City of
BRADFORD
METROPOLITAN DISTRICT COUNCIL

2023 Air Quality Annual Status Report (ASR)

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

Date: June 2023

Information	City of Bradford MDC
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Executive Summary: Air Quality in Our Area

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 28,000 to 36,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

For some pollutants the government has set health based objective levels which Local Authorities must comply with. Where these objectives are not met, Local Authorities must declare Air Quality Management Areas (AQMAs) and draw up Air Quality Action Plans (AQAPs) to improve air quality. This system is known as Local Air Quality Management (LAQM). It is carried out by all Local Authorities as part of their duties under the Environment Act 1995 and subsequent regulations.

This Annual Status Report (ASR) has been produced to meet City of Bradford MDC's statutory reporting requirements in relation to LAQM and the provisions of the Environment Act 1995. Its primary purpose is to examine Bradford's compliance with the UK national air quality objectives within the existing AQMAs and at other *'relevant locations'* within the wider Bradford district.

National air quality objectives reflect the numerical value of the Air Quality Standards which central Government are legally required to meet. Whilst the numerical values of air quality standards and objectives are often the same, the places they apply and the way compliance with them is evaluated are the subject of two different regimes.

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

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

[3] Defra. Air quality appraisal: damage cost guidance, July 2021

[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

Where central Government considers additional local action is required to ensure compliance with a legally binding air quality standard it can mandate individual local authorities to deliver additional action over and above that already being undertaken locally under the LAQM regime.

In 2018, City of Bradford MDC was mandated by Ministerial Direction to work with the Joint Air Quality Unit (JAQU) (an amalgamation of the Government departments of DfT and Defra) to carry out a study (in accordance with Government guidance provided via JAQU) to identify interventions to bring forward Bradford's compliance with the EU limit values for nitrogen dioxide (NO_2).

Following completion of the study in 2020, and subsequent authorisation by JAQU and their technical independent technical review panels, the Government mandated Bradford to implement a Class C Charging Clean Air Zone (CAZ). This was implemented on the 26th September 2022. The Government awarded the Council £39.3m to implement the CAZ, including Clean Air Funding (CAF) to support local businesses to upgrade their vehicles to CAZ standard.

The Bradford CAZ charges do not apply to private cars.

Whilst the Council is required to report on LAQM to the Government this does not align with the Governments additional air quality reporting under the Clean Air Zone framework. With the implementation of the CAZ it is anticipated that this will lead to the revocation of all AQMAs in the Bradford District.

This report is not intended to form any part of the evidence base for the Government mandated Bradford CAP/CAZ or provide a position statement on current compliance with EU limit values (which form the basis of the mandated CAZ requirement).

The previously prepared detailed business case for the Bradford CAP can be found here:

Link to Bradford CAP /CAZ Business case on Breathe Better Bradford website

The impact of the CAZ is subject to ongoing local evaluation which is regularly reported to JAQU, and there is also additional evaluation by the evidence team at JAQU which includes a deep dive study. The CAZ health impact is also being evaluated separately as the subject of a £1m National Institute of Health Research project by the NHS and Born In Bradford (Bradford NHS). Public reports on the impact of the CAZ will be provided on the Breathe Better Bradford website as they become available. A traffic displacement monitoring report is already available here:

Link to CAZ traffic displacement monitoring report on Breathe Better Bradford website

Air Quality in City of Bradford MDC

The main air pollutants of concern in Bradford are nitrogen dioxide (NO2) and particulate matter (PM). A significant source of these pollutants is traffic but industry, heat and power generation, domestic sources and natural activities also contribute.

Bradford has areas of high levels of deprivation and significant levels of health inequality. 27% of the Bradford district population live in areas classed as the 10% most deprived in England. There are above average numbers of deaths from smoking, cancer, heart disease and strokes and it is estimated that emissions of man-made fine particles, PM2.5 cause 4.7% of total mortality. There are marked differences in people's health within the Bradford district with people living in Wharfedale (to the north) typically living five years longer than people living in Tong (to the south). In Bradford there are more deaths as a resulting from smoking, cancer, heart disease, and strokes, and higher rates of mortality in children, than in most parts of the UK

Poor air quality is closely linked to poor health and is frequently identified in the most deprived wards of the city. City of Bradford MDC fully recognises that improving local air quality is essential to deliver better health outcomes for all. This is particularly important for the above national average numbers of young people in the district (23.8% of the total population are under 16) whom are particularly sensitive to the effects of poor air quality. They may experience life-long impacts resulting from pollutant exposure in their early years.

At present Bradford has four declared Air Quality Management Areas

- AQMA order 1 – Mayo Avenue
- AQMA order 2 – Manningham Lane / Queen's Road
- AQMA order 3 – Thornton Road
- AQMA order 4 – Shipley Airedale Road

Maps showing the locations of the AQMAs are available in Appendix D of this report or can be viewed on the council's website here:

Link to AQMA location maps on CBMDC website

Air quality in all the Bradford AQMAs is improving. During 2022 there were remaining exceedances of the annual average nitrogen dioxide objective (NO2) at relevant locations in the Manningham Lane AQMA (order 2) and Shipley Airedale Road AQMA (order 4). The last recorded exceedances of air quality objectives at relevant receptor points in the Thornton Road AQMA (order 3) and Mayo Avenue AQMA (order 1) arose in 2018.

Elevated pollutant levels have previously been identified in other areas of the district. These include:

- Harrogate Road / Killinghall Road
- Saltaire crossroads
- Rooley Lane
- Tong Street
- Canal Road

Air quality in these areas is also generally improving and there were no exceedances of the annual average nitrogen dioxide objective (NO2) at relevant locations in these areas during 2022.

During 2021 a large number of additional passive nitrogen dioxide (NO2) diffusion tube monitoring locations were established around the district to assist with evaluation of the CAZ. This additional monitoring highlighted further areas of elevated pollutant concentrations around the city centre (Godwin Street, Market Street and Sunbridge Road) and along Manchester Road. During 2022 only one site DT161 at Godwin Street exceeded the annual average nitrogen dioxide objective. The other sites remained elevated but there appears to have been a significant improvement on Market Street which may be linked to taxi and bus emission improvements achieved through the CAZ grant programme.

During 2022 a further monitoring site on Low Mill in Keighley returned a concentration greater than the annual average nitrogen dioxide objective level of 40µg/m^3. This site was established to measure baseline concentrations in relation to a planning application and is currently not a relevant location for LAQM purposes. There is no public exposure currently present near this monitoring site.

Additional monitoring established in Ilkley, Silsden and Apperley Bridge during 2021 and 2022 (following concerns raised by residents about local air quality and /or impacts of new development) has not identified any new exceedance of air quality objectives.

Monitoring is ongoing in all these locations and further results from these sites will be included in the 2024 ASR and in future CAZ evaluation reports.

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.

Bradford published its first Air Quality Action Plan in 2009 followed by the Bradford Low Emission Strategy (LES) in 2013. Bradford has also adopted the policies set out in the West Yorkshire Low Emission Strategy (WYLES) (2016). Bradford played a lead role in the development of the WYLES which sets out policies for a consistent approach to emission reduction across the West Yorkshire region.

These documents can be viewed in full here:

- Link to Bradford AQAP on CBMDC website
- Link to Bradford LES on CBMDC website
- Link to WYLES on CBMDC website

Previous ASR reports have documented the measures delivered under these policies and further information is provided in Table 2.2 of this report. Some of the key projects delivered under these policies to date include:

[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

- Development and application of the WYLES planning guidance. This aims to ensure all new developments include air quality mitigation measures. The current guidance can be viewed here Link to WYLES planning guidance on CBMDC website. This policy has secured the inclusion of EV charging points, low emission travel plans and additional emission mitigation measures on planning consents in Bradford since 2014. Due to the introduction of new EV charging Building Regulations (Approved Document S) (June 2022)[7] the WYLES planning guidance will no longer be used to secure EV charging on new dwellings or commercial uses with less than 10 parking spaces. It will continue to seek additional emission mitigation on large developments, including enhanced EV charging provision where considered appropriate on large commercial premises.
- Development and implementation of the WYLES Low Emission Procurement Guidance which seeks to ensure emission impacts are considered during procurement of goods and services in Bradford. The current guidance can be viewed here Link to WYLES Low Emission Procurement Guidance on CBMDC website
- Undertaking of the Bradford and West Yorkshire Low Emission Zone feasibility study (2015). This has now been superseded by the Government mandated Bradford CAP and implementation of the Bradford CAZ in September 2023.
- A series of regional bus retrofit programmes
- Implementation of 88 electric taxi recharging points across the WYLES region Link to taxi recharging scheme information on WYCA website
- Anti-idling awareness activities in schools
- Introduction of Enterprise Car Clubs across the district
- Opening of new railways stations at Apperley Bridge (2015) and Low Moor (2017)
- Opening of the Bradford to Leeds Cycle Superhighway scheme which has now recorded over 1,000,000 cycle trips Link to Cycle Superhighway information on the City Connect website
- Introduction of electric vehicles into the CBMDC fleet, with an ambition for all cars and vans less than 3.5 tonnes to be replaced with electric by 2024.
- Introduction of a corporate cycle to work scheme in Bradford

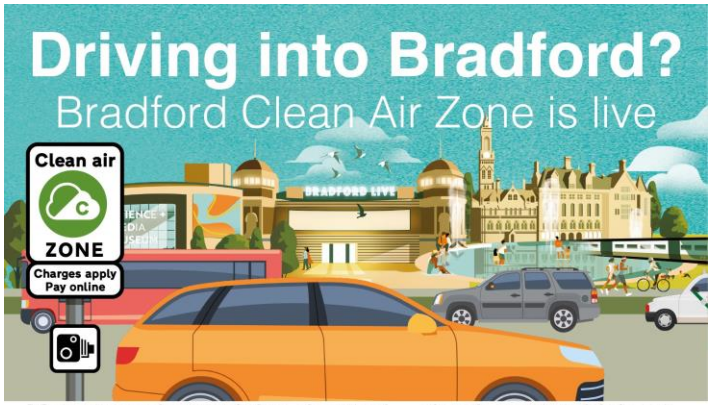
In 2018, City of Bradford MDC was mandated by Ministerial Direction to work with the Joint Air Quality Unit (JAQU) (an amalgamation of the Government departments of DfT and

[7] Infrastructure for charging electric vehicles: Approved Document S (ISBN 978-1-914124-81-5)

Defra) to carry out a study (in accordance Government guidance provided via JAQU) to identify interventions to bring forward Bradford's compliance with the EU limit values for nitrogen dioxide (NO_2).

Following completion of the study in 2020, and subsequent sign-off by JAQU and their technical independent technical review panels, the Government mandated Bradford to implement a Class C Charging Clean Air Zone (CAZ). This was implemented in Bradford on the 26th September 2022.

The Bradford CAZ charges do not apply to private cars.



Many people won't be charged – check your vehicle or pay the charge online at **www.gov.uk/clean-air-zones**

Following a Clean Air Fund bid by Bradford which identified support that would be needed to mitigate the impacts of a Clean Air Zone, the Government awarded the Council £39.3m to implement the CAZ, including Clean Air Funding (CAF) to support local businesses to upgrade their vehicles to CAZ standard. This represents the highest funding award for a CAZ of this type in the UK.

So far this has resulted in:

- 99% of Bradford's 3700 licensed taxis being CAZ compliant. Bradford now has the cleanest taxi fleet in UK with drivers also benefiting from substantial fuel cost savings
- 90% (over 300) local buses upgraded ensuring all scheduled and tendered services meet CAZ standard. An additional £10 million of Government Zero Emission Bus Fund (ZEBRA) will see the introduction of 32 single deck Zero Emission Buses (ZEBs) into the Transdev depot at Keighley. The electric services will operate primarily in the Bradford district, including the high frequency 662 'Shuttle' service linking Keighley with Bradford City Centre via the Aire Valley corridor, which is partially in the city's CAZ and will see 15 ZEBs deployed. Additional services will

operate out of Keighley into the wider district. Due to some contractual delays the ZEBs are now expected to be operational by 2024.

- Defrayment of £7.4m to assist businesses to upgrade over 20% of all lorries operating in the district
- Upgrade of up to 50 coaches in the district
- Over 2,000 grant applications for £4,500 received from local businesses to help upgrade vans to CAZ standard.

The CAZ covers an area of 22.4 km^2. 16 km of digital ducting has been prepared to support the CAZ, including development of 6 new fibre digital rings around the City and installation of over 360 cameras and 3,700 signs.

Bradford's CAZ became live on Monday 26 September 2022. The business case modelling indicated it will reduce Bradford's NO2 levels by up to 35% resulting in widespread compliance with legal limits across the district. CO2-equivalent (CO2e) emissions are also expected to reduce by 147,000 tonnes over the lifetime of the CAZ.

Further details about the Bradford CAZ and the supporting documents can be found on the Breathe Better Bradford website available here: Link to CAZ information on Breathe Better Bradford website.

The area covered by the Bradford CAZ is shown in Appendix D.

Whilst compliance with legal limits is the main driver for the CAZ implementation, health improvement and reduction in greenhouse gases are both key secondary aims. As a result of the measures in the CAP air quality is expected to improve across all Bradford wards leading to a 10% reduction in emergency hospital admissions for heart disease, COPD, respiratory disease and asthma which currently account for 380 hospital admissions per week in the Bradford. The resultant savings to the NHS are expected to be substantial.

City of Bradford MDC is working closely with health researchers at Born in Bradford (BiB), to evaluate the health change associated with the CAP. Bradford is the only Local Authority in the UK to be undertaking this type of research. The research is funded through a £1.1m National Institute for Health Research (NIHR)/NHS bid. The project has collected baseline data to inform the success of the CAP in improving health, and is keeping track of the project as vehicles move across to cleaner alternatives via the support programmes.

The Council has also worked with partners to hold creativity labs for local schools where children were invited to find 'solutions to pollution'. More information on this scheme is included in the consultation section below.

In March 2022 Chris Whitty (England's Chief Medical Officer) visited Bradford and met with members of the Bradford Clean Air Programme team and Born in Bradford. As a result of the visit the Chief Medical Officer Report for 2021 focussed on air quality and included a case study of Bradford's air quality improvement work with Public Health colleagues and NHS researchers.

In March 2021 CBMDC received Defra Air Quality grant funding of £253,432 to develop and implement a Particle Reduction and Awareness Strategy with match funding of £77,179 provided in the form of Bradford staff time. The strategy will focus on achieving community and construction site emission reduction and behavioural change, as well as improving public access to air quality data and exposure reduction advice.

Over the past year CBMDC has been working closely with BiB, the University of York, the University of Sheffield and the West Yorkshire Combined Authority (WYCA) to progress implementation of the Particle Reduction Strategy (PRS).

To date the following action has been taken:

- Indoor air quality measurements have been commenced in 300 homes around Bradford by the University of York. This forms part of the wider INGENIOUS research programme designed to investigate the causes of indoor air pollution in homes and develop intervention programmes.
  Link to INGENIOUS project on University of York website
- CBMDC has procured 12 new low cost real time analysers to be deployed in residential areas to look specifically at domestic emissions with the aim of monitoring external air quality in residential areas before and after domestic emission intervention programmes. The University of York will provide a further 4 analysers to support this project. Monitoring commenced in June 2023.
- The University of Sheffield have developed and implemented a domestic smoke control questionnaire to investigate reasons why some residents opt to use solid fuel heating appliances and what steps they currently take to minimise emissions from these appliances inside, and outside, their home. The results of this questionnaire will be used to develop behaviour change interventions aimed specifically at reducing emissions from domestic solid fuel appliances. These interventions will be actively supported and promoted by CBMDC to reduce domestic smoke emissions within the district.
- CBMDC is in the process of upgrading the Breath Better Bradford website to include information on the following:
  - Sources of air pollution
  - How you can help and protect yourself
  - Health impacts of air pollution
  - Air quality monitoring in Bradford (including link to real time data and GIS plotted diffusion tube data)
  - Air Quality Management Areas
  - Air Quality Action Plans
  - Annual Status Reports
  - Low emission planning and emission mitigation
  - Air quality impact assessment and damage cost calculations

- Air quality exposure assessments
- Indoor air quality project

The new website is expected to go live before Autumn 2023.

- A new regional particulate emission database is being procured at a regional level to identify the main sources of particulate pollution in the West Yorkshire region and to test the impact of potential interventions. This work will form the basis of the final particulate reduction strategy (PRS) for Bradford which will complement the existing Bradford Clean Air Plan (CAP) (increasing its scope beyond NO2 reduction mainly from traffic), and also supporting Bradford's carbon reduction programme and wider measures to address health inequalities in the city.

- An additional project to encourage the uptake of low emission Non-Road Mobile Machinery (NRMM) in the district has not yet been progressed due to insufficient staff resource to progress at the current time. This remains an aspiration for the authority and will be progressed in due course.

Air quality is impacted on by many activities especially those that impact on local highways or create new direct emissions to air. The Bradford Clean Air Programme team routinely work with colleagues across the council and from the West Yorkshire Combined Authority (WYCA) to ensure that changes to the local road network in Bradford and any new large developments are adequately assessed for air quality impacts and mitigated accordingly.

Bradford is committed to a clean growth agenda that includes improved rail connectivity, mass transit systems and alternative fuel infrastructure. These will be designed and implemented in a way which continues to support clean air and carbon reduction whilst allowing the city to grow and thrive. The schemes will be funded through a £317 million West Yorkshire Transforming Cities Fund from the Department for Transport (DfT) (plus local match funding up to £140 million). More information on what the TCF fund will deliver for Bradford is available here:

Link to Transforming Cities Fund Programme for Bradford on WYCA website

Further air quality modelling has recently been commissioned to assess the long term impacts of the Bradford Local Plan and there are longer term plans to create a hydrogen bus test bed and an advanced fuel centre in the district. A pre-planning enquiry was submitted for the proposed advanced fuel centre in February 2023 and the next stage will be development of a full planning applications. The authority is also still working on the

implementation of school streets and has recently put in place an air quality evaluation monitoring network to monitor the impact of the second round of school streets which went live in June 2023.

There are also plans for a low carbon District Heat Network (DHN) to serve many of the larger buildings in Bradford city centre. This will reduce the impact of boiler emissions in the city centre and power heating via air source pumps as a clean low carbon alternative.

Further information on the work the Bradford Clean Air Programme team is doing to assess, mitigate and monitor the impact of large infrastructure schemes and planning applications can be found in Appendix C.

Conclusions and Priorities

Air quality is generally improving across the Bradford District with some areas improving faster than others. There was a clear impact on all areas from the Covid-19 pandemic in 2020. Some 2022 concentrations were higher than those in 2021 and others were lower. Those areas showing improvement in 2022 are mainly located around the busiest, most polluted roads in Bradford. **It is anticipated the CAZ will ensure all legal air quality standards are met and will lead to the revocation of all AQMAs in Bradford.**

During 2022/23 the main focus of air quality improvement work in Bradford has been continued implementation and enforcement of the CAZ, issuing of further local fleet improvement grants and on-going public information campaigns to increase awareness of the CAZ amongst those travelling to the city. Work has also commenced on the Particle Reduction Strategy (PRS) with research having commenced in homes around the city and a new low cost analyser network to look specifically at domestic emissions deployed. Procurement of a new Particulate Emission Inventory has been commenced at a regional level and Bradford's new air quality webpages are at an advanced stage of development.

During 2023/24 the council will continue to work towards the publishing of a new Particulate Reduction Strategy (PRS) and will launch its new Clean Air Schools Programme (CASP) (funded from CAZ revenue). Work will also continue towards the development of a hydrogen bus test bed / advanced fuel centre and the introduction of a low carbon District Heat Network (DHN) scheme.

The council will pursue the planned NRMM project but lack of staff resources to progress this have caused the timelines for this project to increase by around 12 months.

The Clean Air Schools Programme contains;

- 5 new environmental wardens who will work with Schools to support engagement actvity.
- Authorisation of Council officers to enforce anti-idling regulations and assistance with the implementation of school streets.
- A £500,000 grant programme for schools in the most polluted areas to provide funding (£250-£10,000 per school) for schools to implement actvities or works which will reduce pollution in their local vicinity.
- An engagement package for schools with material and resources that will be created to deliver a wide range of activities for pupils to enhance their knowledge of air pollution and allow the school to effectively communicate with parents, visitors, suppliers and the local community. Examples of the types of imagery to be used in the campaign are shown below;

Clean Air Programme officers at the council will continue to input into major highway and infrastructure improvement schemes and will continue to routinely review and comment on all relevant planning applications to ensure appropriate levels of emission mitigation and exposure reduction are implemented. The main challenges in these areas will be staffing resources to adequately assess all schemes and the ability to achieve ongoing sustainable growth. The West Yorkshire Low Emission Planning guidance is in need of updating and this will continue to be progressed with colleagues across the other West Yorkshire authorities over the coming year. Bradford air quality staff are currently leading on this update with decisions already taken on the future approach to EV charging requirements.

Bradford's current Air Quality Action Plan (2009) has been superceded by the Bradford Low Emission Strategy (2013) and the CAP (2019). It is recognised that the current AQAP needs fully updating to reflect the content of the Bradford LES and CAP and this will be progressed once sufficient resource is available to do so. At present the main focus of the Clean Air Programme team is the continued delivery of the CAZ and progressing all aspects of the Particle Reduction Strategy project.

Local Engagement and How to get Involved

CBMDC has previously consulted decision makers and the public on the declaration of AQMAs, the development of the Bradford and West Yorkshire Low Emission Strategies and on various infrastructure and highway improvement programmes.

Public consultations undertaken by CBMDC are usually made available via the council website here: Link to public consultation pages on CBMDC website .

Consultation on WYCA funded schemes are usually consulted on via the WYCA website here: Link to public consultation pages on WYCA website

All planning applications received by CBMDC are made available for public review and comment on the Bradford planning portal Link to CBMDC planning portal.

Recent consultation activities relating to air quality improvement have been focused on the development of the Clean Air Zone. This has been complimented by a local publicity campaign, including a regional campaign covering the area within a one-hour drive of Bradford. A full public consultation on the CAZ proposals took place between February and April 2020. A number of workshops and events were held with transport operators, businesses and members of the public. There were 1637 responses to the consultation including 744 taxi drivers/operators and 88 businesses. Two thirds (67%) of respondents agreed that improving air quality should be a priority for the Council, 21% disagreed and 12% were unsure. The full results of the CAZ consultation are available on the Breathe Better Bradford website here: Link to CAZ consultation information on Breathe Better Bradford website.

The council continues to engage with all CAZ stakeholders using a wide range of different engagement methods to ensure the local community and businesses are fully aware of the CAZ and the exemption and vehicle upgrade grant opportunities available. A Clean Air Zone stay connected newsletter is regularly produced and can be accessed here:

[Link to CAZ stay connected newletters on Breathe Better Bradford Website]

A telephone helpline has been set up specifically CAZ related enquiries:

Clean Air Zone enquiries: 01274 435533

Opening hours:

Monday to Thursday, 8.30am to 5pm

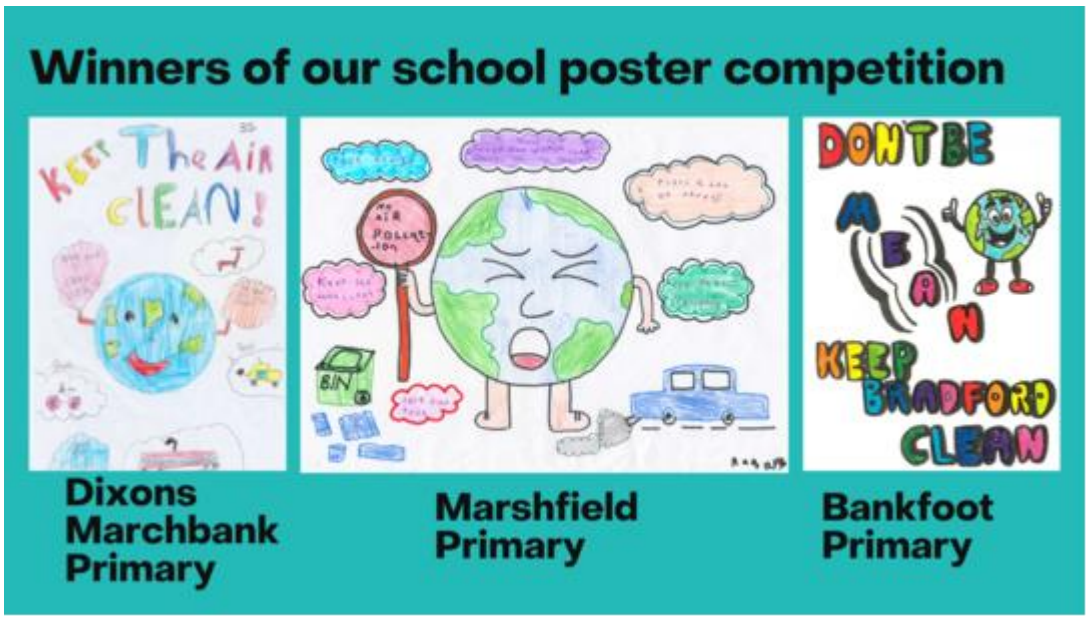
Friday 8.30am to 4.30pm

In the 12 months from Feb 22 to Feb 23 there were 292,615 visitors to the Breathe Better Bradford website. Peaks of over 50,000 visitors per month were seen in September and October and the highest number of daily visitors on launch day (26 September 2022) of 7,435.

City of Bradford MDC are actively working with partners at schools in the District to engage and increase awareness of air pollution and the health related problems it can cause. This work will be extended significantly following the launch of the CASP in summer 2023.

The Council are involved in workshops and creativity labs with Born in Bradford to educate and inspire the children so they can develop new and creative ideas to improve air quality where they live. After developing their air quality improvement ideas in sessions held in each school, individual groups undertook a mini pitch at their school and the highest scoring group from each school went on to present their idea in City Hall on Clean Air Day 2023 to a panel of council members, air quality officers and health experts. A similar event was held at Bradford City Hall in 2021. BBC Look North attended both events.

During 2022/23 a competition was run at local schools to design a clean air poster. The winning images are shown below.



The Council are also working with Born in Bradford on a study called BiB Breathes which will evaluate the impact of the Clean Air Zone on air quality, health and health inequalities in the city of Bradford. The project has a strong emphasis on community engagement and inclusion. The project has worked intensively with 12 schools (both inside and outside the CAZ) with children recruited as air pollution scientists and provided with air pollution monitoring equipment to use on their daily journey to school.

A video of the project work with schools can be viewed on the Born in Bradford website -

Link to video about BiB schools project on BiB website

During 2022/23 air pollution measurements have started to be undertaken in homes of families already taking part in the BiB research programme and additional questionnaires are taking place in homes with solid fuel appliances. If you are an adult with a solid fuel appliance in your home and are interested in taking part in the solid fuel burning research programme you can register your interest here:

Link to expressions of interest in solid fuel research programme

There are only a limited number of questionnaires that can be undertaken under the current programme but expressing an interest may help us to gain funding for further research programmes if you are not successful this time.

In order to improve air quality in Bradford and reduce exposure to pollution, CBMDC advises residents to make simple changes to their everyday life;

- If able, reduce your vehicle use by walking and cycling for shorter journeys. Try and pick routes which are not as heavily trafficked (e.g. through parks and lesser used streets) to reduce the amount of pollution exposure.
- Make the most of public transport as an alternative to using a car, this can save money and reduce impact on the environment. Check out the information on the

Council website for local transport provision and see if it can help better plan journeys - Link to public transport information on CBMDC website

- If you have children who are travelling to school consider the advice on the Council website to help make this journey more sustainable and improve their health - Link to sustainable school travel advice on CBMDC website
- If you own a vehicle which is regularly driven in urban areas, think about the impact on the environment when the time comes to replace it. Consider low emission alternatives, such as hybrids and electric vehicles. Although the initial purchase price may seem high in the longer term they may prove more cost effective through reduced fuel and tax costs. Government grants are available to help with the purchase of some low emission vehicles. More information is available here:

  Link to UK Government information on EV vehicle grants

If you need to own a vehicle and cannot replace it just yet you can still reduce your impact on the environment by following these ECO-driving tips:

- **Switch off your engine when parked**, especially outside schools and homes where children and residents are present. Please note idling your vehicle is an offence for which a fixed penalty notice of £20 can be served.
- **Check your tyres -** Under-inflated tyres mean an engine has to work harder and will produce more emissions.
- **Clear the clutter -** remove unnecessary clutter from your boot and reduce engine workload.
- **Stick to the speed limit -** high speeds produce more emissions. At 70mph a driver could be using up to 15 per cent more fuel than at 50mph.
- **Slow down as you approach traffic jams** - Stop-start traffic jams use more fuel. Slow down early and take your foot off the accelerator. Use the stop start technology on your vehicle if it has it.
- **Close windows and cut down on the use of air conditioning** to reduce emissions
- **Share your journeys** - consider using the West Yorkshire car share scheme to help with this.

- If you have a solid fuel appliance, such as a wood burning stove, ensure you use it correctly with approved dry fuels to minimise smoke emissions. If you live in a Smoke Control Area (SCA) you must comply with the legal requirements for smokeless zones. Residents are advised that if they fail to comply they could risk a fine of up to £1,000 per offence. More information on SCAs is available here:

  Link to Smoke Control area information on CBMDC website

More information on smoke control rules can be found here:

Link to smoke control rules on UK Government website

Even if you don't live in a SCA you must avoid creating a smoke nuisance.

Link to smoke nuisance information on UK Government website

For your domestic heating, especially If you live in an urban area, consider buying a 'low nitrogen oxide' boiler the next time it requires replacement or consider an air or ground source heat pump.

If you would like to see more done to improve air quality in your area then you could contact the local Councillor or MP and tell them about your concerns or ideas. To find out who your local Councillor or MP is and how to contact them;

Link to local democracy information on CBMDC website

Link to UK Parliament website

For more information on national campaigns to improve air quality visit;

Link to Global Action Plan Clean Air Day website

Link to Client Earth website

Link to Friends of the Earth website

Daily national air quality updates, pollution forecasts and advice about how to protect yourself from the impacts of poor air quality can be found at:

Link to UK Air website operated by Defra

Local Responsibilities and Commitment

This ASR was prepared by the Clean Air Programme team of City of Bradford Metropolitan District Council with the support and agreement of the following officers and departments:

- Planning, Transportation & Highways
- Health and Well Being

This ASR has been approved by:

Andrew Whittles, Air Quality Programme Director, Department of Place

e-signature 

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This ASR has not been signed off by a Director of Public Health as Bradford has a dedicated Air Quality Programme Director directly responsible for air quality monitoring and improvement and who regularly briefs the DPH and Members on all air quality matters.

If you have any comments on this ASR please send them to Elizabeth Bates report author at:

Clean Air Programme

Department of Place

1st Floor, Britannia House,

Hall Ings,

BD1 1HX

Tel: 01274 435533 (CAP helpline)

elizabeth.bates@bradford.gov.uk

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Tables

1 Local Air Quality Management

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

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

2 Actions to Improve Air Quality

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 City of Bradford MDC can be found in Table 2.1. The table presents a description of the 4 AQMA(s) that are currently designated within City of Bradford MDC. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMA(s) and also the air quality monitoring locations in relation to the AQMA(s). The air quality objectives pertinent to the current AQMA designation(s) are as follows:

- NO2 annual mean*

** All the AQMAs in Bradford were originally declared for both the annual and hourly NO2 objectives but only the annual average objective is now at risk of being exceeded*

A charging Clean Air Zone (CAZ) came into force in Bradford on Monday 26th September 2022 covering the area of Bradford shown in Appendix D. The CAZ was introduced to address ongoing exceedances of annual average limit values for nitrogen dioxide in response to a Government issued mandate to bring levels of nitrogen dioxide (NO_2) within legal limits in the shortest possible time. More information about the Clean Air Zone is available here: Link to the Breathe Better Bradford website.

