



2024 Air Quality Annual Status Report (ASR)

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

Date: June, 2024

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Executive Summary: Air Quality in Our Area

Air Quality in North West Leicestershire

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 year¹.

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 pollution².

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})	<p>Particulate matter is everything in the air that is not a gas.</p> <p>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.</p> <p>PM₁₀ refers to particles under 10 micrometres. Fine particulate matter or PM_{2.5} are particles under 2.5 micrometres.</p>

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

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 Plan³ 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 Strategy⁴ provides more information on local authorities' responsibilities to work towards these new targets and reduce fine particulate matter in their areas.

The Road to Zero⁵ details the Government's approach to reduce exhaust emissions from road transport through a number of mechanisms, in balance with the needs of the local community. This is extremely important given that cars are the most popular mode of personal travel and the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

During 2023, in line with the council's Zero Carbon Road Map Action Plan, the council has continued to expand its EV charging network and reduce emissions from the council's vehicle fleet.

During 2023 the council in Partnership with Harborough District Council started an air quality grant funded project looking at the impacts of solid fuel burning on PM_{2.5}.

Conclusions and Priorities

The ASR concludes that

- Ibstock appears to be compliant with the AQS and the 2022 concentrations appear to be anomalous.

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

- The AQMA in Copt Oak can be undeclared

In 2024 the council plans to

- Revoke the Copt Oak AQMA
- Continue to monitor air quality in Castle Donington to determine if the AQMA is now Compliant.
- To continue to monitor AQ in Ibstock to confirm there is no exceedance of the AQS

Local Engagement and How to get Involved

The main contributions that our community can make to improving air quality are around minimising emissions from traffic and other sources and limiting exposure at times of poor air quality. Specifically, that means avoiding unnecessary car use for short journeys, utilising public transport where possible, buying and maintaining low emissions vehicles and being linked into the national alert system for predicted episodes of poor air quality.

The public can get further information on Air Quality from the following websites

- North West Leicestershire District Council Air quality website
http://www.nwleics.gov.uk/pages/air_quality
- DEFRA's UK-AIR: Air information Resource website
<https://uk-air.defra.gov.uk/>
- DEFRA's Local Air Quality Management (LAQM) Support website
<http://laqm.defra.gov.uk/>
- Environmental Protection UK Air Pollution website
<http://www.environmental-protection.org.uk/policy-areas/air-quality/about-air-pollution/>

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Protection Department of North West Leicestershire District Council with the support and agreement of the following officers and departments:

Environmental Protection, North West Leicestershire District Council

This ASR has been approved by the councils cabinet committee

<insert link to meeting minutes>

This ASR has been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to Environmental Protection
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1 Local Air Quality Management

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

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

A summary of AQMAs declared by North West Leicestershire District Council can be found in Table 2.1. The table presents a description of the 2 AQMAs that are currently designated within North West Leicestershire. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO₂ annual mean;

We propose to revoke Copt Oak (see section 3.2.1.4 section).

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
Castle Donington	09/01/2008	NO2 Annual Mean	An area encompassing the High Street and Bondgate area of Castle Donington.	NO	47.83µg.m-3	N/A	4	May 2021	https://www.nwleics.gov.uk/files/documents/draft_air_quality_action_plan_for_castle_donington/Draft%20AQAP%20.pdf
Copt oak	30/07/2009	NO2 Annual Mean	An area of the village of Copt Oak that lies within the boundaries of NW Leicestershire District Council.	YES	44µg.m-3	N/A	3	N/A	

- North West Leicestershire District Council confirm the information on UK-Air regarding their AQMA(s) is up to date.
- North West Leicestershire District Council confirm that all current AQAPs have been submitted to Defra.

2.2 Progress and Impact of Measures to address Air Quality in North West Leicestershire District Council

Defra's appraisal of last year's ASR concluded

- 1. Comments from previous ASR appraisals are included and responded to. This is welcomed. However, it is noted that some comments from last year's appraisal are still outstanding, for example the exclusion of Zephyr data from the main section of the report.**
- 2. The council has updated their AQAP in 2023. This is encouraging to hear.**
- 3. The Council has included data from the low-cost Zephyr sensors in the main body of the report. These monitoring results are useful as indicative monitoring but cannot be reported on for LAQM purposes, as highlighted in last year's ASR appraisal. The additional monitoring is appreciated. However, if the council wish to report this data, results and additional information should be included within an appendix at the end of the ASR rather than the main body of the report. The data itself must not be reported in the main body data tables as this type of monitoring sensor is not reference accredited. The council should remove this data from the main body of the report going forward.**

The ASR is designed to communicate the results of monitoring to the public and partners hiding data from low-cost monitors in an appendices does not effectively communicate the results of that monitoring to the wider public and stakeholders as such the council will continue to include the results within the main body of the report.

- 4. The council has included good detail within their discussion of PM_{2.5} in the District. They mention the PHOF D01 indicator, which is useful. It would be beneficial to include the specific statistics for this indicator. Accompanying graphs could also be useful.**

This has been continued.

- 5. The council has included clear and detailed discussed of monitoring data and exceedances split by area. This is useful to understand trends in the district.**

- 6. The council has stated their intention to further investigate the exceedance at Ibstock. The council is encouraged to continue to update their monitoring network to reflect any new hotspots that are identified.**

This has been included as appendix C2 Detailed Assessment of Melbourne Road Ibstock.

- 7. The diffusion tube network increased by three between 2021 and 2022. It would be useful to include a clear statement on where the changes have been made.**

Each areas discussion section of the 2023 ASR (sections 3.2.1.1 to 3.2.1.7) highlights where monitoring sites had ceased and new sites were created. The network was not increased. 4 locations in Kegworth were ceased and 4 new locations were started in Ibstock.

- 8. It is noted that some of the differences between recorded concentrations in 2021 and 2022 at several individual sites is very large (eg. 12N, 46N, 49N, 50N). This is unusual. The council is encouraged to provide discussion on this if there are any specific reasons for these changes, for example if the location of the diffusion tube has been moved during the year.**

Discussion of this has been included where appropriate.

- 9. The council has provided a relevant QA/QC section. The following improvements are suggested for this section going forward:**

- a. Table C.1 has been included to show annualisation calculations. However, the council could include some description and discussion of the annualisation process.**

Annualisation is undertaken in line with the technical guidance using the provided spreadsheet.

- b. There is no statement on whether distance correction was required at diffusion tube monitoring sites in 2022. This should be included.**

Noted for future reports, distance correction was not required so the section was removed as per the instructions in the template.

- c. The council state under 'Additional Air Quality Works Undertaken by North West Leicestershire District Council' that they worked with Harborough District Council. It would be preferable to describe what additional air quality works the two councils undertook at this point in the report.**

Noted.

- d. The council should include a statement on whether the Defra Calendar was followed when deploying diffusion tubes.**

All dates are included within appendix C1 and where the diffusion tube processing tool complains about the dates discussion will be included. The calendar has been followed as shown in appendix C4s.

- e. It would be beneficial to include a screenshot of the national bias adjustment factor spreadsheet.**

All relevant data from the spreadsheet is already included within the report and a link to the spreadsheet is included. Inclusion of a screenshot of a cluttered worksheet within an appendices serves no purpose.

- f. Reference to the Zephyr monitors should be removed.**

See statement regarding point 3.

10. The following formatting issues were noted in the report:

- a. There are several instances of pollutant names are not subscripted correctly. Whilst this does not affect the readability of the report, the council should check future reports for such errors.**

Noted.

- b. Table B.1 is not readable. The table itself is blurry.**

This appears to be a result of the pdf conversion its cause is unknown.

- c. Under 'QA/QC of Diffusion Tube Monitoring' it says 2021 diffusion tubes instead of 2022 diffusion tubes.**

Noted.

- d. The council should use the most up to date template going forward, particularly for tables.**

Noted.

11. Table 2.1 does not provide information on whether each of NWLDCs AQMAs are compliant, and the number of years compliance has been achieved. The formatting of Table A.2, as well as the formatting of maps of monitoring sites, do not make it clear which sites are located in AQMA. For example, Figure D.2 shows site 64N is the only monitoring site within the Copt Oak AQMA, however Table A.2 show several sites within the AQMA.

Noted.

12. In the portal the AQMAs are listed as being amended in 2013, but this is not reflected in the table. The council should ensure the portal and the table match going forward.

North West Leicestershire District Council has taken forward a number of direct measures during the current reporting year of 2023 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 7 measures are included within Table 2.2, with the type of measure and the progress North West Leicestershire District Council have made during the reporting year of 2023 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans Key completed measures are:

- LCC Highways consulted on the implementation of traffic calming measures in Castle Donington. These are currently scheduled to be started in October 2024
- NWLDC installed 4 EV charging parking bays in Ibstock during 2023.

North West Leicestershire expects the following measures to be completed over the course of the next reporting year:

- Installation of Traffic calming measures along High street, Market Street and Bondgate in Castle Donington to further incentivise the use of the Castle Donington Relief Road further removing traffic from the AQMA.

North West Leicestershire District Council's priorities for the coming year are:

- Continue to monitor Castle Donington and Ibstock to ensure the sites are compliant

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

- Leicestershire County Council Highways
- Leicestershire County Council Public Health

North West Leicestershire District Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in 2025.

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	Castle Donington Relief Road and supporting traffic management measures in Castle Donington	Traffic Management	Strategic Highway Improvements	2020	Completed February 2020 for relief road, 2021 for measure as a whole	NWLDC	Consortium of Developers	No	Fully funded	£7.76 million in total	Mainly implemented	Reduction large enough to achieve the annual mean NO2 at all relevant monitoring locations	Traffic flows on Bondgate in Castle Donington, and resulting nitrogen dioxide concentrations	Road built and open. Traffic light rephasing complete. Post scheme monitoring still to be undertaken (delays due to impacts on traffic from Covid restrictions) LCC consulted the public on the proposed measures https://www.castledonington-pc.gov.uk/news/2023/01/castle-donington-traffic-calming-measures-proposal	Traffic calming measures still to be implemented
2	Promote Behaviour Change away from Single Occupancy Private Vehicle Use	Promoting Travel Alternatives	Encourage/ facilitate home working, intensive active travel campaign & infrastructure, Personalised Travel Planning, Promotion of Cycling, Promotion of Walking, School Travel Plans, Workplace Travel Planning	Ongoing group of measures	Ongoing for the measure as a whole, late 2021 for LCC Local Cycling and Walking Infrastructure Plan	NWLDC	Transforming Cities Fund, DfT, LCC	No	Partially funded	Lots of different schemes, difficult to estimate overall cost	Being Implemented	n/a – strategic measure which will also assist in achievement of air quality objective in AQMA	Monitoring strategy for LTP includes	Ongoing work with schools mainly, and travel plans through planning system. Local Cycling and Walking Infrastructure plan being drafted	Largely implemented by LCC. Restricted by resourcing
3	Promote the use of Alternately Fuelled Vehicles	Promoting Low Emission Transport	Priority Parking for LEVs, procuring alternative refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging, taxi emission incentives, taxi licensing conditions	Ongoing group of measures	Ongoing with Zero Carbon Road map	LCC and NWLDC	Office for Low Emission Vehicles (OLEV), Energy Savings Trust (EST), neighbouring local authorities	No	Partially funded	Lots of different schemes, difficult to estimate overall cost	Being Implemented	n/a – strategic measure which will also assist in achievement of air quality objective in AQMA	Proportion of alternatively fuelled vehicles in the fleet on Leicestershire's roads	EV charging points increasing in NWL as funding will allow ultra-low emission buses on Skylink route	
4	Support Actions in the Zero Carbon Road Map Action Plan	Wide range of measures spanning a number of categories	Wide range of measures spanning a number of categories	2019	Ongoing with Zero Carbon Road map	NWLDC	Office for Low Emission Vehicles (OLEV), Energy Savings Trust (EST), NWLDC	No	Partially funded	Lots of different schemes, difficult to estimate overall cost	Being Implemented	n/a – strategic measure which will also assist in achievement of air quality objective in AQMA	Wide range of measures, therefore range of KPIs, which will be driven by Climate Emergency work	the council installed 4 EV charging points in Ibstock during 2023	

