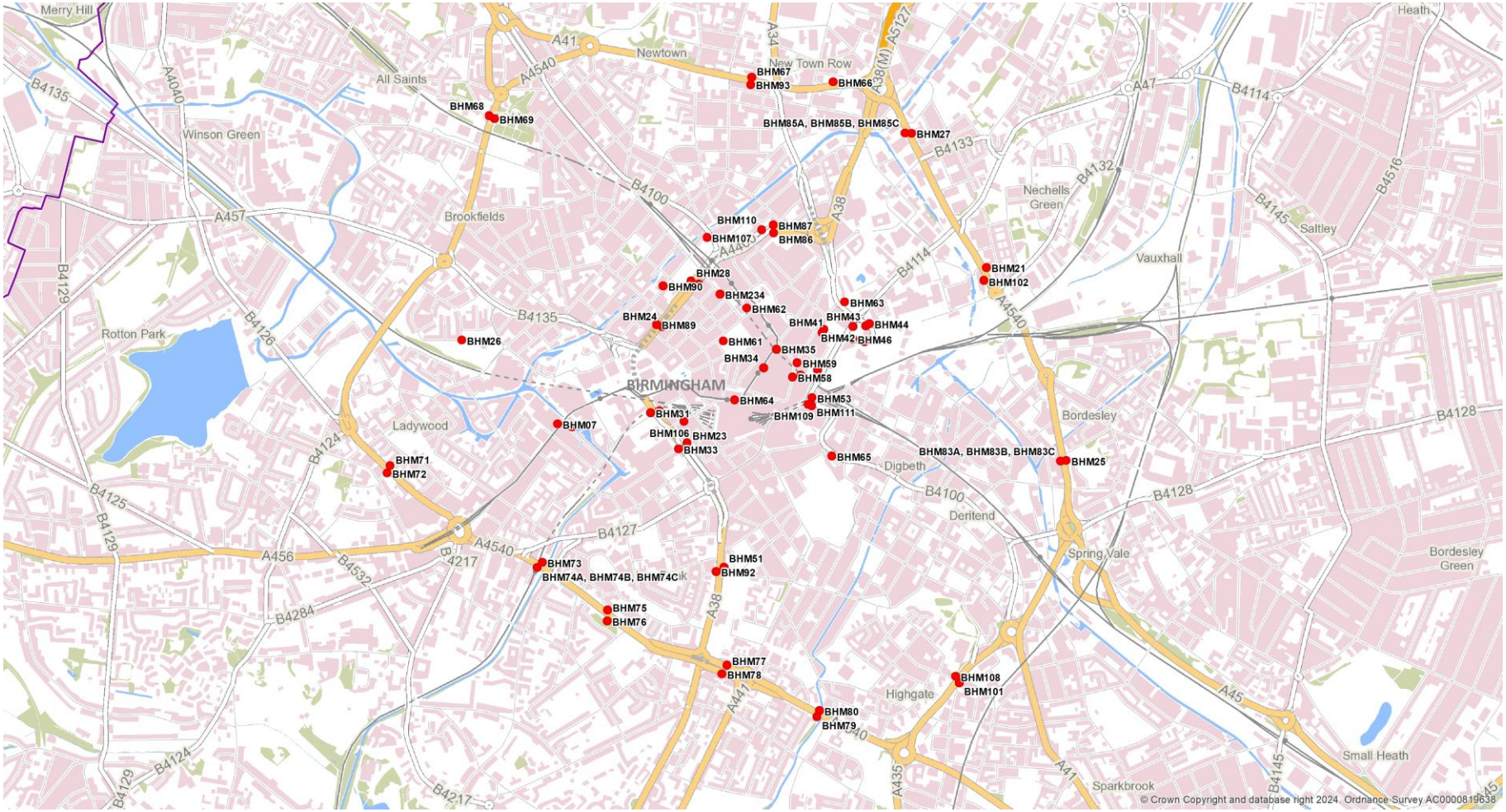
Appendix D: Map(s) of Monitoring Locations and AQMAs

