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

Information	Milton Keynes City Council Details
Local Authority Officer	Megan Harrison
Department	Environmental Health
Address	Civic, 1 Saxon Gate East, Central Milton Keynes MK9 3EJ
Telephone	01908 252759
E-mail	megan.harrison@milton-keynes.gov.uk
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Executive Summary: Air Quality in Our Area

1.1 Air Quality in Milton Keynes

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 equalities 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 343,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

In Milton Keynes the pollutant of most concern is nitrogen dioxide (NO_2) a gas mainly produced during the combustion of fossil fuels, including petrol and diesel, along with nitric oxide (NO). Short term exposure to NO_2 can cause inflammation of the airways and increase susceptibility to respiratory infections and allergens. Breathing in high levels of NO_2 can exacerbate symptoms of pre-existing heart and lung conditions, such as chronic obstructive pulmonary disease (COPD) and asthma.

In Milton Keynes the main source of oxides of nitrogen, along with fines particles is from road traffic emissions. An Air Quality Management Area (AQMA) was declared in 2008 in High Street South and Bridge Street, Olney because the annual mean nitrogen dioxide objective was being exceeded. There is a slight downward trend in the annual mean nitrogen dioxide (NO_2) and particulate matter (PM_{10}) concentrations measured over the last 15 years at the Civic Offices automatic monitoring station. This improvement is mirrored at the two other automatic monitoring stations located in Newport Pagnell and in

[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

Olney. Since 2015 the annual mean objective for NO_2 has not been exceeded at any monitoring location throughout the Borough, including within the AQMA.

In Milton Keynes City Council (a unitary authority) air quality is managed jointly by Environmental Health, Transport Policy, Development Control, Public Health and Sustainability Departments. The Council also works in partnership with other local authorities in Buckinghamshire as a member of the Buckinghamshire Air Quality Management Group (BAQMG) and with the Environment Agency (East of England Region) and attends Herts, Beds and Neighbouring Authorities Air Quality Forum.

1.2 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.

School Streets Pilot

On 31 January 2022, the Council introduced a new School Streets pilot scheme for Chestnuts and Cold Harbour Schools in West Bletchley. The new pilot scheme is an

[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

approach to transforming road safety and air quality outside schools, so that pedestrians and cyclists are prioritised during school drop off and pick up times. School Streets will help to reduce congestion and air pollution outside the school entrance, making it safer for parents and pupils to walk or cycle to school. In order to introduce these pedestrian zones, the Council has implemented an experimental prohibition of motor vehicles restriction on part of St Georges Road (for Chestnuts School) and Highland Close (for Cold Harbour School) during school drop off and pick up times. The experimental restrictions remained in operation until 31 July 2022. Loughton School restrictions began 13 June 2022.

A small minority of drivers ignored the rules which raises safety concerns and means the pilot cannot continue in its current form. While the ending of the pilot means no additional restrictions on vehicles around these schools, we urge drivers to think twice where possible about driving close to the school, and as always to observe local parking restrictions, as ad hoc parking enforcement will continue – as is the case at all schools across the city.

MK City Council will now review the feedback received during the pilot, which has been largely positive, and will seek greater enforcement powers from the Department for Transport in advance of potentially reinstating the pilot at these schools and rolling out School Streets to other locations in the city. Further details can be found here.

Milton Keynes set for an electric boost in 2022 with 250 new EV chargers

Electric vehicle charging points will be installed on streets in older residential areas of Milton Keynes after securing a £1.1m grant. As part of the Council's commitment to a carbon negative future, it has been working with Connected Kerb and Ringway to secure the largest grant offered to date from the Office for Zero Emission Vehicles (OZEV).

Around 40% of homes in Milton Keynes do not currently have access to off street charging facilities. The grant will be used to install 250 charging points on residential roads in older areas of Milton Keynes where there are fewer off street parking options but where electric vehicle ownership is on the rise.

Charging points began installation in the areas of Wolverton, Stony Stratford, Newport Pagnell, Bletchley and Olney from Thursday 24th February 2022.

Cabinet Member for Climate Action and Sustainability, Cllr Jenny Wilson-Marklew said: "We're delighted to have secured funding to make it easier for local people to use electric vehicles. Encouraging drivers to make the switch to electric is a vital part of our carbon

neutral future. It needs to be made as easy as possible and we look forward to working with all of our partners to begin this ground-breaking project."

Milton Keynes Car Club

Milton Keynes City Council launched an electric car share scheme in partnership with Enterprise to give local people the opportunity to borrow electric cars on a pay per use basis.

Car club members have access to a combination of electric and hybrid vehicles in eight locations across the city. Members can see the live state of charge and mileage range on every Enterprise Car Club electric vehicle when they book on the website. This means that they can be certain the vehicle will have enough power for the journey they are planning to make, bringing extra peace of mind.

Users who sign up to become a member of Enterprise Car Club in Milton Keynes will also have access to more than 1,400 vehicles located in 180 towns, cities and communities across the UK.

Conveniently the vehicles will be located on-street and are able to be rented contact-free, with ease of joining the club and step-by-step guide to enrolment and reservation. Cars were available to reserve from Friday 4th March 2022 via an app. Further details and location can be found here.

Car clubs are known for helping reduce car ownership levels, easing parking pressures and congestion while offering users the benefit of accessing a car without the burden of owning one at a fraction of a typical car ownership cost.

Those who give up their cars and choose car share schemes also tend to use other more sustainable modes more – public transport, walking, cycling and e-scooters.

Cabinet Member for Climate Change and Sustainability, Cllr Jennifer-Wilson Marklew said: "Around 635,000 people are signed up to car clubs across Britain and we think it will work well for lots of individuals and businesses in MK. It was a straightforward decision to launch an electric car club as it's more sustainable and cuts emissions, and will allow more drivers to reduce their carbon footprint. For many people the purchase price of an electric car is still out of reach and we hope this offers a more flexible option. I'm looking forward to seeing good use being made of the club."

E-Scooter trial to continue in MK

Since 2020, local people have made more than 300,000 electric Spin scooter journeys. MK was the first place to introduce the Spin trials (alongside other e-scooter operators Lime and Ginger) suggesting a real appetite for sustainable and convenient travel in MK. E-scooter trials in Milton Keynes are set to be extended for another 16 months with around 1.6m journeys already completed in the city.

The scooters have proved popular in MK and have replaced an estimated 390,000 car journeys, saving 128 tonnes of carbon.

The trials are led by Central Government and were initially planned to last 12 months. However, Government is seeking more time to consider national policy which means local authorities have the option to permit an extension of local trials. In Milton Keynes, trials are proposed to be extended until May 2024.

“We want Milton Keynes to lead in providing innovative low-cost sustainable transport. The popularity of e-scooters in MK isn’t surprising and shows a collective commitment from local people to cut emissions. We know there’s been some issues with the scooters and that’s exactly the kind of thing that the trial is intended to shine a spotlight on. We listen to people’s feedback and pass this onto the operators, so they can improve their service, and we all take one step nearer to a transport network that does more to tackle climate change.” - Cabinet Member for Climate Action and Sustainability, Cllr Jennifer Wilson-Marklew

Driverless Car Trials

Milton Keynes made the national headlines in January 2022 following the announcement that Milton Keynes is to become the first place to trial advanced 5G connectivity to power a fleet of four different autonomous vehicles on UK roads.

The autonomous vehicles will be based at Stadium MK and used by a range of their staff to support them in their daily duties. This follows previous trials with autonomous vehicles in the city in 2016.

'One stop shop' transport app

An innovative city-wide transport app that shares real-time information and books tickets regardless of the operator is one step nearer thanks to MK Council's 5G plans.

On the new app, passengers will be able to check how far away a vehicle is and how many seats are available in real time, and easily plan, book and pay for transport in a single transaction. The app is being made possible to due to MK City Council developing a reliable local 5G service.

The Council hopes better real time information will encourage more people into trying sustainable transport. It will eventually integrate the app into its existing journey planning website and app, www.getaroundmk.org.uk.

Cabinet Member for Climate and Sustainability, Cllr Jenny Wilson-Marklew said: "MK is leading the way yet again, making it easier for people to get around when they use more sustainable transport choices. The app will give passengers greater confidence that a vehicle is on its way and how long a journey by public transport will actually take.

Uncertainty is one of the reasons some people are put off using public transport, so we hope these kind of innovations will encourage more residents to give public transport a try."

MK City Council installs new 'diamond' secure cycle parking in city centre

Milton Keynes residents are set to benefit from 174 new and extremely secure cycling parking spaces in the city centre, with the first being installed at Lloyds Court.

Milton Keynes City Council set aside £60,000 to install 87 Streetpods, which is a type of maximum-security bike storage for public spaces. The units are 'Sold Secure Diamond-Rated' - the highest level of bicycle security available in the UK (Sold Secure is an independent body that assesses security products). They're resistant to prolonged attacks and as such are recommended by UK police.

The new pods, which are free to use, are being installed across the city centre including Lloyds Court, MK Gallery, in the wider Theatre District, and at Xscape and Midsummer Place.

Each pod can hold two bikes in a 'high-low' design to avoid handlebar clashes. Each front wheel fits neatly into a secure shell made from recycled materials that contains a ring of reinforced solid steel, and the back wheel and frame can be additionally secured though the steel ring using the cyclist's own D-lock. Experts recommend securing your bike with a heavy-duty 'Sold Secure' rated D-lock – or even two locks - where possible.

MK City Council heard through its recent 'Ride It, Lock It, Love It' initiative that local people would be more likely to cycle to the city centre if they were more confident in security. The Council is committed to increasing the number of secure cycle parking options, as it wants

to encourage more people to try travelling by two wheels and as such contribute to a cleaner, greener, healthier and more sustainable MK.

Cllr Jenny Wilson-Marklew, Cabinet Member responsible for Climate Action and Sustainability said: “We’re introducing these new Streetpods to give everyone more confidence in city centre bike security, and to encourage more people to choose two wheels more often as a way of cutting their carbon footprint. We’ll monitor their demand and keep working with partners to crack down on bike theft.”

MK City Council celebrates clean air day

16 June: MK City Council marked national clean air day - the UK’s largest air pollution campaign, bringing together communities, businesses, schools and health professionals.

MK City Council wants Milton Keynes to become a showcase for how a green and clean city should behave, and has been working with partners on innovative schemes to tackle climate change, and on becoming carbon neutral by 2030 and carbon negative by 2050.

MK’s unique grid road structure and 200 miles of redways helps to maintain air quality for pedestrians and cyclists alike, and a major pollution report found that the city has cleaner air than any other urban area in the UK.

In addition:

- The city is one of the best places to own an electric vehicle - with over 400 charging points and many more in the pipeline. Following a successful council bid last year, MK will be home to a brand new fleet of fully electric buses from next year.

- We're one of the most cycling-friendly places in the UK, with council initiatives to encourage more people to take up cycling including secure cycle parking, changing facilities, and over 300 public bikes available to hire.
- The council is currently running a pilot for a rewards system where local people earn vouchers for major retailers if they travel using green and healthy methods.

Find more details on the Get Around MK website.

"We're serious about tackling climate change and need everyone's help to achieve this. We've got some really exciting plans for sustainable travel in MK and want to make it easier for residents to do their bit. Everyone can make small changes which could have a big impact whether it's doing the school run on foot or using a bike to get to work." - Cabinet Member for Climate Action and Sustainability, Cllr Jennifer Wilson-Marklew

Council extends free electric bike loans

Cllr Jenny Wilson-Marklew handing over an eBike to MK's first new loanee, Geoff

In June Milton Keynes City Council announced it is extending a popular trial where residents can borrow an electric bike for free.

The Council teamed up with Fully Charged, a Silverstone-based eBike test centre to arrange the sustainable travel trial a year ago. Since then local people have cycled around 4,000 miles on the borrowed electric bikes.

Five bikes are available, and they can be used for up to four weeks for free. The bikes are proving very popular and have been out on loan for 90% of the time (loan availability was slightly disrupted by the pandemic).

The Council is now extending the trial for a further six months with potential to make electric bike hire a permanent feature in the city. During the pandemic, cycling and walking increased by almost 60% in some areas of Milton Keynes and the Council is capitalising on ongoing interest in cycling and promoting the eBikes as an environmentally friendly transport option.

Applications to loan an eBike should be made to Fully Charged and full details are on the Get Around MK website. MK City Council and Fully Charged will continue to host a monthly eBike pick up and drop off sessions at Station Square, where people pick up their equipment and receive a short briefing.

“We’re really excited to be able to extend this scheme which has been hugely popular with local people. The trial gives residents the opportunity to test electric bikes out before making a commitment to buying one. People are falling in love with eBikes and we want them here for good.” - Cabinet Member for Climate Action and Sustainability, Cllr Jennifer Wilson-Marklew

City Council Secures £1m for drone project

Milton Keynes City Council has successfully secured £1m of government funding to develop and deploy drones that could speed up the delivery of vital medicines, ease road congestion and reduce carbon emissions globally.

The City Council will work with Cranfield University’s Drone Innovation Hub and Satellite Applications Catapult Westcott DronePort to test and trial new drone-based services that work alongside current delivery services and autonomous vehicles. Milton Keynes has built a strong reputation as a world leader in future technologies and this latest trial will help create more high-tech jobs for local people.

The project includes smart traffic monitoring, secure parcel deliveries, remote building inspections and the transfer of vital medical supplies as part of an emergency response. Real-time information sharing through drone technologies will allow several services to work together and act faster when responding to incidents. Integrating ground and air-based services can also reduce carbon emissions.

“We’re proud to be hosting yet another trial to test future technologies in MK which will build on our reputation as a world leading smart city. The technologies have the potential to bring practical benefits to help people in everyday life and in time critical emergencies. If

the trials are successful it will also help us meet our climate action ambitions and create new jobs of the future for local people." - Leader of MK Council, Cllr Pete Marland

1.3 Conclusions and Priorities

All air quality objectives have been achieved throughout the Borough even though the city continues to grow rapidly. Concentrations of NO_2 in Milton Keynes are slightly up from 2020 but lower than 2021 and continuing the long-term downward trend. This long-term downward trend has also been seen in the levels of PM_{10}. Priorities for the coming year are to continue promoting the use of ultra-low emission vehicles (ULEVs) and the initiatives in the MK Go Ultra Low City scheme. The public will also be encouraged to use public transport and to cycle and walk making full use of the extensive (325 km) Milton Keynes redway system. The draft Milton Keynes' Local Cycling and Walking Infrastructure Plan focuses on delivering smaller "missing links" schemes (gaps in the redway network), planning new larger schemes, where there is no infrastructure at present, as well as improving existing redway infrastructure. The Council will be following the vision set out in the MK Strategy for Future 2050 and promoting the use of the Get Around MK app and new MK Connect Service. We hope to continue the success of the e cargo bikes and e scooters, and make further progress the community electric car clubs across Milton Keynes.

Actions and initiatives detailed in the governments' Clean Air Strategy 2019 (published January 2019) are designed to reduce emissions and air pollution leading to improved health and quality of life.

The new Local Plan for Milton Keynes, Plan:MK, covering the period up to 2031 was adopted by Milton Keynes Council on 20 March 2019. Details of the council's major developments, including a location map of sites can be found on the Planning Hub.

All applications for new developments that may have an impact on air quality have been assessed against the guidance documents produced by the Institute of Air Quality Management (IAQM).

1.4 Local Engagement and How to get Involved

Milton Keynes has a huge network of redways, super routes, leisure routes and places to ride. Make up your own route or follow one of our suggestions. You can also join a group, go on an organised ride or take part in an event, there are lots of ways you can get involved and take up cycling in MK. We're a cycle friendly city with commuter facilities, secure cycle parking and a lot of cycle shops.

Improve your cycling knowledge by taking a course – learn to ride, Bikeability or maintenance, there's something for all abilities.

MK Connect is our local transport service aimed at residents who aren't served by an existing bus route and can't get around by other means. Vehicles are shared by passengers heading the same way, with pickups typically within a couple of hundred metres of the passenger's home. More than 400,000 journeys have been made on MK Connect in the last year.

Further information is available on the MK Connect service.

Try car sharing:

- Car sharing can reduce the number of miles you put on your car and save you money in fuel and maintenance costs.
- Sharing the drive can also reduce your stress levels.
- If you commute with someone else in your company you can get to learn about their department and work.
- You could even make new friends or be a part of a new social group.
- Use Milton Keynes Liftshare to find someone who's travelling the same journey, save on fuel and have some company on the commute.

Join the Central Milton Keynes car-sharing scheme

Milton Keynes City Council Car Share is a parking permit for Central Milton Keynes employees who share a journey to work.

Join the permit scheme for just £130 a year per person (£65 per person for a six month permit) to receive the following benefits:

Free parking in all standard rate spaces and over 350 reserved cars share bays in prime locations. Please see our Central Milton Keynes parking map for locations of our ample central standard (purple) bays.

Interested to learn more, visit the Car Sharing pages.

1.5 Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Milton Keynes City Council with the support and agreement of the following officers and departments:

Environmental Health, Transport, Planning and Sustainability teams.

I If you have any comments on this ASR, please send them to Megan Harrison at:

Civic, 1 Saxon Gate East, Central Milton Keynes, MK9 3EJ

01908 252759

Megan.Harrison@Milton-Keynes.gov.uk

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Tables

2 Local Air Quality Management

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

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

3 Actions to Improve Air Quality

3.1 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 Milton Keynes City Council can be found in Table 3.1. The table presents a description of the Olney AQMA that is currently designated within Milton Keynes City Council. Appendix D: Maps of Monitoring Locations and AQMAs provides maps of AQMA and also the air quality monitoring locations in relation to the AQMA. The air quality objectives pertinent to the current AQMA designation are as follows:

- NO_2 annual mean

A revocation report has been prepared, discussed at Olney Town Council meeting and consulted on. The revocation just need to be passed by the Council at the next meeting.

A local Air Quality Strategy is under development to prevent and reduce polluting activities.

Table 3.1 – 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
Olney AQMA	Declared December 2008	NO2 Annual Mean	An area in Olney encompassing all properties fronting Bridge Street and High Street South, and also including part of Market Place.	NO	43.2	15.96 µg/m^3 at automatic station, 29.1 µg/m^3 highest diffusion tube	9	Olney Action Plan, 2012	https://www.milton-keynes.gov.uk/environmental-health-and-trading-standards/pollution/local-air-quality-management

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

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

3.2 Progress and Impact of Measures to address Air Quality in Milton Keynes

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

Defra comments	MKC comments
The report is well structured, detailed, and provides the information specified in the Guidance.	Noted
1. MKCC have provided sound justification for the revocation of the Olney AQMA (for consistent compliance with the NO2 annual mean AQO).	Noted
2. MKCC have made clear what measures from the AQAP were completed in 2021, and what the measures and priorities are for the next reporting year. This is very useful as it allows the reader to easily what progress is being made in the implementation of all measures contained within the AQAP.	Noted
3. MKCC have presented NO2 trends for automatic monitoring locations both inside the Olney AQMA and outside of the Olney AQMA. This is extremely useful as it allows the reader to easily understand trends relating to NO2 in these locations. This approach to data/trend presentation is encouraged for future reports.	Noted
4. The objective line in Figures A.1 and A.6 should be made clearer so that the figures are easier to read and interpret for the reader.	Noted and changed colour to red to clearly show the objective level.