It is anticipated the CAZ will ensure all legal air quality standards are met and will lead to the revocation of all AQMAs in Bradford.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Mayo Avenue / Manchester Road (Order 1)	2006	NO2 annual mean	An area surrounding the junction of the A6177 and A641 with terrace housing and a primary school close to the roadside	NO	57 (Mayo Ave at continuous monitoring station not distance corrected)	35.6 (Mayo Ave distance corrected tube DT105)	4	Bradford Clean Air Plan (2020), Bradford Low Emission Strategy (2013), Bradford AQAP (2009)	Visit the AQAPs for Mayo Ave AQMA Link to Bradford Clean Air Plan (CAP) Link to Bradford Low Emission Strategy Link to Bradford Air Quality Action Plan

Manningham Lane / Queens Road (Order 2)	2006	NO2 Annual Mean	An area surrounding the junction of the A6177 and A650 with terrace housing close to the roadside	NO	33 (Manningham Lane at continuous monitoring station not distance corrected)	44.4 (Queens Road in line with receptor (fallen from 54 in 2008)	0	Bradford Clean Air Plan (2020), Bradford Low Emission Strategy (2013), Bradford AQAP (2009)	Visit the AQAPs for Manningham Lane Link to Bradford Clean Air Plan (CAP) Link to Bradford Low Emission Strategy Link to Bradford Air Quality Action Plan
Thornton Road (order3)	2006	NO2 Annual Mean	A canyonised area adjacent to the B6145 with residential accommodation and student accommodation adjacent to the road	NO	35 (Thornton Road continuous monitoring station at relevant receptor)	31 (Thornton Road continuous monitoring station at relevant receptor)	4	Bradford Clean Air Plan (2020), Bradford Low Emission Strategy (2013), Bradford AQAP (2009)	Visit the AQAPs for Thornton Road Link to Bradford Clean Air Plan (CAP) Link to Bradford Low Emission Strategy Link to Bradford Air Quality Action Plan

Shipley Airedale Road (order 4)	2006	NO2 Annual Mean	An area of the A650 Shipley Airedale Road where apartments are adjacent to multi-lane traffic flow	NO	68 (Shipley Airedale Rd continuous monitoring station not distance corrected)	48.3 (Shipley Airedale Rd distance corrected diffusion tube DT12)	0	Bradford Clean Air Plan (2020), Bradford Low Emission Strategy (2013), Bradford AQAP (2009)	Visit the AQAPs for Shipley Airedale Road Link to Bradford Clean Air Plan (CAP) Link to Bradford Low Emission Strategy Link to Bradford Air Quality Action Plan
Mayo Avenue / Manchester Road (Order 1)	2006	NO2 1 Hour Mean	An area surrounding the junction of the A6177 and A641 with terrace housing and a primary school close to the roadside	NO	unknown	0 hours exceeded 200, max hourly conc = 159	8	Bradford Clean Air Plan (2020), Bradford Low Emission Strategy (2013), Bradford AQAP (2009)	Visit the AQAPs for Mayo Ave AQMA Link to Bradford Clean Air Plan (CAP) Link to Bradford Low Emission Strategy Link to Bradford Air Quality Action Plan

Manningham Lane / Queens Road (order 2)	2006	NO2 1 Hour Mean	An area surrounding the junction of the A6177 and A650 with terrace housing close to the roadside	NO	unknown	0 hours exceeded 200, max hourly conc = 124.0	>10 years	Bradford Clean Air Plan (2020), Bradford Low Emission Strategy (2013), Bradford AQAP (2009)	Visit the AQAPs for Manningham Lane Link to Bradford Clean Air Plan (CAP) Link to Bradford Low Emission Strategy Link to Bradford Air Quality Action Plan
Thornton Road (order 3)	2006	NO2 1 Hour Mean	A canyonised area adjacent to the B6145 with residential accommodation and student accommodation adjacent to the road	NO	unknown	0 hours exceeded 200, max hourly conc=163	8	Bradford Clean Air Plan (2020), Bradford Low Emission Strategy (2013), Bradford AQAP (2009)	Visit the AQAPs for Thornton Road Link to Bradford Clean Air Plan (CAP) Link to Bradford Low Emission Strategy Link to Bradford Air Quality Action Plan

Shipley Airedale Road (Order 4)	2006	NO2 1 Hour Mean	An area of the A650 Shipley Airedale Road where apartments are adjacent to multi-lane traffic flow	NO	unknown	0 hours exceeded 200,max hourly conc = 136	>10 years	Bradford Clean Air Plan (2020), Bradford Low Emission Strategy (2013), Bradford AQAP (2009)	Visit the AQAPs for Shipley Airedale Road Link to Bradford Clean Air Plan (CAP) Link to Bradford Low Emission Strategy Link to Bradford Air Quality Action Plan

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

☒ **City of Bradford MDC confirm that all current AQAPs have been submitted to Defra.**

Progress and Impact of Measures to address Air Quality in City of Bradford MDC

Defra's appraisal of last year's ASR concluded the report is well structured, detailed, and provided the information specified in the Guidance.

The main comments received were:

1. The headers within table A.4(b) appear to be formatted incorrected, with some headers appearing in the middle of the page as opposed to at the top of the page. This should be fixed to ensure consistency and to enable the tables to be easily read.

   CBMDC response: This issue was addressed in the 2021/2022 report prior to publication on the website and the same issue has been avoided in this report

2. The Council have provided a good description of current AQAP measures, and have included these in table 2.2. The addition of colour coding to highlight the expected impact of measures, or implementation time is particularly useful, and it is clear that there are a number of measures which may have a greater or faster impact.

   CBMDC response – no improvement needed. The same colour coding approach has been taken in this report.

3. Figures are clear and well-presented, with consistency between the chosen background mapping and colour-coding of the monitoring sites. However, it may be useful to include a key on each figure highlighted the colour-coding between passive and continuous monitoring sites for completeness.

   CBMDC response – a key indicating which data is from passive diffusion tubes (DT) and which is from continuous automatic real time stations (CM) has been provided on relevant charts in this report.

4. A detailed description of the appropriate QA/QC measures has been provided. This includes evidence of both distance-correction and annualisation calculations. An image of the appropriate spreadsheet for the 2021 national bias adjustment could be included in future ASRs to demonstrate where the chosen national bias adjustment factor has come from.

CBMDC response – a copy of the relevant bias correction spreadsheet has been included in this report as requested.

5. It is welcomed that the Council has included the comments from Defra's appraisal of the 2020 ASR and have provided commentary on each point. This should be continued in future ASRs.

   CBMDC response – no improvement needed. The same approach has been taken here.

6. Overall, this report is well-written and provides a good level of detail. Information is given both in-writing and visually to give the reader a well-rounded picture on the air quality within City of Bradford. It is clear that the Council is committed to improving air quality, with a range of measures currently in progress.

   CBMDC response – no response required. CBMDC remains committed to improving air quality with a further update on progress and new measures included in this report.

City of Bradford MDC 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 2.2. 28 eight measures are included within Table 2.2, with the type of measure and the progress City of Bradford MDC 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 2.2.

More detail on these measures can be found in their respective Action Plans; the Bradford AQAP, the Bradford Low Emission Strategy and the more recent Bradford Clean Air Plan (CAP). Some measures have also been delivered via the West Yorkshire Low Emission Strategy (WYLES).

Key completed measures are:

- **Implementation of the Bradford Clean Air Zone (2022)** – the government mandated Bradford CAZ went live on 26th September 2022 setting minimum emission standards for HGVs, buses, coaches, taxis and LGVs within the Braford Outer Ring Road and into the Aire Valley corridor. The impacts of the scheme on local air quality and health are subject to ongoing evaluation.
- **School Streets pilot scheme (2021) –** trial of schemes to reduce traffic movements outside schools during drop off and pick up times completed. Car traffic level

reductions of between 50% and 77% seen at some schools. Further trial planned for 2023.

- **School creativity labs (2021)** – Air quality sessions held in schools to encourage pupils to come up with innovative ideas for improving air quality in their areas culminating in an opportunity to pitch their ideas to a panel of experts at City Hall. Further creativity labs currently being delivered with pitching event for finalists on Clean Air Day 2023.
- **West Yorkshire rapid charge network (2019)** – a network of 88 rapid chargers across West Yorkshire each with two bays, one for use by taxis and private hire and one for the general public. 3,608 drivers are known to be using the charging network with 13981 charges having taken place to date.
- **Opening of the Leeds Bradford Cycle Superhighway** (2019) providing a 9 mile segregated safe cycle path between Leeds and Bradford to encourage cycle commuting and open up opportunities for leisure cycling. Since the scheme opened there have been a total of 118575 cycle trips counted along the Leeds Old Road area of Bradford.
- **Delivery of new rail stations** at Apperley Bridge (2015) and Low Moor (2017) increasing opportunities for rail travel in the Bradford District. Usage figures for Apperley Bridge have grown from 96,418 in 2015/2016 to 263,090 in 2021/2022. At Low Moor they have increased from 133,060 in 2017/2018 to 151,712 in 2021/2022.
- **Introduction of Enterprise Car Club** reducing the need for private car ownership and offering access to lower emission vehicles. The Bradford scheme has seen a 158% increase in membership sign-ups during 2022 and vehicle utilisation continues to grow.
- **Implementation of the West Yorkshire Low Emission Strategy and West Yorkshire Low Emission planning guidance** (2013) - these documents have ensured a regional approach to emission reduction across all areas of local government activity and have successfully applied emission mitigation to many developments across the West Yorkshire region.

City of Bradford MDC expects the following measures to be completed over the course of the next reporting year:

- **Continued evaluation of the Bradford CAZ –** ongoing monitoring and evaluation by the council and by independent assessors working on behalf of JAQU

- **Implementation of a Clean Air Schools Programme (CASP) -** a new comprehensive package (circa £1.09m) of grants, engagement and education for the benefit of all Bradford District Schools funded by Clean Air Zone revenue and work with partners. Will include adoption of anti-idling enforcement powers and a competitive fund for schools to access grants to undertake air quality improvements on their sites.
- **Introduction of ZEBRA funded electric buses -** 32 new zero emission electric buses to be provided at the Transdev Keighley depot in Bradford by 2024.
- **Domestic emissions air quality research programme and development of intervention programmes –** undertaking of air pollution measurements inside and outside homes alongside activity recording questionnaires to identify key polluting activities and identify potential intervention programmes. Work being undertaken in partnership with University of York and University of Sheffield and supported by a new low cost air pollution sensor network procured by CBMDC during 2021/2022. Funded by a Defra Air Quality Grant.
- **Relaunch of Breathe Better Bradford website -** to include public access to real time data and more information on exposure prevention, health impacts and improvement measures. New site expected to go live by autumn 2023.
- **Implementation of second School Streets pilot scheme –** roll out of the pilot scheme to a further 5 schools this time with air pollution measurements being taken before and after implementation to assess air quality impacts
- **Further school creativity labs with Born in Bradford –** continuation of the scheme started in 2021 to encourage children to think about how air quality in their areas can be improved. Idea pitching session held at City Hall on Clean Air Day 2023.
- **Continued development of plans to provide an advance refuelling centre and hydrogen bus / taxi testbed in Bradford –** a site has been identified and pre-planning enquiry submitted. Aim is to have hydrogen vehicles operational in the city by 2025 to coincide with Bradford's City of Culture events.
- **Development of a Particulate Reduction Strategy (PRS) –** identification and quantification of PM emission sources (in conjunction with other West Yorkshire authorities), scenario testing of potential interventions and drawing up of a long term strategy for reducing PM emissions across the Bradford District.
- **Continued planning and implementation of TCF projects –** Continued planning / delivery of major infrastructure projects including Park and Ride development, cycle

superhighway extension, transport interchange improvements and major junction improvements / relief road provisions

- **Updating of the West Yorkshire Low Emission Strategy -** This update will reflect the growing need to address particulate emissions across the West Yorkshire region and to identify further measures to ensure regional compliance with nitrogen dioxide objectives. The revised strategy will also ensure a more joined up approach to regional monitoring and dissemination of regional air quality information. The WYLES group is currently in the process of procuring a new emission database for the region and a network of low cost PM analysers that will be linked to a regional public information dashboard.
- **Updating of the West Yorkshire Low Emission planning guidance** – this update will reflect introduction of Building Regulations for EV charging and aim to further simplify and unify the approach to providing low emission mitigation on developments across the West Yorkshire region.
- **Continued development of plans to provide a District Heat Network (DHN) scheme for Bradford –** scheme to provide a low emission air source heat pump / gas scheme are currently at the planning application stage. Permission has already been granted for development of the associated pipe network and this work is ongoing.

City of Bradford MDC worked to implement these measures in partnership with the following stakeholders during 2022:

- Public health / highways department at CBMDC
- Local bus operators
- Local business community
- Local schools
- Residents
- Born in Bradford (BiB)
- Joint Air Quality Unit (JAQU)
- University of Leeds
- West Yorkshire Combined Authority (WYCA) and other West Yorkshire local authorities (Kirklees, Calderdale, Leeds, Wakefield)
- University of York
- University of Sheffield

Progress on the following measures has been slower than expected:

- **Implementation of measures to reduce emissions from Non Road Mobile Machinery (NRMM)**. This is due to insufficient staff time being available at present to implement this project and local pressure to prioritise other air quality improvement activities ahead of this one. The delivery of this project remains an aspiration for the council and will be progressed once sufficient staffing resources can be put in place. It is currently anticipated that this project will not commence until autumn 2023.

City of Bradford MDC anticipates that the measures stated above and in Table 2.2 will achieve compliance in all of the AQMAs.

The measures presented in Table 2.2 are arranged in chronological order of introduction.

The effectiveness of the measures in Table 2.2 is indicated by the shade of the colours.

The lighter shaded measures will have only a relatively small impact or take longer to implement.

The darker shaded measures are those which are expected to deliver the greatest or fastest emission reductions in Bradford.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1 (overarching policy document for measures 6:27)	On-going implementation and review of the Bradford Low Emission Strategy (LES)	Policy Guidance and Development Control	Low Emissions Strategy	2013	Policy completed 2013.	CBMDC , WYCA, BiB, Local universities, local developers	Defra air quality grant of £102,000 provided to develop the LES. Various Government/ WYCA/CBMDC/BiB/ academia funded infrastructure / research/ education projects delivered as part of the LES.	Yes	Funded	£100K-£500K	Implementation	Contains many policies to address emissions from vehicles and other sources in Bradford	Level of measured ongoing air quality improvement in Bradford AQMAs	This is a live document subject to on-going local delivery and review in response to national, regional and local policy developments	Availability of staff to continually update and implement measures. Availability of funding for major schemes and the amount of time and resources needed to develop successful funding bids.
2	Bradford low emission planning guidance	Policy Guidance and Development Control	Clean Air Planning and Policy Guidance	2013	Policy completed 2013.	City of Bradford MDC, Local developers	Defra air quality grant of £102,000 provided to develop the LES and associated guidance	Yes	Funded	£100K-£500K	Implementation	Prevention and mitigation of vehicle and point source emissions from new development assessed on a case by cases basis.	Number of EV charging points delivered on new developments	LES planning guidance routinely applied to all planning applications since 2014 Number of EV charging points conditioned currently estimated to be in excess of 8,000+	LES planning guidance currently under review to bring in line with EV charging Building Regulations (Document S). EV charging requirements on domestic properties no longer conditioned at planning as these are now required as standard by Document S. Commercial EV charging still being agreed on a cases by case basis via planning to ensure is sufficient and suited to the end users. Key performance indicator to be updated next year to 'number of EV charging strategies approved at planning stage' as it is no longer possible to keep track of the number of domestic EV charging points being implemented through building control.
3	Bradford / WY LEZ feasibility study	Promoting Low Emission Transport	Low Emission Zone (LEZ)	2013	2015	CBMDC in conjunction with City of Leeds Council	DEFRA air quality grant 2013 £50,000	Yes	Funded	£50k -£100K for feasibility study	Aborted	LEZ study indicated NOx emission of 195.6 tonnes on Bradford outer ring road. The more recent CAP proposals are expected to achieve full compliance with the NO2 objectives across the whole district by 2023.	Not applicable	LEZ not implemented. Superseded by Bradford Clean Air Plan (CAP) / CAZ	Following completion of the LEZ feasibility study both Leeds and Bradford were mandated to undertake new CAP feasibility studies at different times resulting in two different CAZ plans to replace the regional LEZ concept. The Leeds CAZ is currently on hold.

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															The Bradford CAZ commenced in September 2022.
4	Feasibility study for Alternate Fuel Centre	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2013	2013	City of Bradford MDC	Feasibility study funded from DEFRA LES funding	Yes	Funded	<£10K	Completed	77 tonnes NOx saving predicted from gas re-fuelling facilities (from 2013 feasibility study)	Not yet set	Feasibility study completed. Gas vehicle trials completed. Pre-planning enquiry for construction of a hydrogen electrolyser, hydrogen refuelling station and low carbon technology education centre submitted in February 2023 by potential site developer. Project group set up with Northern Gas Networks to support this project with MOUs determined.	Preferred option is now development of a hydrogen production and refuelling facility as an alternative to CNG. To be delivered by third party supplier. The project is named HY Bradford and is progressing with Bradford's support.
5	Bradford bus retrofitting programme	Vehicle fleet efficiency	Vehicle retrofitting programmes	2014	2015	City of Bradford MDC in partnership with local bus operators	CVTF (2014) £394,998	No	Funded	£100K-£500K	Completed	Real world (PEMS) emission testing of the retrofitted buses showed a 95% reduction in NOx emissions and improvements in air quality in Manningham Lane	Number of buses retrofitted	25 Euro III buses in Bradford retrofitted with SCRT. 11 in the city centre and 14 on Manningham Lane	Bradford CAZ-C implemented in September 2022 setting minimum Euro 6 equivalent standard for all local bus services operating in the CAZ. This involved Clean Air Fund spend of £1,416m, facilitating the brand new replacement of 39 older buses (at a cost of £663,000) and the retrofit of 46 buses. This is in addition to the 230 buses retrofitted in West Yorkshire by the Combined Authority
6	Voluntary emission standards for buses	Promoting Low Emission Transport	Other	2015	2021	City of Bradford MDC / (WYCA / Bus operators	n/a - additional improvements funded by bus operators	No	Not funded	Cost reflects CBMDC staff time on liaison with bus companies only, not the cost of improvements made.	Completed	24.7 tonnes of NOx reduction estimated for first local agreed target of Euro IV by 2018	Number of buses meeting locally agreed emission standard targets	Good progress was made with locally negotiated bus fleet emission reductions prior to the introduction of the CAZ standards that are now driving local bus improvements.	Measure now superseded by formal CAZ entry standards for buses.
7	Car clubs	Alternatives to private vehicle use	Car Clubs	2015	On-going implementation	CBMDC/ WYCA / Enterprise	No funding is provided to Enterprise to run the scheme. The original contract provided upfront promotion and vehicle leasing funding only (WYCA Local Transport Plan ITB funding).	No	Partially Funded	<10k	Implementation		Number of registered car club members	Membership of the car club at Bradford sites increased by 158% in 2022 compared to 2021. There were 2236 bookings made in 2022 compared with 1637 in 2021. The site with highest use is at	Membership and usage of the car club continues to grow but is still below capacity. CBMDC continues to promote the car club and seeks to obtain space and EV charging for car club bays on

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														South Street, Keighley.	new developments.
8	Adoption of West Yorkshire Low Emission Strategy	Policy Guidance and Development Control	Low Emissions Strategy	2016	Policy completed 2016.	City of Bradford MDC in conjunction with City of Leeds Council, Wakefield City Council, Calderdale Council and Kirklees Council	£150,0000 DEFRA air quality grant (2012)to develop the strategy and additional contributions from the WY LAs to deliver various measures around the region	Yes	Funded	£100K-£500K	Implementation	Contains many policies to address emissions from vehicles and other sources in West Yorkshire	Level of measured ongoing air quality in West Yorkshire	This is a live document subject to on-going local delivery and review in response to national, regional and local policy developments	Loss of dedicated WYLES officer post in 2021 and availability of remaining WY officers to update the WYLES and ensure continued implementation. Availability of funding for major schemes and the amount of time and resources needed to develop successful regional funding bids.
9	WYLES procurement guidance	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2016	2016	City of Bradford MDC in conjunction with City of Leeds Council, Wakefield City Council, Calderdale Council and Kirklees Council	DEFRA air quality grant 2012 £1500000	Yes	Funded	£100K-£500K	implementation	Reduced emission impact from vehicle based services and transport procured by WY LAs. Contracts assessed on an individual basis by several LAs. Overall impact difficult to quantify.	Number of contracts the policy is applied to in Bradford	Ongoing implementation within individual LAs	LEV procurement policy 5% of award decision as part of procurement policy (social values)
10	Low emission procurement policies for City of Bradford MDC fleet	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2013	2016	City of Bradford MDC	In house project	No	Funded	<£10K	Implementation	Reduction of 332t/CO2e 2014/15-2015/16 via procurement of 7 electric vans and 2 electric pool cars with 3 additional charging stations	Number of CAZ compliant vehicles in CBMDC fleet	Whole life costs have been introduced into vehicle procurement considerations including air quality damage costs.	CBMDC now working towards making all council fleet cars and vans < 3.5 tonnes electric by 2024.
11	Cycle Super Highway	Transport Planning and Infrastructure	Cycle network	2013	2016	City of Bradford MDC / WYCA (Metro)/ City Connect Partnership	DfT £18M, £11M local funding	No	Funded	>£10M	Implementation	Not available as origin destination survey / mode switch surveys not yet carried out.	Number of cycle journeys	Main scheme opened in 2016. Additional Shipley to Bradford (Canal Road) section opened May 2019. 118475 cycle trips recorded on the Leeds Old Road section since opening.	Further extension planned for Thornton Road as part of TCF allocation for Bradford.
12	Delivery of new railway stations at Apperley Bridge and Low Moor	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2000	Apperley Bridge opened Dec 2015	City of Bradford MDC / WYCA	Apperley Bridge £8 million (WYCA) Low Moor £10.8 million (WYCA)	No	Funded	>£10m	Completed	The new stations encourage rail travel as an alternative to the car. The actual emission savings to date have not been calculated.	Passenger numbers using the stations	Passenger numbers have increased at Apperley Bridge from 96,418 in 2015/16 to 263,090 in 2021/22. At Low Moor numbers have increased from 133,060 in 2017/18 to 151,712 in 2022.	The pandemic resulted in much lower use of trains in 2020 and 2021 but passenger numbers are now recovering and growing. Additional improvements also taking place to improve parking provision at Steeton and Silsden station car park to encourage more rail travel in the district.
13	Staff Travel Plan	Promoting Travel Alternatives	Workplace Travel Planning	2013	2015	City of Bradford MDC	Developed in house	No	Not funded	<£10k	Completed	Plan aims to reduce single occupancy car trips by 5% over 5 years and	Number of single occupancy car trips and reduction in staff commuter car trips.	Progress monitoring not yet completed.	Plan is actively promoted to new starters. Progress monitoring and

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												reduce car commuter trips by staff from 62% (2014) to 57% by 2029			plan review /update due.
14	Identifying barriers to walking to school	Promoting Travel Alternatives	School Travel Plans	2017	School travel plan policy adopted 2017	City of Bradford MDC / Bradford Institute of Health Research / Born in Bradford / Local education providers	Research partnership funding	No	Not funded	£10k to £50k	Completed	Study identified best policy measures to include in the CBMDC school travel plan policy. Subsequent policy continues to address school travel. Overall impact difficult to quantify.	Not applicable	Bradford school travel plan published 2017.School streets programme currently being developed to address some of the issues identified in the study	Willingness of parents and schools to engage with the research and/or change behaviour. On-going on site management of school street closures is a challenge.
15	Eco-stars Fleet Recognition Scheme	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2017	2020	WYLES steering group / City of Bradford MDC / ECO-stars scheme	WYCA funded	No	Funded	£10K to £50K	Completed	The ECO stars scheme claims a typical van operator could see its annual output of carbon dioxide fall by six tonnes per year	Number of Bradford based operators joining the scheme	Scheme operated in West Yorkshire between 2017 and 2020	The introduction of the West Yorkshire ECO-stars scheme was a measure in the WYLES. Local scheme was reliant on an annual funding allocation which was not renewed in 2021.
16	West Yorkshire bus retrofitting project	Vehicle fleet efficiency	Vehicle retrofitting programmes	2018	2020	City of Bradford MDC in partnership with DEFRA, WYCA, West Yorkshire bus operators	DEFRA - £7.186 million LPTIP - £850k	No	Not funded	£1m to £10m	Completed	Programme estimated to have delivered 560 tonnes of NOx removal annually across the WY region	Not applicable	Programme retrofitted 471 buses across WY	Bradford CAZ-C implementation has set minimum Euro 6 equivalent standard for all local bus services operating in the CAZ.
17	Encouraging uptake of low emission taxis	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2018	2020	City of Bradford MDC / WYCA/ ENGIE	OLEV £2 million WYCA and partner LAs £1.2 million match funding	No	Funded	£1m-£10m	Completed	318,141kW of energy has been used by the charging points in Bradford to date which equates to a CO2 saving of 254,210 kg.	Number of charges undertaken	22 Rapid chargers installed across the Bradford District each has 2 bays one for public and the other designated for Taxi use. 100+ charge points installed across wider WY region.. 3,608 drivers are known to be using the charging network with 13981 charges having taken place to date.	This is the biggest rapid charging network outside London.
18	Public awareness	Public Information	Via other mechanisms	2016	Delivery ongoing	City of Bradford MDC / NHS / Born in Bradford/ Universities	Early activities funded mainly by partners. Government funded CAP settlement included funding for public engagement / marketing campaign for the CAP / CAZ.	No	Funded	£100-£500K	Implementation	Not quantified	n/a	Activities to date have included raising public awareness through the use of street infographics on air pollution stations, air quality and health online petition in partnership with Doctors and academics at the University of Leeds, workshops held in schools and anti-idling awareness raising.	Further funding recently applied for (£300,000) to reach an audience within 1-hour drive of the CAZ. Air quality grant funding obtained in 2021/22 to develop a Particulate Reduction Strategy that will include public engagement on reducing particulate emissions and reducing personal exposure. The

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
														The Clean Air Plan / CAZ development is supported by the Breathe Better Bradford website	one- hour drive involved radio advertising, billboards, geo-fenced social media messaging, bus backs, posters, a leaflet to every home and business in the District, use of the VMS road messaging signs in Bradford and on the motorway and various other communication methods. The Programme was evaluated by JAQU and found to have been very effective in raising awareness with unprecedented awareness levels in Bradford of 97%.
19	Clean Air Zone (CAZ)	Promoting Low Emission Transport	Low Emission Zone (LEZ)	2019	2022	City of Bradford MDC in partnership with JAQU and local stakeholders	£39.3m Central Government funded project	No	Funded	>£10m	Implementation	CAZ expected to deliver compliance with the AQ standards in Bradford.	Compliance with air quality standards	Consultation phase completed in 2021.360 cameras, 2,500 signs and 6 new fibre digital rings now in place. 89% of taxi fleet already CAZ compliant and more electric buses on the way. £7.4M in grants to assist HGV upgrades. 2000 applications for LGV upgrade support. Local exemption registration taking place. HIA and other evaluation taking place working with the Born In Bradford Health Research Unit (NHS)	The CAZ went live on 26th September 2022. By April 2023 the Clean air zone had resulted in the collection of ~£2.5m in charges with the issuing of ~59,000 PCNS and a total revenue of ~£4.5m. The CAZ has resulted in a huge shift in the compliance rate of vehicles with LGVs just before launch at 47% compliant to 70% within the first month. 99% of Bradford's taxis are compliant with zone along with all commercial buses and 97% of HGVs. This will yield improvements in air quality with a 35% reduction in NO2 at key location predicted in the FBC modelling.
20	School Streets Pilot Schemes	Traffic Management	Other	2021	2024	CBMDC/ Local schools/ Act Early Research Consortium	WYCA funded £66,000	No	Funded	£10K to £50K	Implementation	AQ impacts of first round not measured. Monitoring is being put in place to evaluate AQ impacts fo the second round of interventions due to commence in June 2023.	Self-reported measures on travel modes to school/perceptions of school environment pre- and post-school street. Traffic Counts. AQ monitoring results (before and after)	First pilot schemes trialled in 2021/2022. Second round due to commence in June 2023.	Staff time/capacity to put out signs and marshall the schemes and lack of community engagement to assist were main issues identified in the first pilot schemes.

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21	ZEBRA funded electric buses	Promoting Low Emission Transport	Public vehicle Procurement – Prioritising uptake of low emission vehicles	2022	2023	City of Bradford MDC in partnership with local bus operators and WYCA	£10M ZEBRA bus funding for 32 new electric buses in Bradford to support CAZ implementation. Some private investment from local bus operator	No	Funded	>£10M	Implementation	Predicted 0.5µg/m3 reduction in NO2 on Godwin Street and Sunbridge Road.	Not yet set	ZEBRA funding secured and buses being procured for deployment in 2024	The buses will operate on a shuttle corridor between Keighley and Bradford. Original plans for an electric shuttle to Leeds Bradford Airport are not progressing due to a land ownership issue. All 32 buses will now be based at the Keighley depot and travel predominantly within Bradford
22	South Bradford Park and Ride and Expressway	Alternatives to private vehicle use	Bus based Park and Ride	2019	Works to commence by 2023	CBMDC / WYCA	To be delivered as part of the wider West Yorkshire Transforming Cities Fund. £317 million from the Department for Transport (DfT) plus local match funding of up to £140 million. Link to TCF information on WYCA Your Voice website	No	Funded	>£10M	Planning	Impact assessment work ongoing at present. Should improve air quality in Mayo Avenue AQMA and the wider CAZ especially around Manchester Road	Not yet set	Business case completed. Public consultation took place in 2021.Detailed scheme design and planning in progress	Minimum 500 space P&R site planned to reduce congestion on Manchester Road and through Mayo Avenue AQMA. More information available about the scheme on WYCA Your Voice website.
23	Bradford Interchange Access	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2019	Works to commence by 2023	CBMDC / WYCA	To be delivered as part of the wider West Yorkshire Transforming Cities Fund. £317 million from the Department for Transport (DfT) plus local match funding of up to £140 million. Link to TCF information on WYCA Your Voice website	No	Funded	>£10M	Planning	Scheme will improve access and environment around the rail / bus interchange to encourage further uptake of low emission transport options. Scheme will also incorporate low emission infrastructure for cars and taxis.	Not yet set	Business case completed and public consultation took place in 2021.Detailed scheme design and planning in progress	Long term ambition is still to have a new Northern Powerhouse rail station in Bradford to replace the current interchange and Foster Square stations. The scaling back of the HS2 scheme is likely to considerably set back the timeline for new rail facilities in Bradford making upgrade of the current interchange an essential interim measures. More information on this project is available on WYCA Your Voice website.
24	Bradford City Centre Cycling and Walking Improvements	Transport Planning and Infrastructure	Cycle network	2019	Works to commence by 2023	CBMDC / WYCA	To be delivered as part of the wider West Yorkshire Transforming Cities Fund. £317 million from the Department for Transport (DfT) plus local match funding of up to £140 million. Link to TCF information on WYCA Your Voice website	No	Funded	>£10m	Planning	The scheme will implement a series of bus, cycle and pedestrian improvement measures to promote bus use and enable safe walking and cycling to and within Bradford City Centre.	Not yet set	Business case completed and public consultation took place in 2021.Detailed scheme design and planning in progress	More information on the proposed walking, cycling and bus infrastructure upgrades can be found on WYCA Your Voice website.
25	West Bradford Cycle	Transport Planning and Infrastructure	Cycle network	2019	Works to commence by 2023	CBMDC / WYCA	To be delivered as part of the wider West Yorkshire	No	Funded	>£1m	Planning	The scheme will provide an additional link to	Not yet set	Business case completed and public consultation	More information on the West Bradford Cycle

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	Superhighway extension						Transforming Cities Fund. £317 million from the Department for Transport (DfT) plus local match funding of up to £140 million. Link to TCF information on WYCA Your Voice website					the existing cycle superhighway and will run through the Thornton Road AQMA		took place in 2020. Detailed scheme design and planning in progress	Superhighway extension can be found on WYCA Your Voice website.
26	Particle Reduction Strategy	Policy Guidance and Development Control	Low Emissions Strategy	2021	2024	CBMDC / London Las/ Local universities/BiB	Defra AQ grant fund 2021/22 £253k	Yes	Funded	£100k to £500k	Implementation	The strategy will aim to deliver PM reduction across the whole district with a focus on domestic and construction emissions. An emission impact assessment will form part of the strategy development.	Not yet set	Following the successful AQ grant application in 2021 a study into indoor air quality in homes has already commenced in partnership with University of York and BiB. A research questionnaire around use of domestic wood burning stoves has been developed and delivered by Sheffield University with a report on opportunities for interventions to follow. A network of low cost PM analysers has been procured by Bradford Council and will be deployed into residential areas in summer 2023. The Bradford Council Breathe Better Bradford website is being update to include more information on air pollutants / data (including PM10 and PM2.5). A regional PM emissions inventory is being commissioned to inform the further development of the particle reduction strategy for Bradford.	Plans to develop a scheme to reduce emissions from Non Road Mobile Machinery (NRMM) on construction sites has been delayed due to a lack of staff resources to progress it, it will be revisited in the coming year with a view to aligning the project with exploratory NRMM currently being carried out by DEFRA
27	Clean Air Schools Programme (CASP)	Public Information	Other	2023	2025	CBMDC and partners	£1.09m	NO	Funded	£1 million - £10 million	Planning	not yet assessed	not yet set	The CASP was approved by the Council Executive on the 6th June 2023 and is now in the planning stage.	The CASP involves employment of 5 new environmental wardens who will work with all the district's schools alongside engagement and communication colleagues to deliver a programme to engage with children and parents on air pollution. All

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
															Bradford's uniformed wardens will be authorised to enforce anti-idling and will engage with residents with a focus on school premises to reduce idling of vehicles. The programme also includes a £0.5m grant programme for schools in the most polluted areas to apply for interventions (up to £10k) to reduce emissions and improve air quality in the vicinity of their premises. This may include capital works, engagement and behaviour change programmes such as walking buses and vegetation barriers.
28	District Heat Network	Promoting Low Emission Plant	Shift to installations using low emission fuels for stationary and mobile sources	2023	2024	CBDMDC and 3rd party	TBD	NO	Not Funded (private finance)	> £10 million	Planning	8,000tonnes/yr of carbon	Tonnes CO2Eq reduction NO2 reduction	The DHN is at implementation stage and pipes are currently being installed. CBDMDC have supported this project however it is being actioned by a 3rd party supplier	The DHN will improve air quality via offset of older individual boiler plant. The DHN is substantially powered via air source heat pump offering a clean low carbon alternative to other heating sources. There is a backup gas supply for winter spikes in demand and other unforeseen reduction is supply via air source.

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

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

In Bradford, emissions of man-made fine particles PM2.5 are estimated to cause 4.7% of total mortality. Road transport emissions are a significant source of fine particulate but locally elevated concentrations can also arise from biomass combustion, heating, industry and wind-blown dust. The World Health Organisation (WHO) classifies diesel exhaust emissions as carcinogenic.

Born in Bradford (BiB) is one of the largest and most important medical research studies currently being undertaken in the UK. It is tracking the lives of 13,500 Bradford born babies (and their families) to ascertain more about the causes of childhood illness. The work has already identified a number of important linkages between air pollution exposure including PM2.5 related impacts. The Council collaborates with BiB, the aim being to develop evidence based policy making.

