IPSWICH
BOROUGH COUNCIL

2023 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, 2023

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Executive Summary: Air Quality in Our Area

Air Quality in Ipswich Borough

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equality issues because areas with poor air quality are also often less affluent areas[1,2].

The mortality burden of air pollution within the UK is equivalent to 29,000 to 43,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

In order to comply with its duty to review the air quality within its area, Ipswich Borough Council (IBC) monitors nitrogen dioxide (NO_2) levels within the town using two automatic monitors located on St Matthews Street and Chevallier Street and a total of 101 diffusion tubes positioned at 90 carefully selected locations across the borough. Changed and analysed on a monthly basis, the data from the diffusion tubes provides a measure of how nitrogen dioxide levels vary over time and is used to calculate an annual mean concentration at each monitoring location. Once corrected for experimental bias and adjusted to take into account the location of the tubes relative to any likely human exposure, these annual values should not exceed the national air quality objective level of 40µg/m3. In the event that this level is, or is likely, to be exceeded on a consistent basis Local Authorities have a legal duty to declare an Air Quality Management Area (AQMA) encompassing the relevant locations. Both nationally and locally the main source of high levels of nitrogen dioxide is road transport.

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[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

[3] Defra. Air quality appraisal: damage cost guidance, January 2023

[4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

Currently, Ipswich Borough Council has a total of four AQMAs, all due to continued exceedance of the annual mean NO_2 objective level:

- *Ipswich AQMA No.1* - Encompassing the land in and around the junction of Norwich Road, Chevallier Street and Valley Road, this area extends along Chevallier Street to the junction with Providence Lane. (declared 2006; amended in 2017 and 2021);
- *Ipswich AQMA No. 2* - From the junction with Peel Street, extending along Crown Street, St Margarets Street and St Helens Street to the junction with Palmerston Road, and from St Margarets Street extending up Woodbridge Road to just beyond the junction with Argyle Street. (declared 2006; amended 2017);
- *Ipswich AQMA No. 3* - Encompassing the land in and around College Street, Key Street, Salthouse Street, Fore Street, Star Lane, Neptune Square and Grimwade Street. (declared 2006; amended in 2017 and 2021);
- *Ipswich AQMA No*. 5 - Incorporating the land in or around St. Matthews Street / Norwich Road between the Civic Drive roundabout and Bramford Road (declared 2017).

Further information on the above AQMAs (including maps showing their location and boundaries) is available on Ipswich Borough Council's AQMA webpage on the DEFRA website.

Following the amendment of AQMA Nos. 1 to 3 and the revocation of AQMA No. 4 (Incorporating the Bramford Road / Yarmouth Road / Chevallier Street junction and part of Chevallier Street (declared 2010)) in August 2021, Ipswich Borough Council worked closely with the local Highway Authority, Suffolk County Council and other stakeholders, including Public Health, to update the 2019 - 2024 Air Quality Action Plan (AQAP). The updated AQAP was published in October 2021.

Ipswich Borough Council is a member of the Suffolk Air Quality Management Group which includes all of the Suffolk Local Authorities.

When comparing the 2022 bias adjusted results to the 2021 results; in 2021 there were three recorded exceedances which are the same three sites that recorded exceedances in 2022 (one exceedance within AQMA 2 and two exceedances within AQMA 5). In 2022, six sites recorded concentrations within 10% below the annual mean NO_2 objective level.

For the fourth year in a row, there were no exceedances of the annual mean NO_2 objective level in AQMA 1. However, in 2019, Tube 14 within AQMA 1 recorded a concentration

within 10% below the annual mean NO_2 objective level. Despite this, AQMA 1 has experienced three consecutive years of annual mean concentrations being lower than 36µg/m^3. In line with LAQM.TG22, the Council will now conduct a detailed assessment and consider whether to pursue the revocation of AQMA 1. The outcome of the detailed assessment will be reported on in next year's ASR.

Figures A.1 – A.11 shows bias corrected trendline plots for clusters of passive monitoring locations in and around each of the 4 AQMAs. Despite AQMA 4 being revoked in August 2021, it is included for transparency to help demonstrate that it was appropriate to revoke the AQMA due to continued NO_2 concentrations under the national objective level.

When looking at the bias corrected data for 2022, annual mean NO_2 concentrations have generally increased slightly compared to the previous two years. However, concentrations have generally remained below 2019 levels. It is likely that the increase in concentrations in 2021 and 2022 compared to 2020 was linked to the relaxation and removal of Government restrictions associated with the COVID-19 pandemic. Further changes to emissions will be reported on in subsequent ASR's.

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.

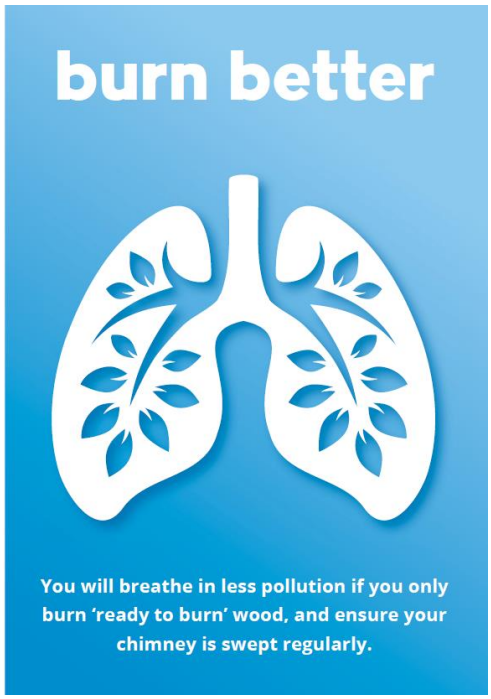
The Environmental Improvement Plan[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce $PM_{2.5}$ in their areas. The Road to Zero[6] details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

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

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

Delivery of Defra grant funded monitoring and behavioural change campaign focused on domestic burning.

The Council has been awarded £115,632 from Defra in March 2022 as part of its Air Quality Grant Programme. The two-year project is focused on a monitoring and behavioural change campaign around domestic burning. At the time of writing this report, the Council will shortly be collaborating with the Suffolk Fire and Rescue Service to conduct a range of domestic burning experiments measuring concentrations of particulate matter. Data collected as part of the burning experiments will be used in behaviour change materials. Furthermore, the Council had just arranged the installation of a FIDAS analyser which is now gathering data. The Council are committed to delivering this project to help better inform the public on the harmful impact of domestic burning and to reduce concentrations of particulate matter.



Continued commitment to zero emission fleet

At the time of writing this report, the Council's electric fleet now consists of 20 electric cars and 26 small electric vans. In addition, the larger vehicle fleet now includes ten pickups, sixteen tippers, eighteen refuse collection vehicles, one glass collection vehicle, one road sweeper, and one tail lift vehicle, all of which are Euroclass VI standard. The 3-year replacement plan for small vehicle fleet to zero emission was concluded in 2022. However, the Council are committed to reducing emissions within the fleet and the renewal programme has been extended to a rolling programme, with phase one now due for completion in 2031. Half a million pounds has been set aside for fleet renewal each year.

Expansion of EV charging points in Council Car Parks

The Council have secured external funding from the Energy Savings Trust to install 24 charging units in 6 additional car parks - William Street, Fore Street, Smart Street, Regent Street, Portman Road A and South Street. Users of these EV charging points would be able to park for free overnight, only paying for the electricity they use.

Publication of Suffolk County Council's Air Quality Strategy for Suffolk and the development of a public engagement plan

Improving air quality across Suffolk is one of Suffolk Public Health and Communities' priorities for 2023/24. As a result, Suffolk County Council have published an Air Quality Strategy. At the time of writing this ASR, a public engagement plan was also due to be published imminently. The plan aims to increase public awareness of the health impacts of air quality in Suffolk, enabling individuals to make choices that protect both their health and the health of others from the harmful effects of pollution. Officers from both the County and Borough Councils, together with other stakeholders, will be working together to deliver the workstreams within the Air Quality Strategy and engagement plan. The Healthy Suffolk webpages are being updated and will provide a range of information to raise awareness of the health impacts of air quality and what we are doing to address it. These pages will continue to be developed and updated as we move forward.

Conclusions and Priorities

Since 2020, the Council have used a combined local bias correction factor as a result of a high data capture rate from both of our continuous analysers. However, due to the exceptional temperatures experienced in the summer of 2022, data between June and September had to be rejected from our analyser on Chevallier Street as the monitor could not be cooled sufficiently despite the procurement of a new air conditioning unit. As a

result of this, we had less than 75% data capture for the Chevallier Street site and have been unable to calculate a combined local bias correction factor for 2022.

The Council calculated a local bias correction factor from the St Matthews Street analyser (98% data capture), and this was recorded as 0.66. As the local bias correction factor was lower than the nationally derived bias correction factor (0.76), it was decided to apply the national correction factor to the data this year to give robust, conservative results. Had the Council applied the local correction factor to the data, we would not have recorded any exceedances of the annual mean NO_2 objective level for 2022.

Once bias adjusted using the national factor and distance corrected, the nitrogen dioxide diffusion tube data for 2022 shows that the national air quality objective for mean annual NO_2 concentrations were exceeded at three of Ipswich Borough Councils monitoring locations. These sites were located within AQMAs 2 and 5. No exceedances were noted in AQMA 1 and 3 following bias adjustment and distance correction.

The Council has several key challenges/priorities for addressing air quality over the forthcoming reporting year. These include:

- To continue to work towards implementing the measures in the existing AQAP and to develop and implement a new Air Quality Action Plan.
- To conduct a Detailed Assessment of AQMA 1 and to revoke this AQMA if considered appropriate.
- The continued delivery of the Councils 2020-2030 Climate Change Strategy and Action Plan. There are a number of actions within the strategy that will benefit air quality and will be priorities for the foreseeable future.
- The continued growth in housing development and business activity will be a major challenge when addressing air quality in the Borough. Ensuring all developments have suitable measures in place to mitigate against their impacts will be essential in ensuring air quality is maintained and improved in Ipswich; the Low Emissions SPD (adopted in November 2021) should assist with this.
- The Council was awarded £115,632 from Defra in March 2022 as part of its Air Quality Grant Programme. The two-year project is focused on a monitoring and behavioural change campaign around domestic burning. Delivering this project will be a key priority for the Council over the next reporting period.

The Council will continue to monitor air quality across Ipswich as this is essential for informing our air quality work and developing measures that can provide potential improvements.

Local Engagement and How to get Involved

The main source of air pollution in Ipswich is road traffic. We are working to meet the challenge set by the Government for NO_2, PM_{10} and $PM_{2.5}$ targets but it will also require a concerted public effort with each person doing their bit in order to try and increase active travel and reduce the use of the motor vehicle where possible. Below are a few suggestions on how to get involved:

- Try to use your car less. Walking and cycling are much cleaner, cheaper and healthier forms of travel. A map showing cycle routes across Ipswich is available on the Way to go Suffolk Website.
- Use public transport, such as the bus and train.
- If you have to use your car, you can reduce emissions by not idling when parked. You can also reduce emissions from your car by ensuring it is regularly serviced and by driving efficiently.
- Consider purchasing an electric vehicle. The Council is working to improve the local charging infrastructure across Ipswich. Electric vehicles are reducing in cost and technology is improving to make this technology more viable. If you opt to purchase a traditionally fuelled vehicle, consider the most fuel efficient petrol vehicle rather than buying a diesel vehicle. See the Zap Map website for locations of charging points.
- Consider car sharing to reduce emissions and save money. See the Suffolk Car Share website for details.
- Avoid having bonfires. If you do choose to have a fire, only burn dry garden waste and avoid burning on days that already have high pollution levels.
- Avoid burning solid fuel. If you do choose to burn solid fuel, always ensure the appliance is well maintained and fuel is clean and dry

More information on air quality within Ipswich is available on the Ipswich Borough

Council Air Quality Management website.

If you have any specific questions or concerns, or if you would like to make suggestions on possible improvements and/or supply additional air quality information, please contact Environmental Health at Ipswich Borough Council on 01473 433115 or environmental.health@ipswich.gov.uk.

If you would like any further information on national air quality, including the latest news, air pollution forecasts, the latest measured levels and a summary, interactive monitoring, and general information about air pollution, consult the Defra website.

Local Responsibilities and Commitment

Council with the support and agreement of the following departments:

Public Protection, Ipswich Borough Council

- Principal Environmental Health Officer (Environmental Protection)
- Environmental Health Officer (Environmental Protection)

Planning and Development, Ipswich Borough Council

- Head of Town Planning and Development
- Planning Policy Team Leader

Culture and Environment, Ipswich Borough Council

- Climate Change Project Manager

Growth, Highways and Infrastructure, Suffolk County Council

- Transport Policy & Development Manager
- Senior Principal Transport Planner
- Behaviour Change Manager

Public Health and Communities, Suffolk County Council

- Health Protection Manager

This ASR has been approved by the Assistant Director for Housing & Communities (Ipswich Borough Council)

This ASR has been signed off by Stuart Keeble, Director of Public Health, Suffolk County Council.

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

Ipswich Borough Council, Grafton House, Ipswich, Suffolk, IP1 2DE

Telephone: 01473 433115

Email: environmental.health@ipswich.gov.uk

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1 Local Air Quality Management

This report provides an overview of air quality in Ipswich Borough during 2022. 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 Ipswich Borough Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

A summary of AQMAs declared by Ipswich Borough Council can be found in Table 2.1. The table presents a description of the four AQMAs that are currently designated within Ipswich. 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:

- NO_2 annual mean less than 40µg/m^3

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
Ipswich AQMA No.1	Declared 11/04/2006 Amended 12/09/2017 Amended 19/09/2021	NO2 Annual Mean	Encompassing the land in and around the junction of Norwich Road, Chevallier Street and Valley Road, this area extends along Chevallier Street to the junction with Providence Lane	NO	50µg/m^3	32µg/m^3	4 years	Ipswich Borough Council Air Quality Action Plan 2019-2024 (updated 2021)	https://www.ipswich.gov.uk/sites/www.ipswich.gov.uk/files/air_quality_action_plan_2019-2024_updated_2021.pdf
Ipswich AQMA No.2	Declared 11/04/2006 Amended 12/09/2017	NO2 Annual Mean	An area from the junction with Peel Street, extending along Crown Street, St Margarets Street and St Helens Street to the junction with Palmerston Road, and from St Margarets Street extending up Woodbridge	NO	45µg/m^3	42µg/m^3	Not compliant	Ipswich Borough Council Air Quality Action Plan 2019-2024 (updated 2021)	https://www.ipswich.gov.uk/sites/www.ipswich.gov.uk/files/air_quality_action_plan_2019-2024_updated_2021.pdf

			Road to just beyond the junction with Argyle Street.						
Ipswich AQMA No.3	Declared 11/04/2006 Amended 12/09/2017 Amended 19/08/2021	NO2 Annual Mean	Encompassing the land in and around College Street, Key Street, Salthouse Street, Fore Street, Star Lane, Neptune Square and Grimwade Street.	NO	50µg/m^3	37µg/m^3	3 years	Ipswich Borough Council Air Quality Action Plan 2019-2024 (updated 2021)	https://www.ipswich.gov.uk/sites/www.ipswich.gov.uk/files/air_quality_action_plan_2019-2024_updated_2021.pdf
Ipswich AQMA No.5	Declared 12/09/2017	NO2 Annual Mean	An area incorporating the land in or around St. Matthews Street / Norwich Road between the Civic Drive roundabout and Bramford Road.	NO	49µg/m^3	43µg/m^3	Not compliant	Ipswich Borough Council Air Quality Action Plan 2019-2024 (updated 2021)	https://www.ipswich.gov.uk/sites/www.ipswich.gov.uk/files/air_quality_action_plan_2019-2024_updated_2021.pdf

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

☒ **Ipswich Borough Council confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in Ipswich Borough

Defra's appraisal of last year's ASR concluded that:

"On the basis of the evidence provided by the local authority the conclusions reached are accepted for all sources and pollutants."

Ipswich Borough Council has taken forward a number of direct measures during the current reporting year of 2023 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. Measures are included within Table 2.2, with the type of measure and the progress Ipswich Borough 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 the Ipswich Borough Council Air Quality Action Plan 2019 – 2024 (updated 2021). Key completed measures are:

- EV charging infrastructure has now been installed at the Council's headquarters to support the delivery of the new fleet. The Council's electric fleet now consists of 20 electric cars and 26 small electric vans. In addition, the larger vehicle fleet now includes ten pickups, sixteen tippers, eighteen refuse collection vehicles, one glass collection vehicle, one road sweeper, and one tail lift vehicle, all of which are Euroclass VI standard.
- EV charging infrastructure continues to be installed at the Council's offices and Council owned car parks.
- The Suffolk anti-idling campaign has been launched.
- The Introduction of a Hackney Carriage and Private Hire Licensing Policy 2019 - 2022 which sets standards in relation to vehicle age to help reduce the levels of pollutants emitted from the local taxi fleet.
- The Councils Low Emissions SPD was adopted in November 2021 which requires developers to mitigate against air quality impacts arising from development.
- The Councils Local Plan was adopted in March 2022 which includes a policy on Air Quality.
- The Council has success in obtaining grant funding from Defra under the 2021 Air Quality Grant Programme to run a campaign around domestic burning. The Council

aspires to continue to bid for future Defra grant funding when opportunities are available.

- Although not a specific measure listed within the AQAP, an Air Quality Profile for Suffolk has been produced. The report maps, at a district and borough level, local air pollution levels and explores evidence-based interventions that can be undertaken by local authorities, businesses, communities and individuals to improve air quality.
- Although not a specific measure listed within the AQAP, Suffolk County Council have also published their Air Quality Strategy. A key element of the Air Quality Strategy is a public engagement plan which is being developed to increase public awareness of the health impacts of air quality in Suffolk, enabling individuals to make choices that protect both their health and the health of others from the harmful effects of pollution. The delivery of the strategy will be closely monitored by the council to ensure it is accomplishing what it has set out to do. The strategy will also feed into the collective work of the Suffolk Health and Wellbeing Board.

Ipswich Borough Council expects the following work to be completed over the course of the next reporting year:

- Assist the Councils Car Parking Services in the development of their policies and strategies to promote clean travel and improved air quality. Review use of short and long stay car parks (Measure B7).
- Development and implementation of campaign to provide information about the impacts of domestic burning and good practice, including wood burners and burning of garden waste (Measure D1). Although the project is due to conclude early 2025, the key information and materials in connection with the project should be finalised in 2024.
- Work with the Private Sector Housing team to improve their renovation grant criteria and include air quality considerations (Measure D4).
- The development and publication of a new Air Quality Action Plan. It is likely that a number of measures from the Council's existing action plan will be taken forward with a range of new measures to continue to reduce the concentrations of NO_2 (and particular matter) within and outside of AQMAs. A number of measures within the existing AQAP are considered to be educational/promotional in nature (such as Measure A1 - Development and implementation of an anti-idling campaign and Measure A2 - Campaign to raise awareness of air quality issues in schools near

AQMAs to subsequently influence behavioural change and improve air quality near schools), hence why these will continue into the future AQAP.

- The final development and implementation of a Suffolk County Council led Air Quality Engagement Plan aimed at increasing public awareness of air quality issues across Suffolk.

Ipswich Borough Council's priorities for the coming year are:

- To continue to work towards implementing the measures in the existing AQAP and to develop and implement a new Air Quality Action Plan.
- To conduct a Detailed Assessment of AQMA 1 and to revoke this AQMA if considered appropriate.
- To continue to monitor air quality across Ipswich as this is essential for informing our air quality work and developing measures that can provide potential improvements.
- To work with officers implementing the Council's Climate Change Strategy to ensure a joined-up approach in tacking both climate change and air quality. There are several actions within the strategy that will benefit air quality and will be priorities for the foreseeable future.
- To continue to assess and comment on planning applications and major developments in relation to air quality. This is essential in order to ensure future emission reductions within the district, and to reduce the likelihood of additional AQMAs being declared and further deterioration of air quality in existing AQMAs.
- To progress the Councils monitoring and behavioural change campaign focused on domestic burning.

Ipswich Borough Council worked to implement these measures in partnership with the following stakeholders during 2022:

- Suffolk County Council – Public Health, Highways, Fire and Rescue Service
- Neighbouring district and borough Councils in Suffolk
- The University of Suffolk
- Ipswich and East Suffolk Clinical Commissioning Group

The principal challenges and barriers to implementation that Ipswich Borough Council anticipates facing are

- Limitations on the level of dedicated resource available for air quality management activities; and

- Difficulty in obtaining sufficient support to include potentially more intrusive and/or costly interventions to secure significant and necessary improvements in air quality throughout the AQMAs.

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

- The delivery of air quality messages on IBC procured variable messaging signs. The signs have been installed but there is at least a 6-month delay on allowing air quality messages due to operational reasons.
- Work with other Bus Operators in the town to encourage the renewal of their fleets – The current economic climate and limited funding from Government has meant that the operators with very little spare funding to invest in new fleet.
- Supporting, where appropriate, the measures identified in the Ipswich Strategic Planning Area Transport Mitigation Strategy – delays encountered as Local Planning Authorities not yet agreed apportionment of funding towards strategy

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

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	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
A1	Development and implementation of an anti-idling campaign, including where appropriate an enforcement regime	Other	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	< £10k	Implementation	Low	Development of campaign materials	Campaign materials previously produced by the Suffolk Air Quality Working Group. Implementation on-going. Internal staff within Environmental Health and Waste Operations have been given anti-idling training. A number of anti-idling events have been held outside schools. Anti-idling events are currently planned at two schools in June 2023. Officers have received information from Suffolk Public Health and Colchester BC on the effectiveness of signage in reducing vehicle idling - Colchester conducted a Defra Grant funded project around this. Officers will shortly be reviewing the information with a view to implementing a similar scheme in Ipswich.	Ongoing campaigns, hence completion date listed for lifetime of current AQAP. Exact costs unknown – will be from officer time and material costs.
A2	Campaign to raise awareness of air quality issues in schools near AQMAs to subsequently influence behavioural change and improve air quality near schools	Public Information	Other	2019	2024	Ipswich Borough Council	No	NO	Funded	£10k - 50k	Implementation	Low	Present information to schools near AQMAs and within the borough.	IBC have produced an 'Air Aware Ipswich' Schools Toolkit. A 12 week programme aimed at raising awareness of air quality issues with school children. This has been adapted from initiatives used in London and Oxford. This is available at: https://www.ipswich.gov.uk/content/air-quality-resources-schools. SCC have a School Streets Policy. Ranelagh Primary School has submitted an application for an experimental Traffic Regulation Order (TRO) in connection with a trial school street and it is being processed. It is hoped that the experimental TRO will be in place by the new school year - September 2023. Another two schools are going through the consultation process for a school street. Three schools took part in the Sustrans Big Walk and Wheel Event in March 2023. Five schools in Ipswich have Modeshift Stars accreditation. Ravenswood school are setting up a walking bus.	It has been difficult to engage with some schools, possibly due to competing demands they face. Ongoing campaign, hence completion date listed for lifetime of current AQAP. Costs unknown – will be officer and material costs.