Map of Automatic Monitoring Sites



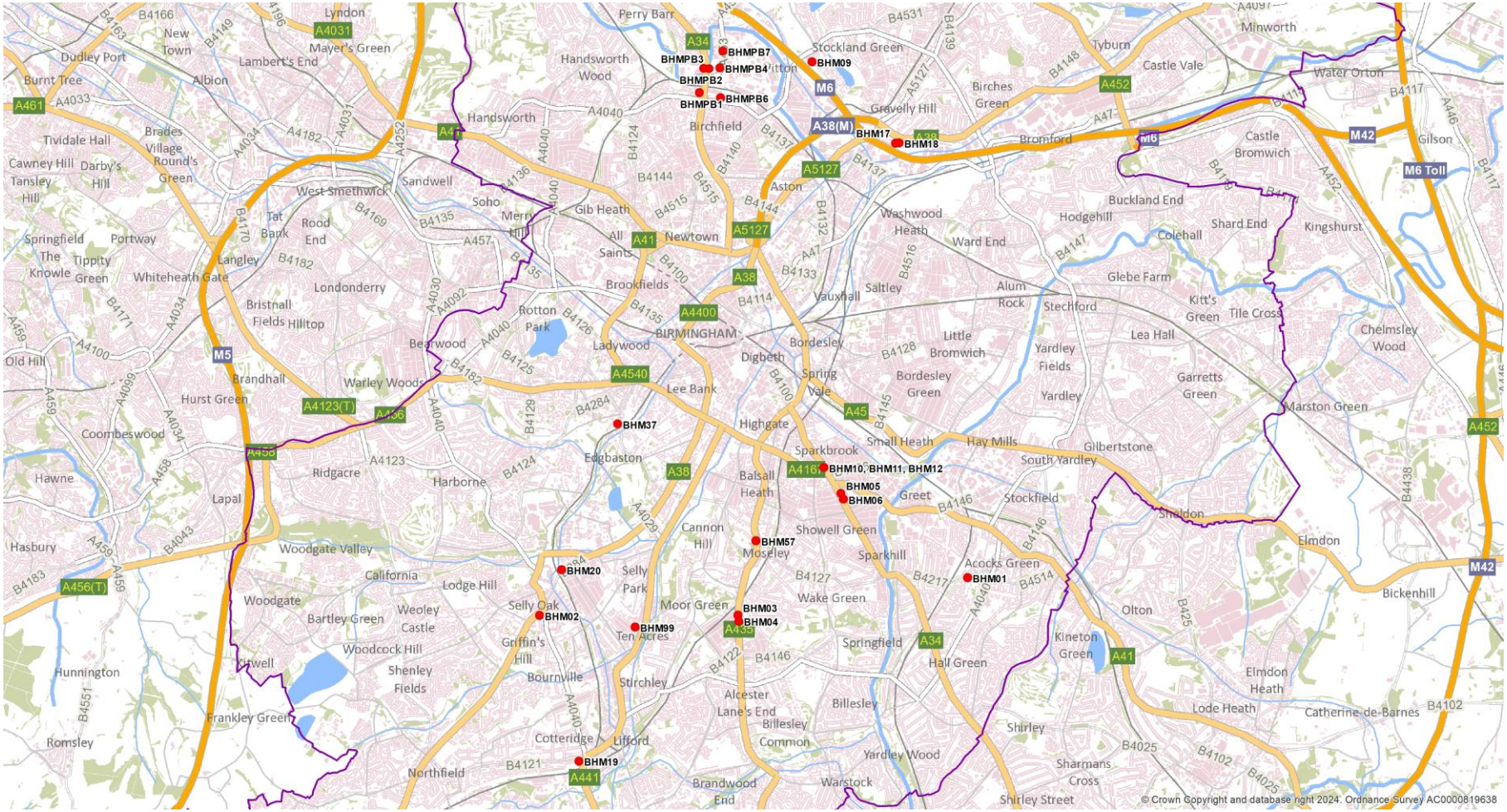
N.B. AQMA boundary indicated by purple line.

Map of Non-Automatic Monitoring Sites (City Centre Locations)



N.B. AQMA boundary indicated by purple line.