City of Bradford MDC is taking the following measures to address $PM_{2.5}$:

- **Long term PM2.5 monitoring** - City of Bradford MDC Public Health Department has funded PM2.5 monitoring at three of the existing air pollution stations (Bingley, Keighley and Shipley Airedale Road) since 2013. The data is used to inform major research programmes (such as the 'Born in Bradford (BiB)' and is to be made available to the public via the Air Quality net website available here: Link to Air Quality Data Management website.
- **Bradford CAZ -** has removed a large number of older diesel vehicles from Bradford's roads which were a significant former source of exhaust PM2.5 emissions. These have been replaced with either cleaner Euro 6 diesel vehicles, Euro 4-6 petrol vehicles or hybrid and zero emission electric vehicles. Whilst the CAZ vehicle emission upgrades have removed significant amounts of exhaust related PM2.5 emissions a significant amount of PM2.5 emissions relating to brake and tyre wear still remain. It is

therefore important that the council tackles other sources of PM2.5 emissions in the district and continues work to facilitate the use of other modes of transport.

- **Bradford Particulate Reduction Strategy (PRS) -** over the past year CBMDC has been working closely with BiB, the University of York, the University of Sheffield and the West Yorkshire Combined Authority (WYCA) to progress implementation of the Particle Reduction Strategy (PRS). Activities so far include:
  - Indoor air quality measurements (including PM2.5) commenced in 300 homes around Bradford by the University of York. This forms part of the wider INGENIOUS research programme designed to investigate the causes of indoor air pollution in homes and develop intervention programmes.
    Link to INGENIOUS project on University of York website
  - CBMDC has procured 12 new low cost real time analysers which are now deployed in residential areas to look specifically at domestic emissions with the aim of monitoring external air quality in residential areas before and after domestic emission intervention programmes. The University of York will provide a further 4 analysers to support this project. The monitoring includes PM2.5 measurements. Some of these new analysers have been placed in areas where there are known to be large amounts of solid fuel burning taking place and where PM2.5 measurements will be of particular interest.
  - The University of Sheffield have developed and implemented a domestic smoke control questionnaire to investigate the reasons why some residents opt to use solid fuel heating appliances and what steps they currently take to minimise emissions from these appliances inside and outside their home. The results of this questionnaire will be used to develop behaviour change interventions aimed specifically at reducing PM2.5 emissions from domestic solid fuel appliances. These interventions will be actively supported and promoted by CBMDC to reduce domestic smoke emissions within the district.
  - CBMDC is in the process of upgrading the Breath Better Bradford website which will include information on the following:
    - Sources of PM2.5
    - Health impacts of PM2.5
    - PM2.5 air quality monitoring in Bradford (including link to real time PM2.5 data)
    - Information and advice on how to reduce exposure to PM2.5

The new website is expected to go live in Summer 2023.

- A new regional particulate emission database is being procured at a regional level to identify the main sources of PM2.5 pollution in the West Yorkshire region and to test the impact of potential PM2.5 interventions. This work will form the basis of the final particulate reduction strategy (PRS) for Bradford which will complement the existing Bradford Clean Air Plan (B-CAP) (increasing its scope beyond NO2 reduction mainly from traffic), and will also support Bradford's carbon reduction programme and wider measures to address health inequalities in the city.
- An additional PRS project to encourage the uptake of low emission Non-Road Mobile Machinery (NRMM) in the district has not yet been progressed due to insufficient staff resource to progress at the current time. As most NRMM plant is diesel operated it can be a significant source of PM2.5 near construction sites and addressing this source of emissions remains a priority for the local authority. The new Clean Air Schools programme to be introduced by CBMDC during 2022/2023 will seek specifically to tackle idling exhaust emission from vehicles outside schools and allow schools to bid for grants to improve air quality conditions within their school environment. The programme will prioritise schools where PM2.5 emissions are known to be elevated. To achieve these improvements a new Schools Clean Air officer post and several new street warden posts will be created to work in partnership with local schools.

In addition to the above projects these other existing measures in the local actions table (Table 2.2) are expected to deliver further reductions in PM2.5 emissions:

- Continued implementation of the Bradford and West Yorkshire Low Emission Strategies (measure 1 and 8) which aim to minimise emissions of all pollutants (including PM2.5) from a wide range of local authority activities. The updated version of the WYLES (currently in development) will place a greater emphasis on reducing PM2.5 emissions than the current plan
- Continued implementation of the Bradford and West Yorkshire Low Emission Planning Guidance (measure 2) which seeks to mitigate emissions of all pollutants (including PM2.5) from developments in the West Yorkshire region. Specifically, the guidance encourages the use of electric vehicles and requires the undertaking of Construction Dust risk assessments and development of dust management plans to reduce PM emissions during construction and demolition.

- Implementation of an alternative fuel centre (measure 4) which will now aim to allow the introduction hydrogen vehicles, further removing the number of diesel operated vehicles in the district
- Further role out of car clubs (measure 7) reducing the need for second car ownership and allowing access to newer and alternatively fuelled vehicles that often have lower PM2.5 emissions than privately owned vehicles.
- Continued implementation of low emission procurement policies (measures 9 and 10) which will further reduce PM2.5 emissions from vehicles operated by City of Bradford MDC
- Further development of the Cycle Superhighway (measure 11) to allow increasing numbers of trips to be made by bike, reducing both tailpipe and road PM2.5 emissions from larger vehicles
- Encouraging further use of new rail stations at Apperley Bridge and Low Moor (measure 12) to reduce road based trips (reducing both exhaust and road based PM2.5 emissions)
- Further promotion of staff travel plan (measure 13) to reduce PM2.5 emissions during travel to work by City of Bradford MDC staff

Smoke Control Areas

Large areas of Bradford are designated as Smoke Control Areas (SCAs). Within these areas it is an offence to emit visible smoke from a chimney. Fixed Penalty Notices (FPNs) can now be issued for emission of smoke in SCAs.

Maps showing the extent of SCAs in Bradford can be found here:

Link to Smoke Control area information on CBMDC website

More information on smoke control rules can be found here:

Link to smoke control rules on UK Government website

Smoke control areas in Bradford are enforced by the Environmental Health Department.

Domestic smoke emissions from chimneys in any location can under some circumstances constitute a statutory nuisance. Investigate of statutory nuisance complaints is also undertaken by the Environmental Health Department.

More information on nuisance provisions in relation to domestic emissions can be found here:

Link to UK Government advice page on smoke and statutory nuisances

Bonfires

Bonfires can be another significant source of $PM_{2.5}$ emissions. City of Bradford MDC provides advice on bonfires via this website

Link to nuisance bonfire advice on CBMDC website

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

This section sets out the monitoring undertaken within 2022 by City of Bradford MDC 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.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

City of Bradford MDC undertook automatic (continuous) monitoring at 7 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. The UK air quality net presents automatic monitoring results for all automatic monitoring undertaken by City of Bradford MDC. Results for the AURN (Automatic and Urban Rural Network) site at Mayo Avenue are available on the UK air website here: link to Bradford Mayo Avenue information on UK air website.

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

3.1.2 Non-Automatic Monitoring Sites

City of Bradford MDC undertook non- automatic (i.e. passive) monitoring of NO_2 at 195 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 or can be viewed here GIS map of Bradford Diffusion Tube data. 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.

Individual Pollutants

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

3.1.3 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO2 annual mean concentrations for the period 2018 to 2022 with the air quality objective of 40µg/m3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2020 and 2021 datasets of monthly mean values are provided in Appendix B. Note that the concentration data presented in Tables B.1 includes distance corrected values, only where relevant.

Table A.5 in Appendix A compares the ratified continuous monitored NO2 hourly mean concentrations for the period 2016 to 2021 with the air quality objective of 200µg/m3, not to be exceeded more than 18 times per year.

During 2022 there were no exceedances of the hourly objective for nitrogen dioxide at any automatic monitoring sites in the Bradford District. There have been no recorded exceedances of the hourly objective at any of the Bradford automatic sites in the last 5 years. The last recorded exceedances of the hourly nitrogen dioxide objective in Bradford occurred in the Thornton Road (CM5) and Mayo Avenue (CM4) AQMAs during 2014.

Annual mean nitrogen dioxide concentrations of >60 µg/m3 measured at a passive diffusion tube monitoring site can be indicative of exceedances of the hourly objective. The highest annual mean concentration recorded at a diffusion tube monitoring site in Bradford during 2022 was 49.3µg/m3 at site DT12 on Shipley Airedale Road. This site is located in the Shipley Airedale Road AQMA very close to the continuous analyser (CM6). As the highest recorded diffusion tube measurement in 2022 was below 60 µg/m3 (adjacent to a continuous analyser which also showed no breaches of the hourly objective) it is unlikely that the hourly nitrogen dioxide objective was exceeded at any monitored location in the Bradford district during 2022.

As presented in Table A.3 (Appendix A) there were no exceedances of the annual mean nitrogen dioxide objective at any of Bradford's automatic monitoring sites during 2022.

There were seven locations where passive diffusion tube monitoring returned an annual average concentration of greater the 40µg/m^3 as detailed in Table A.4 (Appendix A). These were:

- DT12 (49.3 µg/m^3): Treadwell Mills, Shipley Airedale Road (relevant location within AQMA 4)
- DT72 (44.4 µg/m^3): Queen's Road, Manningham (relevant location within AQMA 2)
- DT31 (40.5 µg/m^3): Saltaire crossroads (non-relevant not in an AQMA but included in the CAZ)
- DT161 (40.6 µg/m^3): Godwin Street (relevant location not in an AQMA but included in the CAZ)
- DT281(41.2 µg/m^3): Manchester Road (relevant location within AQMA 1)
- DT211 (44.1 µg/m^3): Manchester Road (non-relevant location not in an AQMA but included in the CAZ)
- DT191 (45.5 µg/m^3): Low Mill Keighley (non-relevant location not in an AQMA or the CAZ)

With the exception of site DT191 (currently a non-relevant location monitored for planning purposes) all sites that exceeded the annual average nitrogen dioxide objective in 2022 are already within declared AQMAs and/or the CAZ. Where applicable the results from these sites have been distanced corrected to the nearest relevant receptor point (Table C.4). After distance correcting only tubes DT12 and DT161 showed an exceedance at the nearest relevant receptor point. A distance correction has not been undertaken for site DT72 as this site is located on a traffic light close to a junction but is in line with a relevant receptor point further along the road.

Sites DT72 and DT12 have a long history of exceedance but are both showing long term improvement as shown on Figures A.4 and A.6. Both sites are expected to see further improvement in annual average concentrations during 2023 as a result of the introduction of the CAZ in September 2022.

Site DT161 Godwin Street was established in 2019 as it was a location identifed by national modelling work as being at risk of exceeding 40µg/m^3. A total of four monitoring sites were established on Godwin Street but only site DT161 has shown a slight exceedance. Between 2022 and 2021 the annual average concentration of nitrogen dioxide at site DT161 decreased by 2.6µg/m^3.

Site DT191 is a kerbside side adjacent to the A6035 in Keighley where a planning proposal for an apartment block on the opposite side of the road was approved in July 2022 (21/00583/MAF). The tube is being used to assess air quality in the locality before

and after the development takes place. The detailed air quality impact assessment submitted with the planning application indicated that concentrations at the front façade of the proposed homes would be within the air quality objectives by the anticipated scheme completion year. Monitoring being undertaken at the opposite side of the road (DT190) has confirmed this is already the case with an annual average concentration of 25.3µg/m^3 recorded at this site in 2022. An AQMA is not being declared at site DT191 as it is not a relevant location and there is currently no other relevant location within the vicinity of the site considered to be at risk of exceeding air quality objectives.

Within Bradford's four AQMAs there has been a general improvement in air quality since 2018 (Figures A.3 to A.6). During 2022 there were no exceedances of the nitrogen dioxide objectives in the Mayo Avenue AQMA (order 1) or the Thornton Road AQMA (order 3). The last exceedance of a nitrogen dioxide objective at relevant receptor points in these AQMAs occurred 4 years ago. Current Defra guidance indicates an AQMA can be considered for revokation after objectives have been met for a minimum of 3 consecutive years, but this should not include years impacted on by the Covid-19 pandemic. The AQMAs at Mayo Avenue AQMA (order 1) and Thornton Road AQMA (order 3) will therefore remain in place until the council is certain there is no further risk of air quality exceedances in these locations. Monitoring in these AQMAs will continue throughout 2023 and a further update on air qualty in these AQMAs provided in the 2024 ASR report.

In the Manningham Lane AQMA (order 2) and Shipley Airedale Road AQMA (order 4) exceedances of the annual average nitrogen dioxide objective remained in 2022 as detailed above. These AQMAs will therefore remain in place for a further year and monitoring will continue. A further update on concentrations in both these AQMAs will be provided in the 2024 ASR.

It is anticpiated the introduction of a CAZ will lead to the revocation of all AQMAs and compliance with the air quality standards in Bradford.

In previous ASR reports City of Bradford MDC has also reported on air quality conditions in the following additional areas of concern:

- Harrogate Road / Killinghall junction
- Saltaire crossroads
- Rooley Lane / Tong Street
- Canal Road

These are locations where elevated concentrations of nitrogen dioxide have been measured in the past.

Figure A.7 (Appendix A) shows annual mean nitrogen dioxide concentrations at monitoring locations around the Harrogate Road / Killinghall Road junction. The locations of the monitoring sites in this area are shown on Figure D.11. The last recorded exceedance of the annual average objective in this area was recorded in 2018 at site DT42. Since 2018 concentrations in this area have reduced at all sites and are currently not of concern. During 2022 some diffusion tubes in this area returned slightly higher results than for 2021 and some slightly lower but all remained well within the 40 µg/m^3 objective level and are no longer of concern.

Figure A.8 (Appendix A) shows annual mean nitrogen dioxide concentrations at monitoring locations around Saltaire crossroads for the period 2018 to 2022. The locations of the monitoring sites in this area are shown on Figure D.12. As detailed above, site DT31 within this area showed an exceedance of the annual average objective in 2022 (at the monitoring location) but once corrected for distance to the nearest relevant receptor the concentration fell to 29.3 µg/m^3. DT50 was also close to the objective at the monitoring site during 2022 (39.0µg/m^3) but this also fell back below the objective level after being distance corrected (33.4 µg/m^3). Both these sites have regularly exceeded the objective at the monitoring sites since 2018 but are showing gradual improvement. All monitoring sites within the immediate vicinity of Saltaire crossroads showed an improvement between 2021 and 2022. Some sites located slightly further away (which experience lower traffic levels and are more influenced by changes in background pollutant concentrations) showed a slight increase between 2021 and 2022 (DT175, DT176 and DT180). There were no exceedance of air quality objectives at relevant locations in the vicinity of Saltaire crossroads during 2022 and levels are improving. Monitoring around Saltaire crossroads will continue during 2023 and a further update on pollutant concentrations in this area provided in the 2024 ASR report.

Figure A.9 (Appendix A) shows annual mean nitrogen dioxide concentrations at monitoring locations around Rooley Lane and Tong Street for the period 2018 to 2022. The location of the monitoring sites in this area are shown on Figure D.14. The last recorded exceedance of the annual average objective in this area was in 2018 at site DT64 (Tong Street). Since 2018 concentrations at this site have fallen to well below the objective levels. All other sites in this area have been consistently below the annual objective level since 2018 and

have shown gradual improvement over this period. Concentrations in this area in 2022 were generally lower than those measured in 2021.

Figure A.10 presents NO_2 annual mean concentrations around the Canal Road area betweeen 2018 to 2022. The location of the monitoring sites in this area are shown on Figure D.13. There were no exceedances of the annual average nitrogen dioxide objective in this area in 2022. There has been an ongoing improvement in air quality in this area since 2018 with all the measured 2022 values being lower than those recorded in 2021.

In addition to the AQMAs and other areas of previous concern, City of Bradford MDC also undertakes air pollution monitoring around the city centre and at other locations which are considered likely to be impacted on by planning proposals or major highways works.

Figure A.11 (Appendix A) presents annual mean nitrogen dioxide concentrations around Greengates crossroads. The location of Greengates crossroads is shown in Figure D.4. The monitoring in this area was established in 2016 to measure baseline concentrations prior to a major junction improvement scheme. Following completion of the scheme monitoring will be continued for a further 5 years to evaluate the impact of the scheme on local air quality. The scheme commenced in July 2020 and is now completed. More information about the scheme is available here: Link to information about the Greengates crossroads highways improvement scheme on City of Bradford Council website. A full air quality impact assessment for the scheme was undertaken by consultants to accompany the planning application for the scheme and is available to view here: Link to Greengates crossroads planning application on City of Bradford MDC website

As can be seen from Figure A.11 there have been previous exceedances of the annual average objective in this area but since the baseline monitoring started the situation has generally improved. Monitoring was ceased in the area in October 2020 to allow the construction works to take place and has been gradually re-established over the past year as works have been completed. Initial indications are that air quality in this area has improved since 2018. Monitoring will be continued throughout 2023 and a further update on air quality in this area will be provided in the 2024 ASR.

During the junction improvement works at Greengates crossroads traffic was significantly delayed in some locations and some diverted onto other routes. At the request of local residents additional monitoring was established in the area on Apperley Road (DT276) and further down Harrogate Road (DT275) to monitor this impact. Both sites returned results well within the objective level (16.9µg/m^3 and 27.0µg/m^3 respectively) and were not of concern. Monitoring is continuing at these locations during 2023 but concentrations are

expected to fall back further now that the junction works are complete and all the temporary traffic lights have been removed.

Figure A.12 presents NO_2 annual mean concentrations at long term monitoring locations around the city centre between 2018 to 2022. The location of these monitoring sites are shown in Figure D.15. The long term monitoring sites show a general improvement in the city centre since 2018. Two sites showed an improvement between 2021 and 2022 (DT79 and DT84) but another site (DT80) showed a slight increase.

New city centre monitoring was introduced on Godwin Street in 2020 (sites DT161, DT162, DT163 and DT164) as this street was identified as being at high risk of exceeding the annual mean objective during the CAZ modelling process. As detailed above site DT161 slightly exceeded the 40µg/m^3 objective level in 2022. All the other sites on Godwin Street have returned values below the objective since monitoring commenced.

Other new sites established on Market Street and Sunbridge Road indicate no exceedances. The tubes on Market Street showed a improvement between 2021 and 2020 with tube DT167 falling by 6.2µg/m^3 and tube DT185 by 2.0 µg/m^3. Market Street carries mainly buses and taxis and some of this improvement may have resulted from emission improvements arising from upgrading of the taxi fleet and introduction of cleaner buses prior to the CAZ going live in September 2022.

Monitoring at all sites will continue during 2023 and a further update provided in the 2024 ASR. Emissions from buses in the city centre are expected to fall further during 2023 when the new ZEBRA funded electric buses are introduced. 99% of Bradford's 3700 licensed taxis are already CAZ compliant but further grants are currently being offered to drivers to try and encourage a further switch from hybrid to fully electric vehicles to drive emissions down further.

Figure A.13 (Appendix A) presents annual mean nitrogen dioxide concentrations around the Parry Lane area of the district for the period 2018 to 2022. Baseline monitoring in this area was initially commenced in 2016 in response to plans for a large diesel operated Short Term Operating Reserve (STOR) in the area. The location of these monitoring sites are shown in Figure D.4. There have been no exceedances of the annual average objective at these locations since monitoring began and levels have generally improved over the 2018 to 2023 period. To date the STOR has not been developed but other changes are taking place in this area including the introduction of a new business park / fast food restaurant. The area has also previously been identified as a potential location

for a Compressed Natural Gas (CNG) refuelling facility and more recently as the potential location for a hydrogen testbed which would introduce a hydrogen production and refuelling facility. Current concentrations in this area are well below the 40µg/m^3 objective. Monitoring will continue in this area during 2023 and a further update will be provided in the 2024 ASR report, including progress on the hydrogen testbed facility.

Figure A.14 (Appendix A) presents annual mean nitrogen dioxide concentrations at other planning baseline sites around the district for the period 2018 to 2022. These sites have been established to monitor baseline conditions prior to implementation of new developments. The location of these sites are available in the GIS tool.

Site DT139 is close to a new secondary school on Thornton Road as shown on Figure D.4. The site was fully developed during 2020/2021 with the school opening in November 2021. The baseline monitoring was established in 2016 when the council became aware of proposals for a new school on this site which is adjacent to a busy main road. The monitoring helped to inform the exposure assessment undertaken for the site and influenced the final layout of the site which was redesigned to reduce the childrens exposure to air pollution, following advice from the air quality team. Further information about the air quality assessment in relation to this school can be found here: Link to Eden School planning application on City of Bradford MDC website. The 2022 concentration measured at this site (30.7µg/m^3) was 5.47µg/m^3 higher than that recorded in 2021 but remains well within the annual average objective level. The magnitude of change at this site between 2021 and 2022 is higher than that seen at many other sites and may be in part due to the introduction of the school and additional traffic associated with it.

Site DT78 is located on Aireworth Road and is providing base line monitoring prior to the introduction of an approved Energy from Waste (EfW). The site has not yet been developed but monitoring is being continued to inform the CAZ evaluation and to ensure recent data is available should the EfW progress. Concentrations in this location are currently well below the 40 µg/m^3 objecitve level and have decreased slightly since 2018.

During 2022 a large amount of other monitoring was collected from around the district to assist with the longer term evaluation of the CAZ. These results have been included in this report for completeness but have not been subject to a detailed analysis for the purpose of this report as the CAZ evaluation is a separate process to annual LAQM reporting and has to be undertaken again EU standards not air quality objectives. It is anticipated introduction of the CAZ will lead to the revocation of all AQMAs and achieving compliance with air quality standards in Bradford. Only two AQMAs, Manningham Lane (order 2) and

Shipley Airedale Road (order 4) are still considered to be at risk of breaching air quality objectives. Air quality in both these areas is showing signs of continous improvement and in the case of Manningham Lane there are already large scale plans in place to improve air quality further.

All monitoring undertaken in 2022 has been continued into 2023 and will be reported on again in 2024 ASR report.

3.1.4 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.

All reported PM10 data has been independently verified and ratified by Air Quality Data Management Services (www.aqdm.co.uk) on behalf of City of Bradford MDC.

There have been no exceedances of the annual mean or 24 hour PM10 objectives in Bradford since 2016. Annual average concentrations of PM10 in Bradford in 2022 were the same as those measured in 2021 at two of the continuous monitoring sites but slightly higher at site CM2. 2022 had more days when the daily average exceeded 50ug/m^3 at all the measured sites compared to 2021. Across all measured sites annual average PM10 concentrations have fallen since 2018 but the post covid-19 trend is not yet clear.

PM10 monitoring is on-going at all the continuous monitoring sites CM2 (Keighley), CM6 (Shipley Airedale Road) and CM8 (Tong Street). Further results from thee sites will be provided in the 2024 ASR report.

In October 2021 CBMDC successfully applied for an Air Quality Grant to develop a Particulate Reduction Strategy. As part of this programe 12 additional low cost analysers (Zephyrs) have recently been procured and will be deployed around the district from June 2022 onwards. The analysers will be placed mainly in housing areas with some being targeted specifically at areas where signifcant levels of domestic smoke emissions are known to be occuring. The units have MCERTS certification for PM10 measurments. Results from these units will be subject to independent verification by the council's current

data management contractor (AQDS) and will be made available on line here Link to UK airquality.net website .

3.1.5 Particulate Matter ($PM_{2.5}$)

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

Figure A.15 in Appendix A shows the trends in annual mean PM2.5 concentrations.

All PM2.5 data has been verified and ratified by Air Quality Data Management Services (www.aqdm.co.uk) on behalf of City of Bradford MDC.

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 require that in England by the end of 2040:

- An annual average of 10 µg/m^3 for PM2.5 is not exceeded at any monitoring station.
- Population exposure to PM2.5 is at least 35% less than in 2018 (at urban and some suburban background sites).

PM2.5 concentrations in Bradford in 2022 were the same as those measured in 2021 at two of the continuous monitoring sites but slightly higher at site CM2. At all sites the annual average PM2.5 concentration was below 10 µg/m^3. Between 2018 and 2022 the annual average concentration at the urban centre site in Keighley (CM2) reduced by 18.2%. Further reductions will therefore be needed to achieve the long term population exposure target in Bradford.

In October 2021 CBMDC successfully applied for an Air Quality Grant to develop a Particulate Reduction Strategy. As part of this programe 12 additional low cost analysers (Zephyrs) have recently been procured and will be deployed around the district from June 2022 onwards. The analysers will be placed mainly in housing areas with some being targeted specifically at areas where significant levels of domestic smoke emissions are known to be occuring. The units have MCERTS certification for PM2.5 measurments. Results from these units will be subject to independent verification by the council's current data management contractor (AQDS) and will be made available on line here Link to UK airquality.net website .

3.1.6 Sulphur Dioxide (SO_2)

Table A.9 in Appendix A compares the ratified continuous monitored SO_2 concentrations for 2022 with the air quality objectives for SO_2.

There were no exceedances of any SO2 objectives in Bradford during 2022. Due to the very low levels of SO2 measured in Bradford in recent years and the significant cost associated with operating the SO2 analyser monitoring was ceased at the end of 2022. SO2 measurements for Bradford will not be reported in future ASR reports.

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)
CM2	Keighley	Urban Centre	406058	441273	NO2; PM10	NO	Chemiluminescent	n/a	5	2.7
CM3	Manningham Lane	Roadside	415582	434457	NO2	YES, AQMA order 2, CAZ	Chemiluminescent	4	1.5	1.5
CM4	Manchester Road / Mayo Avenue	Roadside	415933	430569	NO2	YES, AQMA order 1, CAZ	Chemiluminescent	2	2	1.5
CM5	Thornton Road	Roadside	415870	433054	NO2	YES, AQMA order 3, CAZ	Chemiluminescent	0	2	1.5
CM6	Shipley Airedale Road	Roadside	416974	433245	NO2; PM10	YES, AQMA order 4, CAZ	Chemiluminescent	2	2	2.7
CM7	Rook Lane	Roadside	417860	430705	NO2	NO, CAZ	Chemiluminescent	1	1.5	1.5
CM8	Tong Street	Roadside	419188	430213	NO2; PM10	NO, CAZ	Chemiluminescent	0	5.8	2.7

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)
DT168	Rockhill Lane LP22 near M606	Suburban	417033	429293	NO2	No	13.0	17.0	No	2.5
DT198	LP128 Rooley Lane/Gardiner Row	Roadside	417930	430975	NO2	CAZ	0.4	2.6	No	3.0
DT197	LP 116 outside Rooley Medical Centre	Roadside	417846	430739	NO2	CAZ	n/a	2.6	No	2.8
DT196	LP74 Rooley Lane opposite Toby Carvery	Roadside	417369	430370	NO2	CAZ	5.9	2.4	No	2.5
DT195	LP60 opposite DT194, Rooley Lane	Roadside	417178	430344	NO2	CAZ	n/a	2.7	No	2.4
DT194	LP61 Rooley Lane	Roadside	417184	430315	NO2	CAZ	11.0	4.0	No	2.5
DT76	post 12 junc Rook Ln/Tong St	Kerbside	418268	430732	NO2	CAZ	5.5	0.6	No	2.5
DT45	Rook Lane lampost 17	Roadside	417877	430717	NO2	CAZ	5.0	1.5	No	2.5
DT214A DT214B DT214C	Post outside 221 Bierley Lane nr junction with Rockhill Lane	Roadside	417715	429299	NO2	No	11.5	1.7	No	2.5
DT215A DT215B DT215C	Post corner of Sheldon Ridge	Roadside	417708	429380	NO2	No	5.5	1.6	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT216A DT216B DT216C	Post 2 Shetcliffe Lane outside house 17	Roadside	418853	430309	NO2	No	3.7	1.3	No	2.5
DT217A DT217B DT217C	Post 3 Shetcliffe Lane outside house 28	Roadside	418829	430288	NO2	No	4.5	1.6	No	2.5
DT88	Tong Street lamp post no 18	Roadside	418829	430399	NO2	No	0.5	2.4	No	2.3
DT89A DT89B DT89C	Tong St/Broadstone Way Car Park	Roadside	419188	430213	NO2	No	5.0	3.9	No	2.4
DT199A DT199B DT199C	Tong Street LP 202 opposite DT89	Roadside	419178	430193	NO2	No	n/a	3.5	No	2.8
DT64A DT64B DT64C	Tong Street	Roadside	419342	430114	NO2	No	0.5	2.9	No	2.5
DT200A DT200B DT200C	Tong Street opposite DT200 near KFC	Roadside	419328	430099	NO2	No	n/a	2.2	No	2.5
DT220A DT220B DT220C	Broadstone Way LP2 near junction with Tyersal Lane	Roadside	419215	431809	NO2	No	6.7	1.7	No	2.5
DT221A DT221B DT221C	Broadstone Way LP3 near junction with Tyersal Lane	Roadside	419196	431834	NO2	No	3.6	4.2	No	2.5
DT222A DT222B DT222C	LP on Wakefield Road near Busfield	Roadside	417861	431486	NO2	CAZ	30.0	5.3	No	2.4
DT223A DT223B DT223C	LP64 Wakefiled Road outside house no.705	Roadside	417862	431536	NO2	CAZ	3.0	2.0	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT218A DT218B DT218C	Near house 567 Sticker Lane LP 78&067	Roadside	418292	431290	NO2	CAZ	14.5	2.0	No	2.5
DT219A DT219B DT219C	Near house 528 Sticker Lane LP 76&666	Roadside	418303	431328	NO2	CAZ	13.0	2.6	No	2.4
DT116	Sticker Lane lp41	Roadside	418564	432218	NO2	CAZ	1.0	2.6	No	2.6
DT118	Fearnville Drive lp1	Roadside	418666	432470	NO2	No	15.0	1.3	No	2.6
DT201	Bowling Back Lane / Parry Lane LP35 outside house 250	Roadside	418108	432322	NO2	CAZ	0.0	1.8	No	2.5
DT202	Parry Lane LP2	Roadside	418135	432272	NO2	CAZ	n/a	2.2	No	2.5
DT203	LP 43 Bowling Back Lane opposite entrance to recycling centre	Roadside	418345	432366	NO2	CAZ	n/a	1.3	No	2.5
DT160A DT160B DT160C	Laisterdyke	Roadside	418644	432898	NO2	CAZ	0.0	2.3	No	2.4
DT204A DT204B DT204C	Laisterdyke LP9 opp DT119	Roadside	418640	432870	NO2	CAZ	n/a	3.0	No	2.4
DT120A DT120B DT120C	Leeds Rd St Marys School	Roadside	417991	432926	NO2	CAZ	0.0	6.6	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT209A DT209B DT209C	LP57 Leeds Road opposite Steadman Terrace and 120	Roadside	417960	432907	NO2	CAZ	n/a	5.0	No	2.6
DT205	LP6 Killinghall Road across from house no. 17	Roadside	418597	433111	NO2	CAZ	13.0	3.3	No	2.2
DT206	LP5 Killinghall Road outside house no. 17 opp DT205	Roadside	418579	433109	NO2	CAZ	2.0	2.7	No	2.4
DT233	LP 23 Killinghall Rd nr house 105 and pharmacy near Ellerton Street	Roadside	418546	433430	NO2	CAZ	1.5	3.5	No	2.5
DT232	LP24 outside 78 Killinghall Road	Roadside	418563	433432	NO2	CAZ	15.5	3.1	No	2.4
DT230A DT230B DT230C	Post 18 Gain Lane near house 48 opp Morrisons HQ	Roadside	418784	434409	NO2	No	11.5	3.7	No	2.4
DT231A DT231B DT231C	Post 17 Gain Lane opp house 48 outside Morrisons HQ	Roadside	418791	434424	NO2	No	n/a	3.6	No	2.4
DT5	Harrogate Road (furthest from crossroads)	Roadside	417982	434886	NO2	No	0.0	1.3	No	2.7
DT39A DT39B DT39C	Harrogate Road (nearest crossroads)	Roadside	417927	434799	NO2	No	2.0	1.2	No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT208A DT208B DT208C	Harrogate Road opposite DT5	Roadside	417966	434884	NO2	No	5.0	1.4	No	2.4
DT99	Charnwood Grove/Harrogate Rd LP below junc	Roadside	418033	434970	NO2	No	17.0	1.8	No	2.7
DT86	Otley Rd lamp post no 2	Roadside	417894	434753	NO2	No	0.0	2.5	No	2.5
DT42A DT42B DT42C	Killinghall	Roadside	417902	434751	NO2	No	1.5	1.4	No	2.2
DT207A DT207B DT207C	Killinghall Road opp DT42	Roadside	417912	434759	NO2	No	0.3	3.9	No	2.4
DT228A DT228B DT228C	LP80 Killinghall Rd between Fagley Road and Nothcote Road	Roadside	418090	434429	NO2	CAZ	3.5	2.9	No	2.5
DT229A DT229B DT229C	LP83 Killinghall Road between Fagley Road and Northcote Road	Roadside	418059	434509	NO2	CAZ	0.2	2.2	No	2.5
DT92	Harrogate Rd	Roadside	419006	437217	NO2	No	n/a	2.0	No	2.2
DT93	New Line (former school)	Roadside	419003	437308	NO2	No	n/a	1.3	No	2.6
DT286	Lp at the end of Stockhill Road at junction with Harrogate Road	Roadside	419103	437334	NO2	No	0.0	2.6	No	2.6