Measure No.	Measure	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
A3	Promote the Councils Green Travel Plan to employees, including use of agile working. Confirm SCC and Mid Suffolk and Babergh DC are promoting their own travel plans	Promoting Travel Alternatives	Workplace Travel Planning	2019	2024	Ipswich Borough Council	Ipswich Borough Council	No	Funded	< £10k	Implementation	Low	Annual promotion of travel plan. Increase in the number of employees walking, cycling or using public transport in the Councils Travel Plan survey	Staff travel plan promoted on the intranet. A large proportion of staff are 'hybrid working', dividing their working time between home and the office, thereby reducing the number of commuting trips. Dr Bike sessions promoted to employees to enable their bikes to be checked and maintained by a competent mechanic.	
A4	Active participation in annual Clean Air Days	Public Information	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	No	Funded	Unknown	Implementation	Low	Participation in annual Clean Air Days	Clean Air Day 2023 is currently being planned at the time of writing this years ASR. Two schools are signed up for a workshop and anti-idling event on the day. Officers also intend to publish information relating to the Defra grant funded domestic burning campaign.	Ongoing commitment, hence completion date listed for lifetime of current AQAP. Costs unknown – will be officer and material costs
A5	Investigate the feasibility of promoting air quality messages on IBC procured variable message signs around Ipswich	Public Information	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	No	Funded	£100k - £500k	Completed	Low	Promote anti-idling messages quarterly.	VMS project cost £259,000. All VMS had been installed. Anti-idling messages to be prepared and agreed with the relevant operational team.	At present, signs only being used to display car park information for operational purposes. This will be reviewed in 6 months and planning restrictions will need to be considered. Once messages determined, ongoing promotion of messages, hence completion date listed for lifetime of AQAP.

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A6	Promotion of travel alternatives e.g. walking, cycling, public transport, car sharing & air quality matters. Measure includes: Development and implementation of the Ipswich Air Aware Campaign. Investigate the feasibility of promoting air quality messages on non IBC owned variable message signs around Ipswich (e.g. Bury Road)	Public Information	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Partially Funded	Unknown	Implementation	Low	Website patronage, number of Facebook posts/comments, number of video views Air quality messages being displayed. The Way To Go Suffolk Website – typically between 250 and 500 monthly users and between 600 and 900 page views per month.	Ipswich Air Aware Communications campaign drafted. Officers currently in discussions with SCC Public Health around extending the campaign to a wider campaign across Suffolk. In 2020, SCC worked with borough and district councils to develop the Suffolk Air Quality Profile, published in 2021, with the aim of increasing local knowledge, identifying areas of concern and making recommendations on what could be done to mitigate the impact of poor air quality. This led to the Suffolk Health and Wellbeing Board making air quality a priority. The recommendations from the Suffolk Profile have informed both the development of a Suffolk wide Air Quality Strategy, published in May 2023, and a Suffolk Air Quality Community Engagement Plan. The Community Engagement Plan also includes engaging with the public on sustainable transport issue to try and encourage modal shift. Ipswich Community Cycling day delivered at Murryaside community centre in March 2023. 7 bikes fixed. 12 e-bike trials took place. Bike fix at Endeavour House in March 2023 – 20 bikes fixed. Participation in 6 x IBC Summer Fun Days in summer 2022 offering free family cycling lessons in more deprived areas of Ipswich. Free trial of 8 e-bikes at Ipswich Port for staff to trial commuting for 3 months. SCC funded GoJauntly walk creation in Ipswich for 2023 and walking challenge county-wide in March 2023.	Messages can also link to other campaigns: ant idling/ domestic burning/ clean air day/ discounted public transport promotions. SCC requirements to use the VMS largely restrict messages that can be displayed. They cannot be too long, refer to secondary sources of information or ask a question.

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B1	Explore opportunities to increase Ipswich's Park and Ride scheme, including consideration given to re-opening the Bury Road Park and Ride, and promote current schemes to incentivise people coming into Ipswich town centre to use public transport over private cars	Alternatives to private vehicle use	Bus based Park & Ride	2019	2024	Suffolk County Council and Ipswich Borough Council	Suffolk County Council and Ipswich Borough Council	NO	Not Funded	Unknown	Planning	Low	Increase in Park and Ride uptake	SCC are developing bus priority measures for key corridors in Ipswich, with a view to implementation, subject to consultation, once funding is identified. This could be from Central Government or development funded as part of the mitigation package. Bury Road Park and Ride was included in the Ipswich sustainable transport package Levelling Up Fund (LUF) bid. This was not successful in receiving funding in the latest round, but could be rolled over into a later LUF bidding round, depending on the fit to any future LUF criteria. Measures could include new bus lane, bus gates, removal of pinch-points and enforcement of existing restrictions through Moving Traffic Enforcement to clear congestion from bus routes. Central to bus priority measures will be the strategic use of traffic signals underpinned by Suffolk's new Traffic Signal Policy.	SCC indicate that increasing the use of the Park & Ride scheme, along with other bus patronage, is an objective of the Enhanced Bus Partnership (EP) and is identified in the Ipswich Strategic Planning Area (ISPA) mitigation strategy. To ensure the financial viability of the North West Park & Ride services, the existing service would need to increase patronage before additional sites could be viable. Opening the North West P&R site is included within the ISPA strategy. Barriers to the development of this measure include increasing bus patronage, linked to level and cost of parking in the town (particularly company-owned car parks), and also continued home-working for many.

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B2	Procurement of low emission vehicles in Ipswich Borough Council Fleet	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2019	2031	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	£1 million - £10 million	Implementation	Low	Provision of new vehicles	The Council have 52 electric vehicles in total: 20 electric cars, 26 small electric vans, and 6 large electric vans, replacing a proportion of the older diesel vehicles. 6 new Euroclass VI pickups are due to arrive by summer 2023. In addition, the larger vehicle fleet now includes 10 pickups, 16 tippers, 18 refuse collection vehicles, 1 van, 1 glass collection vehicle, 1 road sweeper, and 1 tail lift vehicle, all of which are Euroclass VI standard. It is estimated that there has been a 50% reduction in NOx emissions from the Council's fleet as a result of these vehicle replacements.	3-year replacement plan for small vehicle fleet to zero emission was concluded in 2022. However, the Council are committed to reducing emissions within the fleet and the renewal programme has been extended to a rolling programme, with phase one now due for completion in 2031. Half a million pounds has been set aside for fleet renewal each year. The Council has now reached EV capacity until the new depot comes online.

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B3	Provision of EV charging points across IBC offices, Crown Street and Elm Street public car parks and investigate the feasibility of additional charging points across IBC car parks	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2019	2019	Ipswich Borough Council	Ipswich Borough Council	No	Partially Funded	£500k - £1 million	Completed	Low	Provision of 4 charging stations (8 points) at Grafton House. Usage of EV charging points by the public	Number of charging points now installed at the following locations: Grafton House – 26 Gipping House – 8 Christchurch Mansion – 4 Chantry Park – 2 Holywells Park – 2 Crematorium – 1 Gainsborough sports centre – 2 Crown Car Park – 28 Elm St Car Park – 2 rapid chargers Majors Garage – 1 Upper Orwell Street North Car Park - 2. 149 points proposed at Portman Road Car Park with capacity for 298 EV charging spaces - approx. cost £500k. The Council have also secured some external funding from the Energy Savings Trust to install 24 charging units in 6 additional car parks - William Street, Fore Street, Smart Street, Regent Street, Portman Road A and South Street. Project is currently on hold until full match funding amount is found.	Provision of additional charging points depends on success of usage of current charging points. Usage at sites increasing year on year. Crown car park – Between June 2022 and April 2023 – there has been 17606hrs of charging sessions using total of 106905.37kWh. Upper Orwell North car park – Between June 2022 and April 2023 there has been 3081hrs17mins of charging sessions using total of 15488.88kWhr. Elm Street Car Park - Between June 2022 and April 2023 – there has been 6070hrs56 mins of charging sessions using total of 124,838.2kWh. Delivery of new Portman Road Car Park currently in the design and tender stage. Current plans are for 300 EV charging units within the car park, with an initial 150 chargers made available upon opening. Completion date for car park build to be confirmed, but likely late 2025-2026.
B4	Promote the use of Norwich Road Shoppers Car Park, short term parking bays behind businesses on Norwich Road. Incentivising use of allocated parking and enforcement against unauthorised on street loading/ parking to assist with the reduction of congestion in the area.	Traffic Management	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	Unknown	Implementation	Low	Reduction in congestion along Norwich Road/St Matthews Street. Number of penalty notices served	Between 01/06/2022 - 15/05/2023 the following number of PCNs were served along Norwich Road, St Matthews Street and St Matthews Street Service Road (North): 983 for parking on yellow lines / 29 for parking where a loading restriction is present /1 for parking in a bus stop or stand/ 1 for parking on a pedestrian crossing. 8 PCN's were issued in Norwich Road Shoppers Car Park for overstaying in the free parking bays.	Implementation costs not known.

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B5	Investigate what other organisations in the town are doing with regards to fleet renewal (e.g. other Local Authorities and large businesses) and whether there are opportunities (and funding) for an accelerated take up of ULEVs in the town.	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2019	TBC	Ipswich Borough Council. Other organisations. LEVI funding	Depends on the organisation as to the funding source	No	Partially Funded	£1 million - £10 million	Implementation	Low		SCC have just completed 100 charge points as part of Plug in Suffolk on community owned assets (village halls etc) and plan to install more EV charge points in Suffolk this year as part of the Local Electric Vehicle Infrastructure pilot work. SCC are working with taxi drivers and the Energy Saving Trust to help understand barriers to switching to EV's/ help to transition to EVs. SCC will survey taxi drivers as part of project. Taxi EV report to be drafted around autumn. EV charge points on SCC own properties for SCC use: 73 outlets currently installed. 36 Outlets proposed for 2023, all primarily aimed at pool cars (but accessible to other users when not in use for pool cars). IBC have supported the local CCG to develop their ICS Green Plan which was rolled out on 1st July 2022. In terms of the ICS Green Plan, they have started some EV exploratory work. The NHS has committed to investing in Trust fleets being ELV or ULEV to help improve air quality and deliver net zero emission.	Completion date unknown as an ongoing measure. It is hoped that the Council can work with Ipswich Town Football Club in the future to develop initiatives that encourage sustainable travel to games.

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B6	Accelerate the provision of on-street public EV charging points	Promoting Low Emission Transport	Other	2021	TBC	Suffolk County Council	Suffolk County Council	NO	Partially Funded	£1 million - £10 million	Implementation	Low	Provision of EV	The County Council has not installed any on-street charge points and is awaiting the outcome and evaluation of numerous national trial projects before making any further decisions on the provision of on street charging. At this time SCC has not changed its current position with respect to on-street residential parking. Their position can be found here: https://www.suffolk.gov.uk/roads-andtransport/transportplanning/electric-vehicle-charging-policy/. Members of the public who are interested in community on-street charging can request it via this link. This will help SCC identify where more residential charging facilities may be required in the future. SCC currently developing an EV Strategy for Suffolk. SCC commissioned a report from WSP looking at current/future need for EV infrastructure. EV strategy to be drafted around mid-summer and will link in with existing EV strategies/policies for District and Boroughs.	Completion date unknown as an ongoing measure.
B7	Assist the Councils Car Parking Services in the development of their policies and strategies to promote clean travel and improved air quality. Review use of short and long stay car parks	Promoting Low Emission Transport	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Not Funded	Unknown	Planning	Low	Unknown at this point	Council Executive approved proposals for changes to both off-street and on-street parking tariffs which could be considered to have an environmental benefit by encouraging the use of more sustainable transport. A summary of the main changes is as follows: Off-Street * Short-stay parking charges increased by 15% from £1.30 per hour to £1.50 per hour. * Long-stay parking charges increased by 20% from £1 per hour to £1.20 per hour, with all day parking increasing by 24% from £5 to £6.50. * Charging hours increased so that charges now apply until 10pm instead of 8pm. On-Street * Parking charges increased by varying amounts, typically around 20-25% although in some cases by a higher amount. * Charging hours increased so that charges now apply until 8pm instead of 6pm.	

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B8	Continue to explore the possibility and apply to DEFRA for grant funding under Air Quality Grant Schemes and any other appropriate funding	Public Information	Other	2019	2024	Ipswich Borough Council	Ipswich Borough Council	YES	Funded	£100k - £500k	Implementation	Low	Depends on the nature of the works relating to grant funding. Current grant project will be a reduction in domestic burning complaints. Reduced PM concentrations	The Suffolk Air Quality Working group are currently exploring whether to submit a joint bid to Defra for an air quality project in the next round of funding. Ipswich secured £115,632 from Defra as part of the 2021 Air Quality Grant Programme to run a monitoring and behavioural change campaign around domestic burning. Ipswich have committed £33,939 in match funding. Officers are currently progressing with the grant project.	Project currently in the implementation phase. Sensors installed and gathering data to inform educational messaging.
B9	Work with Bus Operators in the town (i.e. Ipswich Buses, First, Norse, Beestons), to encourage the renewal of their fleet to cleaner i.e. Euro VI or better and/or low emission, hybrid buses, on certain routes	Vehicle Fleet Efficiency	Other	2019	2024	Suffolk County Council and Ipswich Borough Council	Bus Operators (plus other sources of funding)	NO	Partially Funded	Unknown	Implementation	Low	Reduced fleet emissions	First - DfT have announced an update on future funding and will extend the current £2 fare cap and continue the bus recovery funding. The significant element of the update is that both of these schemes will run for some considerable time, instead of the previous situation where we were moving forward in 3 month blocks, so this may give operators the ability to look further ahead than before. In terms of fleet replacement, despite a lack of funding, First have introduced 17 brand new Euro VI Wrightbus Streetdecks into Ipswich and the surrounding areas, which represents just over a third of our Star Lane based fleet. they will continue to look at future fleet replacement options that tie in with the First Bus commitment to operate an entirely zero emission fleet by 2035. Ipswich Buses - Due to the continued trading uncertainty following the pandemic and now more generally across the economy, with unprecedented with fuel and wage cost escalation, the bus the industry is still being assisted on an ad-hoc basis by Government funding to help maintain the stability of commercial bus networks across England. Future funding remains uncertain and due to this no brand-new vehicles have been purchased in recent years and we continue to replace only occasional vehicles from the second-hand market. Our fleet current emission profile is below, and we do not foresee this changing very much over the come 12-month period due to the trading and funding uncertainties mentioned above: Emissions: Total Euro 3 4 Euro 4 11 Euro 5 47 Euro 6 12 Total fleet size: 74	SCC are developing bus priority measures for key corridors in Ipswich, with a view to implementation, subject to consultation, once funding is identified. This could be from Central Government or development funded as part of the mitigation package. Measures could include new bus lane, bus gates, removal of pinch-points and enforcement of existing restrictions through moving Traffic Enforcement to clear congestion from bus routes. Central to bus priority measures will be the strategic use of traffic signals underpinned by Suffolk's new Traffic Signal Policy.

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B10	Work with other Bus Operators in the town (i.e. First, Norse, Beestons) to encourage the renewal of their fleets to cleaner i.e. Euro VI or better and/or low emission, hybrid buses, on certain routes.	Transport Planning and Infrastructure	Other											Amalgamated measure B10 with measure B9 so the combined measure refers to all bus operators in the town	
B11	Introduction of taxi emissions standards policy	Promoting Low Emission Transport	Taxi Licensing conditions	2018	2019	Ipswich Borough Council	Ipswich Borough Council	No	Funded	Unknown	Completed	Low	Reduction in non-euro 6 diesel	Completed - New Hackney Carriage and Private Hire Licensing Policy 2019-2022	
B12	Review opportunities for alterations to traffic management to reduce congestion in AQMAs, including the provision of red routes.	Traffic Management	UTC, Congestion management, traffic reduction	2019	TBC	Suffolk County Council	Suffolk County Council	NO	Not Funded	Unknown	Planning	AQMA No.5 approx. 2% reductio n in NOx	Reduction in congestion on Civic Drive/ St Matthews Street roundabout	Opportunities to alterations to traffic management linked to ISPA mitigation work and town strategy.	No completion date known. Possible mitigation dependant on funding and appropriate support from stakeholders. Likely that funding will be sought as and when opportunity arises, unless suitable funding agreement made available from other sources e.g. Defra or DfT. In the Suffolk Air Quality Strategy Action Plan there is an action to scope out evidence based initiatives to reduce transport related emissions. Transport colleagues will focus on this. IBC and SCC officers to meet shortly to discuss how to take this forward.
B13	Review (in conjunction with other IBC/ SCC work streams), the traffic management arrangements in the St Matthews St/ Norwich Rd corridor. Maintaining delivery facilities, whilst minimising disruption to traffic flows.	Freight and Delivery Management	Quiet & out of hours delivery	2019	TBC	Suffolk County Council	Suffolk County Council	No	Not Funded	Unknown	Planning	Low	Reduction in congestion along Norwich Road & St Matthews Street	This will tie into the IPSA transport mitigation work. See measure C7.	In the Suffolk Air Quality Strategy Action Plan there is an action to scope out evidence-based initiatives to reduce transport related emissions. Transport colleagues will focus on this. IBC and SCC officers to meet shortly to discuss how to take this forward.

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C1	Develop and implement a Low Emission Strategy SPD	Policy Guidance and Development Control	Low Emissions Strategy	2019	2021	Ipswich Borough Council	Ipswich Borough Council	No	Funded	Unknown	Completed	Medium	Implementation of SPD	Low Emissions SPD formally adopted in November 2021.	The Low Emissions Supplementary Planning Document was adopted in November 2021 and is now in use. Training was delivered to Council planning staff, whilst agents and developers were alerted to the new requirements to enable planning applications to be validated.
C2	Embed air quality considerations in the Councils Local Plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2021	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	Unknown	Completed	Medium	Air quality considerations embedded in Local Plan	Local Plan formally adopted on 23rd March 2022. Includes policy DM3 Air Quality	
C3	Comment on best practice measures in relation to air quality in planning applications and major developments. Support alternatives to single occupancy car use arising from new developments, through the use of robust travel plans secured through the planning process	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	£10k - 50k	Implementation	Medium	100% of relevant planning applications assessed	Ongoing measure - all relevant applications assessed	Air Quality Assessments asked for in line with EPUK/IAQM guidance. Low emissions SPD should support this measure. SCC are able to deliver travel plans to new developments, which helps with a number of factors and ensures consistency of messages regarding active and sustainable travel options across all developments.

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C4	Support Suffolk County's development of Local Ipswich Cycling and Walking Infrastructure Plans, and work to improve existing cycle routes	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2019	TBC	Suffolk County Council	Suffolk County Council	NO	Partially Funded	Unknown	Implementation	Medium	Implementation of Walking and Cycling Infrastructure Plan	SCC has delivered schemes in Ipswich for tranches 1 and 2 of the Active Travel Fund. Schemes delivered include new or upgraded cycle lanes on Portman Road, Princes Street, Valley Road, Colchester Road and Bixley Road, modal filters on Fuchsia Lane, Wellesley Road, Milner Street, Leopold Road, Westbury Road, Portman Road, Chalon Street, Jovian Way, The Avenue and Bridge Street. These schemes were all delivered on a trial basis initially and have all since been made permanent. Other permanent improvements delivered include upgraded provision for pedestrians and cyclist on the Waterfront, place-making schemes that enhance and build on the upgrades delivered. Funding has been secured to develop and deliver a range of future improvements to the network including route upgrades on Nacton Road, Woodbridge Road, Princes Street, Ipswich Hospital to the Waterfront and the development of an Ipswich package to deliver network-wide improvements. IBC have met with SCC and a draft LWCIP is being prepared for Ipswich. A challenge will to be include 'Wheeling' which focuses on wheelchairs and mobility scooters. IBC are exploring options for informal engagement work with protected characteristics groups under the Equality Act 2010, to ensure that the LCWIP is inclusive and meets the requirements of Active Travel England. Draft plan being updated to include information on wheeling but limited information from the DfT on this. Planned target is summer/autumn Exec with consultation later in the year. Some schemes in SCC LWCIP have some costed element, but in Ipswich LWCIP have not had enough work done on them for costs yet, but funds likely to come from a number of different sources including Sustrans, developer funding, levelling up, IBC, SCC and ISPA.	

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C5	Support the Local Transport Plan to create a more efficient use of the highway in and around the town, and across Suffolk	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2019	2026	Suffolk County Council	Suffolk County Council	NO	Partially Funded	Unknown	Planning	Medium	Development of LTP	The new Local Transport Plan (LTP4) is currently under development. The policy aspect of the plan has been drafted and the delivery aspect of the plan is being prepared. The delivery aspect of the LTP will need to be completed alongside devolution timescales. The final publication of the LTP is being delayed by the lack of guidance produced by the Department for Transport (DfT). The DfT had originally planned to release guidance in early 2022. The LTP will be focused on decarbonising transport in Suffolk, and this will have associated benefits for Air Quality, as the two issues are closely related. The LTP will contain a dedicated section on Air Quality.	SCC are still waiting for updated guidance from the Department for Transport (DfT), which was originally planned for early 2022. The lack of guidance from the DfT is delaying the final publication of the plan.
C6	Supporting, where appropriate, Suffolk Climate Change, Environment & Energy Board's development and implementation of the Suffolk Climate Emergency Plan.	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2019	2030	Suffolk Climate Change, Energy & Environment Board (SCCEEB) reporting to Suffolk Public Sector Leaders (SPSL)	Suffolk Climate Change, Energy & Environment Board (SCCEEB) reporting to Suffolk Public Sector Leaders (SPSL)	NO	Partially Funded	£1 million - £10 million	Implementation	- (Relates to CO2 emissions not NO2)	Reduction in absolute CO2 emissions in Suffolk	The Suffolk Climate Emergency Plan has been agreed by Suffolk's Public Sector Leaders and is available at: https://www.greensuffolk.org/about/suffolk-climate-change-partnership/suffolk-climate-emergency-plan-2/. IBC have involvement in all of the SCEP action themes: https://www.greensuffolk.org/app/uploads/2021/07/Suffolk-CEP-Table-of-actions.pdf The Suffolk Climate Change, Environment and Energy Board (SCCEEB) are co-ordinating work to improve the energy efficiency of homes using low carbon methods.	IBC have recently appointed a Climate Change Project Manager who will hopefully feed in the Councils contribution to this workstream.

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C7	Supporting, where appropriate, the measures identified in the Ipswich Strategic Planning Area Transport Mitigation Strategy developed by Suffolk County Council to support the Ipswich Strategic Plan Area (ISPA) local plans, works to be funded by the ISPA authorities	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2021	TBC	Suffolk County Council. IPSA authorities	IPSA authorities	NO	Not Funded	Unknown	Planning	Medium	Implementation of transport mitigation strategy	The Ipswich Strategic Planning Area (ISPA) mitigation strategy has been used to secure sustainable transport mitigation on larger sites, such as Wolsey Grange 2 recently. But coming up with a funding formula which can be applied to a wider range of rural and urban sites has proven to be more difficult. Discussions are ongoing with the District / Borough councils to try and refine a project plan and agree on a mechanism for funding.	
D1	Development and implementation of campaign to provide information about the impacts of domestic burning and good practice, including wood burners and burning of garden waste	Public Information	Other	2021	2024	Ipswich Borough Council	Ipswich Borough Council, DEFRA	YES	Funded	£100k - £500k	Implementation	Low	Reduction in number of domestic burning complaints received. Reduction in PM concentrations	Information produced on IBC website relating to domestic burning. Bonfire complaint letters also updated with information. Ipswich secured £115,632 from Defra as part of the 2021 Air Quality Grant Programme to run a monitoring and behavioural change campaign around domestic burning. Project ongoing. Ipswich have committed £33,939 in match funding. Further information on domestic burning will be provided as part of the Defra grant funded project and link to the Ipswich 'Air Aware' Campaign. Hetas and Woodsure have been proactively looking online at wood sellers and identifying those who are not signed up to Woodsure 'Burn Right' campaign. Two sellers were within Suffolk and Trading Standards will be contacting them to advise them of the legislation around solid fuels.	At the time of writing this report, the Councils particulate matter analyser which will monitor PM2.5 and PM10 has just been installed. Levels of particulate matter will be reported on in next years ASR.