5. Figure A.6 should be renamed 'Figure A.4' as there is no Figure A.4 or Figure A.5 contained within the ASR.	Updated in v2 on website
6. Figures should be produced for Table A.7 and Table A.10 to visualise the results within these tables to allow the reader to more easily see the results and trends contained within these tables	Additional graphs for Tables A7 and A10 included in this report
7. Table 2.2 (which shows progress on measures to improve air quality) should be filled in as much as possible to show as much detail as possible about the status of each individual measure.	Noted
8. Graphs containing the results and trends of the NO2 annual mean monitoring results from the non-automatic monitoring sites should be produced and shown in the ASR in the same manner as the results from automatic monitoring sites. This will allow the reader to see the trends and results from the non-automatic monitoring sites which makes up the vast majority of the total monitoring sites.	Noted and included in this report
9. Justification of the choice of diffusion tube bias adjustment factor should be provided to give the reader satisfaction and confidence that the correct diffusion tube bias adjustment factor is being used.	Noted and included
10. Figure D5 does not show the locations of the non-automatic monitoring sites particularly clearly. Figures should be produced that show the locations of the non-automatic monitoring sites to the same detail that Figures D1 – D3 show the	We have a new Council mapping system. More detailed figures showing the locations will be prepared for the next report and made available for the public to search for on the Council's My Milton Keynes Interactive Mapping

locations of the automatic monitoring sites and the Olney AQMA boundaries.	
11. In future reports, it would be good to have a section where planning applications are discussed and assessed, and whether they would have an impact on overall air quality and on the Olney AQMA.	Noted and included in this report

Milton Keynes City Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 3.2. 33 measures are included within Table 3.2, with the type of measure and the progress Milton Keynes City Council have made during the reporting year of 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 3.2.

More detail on these measures can be found in their respective Action Plans, links to which are in the table. Key completed measures are:

- Get Around MK website and app up and running.
- MK Connect Service
- E-cargo bikes up and running.
- E-scooters scheme extended.
- MK electric car community clubs launched and expanded

Milton Keynes City Council expects the following measures to be completed over the course of the next reporting year:

- Electric vehicle charging points for older residential areas
- School Street Pilot expanded

Milton Keynes City Council's priorities for the coming year are:

- Encouraging the continued uptake of ULEVs following the MK Go Ultra-Low City scheme and the expansion of the electric vehicle charging network.
- Promoting the Get Around MK website and app.

- Progressing the measures in the Mobility Strategy, the First and Last Mile Strategy and the Transport Infrastructure Delivery Plan .
- Progressing the measures in the Sustainability Strategy.
- Progressing the measures in the Milton Keynes Future for 2050 strategy.

The measures stated above and in Table 2.2 have already achieved compliance in Olney AQMA and Milton Keynes Council anticipates that they will achieve exposure reduction across the borough.

Table 3.2 – 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
1	Go Ultra Low City Scheme	Promoting Low Emission Transport	Other	2017		MK Council	Office for Low Emission Vehicles (OLEV)	NO	Partially Funded		Implementation	n/a	ULEV ownership per capita	EV Centre opened in July 2017 and by June 2019 had welcomed 100,000 visitors and arranged 4000 test drives.	Trialling of driverless cars on highways and pods on shared footpaths https://www.gov.uk/government/news/40-million-to-drive-green-car-revolution-across-uk-cities
2	Expansion of Electric Vehicle charging network	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2015		MK Council	MK Council/OLEV	NO	Partially Funded		Implementation	n/a	Number of recharging events No of charge points	New charging hub at MK Coachway with 8 rapid and 4 ultra-rapid charge points. More than 400 public charge points installed.	15 min hub sites identified to act as multi charger sites to support residential charging
3	Vivacity - a sensor network providing real-time transport information; volume, classification, speed, turning counts, parking availability.	Traffic Management	UTC, Congestion management, traffic reduction	2017	2018	MK Council/Vivacity	MK Council/Vivacity	NO	Partially Funded		Completed	n/a		Approx 400 sensors on highways and 1300 on parking areas.	Parking data purchased by MyMK for use in parking app. Traffic junction sensors are currently turned off.
4	Urban Traffic Management Control (UTMC) system	Traffic Management	UTC, Congestion management, traffic reduction	2018	2022	MK Council/DfT	National Productivity Infrastructure Fund. Planning tariff/section 106 agreement	NO	Funded		Implementation			First tranche of CMK signals upgraded, more to follow. CCTV and more of system to be delivered in next 2 years.	Installing an urban traffic management control system, inc bus priority measures.
5	UK Auto Drive programme	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2015	2018	MK Council, Government, industries	MK Council, Government, industries £19.4M	NO	Partially Funded	£10k - 50k	Completed			Trialling of driverless pods on shared footpaths ongoing. trailing of driverless cars on public highways in MK started March 2018	Research, development, and integration of automated and connected vehicles http://www.ukautodrive.com/the-uk-autodrive-project/
6	Free ULEV green car parking permit. Cheaper permits for low emission vehicles	Promoting Low Emission Transport	Priority parking for LEV's	2016		MK Council	MK Council	NO	Not Funded		Implementation	n/a	Number of permits issued	Introduced July 2016	https://www.milton-keynes.gov.uk/highways-and-transport-hub/smarter-choices/electric-vehicle-charge-points
7	Smarter travel choices	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2012		MK Council	MK Council	NO	Not Funded		Implementation	n/a	Number of visits to website per month, currently 5000 per month	ongoing	New website developed https://www.getsmartertravelmk.org/

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
8	Love to Ride - website encouraging cycling – cycle September June bike week. Prizes	Promoting Travel Alternatives	Promotion of cycling	2017		MK Council	MK Council	NO	Not Funded		Implementation		Number of new rides and miles ridden per 12 months	All time participation stats up to April 2019: 134 organisations, 1858 people, 434 new riders, 1,147,712 miles 95,929 trips	Cycle incentives website https://www.lovetoride.net/miltonkeynes
9	Super Redway Routes	Transport Planning and Infrastructure	Cycle network	2017		MK Council	MK Council	NO	Not Funded		Implementation			H6 super route completed. Works have been undertaken on other Redway routes e.g., H8 Marlborough St.	Awaiting funding for further routes
10	Cycling information, events, and opportunities	Public Information	Via the Internet	2012		MK Council	MK Council	NO	Not Funded		Implementation	n/a		ongoing	Pedalling Culture Website developed http://www.pedallingculture.com/
11	Santander bike hire	Transport Planning and Infrastructure	Public cycle hire scheme	2017	2020	Santander/Nextbike	Santander/Nextbike	NO	Funded		Completed	n/a	Number of hires	300 bikes 42 docking stations	Scheme relaunched in Dec 2019 with new cycle fleet and docking stations.
12	Lime-E Bikes	Transport Planning and Infrastructure	Public cycle hire scheme	2018		Lime	Lime	NO	Funded		Implementation	n/a	Number of hires	50 bikes supplied (dockless GPS tracked)	Bikes are unlocked using phone app
13	Public Health support for healthy schools	Promoting Travel Alternatives	Promotion of walking	2019	2024	MK Council	MK Council	NO	Not Funded		Implementation	n/a	No. of schools engaged	MoreLife UK commissioned to deliver- due to start schools element in Sept 2019	Working to improve the whole school environment to reduce childhood obesity- from physical activity policies to staff training and will include active travel
14	Modeshift STARS – national schools awards scheme	Promoting Travel Alternatives	School Travel Plans	2017		MK Council/DfT	DfT	NO	Partially Funded		Implementation		Number of schools registered	40 schools registered. 19% light green modes (bus, park&stride, car sharing) 41% green modes (walking, cycling, scooting) 40% car	Walk to school, bike school and scooter training https://modeshiftstars.org/#
15	East West Rail	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2019	2024	East West Railway Company / Network Rail	EWR Consortium	NO	Funded		Implementation	n/a		Phase 1 complete. Phase 2 construction started early 2020	https://www.eastwestrail.org.uk/
16	A421 Dualling to M1 J13	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2018	2021	Central Beds Council/MK Council	DfT £28.5m project	NO	Funded	£10k - 50k	Completed			Initial preparatory roadworks commenced Sept 2018	http://www.centralbedfordshire.gov.uk/transport/a421/overview.aspx

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
17	Highways England All-Lane Running (ALR) Smart Motorway	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2018	2022	Highways England	Highways England £373m project	NO	Funded	£100k - £500k	Planning	Environmental report found NO2 emissions not significant and scheme will ease congestion		Works commenced June 2018	https://highwaysengland.co.uk/projects/m1-junction-13-to-junction-16-smart-motorway/
18	Real time passenger information (RTPI) – bus routes	Transport Planning and Infrastructure	Bus route improvements	2014		MK Council	MK Council	NO	Not Funded		Implementation	n/a		Most key routes now have RTPI	https://www.milton-keynes.gov.uk/highways-and-transport-hub/bus-and-taxi/real-time-passenger-information
19	E-cargo bikes project	Promoting Travel Alternatives	Promotion of cycling	2020	2021	MK Council	Govt grant £220K	NO	Funded	£50k - £100k	Implementation		Mileage undertaken using electric bikes	21 e-cargo bikes purchased	Level of take up for lease - will promote this for businesses https://getaroundmk.org.uk/cycling/e-cargo-bikes
20	Milton Keynes Strategy for 2050	Other	Other	2020	2032	MK Council		NO	Not Funded		Planning			Long term strategy approved by Cabinet Dec 2020	https://www.mkfutures2050.com/
21	Electric Vehicle charging technologies trial	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2020	2021	MK Council CrowdCharge Flexitricity		NO	Funded		Implementation			Trial in progress	https://crowd-charge.com/
22	E-scooters	Alternatives to private vehicle use	Other	2020	2024	MK Council, Lime, Spin, Ginger	DfT	NO	Funded		Implementation		Number of hires	Initial trial of 50 completed, now 300 available for public use	https://getaroundmk.org.uk/get-connected/go-electric/e-scooter-trials
23	Solar powered bus stops	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2020	2021	MK Council	MK Council	NO	Not Funded		Implementation			Two displays installed	
24	Get Around MK website and app	Promoting Travel Alternatives	Personalised Travel Planning	2021	2021	MK Council	MK Council	NO	Partially Funded		Implementation			Get Around website and app launched	https://getaroundmk.org.uk/
25	MK Connect	Alternatives to private vehicle use	Other	2021	2021	MK Council	MK Council	NO	Partially Funded		Implementation		Number of hires	MK Connect in operation	https://ridewithvia.com/mk-connect/
26	Electric vehicle community charging hubs	Alternatives to private vehicle use	Car Clubs	2021	2023	MK Council	MK Council	NO	Partially Funded		Planning			The 1st hub has opened at Saxon Gate, Stony Stratford will open soon. More to follow	https://getaroundmk.org.uk/news/milton-keynes-community-charging-hubs
27	Bicycle parking	Alternatives to private vehicle use	Other	2021	2022	MK Council, Turvec, PWLC	MK Council, Turvec, PWLC	NO	Partially Funded		Implementation			Project launched	https://getaroundmk.org.uk/get-connected/work-smarter/cycling-parking

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
28	Electric vehicle charging points for older residential areas	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2022		MK City Council, Connected Kerb, Ringway, OZEV	OZEV	NO	Funded	£1 million - £10 million	Implementation			Work has commenced	https://getaroundmk.org.uk/news/residential-electric-vehicle-charging
29	Milton Keynes Car Club	Alternatives to private vehicle use	Car Clubs	2022		MKCC, Enterprise Car Club	MKCC, Enterprise Car Club	NO	Funded		Implementation		Number of hires	Some clubs have opened	https://getaroundmk.org.uk/get-connected/go-electric/car-club
30	School Streets Pilot	Promoting Travel Alternatives	School Travel Plans	2022		MK City Council	MK City Council	NO	Partially Funded		Implementation			Pilot of two schools. More planned	https://www.milton-keynes.gov.uk/school-streets
31	5G network enabled one stop shop transport app	Promoting Travel Alternatives	Other	2022		MK City Council	MK City Council	NO	Not Funded		Planning			Local 5G service being implemented	https://www.milton-keynes.gov.uk/news/2022/mk-lead-way-one-stop-shop-transport-app
32	Diamond secure cycle parking	Promoting Travel Alternatives	Promotion of cycling	2022	2022	MK City Council	MK City Council	NO	Not Funded	£50k - £100k	Completed		Number of uses	Streetpods have been installed at various CMK locations	https://www.milton-keynes.gov.uk/news/2022/mk-council-installs-new-diamond-secure-cycle-parking-city-centre
33	Drone project	Other	Other	2022		MK City Council, Cranfield University Westcott DronePort	Government funding	NO	Funded	£500k - £1 million	Planning			Planning and development stage	https://www.milton-keynes.gov.uk/news/2022/city-council-secures-ps1m-drone-project

3.3 PM2.5 – 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.

The national air quality objective for $PM_{2.5}$ is an annual mean concentration of 20 µg/m^3, to be achieved by 01-Jan-2020. There is a target to reduce concentrations at urban background locations by 15%, to be achieved between 2010 and 2020.

The Public Health Outcomes Framework (PHOF) includes an indicator relating to anthropogenic particulate air pollution, measured as fine particulate matter, $PM_{2.5}$. The indicator is known as D01 (previously 3.01) and the latest value for Milton Keynes is 6.1%, calculated from modelled 2020 data. This is the fraction of annual all-cause adult mortality attributable to $PM_{2.5}$. As a comparison, the value for Central Beds is 5.7% and Luton 6.2%.

It is estimated that UK emissions contribute about 50% of total annual average $PM_{2.5}$, the rest is mainly from European countries, the proportion varying from year to year depending on meteorology; many episodes of high concentration occur on easterly winds. Emissions from diesel engines are a major source of fine particles. In January 2019 the government published the national Clean Air Strategy 2019. This identifies domestic wood and solid fuel burning as a major source of locally derived $PM_{2.5}$ emissions (up to 38%).

The health effects of $PM_{2.5}$ are recognised in Milton Keynes and the Joint Strategic Needs Assessment (JSNA) contains a section on this pollutant and its effect on the local population.

Milton Keynes Council is taking the following measures to address $PM_{2.5}$ primarily by reducing emissions from transport and by promoting a more active lifestyle:

- Partnership working to address pollution and health concerns takes place between Environmental Health, Transport Policy, Public Health and Sustainability Departments within the Council. Public health evidence will be implemented to prevent and minimise impacts of air pollution, including NICE Guideline NG70: Air

pollution: outdoor air quality and health (2017) and the Public Health England: Review of interventions to improve outdoor air quality and public health (2019).

- By promoting active travel plans - the “Get Smarter Travel in MK” campaign encourages more sustainable forms of travel such as walking and cycling, moving away from single occupancy vehicles.
- Raising awareness of the effect of air pollution on public health and of the health benefits of more active travel.
- Promoting the use of electric and other low emission vehicles and providing charge points throughout the Borough.
- Improving bus services and providing real time bus passenger information to encourage the use of public transport; Get on Board is a promotional initiative funded by the Department of Transport’s Better Bus Area (BBA) fund.
- Procuring electric buses for major routes through the city.
- By adopting a low carbon, more sustainable approach to living in Milton Keynes. By implementing the Sustainability Strategy 2019-2050
- Promoting the use of Eco-design Ready domestic wood burning stoves and distributing leaflets advising how to operate and maintain stoves and the importance of using dry logs.
- Promoting the Ready to Burn fuel certification scheme for Manufactured Solid Fuels (MSF) and wood fuel, to comply with Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020.

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

This section sets out the monitoring undertaken within 2022 by Milton Keynes City 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.

4.1 Summary of Monitoring Undertaken

4.1.1 Automatic Monitoring Sites

Milton Keynes City Council undertook automatic (continuous) monitoring at 3 sites during 2022. Table A.1 in Appendix A shows the details of the automatic monitoring sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem.

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.

4.1.2 Non-Automatic Monitoring Sites

Milton Keynes City Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 37 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.

4.2 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.

4.2.1 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.

4.2.2 Particulate Matter (PM_{10})

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

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

There were no exceedances of the annual mean objective and one exceedance of the daily mean objective. The Civic station recorded an annual mean concentration of 12.4 µg/m^3, well within the objective. Figure A.3 shows there is a slight downward trend at the stations over the last 10 years that flattens out from 2014 rising again in 2019, with 10 exceedances of the 24-hour mean. As with NO_2 data, the 2020, 2021 and 2022 datasets have reversed this apparent shift.

4.2.3 Particulate Matter ($PM_{2.5}$)

Error! Reference source not found. in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years.

The $PM_{2.5}$ annual mean concentration at the Civic Offices in 2022 was 8.18 µg/m^3. With only 4 years of measured $PM_{2.5}$ data it is difficult to draw any trends, however, the readings have decreased from 2019 levels.

4.2.4 Sulphur Dioxide (SO_2)

Automatic monitoring was undertaken between 1999 and 2012. Sulphur dioxide is no longer monitored in Milton Keynes because levels are very low and there are no risks of exceeding air quality objectives.