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT94	Stockhill Rd (school)	Roadside	419076	437345	NO2	No	0.0	1.1	No	2.5
DT273	New Line, Greengates on LP across from ASDA & Bank	Roadside	419138	437213	NO2	No	9.5	3.0	No	2.5
DT274	LP on Greengates X Roads	Roadside	419107	437314	NO2	No	n/a	3.5	No	2.5
DT275	on LP across from 138 Harrogate Road (Binns Hearing)	Roadside	419317	437551	NO2	No	n/a	4.0	No	2.7
DT276	Apperley Road (Canal Bridge) outside Apperley Cottage LP 29	Kerbside	418979	437969	NO2	No	2.7	0.2	No	2.5
DT272	Barkerend Road - Traffic Light sign outside house no 293	Roadside	417661	433528	NO2	CAZ	11.0	6.7	No	2.6
DT224A DT224B DT224C	Barkerend Road LP24 opp Discovery House	Roadside	417117	433431	NO2	CAZ	n/a	5.0	No	2.3
DT225A DT225B DT225C	Barkerend Road outside alterations shop	Kerbside	417087	433444	NO2	CAZ	n/a	0.5	No	2.3
DT226A DT226B DT226C	Otley Road LP 47 outside 201 Otley Road	Roadside	417047	434252	NO2	CAZ	n/a	1.7	No	2.4
DT227A DT227B	Otley Road LP 50 next to house 234	Roadside	417054	434165	NO2	CAZ	0.0	3.8	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT227C										
DT123A	Otley Rd/SunnyBank	Roadside	414766	437113	NO2	CAZ	20.0	1.4	No	2.5
DT123	lp5 Otley Rd CE School	Kerbside	414660	436974	NO2	CAZ	7.8	0.5	No	2.4
DT124	lp4 Otley Rd terrace props	Roadside	414620	436924	NO2	CAZ	6.3	2.4	No	2.4
DT121	lp40 Bradford Rd nr Branch	Roadside	414546	436933	NO2	CAZ	7.1	2.6	No	2.4
DT122	lp33 Bradford Rd nr Branch	Roadside	414567	436811	NO2	CAZ	8.0	2.3	No	2.3
DT126	Bradford Rd pelican crossing	Kerbside	414643	436505	NO2	CAZ	11.0	0.6	No	2.5
DT125	lp20 165 Otley Rd	Roadside	414674	436471	NO2	CAZ	8.3	2.5	No	2.5
DT127	lp36 Keighley Rd	Roadside	415044	435558	NO2	CAZ	10.4	0.4	No	2.5
DT128	lp11 Frizley Gardens	Urban Background	415331	435796	NO2	CAZ	0.0	96.0	No	2.5
DT130	lp1 Midland Road	Roadside	415839	434674	NO2	CAZ	3.0	3.4	No	2.4
DT132	LP136 Manningham Lane	Roadside	415717	434265	NO2		3.5	1.1	No	2.3
DT71A DT71B DT71C	LP53 Manningham	Roadside	415580	434461	NO2	Yes, AQMA 2,CAZ	8.3	2.6	No	2.6

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
	Lane adj real time monitoring site									
DT278	LP 46 Manningham Lane near DT71	Roadside	415570	434477	NO2	Yes, AQMA 2,CAZ	7.0	2.0	No	2.1
DT172A DT172B DT172C	LP47 junction of Maninngham Ln and Springbank Ln opp DT71	Roadside	415590	434478	NO2	Yes, AQMA 2,CAZ	12.0	2.5	No	2.5
DT72	LP2 Queens Rd (traffic lights)	Roadside	415573	434521	NO2	Yes, AQMA 2,CAZ	0.0	3.1	No	2.5
DT235A DT235B DT235C	LP3 outside house 21 Marlborough Ave	Roadside	415474	434456	NO2	Yes, AQMA 2,CAZ	5.0	2.5	No	2.5
DT156	LP33 Whetley Lane opp medical practice	Roadside	414781	434126	NO2	CAZ	0.0	2.4	No	2.5
DT236	LP19 Whetley Ln outside flats opp house 63	Roadside	414498	433935	NO2	CAZ	8.0	4.1	No	2.4
DT237	LP20 Whetley Ln A6177 opp DT236	Roadside	414536	433981	NO2	CAZ	5.5	2.5	No	2.4
DT238A DT238B DT238C	LP5 outside house 26 Wheltey Ln near junction with Thornton Rd	Roadside	414290	433759	NO2	CAZ	6.5	3.7	No	2.4
DT239A DT239B DT239C	LP6 Whetley Ln outside no. 27 tax investigation (opposite DT238)	Roadside	414268	433765	NO2	CAZ	4.0	4.2	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT139A DT139B DT139C	Eden School site Thornton Road	Roadside	414396	433648	NO2	CAZ	20.0	2.1	No	2.3
DT240A DT240B DT240C	LP92 Thornton Rd opposite DT139	Roadside	414403	433665	NO2	CAZ	0.5	4.7	No	2.6
DT152	LP119 outside no.620 Thornton Road	Roadside	413835	433663	NO2	No	1.5	2.9	No	2.5
DT151A DT151B DT151C	LP3 outside no.12 Allerton Road	Roadside	413700	433687	NO2	No	2.5	2.3	No	2.6
DT149A DT149B DT149C	LP53 Cemetery Rd nr hardware store	Roadside	413750	433573	NO2	No	5.9	2.5	No	2.4
DT241A DT241B DT241C	LP15 Cemetery Rd outside house no.137 opp cemetery	Roadside	413840	432676	NO2	No	7.0	1.6	No	2.4
DT242A DT242B DT242C	LP18 outside house no.97 Clayton Road	Roadside	413721	432067	NO2	No	4.7	2.4	No	2.5
DT243A DT243B DT243C	LP17 outside house no. 110 Clayton Rd	Roadside	413729	432097	NO2	No	5.8	1.9	No	2.5
DT244	LP16 Hollingwood Lane nr Tanner Hill	Roadside	413225	431373	NO2	No	13.3	1.7	No	2.4
DT245	LP17 Hollingwood Lane opp DT244	Roadside	413243	431386	NO2	No	8.0	1.3	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT246A DT246B DT246C	Concrete LP013 outside house no.65 Horton Grange Rd	Roadside	414722	432432	NO2	CAZ	7.0	1.9	No	2.4
DT247A DT247B DT247C	Metal post 13A outside house no.66 Horton Grange Road on opp side of road to 246	Roadside	414731	432443	NO2	CAZ	6.0	1.8	No	2.4
DT144A DT144B DT144C	LP26 Horton Grange Road opp medical centre	Kerbside	414908	432312	NO2	CAZ	6.3	1.0	No	2.3
DT146	LP3 All Saints Rd	Roadside	415005	432231	NO2	CAZ	0.0	5.0	No	2.3
DT143A DT143B DT143C	LP64 Bridal Shop Great Horton Rd	Kerbside	414902	432251	NO2	CAZ	0.0	0.5	No	2.2
DT142	LP74 464 Great Horton Rd	Roadside	414724	432095	NO2	CAZ	4.0	2.9	No	2.4
DT248	LP34 outside St Oswalds CofE academy A6177 Cross Ln	Roadside	414499	431676	NO2	CAZ	8.3	2.1	No	2.4
DT249A DT249B DT249C	LP10 outside 76 Southfield Ln (A6177) just before Quaker Ln turn off	Roadside	414862	431173	NO2	CAZ	2.7	1.3	No	2.3
DT250A DT250B DT250C	LP12 opp DT249 across from house no.100	Roadside	414788	431184	NO2	CAZ	23.0	2.3	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
	Southfield Ln side of Co-op Academy Grange									
DT252A DT252B DT252C	LP6 Southfield Rd (A6177) outside house no.35	Roadside	415228	431031	NO2	CAZ	13.0	1.9	No	2.3
DT251A DT251B DT251C	LP7 Southfield Rd (A6177) opp DT252	Roadside	415222	431010	NO2	CAZ	16.0	1.8	No	2.5
DT253A DT253B DT253C	LP6 Holdroyd Hill near house no.72 just after Sanderson Ave	Kerbside	415320	430090	NO2	No	1.4	0.3	No	2.4
DT254A DT254B DT254C	LP17 Fair Rd, Wisbey nr Oakdale Cres and Medical Centre	Roadside	414637	430131	NO2	No	6.3	2.0	No	2.3
DT255A DT255B DT255C	LP16 Fair Rd Wisbey nr caravan shop opp Oakdale Cres	Roadside	414629	430122	NO2	No	6.0	1.8	No	2.3
DT257A DT257B DT257C	LP17 Moore Ave outside house no. 60	Roadside	414260	430531	NO2	No	13.9	2.3	No	2.6
DT256A DT256B DT256C	LP18 Moore Ave outside house no. 113	Roadside	414239	430526	NO2	No	13.0	2.5	No	2.4
DT283	LP 237 junction of Cardigan Street and Sand Beds,	Roadside	410565	430351	NO2	No	2.1	2.5	No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
	Queensbury - outside no. 21									
DT284	Post on the corner of Foster Street and West End, Queensbury	Roadside	410585	430112	NO2	No	6.5	1.4	No	2.6
DT285	LP 8 Brighouse Road Near Cottages after Tesco	Roadside	410075	430120	NO2	No	1.0	1.1	No	2.7
DT259A DT259B DT259C	LP25 Beacon Rd house no.246	Kerbside	413785	430386	NO2	No	17.9	0.0	No	2.5
DT258A DT258B DT258C	LP26 Beacon Rd house no.167	Roadside	413749	430389	NO2	No	12.1	1.7	No	2.3
DT261A DT261B DT261C	LP7 Netherlands Ave outside house 51	Roadside	415339	429334	NO2	No	15.5	1.1	No	2.5
DT260A DT260B DT260C	LP8 Netherlands Ave near scout hut	Roadside	415368	429297	NO2	No	13.0	0.8	No	2.5
DT262A DT262B DT262C	LP12 outside house 50 Cleckheaton Rd	Roadside	415894	429519	NO2	No	5.6	4.0	No	2.5
DT171	Staithgate Lane Newhall Dr Lampost 4 House 26	Suburban	416678	429910	NO2	No	16.5	2.7	No	2.5
DT133	lp121 Canal Road gasworks	Roadside	416260	434581	NO2	CAZ	n/a	2.2	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)
DT111A DT111B DT111C	Midland Terrace (Canal Rd)	Roadside	416015	435028	NO2	CAZ	3.0	2.6	No	2.5
DT234A DT234B DT234C	Opposite side of road to 111 LP 106 house no. 11	Roadside	416019	434990	NO2	CAZ	n/a	2.4	No	2.3
DT73A DT73B DT73C	LP61 Canal Road (opp garden centre)	Kerbside	415438	435834	NO2	CAZ	22.0	0.5	No	2.4
DT173A DT173B DT173C	LP 62 Canal Road same side as the garden centre opposite DT73.	Roadside	415442	435799	NO2	CAZ	60.0	1.9	No	2.5
DT74	LP4 Gaisby Lane	Kerbside	415549	435918	NO2	NO	5.0	0.2	No	2.6
DT129	lp24 Valley Road	Roadside	415089	436637	NO2	CAZ	20.0	2.6	No	2.2
DT112A DT112B DT112C	Canal Road LP nearest flats by car wash	Kerbside	415024	436743	NO2	CAZ	9.2	1.0	No	2.4
DT174A DT174B DT174C	LP18 Valley Rd opposite car wash and DT112	Roadside	415029	436771	NO2	CAZ	100.0	2.2	No	2.6
DT131	Fox Corner Shipley	Kerbside	414856	437605	NO2	CAZ	n/a	0.7	No	1.5
DT269	Victoria Street LP4	Roadside	413900	437738	NO2	CAZ	3.5	2.5	No	2.5
DT91A DT91B DT91C	Dove St / Saltaire Rd	Roadside	413697	437723	NO2	CAZ	0.1	2.4	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT175A DT175B DT175C	Saltaire Road opposite Dove St	Roadside	413709	437745	NO2	CAZ	3.4	2.0	No	2.5
DT30A DT30B DT30C	29 Saltaire Road	Roadside	413861	437772	NO2	CAZ	1.7	2.2	No	2.5
DT180A DT180B DT180C	Saltaire Road outside Methodist Church	Roadside	413856	437784	NO2	CAZ	4.5	1.8	No	2.4
DT49A DT49B DT49C	outside house no.9 Moorhead Lane	Roadside	413600	437653	NO2	CAZ	5.0	1.8	No	2.6
DT176A DT176B DT176C	Moorhead Lane opp DT49	Roadside	413597	437628	NO2	CAZ	0.1	1.6	No	2.5
DT50	outside no.203 Bradford Road	Roadside	413510	437732	NO2	CAZ	3.4	2.0	No	2.3
DT177A DT177B DT177C	LP 30 outside dress shop, Bradford Rd (Bingley Rd)	Roadside	413501	437732	NO2	CAZ	2.7	3.7	No	2.3
DT31	Bradford Road / Bingley Road on traffic light opp Hirst Road	Roadside	413527	437713	NO2	CAZ	9.6	1.6	No	2.2
DT101A DT101B DT101C	LP39 Bingley Rd, Saltaire nearest shops	Roadside	413418	437725	NO2	CAZ	8.0	1.1	No	2.5
DT179A DT179B DT179C	LP40 Bradford Rd (Bingley Rd) Saltaire	Roadside	413417	437708	NO2	CAZ	5.5	2.5	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT102A DT102B DT102C	LP43 Bingley Rd, Saltaire	Roadside	413338	437720	NO2	CAZ	7.5	2.4	No	2.3
DT178A DT178B DT178C	Bingley Rd Saltaire LP 44 opposite D102	Roadside	413334	437703	NO2	CAZ	7.2	2.9	No	2.5
DT270	Bingley Road outside COOP	Roadside	413719	437665	NO2	CAZ	3.7	3.0	No	3.0
DT271	Bingley Road across from DT270	Roadside	413723	437678	NO2	CAZ	2.8	2.1	No	2.1
DT78	LP11 Aireworth Road, Keighley	Roadside	407380	441811	NO2	NO	6.0	2.0	No	2.4
DT68 DT69 DT70	Keighley AQMS	Urban Centre	406060	441274	NO2	NO	0.0	8.0	Yes	3.6
DT190	Low Mill Keighley near Aldi	Roadside	406495	441280	NO2	NO	n/a	2.6	No	2.5
DT191	Low Mill Keighley - opposite DT190	Kerbside	406508	441310	NO2	NO	n/a	0.5	No	2.5
DT21	12 Prospect Street Keighley	Urban Background	404719	440613	NO2	NO	0.5	n/a	No	2.4
DT282	LP 9 Bolton Road, Silsden - outside no. 75	Roadside	404451	446762	NO2	NO	2.7	1.5	No	2.4
DT134	Lp2 Rylstone Street KLY	Roadside	406940	441922	NO2	NO	13.0	1.1	No	2.3
DT135	LP17 Hard Ings Road KLY	Roadside	406582	442028	NO2	NO	6.8	2.3	No	2.6

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT136	LP18 Hard Ings Road KLY	Roadside	406540	442038	NO2	NO	0.5	2.7	No	2.6
DT137	LP21 Hard Ings Road KLY	Roadside	406475	442046	NO2	NO	4.1	2.7	No	2.4
DT138	LP28 Hard Ings Road KLY	Roadside	406255	442140	NO2	NO	n/a	2.3	No	2.6
DT80	LP40 City Exchange	Roadside	416388	432817	NO2	CAZ	0.1	5.4	No	2.6
DT84	Wilton St- Omar Khan's	Roadside	416054	432675	NO2	CAZ	0.0	12.5	No	2.5
DT79	Centenary Square	Urban Centre	416282	432966	NO2	CAZ	0.1	70.0	No	2.6
DT161A DT161B DT161C	Godwin Street LP 6	Roadside	416148	433102	NO2	CAZ	0.1	1.8	No	2.4
DT162A DT162B DT162C	Godwin Street LP 7	Roadside	416148	433134	NO2	CAZ	0.1	2.7	No	2.4
DT163A DT163B DT163C	Godwin St LP 8	Roadside	416147	433158	NO2	CAZ	0.1	1.7	No	2.6
DT164A DT164B DT164C	Godwin St EASA training	Roadside	416139	433134	NO2	CAZ	0.1	1.7	No	2.6
DT109A DT109B DT109C	LP 20 Thornton Road near AQMS	Roadside	415858	433061	NO2	Yes , AQMA 3, CAZ	0.1	4.3	No	2.6
DT181A DT181B DT181C	LP opposite DT109 Thornton Road	Roadside	415845	433041	NO2	Yes , AQMA 3, CAZ	0.1	10.1	No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT108A DT108B DT108C	LP18 Thornton Road near AQMS	Roadside	415891	433045	NO2	Yes , AQMA 3, CAZ	0.1	4.3	No	2.7
DT182A DT182B DT182C	LP opposite DT108 Thornton Road	Roadside	415874	433026	NO2	Yes , AQMA 3, CAZ	0.1	9.9	No	2.3
DT110	LP adjacent to student accommodation Thornton Road	Roadside	415806	433061	NO2	Yes , AQMA 3, CAZ	2.0	9.0	No	2.4
DT279	Lister Hills Road LP3 near junction with Thornton Road	Roadside	415591	433141	NO2	CAZ	n/a	1.8	No	2.5
DT280	Thornton Road LP 32 near junction with Lister Hills Road	Roadside	415665	433175	NO2	CAZ	n/a	1.7	No	2.6
DT183	Sunbridge Road near Tesco	Roadside	416215	433059	NO2	CAZ	7.1	1.1	No	2.4
DT184	Sunbridge Road near Tesco across road from DT183	Kerbside	416217	433071	NO2	CAZ	3.1	0.6	No	2.4
DT167A DT167B DT167C	LP 4 Market St	Kerbside	416392	433046	NO2	CAZ	2.5	0.6	No	2.5
DT185A DT185B DT185C	Market St opposite DT167	Roadside	416381	433054	NO2	CAZ	2.4	1.9	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT277	Market Street, Attached to Hot Crazes Building	Kerbside	416398	433050	NO2	CAZ	0.1	1.7	No	2.3
DT12A DT12B DT12C	Treadwell Mills - Shipley Airedale Rd	Roadside	416970	433259	NO2	Yes , AQMA 4, CAZ	0.5	3.4	No	2.4
DT103A DT103B DT103C	Mayo Ave first LP left of AQMS	Roadside	415925	430572	NO2	Yes, AQMA 1, CAZ	5.1	3.4	No	2.6
DT104A DT104B DT104C	Mayo Ave first LP right of AQMS	Roadside	415961	430558	NO2	Yes, AQMA 1, CAZ	5.1	3.9	No	2.5
DT188A DT188B DT188C	Mayo Avenue LP20 opposite DT104	Roadside	415979	430522	NO2	Yes, AQMA 1, CAZ	n/a	1.8	No	2.5
DT189A DT189B DT189C	LP16 Mayo Avenue outside Matalan car park opp DT103	Roadside	415910	430551	NO2	Yes, AQMA 1, CAZ	n/a	2.6	No	2.1
DT105	Manchester Rd LP nearest house 793	Roadside	415780	430504	NO2	Yes, AQMA 1, CAZ	3.7	3.1	No	2.5
DT281	Manchester Road LP 79B near DT105	Roadside	415771	430476	NO2	Yes, AQMA 1, CAZ	3.7	2.5	No	2.6
DT186A DT186B DT186C	Manchester Road opp DT105 on LP81A end of Chellow St	Roadside	415743	430482	NO2	No	8.1	2.9	No	2.5
DT187A DT187B DT187C	Smiddles Lane LP4 in front of houses.	Roadside	415715	430669	NO2	Yes, AQMA 1, CAZ	2.6	2.5	No	2.6

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
	Opposite school and DT106									
DT106A DT106B DT106C	Smiddles Lane LP nearest fence to Bankfoot School	Roadside	415702	430701	NO2	Yes, AQMA 1, CAZ	0.0	3.6	No	2.3
DT192A DT192B DT192C	Mayo Avenue LP32 outside house no 144	Roadside	416218	430420	NO2	CAZ	11.1	3.7	No	2.5
DT193A DT193B DT193C	Mayo Avenue LP31 opposite 192	Roadside	416239	430435	NO2	CAZ	10.5	2.7	No	2.4
DT212A DT212B DT212C	Rooley Avenue LP11 outside house 49	Roadside	416398	430194	NO2	CAZ	11.1	3.7	No	2.4
DT213A DT213B DT213C	Rooley Avenue LP12 opposite house 212	Roadside	416390	430214	NO2	CAZ	13.0	1.3	No	2.5
DT210A DT210B DT210C	Silver LP outside Ocean City Apartments Manchester Road	Roadside	415889	431081	NO2	CAZ	3.8	8.5	No	2.5
DT211A DT211B DT211C	Manchester Road LP63B opposite 210	Roadside	415922	431089	NO2	CAZ	5.5	2.4	No	2.5
DT263	LP12 A65 outside house no.31 Springbank near All Saints school	Roadside	411245	447863	NO2	NO	9.5	2.5	No	2.5
DT264	The Grove - Ilkley - outside Crew clothing	Roadside	411600	447618	NO2	NO	0.1	2.3	No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT265	LP8 outside Midland pub, Station Rd , Ilkley	Roadside	411782	447598	NO2	NO	0.1	2.0	No	2.5
DT266	LP 6 Brook St, Ilkley near Banyan	Roadside	411704	447666	NO2	NO	0.1	1.3	No	2.5
DT267	LP TC 19 Leeds Rd, Ilkley near Woody's barbers	Roadside	411786	447811	NO2	NO	0.5	2.8	No	2.5
DT268	Leeds Road Ilkley - Outside Daniels Café junction with Victory Road	Roadside	411873	447807	NO2	NO	22.5	2.5	No	2.6

Notes:

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

(2) N/A if not applicable.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
CM2	406058	441273	Urban Centre	full year	96.7	27	24	20	22	21
CM3	415582	434457	Roadside	full year	91.9	**51**	**43**	35	32	27
CM4	415933	430569	Roadside	full year	90.5	**44**	**41**	34	38	33
CM5	415870	433054	Roadside	full year	90.8	**45**	39	29	34	31
CM6	416974	433245	Roadside	full year	97.2	**48**	**46**	38	**41**	37
CM7	417860	430705	Roadside	full year	86.2	38	38	29	35	32
CM8	419188	430213	Roadside	full year	94.6	34	33	23	23	25

☒ **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
DT168	417033	429293	Suburban	100.0	100.0				29.4	27.3
DT198	417930	430975	Roadside	100.0	100.0				29.0	30.2
DT197	417846	430739	Roadside	100.0	100.0				25.3	27.9
DT196	417369	430370	Roadside	100.0	100.0				28.8	28.9
DT195	417178	430344	Roadside	92.3	92.3				30.9	30.1
DT194	417184	430315	Roadside	100.0	100.0				25.3	24.8
DT76	418268	430732	Kerbside	50.0	50.0	31.0	26.0	23.7	27.0	20.6
DT45	417877	430717	Roadside	92.3	92.3	32.0	27.0	24.0	25.2	24.3
DT214A DT214B DT214C	417715	429299	Roadside	100.0	100.0				20.9	21.0
DT215A DT215B DT215C	417708	429380	Roadside	100.0	100.0				15.9	16.7
DT216A DT216B DT216C	418853	430309	Roadside	84.6	84.6				16.4	17.8

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
DT217A DT217B DT217C	418829	430288	Roadside	92.3	92.3				15.6	16.9
DT88	418829	430399	Roadside	75.0	75.0	34.0	26.0	25.5	27.8	24.2
DT89A DT89B DT89C	419188	430213	Roadside	100.0	100.0	34.0	29.0	24.8	29.9	28.5
DT199A DT199B DT199C	419178	430193	Roadside	100.0	100.0				18.7	20.7
DT64A DT64B DT64C	419342	430114	Roadside	100.0	100.0	40.0	34.0	31.5	32.7	28.8
DT200A DT200B DT200C	419328	430099	Roadside	100.0	100.0				20.7	21.0
DT220A DT220B DT220C	419215	431809	Roadside	82.7	82.7				17.8	18.7
DT221A DT221B DT221C	419196	431834	Roadside	92.3	92.3				16.3	16.6
DT222A DT222B DT222C	417861	431486	Roadside	100.0	100.0				21.0	23.8
DT223A DT223B DT223C	417862	431536	Roadside	100.0	100.0				36.8	38.5
DT218A DT218B DT218C	418292	431290	Roadside	100.0	100.0				30.1	29.1

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
DT219A DT219B DT219C	418303	431328	Roadside	100.0	100.0				25.6	25.9
DT116	418564	432218	Roadside	92.3	92.3	27.0	24.0	18.9	20.6	22.6
DT118	418666	432470	Roadside	100.0	100.0	27.0	27.0	20.5	22.1	24.1
DT201	418108	432322	Roadside	92.3	92.3				30.0	28.0
DT202	418135	432272	Roadside	100.0	100.0				22.0	21.2
DT203	418345	432366	Roadside	92.3	92.3				23.6	25.6
DT160A DT160B DT160C	418644	432898	Roadside	100.0	100.0			22.9	24.4	23.8
DT204A DT204B DT204C	418640	432870	Roadside	100.0	100.0				19.2	20.6
DT120A DT120B DT120C	417991	432926	Roadside	100.0	100.0	35.0	31.0	27.1	30.6	30.5
DT209A DT209B DT209C	417960	432907	Roadside	92.3	92.3				33.1	31.3
DT205	418597	433111	Roadside	100.0	100.0				24.4	26.0
DT206	418579	433109	Roadside	92.3	92.3				29.4	30.9

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
DT233	418546	433430	Roadside	92.3	92.3				25.5	27.6
DT232	418563	433432	Roadside	82.7	82.7				23.0	22.8
DT230A DT230B DT230C	418784	434409	Roadside	84.6	84.6				19.0	20.9
DT231A DT231B DT231C	418791	434424	Roadside	100.0	100.0				17.7	19.6
DT5	417982	434886	Roadside	84.6	84.6	29.0	29.0	25.7	28.3	29.0
DT39A DT39B DT39C	417927	434799	Roadside	90.4	90.4	35.0	31.0	26.2	28.2	26.5
DT208A DT208B DT208C	417966	434884	Roadside	100.0	100.0				19.4	21.9
DT99	418033	434970	Roadside	92.3	92.3	25.0	24.0	19.3	20.7	22.6
DT86	417894	434753	Roadside	92.3	92.3	31.0	27.0	23.3	28.0	28.9
DT42A DT42B DT42C	417902	434751	Roadside	92.3	92.3	43.0	34.0	30.6	33.1	31.3
DT207A DT207B DT207C	417912	434759	Roadside	100.0	100.0				22.4	24.5

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
DT228A, DT228B DT228C	418090	434429	Roadside	100.0	100.0				32.3	35.0
DT229A DT229B DT229C	418059	434509	Roadside	100.0	100.0				22.9	25.2
DT92	419006	437217	Roadside	82.7	82.7					26.0
DT93	419003	437308	Roadside	100.0	57.7					23.7
DT286	419103	437334	Roadside	100.0	26.9					24.2
DT94	419076	437345	Roadside	100.0	100.0					17.9
DT273	419138	437213	Roadside	100.0	100.0					23.0
DT274	419107	437314	Roadside	92.3	92.3					25.9
DT275	419317	437551	Roadside	89.0	75.0					27.0
DT276	418979	437969	Kerbside	100.0	100.0					16.9
DT272	417661	433528	Roadside	100.0	100.0					25.1
DT224A DT224B DT224C	417117	433431	Roadside	100.0	100.0				26.4	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
DT225A DT225B DT225C	417087	433444	Kerbside	100.0	100.0				33.3	35.0
DT226A DT226B DT226C	417047	434252	Roadside	65.4	73.1					26.3
DT227A DT227B DT227C	417054	434165	Roadside	100.0	100.0				20.9	22.4
DT123A	414766	437113	Roadside	92.3	92.3			33.2	34.3	32.3
DT123	414660	436974	Kerbside	80.8	80.8			33.2	34.3	34.0
DT124	414620	436924	Roadside	92.3	92.3			34.0	31.6	30.2
DT121	414546	436933	Roadside	100.0	100.0			22.0	22.1	21.3
DT122	414567	436811	Roadside	100.0	100.0			30.3	30.4	29.0
DT126	414643	436505	Kerbside	100.0	100.0			19.4	20.1	19.2
DT125	414674	436471	Roadside	92.3	92.3			15.1	18.5	19.2
DT127	415044	435558	Roadside	100.0	100.0			36.1	37.5	35.7
DT128	415331	435796	Urban Background	100.0	100.0			13.0	12.5	12.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
DT130	415839	434674	Roadside	92.3	92.3			29.7	31.3	28.3
DT132	415717	434265	Roadside	100.0	100.0			34.9	37.8	37.2
DT71A DT71B DT71C	415580	434461	Roadside	69.2	69.2	40.0	36.0	30.4	29.7	34.0
DT278	415570	434477	Roadside	100.0	76.9					38.8
DT172A DT172B DT172C	415590	434478	Roadside	100.0	100.0				30.2	30.7
DT72	415573	434521	Roadside	100.0	100.0	66.0	57.0	47.1	48.8	44.4
DT235A DT235B DT235C	415474	434456	Roadside	100.0	100.0				32.5	35.3
DT156	414781	434126	Roadside	65.4	65.4			33.3	30.0	33.7
DT236	414498	433935	Roadside	92.3	92.3				22.2	23.8
DT237	414536	433981	Roadside	82.7	82.7				23.9	26.1
DT238A DT238B DT238C	414290	433759	Roadside	84.6	84.6				24.4	26.6
DT239A DT239B DT239C	414268	433765	Roadside	100.0	100.0				30.3	34.5

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
DT139A DT139B DT139C	414396	433648	Roadside	100.0	100.0		22.0	22.3	25.3	30.7
DT240A DT240B DT240C	414403	433665	Roadside	100.0	100.0				30.0	33.2
DT152	413835	433663	Roadside	100.0	100.0			33.4	30.7	35.4
DT151A DT151B DT151C	413700	433687	Roadside	100.0	100.0			27.5	25.3	29.1
DT149A DT149B DT149C	413750	433573	Roadside	100.0	100.0			27.9	28.1	30.9
DT241A DT241B DT241C	413840	432676	Roadside	90.4	90.4				21.4	24.9
DT242A DT242B DT242C	413721	432067	Roadside	100.0	100.0				17.3	19.6
DT243A DT243B DT243C	413729	432097	Roadside	100.0	100.0				21.7	23.4
DT244	413225	431373	Roadside	82.7	82.7				15.2	16.6
DT245	413243	431386	Roadside	92.3	92.3				16.2	17.3
DT246A DT246B DT246C	414722	432432	Roadside	100.0	100.0				26.3	27.8

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
DT247A DT247B DT247C	414731	432443	Roadside	100.0	100.0				20.9	24.0
DT144A DT144B DT144C	414908	432312	Kerbside	90.4	90.4			29.9	28.9	31.8
DT146	415005	432231	Roadside	100.0	100.0			19.4	20.9	23.1
DT143A DT143B DT143C	414902	432251	Kerbside	100.0	100.0			34.2	33.3	36.2
DT142	414724	432095	Roadside	92.3	92.3			27.8	27.6	30.1
DT248	414499	431676	Roadside	100.0	100.0				26.6	28.5
DT249A DT249B DT249C	414862	431173	Roadside	82.7	82.7				25.9	28.7
DT250A DT250B DT250C	414788	431184	Roadside	100.0	100.0				20.5	23.8
DT252A DT252B DT252C	415228	431031	Roadside	100.0	100.0				29.5	30.5
DT251A DT251B DT251C	415222	431010	Roadside	100.0	100.0				22.7	25.4
DT253A DT253B DT253C	415320	430090	Kerbside	100.0	100.0				23.5	27.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
DT254A DT254B DT254C	414637	430131	Roadside	92.3	92.3				18.5	20.5
DT255A DT255B DT255C	414629	430122	Roadside	90.4	90.4				16.4	19.6
DT257A DT257B DT257C	414260	430531	Roadside	100.0	100.0				14.6	16.0
DT256A DT256B DT256C	414239	430526	Roadside	100.0	100.0				11.1	13.9
DT283	410565	430351	Roadside	100.0	67.3					18.6
DT284	410585	430112	Roadside	100.0	67.3					18.1
DT285	410075	430120	Roadside	100.0	67.3					14.6
DT259A DT259B DT259C	413785	430386	Kerbside	100.0	100.0				17.3	20.2
DT258A DT258B DT258C	413749	430389	Roadside	100.0	100.0				18.5	20.0
DT261A DT261B DT261C	415339	429334	Roadside	100.0	100.0				12.8	14.1
DT260A DT260B DT260C	415368	429297	Roadside	100.0	100.0				12.0	13.5

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
DT262A DT262B DT262C	415894	429519	Roadside	90.4	90.4				26.6	27.6
DT171	416678	429910	Suburban	90.4	90.4				15.3	15.4
DT133	416260	434581	Roadside	100.0	100.0			30.4	32.1	30.9
DT111A DT111B DT111C	416015	435028	Roadside	100.0	100.0	37.0	31.0	29.4	33.8	31.5
DT234A DT234B DT234C	416019	434990	Roadside	100.0	100.0				30.1	31.0
DT73A DT73B DT73C	415438	435834	Kerbside	100.0	100.0	46.0	38.0	33.2	38.0	36.0
DT173A DT173B DT173C	415442	435799	Roadside	100.0	100.0				32.1	29.6
DT74	415549	435918	Kerbside	82.7	82.5	20.0	18.0	17.1	17.2	15.9
DT129	415089	436637	Roadside	84.6	83.0			26.8	28.2	26.2
DT112A DT112B DT112C	415024	436743	Kerbside	100.0	100.0	38.0	32.0	28.3	28.7	25.7
DT174A DT174B DT174C	415029	436771	Roadside	100.0	100.0				23.3	23.3