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D2	Consider and explore the feasibility of further measures that would improve air quality within both AQMAs and across the borough, including emissions testing within AQMAs, clean air zones, low emission zones and congestion charging	Promoting Low Emission Transport	Other	2019	2026	Suffolk County Council and Ipswich Borough Council	Suffolk County Council and Ipswich Borough Council	NO	Not Funded	Unknown	Planning	High (if LEZ/ congestion charging introduced)	-	Following on from the findings of the Air Quality Assessment commissioned by the Ipswich Strategic Planning Area, the Council need to explore how we address the predicted future exceedance within AQMA 2 in both 2026 and 2036 further with SCC. We are now monitoring at this location to ascertain current concentrations. Current concentrations below NO2 objective level. Neither IBC or SCC are intending to implement a low emission zone or congestion charging at this time.	In the Suffolk Air Quality Strategy Action Plan there is an action to scope out evidence-based initiatives to reduce transport related emissions. Transport colleagues will focus on this. IBC and SCC officers to meet shortly to discuss how to take this forward.
D3	Provision of A rated boilers in IBC owned housing stock	Promoting Low Emission Plant	Other Policy	2019	2023	Ipswich Borough Council	Ipswich Borough Council	NO	Funded		Implementation	Low	All larger properties are to have low NOx boilers, defined as boilers that meet a dry NOx emission rating of 40mg/kWh	Completed. The Council are now replacing boilers on a 15-year replacement cycle.	The Council are writing an updated Asset Strategy at the moment and are looking at a pilot of 50 homes to achieve net zero carbon within 3 years. Currently have a budget of £177M between 2025 and 2035 to achieve net zero carbon across the stock. The Council are hoping to get grant funding to fill the gap (estimated that around £340M is required).
D4	Work with the Private Sector Housing team to improve their renovation grant criteria and include air quality considerations	Policy Guidance and Development Control	Other policy	2019	2024	Ipswich Borough Council	Ipswich Borough Council	NO	Funded	£100k - £500k	Completed	Low	100% of all grants with air quality implications	Policy revised to include energy efficient measures e.g. A rated boilers and insulation, thereby helping to reduce energy use and associated emissions. £50k budget set aside for grants annually.	

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Ipswich Borough Council is undertaking a number of measures within its AQAP to improve air quality generally, as described above, which we consider will also have a positive impact on $PM_{2.5}$. The Suffolk Air Quality Group, of which Ipswich Borough Council is a member, has engaged with Suffolk County Council's (SCC) Public Health Department to pursue a unified approach to tackling $PM_{2.5}$. This is focused on promoting modal shift away from motor vehicle use towards active means of travel such as walking and cycling. Work has also been focused on providing information to the public on the harmful impacts of domestic burning, thereby encouraging behaviour change and reduced/improved burning practices.

The Public Health Outcomes Framework (PHOF) is a Public Health England data tool, intended to focus public health action on increasing healthy life expectancy and reducing differences in life expectancy between communities. The PHOF includes an indicator, based on the effect of particulate matter ($PM_{2.5}$) on mortality. According to the public health outcomes framework, the fraction of mortality in those aged over 30 years, attributable to particulate air pollution (measured as $PM_{2.5}$) in 2021 in Ipswich is 5.8%, above the average for England (5.5%) and the East of England Region (5.5%). This would suggest that $PM_{2.5}$ concentrations in Ipswich are slightly higher than other areas in the UK[7]. However, it should be noted that a large proportion of the $PM_{2.5}$ in Suffolk is derived from intercontinental sources over which the local authority has no control; this may explain, either partly or wholly, why the fraction of mortality in those aged over 30 years, is above the average for England.

[7] Public Health England, Public Health Outcomes Framework, accessed 18/04/2023. Available at: https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/1/gid/1000043/pat/6/par/E12000006/ati/101/are/E07000202/yrr/3/cid/4/tbm/1

When using the current Defra background mapping resource (base year 2018, assessment year 2023), the maximum predicted background annual mean $PM_{2.5}$ concentration within Ipswich is 10.8µm/m^3. This is marginally above the new annual mean $PM_{2.5}$ concentration target of 10µm/m^3 set by Government under the Environment Act 2021. However, the deadline for meeting this target is 2040, and it is envisaged that this target will be achieved through a range of measures. Looking at the predicted background concentrations within Ipswich, it would appear that the interim target of 12 µm/m^3 by January 2028 is already met. Nonetheless, the Council will not be complacent and will continue to work towards reducing concentrations of $PM_{2.5}$ within their control.

The Council does not currently conduct any real time monitoring for either PM_{10} or $PM_{2.5}$. Following on from the Councils successful bid to Defra, the Council secured £115,632 from Defra as part of the 2021 Air Quality Grant Programme to run a monitoring and behavioural change campaign around domestic burning. As part of this, the Council has procured a FIDAS reference analyser and six portable sensors. The analyser and sensors will measure both PM_{10} and $PM_{2.5}$. At the time of writing this report, the reference analyser had just been installed. Findings from the monitoring programme, together with how the behavioural change aspect of the campaign is progressing, will be reported in the 2024 ASR. It is hoped that the behavioural change aspect of the campaign will lead to a reduction in concentrations of particulate matter associated with domestic burning.

Furthermore, at the time of writing this report, Defra have submitted a planning application to the Council in relation to the installation of an air quality monitoring station that forms part of the Automatic Urban and Rural Network (AURN). Council officers worked closely with Bureau Veritas to assist them in scoping out a suitable site for the station. Once installed, it will monitor for particulate matter and provide the Council with a useful indicator to assess progress in reducing concentrations of $PM_{2.5}$.

During the latter part of 2019 and in 2020, the Council, together with all the other Local Authorities across Suffolk worked with Suffolk County Council's Transport and Public Health colleagues to prepare an 'Air Quality Profile' report for Suffolk. The report maps, at a district and borough level, local air pollution levels and explores evidence-based interventions that can be undertaken by local authorities, businesses, communities and individuals to improve air quality. The report was published in June 2021 following sign-off from the Suffolk Director of Public Health.

As a result of the report, air quality was made a priority by the Suffolk Health and Wellbeing board as part of their duty to "encourage integrated working" between health,

care, police and other public services in order to improve wellbeing outcomes for Suffolk. The recommendations from the Suffolk Profile have also informed both the development of a Suffolk-wide Air Quality Strategy which was published in May 2023 and the Suffolk Community Engagement Plan.

The Air Quality Strategy sets out the range of actions identified as being important to the improvement of air quality (both concentrations of nitrogen dioxide and particulate matter), along with who is the lead authority for the work, timescales for implementation, and what measurements or outcomes will be achieved.

The air quality engagement plan sets out the action Suffolk County Council (SCC), working with borough and district partners, will take to raise awareness of the health impacts of air quality in Suffolk. The aim is to increase awareness to enable individuals to make choices that protect both their health and the health of others from the harmful effects of pollution.

We will continue to consult with Suffolk County Council Public Health colleagues and be advised by them, and national guidance, on any relevant measures that will reduce exposure to $PM_{2.5}$.

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

This section sets out the monitoring undertaken within 2022 by Ipswich Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Ipswich Borough Council undertook automatic (continuous) monitoring at two sites during 2022 (IPS3 – Chevallier Street / IPS04 – St Matthews Street). Table A.1 in Appendix A shows the details of the automatic monitoring sites. The Air Quality England page presents automatic monitoring results for Ipswich Borough Council, with automatic monitoring results 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.

Following on from the Councils successful bid to Defra, the Council secured £115,632 from Defra as part of the 2021 Air Quality Grant Programme to run a monitoring and behavioural change campaign around domestic burning. As part of this, the Council has procured a reference analyser and six portable sensors. At the time of writing this report, the reference analyser had recently been installed and is now collecting data. Sensors have already been installed and have begun to collect data. Before the sensor data can be published, the sensors need to be co-located against the reference analyser for verification purposes. The analyser and sensors will measure both PM_{10} and $PM_{2.5}$. Findings from the monitoring programme will be reported in the 2024 ASR.

3.1.2 Non-Automatic Monitoring Sites

As part of its normal monitoring programme, Ipswich Borough Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 90 sites during 2022. 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.

Due to issues, the following tubes were relocated in 2022:

- Tube 42 - Norwich Road. Relocated to a downpipe on a relevant receptor in very close proximity to the old site due to issues with access.
- Tube 91 – London Road. Relocated to a nearby relevant receptor due to issues with access.

Both relocated tubes were classed as new locations in 2022 for the purposes of accurate data analysis and the reporting of trends.

Once bias and distance corrected, none of the new locations (including relocated locations) were in exceedance of the annual mean NO_2 concentration. Further details can be found in Appendix B. The Council will continue to monitor levels of pollution at these sites in 2023 and report on them in the 2024 ASR.

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 2022 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. There are no annual averages greater than 60µg/m3 that would indicate an exceedance of the 1-hour mean objective.

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.

Looking at the nationally bias adjusted and distance corrected data for the non-automatic monitoring locations, there were three exceedances if the annual mean NO_2 concentration. The sites that recorded exceedances were:

- 1 site located within AQMA 2. Tubes 11, 12 & 19 – triplicate.
- 2 sites located within AQMA 5. Tube 52 and tubes 64 & 65 – duplicate

Once bias and distance corrected, six sites recorded concentrations within 10% below the annual mean NO_2 objective level, these were:

- 1 site located within AQMA 2. Tube 68.
- 1 site located within AQMA 3. Tubes 30.
- 2 sites located within AQMA 5. Tubes 49 and 53.
- 2 sites located outside AQMAs. Tubes 18 and 31. It should be noted that tube 31 has no relevant receptor near to this site so the annual mean objective level does not apply.

When comparing the 2022 bias adjusted results to the 2021 results; in 2021 there were three recorded exceedances which are the same three sites that recorded exceedances in 2022. In 2021, there were five sites that recorded concentrations within 10% below the annual mean NO_2 objective level. These sites were in AQMA 2 (Tube 68), AQMA 3 (Tube 30), AQMA 5 (Tube 49) and two sites outside AQMAs (Tubes 18 and 31). **Note:** in the 2022 ASR, tube 39 in AQMA 3 was recorded as being within 10% of the annual mean NO_2 objective level, but this was a typo; following distance correction the site was not within 10% of the objective level (recorded as 32.7 µg/m^3).

For the fourth year in a row, there were no exceedances of the annual mean NO_2 objective level in AQMA 1. However, in 2019, Tube 14 within AQMA 1 recorded a concentration

within 10% below the annual mean NO_2 objective level. Despite this, AQMA 1 has experienced three consecutive years of annual mean concentrations being lower than 36µg/m^3. In line with LAQM.TG22, the Council will now conduct a detailed assessment and consider whether to pursue the revocation of AQMA 1. The outcome of the detailed assessment will be reported on in next year's ASR.

Figures A.1 – A.11 shows bias corrected trendline plots for clusters of passive monitoring locations in and around each of the 4 AQMAs. Despite AQMA 4 being revoked in August 2021, it is included for transparency to help demonstrate that it was appropriate to revoke the AQMA due to continued NO_2 concentrations under the national objective level.

When looking at the bias corrected data for 2022, annual mean NO_2 concentrations have generally increased slightly compared to the previous two years. However, concentrations have generally remained below 2019 levels. It is likely that the increase in concentrations in 2021 and 2022 compared to 2020 was linked to the relaxation and removal of Government restrictions associated with the COVID-19 pandemic.

Since 2020, the Council have used a combined local bias correction factor as a result of a high data capture rate from both of our continuous analysers. However, due to the exceptional temperatures experienced in the summer of 2022, data between June and September had to be rejected from our analyser on Chevallier Street as the monitor could not be cooled sufficiently despite the procurement of a new air conditioning unit. As a result of this, we had less than 75% data capture for the Chevallier Street site and have been unable to calculate a combined local bias correction factor for 2022.

The Council calculated a local bias correction factor from the St Matthews Street analyser (98% data capture), and this was recorded as 0.66. As the local bias correction factor was lower than the nationally derived bias correction factor (0.76), it was decided to apply the national correction factor to the data this year to give robust, conservative results. Had the Council applied the local correction factor to the data, we would not have recorded any exceedances of the annual mean NO_2 objective level for 2022. However, tubes 11, 12 &19 – triplicate (AQMA 2) and tubes 64 and 65 – duplicate (AQMA 5) would be within 10% of the annual mean NO_2 objective level.

3.2.2 Particulate Matter (PM_{10} and $PM_{2.5}$)

Ipswich Borough Council does not currently monitor for particulate matter (PM_{10} and $PM_{2.5}$). However, as part of the Councils successful air quality grant application to Defra in 2021, the Council have procured a FIDAS particulate analyser which will analyse both

PM_{10} and $PM_{2.5}$. The analyser has recently been installed and is collecting data. Data collected in 2023 will be reported on in the 2024 ASR submission.

In addition to the above, the Council are currently working with Defra to identify a suitable location for a particulate analyser that forms part of the Automatic Urban and Rural Network (AURN). If a suitable location is found, any data subsequently collected will be reported on in future ASR submissions.

3.2.3 Sulphur Dioxide (SO_2)

Ipswich Borough Council does not monitor for Sulphur Dioxide (SO2) – previous screening work has not suggested that there will be any exceedance of the objective levels.

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)
IPS3	Chevallier Street	Roadside	615261	245350	NO2	NO. Was in AQMA 1 until amended on 19/08/2021	Chemiluminescent	2.5	2.5	1.5
IPS04	St Matthews Street	Roadside	615870	244858	NO2	NO	Chemiluminescent	12.8	2.9	1.38

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)
1	Civic Drive	Roadside	615992	244412	NO2	No	18.8	6.0	No	2.6
2	Chevallier Street	Roadside	615144	245245	NO2	No	1.6	2.0	No	2.4
3	Coprolite Street / Duke Street	Kerbside	617070	244039	NO2	No	N/A	0.8	No	2.6
4	Norwich Road	Roadside	615620	245000	NO2	No	0.0	5.7	No	2.4
5	Fore Street	Roadside	616887	244128	NO2	Yes - AQMA 3	0.9	3.3	No	2.4
6	Kings Avenue	Urban Background	617288	244429	NO2	No	0.0	4.3	No	2.1
7	Bramford Road	Roadside	615007	245239	NO2	No	0.0	5.6	No	2.3
8, 9, 10	Bramford Road	Roadside	615125	245209	NO2	No	4.3	2.2	No	2.5
13	Bramford Lane	Roadside	615117	245305	NO2	No	3.3	1.2	No	2.5
14	Chevallier Street	Roadside	615285	245393	NO2	Yes - AQMA 1	0.4	2.5	No	2.2
15	Tavern Street	Urban Background	616282	244643	NO2	No	N/A	N/A	No	2.6
16	Valley Road / Westwood Court	Roadside	615362	245437	NO2	No	2.6	3.1	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)
17	Woodbridge Road	Roadside	616993	244659	NO2	No	2.1	1.8	No	2.5
18	Yarmouth Road	Roadside	615090	245178	NO2	No	0.0	3.2	No	2.2
11, 12, 19	St Margaret's Street / Piper's Court	Roadside	616593	244753	NO2	Yes - AQMA 2	0.0	2.5	No	2.3
20	Fonnereau Road	Roadside	616458	244829	NO2	No	1.8	2.2	No	2.6
21	St Margaret's Plain	Roadside	616494	244807	NO2	Yes - AQMA 2	N/A	2.0	No	2.4
22	St Margaret's Plain / Northgate Street	Roadside	616489	244785	NO2	Yes - AQMA 2	N/A	1.6	No	2.6
23	St Margaret's Green	Roadside	616645	244784	NO2	No	0.0	3.3	No	2.5
24	St Margaret's Street	Roadside	616663	244692	NO2	Yes - AQMA 2	N/A	3.3	No	2.4
25	St Helen's Street	Roadside	616753	244582	NO2	Yes - AQMA 2	1.1	3.0	No	2.5
26	St Helen's Street / Grimwade Street	Roadside	616971	244511	NO2	No	0.0	3.6	No	2.3
27	Argyle Street	Roadside	616965	244546	NO2	Yes - AQMA 2	0.3	1.2	No	2.3
28	Chevallier Street	Roadside	615194	245292	NO2	No	2.6	1.9	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)
29	Fore Hamlet	Roadside	617118	244074	NO2	No	0.0	2.2	No	2.7
30	Fore Street	Roadside	616939	244114	NO2	Yes - AQMA 3	1.4	2.7	No	2.5
31	Star Lane	Roadside	616332	244149	NO2	No	N/A	2.4	No	2.3
32	Spring Road	Roadside	617398	244573	NO2	No	2.9	2.0	No	2.5
33	Key Street	Roadside	616666	244114	NO2	Yes - AQMA 3	0.0	2.0	No	2.5
34	College Street	Roadside	616467	244072	NO2	Yes - AQMA 3	N/A	1.8	No	2.5
35	Cobden Place	Roadside	616746	244696	NO2	No	0.0	1.1	No	2.4
36	Valley Road	Roadside	616820	246158	NO2	No	15.0	2.2	No	2.5
37	Star Lane	Roadside	616845	244252	NO2	No	0.0	1.1	No	2.5
38	Civic Drive	Kerbside	615904	244805	NO2	No	6.3	0.9	No	2.5
39	Star Lane	Kerbside	616712	244228	NO2	Yes - AQMA 3	1.3	0.8	No	2.4
40	Norwich Road	Roadside	615460	245148	NO2	No	5.7	2.8	No	2.4
41	Bramford Road / Norwich Road	Roadside	615564	245010	NO2	No	0.5	1.3	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)
42	Norwich Road	Roadside	615744	244901	NO2	Yes - AQMA 5	0.0	2.5	No	2.7
43	Bramford Road / Yarmouth Road	Roadside	615109	245200	NO2	No	0.6	3.6	No	2.4
44	Bramford Road	Roadside	615052	245237	NO2	No	4.8	1.6	No	2.4
45, 46, 47	Chevallier Street	Roadside	615261	245350	NO2	No	2.5	4.2	Yes	1.2
48	Valley Road	Roadside	615425	245486	NO2	No	7.4	2.6	No	2.7
49	St Matthew's Street	Roadside	615792	244876	NO2	Yes - AQMA 5	0.0	1.9	No	2.6
50	Barrack Lane	Roadside	615773	244890	NO2	Yes - AQMA 5	1.5	1.4	No	2.4
51	St Matthew's Street	Kerbside	615769	244866	NO2	Yes - AQMA 5	4.5	0.9	No	2.6
52	St Matthew's Street	Roadside	615826	244871	NO2	Yes - AQMA 5	0.0	2.2	No	2.5
53	St Matthew's Street	Roadside	615820	244858	NO2	Yes - AQMA 5	0.0	2.2	No	2.3
54	St Matthew's Street Roundabout	Roadside	615893	244855	NO2	No	10.4	1.3	No	2.5
55	Berners Street	Roadside	615917	244898	NO2	No	0.0	2.3	No	2.5
56	Berners Street	Roadside	615931	244911	NO2	No	0.0	1.5	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)
57	Berners Street	Roadside	615941	244981	NO2	No	0.0	8.1	No	2.5
58	Berners Street	Kerbside	615978	245042	NO2	No	7.7	0.5	No	2.5
59	St Matthew's Street Roundabout	Roadside	615926	244837	NO2	No	N/A	2.9	No	2.5
60	Colchester Road	Roadside	617438	246168	NO2	No	14.5	3.1	No	2.4
61	Valley Road	Roadside	616099	246105	NO2	No	19.5	2.4	No	2.5
62	St Matthew's Street	Roadside	615935	244803	NO2	No	2.9	1.8	No	2.6
63	St Matthew's Street	Roadside	615950	244790	NO2	No	0.0	3.3	No	2.4
64, 65	Norwich Road	Roadside	615688	244939	NO2	Yes - AQMA 5	0.4	1.3	No	2.4
66	Woodbridge Road	Roadside	616807	244669	NO2	Yes - AQMA 2	0.0	3.4	No	2.4
67	Blanche Street	Roadside	616890	244676	NO2	No	6.3	1.4	No	2.6
68	Woodbridge Road	Roadside	616905	244657	NO2	Yes - AQMA 2	0.0	3.4	No	2.5
69	Argyle Street	Roadside	616978	244590	NO2	No	0.0	4.8	No	2.5
70	Argyle Street	Roadside	616965	244583	NO2	No	N/A	1.6	No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
71	St Helen's Street	Roadside	617032	244537	NO2	No	0.0	14.5	No	2.5
72	St Helen's Street	Roadside	617123	244535	NO2	Yes - AQMA 2	0.0	1.9	No	2.6
73	Regent Street	Kerbside	617124	244517	NO2	No	0.0	1.0	No	2.6
74	Grimwade Street	Roadside	616953	244443	NO2	No	N/A	2.1	No	2.5
75	Grimwade Street	Roadside	616927	244395	NO2	No	0.0	7.0	No	2.2
76	St Helen's Street	Roadside	616951	244521	NO2	Yes - AQMA 2	0.0	3.0	No	2.5
77	St Helen's Street	Roadside	616902	244542	NO2	No	0.0	4.7	No	2.5
78	Orchard Street	Roadside	616870	244586	NO2	No	1.5	1.4	No	2.6
79	Woodbridge Road	Kerbside	617052	244677	NO2	No	N/A	0.5	No	2.4
80, 81, 82	St Helen's Street	Kerbside	616821	244546	NO2	Yes - AQMA 2	N/A	1.0	No	2.4
83	Bond Street	Roadside	616792	244498	NO2	No	1.6	1.6	No	2.2
84	Carr Street / Major's Corner	Roadside	616702	244601	NO2	No	N/A	4.4	No	2.5
85	Old Foundry Road	Roadside	616681	244623	NO2	No	0.2	1.3	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)
86	Upper Orwell Street	Kerbside	616727	244566	NO2	No	0.0	0.9	No	2.2
87	Northgate Street	Roadside	616481	244725	NO2	No	0.0	1.8	No	2.3
88	Stoke Street	Roadside	616307	243875	NO2	No	0.0	1.8	No	2.5
89	Hadleigh Road	Roadside	614816	244585	NO2	No	4.2	2.8	No	2.5
90	Hadleigh Road	Roadside	614893	244558	NO2	No	0.0	12.1	No	2.4
91	London Road	Roadside	615195	244621	NO2	No	0.0	9.7	No	2.3
92	Ipswich Hospital	Other	619407	244712	NO2	No	3.8	N/A	No	2.1
93	Grove Lane	Roadside	617360	244536	NO2	No	0.0	4.8	No	2.4
94	Fore Hamlet	Roadside	617363	243887	NO2	No	0.0	7.5	No	2.7
95	Vernon Street	Roadside	616415	243776	NO2	No	0.0	6.1	No	2.4
96	Crown Street	Kerbside	616279	244807	NO2	Yes - AQMA 2	2.2	0.9	No	2.4
97	Crown Street/Northgate Street	Kerbside	616474	244795	NO2	Yes - AQMA 2	5.8	2.9	No	2.2
98	Fore Street	Kerbside	617037	244085	NO2	No	0.0	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)
99, 100, 101	St Matthew's Street	Roadside	615870	244858	NO2	No	11.9	4.2	Yes	1.4