5 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)
Fixed	Civic, CMK	Urban Centre	485070	239131	NO_2; PM_{10}; $PM_{2.5}$; O_3	NO	Chemiluminescence; Fidas 200E; UV absorption	113 (to residential)	4.8	3.2
Roadbox 1	Wolverton Road, Newport Pagnell	Roadside	486290	243344	NO_2	NO	Chemiluminescence	25 (to residential)	3.4	1.5
Roadbox 2	High Street South, Olney	Roadside	488922	251157	NO_2	YES	Chemiluminescence	11 (to residential)	2	1.5

Notes:

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

(2) N/A if not applicable

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)
B1, B2	Northampton Rd, Lavendon (Horseshoe PH)	Roadside	491769	253542	NO2	No	0.6	3.0	No	2.1
C1, C2, C3	10 High St South, Olney (Cowper School House)	Roadside	488914	251173	NO2	Yes - Olney AQMA	0.0	2.0	No	2.3
D1, D2, D3	9 High St South, Olney (Olney Wine Bar)	Roadside	488904	251177	NO2	Yes - Olney AQMA	0.0	1.7	No	2.2
E1, E2, E3	20 High St, Olney	Roadside	488926	251455	NO2	No	3.3	7.6	No	2.2
F1, F2, F3	17 High St, Olney (Opp No.20 High St)	Roadside	488905	251456	NO2	No	0.0	7.2	No	2.1
G1, G2	Corner of Coneygere and Palmers Rd, Olney	Suburban	489108	251213	NO2	No	10.4	1.7	No	2.2

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
I1, I2	63 High St, Newport Pagnell	Kerbside	487588	243912	NO2	No	2.0	0.4	No	2.4
K1, K2	16-17 Greenlands, Newport Pagnell	Suburban	486296	243208	NO2	No	10.1	1.6	No	2.1
L1, L2	5-7 Greenlands, Newport Pagnell	Suburban	486345	243230	NO2	No	5.4	1.4	No	2.5
M1, M2	42-44 Walnut Close, Newport Pagnell	Suburban	486495	243345	NO2	No	7.6	1.5	No	2.0
N1, N2	222 Wolverton Rd, Blakelands	Suburban	486069	243148	NO2	No	25.0	1.6	No	2.2
O1, O2	64 Nicholas Mead, Great Linford	Urban Background	486039	241484	NO2	No	2.4	4.0	No	1.9
R1, R2, R3	Static Air Quality Station (Civic Offices)	Urban Centre	485070	239131	NO2	No	113.0	4.8	Yes	3.5
S1, S2, S3	Roadbox (Newport Pagnell)	Roadside	486290	243344	NO2	No	25.8	1.8	Yes	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)
T1, T2	Silbury Boulevard, CMK (corner of North Tenth St)	Kerbside	485298	239126	NO2	No	28.2	0.9	No	2.5
V1, V2	63 Windsor St, Wolverton	Suburban	481412	240860	NO2	No	2.3	1.1	No	2.3
W1, W2	130 Newport Rd, New Bradwell	Roadside	482965	241515	NO2	No	6.1	1.6	No	2.4
AA1, AA2	Brook Farm, Broughton Rd, Middleton	Suburban	489237	239016	NO2	No	23.0	1.0	No	2.1
BB1, BB2	14-16 Newport Rd, Wavendon	Roadside	491498	237284	NO2	No	9.7	7.2	No	1.9
DD1, DD2	Aylesbury St, Fenny Stratford (Bracknell House)	Roadside	488118	233814	NO2	No	11.1	4.5	No	2.4
EE1, EE2	6 Atherstone Court, Two Mile Ash	Suburban	481331	238825	NO2	No	9.5	0.4	No	1.9

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
FF1, FF2, FF3	Cross Keys Office, High St South, Olney	Roadside	488898	251186	NO2	Yes - Olney AQMA	0.2	1.6	No	2.0
HH1, HH2, HH3	Art Mart, 33 High Street South, Olney	Roadside	488891	251248	NO2	Yes - Olney AQMA	0.6	2.0	No	2.1
JJ1, JJ2, JJ3	New Roadbox location (Olney)	Roadside	488922	251157	NO2	Yes - Olney AQMA	10.1	2.0	Yes	2.1
KK1, KK2, KK3	18/20 Bridge St, Olney	Roadside	488917	251068	NO2	Yes - Olney AQMA	0.4	2.2	No	2.2
LL1, LL2, LL3	Courtney House, Bridge St, Olney	Roadside	488909	251077	NO2	Yes - Olney AQMA	0.4	1.7	No	2.1
MM1, MM2	18 Wheatcroft Close, Beanhill	Urban Background	486332	236228	NO2	No	10.1	0.3	No	2.2
PP1, PP2	1 Tudor Gardens, Stony Stratford	Suburban	479459	239536	NO2	No	17.0	2.3	No	2.2
QQ1, QQ2	Silver Street, Stony Stratford	Suburban	478740	240217	NO2	No	3.0	0.9	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
RR1, RR2	Horsefair Green, Stony Stratford	Suburban	478882	240265	NO2	No	3.5	2.6	No	2.0
TT1, TT2	Co-Op traffic sign, High St, NP (north side)	Roadside	487589	243923	NO2	No	n/a	4.2	No	2.0
WER1, WER2	97 Water Eaton Road, Bletchley	Roadside	487395	233174	NO2	No	12.0	2.5	No	2.4
AAA1, AAA2	4 Mary Rose, Brooklands	Suburban	489835	240351	NO2	No	4.2	4.8	No	2.0
BBB1, BBB2	267 Fen Street, Brooklands	Roadside	490299	239695	NO2	No	6.0	0.5	No	2.0
CCC1, CCC2	Grovesbrook, Station Road, Bow Brickhill	Roadside	490529	234611	NO2	No	12.2	2.9	No	2.0
DDD1, DDD2	Chapel St/Station Rd, Woburn Sands	Roadside	492923	235716	NO2	No	5.7	2.8	No	2.0
EEE1, EEE2	Miles Close, Blakelands	Suburban	486164	243168	NO2	No	17.3	1.6	No	2.0

Table A.3 – Annual Mean NO2 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
Fixed	485070	239131	Urban Centre	87.7	87.7	16.2	23.5	16.36	16.56	12.41
Roadbox 1	486290	243344	Roadside	89.1	89.1	25.6	27.1	24.22	29.67	24.87
Roadbox 2	488922	251157	Roadside	78.4	78.4	19.9	23.9	17.768	18.49	15.96

☒ **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
B1, B2	491769	253542	Roadside	100	100.0	17.4	18.8	14.8	14.5	12.8
C1, C2, C3	488914	251173	Roadside	100	100.0	33.9	36.4	28.5	31.6	26.5
D1, D2, D3	488904	251177	Roadside	100	100.0	30.2	30.9	24.7	33.3	29.1
E1, E2, E3	488926	251455	Roadside	100	100.0	21.3	19.8	17.4	18.3	14.9
F1, F2, F3	488905	251456	Roadside	100	100.0	23.1	25.1	19.6	20.7	17.8
G1, G2	489108	251213	Suburban	100	100.0	10.8	11.1	8.8	9.4	7.9
I1, I2	487588	243912	Kerbside	100	100.0	26.7	24.6	23.6	23.6	20.2
K1, K2	486296	243208	Suburban	100	100.0	22.2	20.5	19.3	18.5	16.8
L1, L2	486345	243230	Suburban	100	100.0	20.7	20.7	17.8	17.6	16.0
M1, M2	486495	243345	Suburban	100	100.0	16.9	14.7	13.9	13.5	11.7
N1, N2	486069	243148	Suburban	100	100.0	21.5	14.8	16.5	18.3	14.8

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
O1, O2	486039	241484	Urban Background	100	100.0	15.2	16.3	13.4	14.7	12.0
R1, R2, R3	485070	239131	Urban Centre	100	100.0	18.4	17.1	13.6	14.6	13.1
S1, S2, S3	486290	243344	Roadside	100	100.0	27.4	21.4	22.2	23.8	20.4
T1, T2	485298	239126	Kerbside	100	100.0	21.6	18.3	17.7	21.3	18.3
V1, V2	481412	240860	Suburban	100	100.0	15.0	15.0	11.8	12.8	11.1
W1, W2	482965	241515	Roadside	100	100.0	17.7	17.9	16.5	18.0	15.4
AA1, AA2	489237	239016	Suburban	100	100.0	14.4	13.7	12.7	12.9	11.4
BB1, BB2	491498	237284	Roadside	100	100.0	18.4	16.5	13.8	15.0	12.1
DD1, DD2	488118	233814	Roadside	100	100.0	22.8	19.8	20.1	22.5	18.4
EE1, EE2	481331	238825	Suburban	100	100.0	12.2	10.6	8.6	9.9	8.4
FF1, FF2, FF3	488898	251186	Roadside	100	100.0	30.6	34.0	27.5	27.7	25.3

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
HH1, HH2, HH3	488891	251248	Roadside	100	100.0	26.6	27.9	23.1	25.3	20.7
JJ1, JJ2, JJ3	488922	251157	Roadside	100	100.0	23.5	18.4	19.9	21.5	16.9
KK1, KK2, KK3	488917	251068	Roadside	100	100.0	32.9	34.7	28.7	31.3	26.8
LL1, LL2, LL3	488909	251077	Roadside	100	100.0	28.1	29.6	25.1	26.6	21.8
MM1, MM2	486332	236228	Urban Background	92.3	92.3	22.6	19.0	20.3	21.7	20.0
PP1, PP2	479459	239536	Suburban	92.3	92.3	10.6	10.3	7.8	8.5	6.7
QQ1, QQ2	478740	240217	Suburban	100	100.0	17.7	14.9	13.3	13.7	11.5
RR1, RR2	478882	240265	Suburban	100	100.0	21.2	19.2	16.9	17.4	14.4
TT1, TT2	487589	243923	Roadside	100	100.0	26.8	25.3	22.9	25.7	18.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
WER1, WER2	487395	233174	Roadside	100	100.0	20.0	17.9	18.8	19.5	15.6
AAA1, AAA2	489835	240351	Suburban	92.3	92.3	19.4	17.8	15.9	16.2	13.5
BBB1, BBB2	490299	239695	Roadside	92.3	92.3	19.7	19.1	17.6	19.1	16.9
CCC1, CCC2	490529	234611	Roadside	100	100.0	14.5	13.4	12.7	12.6	10.4
DDD1, DDD2	492923	235716	Roadside	100	100.0	14.9	15.1	12.0	12.0	10.3
EEE1, EEE2	486164	243168	Suburban	90.4	90.4		14.8	17.5	17.8	15.1

☒ **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

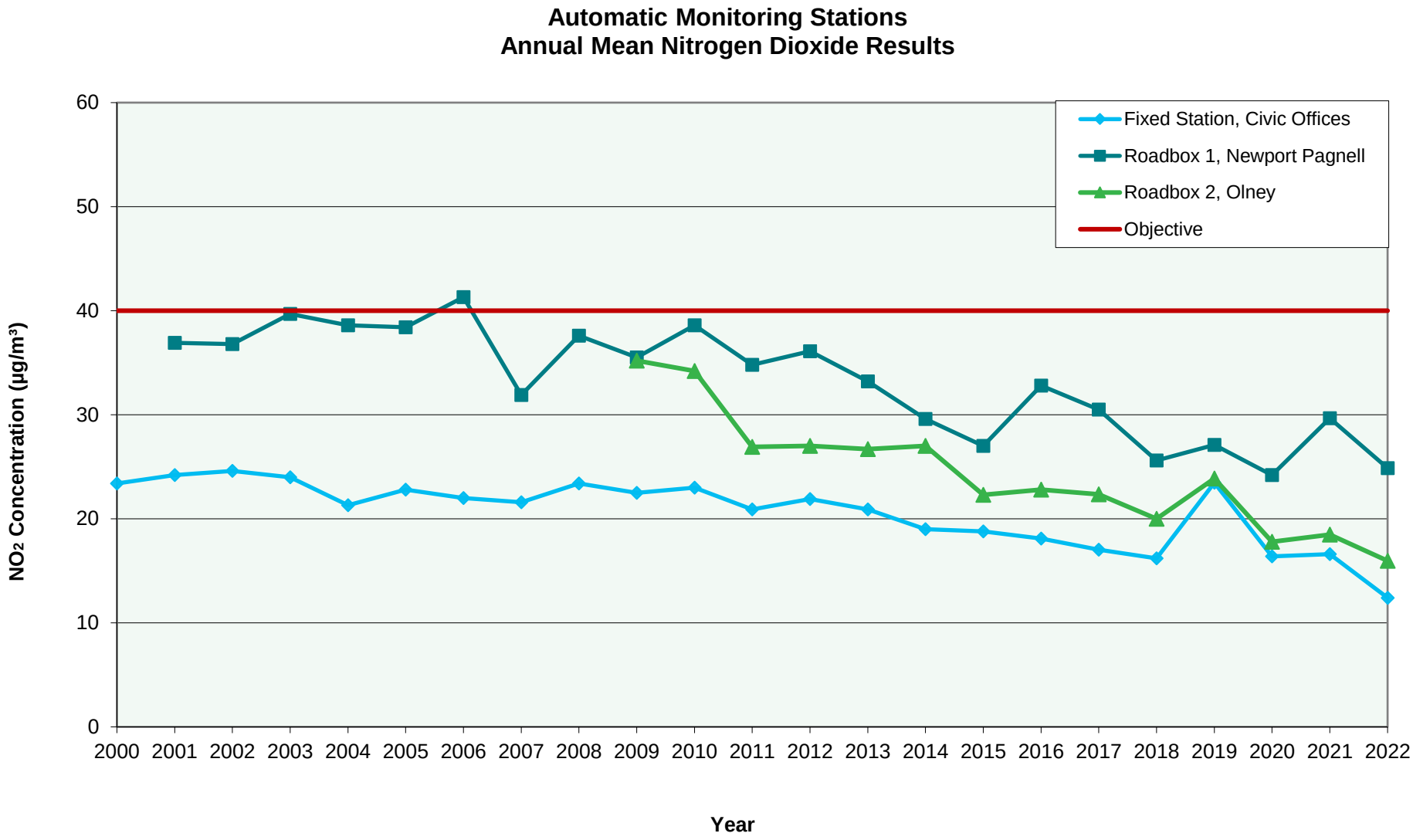


Figure A.2 Trend in Annual Mean NO_2 Concentrations Diffusion Tubes

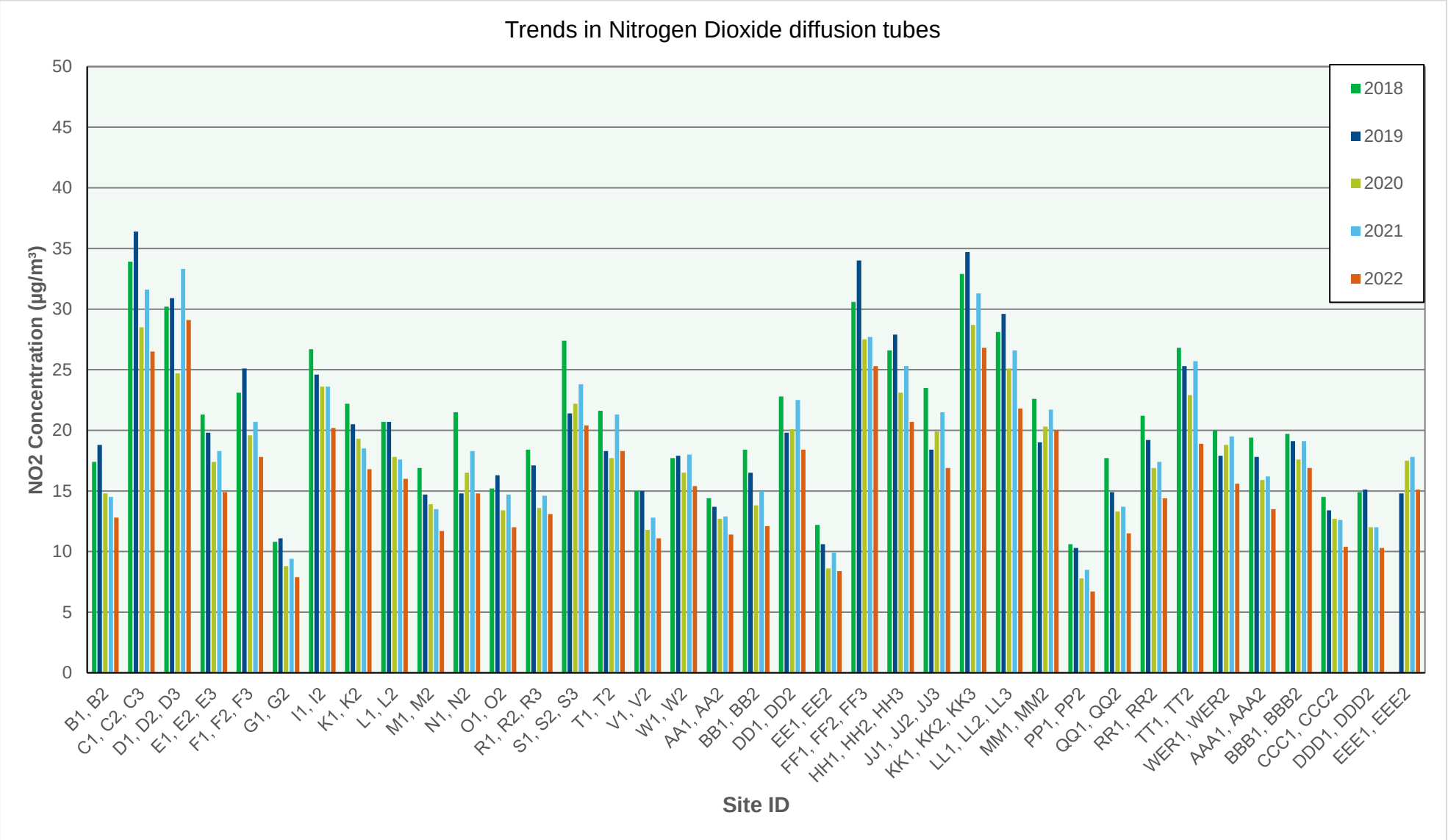


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

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
Fixed	485070	239131	Urban Centre	87.7	87.7	0	0	0	0	0
Roadbox 1	486290	243344	Roadside	89.1	89.1	0	0	0	0	0
Roadbox 2	488922	251157	Roadside	78.4	78.4	0	0	0	0	0 (64.6)

Notes:

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

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

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

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

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

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
Fixed	485070	239131	Urban Centre	98	98	14.7	16.06	11.7	11.6	12.41

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

Notes:

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

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

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

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

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

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

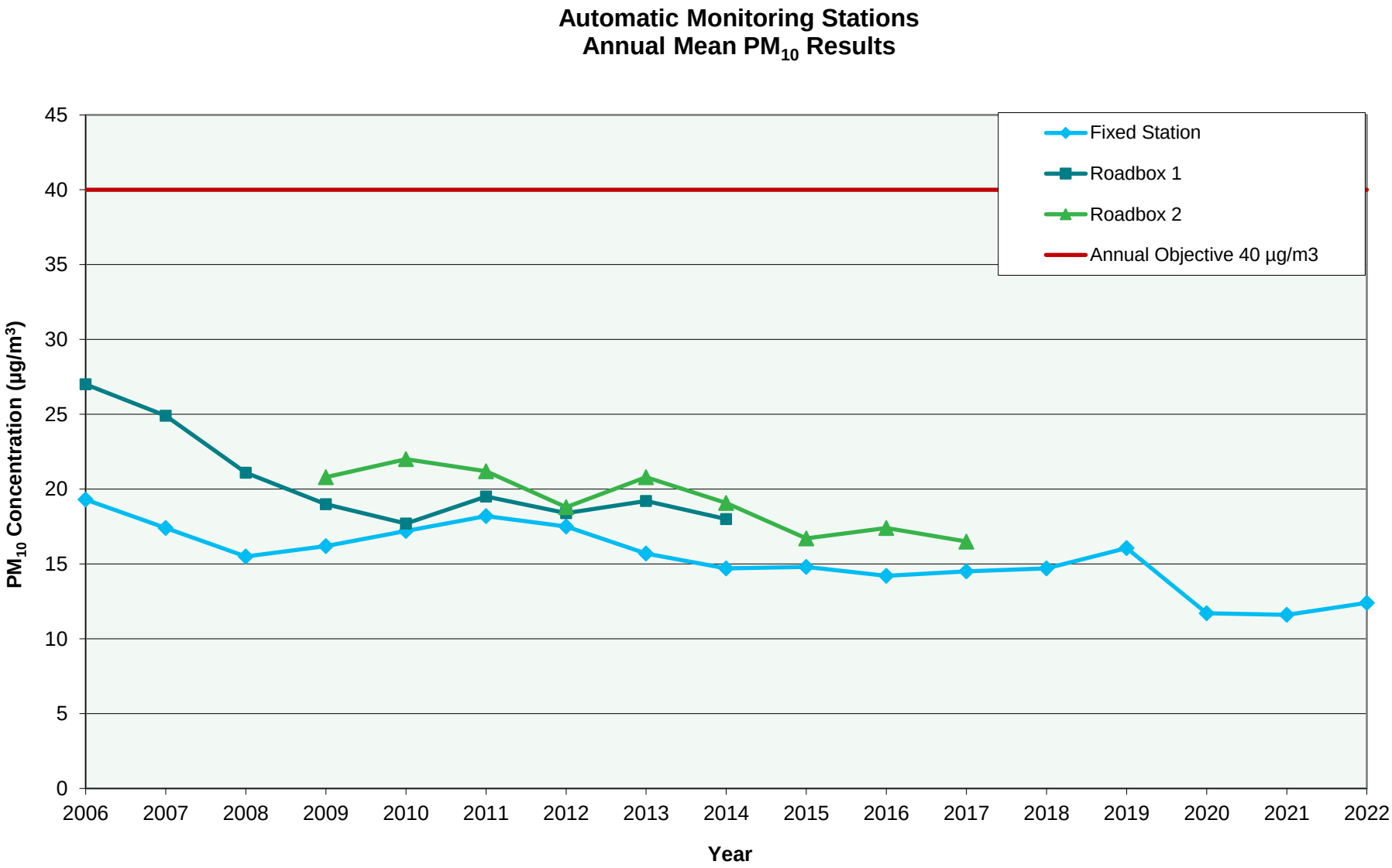


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
Fixed	485070	239131	Urban Centre	98	98	1	10	0	1	1

Notes:

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

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**.