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
DT131	414856	437605	Kerbside	100.0	100.0			37.0	39.1	37.6
DT269	413900	437738	Roadside	90.0	78.0					18.5
DT91A DT91B DT91C	413697	437723	Roadside	90.9	93.6	38.0	29.0	27.7	30.5	27.1
DT175A DT175B DT175C	413709	437745	Roadside	100.0	100.0				27.2	27.6
DT30A DT30B DT30C	413861	437772	Roadside	90.9	93.6	40.0	31.0	26.9	31.3	28.8
DT180A DT180B DT180C	413856	437784	Roadside	100.0	100.0				19.7	21.4
DT49A DT49B DT49C	413600	437653	Roadside	84.6	83.0	33.0	27.0	22.4	25.9	22.0
DT176A DT176B DT176C	413597	437628	Roadside	100.0	100.0				19.4	19.8
DT50	413510	437732	Roadside	64.0	63.5	58.0	49.0	40.7	41.8	39.0
DT177A DT177B DT177C	413501	437732	Roadside	100.0	100.0				32.3	30.1
DT31	413527	437713	Roadside	82.7	82.5	51.0	42.0	37.9	41.4	40.5

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
DT101A DT101B DT101C	413418	437725	Roadside	100.0	100.0	42.0	34.0	31.3	37.9	33.2
DT179A DT179B DT179C	413417	437708	Roadside	100.0	100.0				30.9	30.6
DT102A DT102B DT102C	413338	437720	Roadside	100.0	100.0	46.0	38.0	32.5	31.4	26.8
DT178A DT178B DT178C	413334	437703	Roadside	100.0	100.0				30.6	29.6
DT270	413719	437665	Roadside	100.0	100.0					33.4
DT271	413723	437678	Roadside	100.0	100.0					35.3
DT78	407380	441811	Roadside	81.3	83.8	20.0	21.0	14.0	17.0	18.3
DT68 DT69 DT70	406060	441274	Urban Centre	100.0	100.0	28.0	28.0	20.7	22.0	21.1
DT190	406495	441280	Roadside	90.4	90.3				26.5	25.3
DT191	406508	441310	Kerbside	100.0	100.0				44.7	45.5
DT21	404719	440613	Urban Background	100.0	100.0	11.0	10.0	7.7	8.0	8.8
DT282	404451	446762	Roadside	100.0	68.2					24.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
DT134	406940	441922	Roadside	84.6	84.4			34.5	35.4	33.7
DT135	406582	442028	Roadside	93.7	92.2			29.5	29.7	28.0
DT136	406540	442038	Roadside	100.0	100.0			28.3	29.6	30.7
DT137	406475	442046	Roadside	100.0	100.0			28.6	34.1	35.3
DT138	406255	442140	Roadside	100.0	100.0			30.5	33.5	33.8
DT80	416388	432817	Roadside	100	100.0	36.0	31.0	27.2	28.9	29.7
DT84	416054	432675	Roadside	100	100.0	33.0	28.0	24.1	29.0	27.1
DT79	416282	432966	Urban Centre	73.1	72.7	32.0	27.0	20.7	24.6	23.9
DT161A DT161B DT161C	416148	433102	Roadside	100	100.0			36.0	43.2	40.6
DT162A DT162B DT162C	416148	433134	Roadside	100	100.0			31.5	38.9	37.1
DT163A DT163B DT163C	416147	433158	Roadside	100	100.0			27.6	36.5	36.8
DT164A DT164B DT164C	416139	433134	Roadside	100	100.0			30.8	34.0	34.1

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
DT109A DT109B DT109C	415858	433061	Roadside	100	100.0	34.0	31.0	28.9	32.3	29.2
DT181A DT181B DT181C	415845	433041	Roadside	90.7	93.6				27.1	27.2
DT108A DT108B DT108C	415891	433045	Roadside	100	100.0	33.0	32.0	30.6	33.2	30.0
DT182A DT182B DT182C	415874	433026	Roadside	100	100.0				25.6	26.7
DT110	415806	433061	Roadside	100	100.0	32.0	27.0	23.7	26.5	26.2
DT279	415591	433141	Roadside	44.5	35.1					26.3
DT280	415665	433175	Roadside	100	78.0					31.6
DT183	416215	433059	Roadside	94	92.2				38.4	38.8
DT184	416217	433071	Kerbside	90.4	90.3				36.5	37.5
DT167A DT167B DT167C	416392	433046	Kerbside	100	100.0				45.3	39.1
DT185A DT185B DT185C	416381	433054	Roadside	92.3	92.2				37.8	35.8
DT277	416398	433050	Kerbside	100	78.0					34.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
DT12A DT12B DT12C	416970	433259	Roadside	100	100.0	55.0	52.0	45.8	50.6	49.3
DT103A DT103B DT103C	415925	430572	Roadside	100	100.0	42.0	35.0	35.4	37.6	32.2
DT104A DT104B DT104C	415961	430558	Roadside	100	100.0	51.0	38.0	38.5	41.0	34.8
DT188A DT188B DT188C	415979	430522	Roadside	100	100.0				25.1	26.1
DT189A DT189B DT189C	415910	430551	Roadside	100	100.0				28.6	26.9
DT105	415780	430504	Roadside	76.9	76.9	43.0	37.0	33.6	37.6	39.9
DT281	415771	430476	Roadside	100	76.9					41.2
DT186A DT186B DT186C	415743	430482	Roadside	100	100.0				21.4	23.0
DT187A DT187B DT187C	415715	430669	Roadside	100	100.0				25.9	25.6
DT106A DT106B DT106C	415702	430701	Roadside	100	100.0	30.0	28.0	23.7	24.0	24.4
DT192A DT192B DT192C	416218	430420	Roadside	100	100.0				22.4	23.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
DT193A DT193B DT193C	416239	430435	Roadside	100	100.0				28.7	29.2
DT212A DT212B DT212C	416398	430194	Roadside	100	100.0				25.6	23.9
DT213A DT213B DT213C	416390	430214	Roadside	100	100.0				22.3	23.0
DT210A DT210B DT210C	415889	431081	Roadside	64	64.0					23.8
DT211A DT211B DT211C	415922	431089	Roadside	80.8	80.8				41.4	44.1
DT263	411245	447863	Roadside	82.7	82.7				13.3	15.1
DT264	411600	447618	Roadside	82.7	82.7				12.3	14.5
DT265	411782	447598	Roadside	90.4	90.4				20.8	21.1
DT266	411704	447666	Roadside	82.7	82.7				17.7	19.2
DT267	411786	447811	Roadside	100	100.0				20.1	21.5
DT268	411873	447807	Roadside	100	100.0					19.1

☒ **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 at all real time sites

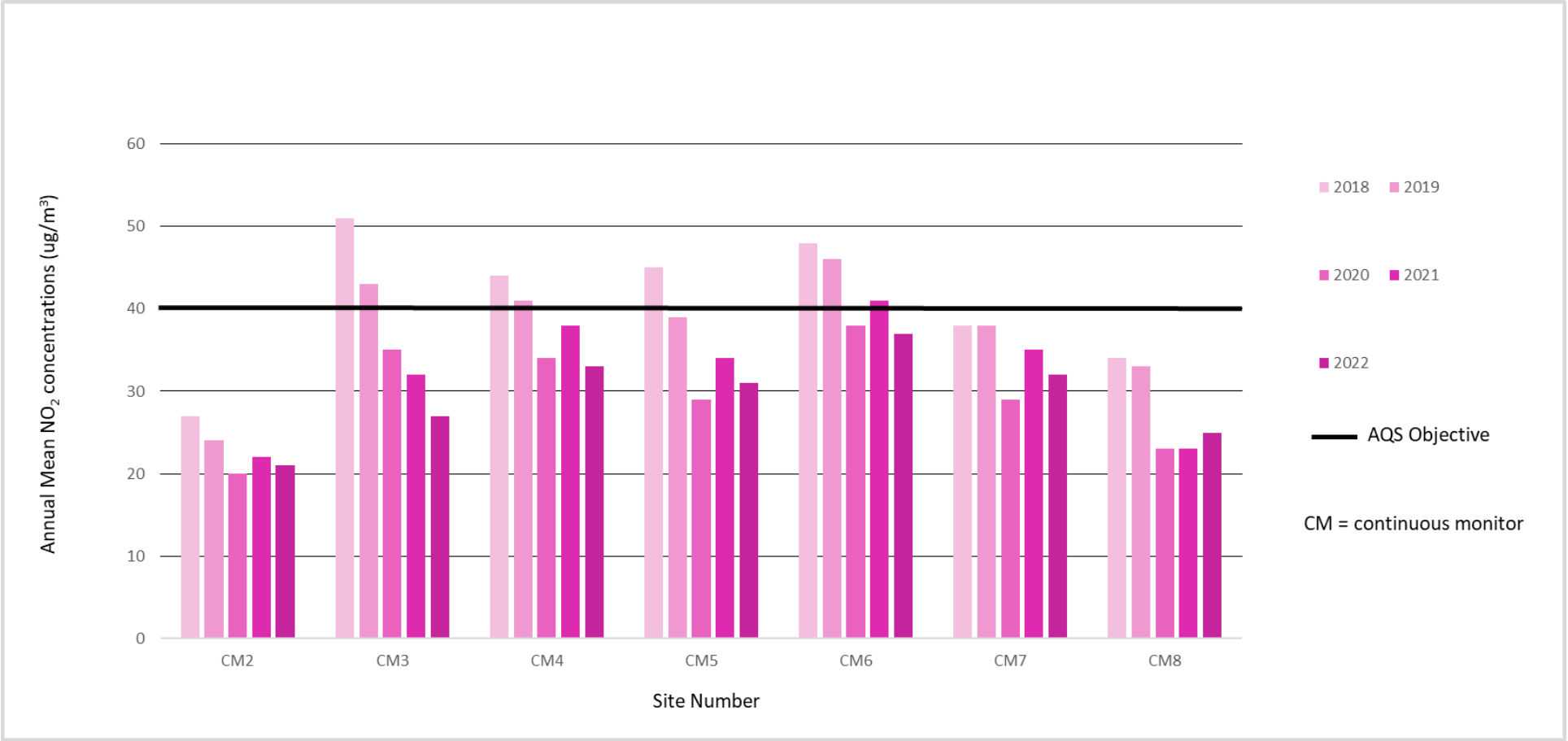

Figure A.2: Trends in Annual Mean NO_2 Concentrations at all background sites

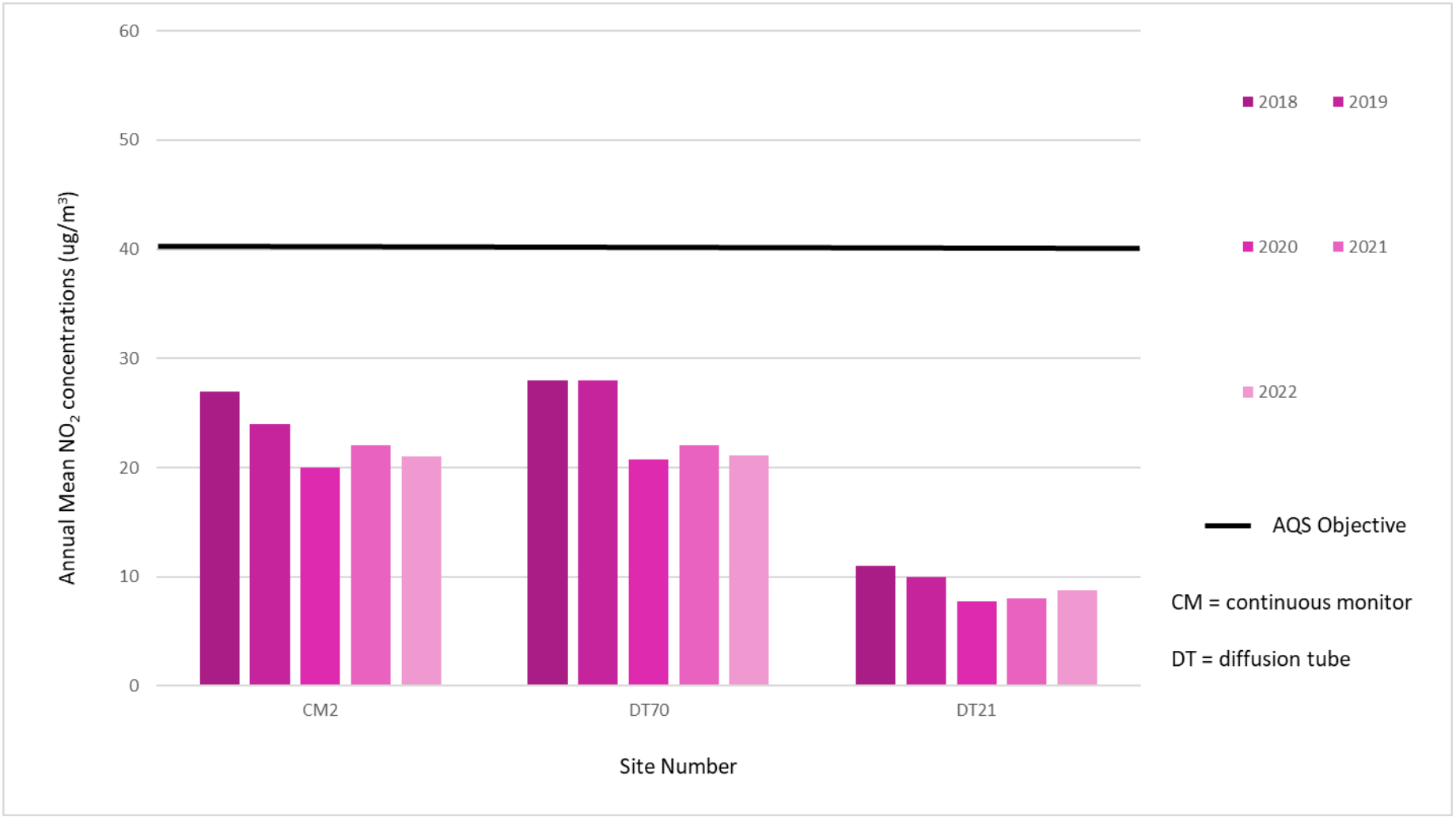

Figure A.3: Trends in Annual Mean NO_2 Concentrations in Mayo Avenue AQMA (order 1)

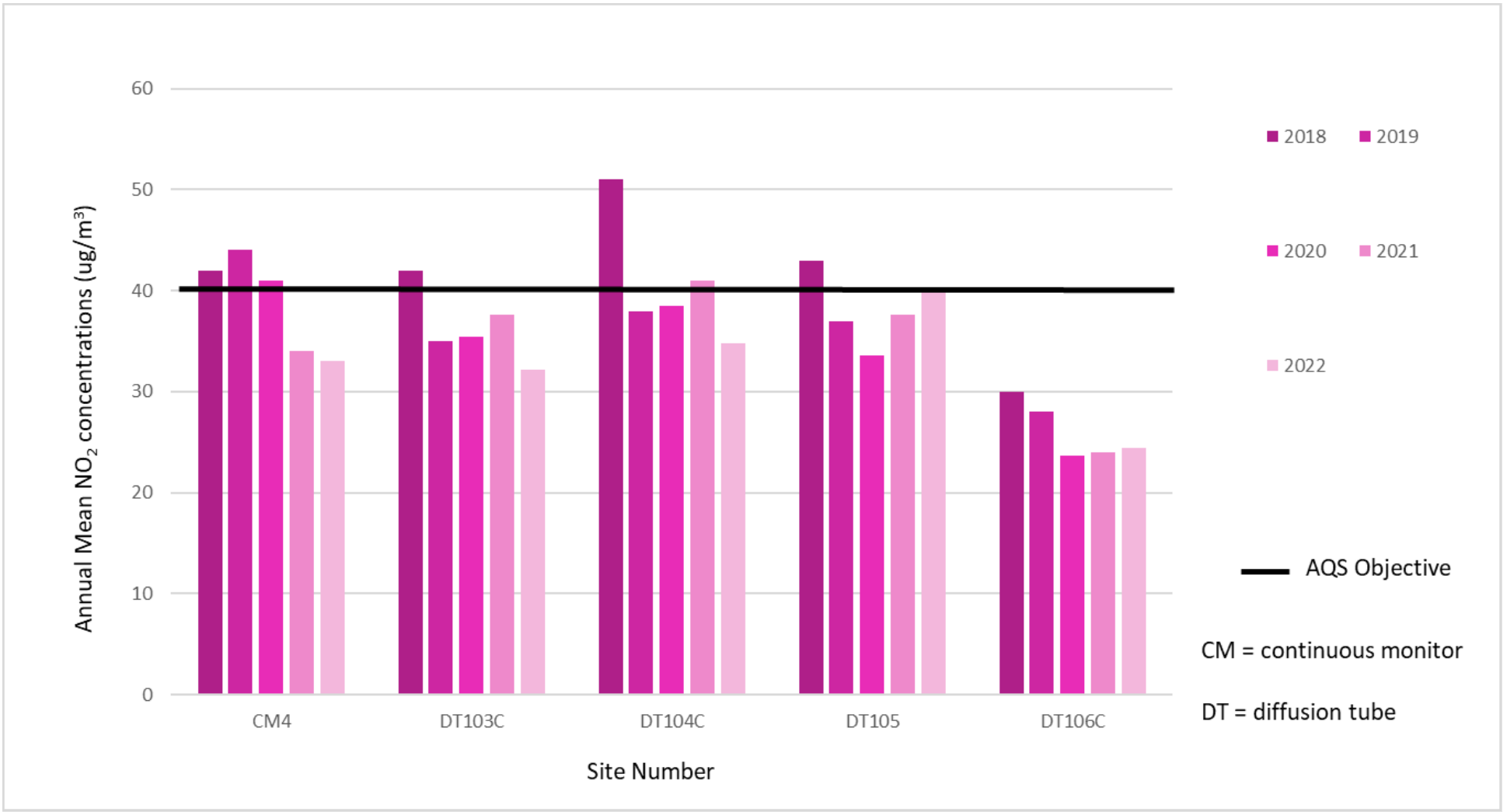

Figure A.4: Trends in Annual Mean NO_2 Concentrations in Manningham Lane AQMA (order 2)

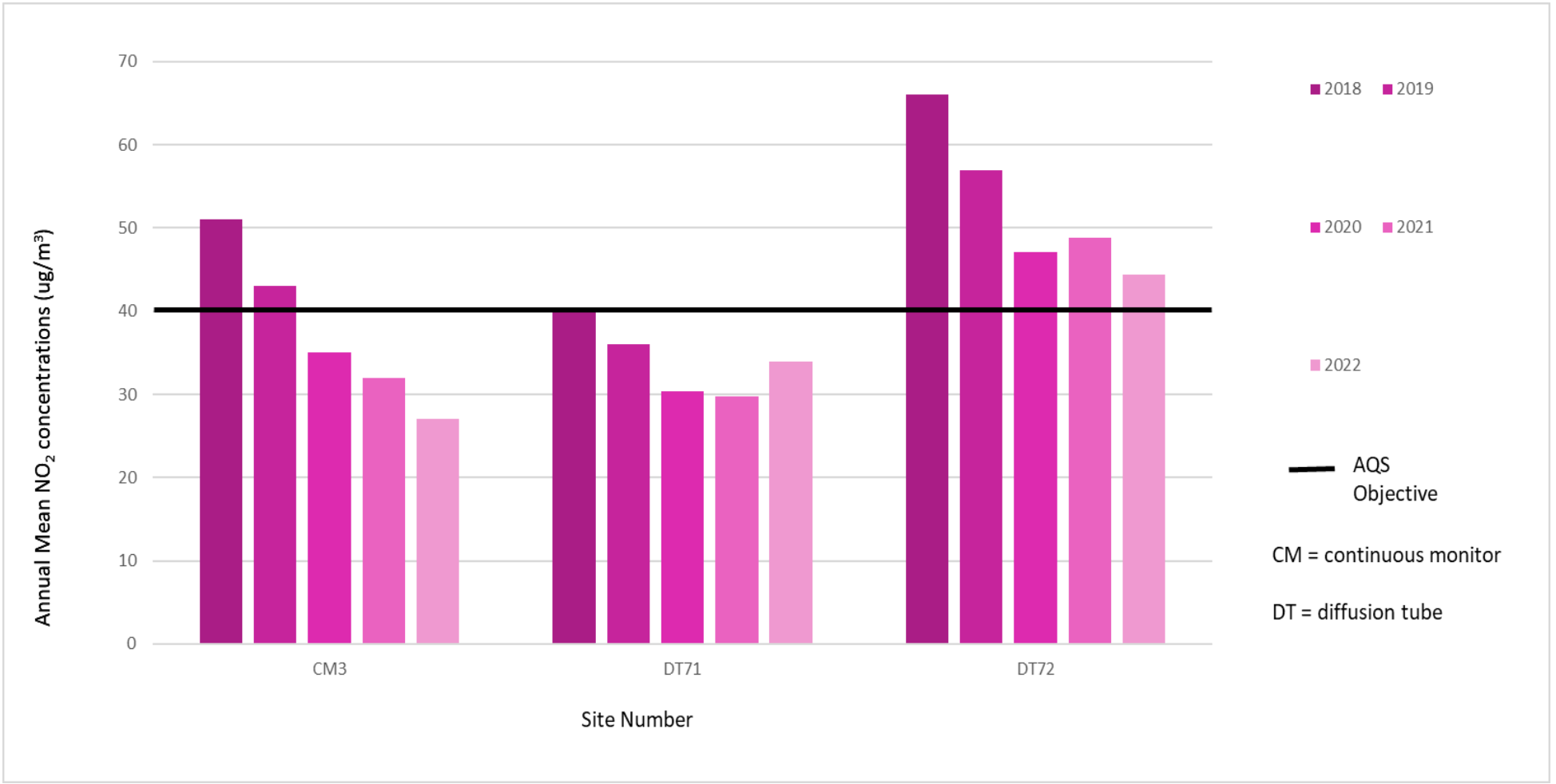

Figure A.5: Trends in Annual Mean NO_2 Concentrations in Thornton Road AQMA (order 3)

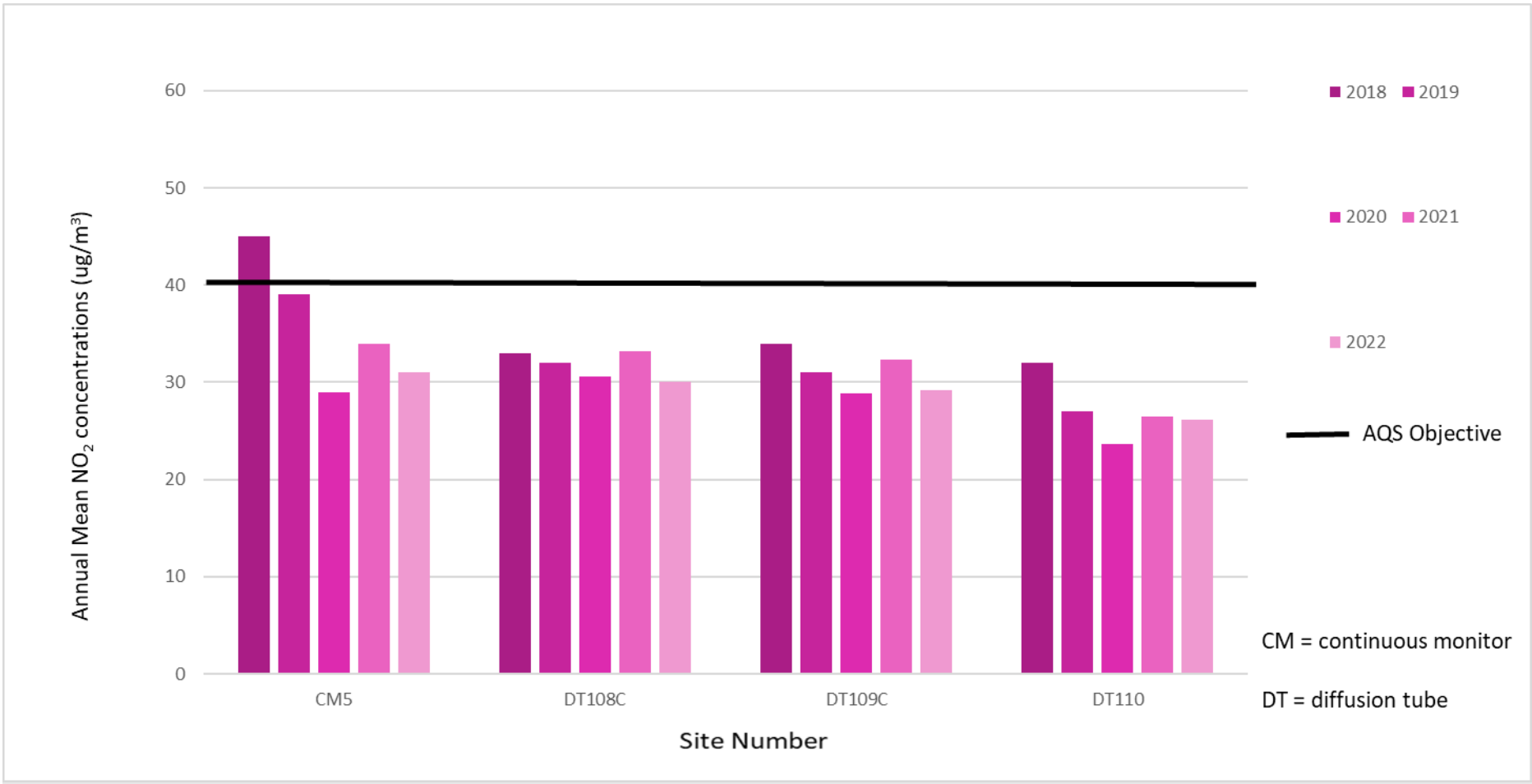

Figure A.6: Trends in Annual Mean NO_2 Concentrations in Shipley Airedale Road AQMA (order 4)

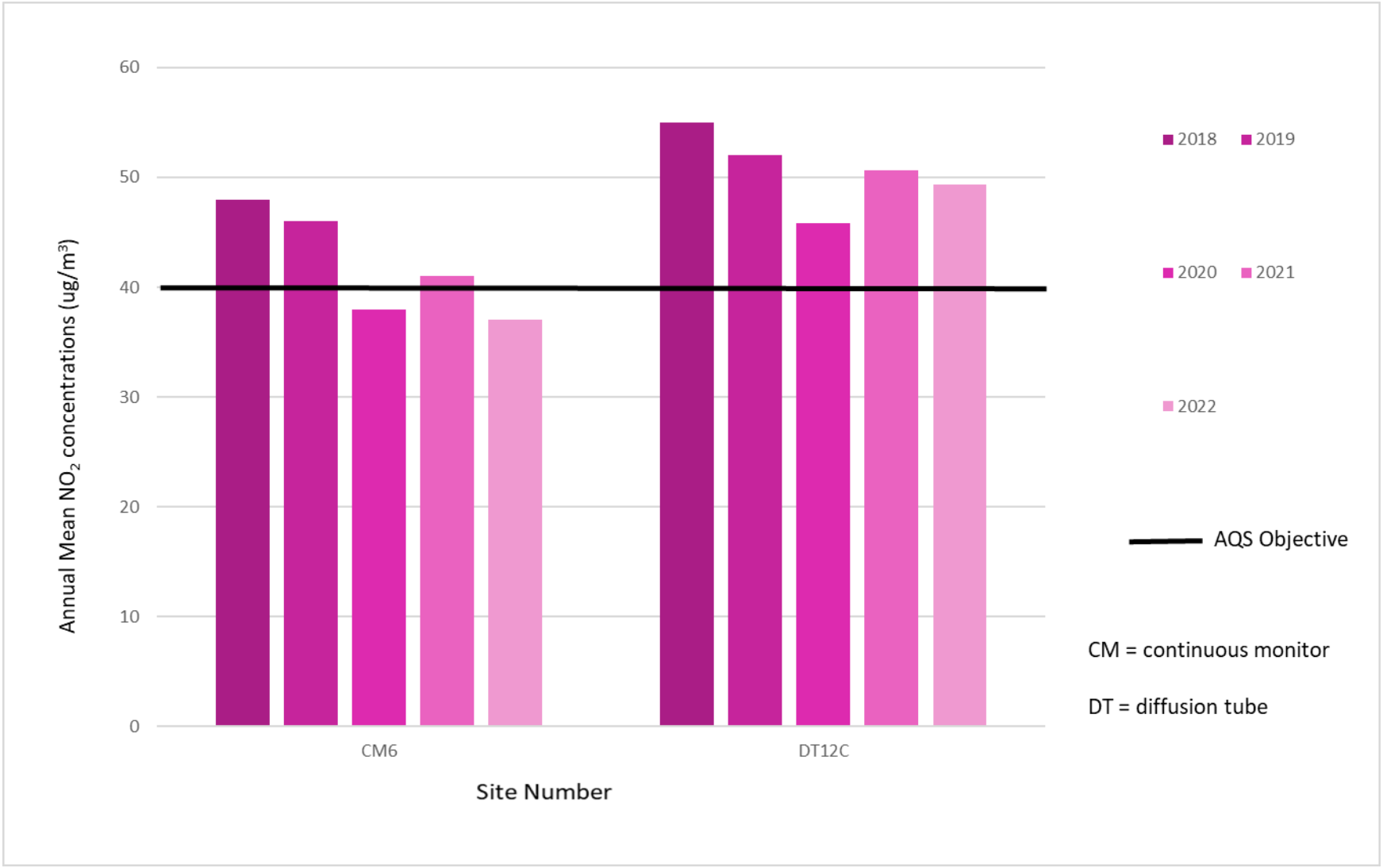

Figure A.7: Trends in Annual Mean NO_2 Concentrations around Harrogate Road / Killinghall junction (area of concern)

Figure A.8 Trends in Annual Mean NO_2 Concentrations around Saltaire Crossroads (area of concern)

Figure A.9: Trends in Annual Mean NO_2 Concentrations around Rooley Lane and Tong Street (area of concern)

Figure A.10: Trends in Annual Mean NO_2 Concentrations around Canal Road (area of concern)

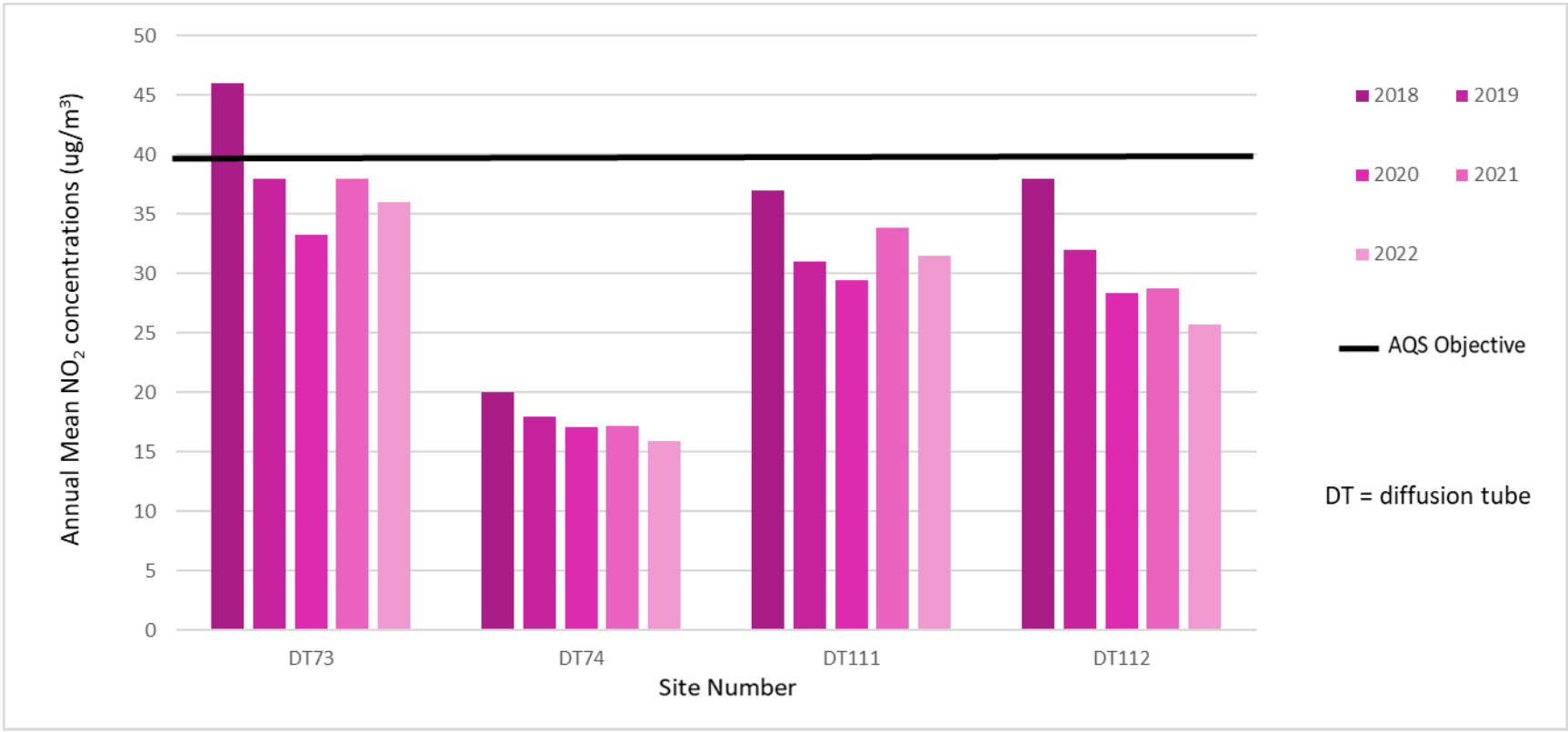

Figure A.11: Trends in Annual Mean NO_2 Concentrations around Greengates Crossroads