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 2022 (%) (2)	2018	2019	2020	2021	2022
IPS3	615261	245350	Roadside	68.66	68.66	28	26	20.7	23	20
IPS04	615870	244858	Roadside	93.26	93.26	**N/A**	37	26.3	28	28

☒ **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.**

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 2022 (%) (2)	2018	2019	2020	2021	2022
1	615992	244412	Roadside	100	100.0	26.0	24.0	18.5	19.3	21.0
2	615144	245245	Roadside	100	100.0	**42.0**	38.0	30.1	30.9	33.7
3	617070	244039	Kerbside	100	100.0	27.0	26.0	19.5	20.9	22.0
4	615620	245000	Roadside	100	100.0	**N/A**	31.0	24.5	26.3	27.4
5	616887	244128	Roadside	100	100.0	**42.0**	39.0	32.1	33.3	33.4
6	617288	244429	Urban Background	100	100.0	**N/A**	**N/A**	**N/A**	12.1	12.9
7	615007	245239	Roadside	100	100.0	31.0	30.0	23.4	25.4	26.2
8, 9, 10	615125	245209	Roadside	100	100.0	34.0	32.0	25.4	29.1	28.4
13	615117	245305	Roadside	100	100.0	24.0	23.0	18.3	20.4	19.8
14	615285	245393	Roadside	100	100.0	**45.0**	**41.0**	32.1	34.2	33.1
15	616282	244643	Urban Background	100	100.0	26.0	22.0	16.7	17.8	19.1
16	615362	245437	Roadside	92.3	92.3	35.0	33.0	25.6	27.3	28.3
17	616993	244659	Roadside	100	100.0	**46.0**	**42.0**	32.9	35.2	35.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
18	615090	245178	Roadside	100	100.0	**N/A**	**41.0**	33.4	36.3	37.4
11, 12, 19	616593	244753	Roadside	100	100.0	**48.0**	**47.0**	36.7	**41.9**	**42.2**
20	616458	244829	Roadside	100	100.0	33.0	29.0	21.9	24.2	26.4
21	616494	244807	Roadside	90.4	90.4	38.0	34.0	25.7	27.2	30.7
22	616489	244785	Roadside	100	100.0	39.0	34.0	23.6	25.4	30.0
23	616645	244784	Roadside	90.4	90.4	21.0	21.0	15.9	17.3	17.9
24	616663	244692	Roadside	100	100.0	**40.0**	38.0	30.3	34.2	33.4
25	616753	244582	Roadside	92.3	92.3	39.0	36.0	29.6	34.8	33.2
26	616971	244511	Roadside	100	100.0	36.0	34.0	25.4	30.0	29.4
27	616965	244546	Roadside	100	100.0	**43.0**	38.0	29.0	31.6	32.6
28	615194	245292	Roadside	100	100.0	38.0	35.0	26.4	29.6	29.7
29	617118	244074	Roadside	100	100.0	32.0	31.0	24.0	27.6	26.9
30	616939	244114	Roadside	92.3	92.3	**49.0**	**46.0**	34.7	37.5	39.6
31	616332	244149	Roadside	100	100.0	**45.0**	**44.0**	33.8	38.6	38.3

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 2022 (%) (2)	2018	2019	2020	2021	2022
32	617398	244573	Roadside	100	100.0	31.0	30.0	23.3	25.2	26.7
33	616666	244114	Roadside	100	100.0	34.0	32.0	23.4	27.7	27.7
34	616467	244072	Roadside	100	100.0	39.0	33.0	25.0	27.7	28.4
35	616746	244696	Roadside	100	100.0	27.0	26.0	19.6	21.2	22.4
36	616820	246158	Roadside	100	100.0	31.0	31.0	22.8	22.6	24.6
37	616845	244252	Roadside	100	100.0	**N/A**	31.0	22.4	25.2	27.8
38	615904	244805	Kerbside	92.3	92.3	35.0	33.0	25.1	27.7	29.8
39	616712	244228	Kerbside	100	100.0	**N/A**	**41.0**	30.5	36.5	37.4
40	615460	245148	Roadside	100	100.0	30.0	27.0	20.1	23.8	22.9
41	615564	245010	Roadside	92.3	92.3	37.0	36.0	27.2	29.2	30.6
42	615744	244901	Roadside	92.3	92.3	**N/A**	**N/A**	**N/A**	**N/A**	34.1
43	615109	245200	Roadside	100	100.0	38.0	36.0	28.8	30.9	32.4
44	615052	245237	Roadside	100	100.0	38.0	34.0	26.1	30.4	30.4
45, 46, 47	615261	245350	Roadside	100	100.0	28.0	26.0	19.9	22.3	22.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
48	615425	245486	Roadside	92.3	92.3	27.0	25.0	19.0	20.7	21.6
49	615792	244876	Roadside	92.3	92.3	**46.0**	**42.0**	32.0	37.5	37.6
50	615773	244890	Roadside	100	100.0	27.0	24.0	19.2	20.2	22.8
51	615769	244866	Kerbside	92.3	92.3	**42.0**	37.0	26.5	30.3	33.6
52	615826	244871	Roadside	100	100.0	**46.0**	**45.0**	36.4	**40.1**	**40.3**
53	615820	244858	Roadside	100	100.0	**46.0**	**44.0**	33.8	35.8	37.8
54	615893	244855	Roadside	100	100.0	37.0	36.0	27.5	29.2	32.3
55	615917	244898	Roadside	100	100.0	29.0	27.0	20.1	23.2	24.6
56	615931	244911	Roadside	100	100.0	29.0	27.0	20.9	24.0	22.9
57	615941	244981	Roadside	100	100.0	25.0	24.0	17.4	18.2	19.6
58	615978	245042	Kerbside	100	100.0	25.0	24.0	17.4	19.1	19.9
59	615926	244837	Roadside	82.7	82.7	32.0	32.0	24.2	25.4	27.1
60	617438	246168	Roadside	100	100.0	29.0	28.0	20.5	21.8	22.5
61	616099	246105	Roadside	90.4	90.4	**40.0**	38.0	28.3	30.2	31.2

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 2022 (%) (2)	2018	2019	2020	2021	2022
62	615935	244803	Roadside	84.6	84.6	36.0	34.0	26.6	28.6	35.5
63	615950	244790	Roadside	90.4	90.4	36.0	37.0	27.0	30.6	33.2
64, 65	615688	244939	Roadside	100	100.0	**55.0**	**51.0**	**40.3**	**41.9**	**44.6**
66	616807	244669	Roadside	100	100.0	**42.0**	39.0	31.0	33.3	33.4
67	616890	244676	Roadside	92.3	92.3	28.0	27.0	21.3	23.2	23.3
68	616905	244657	Roadside	82.7	82.7	**44.0**	**43.0**	33.2	36.2	36.2
69	616978	244590	Roadside	100	100.0	27.0	26.0	20.5	22.2	22.5
70	616965	244583	Roadside	100	100.0	38.0	36.0	25.8	28.0	29.5
71	617032	244537	Roadside	100	100.0	25.0	24.0	17.3	20.6	20.3
72	617123	244535	Roadside	100	100.0	38.0	35.0	26.0	30.3	30.4
73	617124	244517	Kerbside	100	100.0	23.0	22.0	16.0	17.4	17.0
74	616953	244443	Roadside	92.3	92.3	27.0	26.0	20.1	22.1	21.9
75	616927	244395	Roadside	100	100.0	**N/A**	**N/A**	**N/A**	18.9	18.6
76	616951	244521	Roadside	92.3	92.3	37.0	36.0	28.0	31.0	31.6

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 2022 (%) (2)	2018	2019	2020	2021	2022
77	616902	244542	Roadside	100	100.0	29.0	26.0	20.2	23.1	24.2
78	616870	244586	Roadside	100	100.0	24.0	23.0	17.6	20.1	19.8
79	617052	244677	Kerbside	100	100.0	36.0	35.0	27.8	31.1	29.6
80, 81, 82	616821	244546	Kerbside	100	100.0	38.0	36.0	27.4	30.1	32.0
83	616792	244498	Roadside	92.3	92.3	31.0	29.0	21.8	25.9	24.6
84	616702	244601	Roadside	100	100.0	26.0	24.0	18.0	20.1	20.7
85	616681	244623	Roadside	100	100.0	32.0	30.0	23.9	26.4	25.9
86	616727	244566	Kerbside	100	100.0	**N/A**	**N/A**	19.9	22.7	23.4
87	616481	244725	Roadside	100	100.0	**N/A**	**N/A**	22.3	21.3	28.4
88	616307	243875	Roadside	100	100.0	**N/A**	**N/A**	28.4	32.8	31.6
89	614816	244585	Roadside	100	100.0	**N/A**	**N/A**	21.8	24.0	24.8
90	614893	244558	Roadside	100	100.0	**N/A**	**N/A**	20.1	21.1	21.2
91	615195	244621	Roadside	82.7	82.7	**N/A**	**N/A**	**N/A**	**N/A**	21.2
92	619407	244712	Other	92.3	92.3	**N/A**	**N/A**	**N/A**	14.0	14.4

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 2022 (%) [2]	2018	2019	2020	2021	2022
93	617360	244536	Roadside	100	100.0	**N/A**	32.0	24.2	25.8	26.2
94	617363	243887	Roadside	100	100.0	**N/A**	26.0	20.6	20.6	21.9
95	616415	243776	Roadside	92.3	92.3	**N/A**	24.0	17.4	19.8	18.5
96	616279	244807	Kerbside	100	100.0	**N/A**	**42.0**	30.5	32.9	36.7
97	616474	244795	Kerbside	100	100.0	**N/A**	**N/A**	**N/A**	32.2	36.3
98	617037	244085	Kerbside	100	100.0	**N/A**	**N/A**	**N/A**	30.7	31.4
99, 100, 101	615870	244858	Roadside	100	100.0	**N/A**	**41.0**	26.8	29.6	32.1

☒ **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 in AQMA No.1

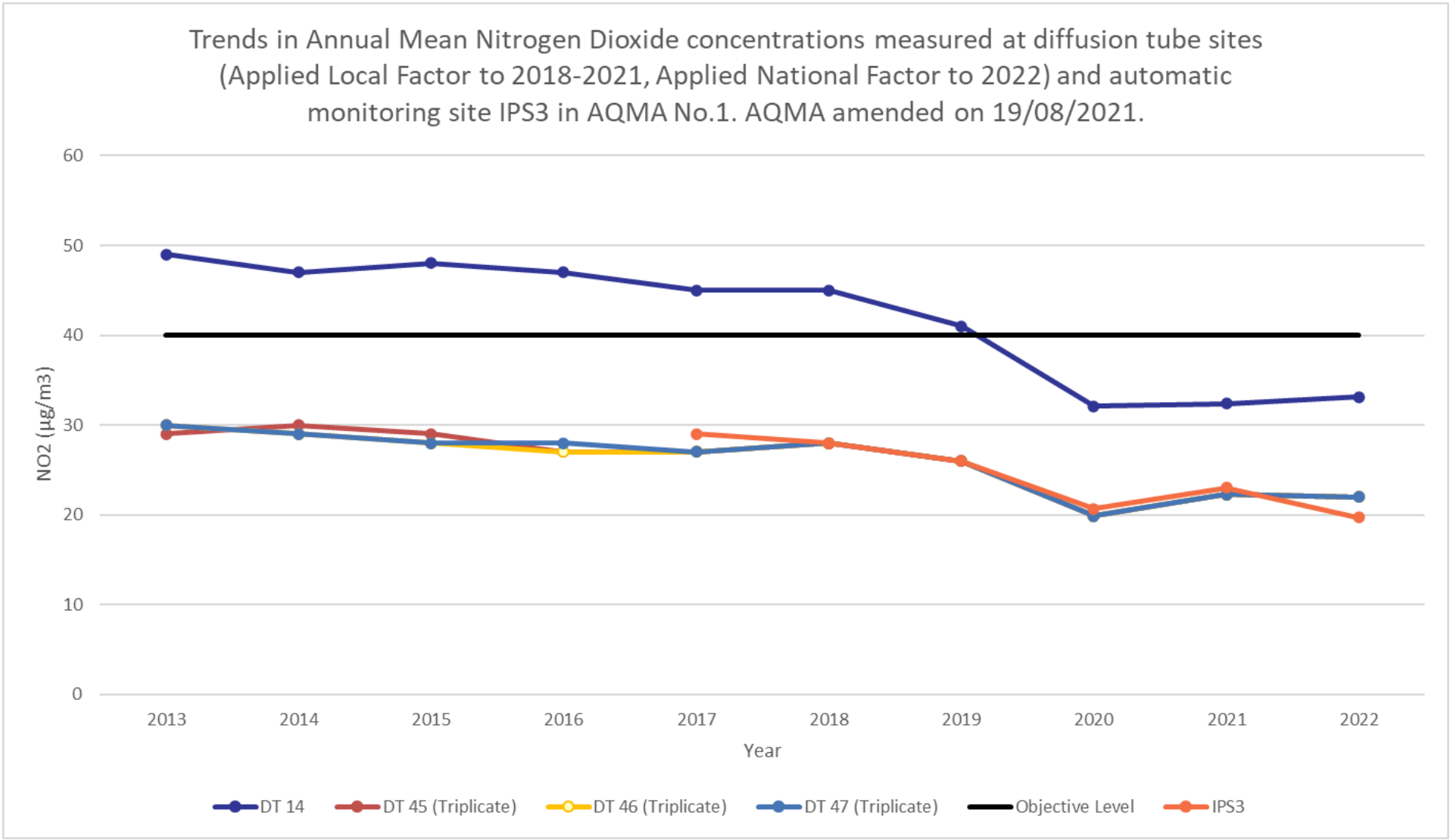


Figure A.2 – Trends in Annual Mean NO_2 Concentrations in AQMA No.2

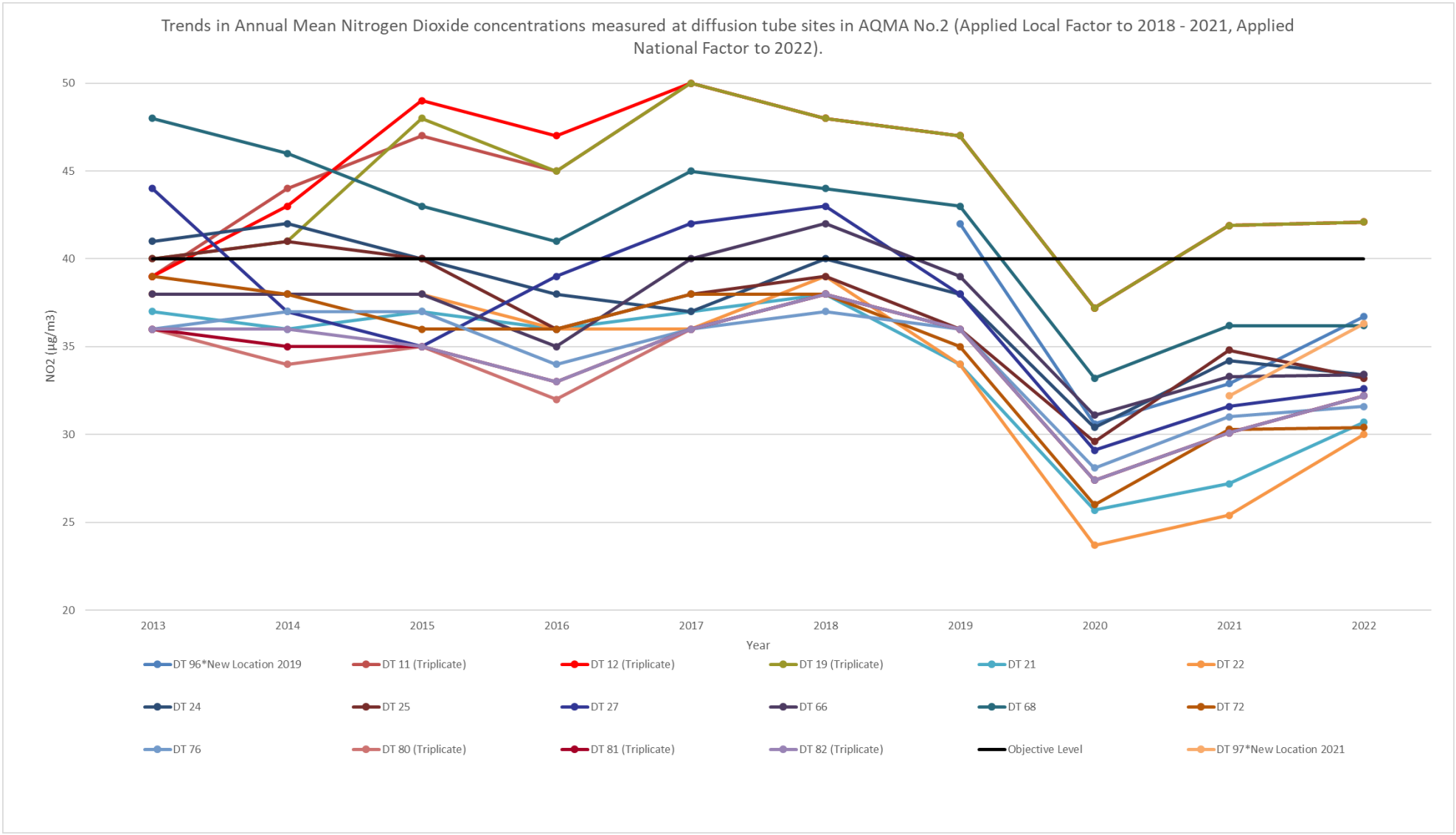


Figure A.3 – Trends in Annual Mean NO_2 Concentrations in AQMA No.3

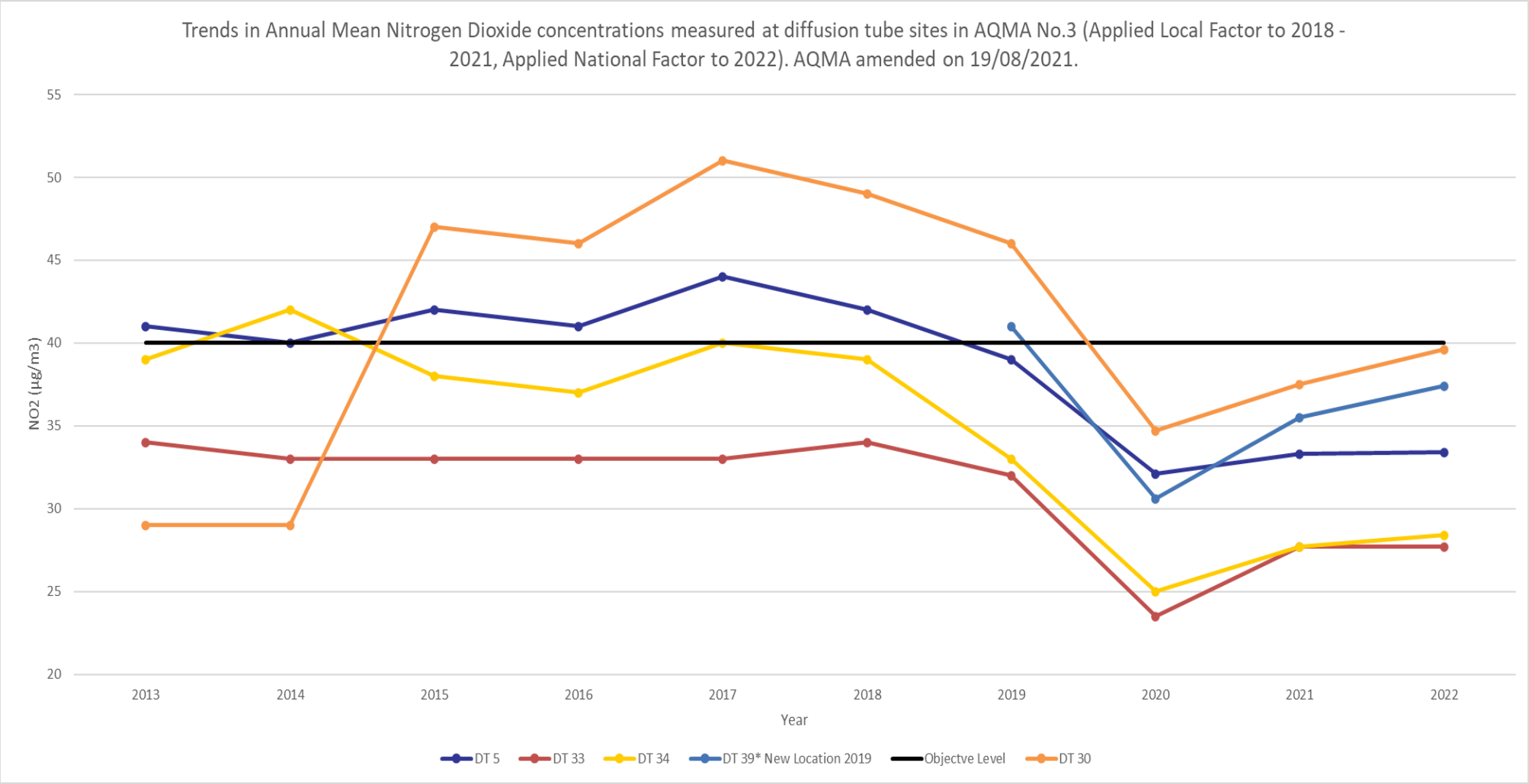


Figure A.4 – Trends in Annual Mean NO_2 Concentrations in former AQMA No.4. AQMA revoked on 19/08/2021.