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

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

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

Figure A.4 Trends in Number of PM_{10} 24hr Means > 50µg/m^3

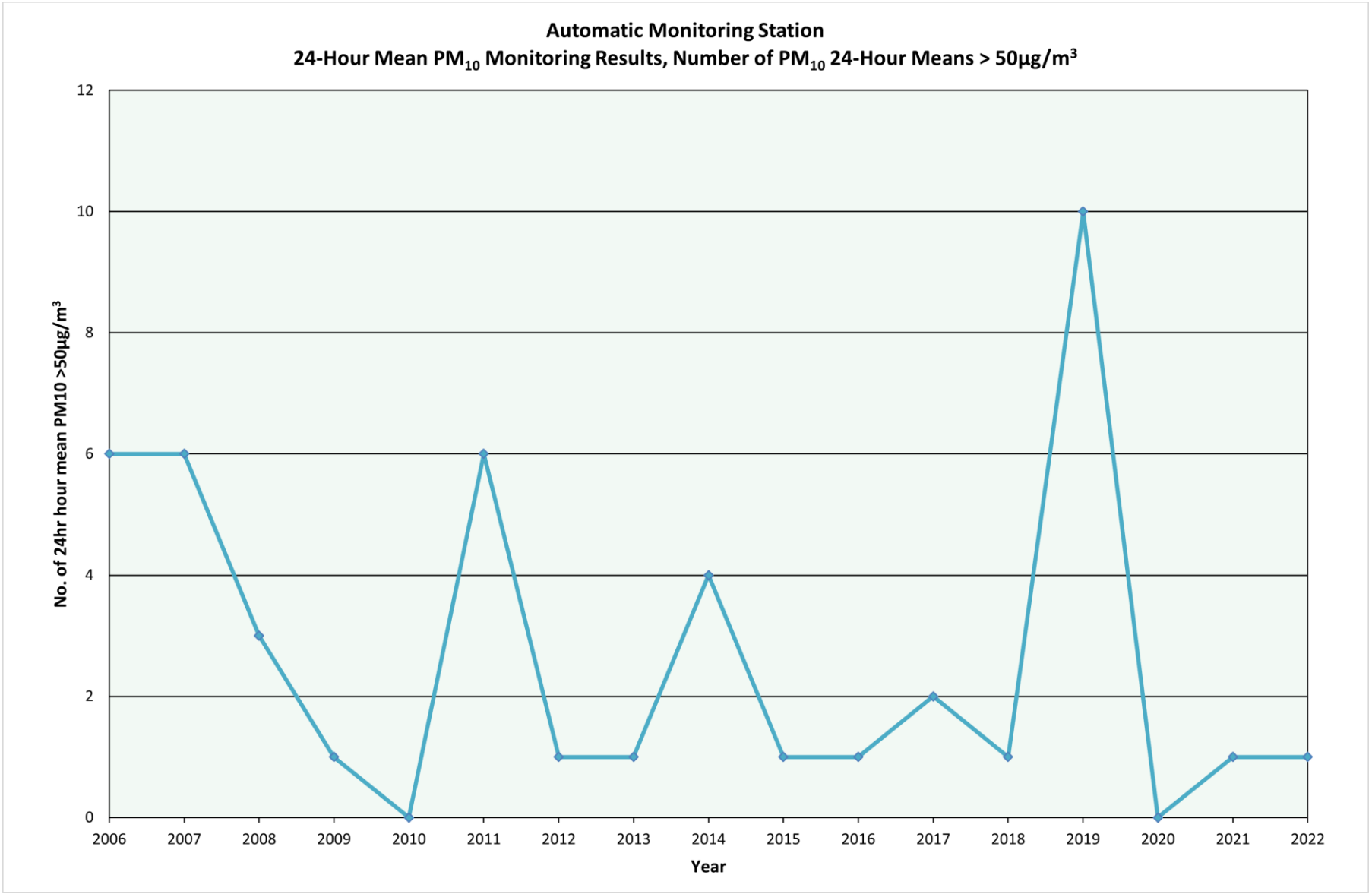


Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
Fixed	485070	239131	Urban Centre	98	98		11.2	7.56	7.88	8.18

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

Notes:

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

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

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

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

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

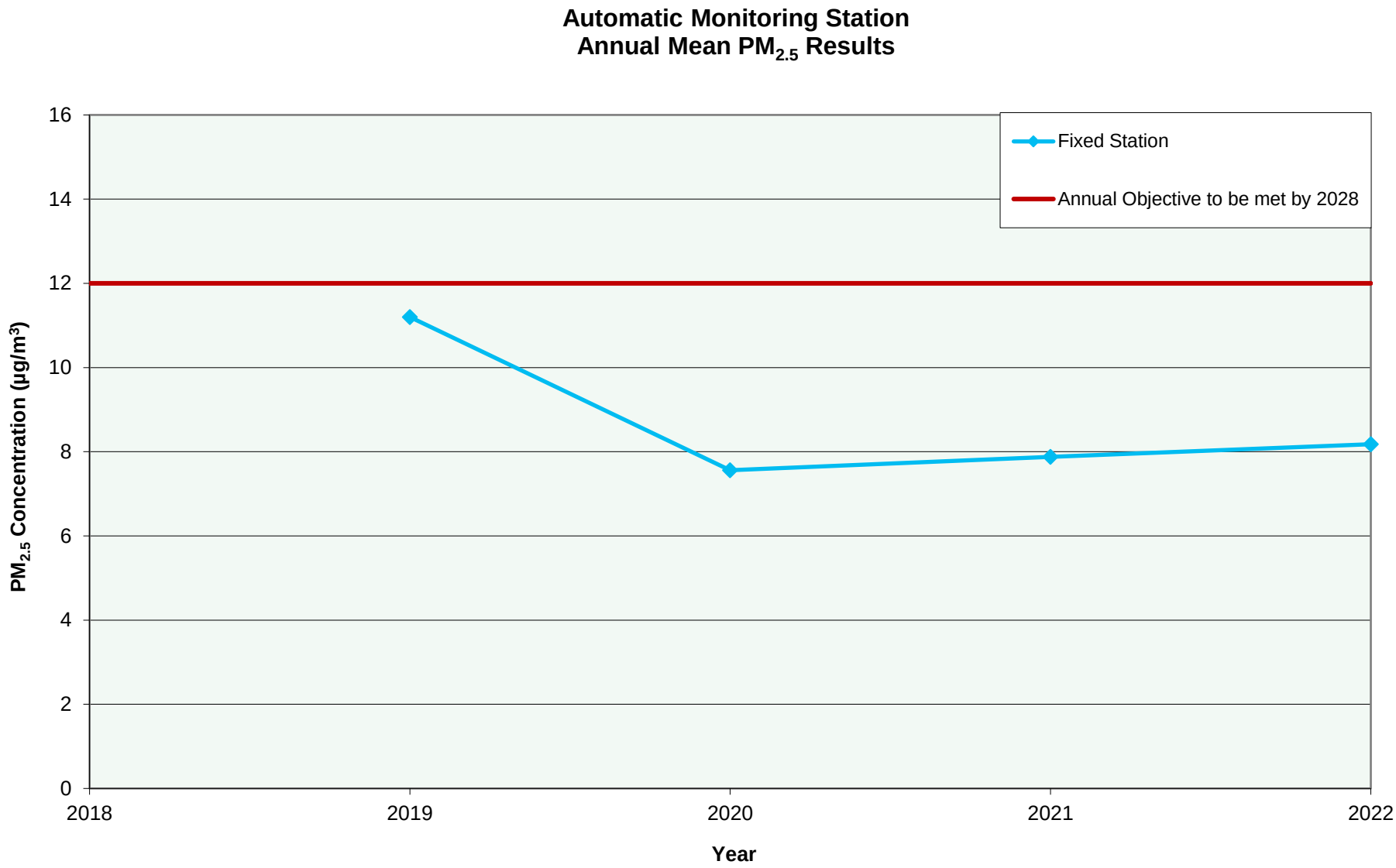


Table A.8 – Annual Mean Daily Max of 8 hour Running Mean O_3 Monitoring Results (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
Fixed	485070	239131	Urban Centre	92.2	92.2	68.25	59.43	61.58	60.44	64.77

Notes:

The annual mean concentrations are presented as µg/m3.

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

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

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

Figure A.6 Trends in Daily Max Running 8hr Mean O_3 Concentrations

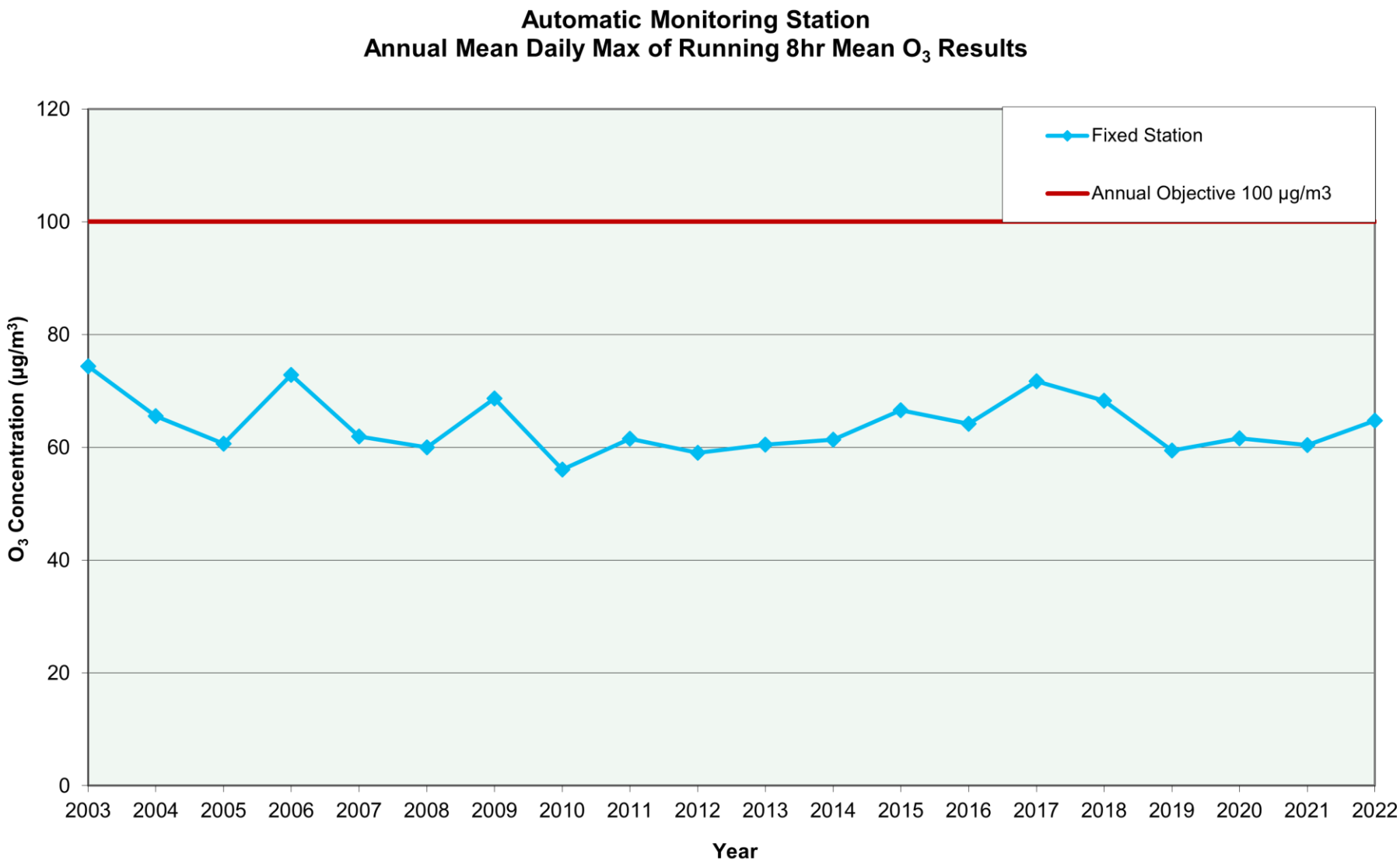
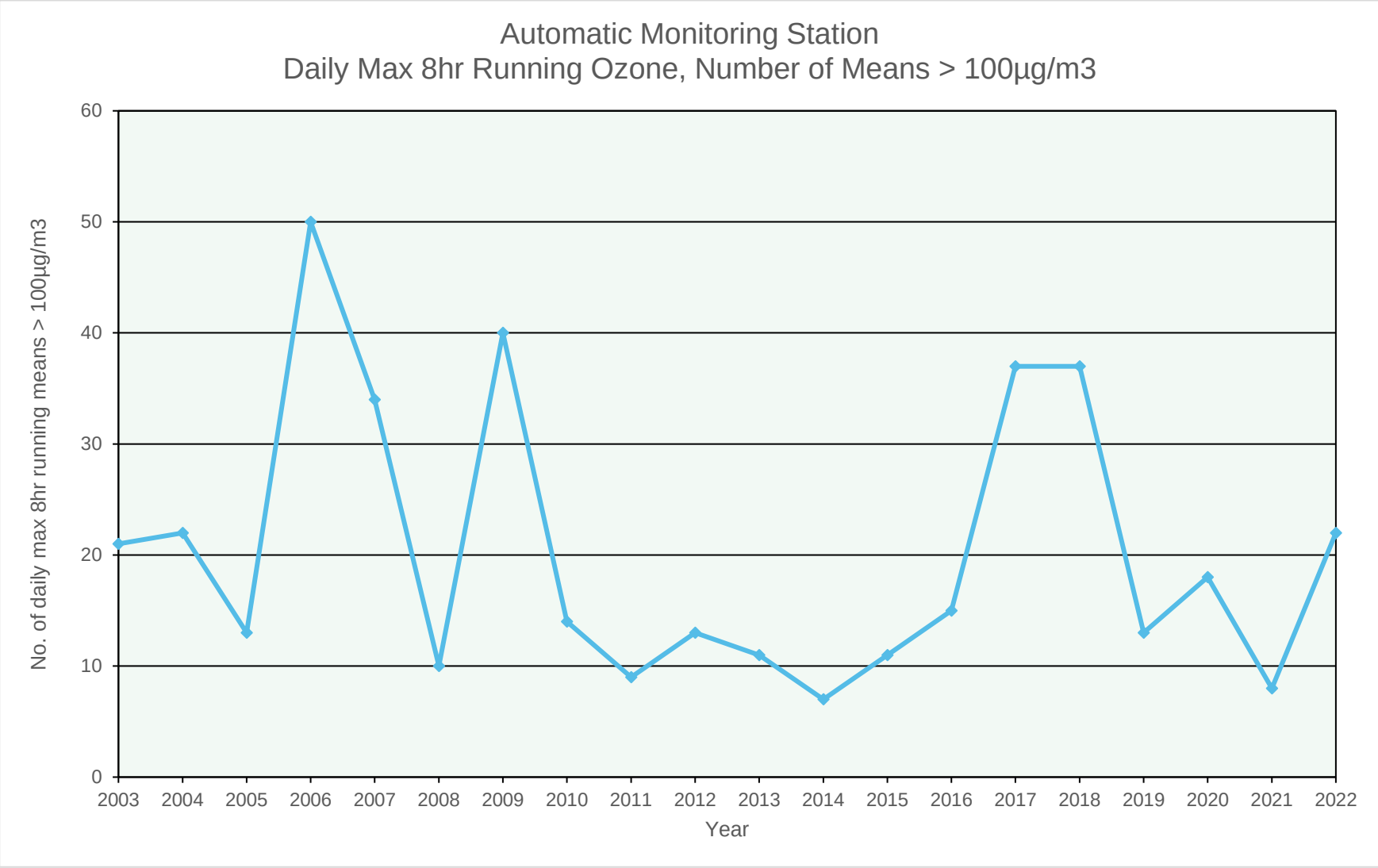


Table A.10 Daily Max 8hr Running Mean O_3 Monitoring Results, Number of Means > 100µg/m^3

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
Fixed	485070	239131	Urban Centre	92.2	92.2	37	13	18	8	22