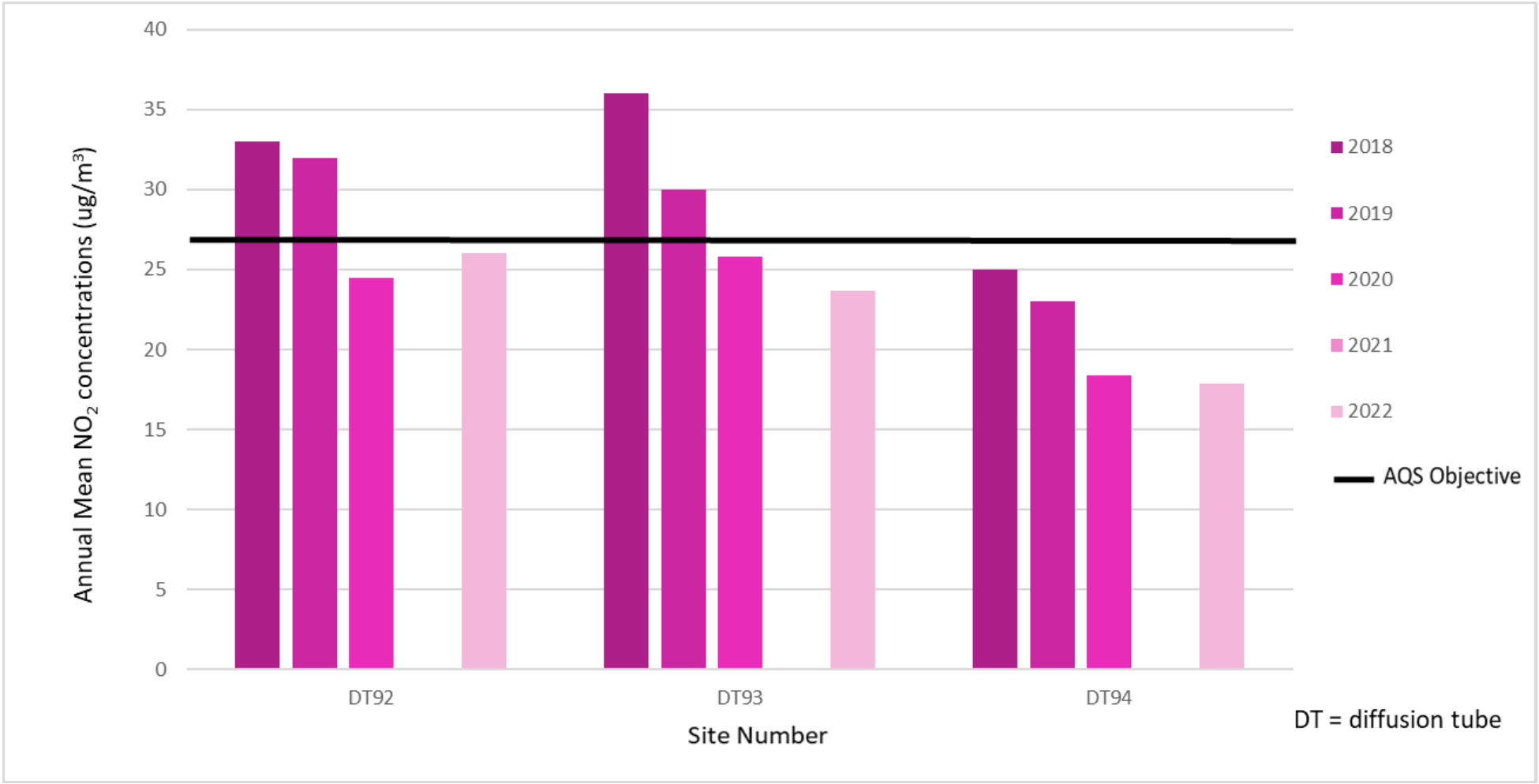

Figure A.12: Trends in Annual Mean NO_2 Concentrations at long term city centre sites

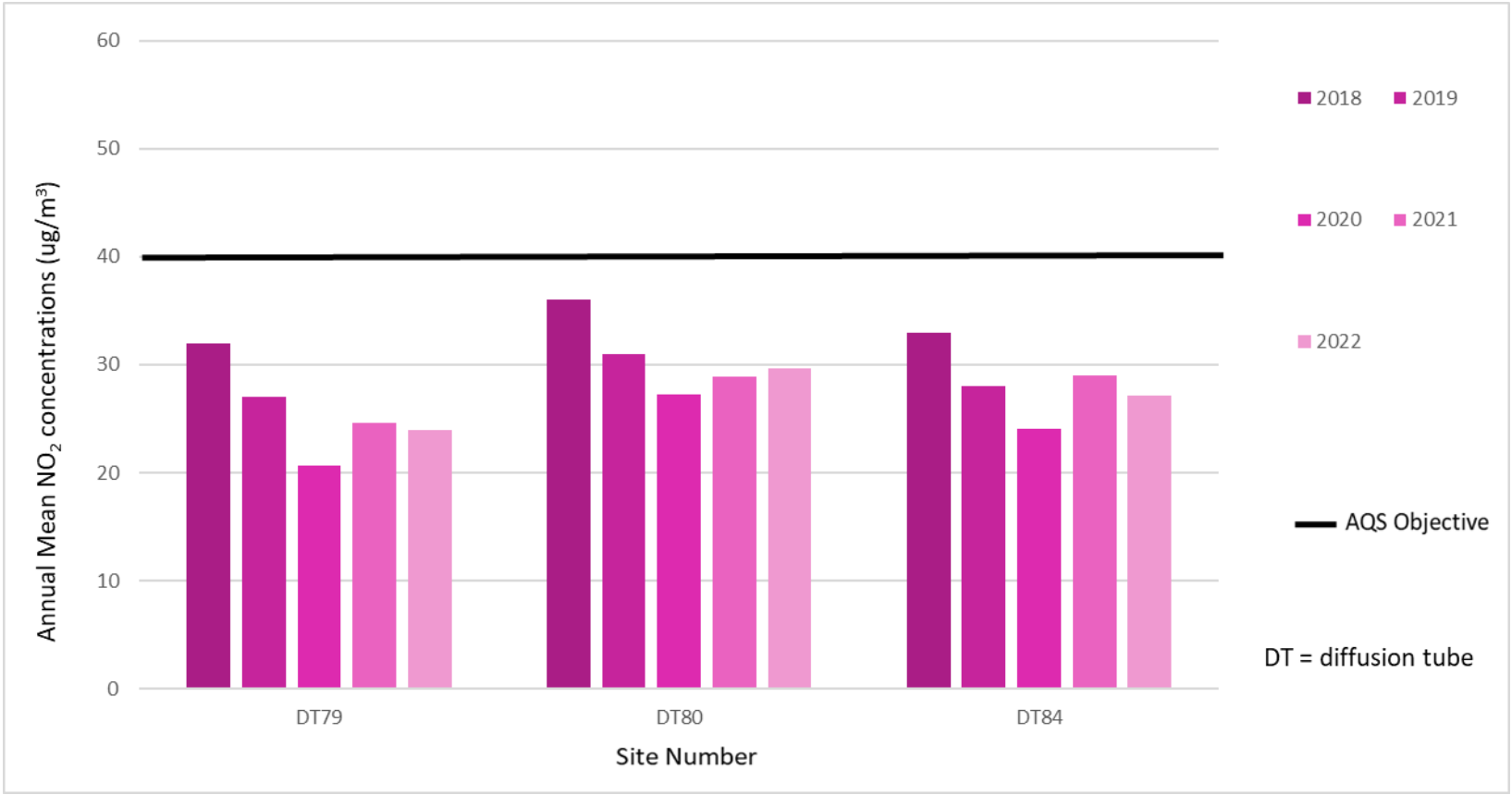

Figure A.13: Trends in Annual Mean NO_2 Concentrations around Parry Lane and Leeds Road

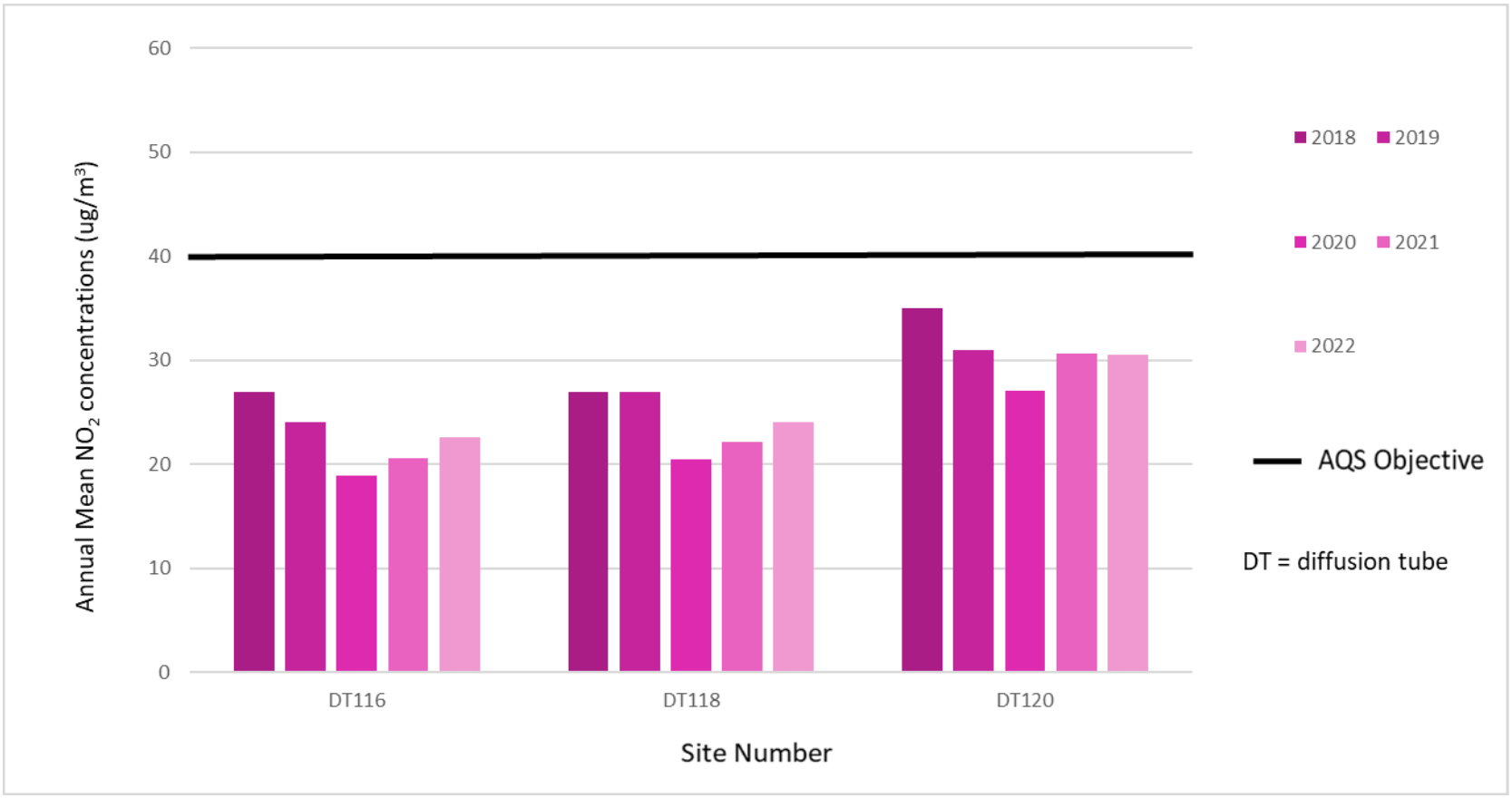

Figure A.14: Trends in Annual Mean NO_2 Concentrations at planning baseline sites

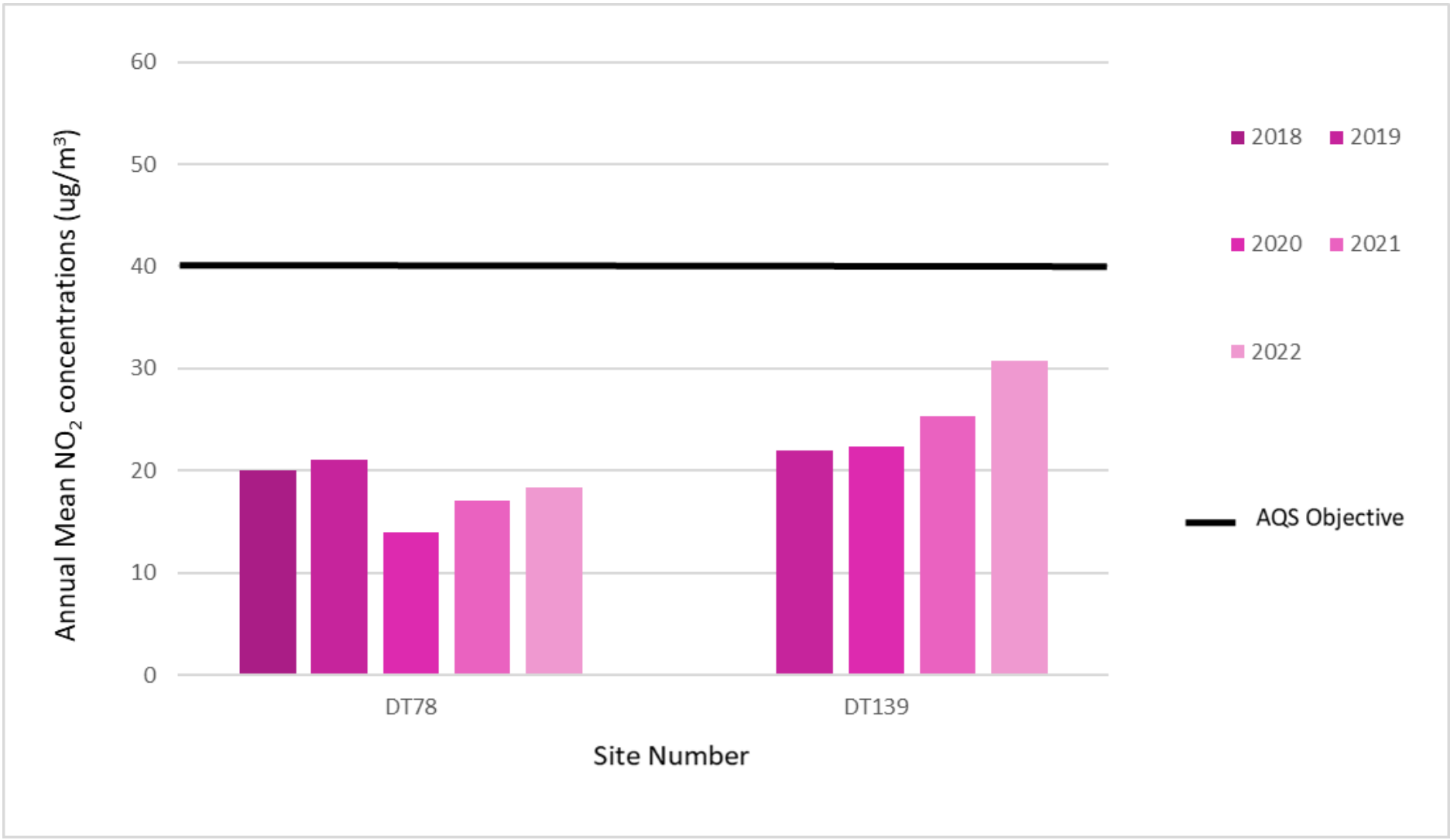

Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

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
CM2	406058	441273	Urban Centre	full year	96.7	0	0	0	**0 (61.0)**	0
CM3	415582	434457	Roadside	full year	91.9	**0 (133.9)**	0	0	0	0
CM4	415933	430569	Roadside	full year	90.5	0	0	**0 (116.4)**	0	0
CM5	415870	433054	Roadside	full year	90.8	0	0	0	**0 (93.3)**	0
CM6	416974	433245	Roadside	full year	97.2	0	0	0	**0 (99.7)**	0
CM7	417860	430705	Roadside	full year	86.2	0	0	0	**0 (129.4)**	0
CM8	419188	430213	Roadside	full year	94.6	0	0	0	0	0

Notes:

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

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

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

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

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

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
CM2	406058	441273	Urban Centre	full year	95.3	**17**	**16**	**12**	**12**	**13**
CM6	416974	433245	Roadside	full year	96.2	21	23	17	17	17
CM8	419188	430213	Roadside	full year	96.6	16	17	14	14	14

☒ **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.15: Trends in Annual Mean PM_{10} Concentrations

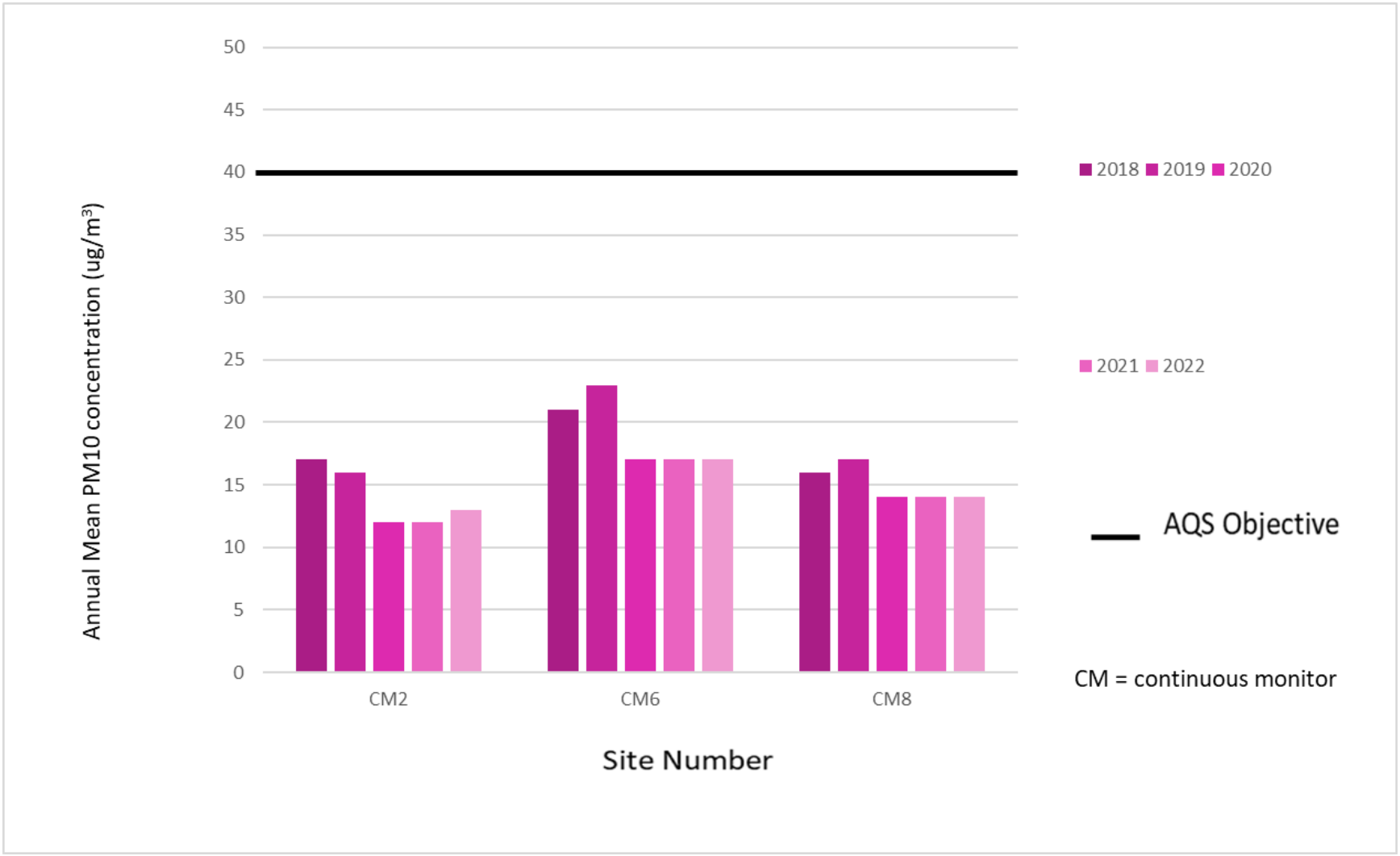

Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

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
CM2	406058	441273	Urban Centre	full year	95.3	4	4	1	0	2
CM6	416974	433245	Roadside	full year	96.2	4	12	4	1	6
CM8	419188	430213	Roadside	full year	96.6	1	1	2	0	3

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.16 – Trends in Number of 24-Hour Mean PM_{10} Results > 50µg/m³

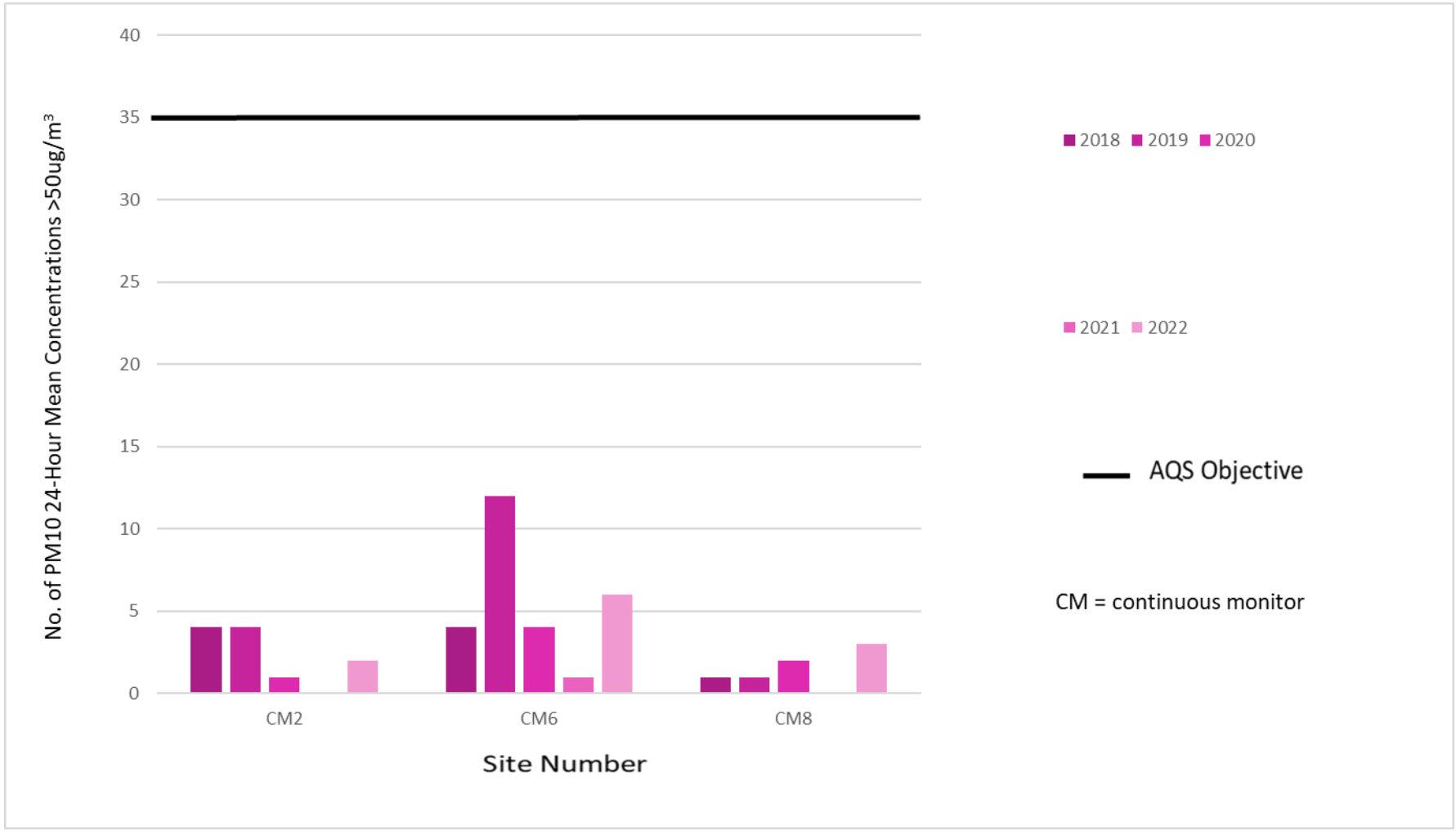

Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results ($\mu g/m^3$)

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
CM2	406058	441273	Urban Centre	full year	95.7	11	10	5	7	9
CM6	416974	433245	Roadside	full year	95.1	14	14	9	9	9
CM8	419188	430213	Roadside	full year	92.6	10	12	7	8	8

☒ **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.17 – Trends in Annual Mean $PM_{2.5}$ Concentrations

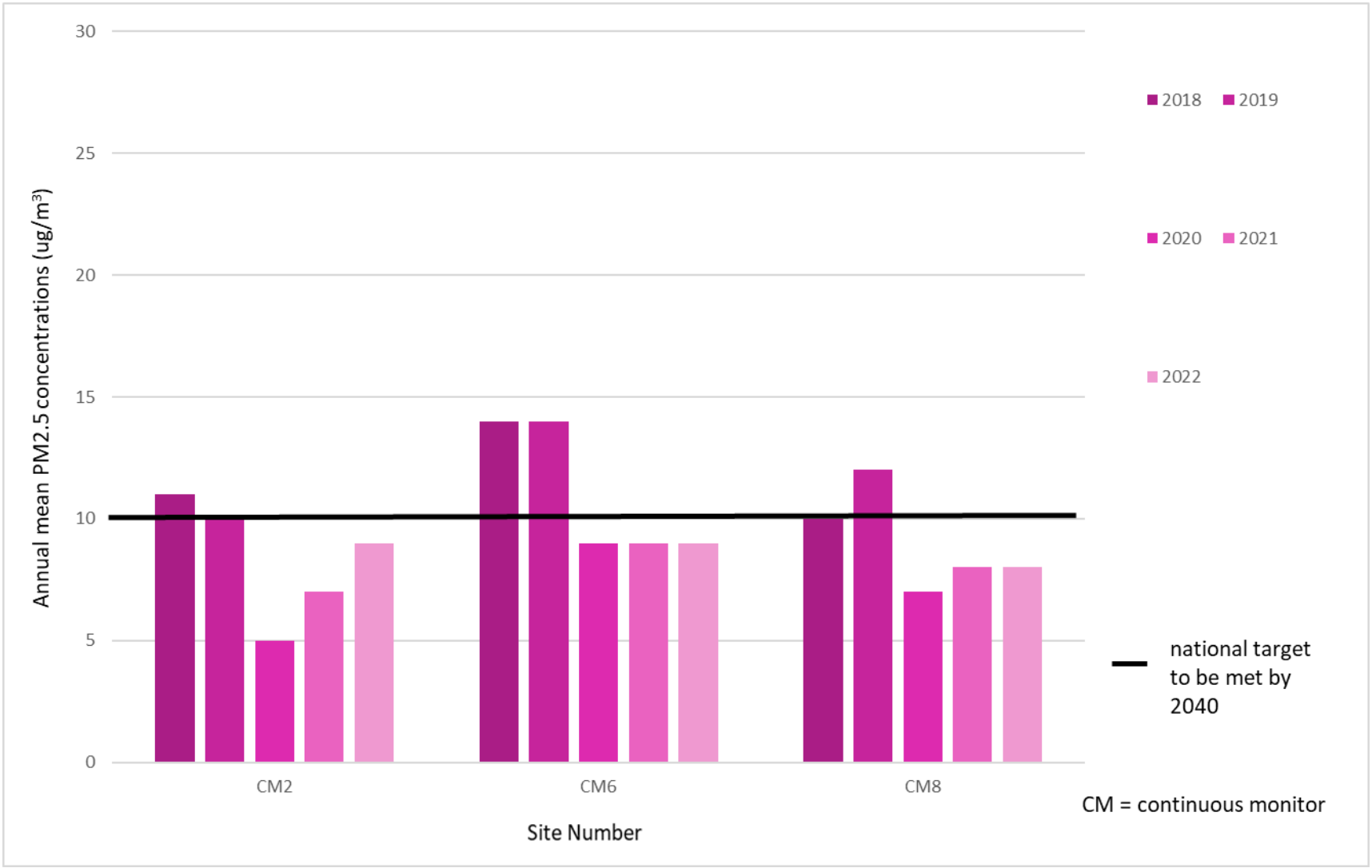

Table A.9 – SO_2 2022 Monitoring Results, Number of Relevant Instances

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	Number of 15-minute Means > 266µg/m^3	Number of 1-hour Means > 350µg/m^3	Number of 24-hour Means > 125µg/m^3
CM2	406058	441273	Urban Centre	full year	96.90%	0	0	0

Notes:

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

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

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 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 (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT168	417033	429293	45.3	36.3	34.2	23.8	27.3	32.2	30.4	35.7	27.3	31.0	36.3	39.2	33.2	27.3	-	
DT198	417930	430975	36.0	24.7	51.3	38.7	30.0	30.2	33.0	41.3	34.0	36.2	42.0	44.5	36.8	30.2	-	
DT197	417846	430739	33.0	24.4	43.8	37.1	26.1	26.4	30.8	35.1	35.6	31.3	40.3	43.7	34.0	27.9	-	
DT196	417369	430370	43.7	41.2	45.6	35.4	30.7	29.7	29.1	33.0	24.4	31.3	40.7	38.5	35.3	28.9	-	
DT195	417178	430344		37.9	42.2	33.6	31.8	32.0	35.9	36.8	32.2	35.3	43.3	43.4	36.8	30.1	-	
DT194	417184	430315	32.9	27.1	38.4	32.4	27.8	26.9	25.9	28.3	27.0	27.8	35.0	34.1	30.3	24.8	-	
DT76	418268	430732	26.7	24.0	42.9							28.0	37.9	34.6	32.3	20.6	-	
DT45	417877	430717		32.4	33.4	25.2	26.1	29.9	26.6	30.5	24.8	27.7	35.5	34.5	29.7	24.3	-	
DT214A	417715	429299	31.6	24.3	31.1	19.5	22.7	24.4	19.7			25.6	30.4	32.3	-	-	-	Triplicate Site with DT214A, DT214B and DT214C - Annual data provided for DT214C only
DT214B	417715	429299	33.8	27.8	31.0	20.9	23.3	24.2	23.4	22.8	19.8	26.5	32.8	33.6	-	-	-	Triplicate Site with DT214A, DT214B and DT214C - Annual data provided for DT214C only
DT214C	417715	429299	29.9	25.1	31.7	16.4	20.2	22.8	22.1	19.1	22.6	26.9	29.8	32.6	25.6	21.0	-	Triplicate Site with DT214A, DT214B and DT214C - Annual data provided for DT214C only
DT215A	417708	429380	24.9	17.8	28.9	15.9	14.7	14.1	13.7	18.3	19.2	21.3	26.2	29.0	-	-	-	Triplicate Site with DT215A, DT215B and DT215C - Annual data provided for DT215C only
DT215B	417708	429380	24.3	18.3	30.1	17.9	13.9	12.7	13.6	17.9	18.7	18.4	27.8	28.4	-	-	-	Triplicate Site with DT215A, DT215B and DT215C - Annual data provided for DT215C only
DT215C	417708	429380		17.3	29.6	17.3	14.7	14.4	14.1	18.8	16.4	21.2	30.0	27.1	20.3	16.7	-	Triplicate Site with DT215A, DT215B and DT215C - Annual data provided for DT215C only
DT216A	418853	430309			31.5	15.5	15.6	13.8	15.6	19.2	19.0	21.8	28.8	30.3	-	-	-	Triplicate Site with DT216A, DT216B and DT216C - Annual data provided for DT216C only
DT216B	418853	430309			32.0	20.8	16.3	15.3	16.1			20.6	27.1	32.9	-	-	-	Triplicate Site with DT216A, DT216B and DT216C - Annual data provided for DT216C only
DT216C	418853	430309			32.5	19.6	17.0	14.1	17.2	19.9	18.5	21.7	28.5	31.5	21.7	17.8	-	Triplicate Site with DT216A, DT216B and DT216C - Annual data provided for DT216C only
DT217A	418829	430288	25.4		29.1	19.0		12.3	15.2	18.7	16.0	18.8	25.9	31.2	-	-	-	Triplicate Site with DT217A, DT217B and DT217C - Annual data provided for DT217C 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 (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT217B	418829	430288	24.9		30.2	19.1	14.9	12.7	14.9	19.0	18.3	18.1	29.6	31.7	-	-	-	Triplicate Site with DT217A, DT217B and DT217C - Annual data provided for DT217C only
DT217C	418829	430288	27.2		27.4	19.1	14.3	11.8	13.9	17.9	18.5	18.6	24.9	29.1	20.7	16.9	-	Triplicate Site with DT217A, DT217B and DT217C - Annual data provided for DT217C only
DT88	418829	430399	34.4	26.0	40.5	30.3	24.8	24.8	25.9		29.0	29.6			29.5	24.2	-	
DT89A	419188	430213			40.8	25.3	32.2	32.4	37.0	37.5	28.5	36.5	42.9	37.0	-	-	-	Triplicate Site with DT89A , DT89B and DT89C - Annual data provided for DT89C only
DT89B	419188	430213	42.3	32.6	36.6	23.8	30.1	32.2	35.9	35.3	32.2	35.2	35.9	35.4	-	-	-	Triplicate Site with DT89A , DT89B and DT89C - Annual data provided for DT89C only
DT89C	419188	430213	39.1	31.4	43.7	25.1	31.7	28.2	37.0	36.6	29.5	36.0	45.2	37.1	34.7	28.5	-	Triplicate Site with DT89A , DT89B and DT89C - Annual data provided for DT89C only
DT199A	419178	430193	30.2	15.7	37.2	27.5	17.8	15.3	17.0	25.8	26.8	18.7	28.4	32.6	-	-	-	Triplicate Site with DT199A, DT199B and DT199C - Annual data provided for DT199C only
DT199B	419178	430193		21.8	39.4	28.7	20.1	14.9	20.8	27.8	26.6	19.8	27.9	34.8	-	-	-	Triplicate Site with DT199A, DT199B and DT199C - Annual data provided for DT199C only
DT199C	419178	430193			37.5	30.2	20.2	15.3	18.3	26.6	23.9	22.0	26.7	33.7	25.3	20.7	-	Triplicate Site with DT199A, DT199B and DT199C - Annual data provided for DT199C only
DT64A	419342	430114	46.9	30.6	42.8	36.0	31.1	30.9	31.6	39.6	31.6	32.1	36.9	36.8	-	-	-	Triplicate Site with DT64A , DT64B and DT64C - Annual data provided for DT64C only
DT64B	419342	430114	40.9	30.6	44.3	36.4	30.2	25.6	31.4	37.5	35.6	29.0	37.9	40.1	-	-	-	Triplicate Site with DT64A , DT64B and DT64C - Annual data provided for DT64C only
DT64C	419342	430114	42.7		41.0	36.6	29.6	29.2	32.0	36.0	33.4	29.9	37.0	39.9	35.1	28.8	-	Triplicate Site with DT64A , DT64B and DT64C - Annual data provided for DT64C only
DT200A	419328	430099	26.3	20.4	30.7	25.5	18.7	17.8	19.0	24.6	22.4	25.5	30.5	30.5	-	-	-	Triplicate Site with DT200A, DT200B and DT200C - Annual data provided for DT200C only
DT200B	419328	430099			32.8	25.6	20.3	15.3	22.5	27.6	23.4	25.8	33.0	34.4	-	-	-	Triplicate Site with DT200A, DT200B and DT200C - Annual data provided for DT200C only
DT200C	419328	430099	34.2		35.0		21.7	18.9	22.0	26.4	24.5	26.4	29.5	34.7	25.6	21.0	-	Triplicate Site with DT200A, DT200B and DT200C - Annual data provided for DT200C only
DT220A	419215	431809		23.7	30.5	19.5	17.9	17.4	20.1	20.8	20.2		26.4	29.6	-	-	-	Triplicate Site with DT220A, DT220B and DT220C - Annual data provided for DT220C only
DT220B	419215	431809				20.0	19.1	17.1	17.8	22.2	19.8		27.7	29.6	-	-	-	Triplicate Site with DT220A, DT220B and DT220C - Annual data provided for DT220C only
DT220C	419215	431809			31.8	21.4	18.6	17.6	20.4	21.0	18.7		27.5	28.1	22.8	18.7	-	Triplicate Site with DT220A, DT220B and DT220C - Annual data provided for DT220C only
DT221A	419196	431834		19.6	27.7	16.9	16.0	14.4	16.4	18.8	17.7	20.0	26.8	29.6	-	-	-	Triplicate Site with DT221A, DT221B and DT221C - Annual data provided for DT221C only
DT221B	419196	431834				17.9	15.8	14.5	14.6	19.3	17.2	19.7	28.2	30.5	-	-	-	Triplicate Site with DT221A, DT221B and DT221C - Annual data provided for DT221C only
DT221C	419196	431834		20.9	28.9	13.9	15.0	13.4	16.3	17.8	17.8	20.3	26.6	26.9	20.2	16.6	-	Triplicate Site with DT221A, DT221B and DT221C - Annual data provided for DT221C 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 (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT222A	417861	431486	27.5	16.0	47.9	30.3	21.5	18.2	22.3	28.0	28.4			39.8	-	-	-	Triplicate Site with DT222A, DT222B and DT222C - Annual data provided for DT222C only
DT222B	417861	431486			45.1	31.3	22.9	18.7	21.5	29.0	36.5	24.9	38.5	39.5	-	-	-	Triplicate Site with DT222A, DT222B and DT222C - Annual data provided for DT222C only
DT222C	417861	431486	27.3	22.0	40.7	32.0	23.3	19.5	24.2	29.7	30.0	27.4	34.4	35.5	29.0	23.8	-	Triplicate Site with DT222A, DT222B and DT222C - Annual data provided for DT222C only
DT223A	417862	431536	44.0	39.5	59.0	34.9	39.3	40.7	42.4	53.8	50.0	35.2	49.8	53.8	-	-	-	Triplicate Site with DT223A, DT223B and DT223C - Annual data provided for DT223C only
DT223B	417862	431536	44.3	40.2	62.2	44.6	42.5	44.3	44.9	56.5	48.3	45.3	53.6	56.5	-	-	-	Triplicate Site with DT223A, DT223B and DT223C - Annual data provided for DT223C only
DT223C	417862	431536	47.8	37.1	59.3	45.5	41.8	39.0	41.9	50.5	48.4	43.5	52.1	55.4	46.9	38.5	**34.6**	Triplicate Site with DT223A, DT223B and DT223C - Annual data provided for DT223C only
DT218A	418292	431290	42.4	34.2	39.6		30.8	30.9	33.3	40.2	26.2	34.8	44.5	47.6	-	-	-	Triplicate Site with DT218A, DT218B and DT218C - Annual data provided for DT218C only
DT218B	418292	431290	40.3		46.6	34.8	29.4	29.6	32.4	38.5	27.0	29.7	41.5	44.8	-	-	-	Triplicate Site with DT218A, DT218B and DT218C - Annual data provided for DT218C only
DT218C	418292	431290	36.8	8.9	43.1	36.2	34.0	35.5	32.7	40.2	25.0	34.3	44.4	49.0	35.4	29.1	-	Triplicate Site with DT218A, DT218B and DT218C - Annual data provided for DT218C only
DT219A	418303	431328	33.9	27.6	38.6	27.0	19.6	25.7	20.1	29.4	35.7	33.6	40.7	41.5	-	-	-	Triplicate Site with DT219A, DT219B and DT219C - Annual data provided for DT219C only
DT219B	418303	431328	39.1	26.5	40.4	26.8	27.0	26.1	26.8	31.1	33.3	33.3	37.8	36.5	-	-	-	Triplicate Site with DT219A, DT219B and DT219C - Annual data provided for DT219C only
DT219C	418303	431328	33.2	27.7	36.5		25.9	27.4	27.3	31.7	35.1	30.9	39.4	36.8	31.6	25.9	-	Triplicate Site with DT219A, DT219B and DT219C - Annual data provided for DT219C only
DT116	418564	432218	33.4	25.2	38.6	23.7	18.1	20.8		25.6	24.6	27.6	30.4	35.2	27.6	22.6	-	
DT118	418666	432470	36.5	32.1	31.0	26.3	24.4	26.0	26.8	27.1	27.3	28.0	35.1	31.8	29.4	24.1	-	
DT201	418108	432322		39.9	38.1	26.1	27.6	30.7	33.2	33.9	29.3	35.0	40.7	40.8	34.1	28.0	-	
DT202	418135	432272	35.7	22.6	31.9	19.5	18.0	17.5	23.6	26.0	23.8	25.7	32.7	33.5	25.9	21.2	-	
DT203	418345	432366		33.3	37.9	24.6	29.0	26.9	28.2	28.8	29.0	31.9	36.7	36.7	31.2	25.6	-	
DT160A	418644	432899	40.0	30.6	31.6	24.1	21.2	25.5	23.6	29.7	27.5	24.4	30.6	35.6	-	-	-	Triplicate Site with DT160A, DT160B and DT160C - Annual data provided for DT160C only
DT160B	418644	432898	43.0	29.5	32.7	26.2	25.8	26.9	25.3	31.2	25.3	30.1	36.2	26.0	-	-	-	Triplicate Site with DT160A, DT160B and DT160C - Annual data provided for DT160C only
DT160C	418644	432898	36.7	30.2	33.9	21.6	22.8	24.3	23.8	28.2	26.3	28.7	29.6	36.4	29.0	23.8	-	Triplicate Site with DT160A, DT160B and DT160C - Annual data provided for DT160C only
DT204A	418640	432870	30.6	24.1	34.5	24.0	19.4	17.0	19.6	22.7	23.8	22.7	29.8	33.6	-	-	-	Triplicate Site with DT204A, DT204B and DT204C - Annual data provided for DT204C 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 (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT204B	418640	432870	33.5	25.0	35.5	22.0	19.5	16.8	19.6	23.1	24.8	24.6	26.7	32.6	-	-	-	Triplicate Site with DT204A, DT204B and DT204C - Annual data provided for DT204C only
DT204C	418640	432870	29.0	22.7	36.0	24.2	18.8	17.6	20.3	24.4	23.1	24.0	29.9	30.2	25.2	20.6	-	Triplicate Site with DT204A, DT204B and DT204C - Annual data provided for DT204C only
DT120A	417991	432926	42.6	43.0	41.9	34.6	34.5	32.1	35.8	36.3	31.6	37.9	41.8	44.0	-	-	-	Triplicate Site with DT120A, DT120B and DT120C - Annual data provided for DT120C only
DT120B	417991	432926	42.2	35.7	43.1	34.5	36.6	35.2	35.6	40.0	32.1	38.3	40.9	45.7	-	-	-	Triplicate Site with DT120A, DT120B and DT120C - Annual data provided for DT120C only
DT120C	417991	432926	50.3	38.1	43.7	33.7	29.8		36.1	38.4	33.3	38.1	37.9	42.4	37.2	30.5	-	Triplicate Site with DT120A, DT120B and DT120C - Annual data provided for DT120C only
DT209A	417960	432907		40.3	47.0	34.2	34.3	26.4	35.4		34.3	38.2	43.2	40.6	-	-	-	Triplicate Site with DT209A, DT209B and DT209C - Annual data provided for DT209C only
DT209B	417960	432907	49.7	40.0	51.1	32.6	35.9	34.3	31.5			38.7	38.5	43.3	-	-	-	Triplicate Site with DT209A, DT209B and DT209C - Annual data provided for DT209C only
DT209C	417960	432907			50.0	35.5	35.8	33.5	35.5		30.8	9.1	44.0	44.1	38.2	31.3	-	Triplicate Site with DT209A, DT209B and DT209C - Annual data provided for DT209C only
DT205	418597	433111	38.1	23.3	40.6	31.1	26.6	24.9	27.1	34.6	28.7	32.3	38.6	34.7	31.7	26.0	-	
DT206	418579	433109	46.7	37.9	45.6	32.1	31.5	31.1	31.9	34.2		38.8	41.9	43.2	37.7	30.9	-	
DT233	418546	433430	39.3	34.3	36.6	31.5	28.3		30.8	32.4	28.7	32.0	37.7	39.2	33.7	27.6	-	
DT232	418563	433432	38.1	26.7	34.5	24.8	22.9	22.7	25.5	26.8	23.8	31.9			27.8	22.8	-	
DT230A	418784	434409		20.0	35.4	21.9		19.5	20.6		22.0	25.6	32.1	32.1	-	-	-	Triplicate Site with DT230A, DT230B and DT230C - Annual data provided for DT230C only
DT230B	418784	434409		24.0	36.0	19.0	22.9	21.7	22.5		21.5	25.1	34.5	36.2	-	-	-	Triplicate Site with DT230A, DT230B and DT230C - Annual data provided for DT230C only
DT230C	418784	434409		25.0	31.4	21.8	19.9	19.9	22.0		23.0	26.9	32.8	29.3	25.5	20.9	-	Triplicate Site with DT230A, DT230B and DT230C - Annual data provided for DT230C only
DT231A	418791	434424	31.2	25.5	31.0	16.7	18.5	18.1	19.6	20.2	16.1	24.3	31.0	30.9	-	-	-	Triplicate Site with DT231A, DT231B and DT231C - Annual data provided for DT231C only
DT231B	418791	434424	31.0		33.4	17.6	19.0	20.1	20.9	19.3	17.6	27.8	34.4	32.0	-	-	-	Triplicate Site with DT231A, DT231B and DT231C - Annual data provided for DT231C only
DT231C	418791	434424	26.4	23.2	31.7	16.9	17.9	18.5	20.1	20.4	17.6	26.0	33.6	29.5	23.9	19.6	-	Triplicate Site with DT231A, DT231B and DT231C - Annual data provided for DT231C only
DT5	417982	434886	39.1	33.6	36.1	22.2	28.9	32.0	34.0			40.1	48.9	39.2	35.4	29.0	-	
DT39A	417927	434799		27.1	37.4	31.3	28.8	29.6	29.2	31.2	28.3	35.1	40.1		-	-	-	Triplicate Site with DT39A, DT39B and DT39C - Annual data provided for DT39C only
DT39B	417927	434799	34.1	32.7	37.2	32.1	29.6	26.5	29.7	36.6	29.8	36.4	37.5		-	-	-	Triplicate Site with DT39A, DT39B and DT39C - Annual data provided for DT39C only

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DT39C	417927	434799		27.5	36.5	29.9	26.9	30.4	31.2	34.9	28.8	35.7	38.2		32.4	26.5	-	Triplicate Site with DT39A, DT39B and DT39C - Annual data provided for DT39C only
DT208A	417966	434884	26.8	26.3	32.2	23.9	20.8	16.4	19.3	24.6	23.0	29.7	39.6	35.3	-	-	-	Triplicate Site with DT208A, DT208B and DT208C - Annual data provided for DT208C only
DT208B	417966	434884	31.4	27.2	34.1	26.8		18.8	19.7	24.3	22.0	30.1	39.2	36.8	-	-	-	Triplicate Site with DT208A, DT208B and DT208C - Annual data provided for DT208C only
DT208C	417966	434884	26.5	25.8	32.2	24.9	20.7	18.7	18.3	24.7	19.8	30.2	38.8	34.1	26.8	21.9	-	Triplicate Site with DT208A, DT208B and DT208C - Annual data provided for DT208C only
DT99	418033	434970	30.2	27.5	30.6	22.4	20.1	21.6		25.3	23.8	29.1	35.8	37.3	27.6	22.6	-	
DT86	417894	434753	34.9		41.9	32.9	27.5	30.5	32.0	38.3	32.5	38.0	40.6	38.5	35.2	28.9	-	
DT42A	417902	434751		38.8	33.5	34.4	33.8	35.6	36.9	42.6		42.4	43.3	43.8	-	-	-	Triplicate Site with DT42A, DT42B and DT42C - Annual data provided for DT42C only
DT42B	417902	434751			42.0	32.6	32.1	34.2	37.7		36.9	36.8	44.0	46.1	-	-	-	Triplicate Site with DT42A, DT42B and DT42C - Annual data provided for DT42C only
DT42C	417902	434751		38.2	40.7	35.6	33.9	33.8	35.5	41.9	33.5	39.5	42.6	40.8	38.2	31.3	-	Triplicate Site with DT42A, DT42B and DT42C - Annual data provided for DT42C only
DT207A	417912	434759	29.9	24.7	39.0	31.0	24.3	24.1	26.2	32.4	29.1	31.5	32.4	32.9	-	-	-	Triplicate Site with DT207A, DT207B and DT207C - Annual data provided for DT207C only
DT207B	417912	434759	27.3	27.3	40.1	31.5	27.0	26.9	28.5	32.9	30.1	32.6	39.7	33.1	-	-	-	Triplicate Site with DT207A, DT207B and DT207C - Annual data provided for DT207C only
DT207C	417912	434759	24.4	24.0	35.6	26.5	25.8	23.5	25.2	31.3	30.4	30.0	35.5	30.0	29.9	24.5	-	Triplicate Site with DT207A, DT207B and DT207C - Annual data provided for DT207C only
DT228A	418090	434429	27.5	50.3	43.3	35.0	36.6	46.5	46.5	40.4	35.9	45.2	48.6	47.9	-	-	-	Triplicate Site with DT228A, DT228B and DT228C - Annual data provided for DT228C only
DT228B	418090	434429	29.5	40.5	48.7	37.5	43.1	48.5	45.7	45.0	41.7	47.6	52.3	52.3	-	-	-	Triplicate Site with DT228A, DT228B and DT228C - Annual data provided for DT228C only
DT228C	418090	434429	27.3	50.7	41.5	29.3	40.3	47.2	44.7	45.2	36.1	43.7	48.0	47.1	42.7	35.0	-	Triplicate Site with DT228A, DT228B and DT228C - Annual data provided for DT228C only
DT229A	418059	434509	53.8	20.6	38.8	29.2	25.2	21.7	24.4	30.9	26.7	28.7	35.4	33.1	-	-	-	Triplicate Site with DT229A, DT229B and DT229C - Annual data provided for DT229C only
DT229B	418059	434509	57.9	23.3	41.0	28.4	23.1	22.9	22.6	31.8	26.2	29.4	34.4	34.0	-	-	-	Triplicate Site with DT229A, DT229B and DT229C - Annual data provided for DT229C only
DT229C	418059	434509	48.3	20.6	39.2	29.1	24.2	19.8	23.8	30.0	25.8	28.8	37.0	34.7	30.7	25.2	-	Triplicate Site with DT229A, DT229B and DT229C - Annual data provided for DT229C only
DT92	419006	437217	37.0	31.9	42.2	27.1	24.3	23.9		29.3	25.8		37.7	38.5	31.8	26.0	-	
DT93	419003	437308						20.9	21.7	25.9	25.5	29.0	39.5	36.3	28.4	23.7	-	
DT286	419103	437334										36.8	37.7	38.2	37.5	24.2	-	

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DT94	419076	437345	26.0	21.5	31.8	14.9	16.0	15.1	14.7	17.5	15.9	25.4	32.4	30.3	21.8	17.9	-	
DT273	419138	437213	38.3	20.7	38.0	22.1	22.4	21.3	23.4	27.7	21.6	28.3	35.9	36.3	28.0	23.0	-	
DT274	419107	437314	32.3	25.1	37.2	27.8	25.7		27.1	33.1	29.0	32.3	38.1	39.5	31.6	25.9	-	
DT275	419317	437551			33.6	23.9		26.6	29.7	33.5	28.7	37.1	46.5	36.6	32.9	27.0	-	
DT276	418979	437969	27.0	20.9	30.1	20.2	20.3	14.9	14.5	17.2	14.9	18.9	22.9	25.5	20.6	16.9	-	
DT272	417661	433528	35.9	23.8	39.6	28.5	25.6	27.2	25.6	29.2	24.1	32.5	38.5	36.2	30.6	25.1	-	
DT224A	417117	433431	42.1	27.6	33.9	28.0		25.7	27.2	28.7	26.0	31.1	35.0	36.1	-	-	-	Triplicate Site with DT224A, DT224B and DT224C - Annual data provided for DT224C only
DT224B	417117	433431	44.6	31.1	36.4	27.3	25.9	24.2	29.0	29.6	25.9	29.2	33.7	32.8	-	-	-	Triplicate Site with DT224A, DT224B and DT224C - Annual data provided for DT224C only
DT224C	417117	433431		30.8	36.2	24.8	24.4	26.7	27.5	29.9	27.0	31.0	36.0	35.6	30.8	25.3	-	Triplicate Site with DT224A, DT224B and DT224C - Annual data provided for DT224C only
DT225A	417087	433444	54.0	43.6	46.7	34.0	39.7	39.5	41.9	40.9	38.2	45.3	49.4	48.2	-	-	-	Triplicate Site with DT225A, DT225B and DT225C - Annual data provided for DT225C only
DT225B	417087	433444	52.3	42.8	46.8	36.8	35.8	41.2	40.8	41.8	36.9	41.2	45.7	47.3	-	-	-	Triplicate Site with DT225A, DT225B and DT225C - Annual data provided for DT225C only
DT225C	417087	433444	52.1	41.9	43.6	35.4	35.1	39.3	39.8	40.5	37.6	42.9	50.1	49.4	42.7	35.0	-	Triplicate Site with DT225A, DT225B and DT225C - Annual data provided for DT225C only
DT226A	417047	434252		30.9				27.0	28.6	29.0	26.2	34.2	41.5	36.2	-	-	-	Triplicate Site with DT226A, DT226B and DT226C - Annual data provided for DT226C only
DT226B	417047	434252	41.6	27.2				29.2	26.3	26.6	23.2			39.8	-	-	-	Triplicate Site with DT226A, DT226B and DT226C - Annual data provided for DT226C only
DT226C	417047	434252	38.3	27.6				28.6	28.0	28.5		31.7	38.3	38.3	32.0	26.3	-	Triplicate Site with DT226A, DT226B and DT226C - Annual data provided for DT226C only
DT227A	417054	434165	30.9	24.5	33.6	21.5	22.1	22.7	21.8		25.4	26.6	32.8	31.3	-	-	-	Triplicate Site with DT227A, DT227B and DT227C - Annual data provided for DT227C only
DT227B	417054	434165	32.1	25.0	35.6	27.0	22.6	21.0	21.7	26.3	26.4	29.0	33.0	33.8	-	-	-	Triplicate Site with DT227A, DT227B and DT227C - Annual data provided for DT227C only
DT227C	417054	434165	30.4	24.0	36.1	27.5	19.7		20.3	25.7	26.5	27.3	35.7	33.8	27.3	22.4	-	Triplicate Site with DT227A, DT227B and DT227C - Annual data provided for DT227C only
DT123A	414766	437113	39.6	38.5	52.1	42.3	34.9	34.4	36.9		33.9	33.8	44.8	41.7	39.4	32.3	-	
DT123	414660	436974	46.5	40.2	47.4		36.0	37.3	37.0	42.7	36.6	41.6	48.9		41.4	34.0	-	
DT124	414620	436924	40.7		43.3	34.9	31.5	32.0	33.0	37.0		34.7	39.3	41.4	36.8	30.2	-	

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DT121	414546	436933	32.4	21.6	30.6	22.3	19.3	19.7	21.1	24.6	22.5	27.4	34.2	35.6	25.9	21.3	-	
DT122	414567	436811	42.2	36.9	40.1	35.6	30.4	29.7	31.4	31.5	32.9	34.5	38.1	41.1	35.4	29.0	-	
DT126	414643	436505	26.4	20.6	33.5	22.9	18.4	16.5	18.1	20.2	21.7	21.9	28.2	32.5	23.4	19.2	-	
DT125	414674	436471	26.4	17.9	34.2	19.0	17.0		17.3	19.8	20.2	23.1	30.7	32.5	23.5	19.2	-	
DT127	415044	435558	39.9	36.1	60.1	46.7	39.9	31.8	36.8	47.0	41.3	41.9	50.9	50.5	43.6	35.7	-	
DT128	415331	435796	18.9	13.1	24.4	13.8	9.8	8.4	12.3	12.7	12.2	14.8	19.7	23.9	15.3	12.6	-	
DT130	415839	434674		35.6	40.0	34.3	34.7	27.2	30.5	36.7	30.3	34.5	38.9	37.4	34.6	28.3	-	
DT132	415717	434265	57.3	47.8	54.2	40.0	40.0	38.6	43.0	42.9	41.7	42.1	46.5	50.2	45.4	37.2	**32.4**	
DT71A	415580	434461				36.1	34.9	35.4	37.7	41.9	38.8	31.4		39.2	-	-	-	Triplicate Site with DT71A , DT71B and DT71C - Annual data provided for DT71C only
DT71B	415580	434461						35.8	38.3	41.8	37.8				-	-	-	Triplicate Site with DT71A , DT71B and DT71C - Annual data provided for DT71C only
DT71C	415580	434461					35.4	37.5	38.6	40.2	38.5	32.7			37.1	34.0	-	Triplicate Site with DT71A , DT71B and DT71C - Annual data provided for DT71C only
DT278	415570	434477				43.1	42.3	49.6	50.6	52.5	50.2	44.1	45.4	48.0	47.3	38.8	**32.5**	
DT172A	415590	434478	43.1	34.7	45.8	28.5	27.8	33.0	36.6	36.8	36.7	36.8	42.6	40.4	-	-	-	Triplicate Site with DT172A, DT172B and DT172C - Annual data provided for DT172C only
DT172B	415590	434478	46.8	35.4	48.1	30.8	30.0	35.0	36.8	37.6	38.3	34.5	41.3	44.4	-	-	-	Triplicate Site with DT172A, DT172B and DT172C - Annual data provided for DT172C only
DT172C	415590	434478	44.8	32.3	47.7	29.1	32.0	34.5	36.4	37.9	37.7	33.0	39.8	42.6	37.5	30.7	-	Triplicate Site with DT172A, DT172B and DT172C - Annual data provided for DT172C only
DT72	415573	434521	45.7	42.2	66.2	57.8	47.5	52.0	54.2	60.5	59.7	50.2	51.9	62.1	54.2	44.4	-	
DT235A	415474	434456	40.6	33.5	58.3	38.5	38.2	35.5	37.5	42.9	44.3	46.2	55.9	50.9	-	-	-	Triplicate Site with DT235A, DT235B and DT235C - Annual data provided for DT235C only
DT235B	415474	434456	46.0	39.6	55.2	40.0	34.4	34.5	41.3	42.1	45.4	47.6	51.1	52.2	-	-	-	Triplicate Site with DT235A, DT235B and DT235C - Annual data provided for DT235C only
DT235C	415474	434456	44.0	38.5	57.2	33.4	35.9	34.6	35.1	41.0	40.2	42.8	44.8		43.1	35.3	-	Triplicate Site with DT235A, DT235B and DT235C - Annual data provided for DT235C only
DT156	414781	434126			57.8			32.1	35.7	44.7	38.3	41.3	47.9	49.9	43.5	33.7	-	
DT236	414498	433935		24.4	42.7	27.1	23.7	22.3	23.3	29.0	27.6	30.9	33.9	35.1	29.1	23.8	-	

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DT237	414536	433981	28.9	25.0	32.6	31.0			29.4	35.6	29.8	30.0	39.6	36.4	31.8	26.1	-	
DT238A	414290	433759			43.7	23.6	24.3	28.0	31.4	30.1	29.7	34.5	35.6	36.8	-	-	-	Triplicate Site with DT238A, DT238B and DT238C - Annual data provided for DT238C only
DT238B	414290	433759			44.0	26.5	27.6		30.9	33.1		31.7	37.7	41.3	-	-	-	Triplicate Site with DT238A, DT238B and DT238C - Annual data provided for DT238C only
DT238C	414290	433759			38.5	28.7	27.1	28.8	28.2	30.1	29.0	35.5	39.1	40.9	32.5	26.6	-	Triplicate Site with DT238A, DT238B and DT238C - Annual data provided for DT238C only
DT239A	414268	433765	49.3	42.0	47.9	36.2	34.5	40.3	39.3	40.6	38.3	38.6	45.9	44.4	-	-	-	Triplicate Site with DT239A, DT239B and DT239C - Annual data provided for DT239C only
DT239B	414268	433765	54.7	48.2	46.6	36.0	35.0	42.6	42.3	41.7	36.0	42.8	50.4	47.8	-	-	-	Triplicate Site with DT239A, DT239B and DT239C - Annual data provided for DT239C only
DT239C	414268	433765	47.3	43.6	46.8	36.7	35.5	39.0	38.1	42.1	36.6	41.5	43.3	43.6	42.1	34.5	-	Triplicate Site with DT239A, DT239B and DT239C - Annual data provided for DT239C only
DT139A	414396	433648	39.0	36.0	45.2	32.1	31.7	34.9	35.2	38.5	33.2	38.0	44.4	43.1	-	-	-	Triplicate Site with DT139A, DT139B and DT139C - Annual data provided for DT139C only
DT139B	414396	433648	44.7	38.2	45.2	33.1	30.5	35.5	35.8	39.6	31.8	38.4	46.4	42.3	-	-	-	Triplicate Site with DT139A, DT139B and DT139C - Annual data provided for DT139C only
DT139C	414396	433648	39.6	31.9	44.6	30.2	28.7	31.4	33.9	36.8	33.9	37.1	44.5	41.2	37.4	30.7	-	Triplicate Site with DT139A, DT139B and DT139C - Annual data provided for DT139C only
DT240A	414403	433665	58.3	37.4	47.1	39.4	36.1	38.9	37.1	43.6	39.7	33.9	45.4	44.0	-	-	-	Triplicate Site with DT240A, DT240B and DT240C - Annual data provided for DT240C only
DT240B	414403	433665	41.3	32.7	44.5	32.5	28.9	33.7	36.7	41.6	38.5	34.4	52.0	35.8	-	-	-	Triplicate Site with DT240A, DT240B and DT240C - Annual data provided for DT240C only
DT240C	414403	433665	48.2	38.2	48.0	39.6	34.4	37.4	37.7	43.1	39.0	35.3	55.5	45.4	40.4	33.2	-	Triplicate Site with DT240A, DT240B and DT240C - Annual data provided for DT240C only
DT152	413835	433663	44.3	34.6	50.2	44.3	36.9	38.0	43.0	47.7	45.4	40.3	47.8	45.7	43.2	35.4	-	
DT151A	413700	433687	31.6	23.6	48.2	36.6	30.5	29.3	30.9	37.4	39.7	31.3	43.6	40.2	-	-	-	Triplicate Site with DT151A, DT151B and DT151C - Annual data provided for DT151C only
DT151B	413700	433687	30.6	27.0	45.8	39.7	29.8	28.8	32.4	40.0	35.9	35.4	46.0	41.3	-	-	-	Triplicate Site with DT151A, DT151B and DT151C - Annual data provided for DT151C only
DT151C	413700	433687	32.9	26.1	44.0	38.9	28.5	29.0	30.8	34.7	35.2	36.9	42.3	41.9	35.5	29.1	-	Triplicate Site with DT151A, DT151B and DT151C - Annual data provided for DT151C only
DT149A	413750	433573	40.3	36.7	43.1	31.0	33.9	38.9	35.5	37.2	34.7	34.5	41.0	39.3	-	-	-	Triplicate Site with DT149A, DT149B and DT149C - Annual data provided for DT149C only
DT149B	413750	433573	47.2	37.5	43.7	35.4	35.1	37.6	35.0	38.6	38.0	37.4	46.5	39.7	-	-	-	Triplicate Site with DT149A, DT149B and DT149C - Annual data provided for DT149C only
DT149C	413750	433573	38.7	33.5	44.2	33.9	30.1	35.3	33.7	36.4	35.5	35.8	41.5	38.7	37.6	30.9	-	Triplicate Site with DT149A, DT149B and DT149C - Annual data provided for DT149C only
DT241A	413840	432676	31.4	21.5	42.9		25.3	23.2	26.8	29.8	28.9	28.1	33.5	37.4	-	-	-	Triplicate Site with DT241A, DT241B and DT241C - Annual data provided for DT241C only

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DT241B	413840	432676	28.9	24.7	44.5		25.2	25.0	27.0	31.7	28.6	28.3	34.4	35.1	-	-	-	Triplicate Site with DT241A, DT241B and DT241C - Annual data provided for DT241C only
DT241C	413840	432676	29.4	25.0	45.2		28.4	23.6	27.8	30.4	30.2	27.2	36.3	36.0	30.3	24.9	-	Triplicate Site with DT241A, DT241B and DT241C - Annual data provided for DT241C only
DT242A	413721	432067	25.0	22.5	36.9	23.2	18.2	17.1	20.0	22.8	20.0	22.8	28.5	31.8	-	-	-	Triplicate Site with DT242A, DT242B and DT242C - Annual data provided for DT242C only
DT242B	413721	432067	26.7	24.3	37.4	22.5	18.3	16.5	20.1	22.7	18.7	22.6	27.8	32.2	-	-	-	Triplicate Site with DT242A, DT242B and DT242C - Annual data provided for DT242C only
DT242C	413721	432067	25.4	22.3	35.1	23.0	18.5	16.6	19.5	22.3	19.3	21.2	29.1	28.4	23.9	19.6	-	Triplicate Site with DT242A, DT242B and DT242C - Annual data provided for DT242C only
DT243A	413729	432097	30.7		39.5	28.4	23.2	21.5	25.7	30.2	27.2	25.0	32.0	36.1	-	-	-	Triplicate Site with DT243A, DT243B and DT243C - Annual data provided for DT243C only
DT243B	413729	432097	30.9		40.7	29.7	25.3	21.5	25.6	30.0	25.0	28.4	34.1	32.5	-	-	-	Triplicate Site with DT243A, DT243B and DT243C - Annual data provided for DT243C only
DT243C	413729	432097	28.2	21.4	39.9	28.5	23.6	20.4	23.0	30.2	27.9	27.3	32.8	37.0	28.5	23.4	-	Triplicate Site with DT243A, DT243B and DT243C - Annual data provided for DT243C only
DT244	413225	431373	22.4	17.8			16.7	13.6	14.0	19.7	18.7	21.3	28.9	29.4	20.2	16.6	-	
DT245	413243	431386	25.8	15.6		22.8	14.5	13.6	16.5	21.2	18.8	22.0	30.7	30.8	21.1	17.3	-	
DT246A	414722	432432	37.2	28.6	40.2	29.0	27.1	28.8	33.9	34.0	30.4	32.7	41.9	37.9	-	-	-	Triplicate Site with DT246A, DT246B and DT246C - Annual data provided for DT246C only
DT246B	414722	432432	39.2	33.3	43.9	27.8	23.3	31.2	32.4	36.4	30.0	36.5	40.6	39.6	-	-	-	Triplicate Site with DT246A, DT246B and DT246C - Annual data provided for DT246C only
DT246C	414722	432432	38.5	29.8	41.7	27.6	27.3	29.6	28.0	34.4	31.2	36.5	40.0	38.3	33.9	27.8	-	Triplicate Site with DT246A, DT246B and DT246C - Annual data provided for DT246C only
DT247A	414731	432443	29.6	22.8	43.3	31.0	22.9	19.0	23.9		30.1	27.4	33.5	34.7	-	-	-	Triplicate Site with DT247A, DT247B and DT247C - Annual data provided for DT247C only
DT247B	414731	432443	31.3	22.4	45.6	30.7	22.9	18.8	23.2	35.6	28.3	29.0	31.4	31.0	-	-	-	Triplicate Site with DT247A, DT247B and DT247C - Annual data provided for DT247C only
DT247C	414731	432443	27.8	21.7	44.4	30.6	22.9	20.1	24.3	34.3	29.6	27.4	30.2	36.0	29.2	24.0	-	Triplicate Site with DT247A, DT247B and DT247C - Annual data provided for DT247C only
DT144A	414908	432312		31.5	56.1			29.9	34.3	36.4	39.2	39.5	46.6	41.5	-	-	-	Triplicate Site with DT144A, DT144B and DT144C - Annual data provided for DT144C only
DT144B	414908	432312	36.4	31.3	48.8			30.0	33.8	40.5	40.1	45.0	44.2	43.4	-	-	-	Triplicate Site with DT144A, DT144B and DT144C - Annual data provided for DT144C only
DT144C	414908	432312	32.9	29.7	55.1	35.1		29.9	34.8	41.4	38.8	41.0	47.7	41.1	38.8	31.8	-	Triplicate Site with DT144A, DT144B and DT144C - Annual data provided for DT144C only
DT146	415005	432231	34.1	25.0	33.0	24.2	21.6	22.3	23.6	26.6	28.5	27.8	35.5	36.0	28.2	23.1	-	
DT143A	414902	432251	43.8	32.7	47.4	43.7	39.5	39.4	41.6	52.8	46.8	42.6	47.6	46.9	-	-	-	Triplicate Site with DT143A, DT143B and DT143C - Annual data provided for DT143C only