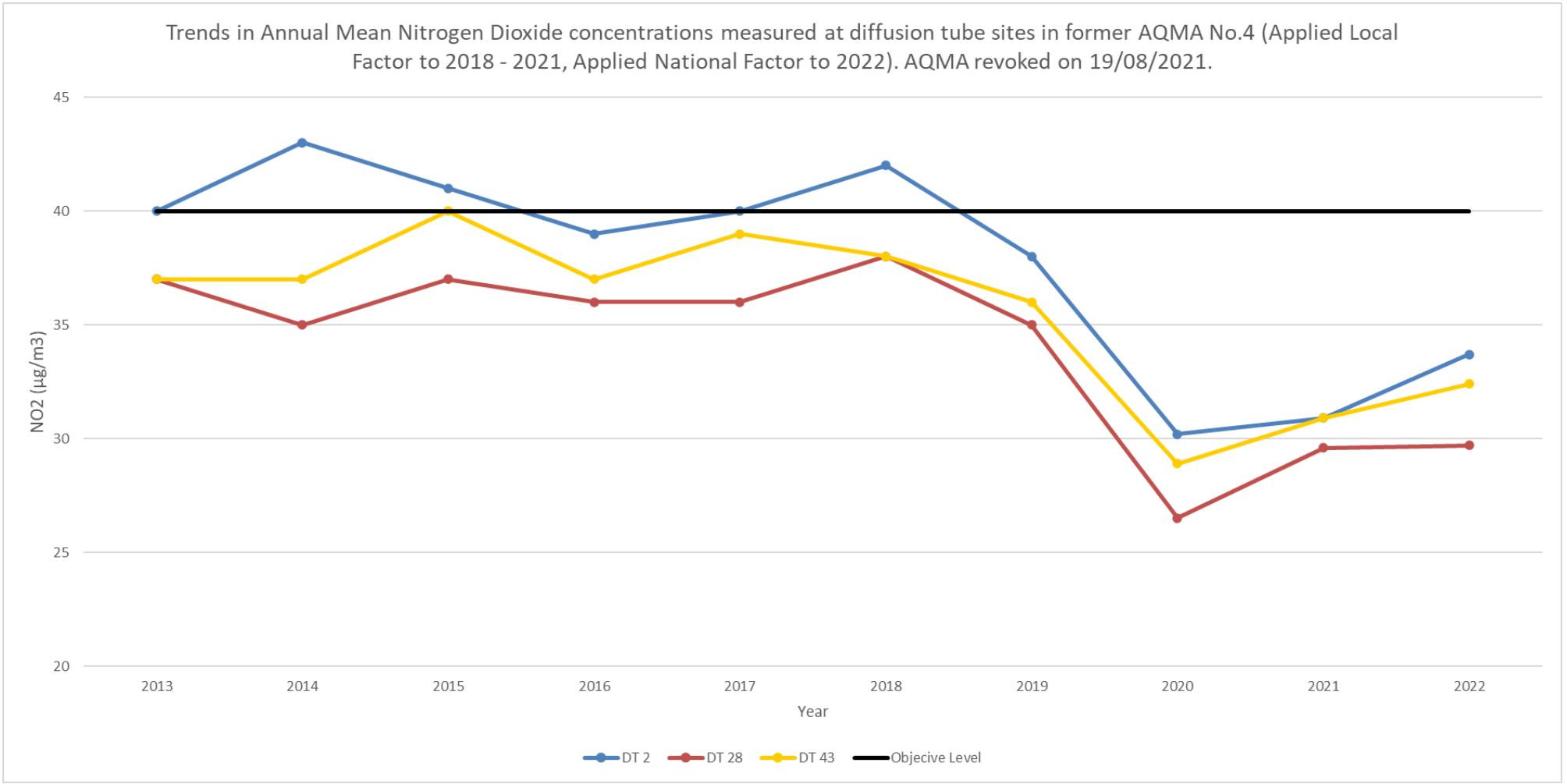


Figure A.5 – Trends in Annual Mean NO_2 Concentrations in AQMA No.5

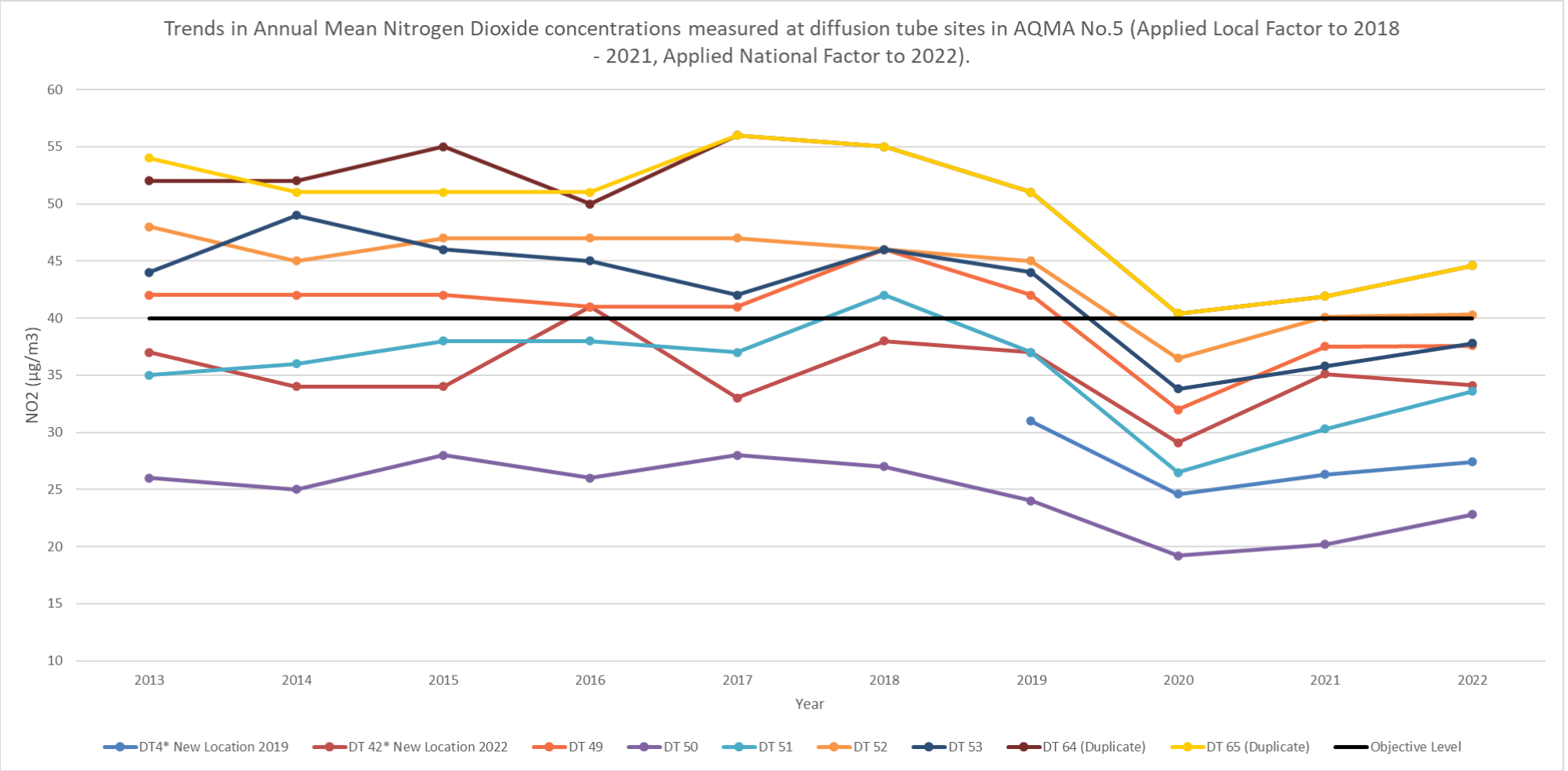


Figure A.6 – Trends in Annual Mean NO_2 Concentrations outside of AQMA sites (other tubes between 1 – 19)

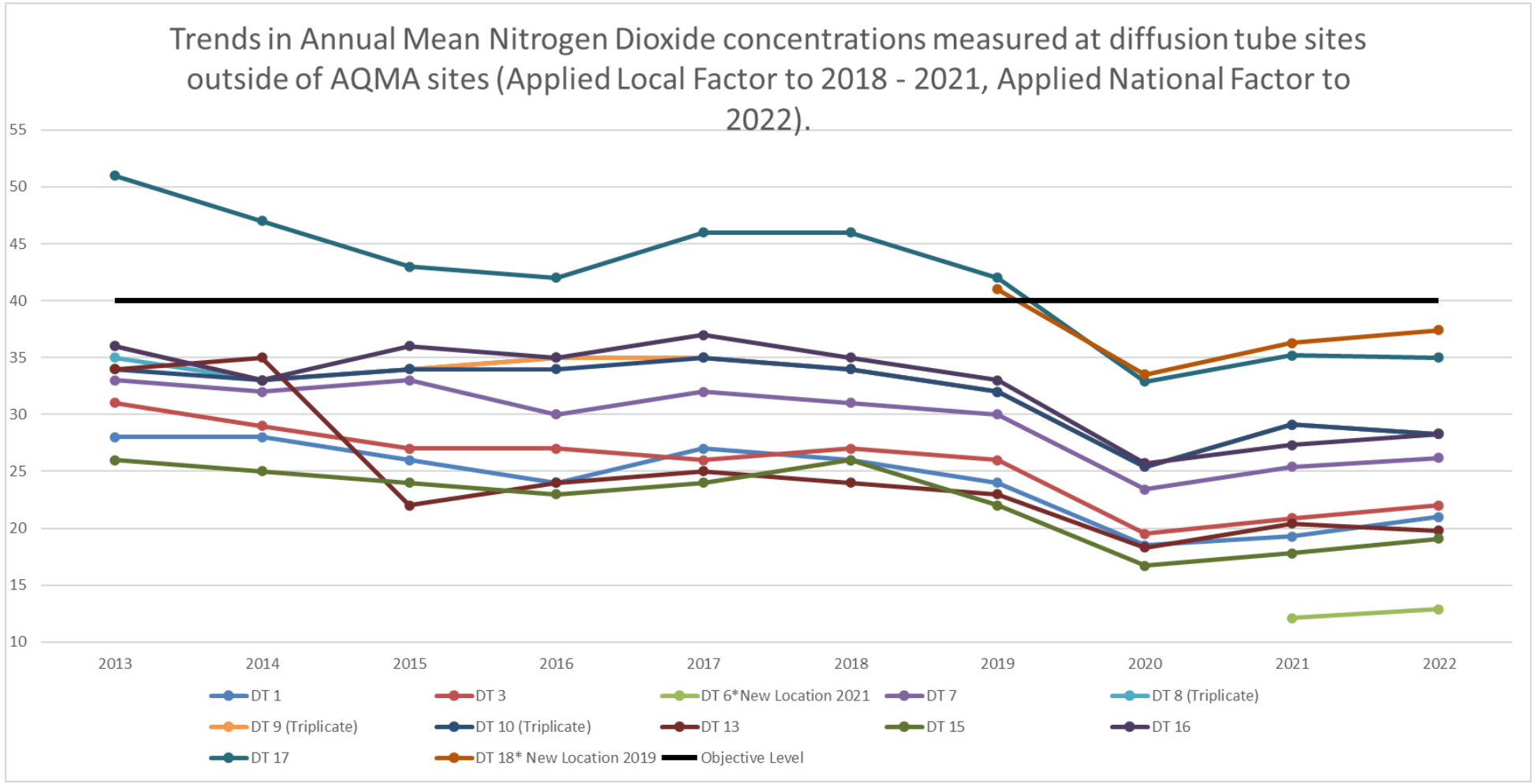


Figure A.7 – Trends in Annual Mean NO_2 Concentrations outside of AQMA sites (other tubes between 20 - 39)

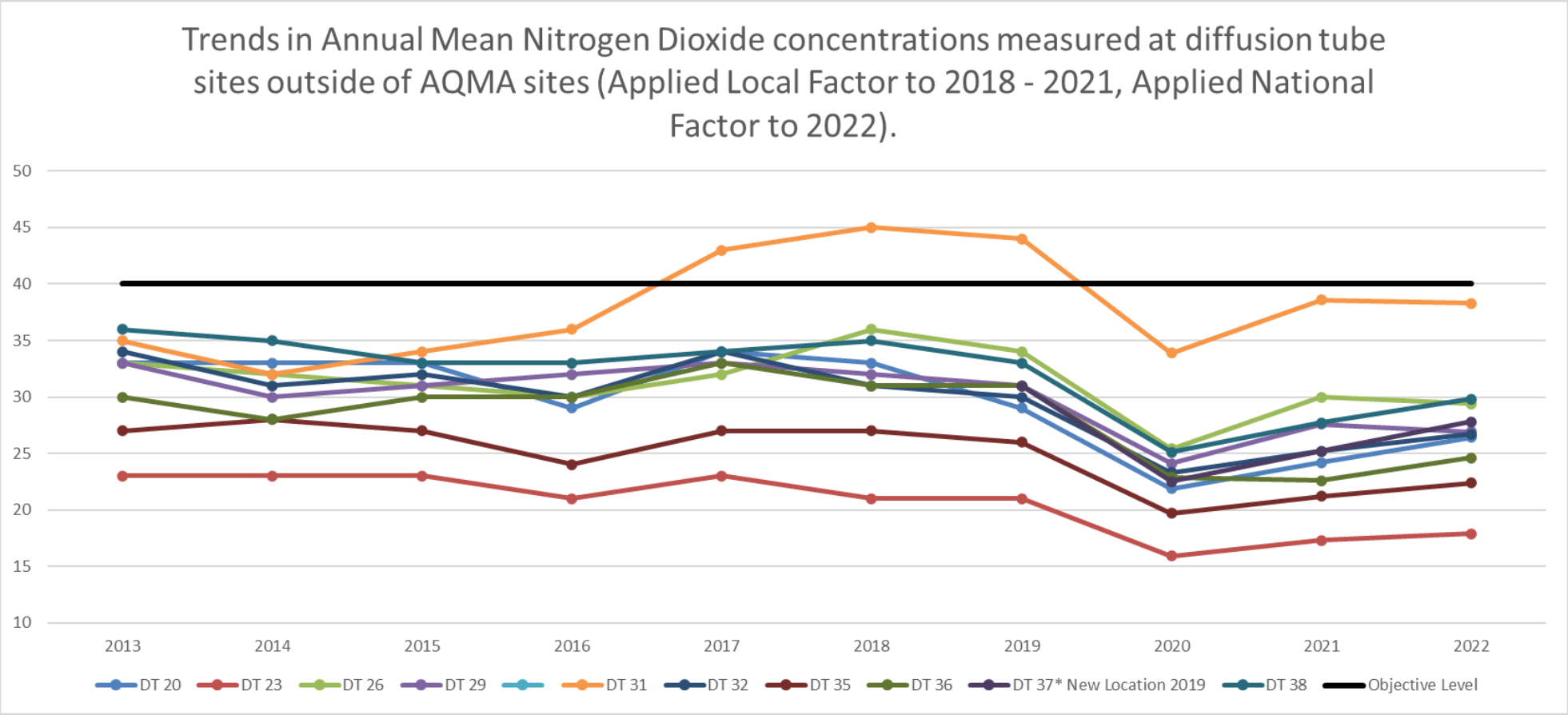


Figure A.8 – Trends in Annual Mean NO_2 Concentrations outside of AQMA sites (other tubes between 40 - 59)

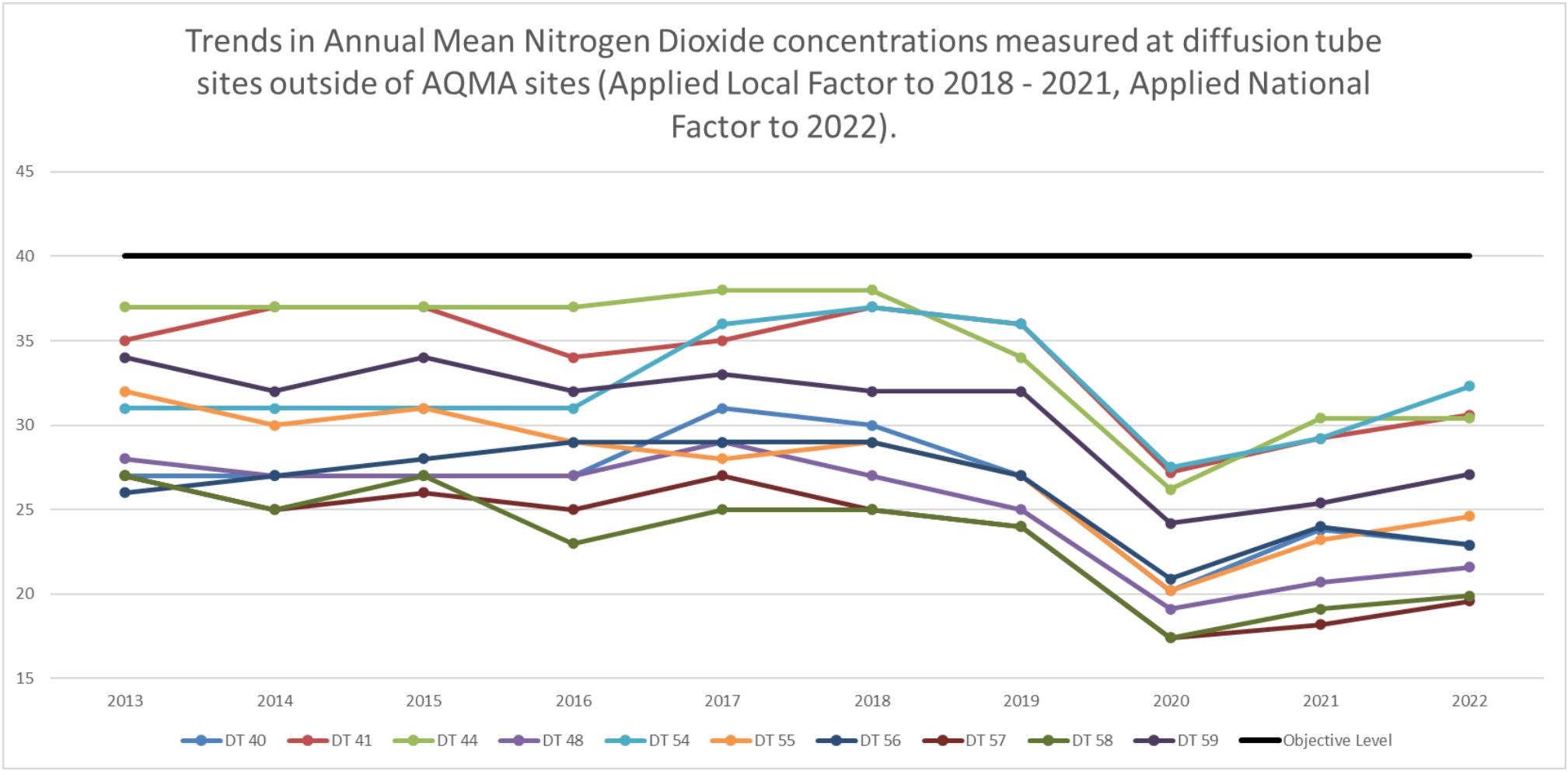


Figure A.9 – Trends in Annual Mean NO_2 Concentrations outside of AQMA sites (other tubes between 60 - 79)

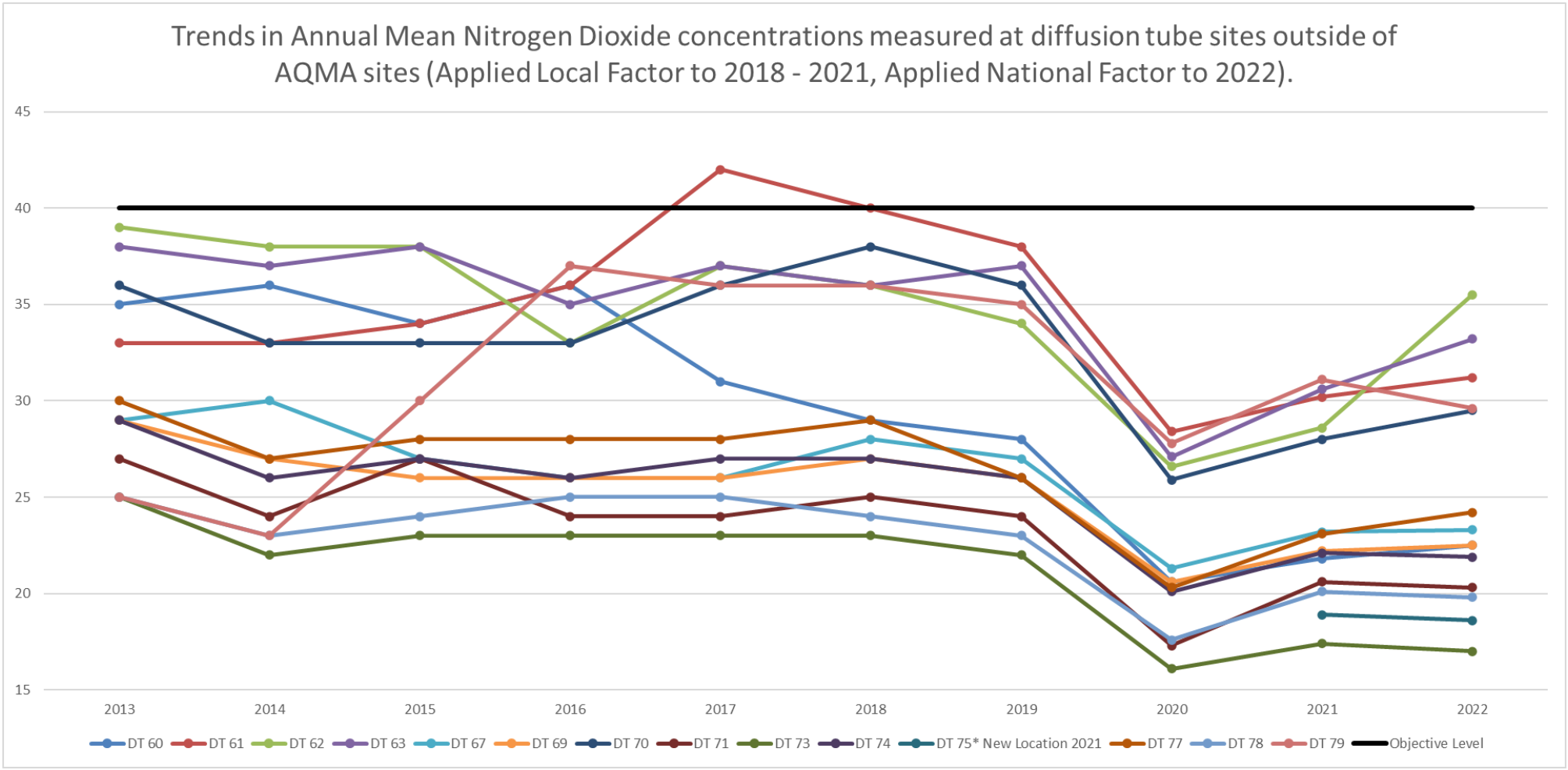


Figure A.10 – Trends in Annual Mean NO_2 Concentrations outside of AQMA sites (other tubes between 80 - 89)