Figure A.7 Trends in Number of Daily Max 8hr Running Mean O_3 > 100µg/m^3



6 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 (0.78)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
B1	491769	253542	28.8	17.5	21.3	12.3	13.3	9.7	10.7	11.1	16.8	19.3	17.8	20.9	-	-		Duplicate Site with B1 and B2 - Annual data provided for B2 only
B2	491769	253542	30.3		20.1	5.0	16.1	8.1	10.8	10.4	15.5	19.3	18.9	23.6	16.5	12.8		Duplicate Site with B1 and B2 - Annual data provided for B2 only
C1	488914	251173	41.7	29.1	41.8	37.2	33.3	28.5	26.6	27.2	37.4	31.1	29.9	39.3	-	-		Triplicate Site with C1, C2 and C3 - Annual data provided for C3 only
C2	488914	251173	42.0	28.3	46.3	33.1	32.4	27.7	32.9	26.0	37.6	31.1	30.0	37.9	-	-		Triplicate Site with C1, C2 and C3 - Annual data provided for C3 only
C3	488914	251173	41.8	28.5	45.1	38.9	32.5	32.0	34.6	28.5	36.7	31.4	26.6	37.8	34.0	26.5		Triplicate Site with C1, C2 and C3 - Annual data provided for C3 only
D1	488904	251177	49.4	37.6	35.6	33.5	35.3	38.7	21.5	28.4	34.7	37.3	42.4	39.6	-	-		Triplicate Site with D1, D2 and D3 - Annual data provided for D3 only
D2	488904	251177	48.5	37.8	35.7	33.5	38.1	35.8	38.6	28.4	38.8	38.0	39.6	42.4	-	-		Triplicate Site with D1, D2 and D3 - Annual data provided for D3 only
D3	488904	251177	58.4	38.3	35.5	32.2	35.4	32.1	34.9	26.8	38.2	35.9	40.6	43.6	37.3	29.1		Triplicate Site with D1, D2 and D3 - Annual data provided for D3 only
E1	488926	251455	25.9	18.6	18.2	20.3	17.1	14.0	15.7	17.2	21.8	19.5	21.7	25.0	-	-		Triplicate Site with E1, E2 and E3 - Annual data provided for E3 only
E2	488926	251455	25.0	9.6	17.0	16.3	16.0	17.4	17.2	16.2	20.4	22.1	18.3	26.4	-	-		Triplicate Site with E1, E2 and E3 - Annual data provided for E3 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 (0.78)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
E3	488926	251455	28.3	20.3	19.4	15.8	13.1	15.4	18.1	13.7	18.8	23.5	17.2	26.1	19.1	14.9		Triplicate Site with E1, E2 and E3 - Annual data provided for E3 only
F1	488905	251456	35.8	24.9	23.2	15.1	23.0	20.2	22.4	17.0	21.7	22.6	19.3	25.8	-	-		Triplicate Site with F1, F2 and F3 - Annual data provided for F3 only
F2	488905	251456	34.4	24.1	26.0	16.6	20.6	20.4	21.7	14.0	22.3	21.0	20.1	27.4	-	-		Triplicate Site with F1, F2 and F3 - Annual data provided for F3 only
F3	488905	251456	34.7	25.0	27.6	19.2	21.5	19.6	23.1	14.7	24.8	22.0	21.4	28.6	22.8	17.8		Triplicate Site with F1, F2 and F3 - Annual data provided for F3 only
G1	489108	251213	21.0	9.0	10.8	6.0	4.3	7.4	7.0	6.2	12.1	11.4	11.1	17.5	-	-		Duplicate Site with G1 and G2 - Annual data provided for G2 only
G2	489108	251213	19.4	9.6	10.7	4.4	7.3	5.6	7.6	6.2	9.3	11.7	11.8	16.9	10.2	7.9		Duplicate Site with G1 and G2 - Annual data provided for G2 only
I1	487588	243912	39.3	27.5	29.6	20.8	24.3	22.1	21.6	18.8	19.2	27.9	29.3	30.6	-	-		Duplicate Site with I1 and I2 - Annual data provided for I2 only
I2	487588	243912	39.4	29.5			27.3	22.5	22.2	14.9	19.4	26.6	27.6	30.1	25.9	20.2		Duplicate Site with I1 and I2 - Annual data provided for I2 only
K1	486296	243208	35.4	27.2	19.7	14.3	20.3	18.7	18.4	6.4	23.6	22.1	28.3	27.1	-	-		Duplicate Site with K1 and K2 - Annual data provided for K2 only
K2	486296	243208	33.7	24.7	19.1	11.0	21.1	15.4	19.4	11.4	22.8	24.0	26.0	25.4	21.5	16.8		Duplicate Site with K1 and K2 - Annual data provided for K2 only
L1	486345	243230	32.5	24.6	19.6	14.6	15.1	16.7	17.2		18.9	22.4	23.5	26.8	-	-		Duplicate Site with L1 and L2 - Annual data provided for L2 only
L2	486345	243230	33.2	24.3	17.7	14.2	20.0	17.8	18.4	11.1	20.0	21.9	25.2	26.7	20.6	16.0		Duplicate Site with L1 and L2 - Annual data provided for L2 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 (0.78)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
M1	486495	243345	29.5	18.7	13.9	10.6	8.7	7.2	11.7		15.1	14.4	15.1	24.6	-	-		Duplicate Site with M1 and M2 - Annual data provided for M2 only
M2	486495	243345	26.9	20.6	14.6	8.9	13.2	11.6	8.0	7.1	16.2	17.4	22.8	22.3	15.0	11.7		Duplicate Site with M1 and M2 - Annual data provided for M2 only
N1	486069	243148	27.5	13.8	26.9	18.2	16.3	13.6	17.1	16.7	19.1	16.0	17.0	24.1	-	-		Duplicate Site with N1 and N2 - Annual data provided for N2 only
N2	486069	243148	31.3	15.5	27.1	19.8	15.7	13.3	15.7	13.2	18.8	16.5	16.3	24.6	18.9	14.8		Duplicate Site with N1 and N2 - Annual data provided for N2 only
O1	486039	241484	24.0	17.8	19.8	11.3	13.9	10.5	13.1	10.5	13.3	14.8	16.5	23.1	-	-		Duplicate Site with O1 and O2 - Annual data provided for O2 only
O2	486039	241484	29.7	17.3	21.1	8.8	12.8	10.7	10.5	3.7	12.4	15.0	16.6	22.4	15.4	12.0		Duplicate Site with O1 and O2 - Annual data provided for O2 only
R1	485070	239131	31.0	18.5	20.7	12.3	12.8	10.2	12.9	11.2	19.1	17.3	19.0	21.6	-	-		Triplicate Site with R1, R2 and R3 - Annual data provided for R3 only
R2	485070	239131	28.9	16.3	19.4	13.8	13.7	12.7	10.2		17.5	17.3	17.4	21.7	-	-		Triplicate Site with R1, R2 and R3 - Annual data provided for R3 only
R3	485070	239131	28.7	16.5	22.1		13.3	11.4	12.2	10.7	14.9	17.3	16.3	24.0	16.9	13.1		Triplicate Site with R1, R2 and R3 - Annual data provided for R3 only
S1	486290	243344	37.7	27.9	27.6	21.6	20.5	19.2	24.3	22.7	24.8	25.7	28.4	34.3	-	-		Triplicate Site with S1, S2 and S3 - Annual data provided for S3 only
S2	486290	243344	40.4	27.8	26.5	21.9	25.9	20.6	22.6	21.6	25.4	25.8	28.2	31.4	-	-		Triplicate Site with S1, S2 and S3 - Annual data provided for S3 only
S3	486290	243344	37.7	29.2	26.8	22.4	24.0	18.2	21.7	20.5	28.1	25.2	25.1	31.2	26.2	20.4		Triplicate Site with S1, S2 and S3 - Annual data provided for S3 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 (0.78)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
T1	485298	239126	37.0	22.7	29.2	16.7	21.0	16.8	16.7	17.5	20.9	23.2	26.9	30.6	-	-		Duplicate Site with T1 and T2 - Annual data provided for T2 only
T2	485298	239126	34.0	22.4	29.3	20.7	21.0	14.8	18.7	18.5	20.6	25.1	24.4	35.2	23.5	18.3		Duplicate Site with T1 and T2 - Annual data provided for T2 only
V1	481412	240860	22.9	12.0	21.4	11.7	12.0	8.0	12.2	9.9	14.4	12.3	15.6	21.9	-	-		Duplicate Site with V1 and V2 - Annual data provided for V2 only
V2	481412	240860	26.2	9.4	21.3	13.7	11.7	5.2	9.5	9.4	13.1	12.7	12.7	21.3	14.2	11.1		Duplicate Site with V1 and V2 - Annual data provided for V2 only
W1	482965	241515	33.9	22.8	25.6	16.1	15.1	15.4	17.4	16.7	22.4	19.5	22.7	25.4	-	-		Duplicate Site with W1 and W2 - Annual data provided for W2 only
W2	482965	241515	34.5	20.8	22.8	17.1	20.0	13.0	13.3	0.3	18.5	18.9	20.3	21.8	19.8	15.4		Duplicate Site with W1 and W2 - Annual data provided for W2 only
AA1	489237	239016	26.5	13.4	20.1	10.8	11.6	7.9	10.1	12.1	11.5	15.2	14.1	20.1	-	-		Duplicate Site with AA1 and AA2 - Annual data provided for AA2 only
AA2	489237	239016	28.4	14.3	18.6	12.3	13.2	9.0	10.1	10.1	12.2	10.3	15.9	22.9	14.6	11.4		Duplicate Site with AA1 and AA2 - Annual data provided for AA2 only
BB1	491498	237284	26.5	13.7	20.4	14.4	14.8	9.7	13.4	14.5	14.3	11.0	13.0	21.9	-	-		Duplicate Site with BB1 and BB2 - Annual data provided for BB2 only
BB2	491498	237284	25.8	14.9	17.1	13.8	11.8	10.2	11.2	17.3	15.0	11.8	13.6	20.8	15.5	12.1		Duplicate Site with BB1 and BB2 - Annual data provided for BB2 only
DD1	488118	233814	34.7	19.8	24.9	19.5	21.6	20.0	19.1	15.7	25.3	22.9	25.3	29.2	-	-		Duplicate Site with DD1 and DD2 - Annual data provided for DD2 only
DD2	488118	233814	36.4	23.2	31.5	24.2	20.3	17.6	22.3	19.3	23.0	20.7	21.6	29.2	23.6	18.4		Duplicate Site with DD1 and DD2 - Annual data provided for DD2 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 (0.78)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
EE1	481331	238825	16.1	10.2	13.9	8.5	8.8	6.8	8.7	8.8	11.3	9.1	9.4	16.4	-	-		Duplicate Site with EE1 and EE2 - Annual data provided for EE2 only
EE2	481331	238825	22.5	7.8	14.8	8.2	8.5	5.3	6.3	8.1	9.7	9.3	11.0	18.1	10.7	8.4		Duplicate Site with EE1 and EE2 - Annual data provided for EE2 only
FF1	488898	251186	44.6	38.3	34.4	23.5	28.3	35.1	30.7	20.0	34.3	33.0	31.4	34.3	-	-		Triplicate Site with FF1, FF2 and FF3 - Annual data provided for FF3 only
FF2	488898	251186	45.2	35.8	30.3	24.7	34.9	35.6	31.1	17.5	33.9	22.8	32.4	34.4	-	-		Triplicate Site with FF1, FF2 and FF3 - Annual data provided for FF3 only
FF3	488898	251186	46.0	35.7	29.0	27.4	35.1	34.1	33.6	20.1	33.0	36.5	37.4	34.6	32.5	25.3		Triplicate Site with FF1, FF2 and FF3 - Annual data provided for FF3 only
HH1	488891	251248	41.1	25.0	27.6	21.5	27.2	21.4	26.2	16.9	30.5	22.6	22.1	34.3	-	-		Triplicate Site with HH1, HH2 and HH3 - Annual data provided for HH3 only
HH2	488891	251248	41.9	26.3	25.4	23.2	25.0	24.2	26.6	23.6	32.2	23.9	21.7	31.1	-	-		Triplicate Site with HH1, HH2 and HH3 - Annual data provided for HH3 only
HH3	488891	251248	39.2	26.5	27.7	24.3	23.1	24.8	26.7	9.3	31.7	24.5	22.8	33.1	26.5	20.7		Triplicate Site with HH1, HH2 and HH3 - Annual data provided for HH3 only
JJ1	488922	251157	34.5	22.2	24.5	21.2	19.9	19.7	13.9	12.6	22.3	21.9	21.0	28.7	-	-		Triplicate Site with JJ1, JJ2 and JJ3 - Annual data provided for JJ3 only
JJ2	488922	251157	34.5	22.6	23.0	21.1	19.7	18.0	15.9	15.9	20.8	21.8	21.3	28.3	-	-		Triplicate Site with JJ1, JJ2 and JJ3 - Annual data provided for JJ3 only
JJ3	488922	251157	32.2	22.2	25.3	16.9	18.5	18.3		14.9	24.0	19.9	19.0	28.0	21.7	16.9		Triplicate Site with JJ1, JJ2 and JJ3 - Annual data provided for JJ3 only
KK1	488917	251068	43.5	35.9	38.6	30.1	35.2	35.3	33.1	26.4	34.2	35.2	30.6	41.1	-	-		Triplicate Site with KK1, KK2 and KK3 - Annual data provided for KK3 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 (0.78)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
KK2	488917	251068	40.2	35.4	39.5	30.9	32.7	33.7	33.6	26.8	34.0	34.6	34.9	37.2	-	-		Triplicate Site with KK1, KK2 and KK3 - Annual data provided for KK3 only
KK3	488917	251068	42.5	33.6	35.2	31.6	31.8	35.6	28.8	26.9	32.3	30.6	36.7	39.3	34.4	26.8		Triplicate Site with KK1, KK2 and KK3 - Annual data provided for KK3 only
LL1	488909	251077	39.7	31.2	23.2	24.6	25.4	30.7	30.0	17.2	27.7	29.8	25.0	34.5	-	-		Triplicate Site with LL1, LL2 and LL3 - Annual data provided for LL3 only
LL2	488909	251077	42.1	31.6	26.2	24.2		26.8	30.2	19.9	27.7	23.2	25.7	30.9	-	-		Triplicate Site with LL1, LL2 and LL3 - Annual data provided for LL3 only
LL3	488909	251077	45.4	31.4	23.8	24.7		28.4		18.2	25.5	24.3	23.1	34.7	28.0	21.8		Triplicate Site with LL1, LL2 and LL3 - Annual data provided for LL3 only
MM1	486332	236228	40.0	27.6	24.7	17.9	23.2	17.8	18.5	19.0	22.9	22.7		44.7	-	-		Duplicate Site with MM1 and MM2 - Annual data provided for MM2 only
MM2	486332	236228	40.3	24.9	21.7	19.9		20.0	41.6	7.7	21.6	22.0		41.2	25.6	20.0		Duplicate Site with MM1 and MM2 - Annual data provided for MM2 only
PP1	479459	239536	15.5	5.1	13.6	9.0	7.4	3.9		5.7	6.9	7.1	5.9	13.6	-	-		Duplicate Site with PP1 and PP2 - Annual data provided for PP2 only
PP2	479459	239536	15.3	6.1	13.8	7.7		3.6		6.8	7.0	6.6	6.5	15.4	8.6	6.7		Duplicate Site with PP1 and PP2 - Annual data provided for PP2 only
QQ1	478740	240217	24.2	12.8	20.3	13.9	12.2	9.3	13.1	14.2	12.3	10.1	12.2	19.1	-	-		Duplicate Site with QQ1 and QQ2 - Annual data provided for QQ2 only
QQ2	478740	240217	21.5	15.0	21.5	13.4	12.4	10.1	13.9	12.0	14.4	12.4	12.5	21.0	14.7	11.5		Duplicate Site with QQ1 and QQ2 - Annual data provided for QQ2 only
RR1	478882	240265	27.3	15.4	24.6	16.3	19.1	15.1	18.2	13.7	18.1	16.6	20.0	23.3	-	-		Duplicate Site with RR1 and RR2 - Annual data provided for RR2 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 (0.78)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
RR2	478882	240265	25.5	16.0	25.9	15.9	16.3	13.6	18.2	12.9	15.9	15.9	17.9	22.7	18.5	14.4		Duplicate Site with RR1 and RR2 - Annual data provided for RR2 only
TT1	487589	243923	37.8	23.8	26.2	24.7	21.7	21.3	21.5	20.1	22.9	20.2	19.3	30.1	-	-		Duplicate Site with TT1 and TT2 - Annual data provided for TT2 only
TT2	487589	243923	40.2	25.3	25.2	24.7	24.5	20.9	22.4	16.0	19.9	21.0	20.3	31.5	24.2	18.9		Duplicate Site with TT1 and TT2 - Annual data provided for TT2 only
WER1	487395	233174	34.0	24.0	21.4	16.6	17.6	11.7	18.2	13.3	19.7	16.7	23.1	25.8	-	-		Duplicate Site with WER1 and WER2 - Annual data provided for WER2 only
WER2	487395	233174	33.5	19.8	21.0	19.1	18.1	16.4	18.2	17.3	16.7	16.0	17.2	23.1	19.9	15.6		Duplicate Site with WER1 and WER2 - Annual data provided for WER2 only
AAA1	489835	240351	29.2	15.7	19.1	12.9	16.4	11.3		16.5	15.9	17.1	14.8	24.0	-	-		Duplicate Site with AAA1 and AAA2 - Annual data provided for AAA2 only
AAA2	489835	240351	30.0	16.2	20.7	14.0	14.4	10.6		12.6	15.9	14.1	16.7	22.5	17.3	13.5		Duplicate Site with AAA1 and AAA2 - Annual data provided for AAA2 only
BBB1	490299	239695	35.8	20.4	24.8	18.2	16.7	15.4		14.0	19.2	23.0	23.2	29.8	-	-		Duplicate Site with BBB1 and BBB2 - Annual data provided for BBB2 only
BBB2	490299	239695	35.7	17.7	25.2	17.6	18.0	14.7		7.1	21.7	17.7	29.8	31.7	21.7	16.9		Duplicate Site with BBB1 and BBB2 - Annual data provided for BBB2 only
CCC1	490529	234611	24.7	13.8	14.4	11.5	8.3	11.5		5.9	10.6	9.8	11.5	17.5	-	-		Duplicate Site with CCC1 and CCC2 - Annual data provided for CCC2 only
CCC2	490529	234611	28.1	13.0	15.6	11.9	11.6	8.3	15.5	10.5	11.2	10.2	10.3	19.3	13.4	10.4		Duplicate Site with CCC1 and CCC2 - Annual data provided for CCC2 only
DDD1	492923	235716	22.3	13.0	14.5	12.2	12.7	8.6	10.4	5.7	13.8	14.8	11.2	18.1	-	-		Duplicate Site with DDD1 and DDD2 - Annual data provided for DDD2 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 (0.78)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DDD2	492923	235716			17.0	11.9	12.0	8.7	12.1	6.0	13.3	11.7	10.1	20.5	13.2	10.3		Duplicate Site with DDD1 and DDD2 - Annual data provided for DDD2 only
EEE1	486164	243168	21.5	13.5	26.4		16.5	14.0	18.7	23.5	22.0	15.3	15.9	24.8	-	-		Duplicate Site with EEE1 and EEE2 - Annual data provided for EEE2 only
EEE2	486164	243168	25.4	14.5	26.2		16.4	14.2	21.0	20.4	21.2	15.2	17.8	22.7	19.4	15.1		Duplicate Site with EEE1 and EEE2 - Annual data provided for EEE2 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.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

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

☒ **Milton Keynes City 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.

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

7.1 New or Changed Sources Identified Within Milton Keynes During 2022

Tables C.1 and C.2 contain details of new developments with planning permission and new developments that have applied for planning permission but have not yet been approved, that have a potential to impact air quality in Milton Keynes.