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
5	Develop Planning Policies to Support Better Air Quality	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance, Low emission strategy, other policy, regional groups	2021	2023	NWLDC	Mainly from existing budgets. Planning system could generate funding through s106 contributions from developers.	No	Funded (collaborative working)	Unknown, but mainly staff time	Complete ongoing	n/a – strategic measure which will also assist in achievement of air quality objective in AQMA	Broader Policy in Local Plan, SPD on Air Quality	"The council adopted an Air Quality Supplementary planning document was adopted by the local plan committee October 2023 https://www.nwleics.gov.uk/pages/supplementary_planning_guidance "	
6	Support and collaborate with LCC on wider Public Health projects	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide strategies to reduce emissions and improve air quality	Ongoing	n/a	NWLDC	Funding through public health, internal budgets for staff time	No	Funded (collaborative working)	No specific budget, as ongoing collaborative work	Being Implemented	n/a – strategic measure which will also assist in achievement of air quality objective in AQMA	n/a as no specific projects identified as yet	Ongoing Health Partnership meetings with the districts, boroughs and Public Health Leicestershire.	Non statutory function will require additional resources to implement
7	Control Domestic Emissions	Promoting Low Emission Plant	Regulations for fuel quality for stationary and mobile sources	2021	n/a	LCC and NWLDC	Mainly from existing budgets.	No	No funding for information campaigns	No specific budget	Planning Phase	n/a – strategic measure which will also assist in achievement of air quality objective in AQMA	Level of solid fuel burning	Some council housing stock changed to air source heat pumps	Very difficult to quantify any change without detailed survey work

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 Strategy⁶, local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter (PM_{2.5}). There is clear evidence that PM_{2.5} (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

The Public Health Outcomes Framework (PHOF) (<https://www.gov.uk/government/collections/public-health-outcomes-framework>) is an Office of Health Improvement and Disparities data tool for England, intended to focus public health action on increasing healthy life expectancy and reducing differences in life expectancy between communities. The tool uses indicators to assess improvements. Recognising the significant impact that poor air quality can have on health, the PHOF includes an indicator relating to fine particulate matter (PM_{2.5}).

The indicator in the PHOF reports the estimates fraction of all-cause adult mortality attributable to anthropogenic particulate air pollution (measured as fine particulate matter).

Based on the latest available figures the position in North West Leicestershire District has the 3rd lowest fraction of attributable deaths to particulate air pollution in Leicestershire. (https://fingertips.phe.org.uk/profile/wider-determinants/data#page/0/gid/1938133043/pat/502/par/E10000018/ati/501/are/E07000131/iid/93867/age/-1/sex/-1/cat/-1/ctp/-1/yr/1/cid/4/tbm/1/page-options/tre-ao-1_tre-so-1)

North West Leicestershire District Council is taking the following measures to address PM_{2.5}:

- Ongoing work in collaboration with public health staff at Leicestershire County Council is delivered through the Joint Strategic Needs Assessment (JSNA) and associated action plan. Within the JSNA there is a chapter on air quality and health. The chapter recognises that by its nature, air quality cannot be controlled by geographical boundaries or by a single individual alone. Instead, collective, systematic efforts are required to reduce air pollution and its harmful

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

effects on health. The key recommendation was that the Leicestershire Air Quality and Health Partnership Steering Group should agree a plan to deliver joint actions to tackle poor air quality and related health issues. The first plan has been completed and the group are currently drafting the Air Quality and Health Partnership 2023-26 document

- The Council controls dust and combustion emissions from permitted processes within the district
- Promoting the use of green waste collection and Leicestershire County Council run waste bring sites over bonfires to dispose of garden waste
- Robust planning process
- Concluded the DEFRA Grant funded project with North West Leicestershire District Council to increase the level of knowledge of PM_{2.5} and ultimately reduce PM_{2.5} emissions by changing behavioural attitudes to solid fuel burning.

2.3.1 Findings of the joint grant project with North West Leicestershire

A 12-month PM₁₀ and PM_{2.5} monitoring programme was carried out in three villages (Donisthorpe, Oakthorpe and North Kilworth) in NWL and Harborough. The monitoring was funded through a grant funded project awarded to NWL and Harborough District Councils, to support work to increase public awareness of the air quality impacts of solid-fuel burning. This report provides an overview of the monitoring results, to try to identify any quantified evidence of domestic solid fuel burning in the three villages.

Detailed statistical analysis of the monitoring results has not identified any clear influences from solid fuel burning in the vicinity of the any of the monitors. The plots produced seem to show periods of higher concentrations, at times, during colder temperatures, during the evening and over the weekend, which could be interpreted as times when residents are more likely to be burning solid fuel, however variations in PM_{2.5} can occur for multiple reasons, due to source, meteorology, chemistry or measurement method; in the absence of a clear signal from the monitoring data and its subsequent analysis, it is concluded that data are not clear enough to draw a conclusion as to what is driving these elevated concentrations.

The full report is attached as

- Appendix C1 Domestic Fuel Burning.

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

This section sets out the monitoring undertaken within 2023 by North West Leicestershire District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2019 and 2023 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

North West Leicestershire District Council did not undertake automatic (continuous) monitoring using a reference monitor during 2023

North West Leicestershire District Council undertook automatic (continuous) monitoring using low-cost non-reference Zephyr monitors at 4 sites during 2023. Though Zephyr monitors are not reference monitors they are useful as indicative monitoring to highlight determine if areas are of potential concern require further monitoring using more recognised methods.

Table A.1 in Appendix A shows the details of the automatic monitoring sites.

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

North West Leicestershire District Council undertook non- automatic (i.e. passive) monitoring of NO₂ at 35 sites during 2023. Table A.2 in Appendix A presents the details of the non-automatic sites.

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

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. 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.

Annualisation has been conducted using the Diffusion Tube Data Processing tool spreadsheet in line with the technical guidance.

Distance correction was not required on any monitoring location in 2023 in line with the technical guidance

Table A.5 in Appendix A compares the ratified continuous monitored NO₂ 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.

3.2.1.1 Ashby

There are 2 monitoring locations within Ashby

Both locations recorded concentrations below the annual mean air quality standard

3.2.1.2 Castle Donington

There are 3 monitoring locations within the Castle Donington AQMA and 6 other monitoring locations in the area. All locations recorded concentrations below the air quality standard however all locations show considerable variability year to year likely cause by substantial development in the area (e.g. East Midlands Gateway Project,

construction of the Relief Road, several major logistics sites being constructed). Given the 4 years of compliance include impacts from COVID lockdowns and the impacts of the several major construction projects in the area, it is difficult to ascertain if the compliance shown is temporary or representative of long term compliance with the air quality standard.

3.2.1.3 Coalville

There are 7 monitoring locations in Coalville area.

All monitoring locations have been below the air quality standard since 2013 and are located closer to the road than relevant receptors, so represent a worst case exposure.

2 zephyrs are located in the Coalville area. The zephyr located on Bardon Road did not exceed the air quality standard.

The zephyr located near Bardon quarry recorded 120 exceedances of the hourly mean however there are no nearby receptors and no obvious source of NO₂.

3.2.1.4 Copt Oak

There was 1 long term monitoring location within the Copt Oak AQMA.

There is 1 monitoring location outside of the AQMA.

There is 1 monitoring location adjacent to the M1.

The 2 locations which are façade locations were substantially below the air quality standard and have been for all monitoring years.

The location adjacent the M1 is not representative of a receptor but represents a worse case location and was slightly below the air quality standard.

As such it can be shown that the air quality standard is being achieved at all relevant receptors and the AQMA can be discharged

3.2.1.5 Hugglescote

There are 2 monitoring locations in Hugglescote, all locations all locations recorded concentrations below the air quality standard.

3.2.1.6 Ibstock

There are 4 diffusion tube monitoring locations in Ibstock. All locations record concentrations substantially below the air quality standard however this location 65N shows a substantial lowering in concentrations compared to 2022, which cannot be explained.

3.2.1.7 Kegworth

There are 4 monitoring locations in Kegworth. All locations recorded concentrations below the air quality standard.

3.2.1.8 Sinope and Whitwick

There is 1 monitoring location in Sinope

There are 2 monitoring locations in Whitwick

All locations recorded concentrations below the air quality standard

3.2.2 Particulate Matter (PM₁₀)

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM₁₀ 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 PM₁₀ 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.

No exceedances of the PM₁₀ objectives were recorded.

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.

2 of the zephyrs recorded exceedances of the new environmental target for PM_{2.5} in Oakthorpe and Donisthorpe.

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)
Z3	Bardon Road (Z902)	Roadside	443991	313322	NO ₂ , PM ₁₀ PM _{2.5}	NO	Zephyr Low cost analyser	2.6	3.3	3
Z4	Bardon Quarry (Z904)	Rural	445286	312418	NO ₂ , PM ₁₀ PM _{2.5}	NO	Zephyr Low cost analyser	N/A	N/A	3
Z5	Donisthorpe (Z1141)	Rural	431982	314134	NO ₂ , PM ₁₀ PM _{2.5}	NO	Zephyr Low cost analyser	N/A	N/A	3
Z6	Oakthorpe (Z1142)	Rural	432654	313155	NO ₂ , PM ₁₀ PM _{2.5}	NO	Zephyr Low cost analyser	N/A	N/A	3