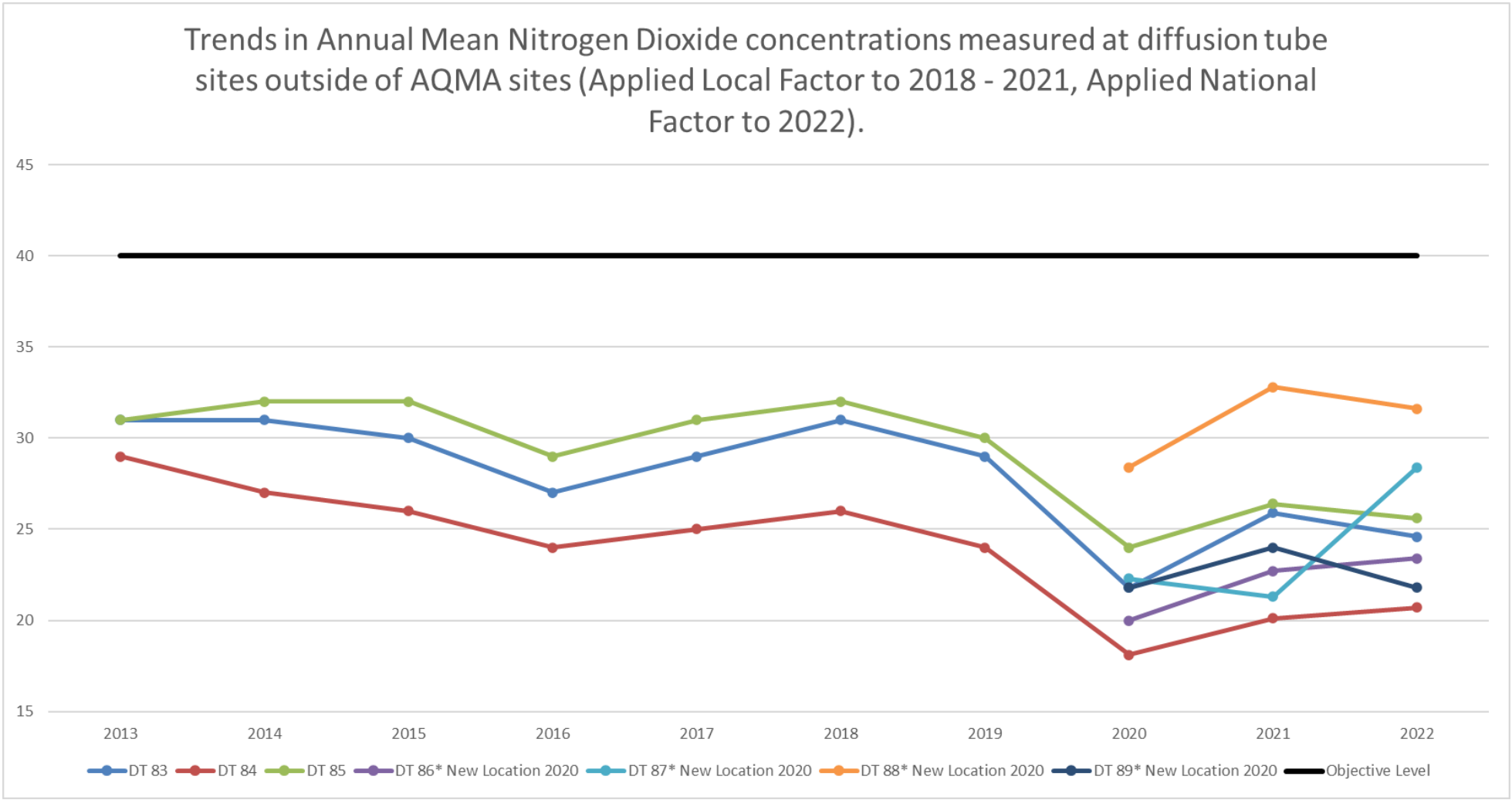


Figure A.11 – Trends in Annual Mean NO_2 Concentrations outside of AQMA sites (other tubes between 90 - 101)

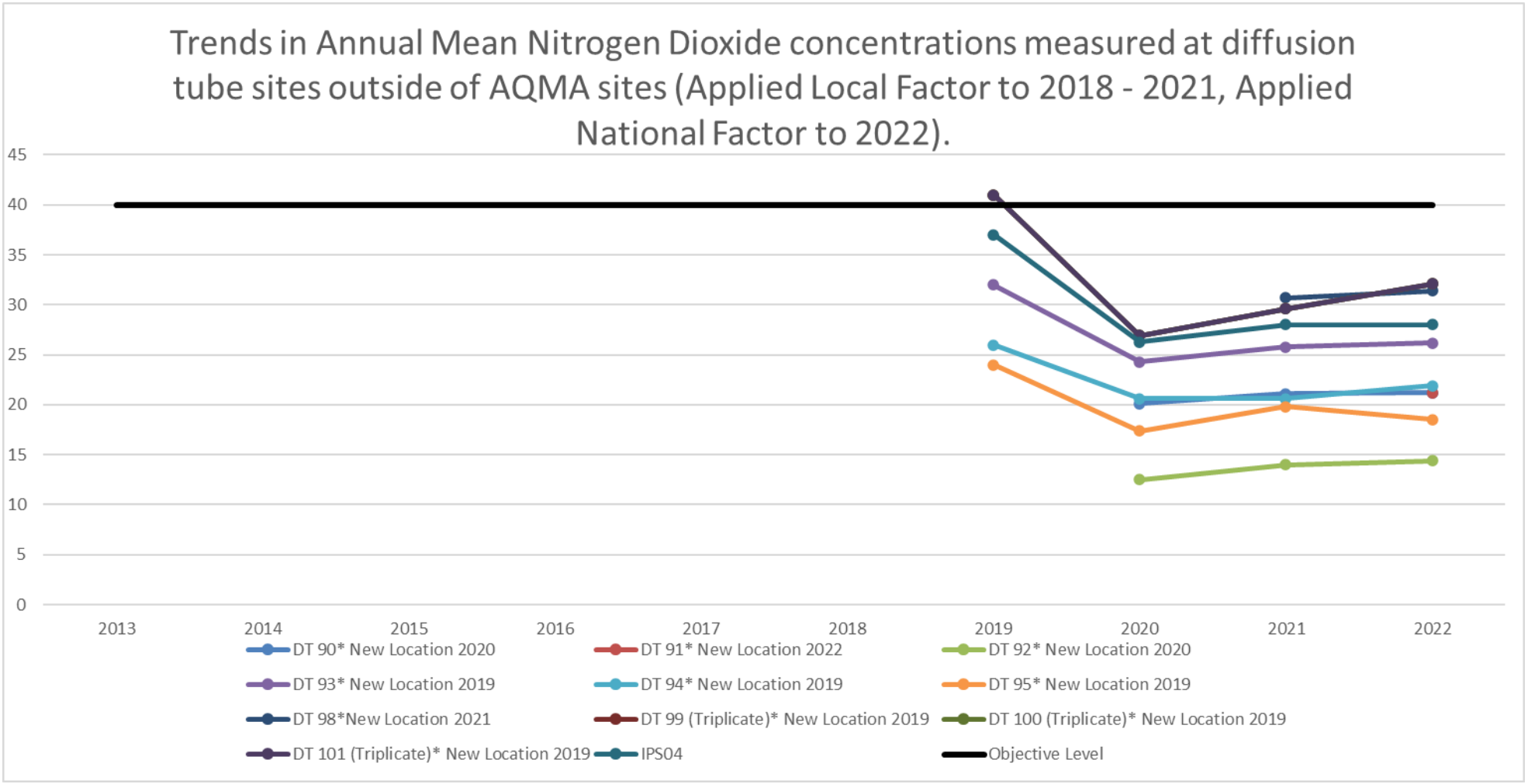


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
IPS3	615261	245350	Roadside	68.66	68.66	0	0	0	0	0
IPS04	615870	244858	Roadside	93.26	93.26	**N/A**	**0(117)**	0	0	0

Notes:

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

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO_2 2022 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	615992	244412	41.9	35.1	35.6	22.8	23.2	20.3	20.1	19.3	23.3	27.1	31.9	31.1	27.6	21.0	17.1	
2	615144	245245	51.4	44.0	55.1	37.2	39.2	42.1	41.8	39.4	39.9	45.6	50.5	45.3	44.3	33.7	30.8	
3	617070	244039	38.3	32.9	34.8	21.5	21.7	23.0	21.5	20.2	25.6	39.0	36.0	32.8	28.9	22.0	-	
4	615620	245000	42.4	35.3	48.8	36.6	32.5	27.7	33.7	38.5	34.8	34.6	32.2	35.9	36.1	27.4	-	
5	616887	244128	54.2	49.1	46.5	29.0	41.7	42.0	43.0	36.0	43.1	47.0	50.8	45.1	44.0	33.4	32.3	
6	617288	244429	25.9	20.7	22.9	14.5	12.2	11.2	13.2	12.1	14.9	17.4	18.3	20.9	17.0	12.9	-	
7	615007	245239	44.3	37.0	42.9	27.0	30.2	30.9	29.8	26.2	32.1	35.6	40.8	36.6	34.5	26.2	-	
8	615125	245209	46.9	36.6	47.4	32.3	31.8	29.7	33.8	35.9	36.7	32.8	33.6	38.6	-	-	-	Triplicate Site with 8, 9 and 10 - Annual data provided for 10 only
9	615125	245209	53.5	37.6	48.0	37.6	34.5	30.8	31.0	33.6	37.6	36.2	26.6	38.2	-	-	-	Triplicate Site with 8, 9 and 10 - Annual data provided for 10 only
10	615125	245209	55.5	38.6	47.2	36.6	35.2	32.3	35.1	40.0	38.5	36.0	30.1	36.5	37.3	28.4	24.3	Triplicate Site with 8, 9 and 10 - Annual data provided for 10 only
11	616593	244753	72.5	65.4	59.4	38.0	51.5	58.6	51.6	36.7	50.3	61.5	67.6	56.8	-	-	-	Triplicate Site with 11, 12 and 19 - Annual data provided for 19 only
12	616593	244753	72.5	70.2	53.1	39.4	49.9	58.9	50.2	37.5	53.1	67.1	60.4	55.8	-	-	-	Triplicate Site with 11, 12 and 19 - Annual data provided for 19 only
13	615117	245305	38.2	27.2	37.8	21.8	18.2	15.6	21.6	19.3	25.0	25.7	31.3	30.7	26.0	19.8	17.9	
14	615285	245393	55.8	43.8	52.3	45.6	42.1	32.7	35.8	40.0	44.0	37.3	46.1	46.7	43.5	33.1	32.4	
15	616282	244643	35.7	31.5	32.7	20.2	20.1	16.3	18.7	16.8	20.9	28.4	28.2	32.7	25.2	19.1	-	
16	615362	245437	48.1	42.4	38.0	25.7	32.1		30.0	30.4	36.3	45.0	43.5	38.3	37.3	28.3	25.8	
17	616993	244659	59.6	50.6	56.0	34.9	33.1	42.8	41.4	41.4	45.5	47.9	50.9	49.0	46.1	35.0	31.6	

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 (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
18	615090	245178	51.8	42.7	59.3	44.5	43.0	49.1	49.4	49.8	48.8	50.1	54.1	48.5	49.3	37.4	-	
19	616593	244753	78.1	66.8	52.9	39.7	51.4	62.5	52.6	36.9	47.8	57.2	58.9	53.8	55.5	**42.2**	-	Triplicate Site with 11, 12 and 19 - Annual data provided for 19 only
20	616458	244829	40.4	42.7	38.0	28.5	32.2	36.0	33.6	30.4	29.7	37.5	37.1	31.3	34.8	26.4	24.9	
21	616494	244807	55.6	46.3	52.6		36.1	32.7	36.4	40.6	35.6	39.2	28.7	41.0	40.4	30.7	-	
22	616489	244785	44.9	40.9	49.5	34.7	35.6	35.2	40.4	39.5	36.9	38.3	40.6	36.8	39.4	30.0	-	
23	616645	244784	34.1	28.5	29.0	16.2	19.2	19.8	19.8	20.7	20.2		23.9	28.2	23.6	17.9	-	
24	616663	244692	59.6	53.7	50.8	35.5	41.3	45.3	42.4	36.9	42.1	49.0	31.7	39.4	44.0	33.4	-	
25	616753	244582	57.2	47.3	50.0	38.0	40.2	41.3	38.8	36.2	39.6	43.6		48.2	43.7	33.2	31.8	
26	616971	244511	47.4	38.8	50.2	38.8	33.2	29.3	36.5	39.4	37.7	37.0	36.0	39.4	38.6	29.4	-	
27	616965	244546	56.0	46.2	46.0	40.5	37.1	38.7	40.1	38.6	38.9	44.2	42.4	46.1	42.9	32.6	31.8	
28	615194	245292	49.7	43.0	51.6	31.4	33.2	36.3	34.2	32.4	34.1	43.4	36.2	43.6	39.1	29.7	26.5	
29	617118	244074	47.0	33.3	46.8	34.9	32.9	27.1	26.7	37.6	33.6	34.4	35.1	35.9	35.4	26.9	-	
30	616939	244114	63.0	59.1	58.8	40.3	48.4	54.0	49.2	46.0		54.5	53.8	46.7	52.2	39.6	37.1	
31	616332	244149	60.4	61.3	52.2	41.0	43.7	44.3	46.1	34.2	43.0	59.9	61.3	56.6	50.3	38.3	-	
32	617398	244573	48.3	43.8	41.2	26.1	32.8	32.7	33.6	27.9	30.6	38.9	27.9	37.3	35.1	26.7	23.8	
33	616666	244114	58.1	33.9	46.4	33.2	30.6	26.8	27.7	35.0	35.0	35.0	37.7	38.4	36.5	27.7	-	
34	616467	244072	46.2	39.5	45.8	29.1	34.1	34.4	30.6	32.3	33.5	38.4	44.7	39.6	37.4	28.4	-	
35	616746	244696	41.7	36.6	35.0	22.4	23.5	24.7	24.5	21.0	23.9	33.9	32.2	33.7	29.4	22.4	17.8	
36	616820	246158	54.4	41.3	36.6	23.1	27.5	24.8	24.9	22.5	25.1	34.4	38.3	35.9	32.4	24.6	-	
37	616845	244252	47.5	35.4	41.5	32.5	31.6	28.4	30.9	41.3	40.1	35.1	35.5	38.4	36.5	27.8	-	
38	615904	244805	47.9	38.2		33.9	34.8	37.7	37.5	34.8	42.4	42.4	44.9	37.0	39.2	29.8	23.0	

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 (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
39	616712	244228	60.8	46.5	54.4	46.6	46.9	43.3	41.5	45.2	47.3	51.4	53.2	52.8	49.2	37.4	33.3	
40	615460	245148	41.3	34.3	35.0	27.4	25.9	22.5	24.6	24.6	30.4	30.8	34.2	31.3	30.2	22.9	20.0	
41	615564	245010	50.7	39.4	47.3	28.6	35.2	41.1	37.7	31.4		46.8	44.1	41.3	40.3	30.6	29.4	
42	615744	244901	55.5		62.1	46.1	37.3	34.0	43.1	47.3	48.6	37.0	39.5	42.4	44.8	34.1	-	
43	615109	245200	49.9	43.4	52.1	37.3	36.3	39.1	39.9	35.5	43.1	42.5	45.7	46.2	42.6	32.4	31.6	
44	615052	245237	54.9	38.9	50.5	38.3	30.5	28.9	35.6	37.6	44.1	39.4	34.5	46.8	40.0	30.4	25.0	
45	615261	245350	35.8	29.7	40.6	25.9	27.1	24.6	24.8	25.7	27.0	27.5	32.7	23.3	-	-	-	Triplicate Site with 45, 46 and 47 - Annual data provided for 47 only
46	615261	245350	29.3	28.8	39.0		27.1	22.9	25.6	27.2	28.8	30.1	27.3	32.3	-	-	-	Triplicate Site with 45, 46 and 47 - Annual data provided for 47 only
47	615261	245350	39.5	28.1	40.2	27.1	25.2	24.0	23.8	27.4	27.5	26.2		33.1	28.9	22.0	20.8	Triplicate Site with 45, 46 and 47 - Annual data provided for 47 only
48	615425	245486	36.7	34.4	36.3	23.3	22.9	22.4	21.4	19.8		31.2	31.0	33.7	28.5	21.6	18.6	
49	615792	244876	61.8	44.8	69.8	45.6	43.0	39.1	45.9	52.0		47.1	46.1	48.3	49.4	37.6	-	
50	615773	244890	47.2	35.6	37.6	21.0	24.2	21.7	23.5	18.6	27.9	31.7	36.6	34.4	30.0	22.8	21.3	
51	615769	244866	45.8	39.0	65.9	38.1	35.4	32.2		43.6	46.9	45.6	49.5	44.8	44.3	33.6	26.4	
52	615826	244871	66.6	46.7	63.1	53.9	44.0	44.7	44.5	50.0	51.8	52.9	65.0	52.8	53.0	**40.3**	-	
53	615820	244858	66.2	57.1	54.2	38.7	49.1	53.0	45.9	40.0	47.4	58.1	36.8	50.2	49.7	37.8	-	
54	615893	244855	53.8	43.7	55.7	34.1	32.5	37.3	34.5	33.6	37.1	48.6	52.6	46.3	42.5	32.3	23.5	
55	615917	244898	46.4	33.8	36.2	30.7	25.0	24.9	24.1	23.4	32.2	34.7	39.6	36.9	32.3	24.6	-	
56	615931	244911	48.4	11.1	42.3	29.8	28.6	29.2	28.5	5.8	29.5	36.6	33.1	38.8	30.1	22.9	-	
57	615941	244981	40.4	30.1	29.2	20.3	21.1	20.1	18.0	16.9	23.1	29.8	20.8	40.1	25.8	19.6	16.4	
58	615978	245042	35.6	28.4	38.8	20.1	19.9	18.6	18.5	16.8	22.9	30.2	34.3	30.7	26.2	19.9	-	
59	615926	244837	48.5	39.9	43.1	27.7	32.0	29.0	30.4	29.9	33.6			42.4	35.7	27.1	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
60	617438	246168	47.6	37.3	29.6	21.5	25.7	24.6	22.5	20.0	25.6	32.1	33.9	34.2	29.6	22.5	17.0	
61	616099	246105	57.1	47.7	45.2		36.2	36.0	34.1	32.9	34.6	40.6	42.8	44.1	41.0	31.2	20.2	
62	615935	244803	51.8	44.6	45.3	32.2	37.7	40.1			76.9	48.4	44.5	45.3	46.7	35.5	30.7	
63	615950	244790	52.0	46.7	49.7	34.3		40.3	39.0	32.8	41.6	58.3	41.7	43.5	43.6	33.2	-	
64	615688	244939	70.0	66.8	56.4	35.3	51.8	56.7	49.6	41.3	63.8	66.7	68.8	66.7	-	-	-	Duplicate Site with 64 and 65 - Annual data provided for 65 only
65	615688	244939	84.5	61.5	60.9	43.2	61.0	57.1	57.8	46.0	59.2	63.2	60.1	60.7	58.7	**44.6**	**43.0**	Duplicate Site with 64 and 65 - Annual data provided for 65 only
66	616807	244669	53.8	50.1	48.7	35.3	41.7	46.6	39.1	36.7	42.7	50.3	36.2	46.0	43.9	33.4	-	
67	616890	244676	42.5	36.6	38.4	23.1	25.2	27.4	26.0	22.5	25.5	36.0		34.5	30.7	23.3	20.4	
68	616905	244657	64.6	52.1	54.0	36.7	45.2	45.6	44.9	42.2	46.5	43.9			47.6	36.2	-	
69	616978	244590	40.8	32.1	37.6	27.3	23.0	20.7	23.8	25.1	27.2	30.9	30.5	36.7	29.6	22.5	-	
70	616965	244583	52.1	43.0	38.9	64.2	31.7	30.1	30.9	25.3	34.7	39.4	32.7	42.7	38.8	29.5	-	
71	617032	244537	37.5	30.0	29.1	25.1	22.5	20.3	21.1	22.3	26.3	26.4	27.8	32.9	26.8	20.3	-	
72	617123	244535	54.9	42.3	44.7	36.8	36.5	31.5	34.3	38.3	41.6	41.4	30.8	46.3	40.0	30.4	-	
73	617124	244517	22.3	28.4	30.8	19.9	16.1	16.8	17.1	18.4	20.6	25.1	24.0	29.2	22.4	17.0	-	
74	616953	244443	39.4	31.0		29.1	22.2	21.1	20.8	22.3	26.2	32.3	35.8	36.6	28.8	21.9	-	
75	616927	244395	34.9	30.1	29.4	19.6	19.3	13.9	18.0	18.5	22.1	26.4	30.8	30.1	24.4	18.6	-	
76	616951	244521	53.8		47.8	36.6	36.6	35.9	39.0	36.1	36.6	43.7	44.7	47.0	41.6	31.6	-	
77	616902	244542	39.0	32.3	39.1	32.8	25.6	24.1	28.4	32.3	29.8	30.8	31.5	36.8	31.9	24.2	-	
78	616870	244586	41.0	35.2	32.8	22.4	20.5	18.1	18.5	15.7	20.7	28.8	24.9	34.3	26.1	19.8	19.1	
79	617052	244677	54.6	47.0	46.5	37.2	30.8	31.9	30.9	28.1	32.7	42.1	43.1	41.8	38.9	29.6	-	
80	616821	244546	54.1	47.1	46.1	34.3	36.8	41.0	34.9	27.4		47.7	52.8	45.0	-	-	-	Triplicate Site with 80, 81 and 82 - Annual data provided for 82 only

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
81	616821	244546	58.9	52.3	42.5	32.8	37.1	41.0	39.5	32.0		46.5	49.9	42.6	-	-	-	Triplicate Site with 80, 81 and 82 - Annual data provided for 82 only
82	616821	244546	55.8	46.5	43.4	31.0	38.2	39.5	37.7	30.2	37.6	46.1	45.3	47.1	42.1	32.0	-	Triplicate Site with 80, 81 and 82 - Annual data provided for 82 only
83	616792	244498	43.4	35.8		29.0	24.6	26.6	27.1	30.5	31.8	34.8	36.9	35.3	32.3	24.6	23.2	
84	616702	244601	29.9	29.4	37.1	24.5	20.6	20.0	23.9	24.1	26.9	27.7	30.0	32.9	27.3	20.7	-	
85	616681	244623	47.0	42.5	41.1	29.4	31.7	30.5	30.6	25.8	32.6	38.7	19.1	39.4	34.0	25.9	25.6	
86	616727	244566	42.3	35.1	39.3	28.3	23.9	22.9	25.5	27.8	25.9	30.1	32.8	35.2	30.8	23.4	-	
87	616481	244725	39.8	33.8	42.7	32.6	29.3	34.9	35.5	37.4	35.6	41.0	44.8	41.8	37.4	28.4	-	
88	616307	243875	57.7	46.5	43.1	39.1	37.9	35.2	35.5	36.9	39.2	38.2	44.8	45.1	41.6	31.6	-	
89	614816	244585	37.2	33.9	44.7	25.9	22.0	27.4	30.7	25.9	32.1	38.5	37.7	36.1	32.7	24.8	21.8	
90	614893	244558	40.2	31.3	34.6	22.1	23.8	24.0	24.2	21.2	25.1	32.8	28.0	26.9	27.9	21.2	-	
91	615195	244621	39.6	31.3	38.9	24.6			19.3	16.9	20.0	24.2	34.9	29.1	27.9	21.2	-	
92	619407	244712		22.8	28.4	14.9	14.4	12.8	15.8	13.6	14.8	21.7	23.5	25.6	18.9	14.4	-	
93	617360	244536	51.6	41.9	36.3	29.7	31.8	28.0	27.6	25.0	32.8	36.8	34.1	37.4	34.4	26.2	-	
94	617363	243887	37.4	35.1	32.2	22.3	25.6	23.5	24.6	20.7	26.4	33.7	31.0	33.0	28.8	21.9	-	
95	616415	243776	31.1	22.5	32.4	22.7	18.6	19.3	21.0		25.5	25.0	24.2	25.1	24.3	18.5	-	
96	616279	244807	56.9	57.0	57.8	42.4	40.4	46.2	44.7	43.2	42.3	51.5	46.6	50.2	48.3	36.7	31.5	
97	616474	244795	47.7	52.1	62.5	43.8	41.7	46.6	45.4	41.1	42.2	46.4	54.4	48.7	47.7	36.3	30.5	
98	617037	244085	50.9	42.6	45.1	31.2	37.9	37.2	39.4	37.3	41.1	46.5	47.9	38.8	41.3	31.4	-	
99	615870	244858	51.4	42.0	60.1	33.9	34.7	35.5	34.6	35.2		45.7	45.7	45.0	-	-	-	Triplicate Site with 99, 100 and 101 - Annual data provided for 101 only
100	615870	244858	52.4	43.9	55.0	34.5	34.8	35.3	35.7	36.2	40.6	44.6	49.4	44.8	-	-	-	Triplicate Site with 99, 100 and 101 - Annual data provided for 101 only

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
101	615870	244858	52.0	46.3	57.5	37.8	37.8	35.8	37.5	34.6	40.5	43.8	40.3	43.1	42.2	32.1	25.0	Triplicate Site with 99, 100 and 101 - Annual data provided for 101 only

☒ **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.**

☒ **National bias adjustment factor used**

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

☒ **Ipswich Borough Council confirm that all 2022 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 Ipswich During 2022

Ipswich Borough Council has not identified any new sources relating to air quality within the reporting year of 2022.