Table C.1 New Developments with Planning Permission

Application Type	Application No:	Location	Proposal	Date of Decision	Progress
Strategic Urban Extension. Residential & Mixed Development	21/00999/OUTEIS	Eastern Expansion Area. East of M1 and London Road, Moulsoe	Approx 5000 dwellings, employment, secondary school and primary school, health hub and linear park	10 February 2022	Outline permission granted infrastructure works commenced.
Extension of operational life of Landfill	22/02874/NMA	FCC - Bletchley Landfill, Guernsey Road, Newton Leys, MK3 5FR	Extended operational life for a further 15 years	24 February 2023	Operational
Residential development	21/01620/FUL	Phase 7B Newton Leys, Bletchley	113 residential dwellings	25 March 2022	Under Construction -
Residential development	17/01059REM	Phase 6 Newton Leys, Bletchley	183 Residential Dwellings	08 March 2023	Under Construction - Nearing completion
Residential development	15/01533/OUTEIS	Eaton Leys, Galley Lane, Little Brickhill	1900 residential development distributed between Milton Keynes and Buckinghamshire Council including Local Centre with retail, with community centre and primary school	2 June 2017	Under Construction - Nearing completion
Warehouse development	19/01818/OUT	Cross Roads Farm, Brickhill Road, Bow Brickhill, MK17 9JL	Warehousing and distribution, B6, B1, B2 and small Cafe	26 February 2020	Construction completed awaiting occupants
Residential development	14/00350/OUTEIS	Former Wavendon Golf Centre, Lower End Road, Wavendon, MK17 8DA	Up to 350 residential Dwellings	2 February 2015	Under Construction - Nearing completion

Urban Extension, Residential and Mixed Development	13/02382/OUTEIS	Land at Glebe Farm, South of A421 Newport Road, Wavendon	Sustainable Urban Extension comprising approximately 1140 dwellings, one primary school, secondary school	2 April 2015	Under construction – Nearing completion
Residential development	14/02167/OUTEIS	Land west of Eagle Farm South, South of A421, North of Lower End Farm, Wavendon	Up to 385 residential dwellings	2 April 2015	Under construction – Nearing completion
Residential development	13/02381/OUTEIS	Land at Eagle Farm, Cranfield Road, Wavendon.	To 410 dwellings and primary school, mixed use local centre	2 April 2015	Under construction – Nearing completion
Residential development	17/03205/OUT	Tower Drive, Groveway V11 to H8 Wavendon Gate	Up to 180 Residential Dwellings	6 June 2018	Under construction – Nearing completion
Residential development	15/02768/OUT	South of Elmswell Gate, Towergate, Milton Keynes	Up to 240 dwellings	14 September 2017	Under construction – Nearing completion
Residential development	20/01176/OUT	Land off Timbold Drive, Kents Hill	Up to 171 Dwelings and retail	11 December 2020	Application permitted – Reserved matters application submitted
Residential Development and local centre	20/00133/OUTEIS	Tickford Fields Farm, North Crawley Road	Up to 930 residential dwellings, Primary School, Local centre with retail and community centre.	28 May 2021	Application Permitted
Sand and Gravel Extraction	18/00009/MIN	Land to North and East of Lathbury, Northampton Road, Lathbury,	Sand and Gravel Extraction and restoration by the importation of inert waste.	20 August 2020	Operational
Screening request for EIA	23/00080/EIASCR	Land to North and East of Lathbury, Northampton Road, Lathbury,	Screening request under EIA relating to two extensions to Sand and gravel extraction area	12 Feb 2023	EIA Required
Residential development	17/00939/OUT	Land west of Yardley Road, Olney	Up to 250 dwellings	31 July 2018	Under construction
Commercial Development	21/02608/FULNMA	Land off Warrington Road, Olney	Offices, light industrial, retails, storage and distribution, hotel, car facility and car showroom.	17 December 2021	Application permitted

Strategic Urban Expansion Residential and Mixed Development	06/00123/MKPCO	Western Expansion Area, Watling Street, Fairfields	Approximately 2200 dwellings, Range of Employment, Primary School and Local Centre	15 October 2007	Under construction – nearing completion
Strategic Urban Expansion Residential and Mixed Development	05/00291/MKPCO	Western Expansion Area, Watling Street, Whitehouse	Approximately 4320 residential units, a range employment classes, a secondary school, 3 primary schools and mixed use centre.	5 October 2007	Under construction – nearing completion
Warehousing and distribution	21/02442/OUTEIS	Caldecote Farm, Willen Road, Newport Pagnell.	Storage and distribution, use class B6.	2 September 2022	Application Permitted
Residential and mixed use	21/002246/FULEIS	Saxon Court 502 Avebury Boulevard, Central Milton Keynes	Two blocks, blocks up to 34 storeys to provide up to 288 residential units, office employment, restaurant, café and retail space	8 September 2022	Application Permitted
Residential and mixed use	19/02804/OUT	Food Centre, Land bounded by Midsummer Boulevard, Secklow Gate. Lower 12th Steet and Avebury Boulevard, MK9 3BQ	4 blocks providing 422 residential units, hybrid building and flexible ground floor uses	25 June 2020	Application Permitted: Demolition and Infrastructure under construction
Redevelopment of site for residential, commercial and community units	20/03293/FUL	Land at the Agora Centre, Church Street, Wolverton	115 new homes, Cohousing Common House nine ground floor commercial and community units of approximately 1000m^2	22 December 2021	Application Permitted. Demolition complete

Table C.2 New Developments not yet approved

Application Type	Application No:	Location	Proposal	Date of Decision	Progress
Strategic Urban Extension. Residential & Mixed Development	22/00524/OUTEIS	North of Bow Brickhill and Woburn Sands Road	Approx 1920 residential Dwellings secondary and primary schools, local centre including retail and commercial		Consultation stage

7.2 Additional Air Quality Works Undertaken by Milton Keynes City Council During 2022

The Olney AQMA revocation report compiled in March 2020 was updated with 2021 and 2022 data to consult with the Olney Town Council and take to the Councillors, see Appendix F

7.3 QA/QC of Diffusion Tube Monitoring

Nitrogen dioxide diffusion tubes are prepared 'in-house' by Milton Keynes Council using 20% triethanolamine (TEA) in water and are analysed following the procedures set out in the AEA Practical Guidance document produced by the Defra Working Group on Harmonisation of NO_2 Diffusion Tubes that was released early in 2008. The Council participates in the proficiency testing scheme, AIR PT, provided by LGC Standards for quality assurance of diffusion tube analysis and the monthly NO_2 Network Field Intercomparison Exercise managed by the National Physical Laboratory (NPL). The monitoring has been completed in adherence with the 2022 Diffusion Tube Monitoring Calendar.

7.3.1 Diffusion Tube Annualisation

All diffusion tube monitoring locations within Milton Keynes City Council 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.

7.3.2 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.

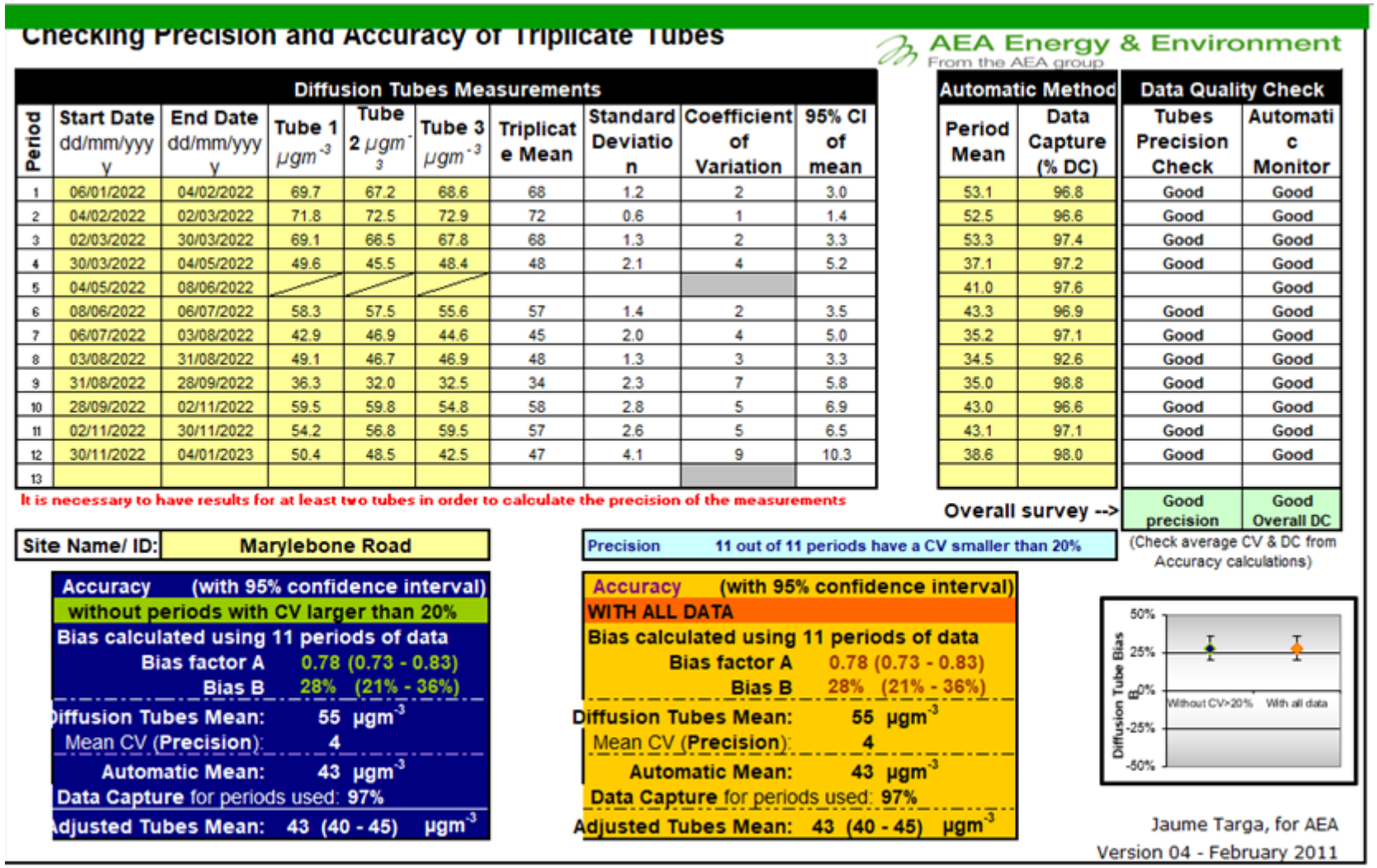
Milton Keynes City Council have applied a national bias adjustment factor of 0.78 to the 2022 monitoring data. A summary of bias adjustment factors used by Milton Keynes City Council over the past five years is presented in Table C.3.

A national factor using MKCC's Marylebone Road intercomparison study has been used because there were some gaps in the data for our local co-location studies. Data from the Marylebone Road study is shown in Figure C.1

Table C.3 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.78
2021	Local	-	0.94
2020	National	06/21	0.83
2019	National	06/20	0.84
2018	Local	-	0.78

Figure C.1 Co-location study at Marylebone Road



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	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor
1	06/01/2022	04/02/2022	69.7	67.2	68.6	68	1.2	2	3.0	53.1	96.8	Good	Good
2	04/02/2022	02/03/2022	71.8	72.5	72.9	72	0.6	1	1.4	52.5	96.6	Good	Good
3	02/03/2022	30/03/2022	69.1	66.5	67.8	68	1.3	2	3.3	53.3	97.4	Good	Good
4	30/03/2022	04/05/2022	49.6	45.5	48.4	48	2.1	4	5.2	37.1	97.2	Good	Good
5	04/05/2022	08/06/2022								41.0	97.6		Good
6	08/06/2022	06/07/2022	58.3	57.5	55.6	57	1.4	2	3.5	43.3	96.9	Good	Good
7	06/07/2022	03/08/2022	42.9	46.9	44.6	45	2.0	4	5.0	35.2	97.1	Good	Good
8	03/08/2022	31/08/2022	49.1	46.7	46.9	48	1.3	3	3.3	34.5	92.6	Good	Good
9	31/08/2022	28/09/2022	36.3	32.0	32.5	34	2.3	7	5.8	35.0	98.8	Good	Good
10	28/09/2022	02/11/2022	59.5	59.8	54.8	58	2.8	5	6.9	43.0	96.6	Good	Good
11	02/11/2022	30/11/2022	54.2	56.8	59.5	57	2.6	5	6.5	43.1	97.1	Good	Good
12	30/11/2022	04/01/2023	50.4	48.5	42.5	47	4.1	9	10.3	38.6	98.0	Good	Good
13													
											Overall survey -->	Good precision	Good Overall DC

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

(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Marylebone Road

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

Accuracy (with 95% confidence interval) without periods with CV larger than 20%
Bias calculated using 11 periods of data
Bias factor A 0.78 (0.73 - 0.83)
Bias B 28% (21% - 36%)
Diffusion Tubes Mean: 55 µgm^{-3}
Mean CV (Precision): 4
Automatic Mean: 43 µgm^{-3}
Data Capture for periods used: 97%
Adjusted Tubes Mean: 43 (40 - 45) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA
Bias calculated using 11 periods of data
Bias factor A 0.78 (0.73 - 0.83)
Bias B 28% (21% - 36%)
Diffusion Tubes Mean: 55 µgm^{-3}
Mean CV (Precision): 4
Automatic Mean: 43 µgm^{-3}
Data Capture for periods used: 97%
Adjusted Tubes Mean: 43 (40 - 45) µgm^{-3}

Jaume Targa, for AEA
Version 04 - February 2011

If you have any enquiries about this spreadsheet please contact the LAQM Helpdesk at: LAQMHelpdesk@uk.bureauveritas.com

7.3.3 NO2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO_2 monitoring locations within Milton Keynes required distance correction during 2022.

7.4 QA/QC of Automatic Monitoring

The three automatic monitoring stations are under a service contract with ACOEM who provide twice yearly services of the stations.

7.4.1 PM10 and PM2.5 Monitoring Adjustment

The type of PM10/PM2.5 monitor utilised within Milton Keynes Council do not require the application of a correction factor.

7.4.2 Automatic Monitoring Annualisation

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

7.4.3 NO2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No passive or automatic NO_2 monitoring locations within Milton Keynes Council required distance correction during 2022.

8 Appendix D: Maps of Monitoring Locations and AQMAs

8.1 Automatic Monitoring Stations

Figure D.1 Map Milton Keynes Showing the 3 Automatic Stations

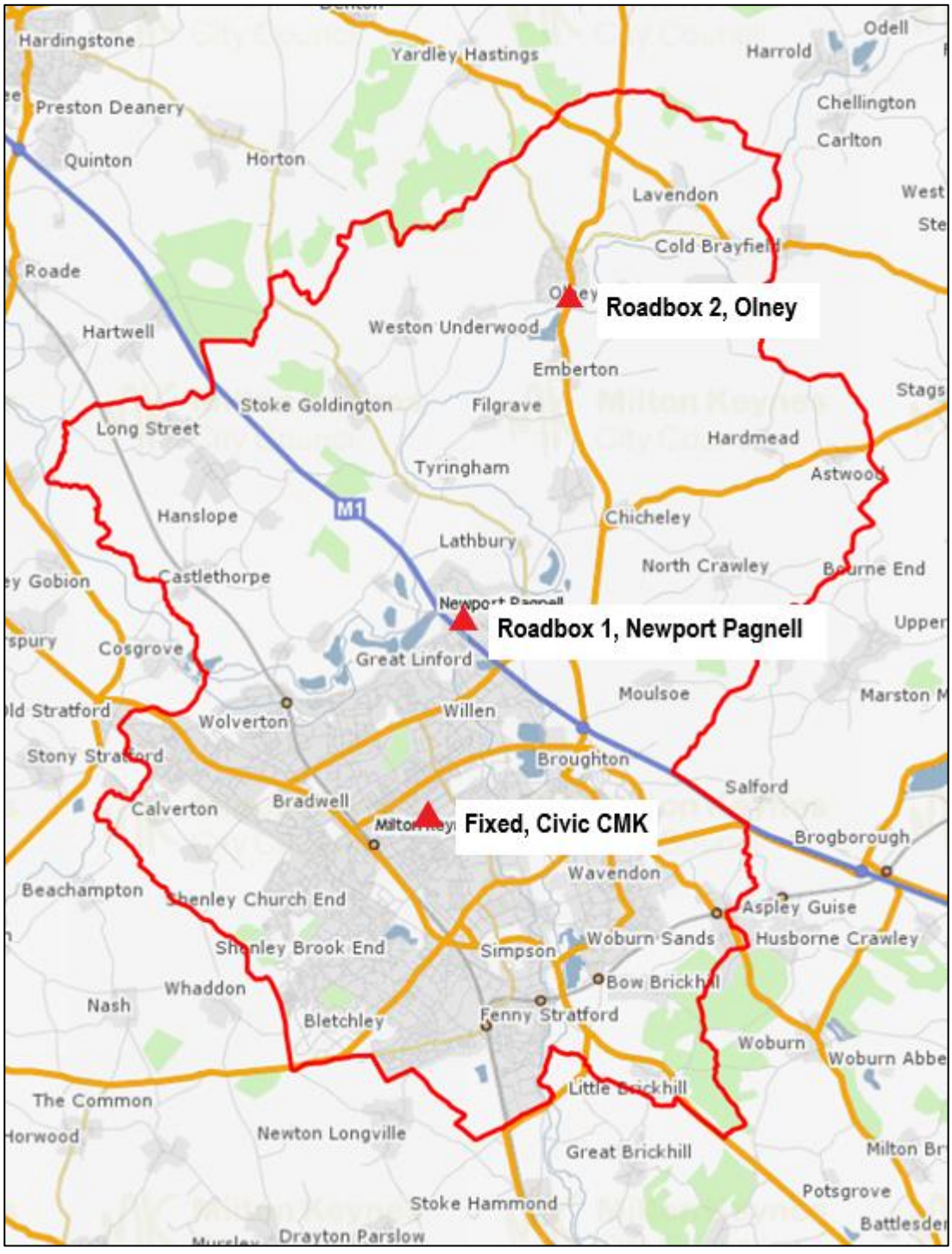


Figure D.2 – Map of Fixed Air Quality Station, Civic Offices, Central Milton Keynes