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)
06N	Broomleys junction (1)	Roadside	443632	314026	NO ₂		5.8	2.0	No	2.0
08N	End Cottage Copt Oak	Rural	448138	313012	NO ₂		0.0	N/A	No	2.0
12N	Aeropark	Other	444161	326355	NO ₂		N	N/A	No	2.0
14N	69 High St CD	Roadside	444216	326788	NO ₂		0.0	2.9	No	2.0
16N	crossroads CD	Roadside	444450	327233	NO ₂		7.5	1.0	No	2.0
17N	13 Bondgate CD	Roadside	444512	327335	NO ₂	Castle Donington	2.0	2.5	No	2.0
18N	34 Bondgate CD	Roadside	444580	327411	NO ₂	Castle Donington	0.0	1.3	No	2.0
19N	94 Bondgate CD	Roadside	444707	327603	NO ₂	Castle Donington	0.0	2.3	No	2.0
23N	120 Whatton road Kegworth	Roadside	448108	326305	NO ₂		0.8	1.4	No	2.0
31N	Sinope	Roadside	440167	315264	NO ₂		4.1	2.5	No	2.0
32N	M1 Bridge Copt Oak	Other	448082	313100	NO ₂		0.0	0.0	No	2.0
40N	35 High Street Castle Donington	Roadside	444323	326975	NO ₂		2.4	3.0	No	2.0
41N	18 High Street Castle Donington	Roadside	444474	327171	NO ₂		2.4	3.0	No	2.0
43N	Direction Sign Bardon Rd/A511 RBT	Roadside	443675	313642	NO ₂		4.7	2.5	No	2.0
47N	12 Derby Rd Kegworth	Roadside	448639	326805	NO ₂		1.8	1.2	No	2.0
48N	28 London Road Kegworth	Roadside	448792	326533	NO ₂		0.0	2.0	No	2.0
49N	10 Central Road Hugglescote	Roadside	442578	312871	NO ₂		9.6	3.2	No	2.0
50N	Hugglescote cross roads	Roadside	442562	312823	NO ₂		5.9	2.5	No	2.0
51N	40mph sign N of petrol station	Roadside	448361	326997	NO ₂		5.9	2.5	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)
53N	20mph sign outside 10 Greenhill Road	Roadside	448436	326931	NO ₂		0.8	1.5	No	2.0
54N	telegraph pole outside 21 Park Lane CD	Roadside	444331	327257	NO ₂		3.2	1.0	No	2.0
56N	lamppost adjacent 27 Broomleys Road	Roadside	443649	314040	NO ₂		4.7	3.0	No	2.0
57N	lamppost outside 21 Broomleys Road	Roadside	443630	314028	NO ₂		12.0	5.0	No	2.0
58N	cycle route sign outside 34 Broomleys Road	Roadside	443634	313996	NO ₂		8.8	2.0	No	2.0
59N	zebra crossing the green Whitwick	Roadside	442754	317177	NO ₂		0.0	1.0	No	2.0
60N	lamppost outside 53 North Street Whitwick	Roadside	443366	316277	NO ₂		1.0	1.0	No	2.0
61N	lamppost outside 53 Wood Street Ashby	Roadside	436194	316958	NO ₂		4.0	0.5	No	2.0
62N	lamppost 45 The Callis, Ashby (opposite Rowena Drive)	Roadside	435587	317204	NO ₂		0.0	2.4	No	2.0
63N	Whitwick Road Coalville	Roadside	442800	314466	NO ₂		6.4	30.0	No	2.0
64N	m1 corner farm Copt Oak	Roadside	448081	313098	NO ₂	Copt Oak	0.0	2.0	No	2.0
65N	lbstock - Yellow Parking Sign outside jr school	Roadside	440566	310316	NO ₂		5.0	2.2	No	2.0
66N	lbstock - 191 Melbourne Road	Roadside	440525	310507	NO ₂		2.5	0.5	No	2.0
67N	Chippy 76 Melbourne Road lbstock	Roadside	440537	310041	NO ₂		0.0	4.0	No	2.0
68N	lbstock - 125 Melbourne Road	Roadside	440598	310238	NO ₂		0.0	4.0	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)
69N	2 South Lane Bardon industrial	Other	446935	323744	NO ₂		4.0	1.0	No	2.0

Notes:

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

(2) N/A if not applicable.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
Z3	443991	313322	Roadside	100%	100%				19.8	18.26
Z4	445286	312418	Rural	89%	89%				27.25	22.3
Z5	431982	314134	Rural	88%	88%				12.88	10.47
Z6	432654	313155	Rural	82%	82%				8.5	8.44

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

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

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

Notes:

The annual mean concentrations are presented as µg.m⁻³.

Exceedances of the NO₂ 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 NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
06N	443632	314026	Roadside	100.0	100.0	32.5	25.3	21.4	14.1	23.4
08N	448138	313012	Rural	100.0	100.0	22.4	16.9	18.8	13.2	15.1
12N	444161	326355	Other	83.0	83.0	18.9	13.4	13.0	24.0	13.9
14N	444216	326788	Roadside	100.0	100.0	20.7	16.1	14.8	16.7	13.7
16N	444450	327233	Roadside	59.9	59.9	31.5	21.5	22.8	29.5	21.9
17N	444512	327335	Roadside	92.3	92.3	30.9	20.7	21.3	17.5	24.1
18N	444580	327411	Roadside	92.3	92.3	42.1	29.8	34.2	15.3	34.1
19N	444707	327603	Roadside	63.7	63.7	27.3	19.7	19.4	23.8	19.1
23N	448108	326305	Roadside	100.0	100.0	20.5	16.0	15.2	25.3	13.1
31N	440167	315264	Roadside	90.4	90.4	22.6	17.2	18.9	18.4	16.2
32N	448082	313100	Other	100.0	100.0	53.9	39.3	39.9	23.6	38.8
40N	444323	326975	Roadside	90.7	90.7	22.9	14.8	15.3	20.4	15.2
41N	444474	327171	Roadside	92.3	92.3	36.2	24.1	24.1	20.5	24.1
43N	443675	313642	Roadside	100.0	100.0	25.8	23.2	19.2	16.4	19.9
47N	448639	326805	Roadside	82.7	82.7	24.5	18.5	17.6	15.7	16.8
48N	448792	326533	Roadside	92.6	92.6	26.3	18.0	17.5	13.4	17.6
49N	442578	312871	Roadside	82.7	82.7	30.9	24.5	25.5	14.5	23.5
50N	442562	312823	Roadside	90.4	90.4	33.2	29.2	28.6	14.5	23.9
51N	448361	326997	Roadside	82.7	82.7	22.4	18.3	18.3	14.8	17.1
53N	448436	326931	Roadside	100.0	100.0	19.8	16.1	15.6	27.3	13.4
54N	444331	327257	Roadside	92.3	92.3	24.7	20.0	17.8	22.4	16.8
56N	443649	314040	Roadside	100.0	100.0	34.2	26.7	22.7	16.7	27.6
57N	443630	314028	Roadside	92.3	92.3	32.0	27.3	27.8	17.1	22.9
58N	443634	313996	Roadside	100.0	100.0	23.1	21.3	23.2	23.6	15.6
59N	442754	317177	Roadside	63.5	63.5		17.7	15.9	19.1	14.4
60N	443366	316277	Roadside	90.4	90.4		24.4	26.4	13.6	21.6
61N	436194	316958	Roadside	53.8	53.8		31.9	25.9	22.5	21.4
62N	435587	317204	Roadside	50.0	50.0		16.9	15.6	30.0	13.8

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
63N	442800	314466	Roadside	82.7	82.7		18.9	18.5	16.7	16.7
64N	448081	313098	Roadside	75.0	75.0			21.1	15.5	27.3
65N	440566	310316	Roadside	65.4	65.4				41.0	12.8
66N	440525	310507	Roadside	82.1	82.1				11.4	14.9
67N	440537	310041	Roadside	100.0	100.0				11.9	16.3
68N	440598	310238	Roadside	82.7	82.7				14.2	12.6
69N	446935	323744	Other	100.0	100.0					12.0

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

Diffusion tube data has been bias adjusted.

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

Notes:

The annual mean concentrations are presented as $\mu\text{g.m}^{-3}$.

Exceedances of the NO₂ annual mean objective of $40\mu\text{g.m}^{-3}$ are shown in **bold**.

NO₂ annual means exceeding $60\mu\text{g.m}^{-3}$, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