Additional Air Quality Works Undertaken by Ipswich Borough Council During 2022

Ipswich Borough Council has not completed any additional works within the reporting year of 2022.

QA/QC of Diffusion Tube Monitoring

Nitrogen dioxide diffusion tubes are supplied by SOCOTEC, Didcot. The method of preparation is 50% TEA in acetone.

Monitoring has been completed in adherence with the 2022 Diffusion Tube Monitoring Calendar. The exposed tubes are analysed in accordance with SOCOTEC's standard operating procedure which complies with the guidelines set out in DEFRA's *'Diffusion Tubes for Ambient NO2 Monitoring: Practical Guidance'*. The analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tubes is within the scope of their UKAS schedule. SOCOTEC participates in the AIR NO_2 PT scheme, the results of which indicate that between September 2020 – June 2022 (more recent data unavailable at the time of writing this report) 100% of QC samples reported were analysed satisfactorily except for between July – August 2021 where 87.5% of QC samples submitted were determined to be satisfactory.

Using the *AEA_DifTPAB_v04.xls* spreadsheet published on the DEFRA LAQM

Support website to check the precision of collocated tubes, the results for all collocated monitoring sites within Ipswich were shown to demonstrate "*Good precision"* (see Figure C.1).

A control tube (travel blank) is sent with each month's tubes.

Figure C.1 – Precision and Accuracy of Collocated Diffusion Tubes

a) Bramford Road (Site ID: 8, 9 & 10)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	06/01/2022	03/02/2022	46.9	53.5	55.5	52	4.5	9	11.2			Good	
2	03/02/2022	03/03/2022	36.6	37.6	38.6	38	1.0	3	2.5			Good	
3	03/03/2022	30/03/2022	47.4	48.0	47.2	48	0.4	1	1.0			Good	
4	30/03/2022	04/05/2022	32.3	37.6	36.6	36	2.8	8	7.0			Good	
5	04/05/2022	07/06/2022	31.8	34.5	35.2	34	1.8	5	4.5			Good	
6	07/06/2022	06/07/2022	29.7	30.8	32.3	31	1.3	4	3.2			Good	
7	06/07/2022	03/08/2022	33.8	31.0	35.1	33	2.1	6	5.2			Good	
8	03/08/2022	01/09/2022	35.9	33.6	40.0	37	3.2	9	8.1			Good	
9	01/09/2022	27/09/2022	36.7	37.6	38.5	38	0.9	2	2.2			Good	
10	27/09/2022	01/11/2022	32.8	36.2	36.0	35	1.9	5	4.7			Good	
11	01/11/2022	01/12/2022	33.6	26.6	30.1	30	3.5	12	8.7			Good	
12	01/12/2022	04/01/2023	38.6	38.2	36.5	38	1.1	3	2.8			Good	
13													
											Overall survey -->	Good	

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

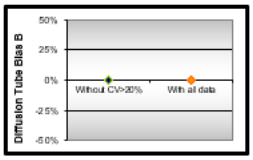
Site Name/ ID: Bramford Road O/S No.122

Precision: 12 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}



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b) Piper's Court (Site ID: 11, 12 & 19)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	03/01/2022	03/02/2022	72.5	72.5	78.1	74	3.2	4	8.0			Good	
2	03/02/2022	04/03/2022	65.4	70.2	66.8	67	2.5	4	6.1			Good	
3	04/03/2022	31/03/2022	59.4	53.1	52.9	55	3.7	7	9.2			Good	
4	31/03/2022	05/05/2022	38.0	39.4	39.7	39	0.9	2	2.3			Good	
5	05/05/2022	10/06/2022	51.5	49.9	51.4	51	0.9	2	2.2			Good	
6	10/06/2022	05/07/2022	58.6	58.9	62.5	60	2.2	4	5.4			Good	
7	05/07/2022	03/08/2022	51.6	50.2	52.6	51	1.2	2	3.0			Good	
8	03/08/2022	02/09/2022	36.7	37.5	36.9	37	0.4	1	1.0			Good	
9	02/09/2022	27/09/2022	50.3	53.1	47.8	50	2.7	5	6.6			Good	
10	27/09/2022	02/11/2022	61.5	67.1	57.2	62	5.0	8	12.3			Good	
11	02/11/2022	01/12/2022	67.6	60.4	58.9	62	4.7	7	11.6			Good	
12	01/12/2022	04/01/2023	56.8	55.8	53.8	55	1.5	3	3.8			Good	
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Overall survey --> Good precision

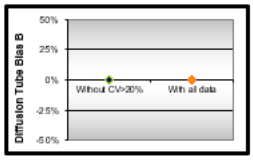
Site Name/ ID: Pipers Court

Precision: 12 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}



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c) Chevallier Street (Site ID: 45, 46 & 47 co-located with IPS3)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	06/01/2022	03/02/2022	35.8	29.3	39.5	35	5.2	15	12.8			Good	
2	03/02/2022	03/03/2022	29.7	28.8	28.1	29	0.8	3	2.0			Good	
3	03/03/2022	30/03/2022	40.6	39.0	40.2	40	0.8	2	2.1			Good	
4	30/03/2022	04/05/2022	25.9	39.5	27.1	31	7.5	24	18.7			Poor Precision	
5	04/05/2022	07/06/2022	27.1	27.1	25.2	26	1.1	4	2.7			Good	
6	07/06/2022	06/07/2022	24.6	22.9	24.0	24	0.9	4	2.1			Good	
7	06/07/2022	03/08/2022	24.8	25.6	23.8	25	0.9	4	2.2			Good	
8	03/08/2022	01/09/2022	25.7	27.2	27.4	27	0.9	3	2.3			Good	
9	01/09/2022	27/09/2022	27.0	28.8	27.5	28	0.9	3	2.3			Good	
10	27/09/2022	01/11/2022	27.5	30.1	26.2	28	2.0	7	4.9			Good	
11	01/11/2022	01/12/2022	32.7	27.3		30	3.8	13	34.3			Good	
12	01/12/2022	04/01/2023	23.3	32.3	33.1	30	5.4	18	13.5			Good	
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Overall survey --> Good precision

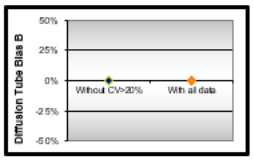
Site Name/ ID: Chevallier Street

Precision: 11 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}



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d) Norwich Road (Site ID: 64 & 65)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	06/01/2022	03/02/2022	70.0	84.5		77	10.3	13	92.1			Good	
2	03/02/2022	03/03/2022	66.8	61.5		64	3.7	6	33.7			Good	
3	03/03/2022	30/03/2022	56.4	60.9		59	3.2	5	28.6			Good	
4	30/03/2022	04/05/2022	35.3	43.2		39	5.6	14	50.2			Good	
5	04/05/2022	07/06/2022	51.8	61.0		56	6.5	12	58.4			Good	
6	07/06/2022	05/07/2022	56.7	57.1		57	0.3	0	2.5			Good	
7	05/07/2022	03/08/2022	49.6	57.8		54	5.8	11	52.1			Good	
8	03/08/2022	01/09/2022	41.3	46.0		44	3.3	8	29.9			Good	
9	01/09/2022	27/09/2022	63.8	59.2		62	3.3	5	29.2			Good	
10	27/09/2022	01/11/2022	66.7	63.2		65	2.5	4	22.2			Good	
11	01/11/2022	01/12/2022	68.8	60.1		64	6.2	10	55.3			Good	
12	01/12/2022	05/01/2023	66.7	60.7		64	4.2	7	38.1			Good	
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Overall survey --> Good precision

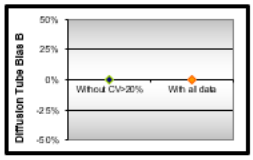
Site Name/ ID: Norwich Road between No's 13 & 15

Precision: 12 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}



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e) St. Helens Street (Site ID: 80, 81 & 82)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	03/01/2022	03/02/2022	54.1	58.9	55.8	56	2.4	4	6.0			Good	
2	03/02/2022	04/03/2022	47.1	52.3	46.5	49	3.2	7	7.9			Good	
3	04/03/2022	31/03/2022	46.1	42.5	43.4	44	1.9	4	4.7			Good	
4	31/03/2022	05/05/2022	34.3	32.8	31.0	33	1.7	5	4.1			Good	
5	05/05/2022	10/06/2022	36.8	37.1	38.2	37	0.7	2	1.8			Good	
6	10/06/2022	05/07/2022	41.0	41.0	39.5	41	0.9	2	2.2			Good	
7	05/07/2022	03/08/2022	34.9	39.5	37.7	37	2.3	6	5.8			Good	
8	03/08/2022	02/09/2022	27.4	32.0	30.2	30	2.3	8	5.8			Good	
9	02/09/2022	27/09/2022			37.6								
10	27/09/2022	02/11/2022	47.7	46.5	46.1	47	0.8	2	2.1			Good	
11	02/11/2022	01/12/2022	52.8	49.9	45.3	49	3.8	8	9.4			Good	
12	01/12/2022	04/01/2023	45.0	42.6	47.1	45	2.3	5	5.6			Good	
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Overall survey --> Good precision

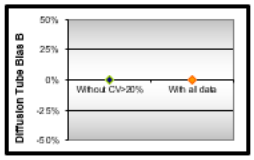
Site Name/ ID: St Helens Street - County Hall

Precision: 11 out of 11 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm^{-3}
Mean CV (Precision):
Automatic Mean: µgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: µgm^{-3}



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f) St. Matthews Street (Site ID: 99, 100 & 101 co-located with IPS04)

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm⁻³	Tube 2 µgm⁻³	Tube 3 µgm⁻³	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	06/01/2022	03/02/2022	51.4	52.4	52.0	52	0.5	1	1.3
2	03/02/2022	03/03/2022	42.0	43.9	46.3	44	2.2	5	5.4
3	03/03/2022	30/03/2022	60.1	55.0	57.5	58	2.6	4	6.3
4	30/03/2022	04/05/2022	33.9	34.5	37.8	35	2.1	6	5.2
5	04/05/2022	07/06/2022	34.7	34.8	37.8	36	1.8	5	4.4
6	07/06/2022	05/07/2022	35.5	35.3	35.8	36	0.3	1	0.6
7	05/07/2022	03/08/2022	34.6	35.7	37.5	36	1.5	4	3.6
8	03/08/2022	01/09/2022	35.2	36.2	34.6	35	0.8	2	2.0
9	01/09/2022	27/09/2022		40.6	40.5	41	0.1	0	0.6
10	27/09/2022	01/11/2022	45.7	44.6	43.8	45	1.0	2	2.4
11	01/11/2022	01/12/2022	45.7	49.4	40.3	45	4.6	10	11.4
12	01/12/2022	05/01/2023	45.0	44.8	43.1	44	1.0	2	2.6
13									

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
Overall survey -->		Good precision	

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

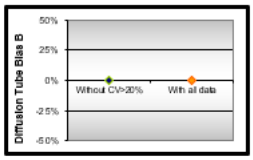
Site Name/ ID: St Matthews Street

Precision: 12 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm⁻³
Mean CV (Precision):
Automatic Mean: µgm⁻³
Data Capture for periods used:
Adjusted Tubes Mean: µgm⁻³

Accuracy (with 95% confidence interval) WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm⁻³
Mean CV (Precision):
Automatic Mean: µgm⁻³
Data Capture for periods used:
Adjusted Tubes Mean: µgm⁻³



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Version 04 - February 2011

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Diffusion Tube Annualisation

All diffusion tube monitoring locations within Ipswich recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

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.

Consulting the *National Diffusion Tube Bias Adjustment Factor Spreadsheet Version 03/23* published on the DEFRA LAQM Support website, for the SOCOTEC, Didcot laboratory; preparation method 50% TEA in acetone; for the year 2022, a bias adjustment figure of 0.76 was obtained based on 26 studies.

Ipswich Borough Council have applied the national bias adjustment factor of 0.76 to the 2022 monitoring data. A summary of bias adjustment factors used by Ipswich Borough Council over the past five years is presented in Table C.1 below.

The decision to apply the national bias adjustment factor gave consideration to the guidance in Box 7.13 of LAQM.TG22. The reason for the decision was due to:

- Since 2020, the Council have used a combined local bias correction factor as a result of a high data capture rate from both of our continuous analysers. However, due to the exceptional temperatures experienced in the summer of 2022, data between June and September had to be rejected from our analyser on Chevallier Street as the monitor could not be cooled sufficiently despite the procurement of a new air conditioning unit. As a result of this, we had less than 75% data capture for the Chevallier Street site and have been unable to calculate a combined local bias correction factor for 2022.
- The Council calculated a local bias correction factor from the St Matthews Street analyser (98% data capture), and this was recorded as 0.66 – see Table C.2 below for the calculation of the local bias correction factor. As the local bias correction factor was calculated using only 10 periods of data and was lower than the nationally derived bias correction factor (0.76), it was decided to apply the national correction factor to the data this year to give robust, conservative results.

To assist with providing transparency to the reader, an example of the national bias correction factor being applied to a diffusion tube is shown below.

Example of applying the national bias correction factor to diffusion tube data:

Diffusion tube 34 (College Street) – annual mean 37.4µg/m^3 (average from 12 months of monthly diffusion tube readings).

37.4µg/m^3 x 0.76 = 28.4µg/m^3

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National Factor	03/23 – 26 studies	0.76
2021	Local	-	0.78
2020	Local	-	0.75
2019	Local	-	0.75

2018	Local	-	0.83

Table C.2 – 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	10				
Bias Factor A	0.66 (0.63 - 0.7)				
Bias Factor B	51% (43% - 59%)				
Diffusion Tube Mean (µg/m^3)	41.7				
Mean CV (Precision)	3.9%				
Automatic Mean (µg/m^3)	27.6				
Data Capture	98%				
Adjusted Tube Mean (µg/m^3)	28 (26-29)				

Notes:

A single local bias adjustment factor has been used to bias adjust the 2022 diffusion tube results.

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure 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.

Distance correction should be considered at any monitoring site where the annual mean concentration is greater than 36µg/m^3 and the monitoring site is not located at a point of relevant exposure. Once corrected for bias, the only monitoring sites that required distance correction due to being greater than 36µg/m^3 and not located at a point of relevant exposure were sites, 30, 39, 64&65 (duplicate), 96 and 97. Site 31 was listed as requiring distance correction, but there is no relevant receptor in the vicinity of the site. The corrections were undertaken using the *NO_2 Fall-Off with Distance Calculator Version 4.2* available on the Defra LAQM Support website. The outputs are presented in Table C.3.

For thoroughness, distance correction was also applied to all non-automatic monitoring sites not located at a point of relevant exposure.

Table C.3 – NO_2 Fall off With Distance Calculations (concentrations presented in µg/m³)

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
30	2.7	4.1	39.6	15.6	*37.1*	*Predicted concentration at Receptor within 10% the AQS objective.*
39	0.8	2.0	37.4	15.6	33.3	
64, 65	1.3	1.7	44.6	13.52818	**43.0**	*Predicted concentration at Receptor above AQS objective.*
96	0.9	3.1	36.7	15.60945	31.5	
97	2.9	8.7	36.3	15.6	30.5	

QA/QC of Automatic Monitoring

The automatic monitors located on Chevallier Street (IPS3) and St Matthews Street (IPS04) are subject to fortnightly routine calibration by an Ipswich Borough Council Environmental Health Officer or Technical Officer.

The analysers are also serviced and the monitoring site audited biannually by Matts Monitors and Ricardo Energy & Environment respectively. Copies of the Certificate of

Calibration issued following the most recent site audits (December 2022) are displayed below (Figures C.2 and C.3).

All automatic monitoring data collected at the Chevallier Street and St Matthews Street sites are managed by Ricardo Energy & Environment using the same quality control procedures utilised by Defra's national air quality network stations. These procedures represent best practice and fully meet the requirements set out in LAQM.TG(22). Ricardo Energy & Environment currently provide UKAS accredited quality control audits and data management services to all Defra national network (AURN) air quality monitoring stations.

All collected data is screened and scaled (based on site calibrations) and the final data sets presented within this report (Figures C.4 and C.5) have benefitted from a full process of data ratification, including thorough additional data quality checks that include site audits and a ratification process that corrects data for instrument sensitivity drift between routine calibrations.

Live and historic monitoring data can be found on the Air Quality England Website

Figure C.2 – Certificate of Calibration for IPS3

0401

CERTIFICATE OF CALIBRATION

Ricardo Energy and Environment, Gemini Building, Fermi Avenue Harwell, Didcot, Oxfordshire OX11 0QR. Telephone 01235 753693

Approved Signatories:

☐	S. Eaton	☐	B Stacey
☐	D Hector	☐	S Stratton
☐	N Rand	☐	S Telfer
☐	B Davies	☐	S Gray
☑	D Lane	☐	T Green
☐	S Copsey		

Signed:

Date of Issue: 14 Dec 22

Certificate Number: 6121

Customer Name and Address:

Ipswich Borough Council
Grafton House
15-17 Russell Road
Ipswich
IP1 2DE

Description: Calibration factors for the air monitoring station at Ipswich St Matthews Street

Ricardo Energy & Environment ID: ED79001143/December 2022

The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95% The uncertainty evaluation has been carried out in accordance with UKAS requirements.

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0401

CERTIFICATE OF CALIBRATION

Date of issue: 14 Dec 22

Certificate Number: 6120

Ricardo Energy & Environment ID: ED79001143/December 2022

Ipswich Chevallier Street
Date of audit: 13 Dec 2022

Species	Analyser Serial no	Zero Response[1]	Zero uncertainty nmol/mol	Calibration Factor[2]	Factor uncertainty %	Converter efficiency (%)[3]	Converter uncertainty (%)
NOx	CM08050004	-0.5	2.5	0.8953	4.0539	99.7 (259ppb)	2.3
NO	CM08050004	-0.1	2.5	0.8618	4.0996	98.7 (136ppb)	2.3

CERTIFICATE OF CALIBRATION

0401

Date of Issue: 14 Dec 22

Certificate Number: 6120

Ricardo Energy & Environment ID: ED79001143/December 2022

The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NOx analysers) by documented methods. The factors have been calculated using certified gas standards. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are reported in concentration units of nmol/mol or µmol/mol.

[1] The zero response is the zero reading on the data logging system of the analyser when audit zero gas was introduced to the analysers under test.

[2] The calibration factor is the multiplying factor required to scale the reading on the data logging system of the analyser into reported concentration units (nmol/mol for NO, NOx, SO_2, O_3 and µmol/mol for CO). It should be used in conjunction with the zero response. A corrected concentration is calculated using the following equation:

Concentration = F(Output - Zero Response)
Where F = Calibration Factor provided on this certificate
Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

[3] Converter eff. is the measured efficiency of the NO_2 to NO converter within the oxides of nitrogen analyser under test.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.

Figure C.3 – Certificate of Calibration for IPS04

0401

CERTIFICATE OF CALIBRATION

Ricardo Energy and Environment, Gemini Building, Fermi Avenue Harwell, Didcot, Oxfordshire OX11 0QR. Telephone 01235 753693

RICARDO

Page 1 of 3

Approved Signatories:

☐	S. Eaton	☐	B Stacey
☐	D Hector	☐	S Stratton
☐	N Rand	☐	S Telfer
☐	B Davies	☐	S Gray
☑	D Lane	☐	T Green
☐	S Copsey		

Signed:

Date of Issue: 14 Dec 22

Certificate Number: 6121

Customer Name and Address:

Ipswich Borough Council
Grafton House
15-17 Russell Road
Ipswich
IP1 2DE

Description: Calibration factors for the air monitoring station at Ipswich St Matthews Street

Ricardo Energy & Environment ID: ED79001143/December 2022

The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95% The uncertainty evaluation has been carried out in accordance with UKAS requirements.

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CERTIFICATE OF CALIBRATION

Date of issue: 14 Dec 22

Certificate Number: 6121

Ricardo Energy & Environment ID: ED79001143/December 2022

Ipswich St Matthews Street
Date of audit: 13 Dec 2022

Species	Analyser Serial no	Zero Response[1]	Zero uncertainty nmol/mol	Calibration Factor[2]	Factor uncertainty %	Converter efficiency (%)[3]	Converter uncertainty (%)
NOx	2696	1.6	2.6	1.0619	3.6020	99.1 (258ppb)	1.2
NO	2696	0.5	2.6	1.0895	3.5826	96.3 (136ppb)	1.2

CERTIFICATE OF CALIBRATION

0401

Date of issue: 14 Dec 22

Certificate Number: 6121

Ricardo Energy & Environment ID: ED79001143/December 2022

The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NOx analysers) by documented methods. The factors have been calculated using certified gas standards. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are reported in concentration units of nmol/mol or µmol/mol.

[1] The zero response is the zero reading on the data logging system of the analyser when audit zero gas was introduced to the analysers under test.

[2] The calibration factor is the multiplying factor required to scale the reading on the data logging system of the analyser into reported concentration units (nmol/mol for NO, NOx, SO_2, O_3 and µmol/mol for CO). It should be used in conjunction with the zero response. A corrected concentration is calculated using the following equation:

Concentration = F(Output - Zero Response)
Where F = Calibration Factor provided on this certificate
Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

[3] Converter eff. is the measured efficiency of the NO_2 to NO converter within the oxides of nitrogen analyser under test.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.

Figure C.4 – 2022 Air Pollution Report – Ipswich Chevallier Street (Site ID: IPS3)

Air Pollution Report

1st January to 31st December 2022

Air Quality England

Ipswich Chevallier Street (Site ID: IPS3)

These data have been fully ratified
Only relevant statistics for LAQM are presented in the table. Cells with - indicate no data available or calculated.