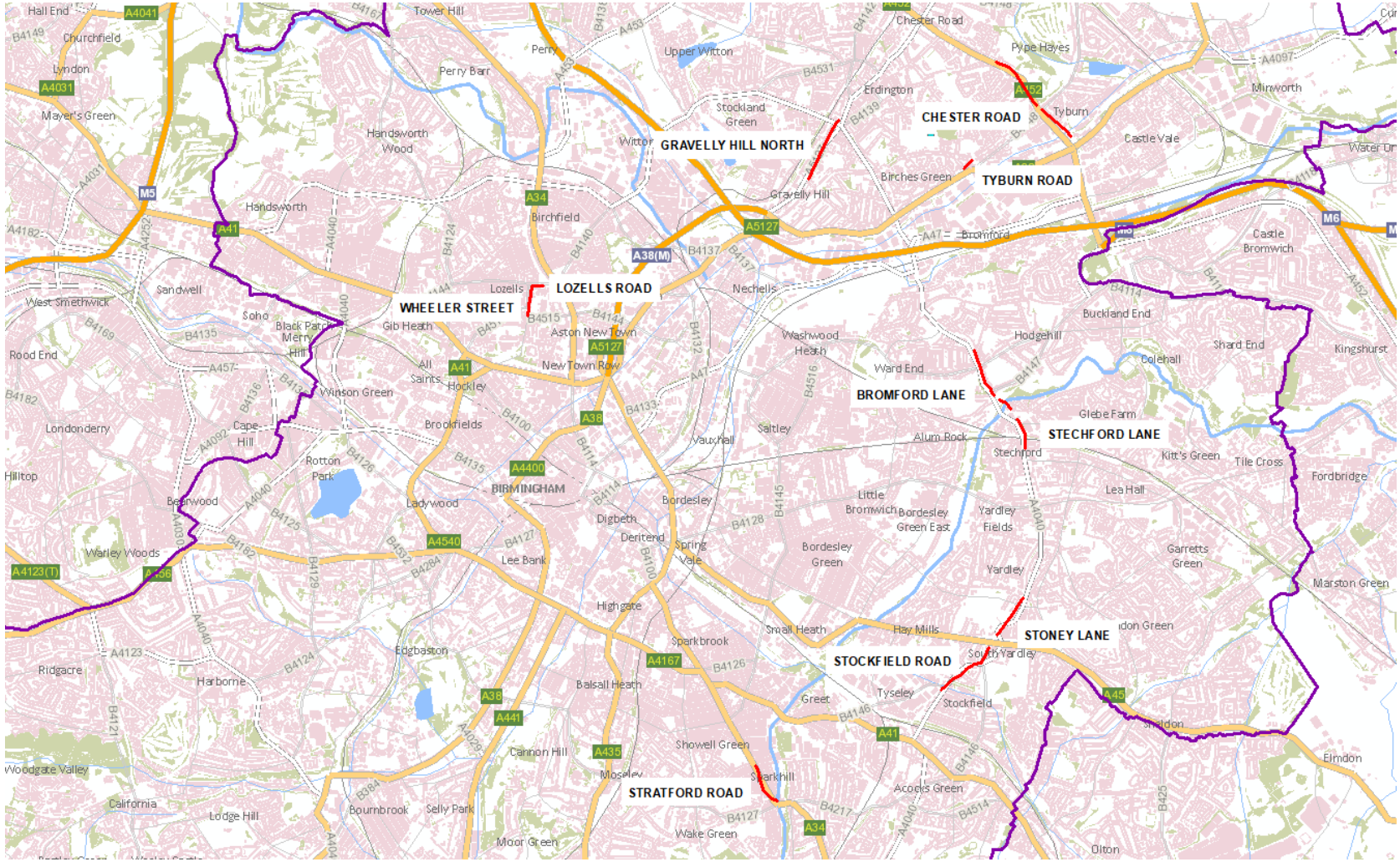
Map of Non-Automatic Monitoring Site (City Wide Locations)



N.B. AQMA boundary indicated by purple line.

Map of Non-Automatic Monitoring Site (Kings Heath LTN Locations)

Map of Tranche 2 Road Links



N.B. AQMA boundary indicated by purple line.

Map of Non-Automatic Monitoring Sites (Tranche 2 Locations)

N.B. AQMA boundary indicated by purple line.

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[7]

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

[7] 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
CAZ	Clean Air Zone
LTN	Low Traffic Neighbourhood
BTP	Birmingham Transport Plan
WMCA	West Midlands Combined Authority
JAQU	Joint Air Quality Unit

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.