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

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

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

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

Figure A.1 – Trends in Annual Mean NO₂ Concentrations in Ashby

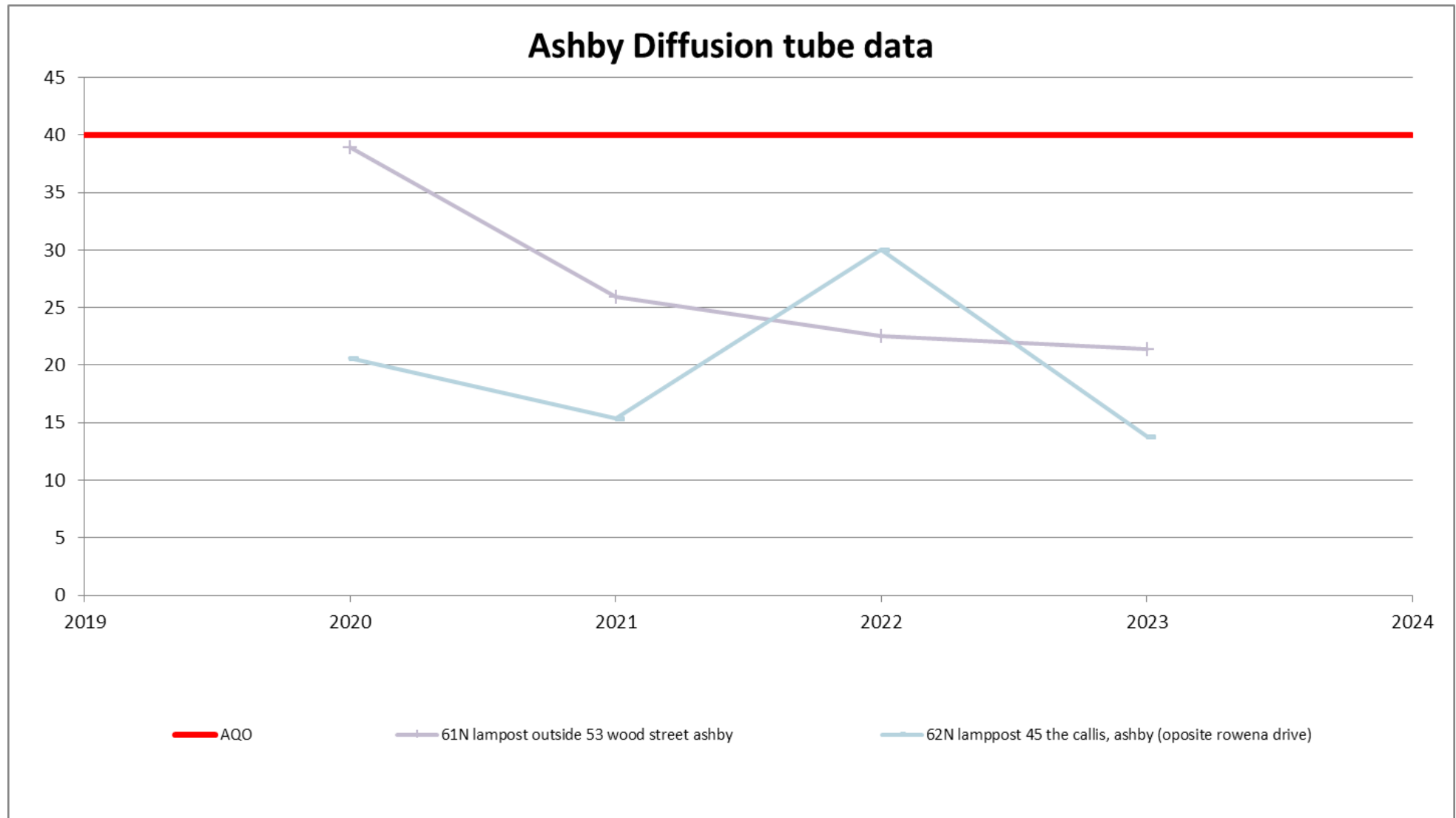


Figure A.2 – Trends in Annual Mean NO₂ Concentrations in Castle Donington

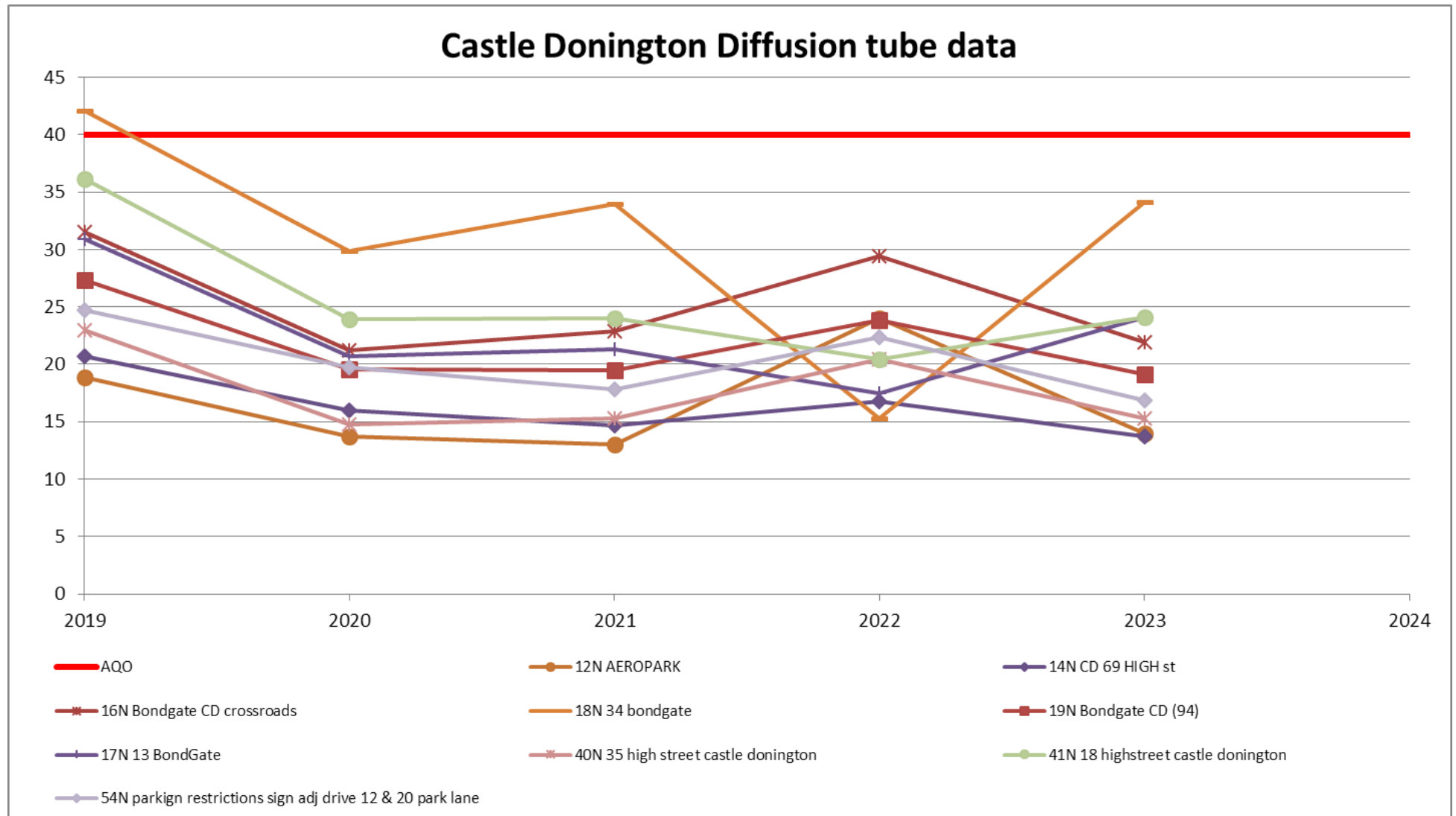


Figure A.3 – Trends in Annual Mean NO₂ Concentrations in Coalville

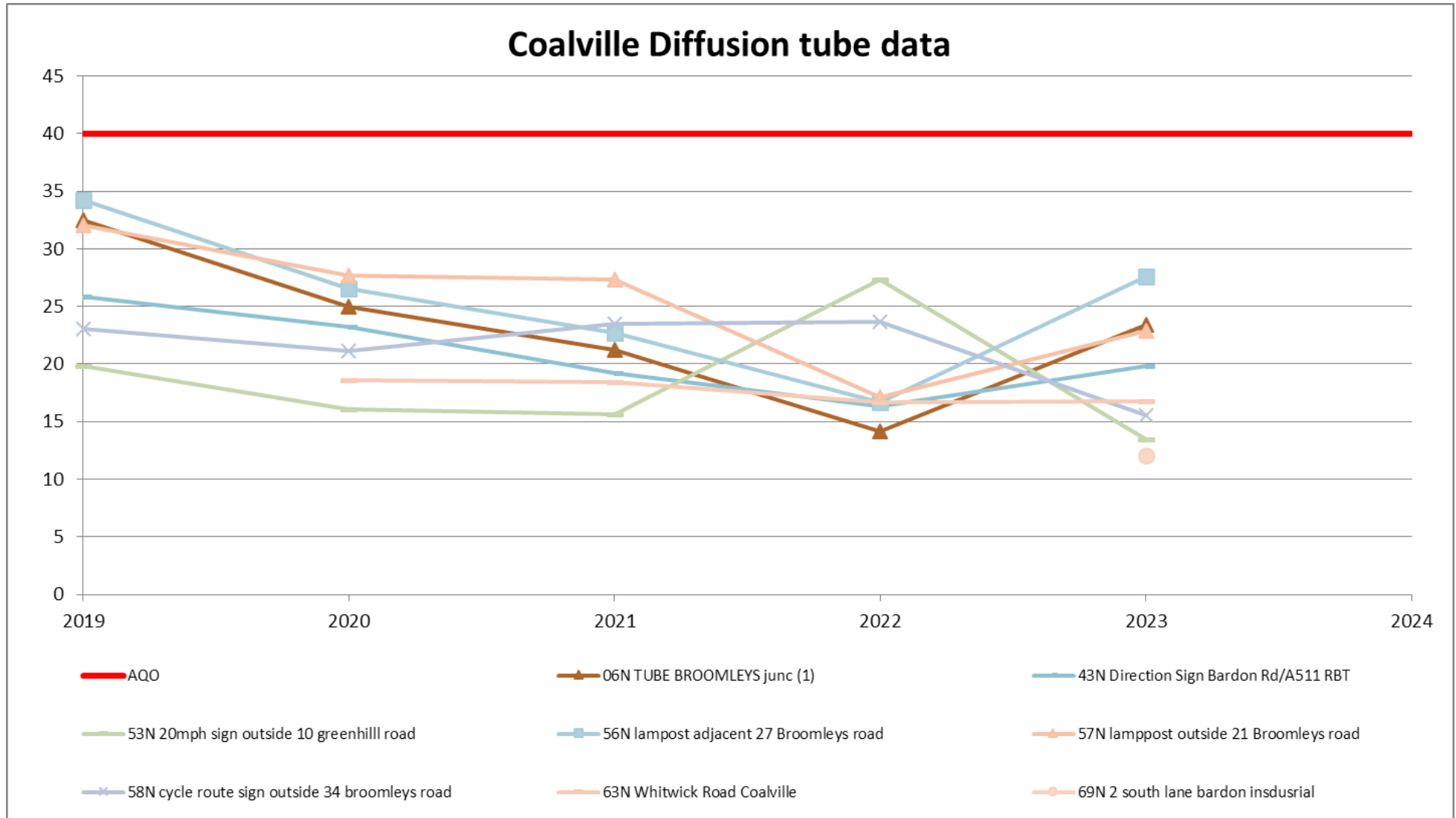


Figure A.4 – Trends in Annual Mean NO₂ Concentrations in Copt Oak

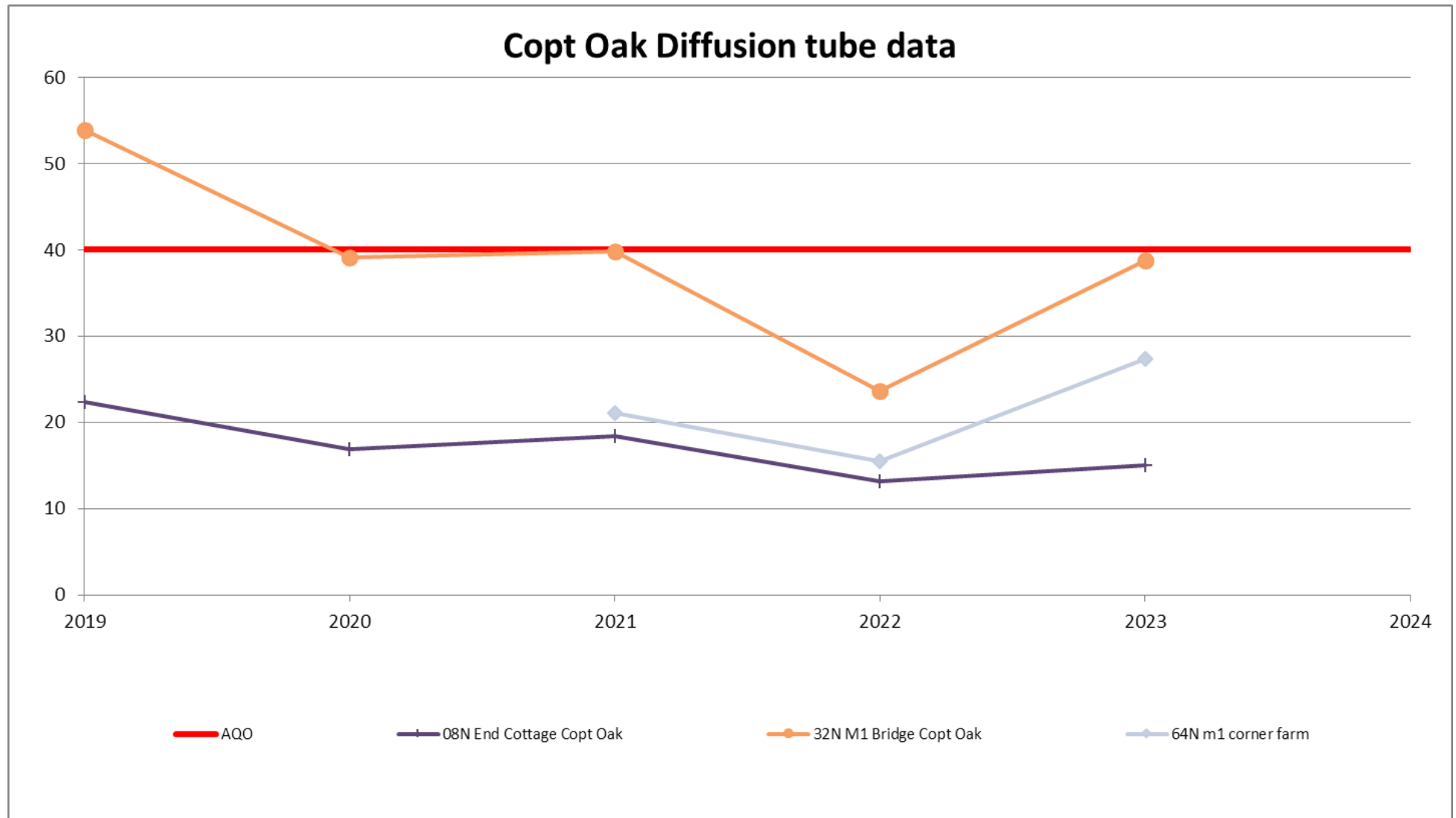


Figure A.5 – Trends in Annual Mean NO₂ Concentrations in Hugglescote

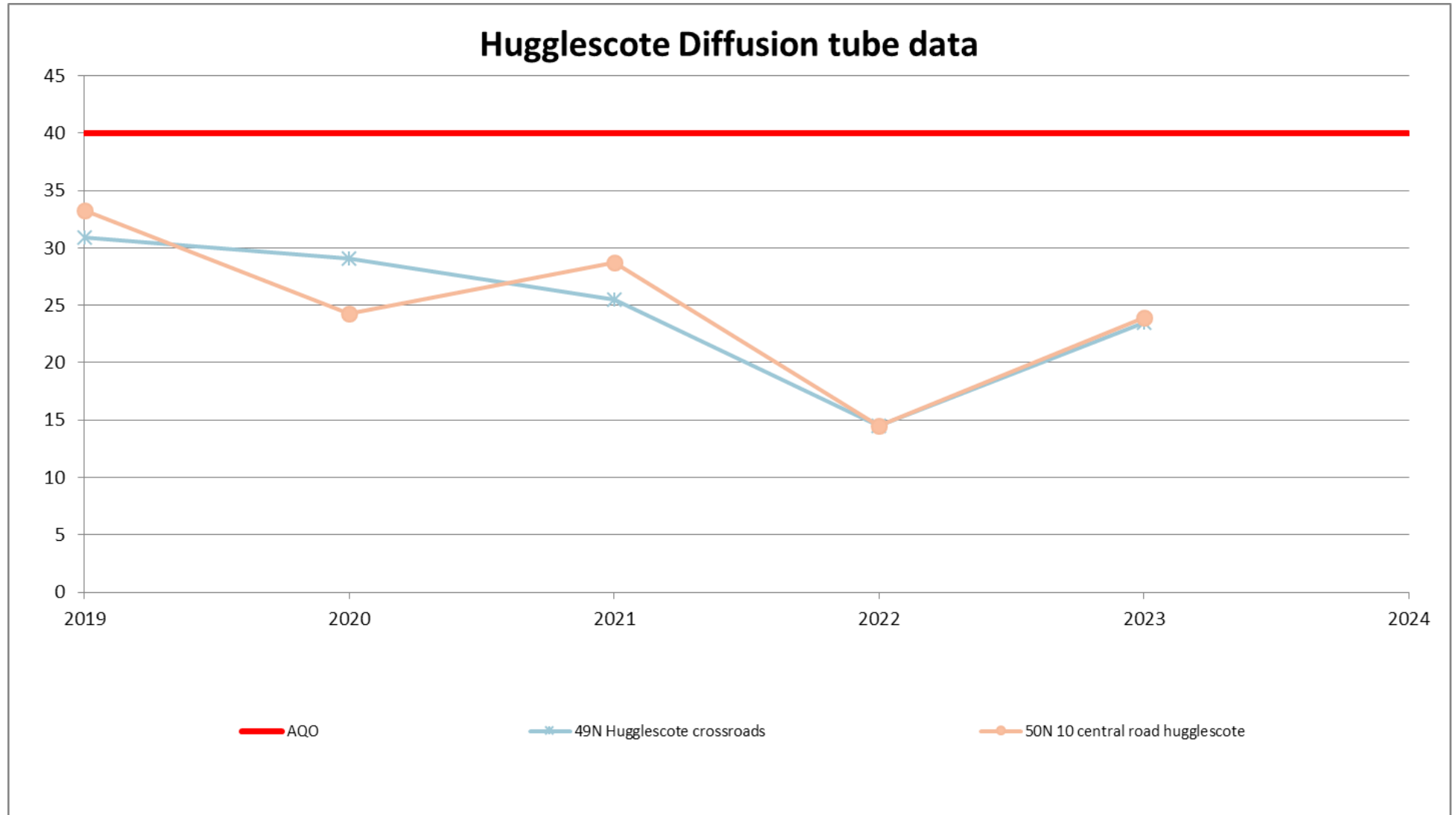


Figure A.6 – Trends in Annual Mean NO₂ Concentrations in Ibstock

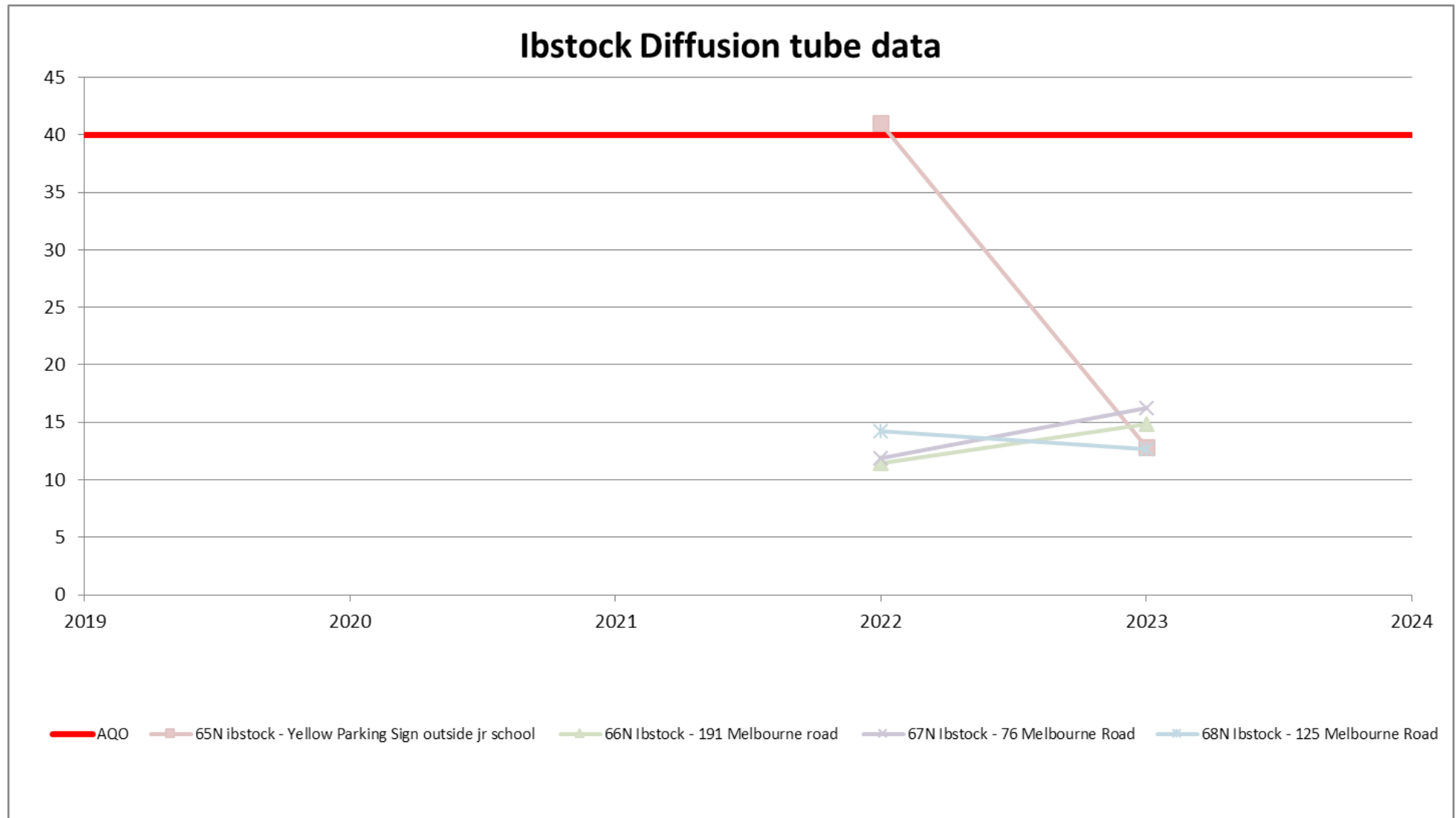


Figure A.7 – Trends in Annual Mean NO₂ Concentrations in Kegworth

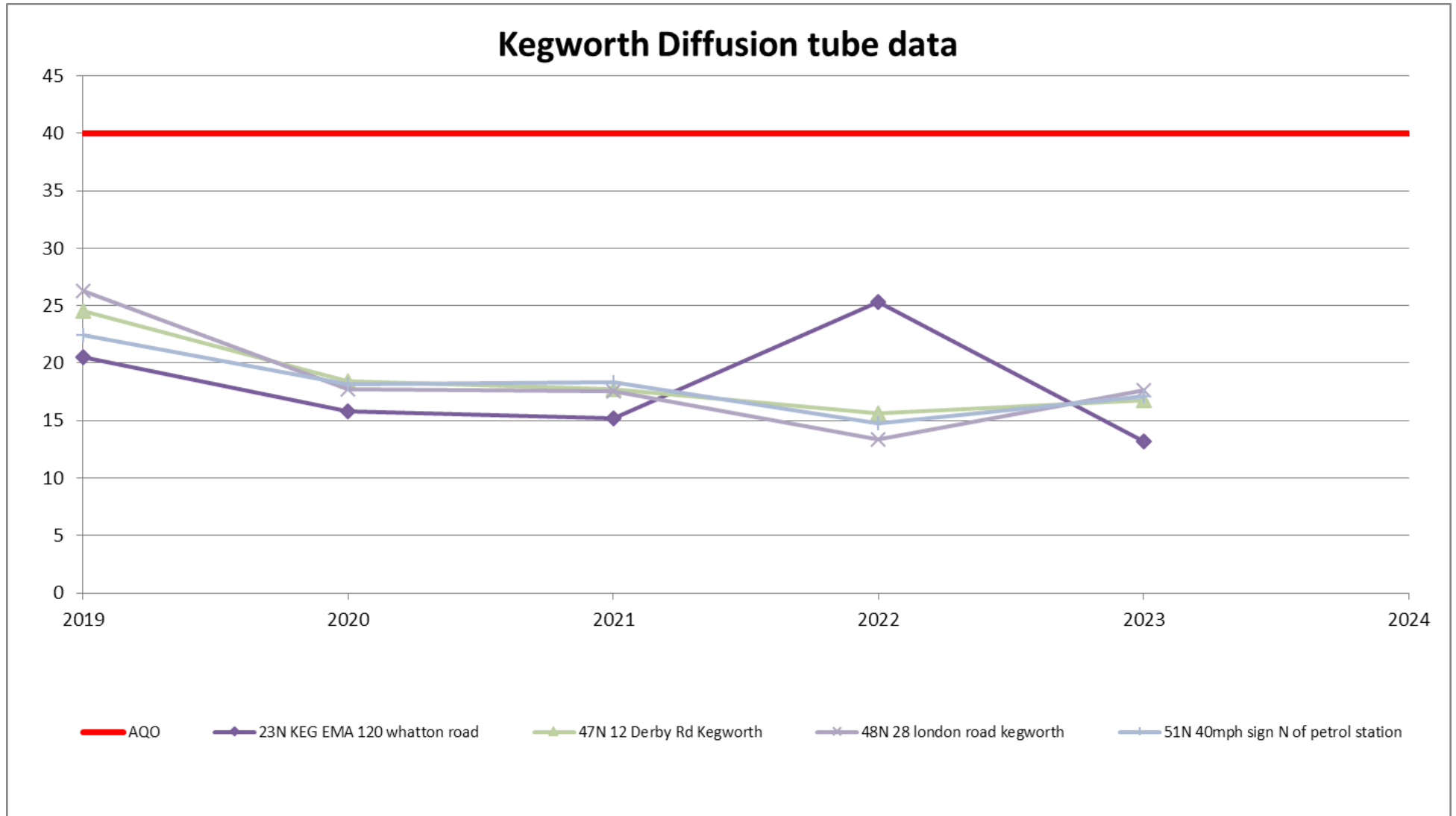


Figure A.8 – Trends in Annual Mean NO₂ Concentrations in Sinope and Whitwick

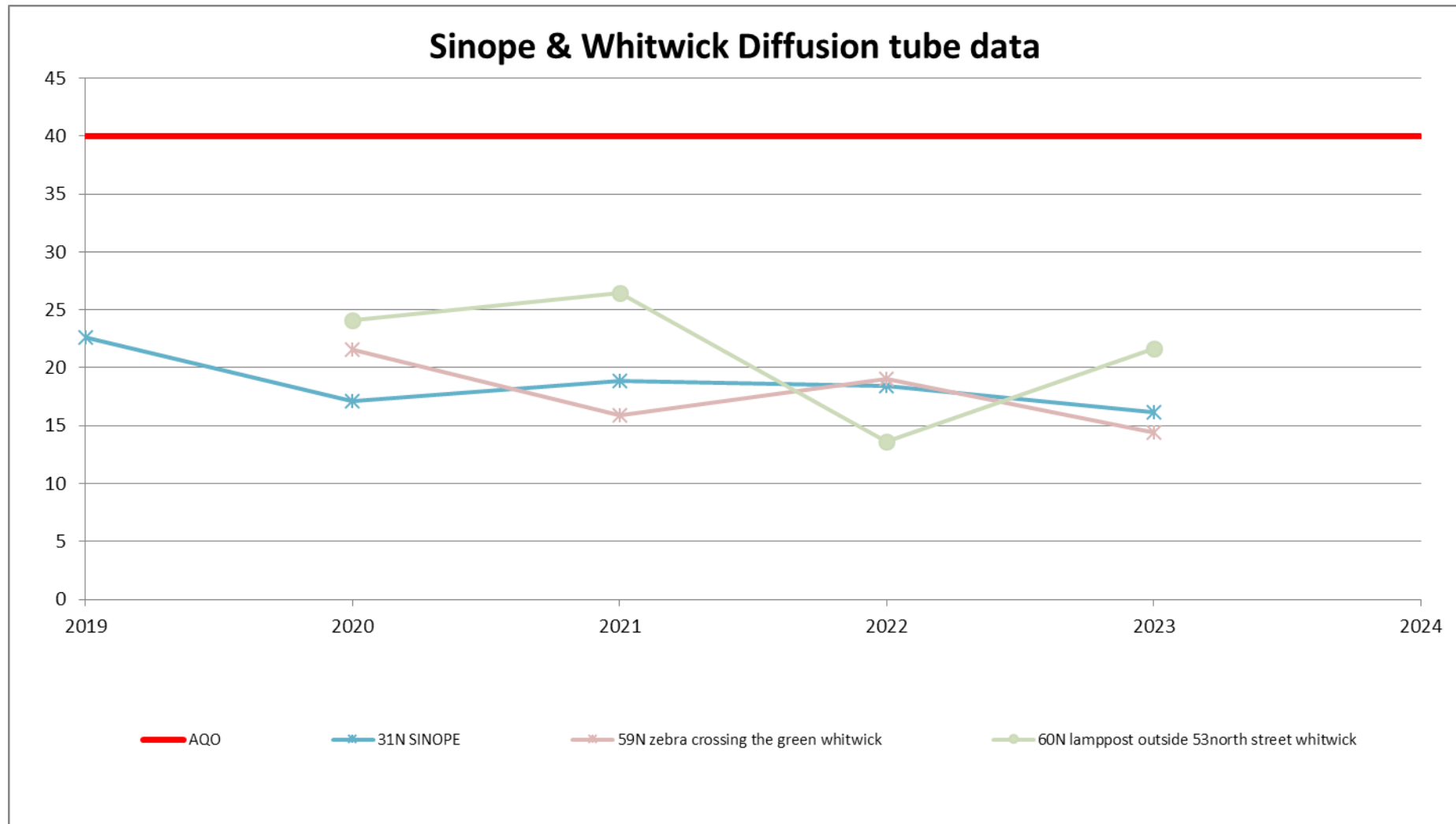