Pollutant	NO µg/m³	NO_2 µg/m³	NO_x as NO_2 µg/m³
Number Days Low	-	256	-
Number Days Moderate	-	0	-
Number Days High	-	0	-
Number Days Very High	-	0	-
Max Daily Mean	142	64	277
Annual Max	548	117	956
Annual Mean	17	22	48
99.8th Percentile of hourly mean	-	98	-
98th Percentile of hourly mean	128	63	255
95th Percentile of hourly mean	57	52	136
50th Percentile of hourly mean	8	18	32
% Annual data capture	68.66	68.66	68.66

All gaseous pollutant mass units are at 20°C and 1013mb. Particulate matter concentrations are reported at ambient temperature and pressure. NO_X mass units are NO_X as NO_2 µgm-3

Pollutant	Air Quality Standards regulations 2010	Exceedances	Days
Nitrogen dioxide	Hourly Mean > 200 micrograms per metre cubed	0	0
Nitrogen dioxide	Annual Mean > 40 micrograms per metre cubed	0	-

Annual Graph

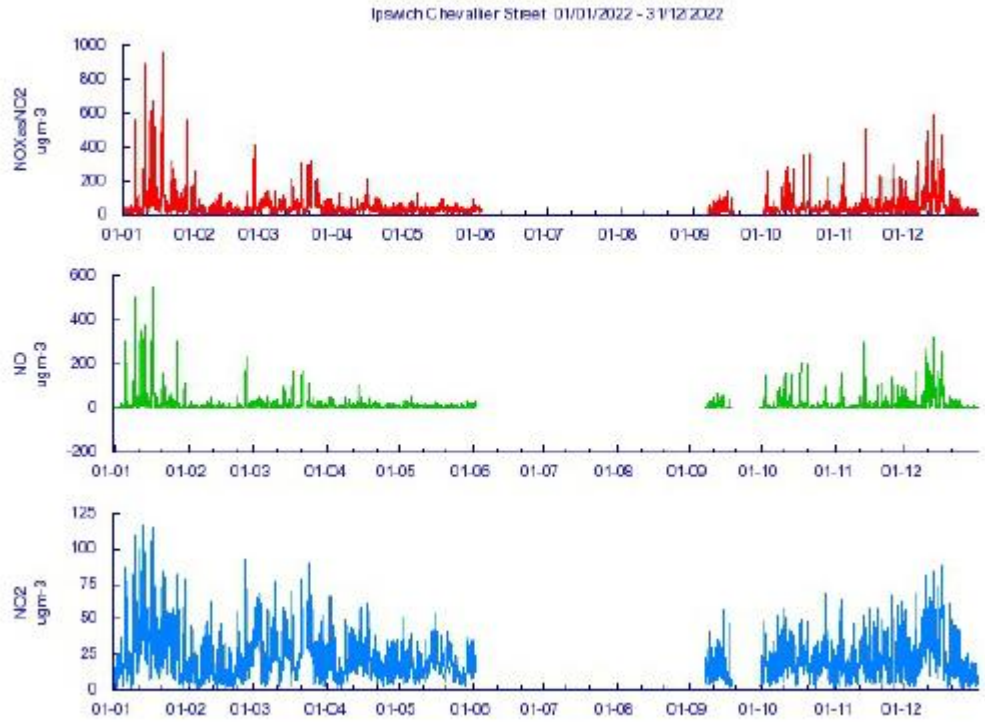


Figure C.5 – 2022 Air Pollution Report – Ipswich St Matthews Street (Site ID: IPS04)

Air Pollution Report

1st January to 31st December 2022

Air Quality England

Ipswich St Matthews Street (Site ID: IPS04)

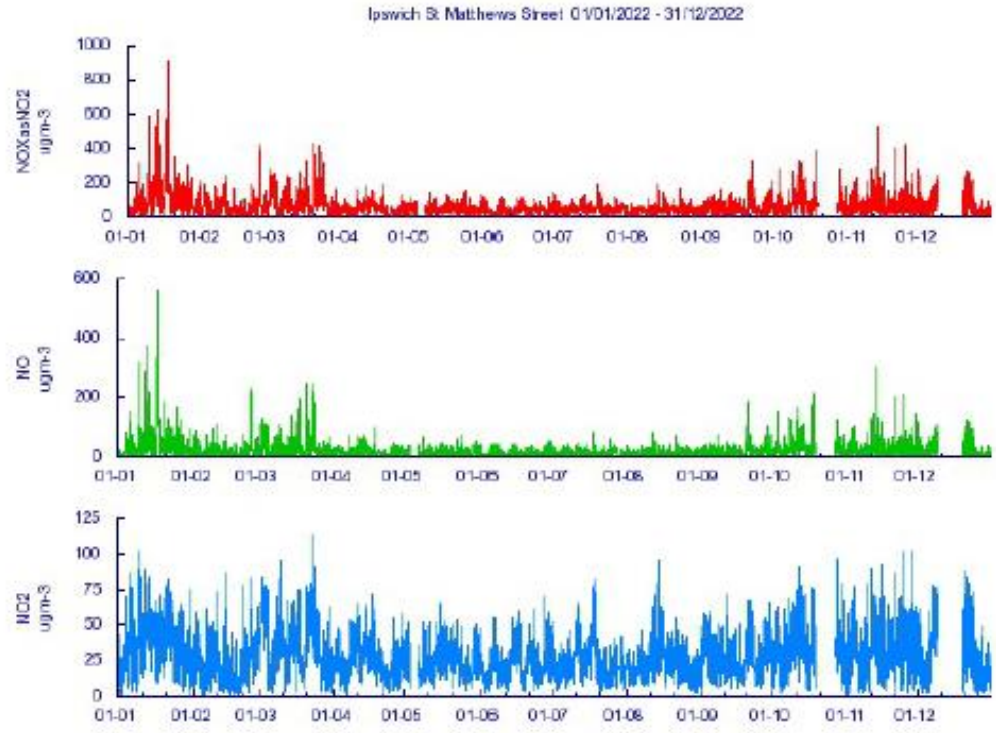
These data have been fully ratified
Only relevant statistics for LAQM are presented in the table. Cells with - indicate no data available or calculated.

Pollutant	NO µg/m³	NO_2 µg/m³	NO_x as NO_2 µg/m³
Number Days Low	-	345	-
Number Days Moderate	-	0	-
Number Days High	-	0	-
Number Days Very High	-	0	-
Max Daily Mean	180	63	318
Annual Max	561	113	911
Annual Mean	23	28	63
99.8th Percentile of hourly mean	-	89	-
98th Percentile of hourly mean	102	70	224
95th Percentile of hourly mean	70	59	164
50th Percentile of hourly mean	16	25	50
% Annual data capture	**93.29**	**93.26**	**93.26**

All gaseous pollutant mass units are at 20°C and 1013mb. Particulate matter concentrations are reported at ambient temperature and pressure. NO_X mass units are NO_X as NO_2 µgm-3

Pollutant	Air Quality Standards regulations 2010	Exceedances	Days
Nitrogen dioxide	Hourly Mean > 200 micrograms per metre cubed	0	0
Nitrogen dioxide	**Annual Mean > 40 micrograms per metre cubed**	**0**	-

Annual Graph



Chevallier Street Monitoring Annualisation

Due to the exceptional temperatures experienced in the summer of 2022, data between June and September had to be rejected as the monitor could not be cooled sufficiently despite the procurement of a new air conditioning unit. At the time of writing this report, works are planned to insulate the cabinet to hopefully prevent a similar issue occurring in the summer of 2023.

In light of the above, the monitor had a data capture of less than 75%. Paragraph 7.140 of LAQM.TG22 states that “Where automatic monitoring has been completed for less than 75% of the year, annualisation techniques can be used to estimate an annual average from a part year average.” The data from the continuous monitoring site has been annualised in accordance with the procedure detailed in LAQM.TG22 Box 7-9. Annualisation data is presented below in Table C.4.

This adjustment was undertaken using whole year datasets from the following AURN monitoring sites (all within a 50 mile radius of Ipswich and with data capture rates of in excess of 85%):

- Southend-on-Sea (UKA 00409) – Type: Urban Background;
- St Osyth (UKA 00445) – Type: Rural Background; and

- Norwich Lakenfields (UKA 00549) – Type: Urban Background

The average ratio (Ra) of the annual mean to period mean ratios (Am/Pm) for these sites was: 0.877744 and is therefore the annualisation factor. The measured period mean concentration (M) for the monitor was 22.41µg/m3. The estimate of the annualised average for the monitor was therefore M x Ra = 22.41 x 0.877744 = 19.7µg/m3.

Table C.4 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Lakenfields	Annualisation Factor St Osyth	Annualisation Factor Southend	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
IPS3	0.868093	0.886196	0.878944	0.877744	22.41	19.7

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, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

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

Figure D.1 – Overview of Ipswich AQMA boundaries and monitoring locations

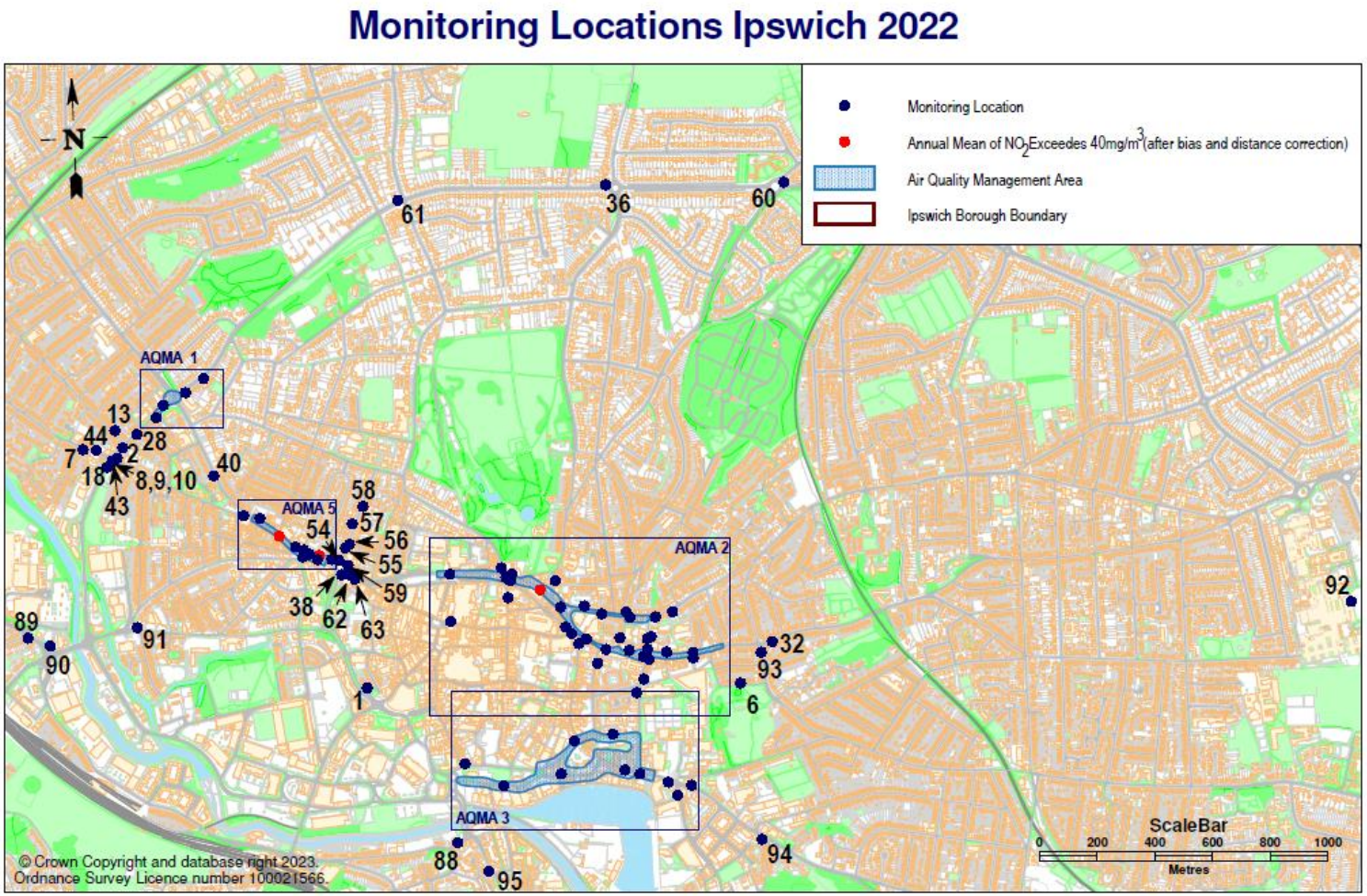


Figure D.2 – Ipswich Air Quality Management Area 1

Figure D.3 – Ipswich Air Quality Management Area 2

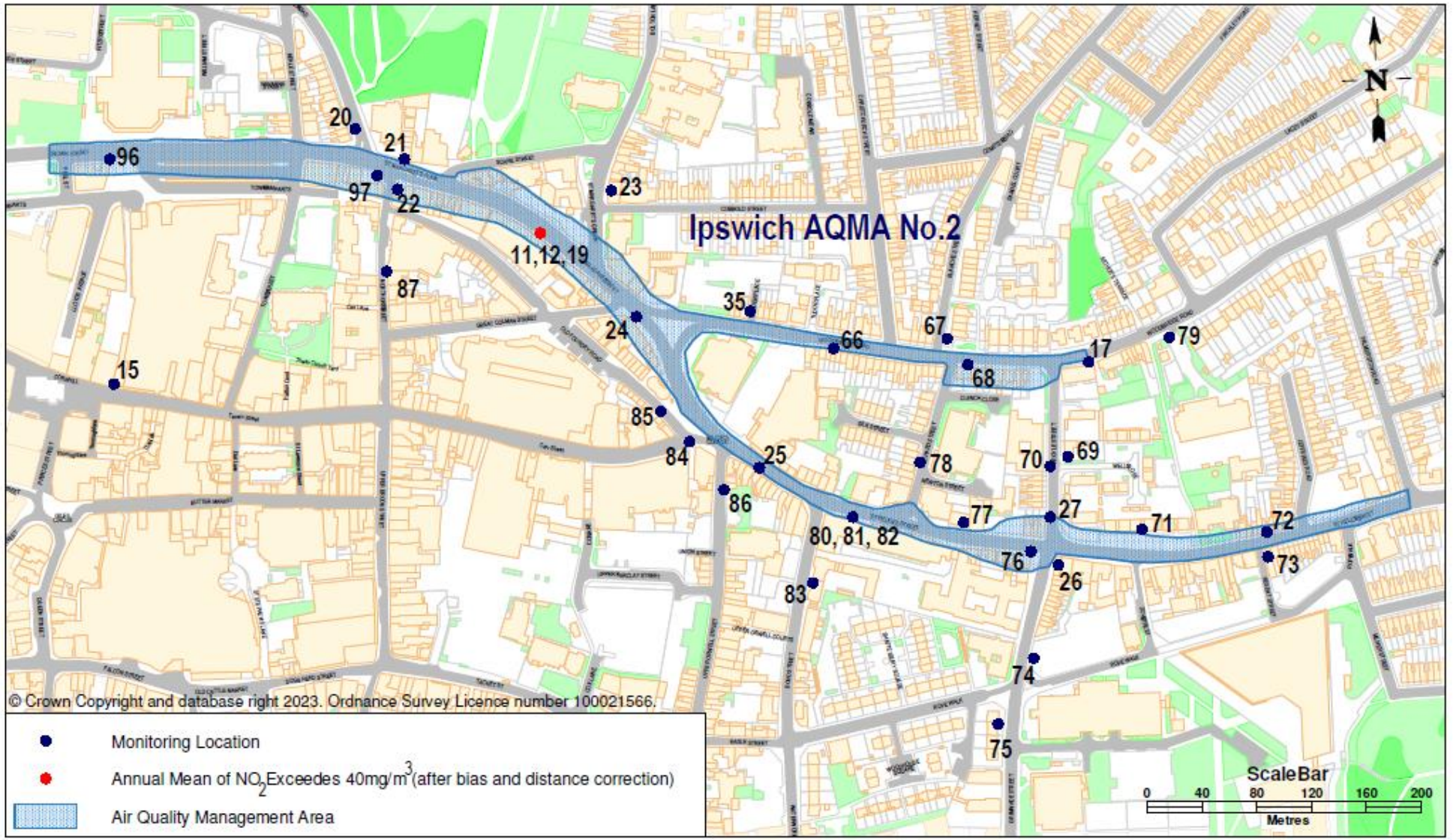


Figure D.4 - Ipswich Air Quality Management Area 3

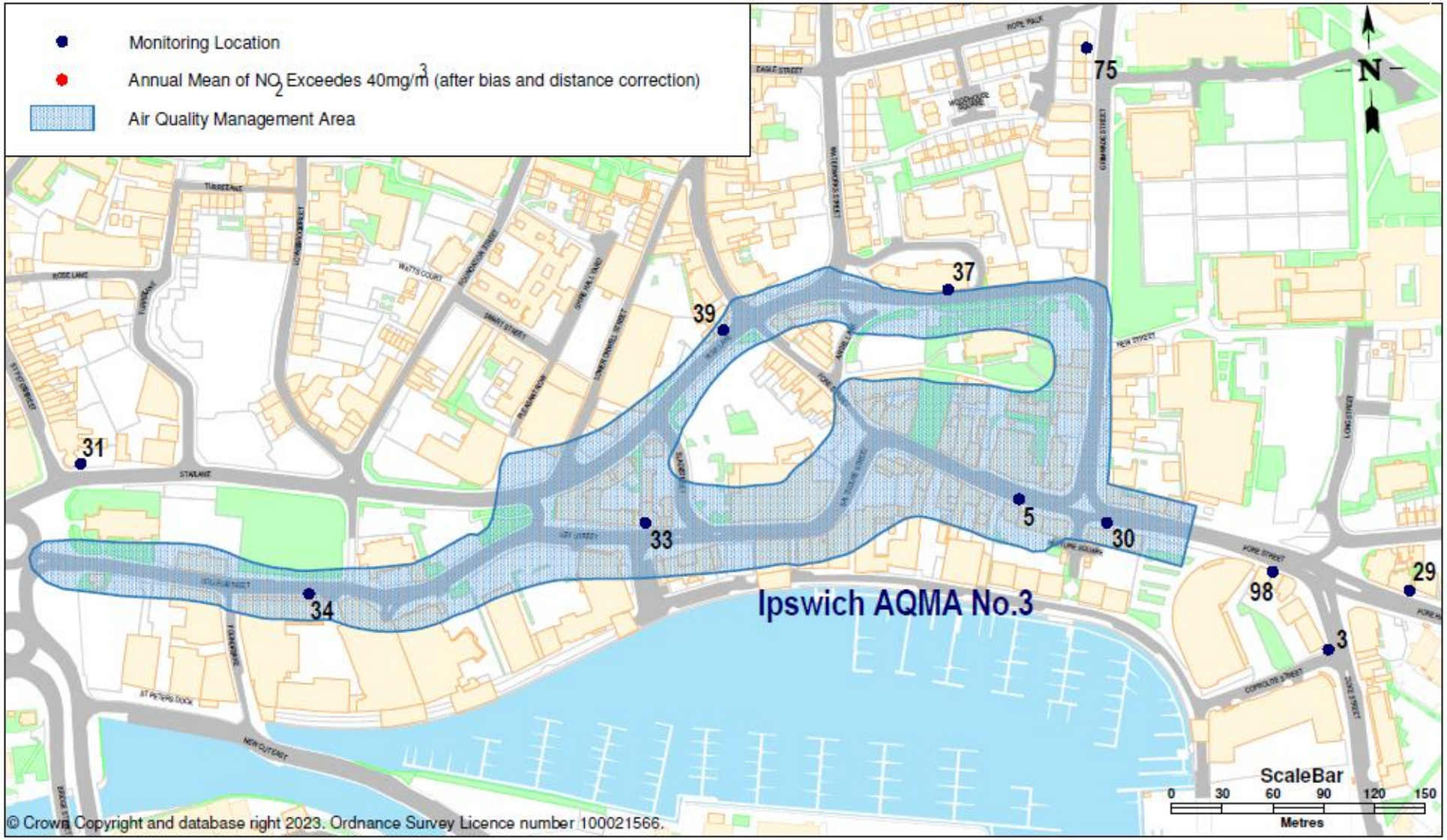
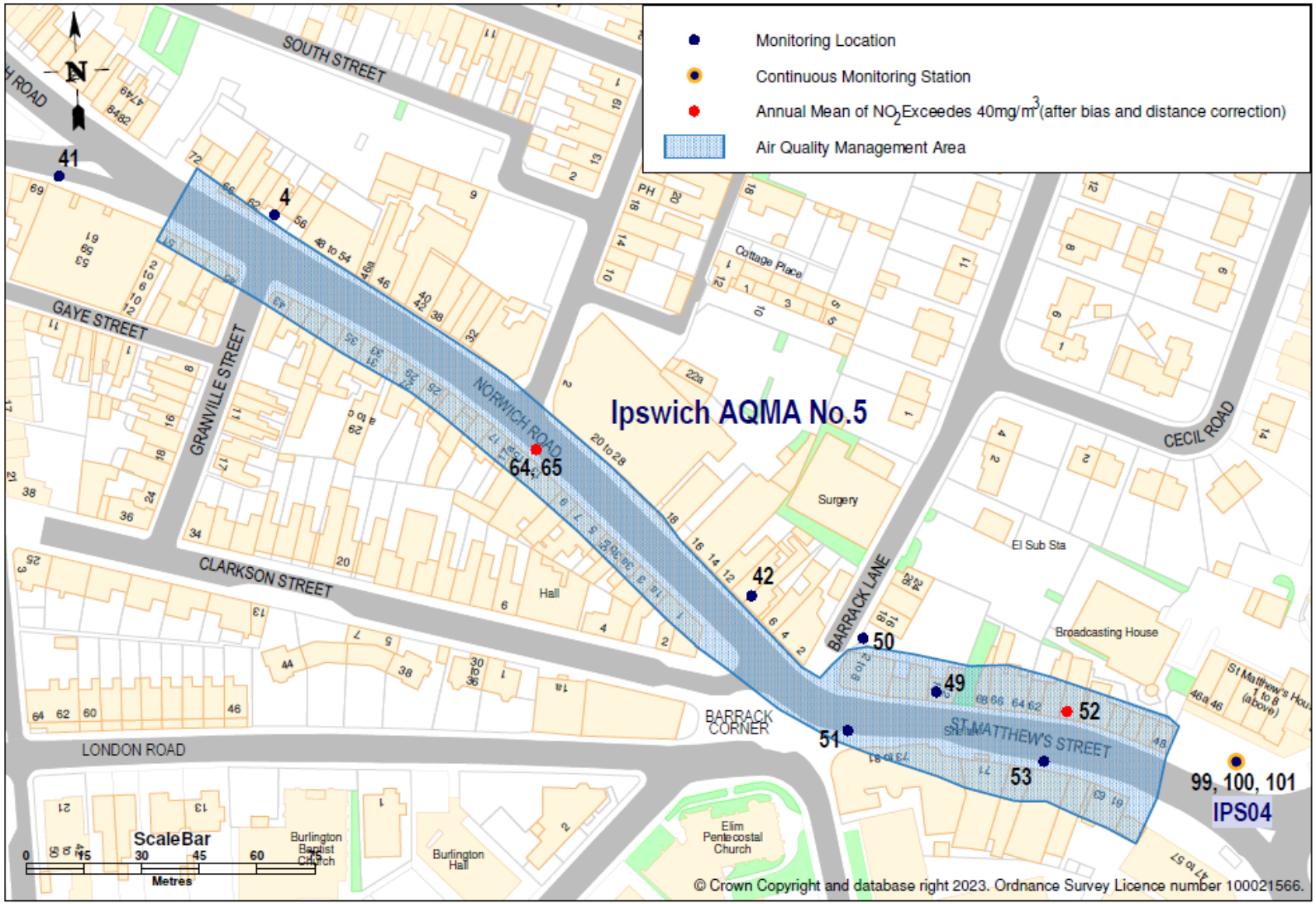


Figure D.5 – Ipswich Air Quality Management Area 5



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[8]

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

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

Glossary of Terms

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

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.