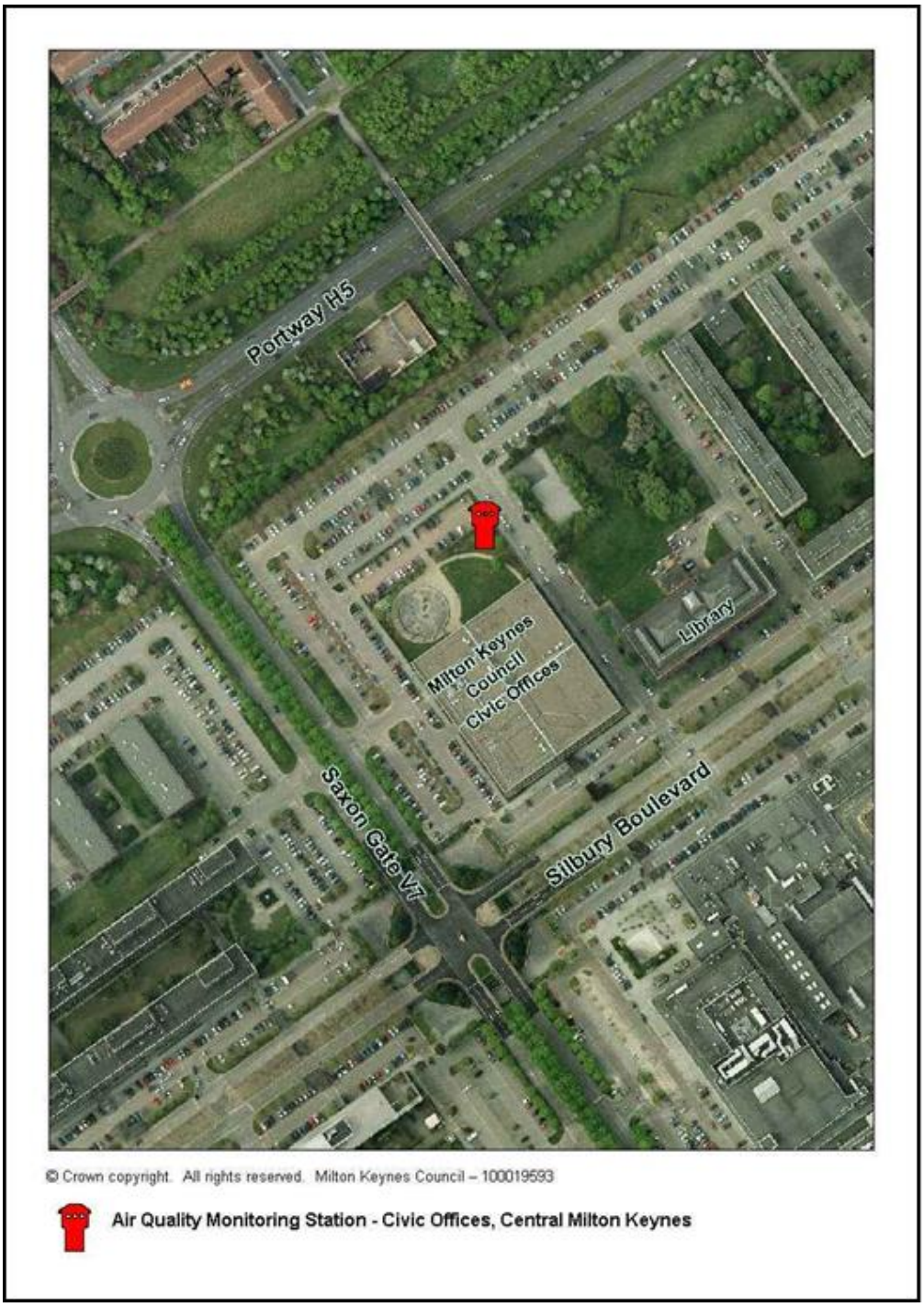


Figure D.3 – Map of Roadbox Station. Wolverton Road, Newport Pagnell

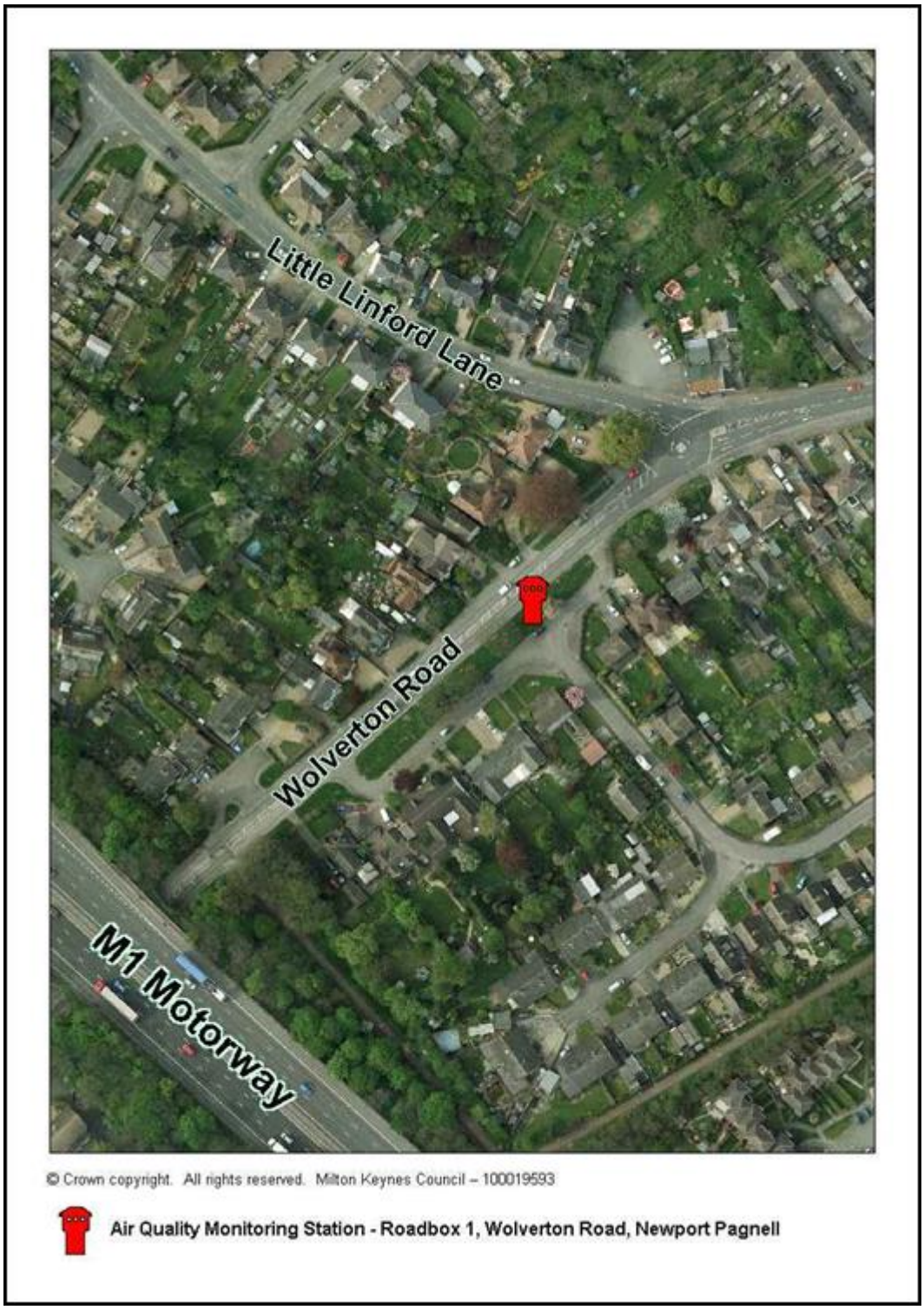


Figure D.4 – Map of Roadbox 2 Air Quality Station, High Street South, Olney (Within Designated Air Quality Management Area)

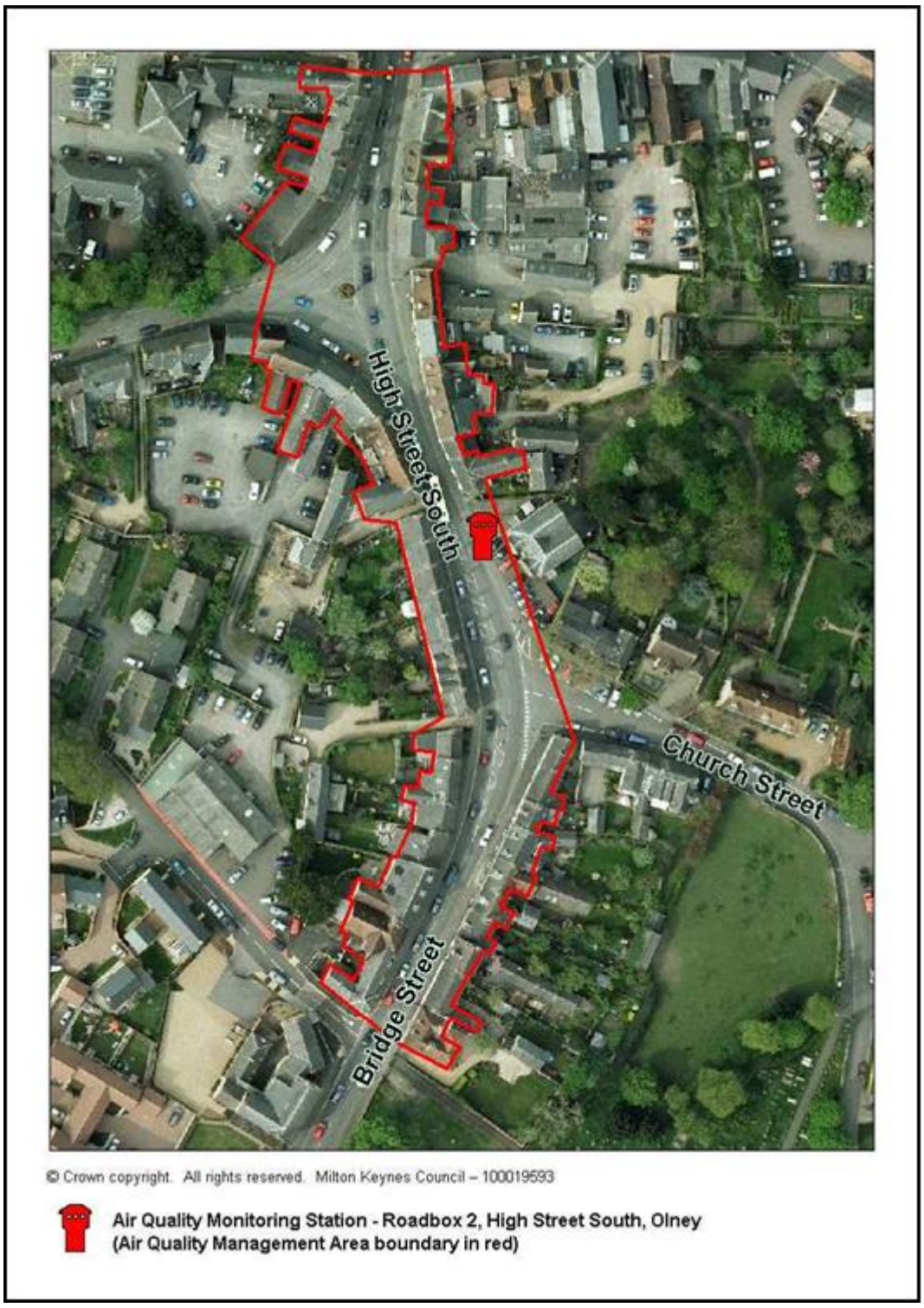


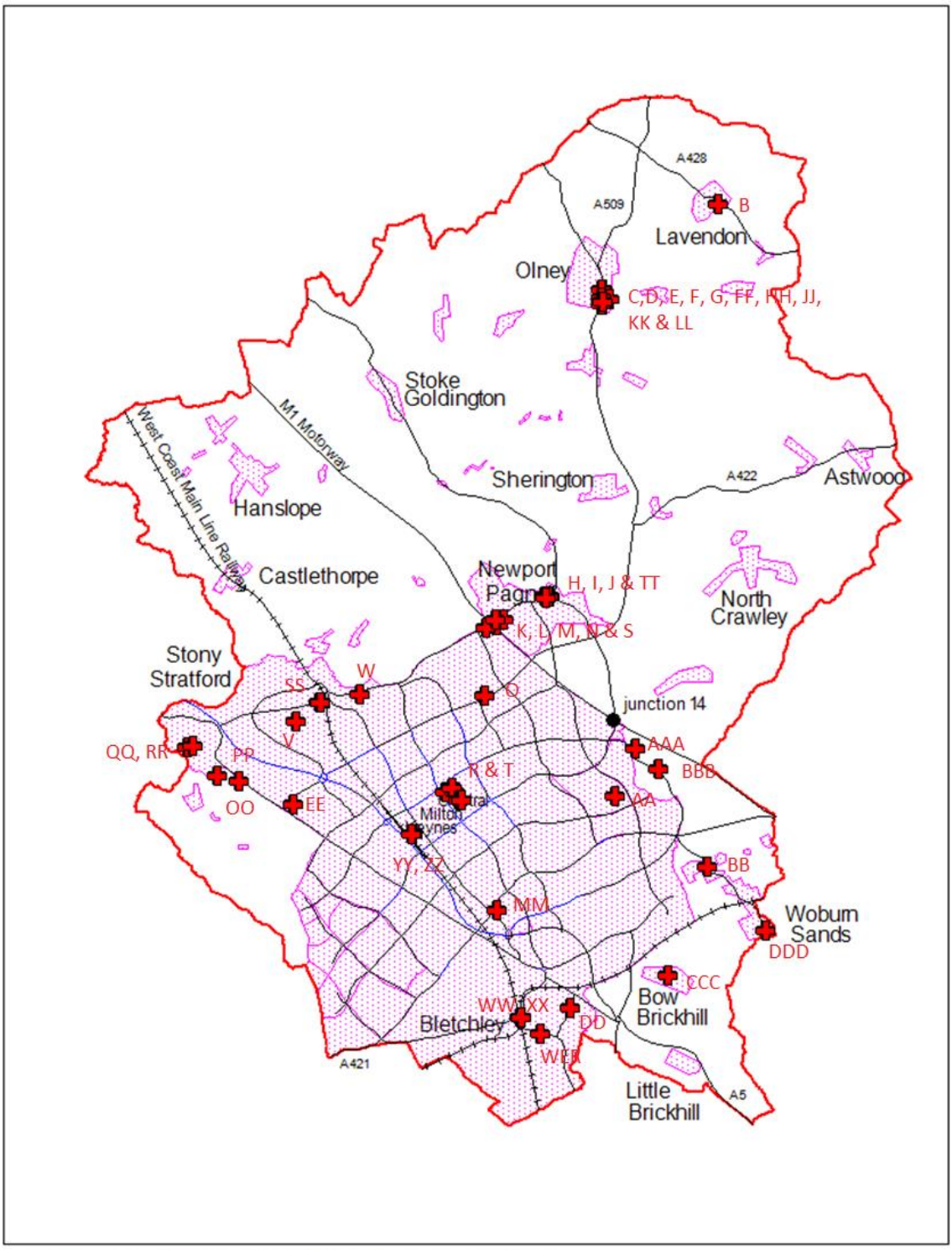
Figure D.5 - Automatic Air Quality Monitoring Station Photographs

Fixed Monitoring Station, Civic, MKCC

Roadbox 1 Monitoring Station Wolverton Road, Newport Pagnell (M1 bridge in background)

Roadbox 2 Monitoring Station High Street South, Olney

Figure D.6 – Map of Non-Automatic Sites



Nitrogen Dioxide diffusion tube location

9 Appendix E: Summary of Air Quality Objectives in England

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

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

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

10 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

11 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.
- Milton Keynes Council, Annual Status Reports 2021.
- Milton Keynes Council, Air Quality Action Plan, Jan 2012.
- Local Air Quality Management Tools, NETCEN, on behalf of Department of the Environment, Food and Rural Affairs, available from web site: http://uk-air.defra.gov.uk/

12 APPENDIX F: Updated AQMA Revocation Report

Milton Keynes City Council
Local Air Quality Management

Revocation of the Air Quality Management Area (Milton Keynes Council) (No1) Order 2008

June 2023

Environmental Health
Civic, 1 Saxon Gate East
Central Milton Keynes
MK9 3EJ

Tel (01908) 252100
International Tel +44 1908 252100

ehnorth@milton-keynes.gov.uk

Megan Harrison
Practitioner – Environmental Health

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1 SUMMARY

1.1 The annual mean air quality objective (AQO) for nitrogen dioxide (NO_2) is 40 µg/m^3. In 2008 a small exceedance of this objective was identified at the façades of residential properties in Olney. Following a Detailed Assessment, an Air Quality Management Area (AQMA) was designated in part of Olney in December 2008 **(Figure 1**).

1.2 The annual mean objective has not been exceeded within the AQMA since 2014 and there is a downward trend in NO_2 levels, which is also reflected at the automatic air quality stations in Newport Pagnell and Central Milton Keynes.

1.3 Automatic monitoring at the current location on High Street South commenced in 2009 and is supplemented by 10 diffusion tube sites, 7 within the AQMA.

1.4 The measured annual mean concentration at the Olney automatic station, which is sited 2 metres from the roadside, was 16.0 µg/m^3 in 2022. The highest diffusion tube result at a building façade was 29.1 µg/m^3 recorded at 9 High Street South, Olney.

1.5 Revoking the AQMA has been considered for a few years and referred to in Annual Status Reports reviewed by Defra. New analysers were installed in all the automatic monitoring stations in February 2019 and so revocation was delayed until new data became available. Results now confirm that there is a downward trend at all monitoring locations and the future risk of exceeding the AQO is remote.

1.6 Although the Covid-19 pandemic will have affected emissions in 2020 there is very little possibility that future NO_2 levels will exceed the annual mean objective. National projections also show continued reductions in emissions and there is very little possibility that future NO_2 levels will exceed the annual mean objective, consequently, the AQMA will be revoked. A copy of the order is attached to this report.

2 INTRODUCTION

2.1 Background - Air Quality Management

2.1.1 A Detailed Assessment of nitrogen dioxide levels in Olney was published in August 2008. The Report identified small exceedances of the annual mean nitrogen dioxide air quality objective at the façades of residential properties (relevant locations in terms of public exposure), in Bridge Street and High Street South. This area forms a small street canyon where pollutants do not readily disperse. An Air Quality Management Area (AQMA) was designated by Order under Section 83 of the Environment Act 1995 on 1st December 2008 (see **Figure 1**).

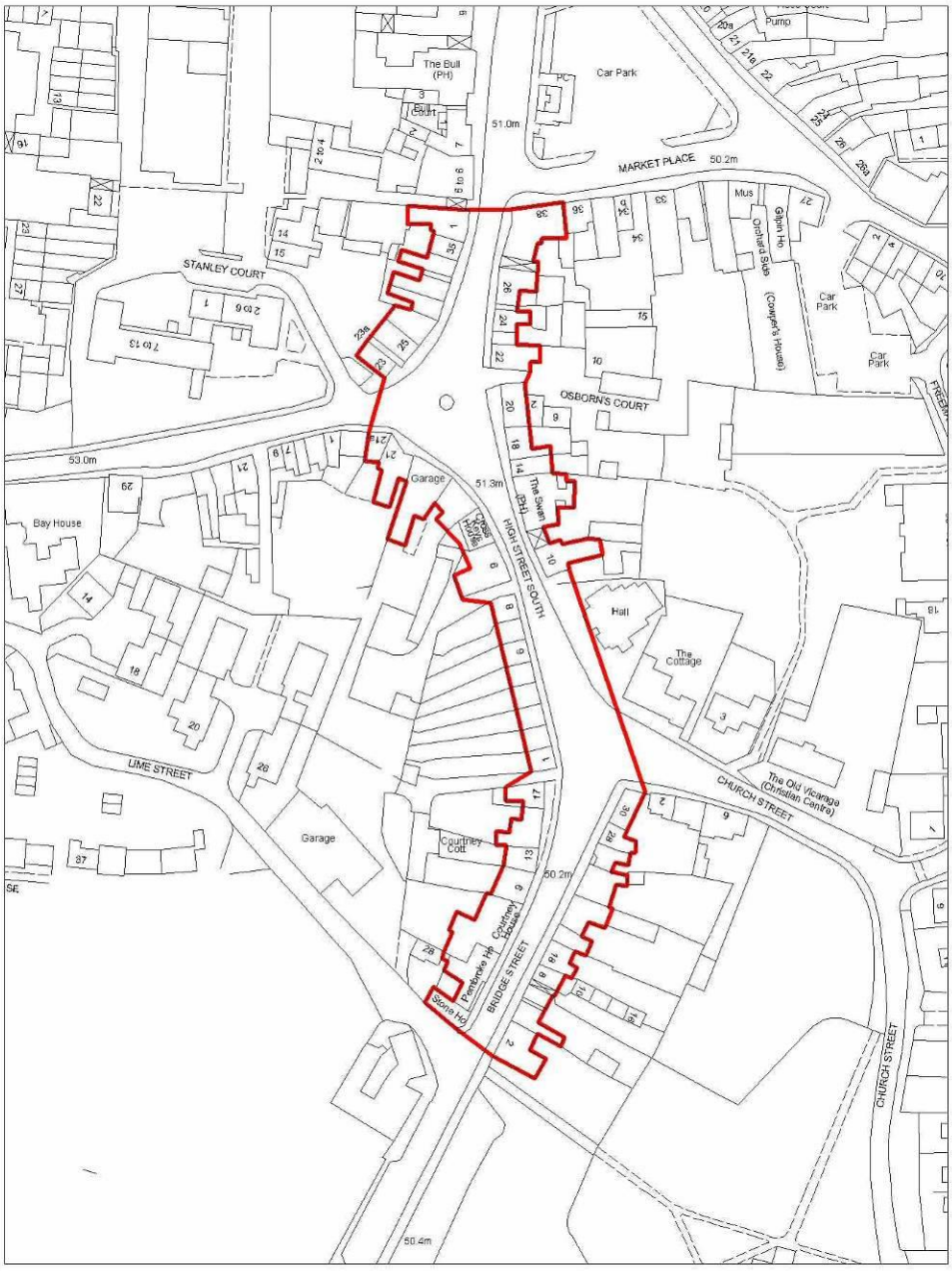
2.1.2 The extent of the AQMA is represented by the red line in **Figure 1** and includes 64 addresses. The source of the pollution is mostly derived from road traffic on the A509.

2.1.3 An Action Plan was prepared in November 2012 containing measures designed to improve air quality within the AQMA.

2.1.4 Milton Keynes City Council air quality reports can be downloaded from the website: https://www.milton-keynes.gov.uk/environmental-health/pollution/local-air-quality-management

- **Figure 1 Olney Air Quality Management Area**

Environment Act 1995, Section 83 (1)
Air Quality Management Area (Milton Keynes Council) (No. 1) Order 2008



The designated area is edged in red

3 MONITORING OF AIR QUALITY IN OLNEY

3.1 Automatic Monitoring

3.1.1 Nitrogen dioxide is monitored automatically in Olney using a chemiluminescent analyser housed within an air conditioned “roadbox” type of enclosure.