Table A.5 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
Z3	443991	313322	Roadside	100%	100%				0	0
Z4	445286	312418	Rural	89%	89%				219 (541)	120
Z5	431982	314134	Rural	88%	88%				0	0
Z6	432654	313155	Rural	82%	82%				0	0 (41.34)

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg.m⁻³ have been recorded.

Exceedances of the NO₂ 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 PM₁₀ Monitoring Results (µg.m⁻³)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
Z3	443991	313322	Roadside	100%	100%				12.72	11.38
Z4	445286	312418	Rural	89%	89%				9.65	10.84
Z5	431982	314134	Rural	88%	88%				11.9	15.16
Z6	432654	313155	Rural	82%	82%				13.1	11.46

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

Notes:

The annual mean concentrations are presented as µg.m⁻³.

Exceedances of the PM₁₀ annual mean objective of 40µg.m⁻³ are shown in **bold**.

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

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

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

Figure A.9 – Trends in Annual Mean PM₁₀ Concentrations

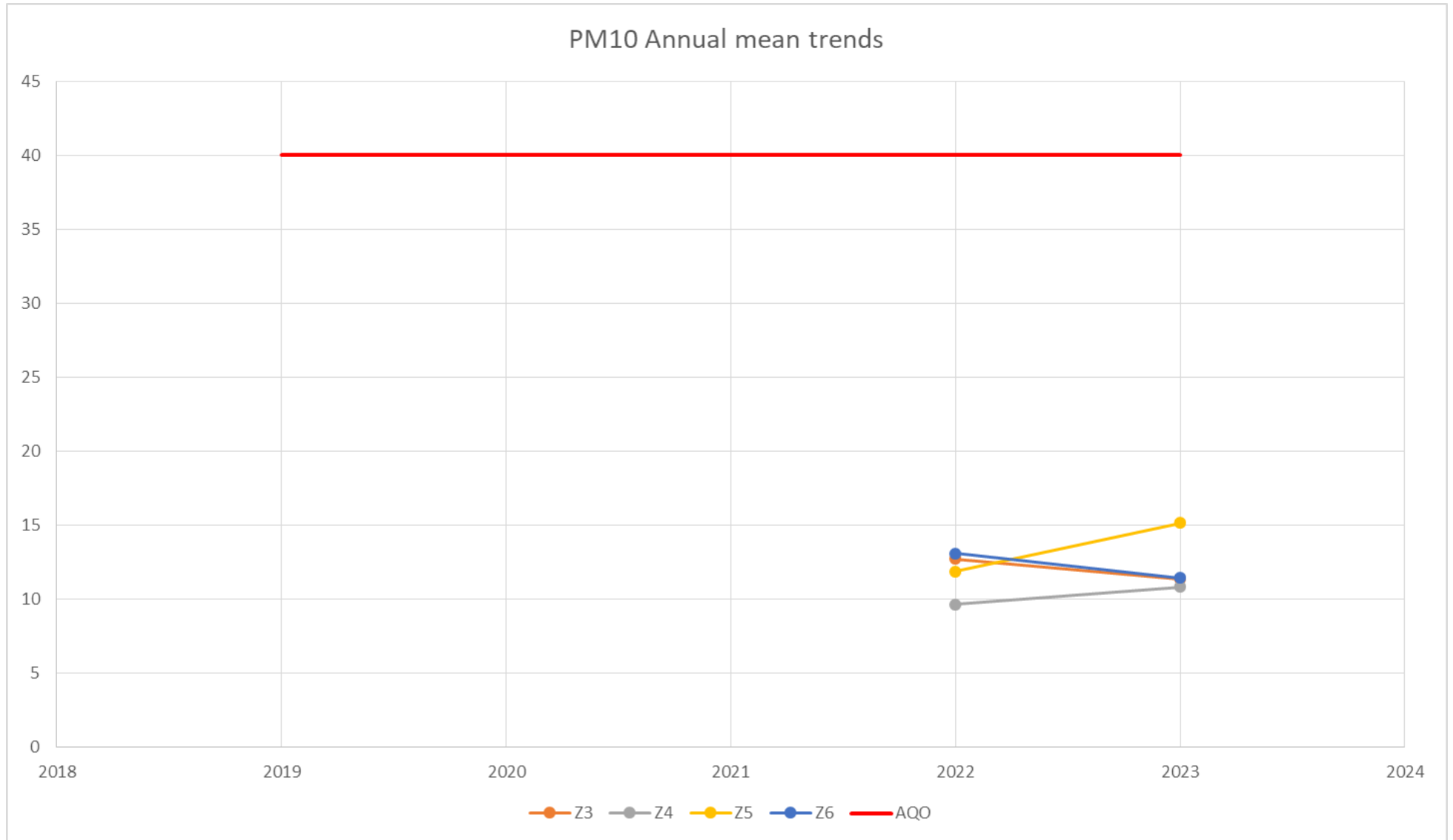


Table A.7 – 24-Hour Mean PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg.m⁻³

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
Z3	443991	313322	Roadside	100.00%	100%				0(36)	0
Z4	445286	312418	Rural	89%	89%				0(35.9)	0
Z5	431982	314134	Rural	88%	88%				0	2
Z6	432654	313155	Rural	98%	98%				0	0

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg.m⁻³ have been recorded.

Exceedances of the PM₁₀ 24-hour mean objective (50µg.m⁻³ not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

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

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

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2023 (%) ⁽²⁾	2019	2020	2021	2022	2023
Z3	443991	313322	Roadside	100.00%	100%				9.7	6.86
Z4	445286	312418	Rural	89%	89%				7.5	6.37
Z5	431982	314134	Rural	88%	88%				11.1	13.8
Z6	432654	313155	Rural	82%	82%				15.1	10.47

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

Notes:

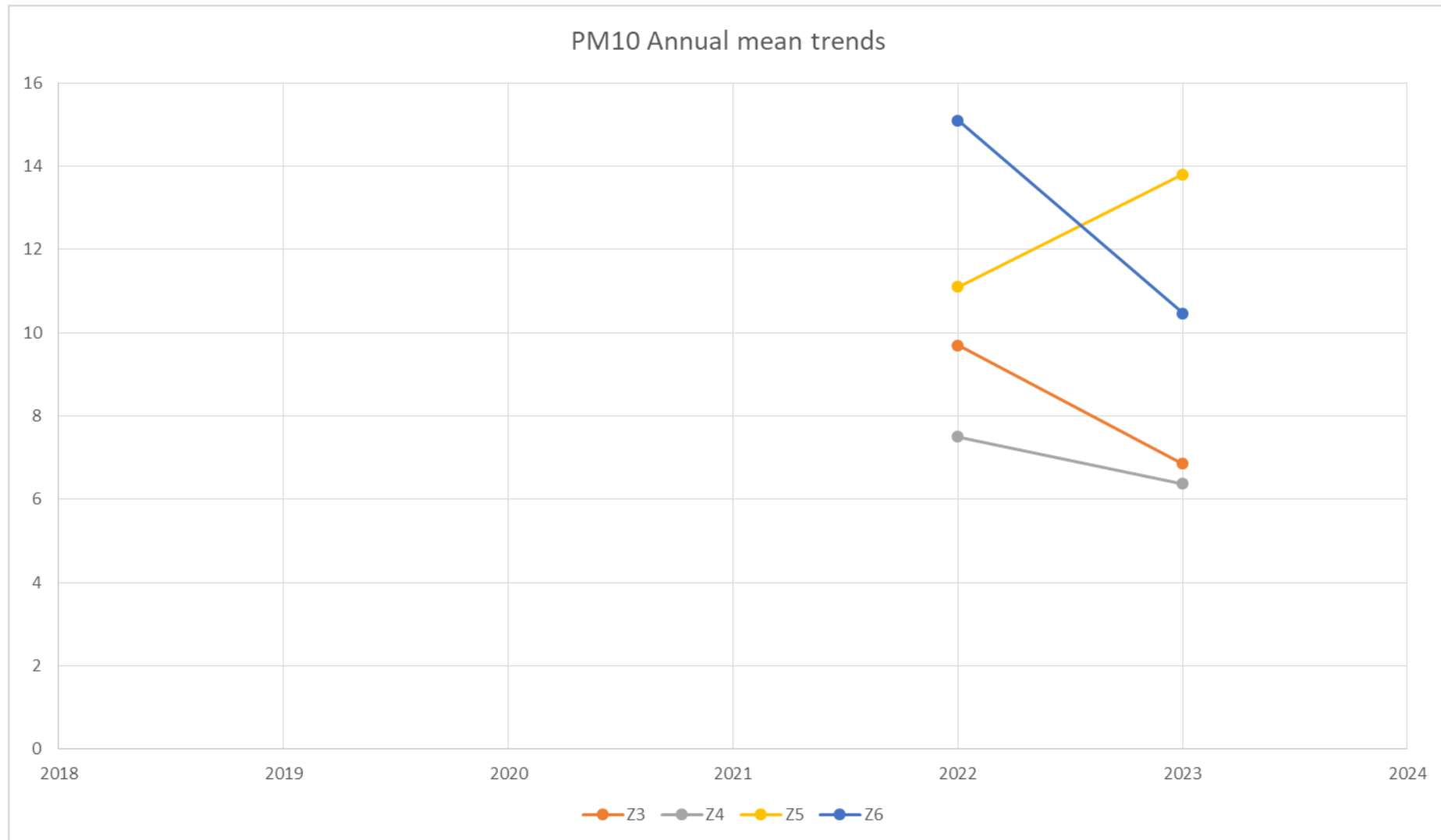
The annual mean concentrations are presented as µg.m⁻³.

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

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

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

Figure A.10 – Trends in Annual Mean PM_{2.5} Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO₂ 2023 Diffusion Tube Results (µg.m⁻³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
06N	443632	314026	14.7	39.3	34.8	34.1	25.3	26.0	25.5	30.6	34.7	33.8	39.4	27.0	30.4	23.4	-	
08N	448138	313012	26.5	17.0	20.1	24.5	17.0	14.3	13.1	19.5	20.9	20.1	24.5	17.4	19.6	15.1	-	
12N	444161	326355	19.4	20.2	27.8	13.1	10.7			14.3	18.3	21.5	20.6	15.2	18.1	13.9	-	
14N	444216	326788	21.8	26.1	19.5	18.3	16.6	15.0	10.6	12.4	17.8	17.7	24.6	13.7	17.8	13.7	-	
16N	444450	327233		37.9	28.8		26.1	26.6	23.1				35.5	20.2	28.3	21.9	-	
17N	444512	327335	34.2	33.8	26.3	27.6	21.7	24.4	34.7	22.7	33.9	37.5	47.1		31.3	24.1	-	
18N	444580	327411	46.3	48.0	40.4	41.1	38.5	35.3	31.4	39.1	49.0	45.1	73.0		44.3	34.1	-	
19N	444707	327603	26.8	19.1	24.5	22.5	16.3		34.7		26.8	31.2			25.2	19.1	-	
23N	448108	326305	25.2	26.3	16.0	12.5	11.4	10.6	11.4	15.0	16.9	20.3	22.1	17.2	17.1	13.1	-	
31N	440167	315264	29.3	28.5	20.1	19.1	15.3	15.4	15.2	18.2	21.3	22.4		26.4	21.0	16.2	-	
32N	448082	313100	56.6	59.4	53.2	55.9	50.1	48.9	47.7	53.0	65.4	28.3	37.6	48.7	50.4	38.8	-	
40N	444323	326975	19.5	25.6	16.1	17.4	13.4		13.6	17.0	22.4	28.4	28.0	16.4	19.8	15.2	-	
41N	444474	327171	33.1	38.3	28.1	32.3	28.0	27.3		28.7	34.1	33.0	36.4	25.0	31.3	24.1	-	
43N	443675	313642	22.6	32.9	24.7	32.3	22.5	30.6	16.6	20.5	28.0	27.9	29.6	21.2	25.8	19.9	-	
47N	448639	326805	25.2	33.0	20.9	22.4	15.0	13.4	23.6	16.5	20.1	27.6			21.8	16.8	-	
48N	448792	326533	31.7	30.4	20.2		19.4	16.3	18.6	21.3	23.6	25.7	23.4	21.4	22.9	17.6	-	
49N	442578	312871	43.9	31.0	32.1	33.0	26.5	25.5	20.4	23.2	36.3	32.7			30.5	23.5	-	
50N	442562	312823	31.6	33.4	34.8	27.3	28.4	28.8	26.0	33.3	33.0	36.2		28.8	31.1	23.9	-	
51N	448361	326997	33.5	20.1	20.5	19.7	15.7	12.7			21.6	25.8	33.3	19.0	22.2	17.1	-	
53N	448436	326931	13.6	20.6	19.0	20.0	17.5	16.6	12.8	15.5	17.9	19.3	23.3	12.9	17.4	13.4	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
54N	444331	327257	26.8		19.2	25.0	18.3	18.0	17.1	19.8	22.3	25.4	28.5	20.0	21.9	16.8	-	
56N	443649	314040	39.4	44.6	32.1	31.8	38.6	35.4	26.1	32.5	40.9	36.1	43.7	28.3	35.8	27.6	-	
57N	443630	314028	36.5		37.9	40.2	25.5	17.2	18.5	27.1	34.5	26.8	31.3	31.3	29.7	22.9	-	
58N	443634	313996	25.0	28.7	21.6	25.7	22.1	21.1	12.4	17.6	21.4	20.2	11.4	15.4	20.2	15.6	-	
59N	442754	317177	17.3	25.7	21.0	20.2			12.4		21.9	22.4		16.3	19.7	14.4	-	
60N	443366	316277	31.7	34.5	30.3	30.2	30.9	28.6	17.6	24.5	32.0	29.0		19.8	28.1	21.6	-	
61N	436194	316958	35.8	37.7		25.2	24.9				31.8	27.8		24.0	29.6	21.4	-	
62N	435587	317204		17.2	17.0	19.2	14.4	12.7			19.8				16.7	13.8	-	
63N	442800	314466	28.7	28.7	23.3	22.8	17.2	17.1	15.5	15.1	25.9	23.1			21.7	16.7	-	
64N	448081	313098	35.6	44.3	32.3	30.9	27.3	18.2			27.4	51.9	51.5		35.5	27.3	-	
65N	440566	310316	13.9	18.6	16.7	19.3	15.0	14.2	12.9					15.7	15.8	12.8	-	
66N	440525	310507	22.7	22.4		18.0		12.9	16.6	16.9	22.2	21.9	23.9	15.4	19.3	14.9	-	
67N	440537	310041	28.4	25.0	19.3	20.2	18.7	19.0	13.0	14.1	24.5	25.2	31.2	15.1	21.1	16.3	-	
68N	440598	310238	10.5	23.2			18.1	16.3	10.0	12.8	18.0	19.4	23.1	12.5	16.4	12.6	-	
69N	446935	323744	23.6	19.0	10.7	14.3	14.7	12.7	12.3	12.4	14.9	16.5	26.0	10.6	15.6	12.0	-	

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

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

Local bias adjustment factor used .

National bias adjustment factor used.

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

North West Leicestershire District Council confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

Exceedances of the NO₂ annual mean objective of 40µg.m⁻³ are shown in **bold**.

NO₂ annual means exceeding 60µg.m⁻³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within North West Leicestershire District Council During 2023

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

Additional Air Quality Works Undertaken by North West Leicestershire District Council During 2023

North West Leicestershire District Council in partnership with Harborough District Council undertook a DEFRA funded investigation regarding the impacts of solid fuel burning on PM_{2.5}. The full report is attached as

- Appendix C1 Domestic Solid-fuel burning

The council commissioned Air Pollution Service Ltd to undertake a detailed assessment of Melbourne Road in Ibstock to determine the likely extent of an air quality management area. The report is attached as

- Appendix C2 Detailed Assessment of Melbourne Road Ibstock

QA/QC of Diffusion Tube Monitoring

The supplier used for diffusion tubes within 2023 was Socotec (Didcote) and the method of preparation was 50% TEA in acetone.

Socotecs QA/QC data is attached as

- Appendix C3 NO₂ Diffusion Tube Information 2023

Monitoring has been completed in adherence with the 2023 Diffusion Tube Monitoring Calendar

The Full Diffusion Tube Data processing tool v4.0 is attached at Appendix C4

Diffusion Tube Annualisation

Annualisation has been carried out in line with the technical guidance and using the diffusion tube data processing tool.

Table C.1 – Annualisation Summary (concentrations presented in $\mu\text{g}/\text{m}^3$)

Site ID	Annualisation Factor Leamington Spa	Annualisation Factor Leicester University	Annualisation Factor Northampton Spring Park	Annualisation Factor Nottingham Center	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
16N	1.0143	0.9867	1.0343	0.9854	1.0052	28.3	28.5
19N	0.9752	0.9699	0.9847	0.9982	0.9820	25.2	24.8
59N	0.9342	0.9680	0.9393	0.9770	0.9546	19.7	18.8
61N	0.9172	0.9505	0.9240	0.9644	0.9390	29.6	27.8
62N	1.0926	1.0313	1.1367	1.0290	1.0724	16.7	17.9
65N	1.0311	1.0350	1.0810	1.0703	1.0543	15.8	16.6

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

North West Leicestershire District Council have applied a national bias adjustment factor of 0.77 to the 2023 monitoring data. A summary of bias adjustment factors used by North West Leicestershire District 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	03/2024	0.77
2022	National	03/2023	0.76
2021	National	03/22	0.78
2020	National	03/21	0.82
2019	National	03/20	0.87