3.1.2 The roadbox monitoring station was installed in March 2009, located 2 metres from the roadside in front of the Church Hall on High Street South (**Figure 2**).

3.1.3 **Table 1** provides details of the council’s three air quality monitoring stations.

- **Figure 2 Olney Air Quality Monitoring Station**

3.2 Diffusion Tube Monitoring

3.2.1 Nitrogen dioxide is extensively monitored in Olney using diffusion tubes attached to the façades of buildings and lamp posts.

3.2.2 There are currently 10 diffusion tube monitoring sites in Olney, seven of which are within the AQMA. Tubes are deployed in triplicate and are co-located on the automatic monitoring station. The tubes are mainly sited on the façades of buildings to measure exposure where people live.

3.2.3 Details of diffusion tube locations can be found in **Table 2**.

3.3 Nitrogen Dioxide Monitoring Data

3.3.1 Automatic monitoring data from MK City Council's three monitoring stations and from the 10 diffusion tube locations in Olney are summarised in **Table 3.**

3.3.2 In February 2019 the analysers in all monitoring stations were replaced with new ones supplied by Air Monitors (now ACOEM). There were issues with the new analysers, relating to initial set up and calibration, as discussed in the Annual Status Report 2020. This resulted in higher than expected results in 2019, now rectified. Results for 2020 are back on track.

3.3.3 There is a downward trend for the annual mean NO_2 concentration at all monitoring locations (**Figure 3**). In Olney the automatic monitoring station mean has fallen from 27.0 µg/m^3 in 2012 to 16.0 µg/m^3 in 2022.

3.3.4 Diffusion tubes are co-located on the automatic monitoring stations. Bias adjustment factors are calculated using the Excel spreadsheet provided by the National Physical Laboratory (NPL). In **Table 3** results have been bias adjusted using the co-location factor calculated using the 3 local stations and the national co-location study at Marylebone Road, in London, run by the NPL.

3.3.5 Bias adjustment calculations are shown in **Appendix A**.

3.3.6 Diffusion tubes located at 10, High Street South (C1,C2,C3) recorded an annual mean of 42.8 µg/m^3 in 2012 reducing to 26.5 µg/m^3 in 2022.

3.3.7 The trend in annual mean NO_2 concentration at diffusion tube locations is represented in **Figure 4** and clearly shows the downward trend, significantly below the air quality objective.

- **Table 3 Details of Automatic Monitoring Stations**

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Monitoring Technique	Distance to Relevant Exposure (m)	Distance to kerb of nearest road (m)	Inlet Height (m)
Fixed	Civic Offices, CMK	Urban Centre	485070	239131	NO_2; PM_{10}; $PM_{2.5}$; O_3	No	FIDAS 200E; Chemiluminescence; UV absorption	113 (to residential)	4.8	3.2
Roadbox 1	Wolverton Road, Newport Pagnell	Roadside	486290	243344	NO_2	No	Chemiluminescence	25 (to residential)	3.4	1.5
Roadbox 2	**High Street South, Olney**	**Roadside**	**488922**	**251157**	**NO_2**	**Yes**	**Chemiluminescence**	**11 (to residential)**	**2**	**1.5**

- **Table 4 Details of Non-Automatic Monitoring Sites in Olney**

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m)	Tube co-located with a Continuous Analyser?	Height (m)
C1 C2 C3	10 High St South, (Cowper School House)	Roadside	488914	251173	NO_2	Yes	0	2.0	No	2.3
D1 D2 D3	9 High St South, (Olney Wine Bar)	Roadside	488904	251177	NO_2	Yes	0	1.7	No	2.2
E1 E2 E3	20 High Street	Roadside	488926	251455	NO_2	No	3.3	7.6	No	2.2
F1 F2 F3	17 High Street (Opp. No.20 High St)	Roadside	488905	251456	NO_2	No	0	7.2	No	2.1
G1 G2 G3	Corner of Coneygere and Palmers Road	Suburban	489108	251213	NO_2	No	10.4	1.7	No	2.2
FF1 FF2 FF3	Cross Keys Office, High St South	Roadside	488898	251186	NO_2	Yes	0.2	1.6	No	2.0
HH1 HH2 HH3	33 High Street South (Art Mart)	Roadside	488891	251248	NO_2	Yes	0.6	2.0	No	2.1
JJ1 JJ2 JJ3	Roadbox 2, High Street South	Roadside	488922	251157	NO_2	Yes	10.1	2.0	Yes	2.1
KK1 KK2 KK3	18/20 Bridge Street	Roadside	488917	251068	NO_2	Yes	0.4	2.2	No	2.2
LL1 LL2 LL3	Courtney House, Bridge Street	Roadside	488909	251077	NO_2	Yes	0.4	1.7	No	2.1

Notes:

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

- **Table 5 Annual Mean NO_2 Monitoring Results**

Site ID	Site Type	Monitoring Type	NO_2 Annual Mean Concentration (µg/m^3)										
			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Fixed	Urban Centre	Automatic	21.9	20.9	19.0	18.8	18.1	17.0	16.2	23.5	16.4	16.6	12.4
Roadbox 1	Roadside	Automatic	36.1	33.2	29.6	27.0	32.8	30.5	25.6	27.1	24.2	29.7	24.9
Roadbox 2	Roadside	Automatic	27.0	26.7	27.0	22.3	22.8	22.4	19.9	23.9	17.8	18.5	16.0
C1 C2 C3	Roadside	Diffusion Tube	**42.8**	**44.0**	**40.5**	32.9	36.9	33.4	33.9	36.4	28.8	31.6	26.5
D1 D2 D3	Roadside	Diffusion Tube	39.6	36.6	34.1	29.5	32.3	31.7	30.2	30.9	25.0	33.3	29.1
E1 E2 E3	Roadside	Diffusion Tube	25.8	24.3	21.9	21.6	23.5	21.4	21.3	21.3	17.6	18.3	14.9
F1 F2 F3	Roadside	Diffusion Tube	27.8	25.4	26.7	23.6	24.9	25.0	23.1	25.1	19.3	20.7	17.8
G1 G2 G3	Suburban	Diffusion Tube	14.5	13.2	12.8	10.5	11.5	11.5	10.8	12.3	9.0	9.4	7.9
FF1 FF2 FF3	Roadside	Diffusion Tube	**41.0**	36.2	37.3	32.9	34.0	34.5	30.6	34.6	27.9	27.7	25.3
HH1 HH2 HH3	Roadside	Diffusion Tube	37.9	32.6	32.0	28.5	30.5	30.9	26.6	29.1	23.4	25.3	20.7
JJ1 JJ2 JJ3	Roadside	Diffusion Tube	27.1	26.4	26.2	22.7	24.5	25.2	23.5	24.8	20.2	21.5	16.9
KK1 KK2 KK3	Roadside	Diffusion Tube	**42.4**	**40.2**	**41.3**	34.2	36.3	36.1	32.9	35.8	29.0	31.3	26.8
LL1 LL2 LL3	Roadside	Diffusion Tube	**40.1**	33.6	34.6	31.6	33.5	32.1	28.1	30.6	25.4	26.6	21.8

Notes: Exceedances of the 40µg/m3 objective level shown in **bold**

Figure 3 Trends in Annual Mean NO_2 Concentrations – Automatic Stations

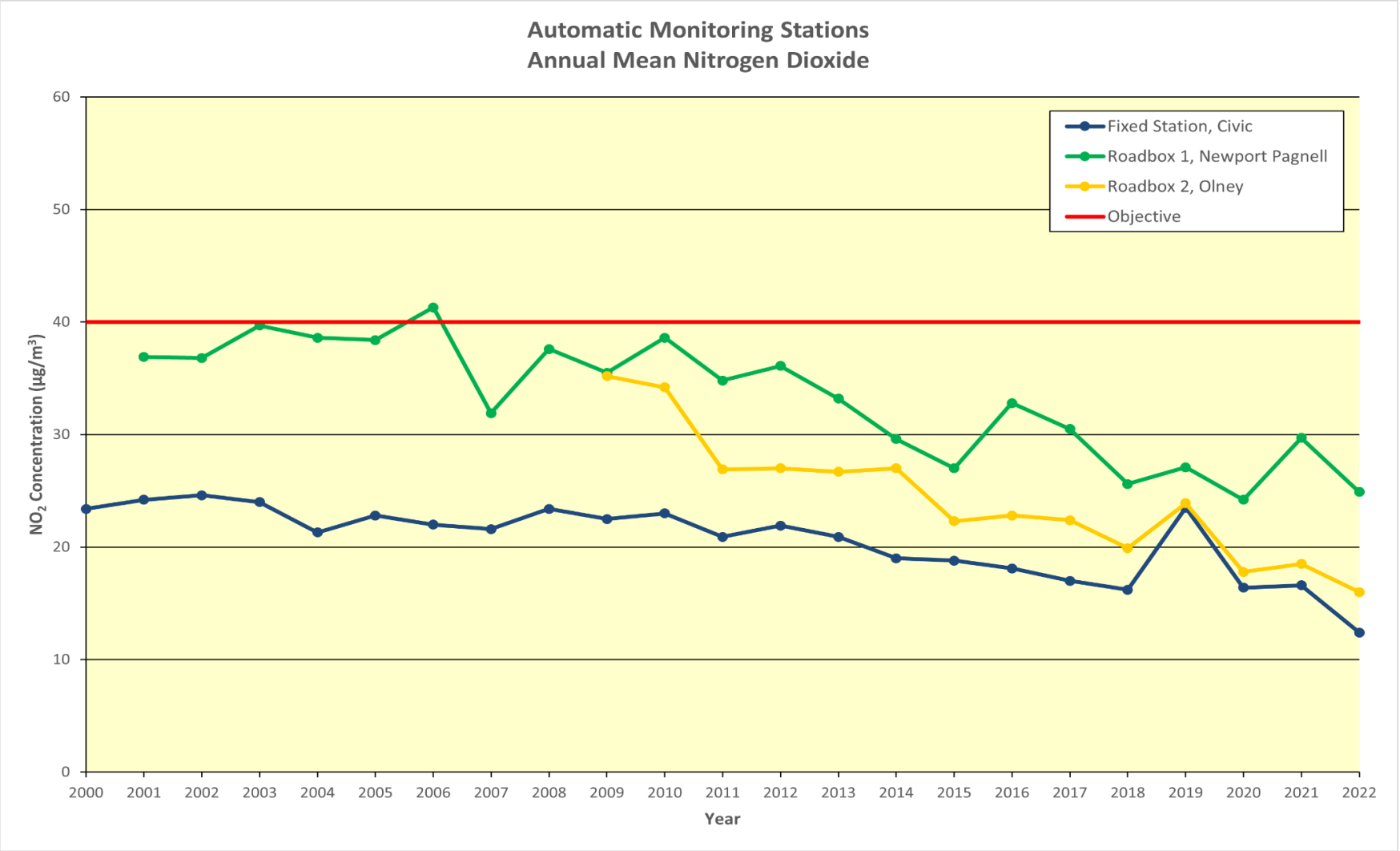
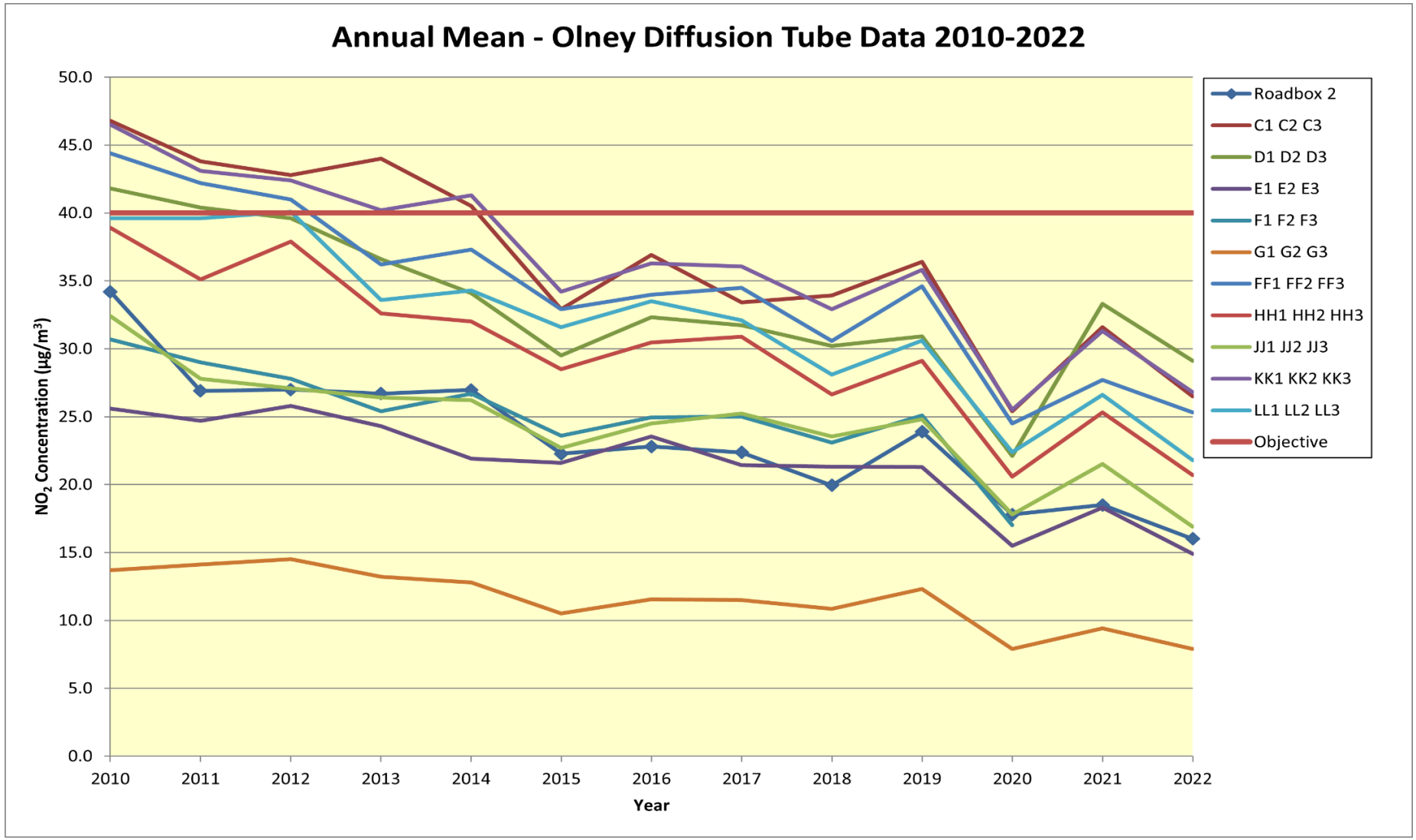


Figure 4 Trends in Annual Mean NO_2 Concentrations - Olney Diffusion Tube Data



1. 4 CONCLUSIONS

4.1 Extensive monitoring of NO_2 levels in Olney has demonstrated that the annual mean objective is comfortably achieved at all locations and consequently the AQMA will be revoked.

4.2 The downward trend in NO_2 concentration is expected to continue in future years as cleaner vehicles replace older less efficient ones.

4.3 There are no plans to relocate the automatic monitoring station, however, the number of diffusion tube sites will be reviewed.

2. APPENDIX A – BIAS ADJUSTMENT

Diffusion Tube Bias Adjustment Factors

Nitrogen dioxide diffusion tubes are prepared 'in-house' by Milton Keynes City Council using 20% triethanolamine (TEA) in water and are analysed following the procedures set out in the AEA Practical Guidance document produced by the Defra Working Group on Harmonisation of NO_2 Diffusion Tubes that was released early in 2008. The Council participates in the proficiency testing scheme, AIR PT, provided by LGC Standards for quality assurance of diffusion tube analysis and the monthly NO_2 Network Field Intercomparison Exercise managed by the National Physical Laboratory (NPL).

Local co-location studies are carried out at all the automatic monitoring stations. Tubes are sited in triplicate near the air intake. In 2022, the bias adjustment factor used was from the co-location study using tubes produced in house at Milton Keynes City Council deployed at Marylebone Road in London. This factor is calculated by using the national bias adjustment spreadsheet provided by NPL, as shown in in **Figure 5.**

- **Figure 5 Co-location Study to produce bias adjustment factor**

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	95% CI of mean
1	06/01/2022	04/02/2022	69.7	67.2	68.6	68	1.2	2	3.0
2	04/02/2022	02/03/2022	71.8	72.5	72.9	72	0.6	1	1.4
3	02/03/2022	30/03/2022	69.1	66.5	67.8	68	1.3	2	3.3
4	30/03/2022	04/05/2022	49.6	45.5	48.4	48	2.1	4	5.2
5	04/05/2022	08/06/2022							
6	08/06/2022	06/07/2022	58.3	57.5	55.6	57	1.4	2	3.5
7	06/07/2022	03/08/2022	42.9	46.9	44.6	45	2.0	4	5.0
8	03/08/2022	31/08/2022	49.1	46.7	46.9	48	1.3	3	3.3
9	31/08/2022	28/09/2022	36.3	32.0	32.5	34	2.3	7	5.8
10	28/09/2022	02/11/2022	59.5	59.8	54.8	58	2.8	5	6.9
11	02/11/2022	30/11/2022	54.2	56.8	59.5	57	2.6	5	6.5
12	30/11/2022	04/01/2023	50.4	48.5	42.5	47	4.1	9	10.3
13									

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

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor
53.1	96.8	Good	Good
52.5	96.6	Good	Good
53.3	97.4	Good	Good
37.1	97.2	Good	Good
41.0	97.6		Good
43.3	96.9	Good	Good
35.2	97.1	Good	Good
34.5	92.6	Good	Good
35.0	98.8	Good	Good
43.0	96.6	Good	Good
43.1	97.1	Good	Good
38.6	98.0	Good	Good
Overall survey -->		Good precision	Good Overall DC

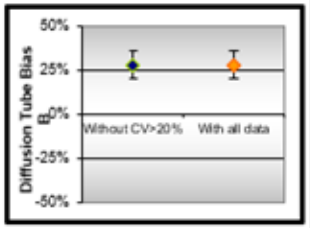
(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Marylebone Road

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

Accuracy (with 95% confidence interval) without periods with CV larger than 20%
Bias calculated using 11 periods of data
Bias factor A 0.78 (0.73 - 0.83)
Bias B 28% (21% - 36%)
Diffusion Tubes Mean: 55 µgm^{-3}
Mean CV (Precision): 4
Automatic Mean: 43 µgm^{-3}
Data Capture for periods used: 97%
Adjusted Tubes Mean: 43 (40 - 45) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA
Bias calculated using 11 periods of data
Bias factor A 0.78 (0.73 - 0.83)
Bias B 28% (21% - 36%)
Diffusion Tubes Mean: 55 µgm^{-3}
Mean CV (Precision): 4
Automatic Mean: 43 µgm^{-3}
Data Capture for periods used: 97%
Adjusted Tubes Mean: 43 (40 - 45) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

If you have any enquiries about this spreadsheet please contact the LAQM Helpdesk at: LAQMHelpdesk@uk.bureauveritas.com

3. REFERENCES

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2. Department for Environment, Food and Rural Affairs, Local Air Quality Management, Technical Guidance LAQM.TG(16), Defra Publications

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5. Milton Keynes Council, Air Quality Action Plan 2012.