Table C.3 – Bias Adjustment Factor spreadsheet

National Diffusion Tube Bias Adjustment Factor Spreadsheet							Spreadsheet Version Number: 03/24				
Follow the steps below in the correct order to show the results of relevant co-location studies										This spreadsheet will be updated at the end of June 2024	
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods										LAQM Helpdesk Website	
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet											
This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.											
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.							Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.				
Step 1:		Step 2:		Step 3:		Step 4:					
Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Select a Preparation Method from the Drop-Down List		Select a Year from the Drop-Down List		Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor shown in blue at the foot of the final column.					
If a laboratory is not shown, we have no data for this laboratory.		If a preparation method is not shown, we have no data for this method at this laboratory.		If a year is not shown, we have no data.		If you have your own co-location study then see footnote 5. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953					
Analysed By ¹	Method ²	Year ³	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision ⁴	Bias Adjustment Factor (A) (Cm/Dm)	
SOCOTEC Didcot	50% TEA in acetone	2023	UB	City Of York Council	11	15	12	27.3%	G	0.78	
SOCOTEC Didcot	50% TEA in acetone	2023	R	City Of York Council	11	22	17	26.8%	G	0.79	
SOCOTEC Didcot	50% TEA in acetone	2023	R	City Of York Council	9	22	17	33.7%	G	0.75	
SOCOTEC Didcot	50% TEA in acetone	2023	R	City Of York Council	10	31	25	26.1%	G	0.79	
SOCOTEC Didcot	50% TEA in acetone	2023	UB	Gravesham Borough Council	12	19	15	25.6%	G	0.80	
SOCOTEC Didcot	50% TEA in acetone	2023	UB	Gravesham Borough Council	12	23	19	18.4%	G	0.84	
SOCOTEC Didcot	50% TEA in acetone	2023	R	Ipswich Borough Council	9	26	20	33.0%	G	0.75	
SOCOTEC Didcot	50% TEA in acetone	2023	R	Ipswich Borough Council	12	36	27	34.3%	G	0.74	
SOCOTEC Didcot	50% TEA in acetone	2023	R	North East Lincolnshire Council	12	43	26	61.3%	G	0.62	
SOCOTEC Didcot	50% TEA in acetone	2023	UB	North East Lincolnshire Council	10	13	10	29.1%	G	0.77	
SOCOTEC Didcot	50% TEA in acetone	2023	R	North East Lincolnshire Council	11	24	21	18.0%	G	0.85	
SOCOTEC Didcot	50% TEA in acetone	2023	R	Cardiff Council / Shared Regulatory Services	11	41	34	22.2%	G	0.82	
SOCOTEC Didcot	50% TEA in acetone	2023	UB	Torfaen County Borough Council	11	12	9	43.3%	G	0.70	
SOCOTEC Didcot	50% TEA in Acetone	2023	R	East Suffolk Council	12	29	21	38.3%	G	0.72	
SOCOTEC Didcot	50% TEA in Acetone	2023	R	Wrexham County Borough Council	11	17	14	25.2%	G	0.80	
SOCOTEC Didcot	50% TEA in Acetone	2023	R	Horsham District Council	12	21	17	23.5%	G	0.81	
SOCOTEC Didcot	50% TEA in Acetone	2023	R	Horsham District Council	10	25	17	43.5%	G	0.70	
SOCOTEC Didcot	50% TEA in Acetone	2023	R	Horsham District Council	10	23	24	-5.4%	G	1.06	
SOCOTEC Didcot	50% TEA in Acetone	2023	UI	North Lincolnshire Council	10	14	11	26.2%	G	0.79	
SOCOTEC Didcot	50% TEA in acetone	2023	R	Bridgend Council	11	32	27	20.8%	G	0.83	
SOCOTEC Didcot	50% TEA in acetone	2023	R	Cambridge City Council	12	22	18	24.6%	G	0.80	
SOCOTEC Didcot	50% TEA in acetone	2023	R	Leeds City Council	10	39	29	32.3%	G	0.76	
SOCOTEC Didcot	50% TEA in acetone	2023	KS	Leeds City Council	10	30	20	48.3%	G	0.67	
SOCOTEC Didcot	50% TEA in acetone	2023	R	Leeds City Council	12	25	19	30.0%	G	0.77	
SOCOTEC Didcot	50% TEA in acetone	2023	UC	Leeds City Council	11	26	19	40.0%	G	0.71	
SOCOTEC Didcot	50% TEA in acetone	2023	KS	Marblebone Road intercomparison	11	53	38	41.4%	G	0.71	
SOCOTEC Didcot	50% TEA in acetone	2023	R	Vale Of White Horse District Council	10	22	18	21.2%	G	0.83	
SOCOTEC Didcot	50% TEA in acetone	2023	UB	Wirral Council	11	15	13	16.7%	G	0.86	
SOCOTEC Didcot	50% TEA in acetone	2023		Overall Factor⁵ (28 studies)				Use		0.77	

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-

automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO₂ monitoring locations within North West Leicestershire District Council required distance correction during 2023.

QA/QC of Automatic Monitoring

The zephyr analyser data is subject to QA/QC procedures conducted by Earthsense the manufacturer of the Zephyr

All zephyr data is attached as

- Appendix C5 zephyr monitoring data

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

Figure D.1 – Map of Non-Automatic Monitoring Sites north of the District

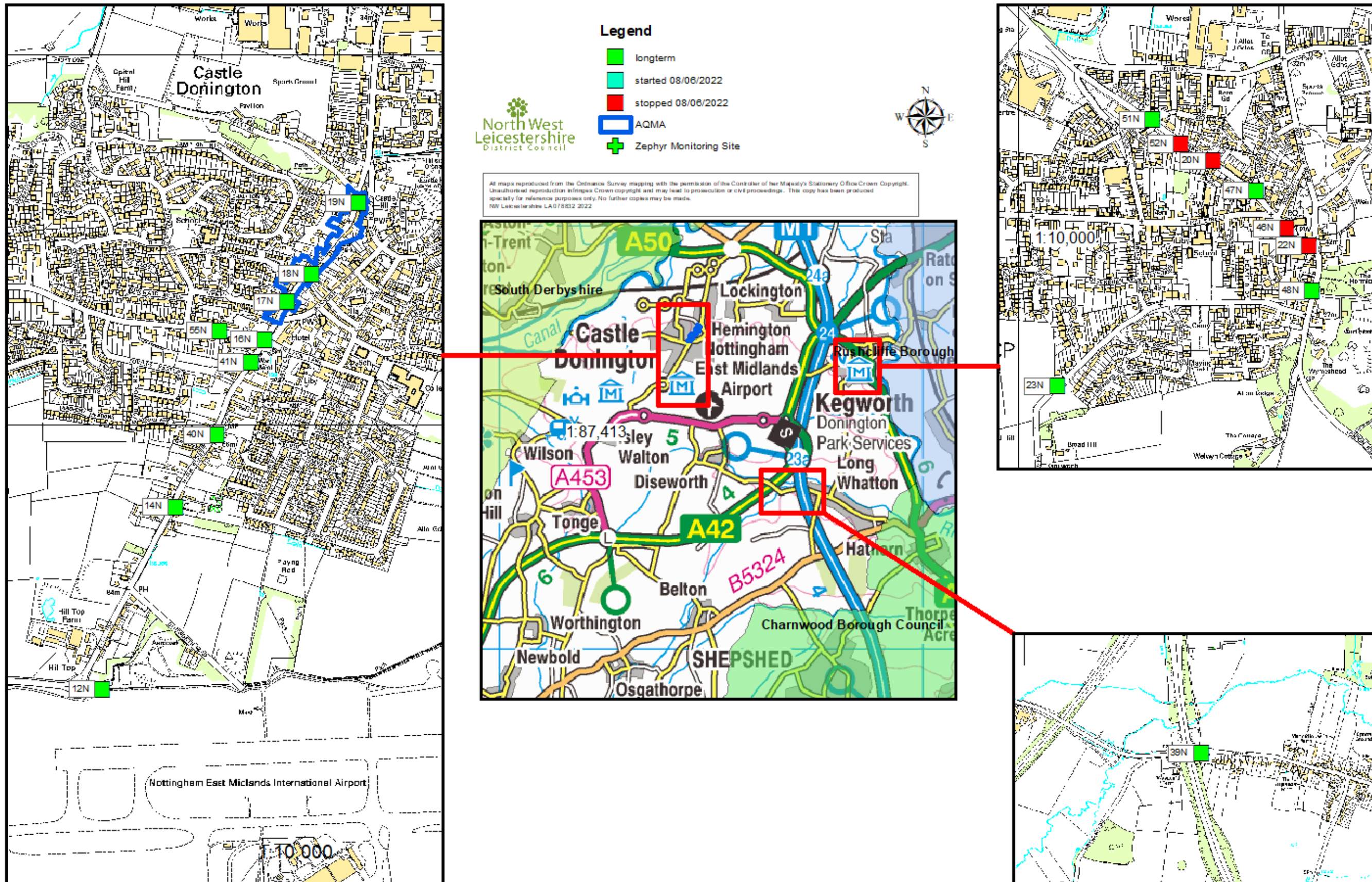
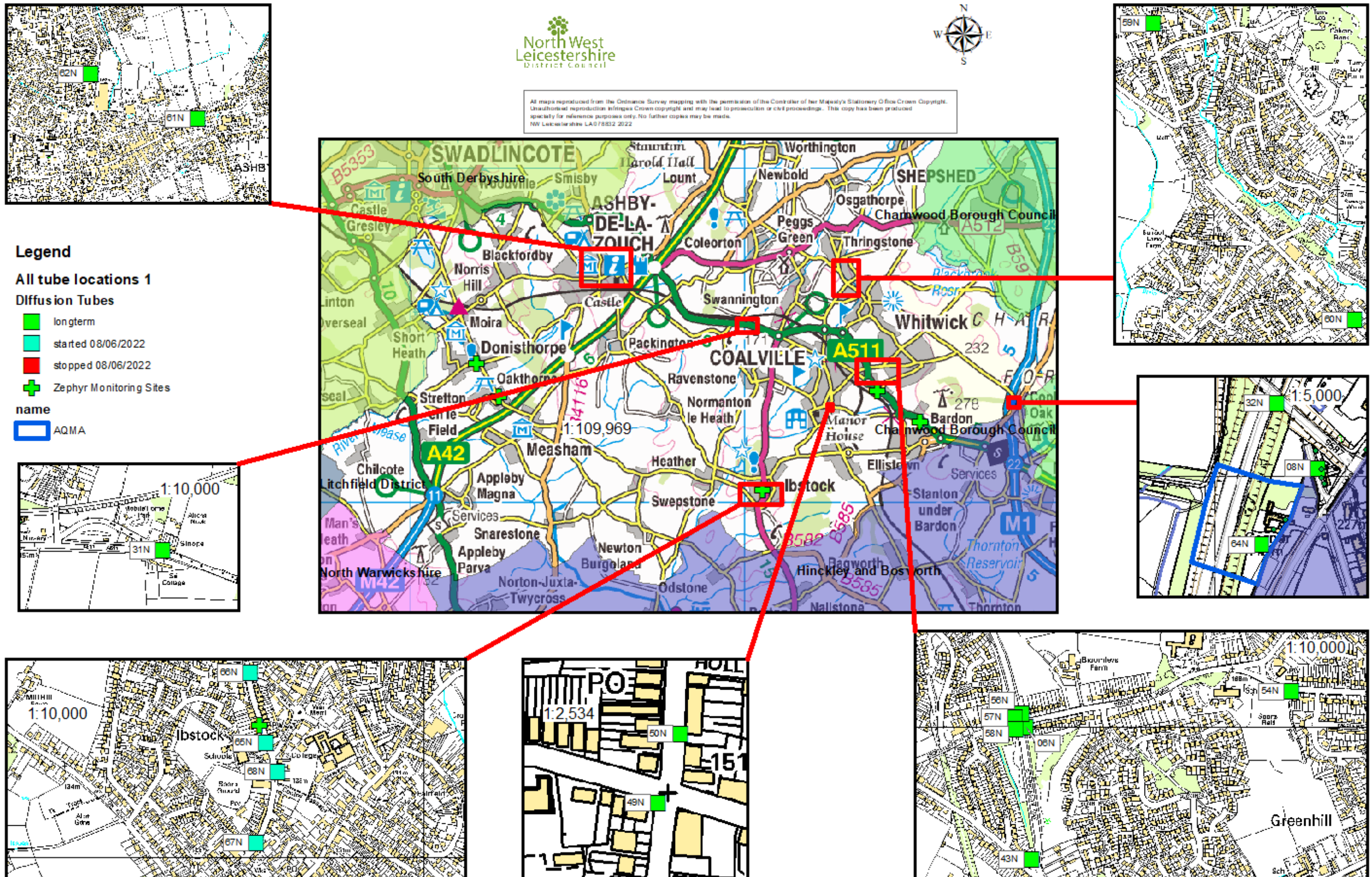


Figure D.2 – Map of Non-Automatic Monitoring Sites south of the District



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁷

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/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide

References

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