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DT143B	414902	432251	43.3	36.2	53.2	45.0	37.6	38.0	41.1	52.5	45.7	39.3	43.2	47.0	-	-	-	Triplicate Site with DT143A, DT143B and DT143C - Annual data provided for DT143C only
DT143C	414902	432251	46.0	34.2	53.5	45.3	39.6	35.5	43.2	54.9	48.7	42.8	48.6	48.3	44.1	36.2	-	Triplicate Site with DT143A, DT143B and DT143C - Annual data provided for DT143C only
DT142	414724	432095	36.9		46.9	37.7	30.0	28.3	31.5	43.6	38.7	30.8	37.7	41.1	36.7	30.1	-	
DT248	414499	431676	41.5	31.1	49.3	32.1	29.7	30.5	33.5	30.7	34.6	32.3	34.1	37.3	34.7	28.5	-	
DT249A	414862	431173	36.1	31.1	45.6	32.1	30.1	30.6	31.6		38.8	35.7	41.5		-	-	-	Triplicate Site with DT249A, DT249B and DT249C - Annual data provided for DT249C only
DT249B	414862	431173	37.8	31.5	51.1	30.9	32.3	30.9	34.5			36.6	41.5		-	-	-	Triplicate Site with DT249A, DT249B and DT249C - Annual data provided for DT249C only
DT249C	414862	431173	38.4	29.2	39.8	28.7	28.9	30.3	32.1		35.8	31.4	39.4		35.1	28.7	-	Triplicate Site with DT249A, DT249B and DT249C - Annual data provided for DT249C only
DT250A	414788	431184	30.9		41.5	31.2	23.4	18.7	22.5		29.0	21.9	30.4	35.9	-	-	-	Triplicate Site with DT250A, DT250B and DT250C - Annual data provided for DT250C only
DT250B	414788	431184	32.0		45.8	33.7	21.6	17.8	24.1	30.1	33.0	25.5	30.1	37.1	-	-	-	Triplicate Site with DT250A, DT250B and DT250C - Annual data provided for DT250C only
DT250C	414788	431184	31.5	23.3		30.0	24.2	17.5	21.8	29.8	32.0	25.0	36.2	35.9	29.0	23.8	-	Triplicate Site with DT250A, DT250B and DT250C - Annual data provided for DT250C only
DT252A	415228	431031	46.1	29.7	40.9	34.0	33.3	34.6		39.7	34.6	34.5	37.2	38.8	-	-	-	Triplicate Site with DT252A, DT252B and DT252C - Annual data provided for DT252C only
DT252B	415228	431031	49.6	35.7	48.1	34.7	34.1	36.3	36.4	37.9	39.1	35.8	43.5	41.6	-	-	-	Triplicate Site with DT252A, DT252B and DT252C - Annual data provided for DT252C only
DT252C	415228	431031	41.8	25.8	41.9	35.0	31.5	29.7	34.9	38.0	38.2	34.3	39.0	39.3	37.3	30.5	-	Triplicate Site with DT252A, DT252B and DT252C - Annual data provided for DT252C only
DT251A	415222	431010	34.8	23.9	40.9	32.3	25.2	23.9	29.2	28.0	35.5	24.8	32.1	36.0	-	-	-	Triplicate Site with DT251A, DT251B and DT251C - Annual data provided for DT251C only
DT251B	415222	431010	27.8	22.3	49.7	33.0	26.8	26.0	29.4	32.5	37.8	28.1	34.2	35.7	-	-	-	Triplicate Site with DT251A, DT251B and DT251C - Annual data provided for DT251C only
DT251C	415222	431010	32.7	23.5	41.5	32.6	25.4	23.4	27.9	31.1	35.4	24.0	31.8	34.7	30.9	25.4	-	Triplicate Site with DT251A, DT251B and DT251C - Annual data provided for DT251C only
DT253A	415320	430090	37.6	27.4	45.3	33.7	29.5	21.9	29.0	39.1	35.4	24.1	36.3	36.8	-	-	-	Triplicate Site with DT253A, DT253B and DT253C - Annual data provided for DT253C only
DT253B	415320	430090	37.5	28.9	45.6	40.6	30.4	24.8	30.2	40.2	39.0	28.3	31.7	37.9	-	-	-	Triplicate Site with DT253A, DT253B and DT253C - Annual data provided for DT253C only
DT253C	415320	430090	37.1	26.4	46.5	35.8	30.4	24.6	29.3	38.1	39.3	25.8	30.8	35.7	33.6	27.6	-	Triplicate Site with DT253A, DT253B and DT253C - Annual data provided for DT253C only
DT254A	414637	430131			33.6		19.3	19.4	22.1		22.4	23.7	29.0	28.0	-	-	-	Triplicate Site with DT254A, DT254B and DT254C - Annual data provided for DT254C only
DT254B	414637	430131	31.7	21.9	34.2	22.9	18.9	18.6	20.3		28.9	25.4	29.9		-	-	-	Triplicate Site with DT254A, DT254B and DT254C - Annual data provided for DT254C only

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DT254C	414637	430131	26.5	23.9	35.4		19.1	19.0	21.1		24.6	21.0	27.1	29.6	25.0	20.5	-	Triplicate Site with DT254A, DT254B and DT254C - Annual data provided for DT254C only
DT255A	414629	430122		19.1	33.3		18.8	14.4	19.8	24.8	23.5	21.8	27.4	30.4	-	-	-	Triplicate Site with DT255A, DT255B and DT255C - Annual data provided for DT255C only
DT255B	414629	430122	27.2	19.9	39.2		19.6	15.8	20.3		25.5	20.1	26.1	31.4	-	-	-	Triplicate Site with DT255A, DT255B and DT255C - Annual data provided for DT255C only
DT255C	414629	430122	27.6	18.0	35.9		19.0	15.0	18.9	23.0	23.9	21.3	29.5	27.5	23.9	19.6	-	Triplicate Site with DT255A, DT255B and DT255C - Annual data provided for DT255C only
DT257A	414260	430531	21.0	18.0	29.7	16.7	14.0	11.0	14.6			19.0	29.1	25.6	-	-	-	Triplicate Site with DT257A, DT257B and DT257C - Annual data provided for DT257C only
DT257B	414260	430531	24.5	14.0	30.9	18.9	14.6	13.2	17.0	17.2	15.4	20.7	27.0	23.6	-	-	-	Triplicate Site with DT257A, DT257B and DT257C - Annual data provided for DT257C only
DT257C	414260	430531		13.9	31.8	16.1		13.0	15.1	16.8	16.8	21.1	25.5	27.0	19.5	16.0	-	Triplicate Site with DT257A, DT257B and DT257C - Annual data provided for DT257C only
DT256A	414239	430526	17.3	12.6	26.4	13.9	12.3	9.1	12.3	15.4	15.5	15.3	25.0	23.6	-	-	-	Triplicate Site with DT256A, DT256B and DT256C - Annual data provided for DT256C only
DT256B	414239	430526	14.9	14.0	27.9	17.0	11.9	9.4	12.6	13.5	16.2	17.4	24.1	23.8	-	-	-	Triplicate Site with DT256A, DT256B and DT256C - Annual data provided for DT256C only
DT256C	414239	430526		15.0	29.8	16.6	12.5	10.1	12.4	14.2	15.7	17.5	25.8	24.6	17.0	13.9	-	Triplicate Site with DT256A, DT256B and DT256C - Annual data provided for DT256C only
DT283	410565	430351					18.5	18.0	18.2	19.1	16.6	24.0	29.1	27.0	21.3	18.6	-	
DT284	410585	430112					18.3	16.0	21.5	19.9	17.4	21.0	28.4	23.0	20.7	18.1	-	
DT285	410075	430120					11.0	12.0	13.3	15.5	17.2	18.3	23.8	22.5	16.7	14.6	-	
DT259A	413785	430386	31.1	19.0	36.0	23.7	19.6	18.6	20.4	23.2	24.8	22.4	28.2	29.5	-	-	-	Triplicate Site with DT259A, DT259B and DT259C - Annual data provided for DT259C only
DT259B	413785	430386	25.8	21.1	39.0	24.6	20.3	16.8	22.1	24.0	23.9	24.8	28.5	28.7	-	-	-	Triplicate Site with DT259A, DT259B and DT259C - Annual data provided for DT259C only
DT259C	413785	430386	28.4		38.1	25.0	19.6	18.2	20.3	23.9	20.4	23.8	29.6	24.6	24.7	20.2	-	Triplicate Site with DT259A, DT259B and DT259C - Annual data provided for DT259C only
DT258A	413749	430389	17.0	21.0	36.7	23.3	20.7	16.4	21.7	24.1	26.1	21.6	28.2	29.8	-	-	-	Triplicate Site with DT258A, DT258B and DT258C - Annual data provided for DT258C only
DT258B	413749	430389	30.3	19.4	34.8	25.4	18.6	17.3	20.5	24.3	24.0	23.6	31.6	26.0	-	-	-	Triplicate Site with DT258A, DT258B and DT258C - Annual data provided for DT258C only
DT258C	413749	430389	27.5	19.4	36.8	24.9	20.5	16.1	20.9	24.1	22.8	24.4	30.1	29.1	24.4	20.0	-	Triplicate Site with DT258A, DT258B and DT258C - Annual data provided for DT258C only
DT261A	415339	429334	23.1	14.0	24.2	15.2	12.0	10.6	13.5	12.5	12.1	16.2	24.6	23.8	-	-	-	Triplicate Site with DT261A, DT261B and DT261C - Annual data provided for DT261C only
DT261B	415339	429334	22.0	16.0		15.0	12.3	10.6	13.4	15.0	14.9	18.5	26.7	21.7	-	-	-	Triplicate Site with DT261A, DT261B and DT261C - Annual data provided for DT261C only

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DT261C	415339	429334	21.7	16.5		13.6	11.7	10.0	13.7	14.0	15.5	17.2	23.9	24.1	17.2	14.1	-	Triplicate Site with DT261A, DT261B and DT261C - Annual data provided for DT261C only
DT260A	415368	429297	19.4	13.4	31.2	16.7	11.6	8.4	11.1	15.3	16.2	15.6	21.5	23.4	-	-	-	Triplicate Site with DT260A, DT260B and DT260C - Annual data provided for DT260C only
DT260B	415368	429297	17.7	14.4	29.6	12.7	10.0	8.7	11.8	15.9	13.7	15.8	21.3	21.8	-	-	-	Triplicate Site with DT260A, DT260B and DT260C - Annual data provided for DT260C only
DT260C	415368	429297	18.8	12.5	28.8		11.1	8.3	11.3	15.1	14.1	15.8	25.1	20.6	16.5	13.5	-	Triplicate Site with DT260A, DT260B and DT260C - Annual data provided for DT260C only
DT262A	415894	429519	42.5	30.8	45.1	28.5	29.3	26.5	28.3	30.9	33.8	32.2	39.8		-	-	-	Triplicate Site with DT262A, DT262B and DT262C - Annual data provided for DT262C only
DT262B	415894	429519	36.4	33.3	45.9	28.1	25.8	28.6	30.7	31.1	34.9	34.3	40.0		-	-	-	Triplicate Site with DT262A, DT262B and DT262C - Annual data provided for DT262C only
DT262C	415894	429519	41.6	33.3	44.2	27.5	27.9	29.2	30.3	31.5	34.2	34.1	39.4		33.6	27.6	-	Triplicate Site with DT262A, DT262B and DT262C - Annual data provided for DT262C only
DT171	416678	429910	22.4	15.3	27.4	19.6	13.7	11.6	13.6	18.6	19.0	19.9	25.7		18.8	15.4	-	
DT133	416260	434581	45.0	33.1	47.0	35.1	29.8	29.6	31.4	34.8	37.2	37.9	43.5	46.9	37.7	30.9	-	
DT111A	416015	435028	41.0	36.2	44.6		33.0	31.3	32.6	35.0	37.7	36.5			-	-	-	Triplicate Site with DT111A, DT111B and DT111C - Annual data provided for DT111C only
DT111B	416015	435028	43.6	37.4	48.0	32.2	34.7	29.1	33.4	37.4	39.8	39.5	48.4	46.9	-	-	-	Triplicate Site with DT111A, DT111B and DT111C - Annual data provided for DT111C only
DT111C	416015	435028	45.2	34.6	48.9	41.2	32.4	27.7	32.9	34.5	34.4	34.3	47.2	40.5	38.4	31.5	-	Triplicate Site with DT111A, DT111B and DT111C - Annual data provided for DT111C only
DT234A	416019	434990		33.2	46.8	36.8	30.5	28.5	34.2	34.9	36.1		47.8	40.8	-	-	-	Triplicate Site with DT234A, DT234B and DT234C - Annual data provided for DT234C only
DT234B	416019	434990	46.0	38.5	50.6	37.6	32.5	29.4	33.4	36.6	39.5	41.4	50.5	49.3	-	-	-	Triplicate Site with DT234A, DT234B and DT234C - Annual data provided for DT234C only
DT234C	416019	434990	40.0	33.3	46.1	32.5	27.9	26.6	31.3	32.6	36.4	36.7	42.0	39.0	37.9	31.0	-	Triplicate Site with DT234A, DT234B and DT234C - Annual data provided for DT234C only
DT73A	415438	435834	45.3	41.6	52.7	45.3		35.9	40.2	47.0	44.7	40.3	50.0	39.9	-	-	-	Triplicate Site with DT73A , DT73B and DT73C - Annual data provided for DT73C only
DT73B	415438	435834	54.0	42.5	56.1	45.0	42.7	32.6	39.5	49.7	46.4	44.1	50.3	44.7	-	-	-	Triplicate Site with DT73A , DT73B and DT73C - Annual data provided for DT73C only
DT73C	415438	435834	45.7	40.3	52.1	42.3	37.8	34.4	38.8	45.3	45.6	38.8	45.2	44.2	43.9	36.0	-	Triplicate Site with DT73A , DT73B and DT73C - Annual data provided for DT73C only
DT173A	415442	435799	39.0	32.9	42.4	34.3	33.8	31.6	35.4	32.5	33.0	37.5	42.9	38.2	-	-	-	Triplicate Site with DT173A, DT173B and DT173C - Annual data provided for DT173C only
DT173B	415442	435799	35.8	28.8	45.6	35.6	34.5	32.4	35.3	35.7	36.7	39.7	44.7	38.3	-	-	-	Triplicate Site with DT173A, DT173B and DT173C - Annual data provided for DT173C only
DT173C	415442	435799	38.2	31.6	44.3	34.7	31.2	29.7	32.0	34.2	33.8	35.7	39.9	36.5	36.2	29.6	-	Triplicate Site with DT173A, DT173B and DT173C - Annual data provided for DT173C 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 (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT74	415549	435918	23.9	20.3	24.0	14.8	14.1	13.7		16.3	16.3	22.3	29.2		19.4	15.9	-	
DT129	415089	436637	34.4			33.2	26.6	27.5	30.4	34.4	35.2	28.4	36.8	34.1	31.9	26.2	-	
DT112A	415024	436743	31.6	24.5	38.1	27.4	26.4	25.3	26.3	25.8	29.0	32.1	33.3	34.5	-	-	-	Triplicate Site with DT112A, DT112B and DT112C - Annual data provided for DT112C only
DT112B	415024	436743	33.8	28.7	39.0	30.9	28.3	24.6	29.4	28.5	29.8	31.9	39.4	33.7	-	-	-	Triplicate Site with DT112A, DT112B and DT112C - Annual data provided for DT112C only
DT112C	415024	436743	38.3	33.4	39.1	29.7	26.4	26.4	29.7	27.9	31.1	35.1	39.9	36.1	31.3	25.7	-	Triplicate Site with DT112A, DT112B and DT112C - Annual data provided for DT112C only
DT174A	415029	436771	34.9	29.4	37.4	25.9	22.8	20.1	22.1	25.4	27.5	26.1	36.8	34.0	-	-	-	Triplicate Site with DT174A, DT174B and DT174C - Annual data provided for DT174C only
DT174B	415029	436771	34.8	27.8	38.7	29.2	21.6	19.9	22.9	26.5	28.0	29.0	36.2	35.7	-	-	-	Triplicate Site with DT174A, DT174B and DT174C - Annual data provided for DT174C only
DT174C	415029	436771	33.9	23.9	36.2	27.0	21.8	20.2	21.9	22.6	24.1	25.5	36.8	36.2	28.4	23.3	-	Triplicate Site with DT174A, DT174B and DT174C - Annual data provided for DT174C only
DT131	414856	437605	63.7	47.2	42.9	45.5	39.0	44.9	46.0	50.2	43.1	44.9	42.7	45.2	45.8	37.6	-	
DT269	413900	437738			26.3	18.0	16.1		17.0	20.7	23.5	22.3	30.7	28.5	22.6	18.5	-	
DT91A	413697	437723		37.0	33.3	25.0	27.0	30.4	32.7	30.8	30.8	34.3	39.7	38.2	-	-	-	Triplicate Site with DT91A , DT91B and DT91C - Annual data provided for DT91C only
DT91B	413697	437723		35.1	35.0	32.7	27.8	30.2	33.2	33.0		33.7	42.0	37.9	-	-	-	Triplicate Site with DT91A , DT91B and DT91C - Annual data provided for DT91C only
DT91C	413697	437723		33.8	36.7	29.2	26.2	29.0	32.8	29.0	32.2	35.9	40.3	35.5	33.1	27.1	-	Triplicate Site with DT91A , DT91B and DT91C - Annual data provided for DT91C only
DT175A	413709	437745	39.6	31.0	34.6	29.4	25.4	30.4	32.7	31.0	31.3	33.2	36.3	37.2	-	-	-	Triplicate Site with DT175A, DT175B and DT175C - Annual data provided for DT175C only
DT175B	413709	437745	44.8	33.8	35.8	31.4		31.0	33.1	31.4	35.7	34.5	38.8	36.6	-	-	-	Triplicate Site with DT175A, DT175B and DT175C - Annual data provided for DT175C only
DT175C	413709	437745	45.3	35.3	35.4	28.7	28.7	30.3	32.3	30.3	35.9	34.6	40.2	37.7	33.7	27.6	-	Triplicate Site with DT175A, DT175B and DT175C - Annual data provided for DT175C only
DT30A	413861	437772		36.3	42.1	34.7	23.3	28.8	32.3	35.4	37.0	37.3	43.1	40.2	-	-	-	Triplicate Site with DT30A, DT30B and DT30C - Annual data provided for DT30C only
DT30B	413861	437772		34.4	38.4	35.3		29.3	30.5	35.1	36.2	36.3	44.9	36.3	-	-	-	Triplicate Site with DT30A, DT30B and DT30C - Annual data provided for DT30C only
DT30C	413861	437772			41.0	34.5		30.0	33.0	33.3	36.5	37.5	43.6	41.0	35.1	28.8	-	Triplicate Site with DT30A, DT30B and DT30C - Annual data provided for DT30C only
DT180A	413856	437784	36.1	30.0	27.5	23.8	19.1	18.8	23.1		23.8	25.7	35.2	31.7	-	-	-	Triplicate Site with DT180A, DT180B and DT180C - Annual data provided for DT180C only
DT180B	413856	437784	29.4		33.1		19.8	16.9	21.9	21.8	23.7	28.6	36.3	33.0	-	-	-	Triplicate Site with DT180A, DT180B and DT180C - Annual data provided for DT180C 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 (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT180C	413856	437784	33.9	25.8	32.1	22.4	18.0	17.6	22.0	21.4	21.8	27.4	33.9	33.6	26.1	21.4	-	Triplicate Site with DT180A, DT180B and DT180C - Annual data provided for DT180C only
DT49A	413600	437653	30.9			21.8	21.6	23.0	24.7	26.4	27.8	25.3	32.6	31.2	-	-	-	Triplicate Site with DT49A, DT49B and DT49C - Annual data provided for DT49C only
DT49B	413600	437653	26.9			27.0	22.1		23.2	28.5	29.9	24.2	33.9	34.4	-	-	-	Triplicate Site with DT49A, DT49B and DT49C - Annual data provided for DT49C only
DT49C	413600	437653	33.4			25.3	19.4	23.1	23.4	27.2	28.8	24.5	32.9	32.2	26.8	22.0	-	Triplicate Site with DT49A, DT49B and DT49C - Annual data provided for DT49C only
DT176A	413597	437628	25.1	19.2	29.3	20.4	17.9	18.4	20.0	22.5	24.9	24.7	31.5	29.5	-	-	-	Triplicate Site with DT176A, DT176B and DT176C - Annual data provided for DT176C only
DT176B	413597	437628	24.3	20.3	32.4	25.4	19.8	18.7	21.9	24.5	25.4	25.6	31.8	29.8	-	-	-	Triplicate Site with DT176A, DT176B and DT176C - Annual data provided for DT176C only
DT176C	413597	437628	24.9	17.6	28.7	22.4	18.5	17.9	21.3	23.7	22.8	25.3	31.4	27.5	24.1	19.8	-	Triplicate Site with DT176A, DT176B and DT176C - Annual data provided for DT176C only
DT50	413510	437732	58.5	40.1		36.9	34.7	37.7	45.1	45.2			47.9		42.6	39.0	**33.4**	
DT177A	413501	437732	41.1	30.9	41.5	37.3	29.9	29.4	35.3	38.5	40.7	31.6	38.8	36.6	-	-	-	Triplicate Site with DT177A, DT177B and DT177C - Annual data provided for DT177C only
DT177B	413501	437732	41.0	28.5	45.1	38.2	30.2	30.1	33.8	41.6	42.9	33.5	41.1	39.7	-	-	-	Triplicate Site with DT177A, DT177B and DT177C - Annual data provided for DT177C only
DT177C	413501	437732	41.4	32.1	46.3	38.9	28.3	31.5	34.7	39.3	42.6	32.8	40.9	38.9	36.7	30.1	-	Triplicate Site with DT177A, DT177B and DT177C - Annual data provided for DT177C only
DT31	413527	437713	58.6	49.6	55.2	46.9		43.9		49.9	47.0	48.4	53.4	43.3	49.4	40.5	**29.3**	
DT101A	413418	437725	51.3	35.6	52.2	43.2	32.1	30.4	41.2		43.9			42.3	-	-	-	Triplicate Site with DT101A, DT101B and DT101C - Annual data provided for DT101C only
DT101B	413418	437725	49.6	40.3	51.3		31.0	32.6	37.2	41.8		35.6		45.1	-	-	-	Triplicate Site with DT101A, DT101B and DT101C - Annual data provided for DT101C only
DT101C	413418	437725	44.8	37.7	44.6		32.4	31.8	37.9	40.3	41.2	34.4	44.7	42.7	40.5	33.2	-	Triplicate Site with DT101A, DT101B and DT101C - Annual data provided for DT101C only
DT179A	413417	437708			41.7				35.3	29.2	38.1	41.7	43.7	38.6	-	-	-	Triplicate Site with DT179A, DT179B and DT179C - Annual data provided for DT179C only
DT179B	413417	437708	36.9	37.7	44.6		31.1	32.1	35.3	32.8	41.4		44.0	38.8	-	-	-	Triplicate Site with DT179A, DT179B and DT179C - Annual data provided for DT179C only
DT179C	413417	437708	38.9	35.5	44.9	33.1	31.8			36.1	38.1	42.6	44.9	39.4	37.3	30.6	-	Triplicate Site with DT179A, DT179B and DT179C - Annual data provided for DT179C only
DT102A	413338	437720	38.6	31.1	39.0	33.8	23.1	24.5	27.8	33.7	34.7	30.6	37.1	36.4	-	-	-	Triplicate Site with DT102A, DT102B and DT102C - Annual data provided for DT102C only
DT102B	413338	437720	40.9	33.2	39.3	30.9	25.8	26.1	28.9	34.6	33.7	30.4	38.0	36.4	-	-	-	Triplicate Site with DT102A, DT102B and DT102C - Annual data provided for DT102C only
DT102C	413338	437720	40.9	27.3	40.6	33.8	24.7	25.6	29.3	32.4	36.4	32.0	38.8	32.3	32.7	26.8	-	Triplicate Site with DT102A, DT102B and DT102C - Annual data provided for DT102C only

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DT178A	413334	437703	38.2		46.3	36.6	29.8	25.3	34.7	34.3	35.6	32.6	42.9	37.2	-	-	-	Triplicate Site with DT178A, DT178B and DT178C - Annual data provided for DT178C only
DT178B	413334	437703	37.6	33.2	50.2	40.8	29.7	27.0	35.0	37.7	36.4	36.5	42.0	36.9	-	-	-	Triplicate Site with DT178A, DT178B and DT178C - Annual data provided for DT178C only
DT178C	413334	437703	27.6		53.3	36.1	28.8	25.5	33.2	36.4	35.8	34.4	41.2	38.3	36.0	29.6	-	Triplicate Site with DT178A, DT178B and DT178C - Annual data provided for DT178C only
DT270	413719	437665	53.0	40.8	42.3	31.0	35.6	38.9	41.0	38.4	39.4	40.8	48.0	42.9	40.7	33.4	-	
DT271	413723	437678	54.7	39.5	53.3	43.7	35.3	31.7	41.9	46.1	45.7	36.4	48.8	43.6	43.1	35.3	-	
DT78	407380	441811		22.0	27.5	18.4		15.6	17.4	17.6	22.1	22.1	29.6	28.4	22.3	18.3	-	
DT68	406060	441274	36.5	27.1	30.5	23.4	19.6	16.7	21.1	22.8	23.7	28.2	30.8	32.2	-	-	-	Triplicate Site with DT68, DT69 and DT70 - Annual data provided for DT70 only
DT69	406060	441274	29.4	28.4	32.2	24.4	19.3	16.0	20.2	21.9	24.2	26.2	30.6	31.3	-	-	-	Triplicate Site with DT68, DT69 and DT70 - Annual data provided for DT70 only
DT70	406060	441274	32.3	27.8	32.8	23.7	19.3	16.9	20.7	21.7	23.4	27.3	33.1	32.7	25.8	21.1	-	Triplicate Site with DT68, DT69 and DT70 - Annual data provided for DT70 only
DT190	406495	441280	39.8	34.7	33.6	26.0	27.5	26.6	28.7	30.1	31.2	30.9	33.1		30.9	25.3	-	
DT191	406508	441310	68.2	53.0	59.2	52.1	49.9	51.9	56.4	57.7	52.1	54.0	59.8	55.5	55.5	45.5	-	
DT21	404719	440613	13.7	10.6	15.2	9.2	7.0	5.3	7.0	8.0	7.2	10.8	16.6	17.4	10.7	8.8	-	
DT282	404451	446762					25.7	26.8	29.7	31.0	29.3	29.3	32.8	22.0	28.1	24.4	-	
DT134	406940	441922	59.0	32.9	37.7	38.5	36.2		41.2	41.4		41.2	45.9	42.1	41.1	33.7	-	
DT135	406582	442028	44.1		34.9	29.7	28.6	28.6	32.3	31.2	35.7	35.8	37.4	39.4	34.2	28.0	-	
DT136	406540	442038	45.1	33.3	45.1	34.5	27.3	28.3	35.0	33.6	36.7	42.0	46.5	42.2	37.4	30.7	-	
DT137	406475	442046	49.0	39.2	48.1	40.1	33.5	34.2	42.2	42.9	42.9	42.5	56.4	47.6	43.1	35.3	-	
DT138	406255	442140	41.5	36.6	47.5	41.9	35.7	37.5	42.7	43.3	42.1	40.8	43.0	41.9	41.2	33.8	-	
DT80	416388	432817	37.6	37.9	51.4	34.7	31.2	25.6	29.8	34.3	36.6	36.0	43.5	38.2	36.3	29.7	-	
DT84	416054	432675	36.6	31.4	43.3	31.1	25.5	24.8	27.2	32.2	34.7	33.6	40.0	38.5	33.1	27.1	-	
DT79	416282	432966	34.5	30.5	35.1	25.9		18.9	23.0		28.3	32.5	34.2		29.1	23.9	-	

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DT161A	416148	433102	43.7	48.8	53.7	45.9	41.5	43.6	45.4	49.7	51.5	46.7	50.6	55.4	-	-	-	Triplicate Site with DT161A, DT161B and DT161C - Annual data provided for DT161C only
DT161B	416148	433102	59.1	43.7	65.6	47.3	46.5	46.0	43.2	53.2	49.9	51.8	57.9	56.8	-	-	-	Triplicate Site with DT161A, DT161B and DT161C - Annual data provided for DT161C only
DT161C	416148	433102	51.3	48.8	56.1	43.3	44.9	43.7	45.2	50.2	47.7	48.0	54.4	54.7	49.5	40.6	**40.3**	Triplicate Site with DT161A, DT161B and DT161C - Annual data provided for DT161C only
DT162A	416148	433134	53.3	46.9	52.2	35.3	41.6	41.2	43.6	48.3	48.4	46.8	58.2	55.8	-	-	-	Triplicate Site with DT162A, DT162B and DT162C - Annual data provided for DT162C only
DT162B	416148	433134	42.9	35.4	55.2	39.6	37.9	33.5	41.9	45.9	46.8	41.6	50.6	47.5	-	-	-	Triplicate Site with DT162A, DT162B and DT162C - Annual data provided for DT162C only
DT162C	416148	433134	47.0	38.8	56.3	40.2	39.0	38.8	40.1	44.5	48.4	47.5	52.9	52.3	45.3	37.1	**37.0**	Triplicate Site with DT162A, DT162B and DT162C - Annual data provided for DT162C only
DT163A	416147	433158	41.9	38.5	57.8	38.4	32.1	39.8	41.4	44.6	44.4	47.9	53.6	53.5	-	-	-	Triplicate Site with DT163A, DT163B and DT163C - Annual data provided for DT163C only
DT163B	416147	433158	41.6	41.1	60.9	39.5	38.4	39.9	42.0	46.1	43.5	52.8	56.5	56.7	-	-	-	Triplicate Site with DT163A, DT163B and DT163C - Annual data provided for DT163C only
DT163C	416147	433158	45.4	38.7	50.6	38.1	35.2	37.7	38.7	43.1	44.4	45.5	51.9	53.5	44.9	36.8	**36.6**	Triplicate Site with DT163A, DT163B and DT163C - Annual data provided for DT163C only
DT164A	416139	433134	45.1	37.7	45.9	34.2	34.9	39.2	37.3	36.8	38.3	46.7	49.7	46.7	-	-	-	Triplicate Site with DT164A, DT164B and DT164C - Annual data provided for DT164C only
DT164B	416139	433134	45.7	36.1	48.9	35.8	36.8	38.0	39.7	39.8	39.1	46.9	48.0	49.5	-	-	-	Triplicate Site with DT164A, DT164B and DT164C - Annual data provided for DT164C only
DT164C	416139	433134	41.0	41.0	46.5	31.2	36.9	40.6	39.4	40.3	37.8	49.2	47.3	49.9	41.6	34.1	-	Triplicate Site with DT164A, DT164B and DT164C - Annual data provided for DT164C only
DT109A	415858	433061	44.5	31.6	44.0	30.2	28.6	27.2	32.0	34.5	35.9	34.3	35.9	40.3	-	-	-	Triplicate Site with DT109A, DT109B and DT109C - Annual data provided for DT109C only
DT109B	415858	433061	47.5	33.6	46.4	30.3	28.9	27.6	31.1	36.5	36.1	33.2	40.6	42.0	-	-	-	Triplicate Site with DT109A, DT109B and DT109C - Annual data provided for DT109C only
DT109C	415858	433061	45.1	35.9	50.5	34.7	31.2	28.6	33.7	34.8	36.2	36.8	36.4	36.1	35.6	29.2	-	Triplicate Site with DT109A, DT109B and DT109C - Annual data provided for DT109C only
DT181A	415845	433041		31.5	42.6	27.3	28.2	25.9	28.3	29.2	29.6	35.2	38.3	41.0	-	-	-	Triplicate Site with DT181A, DT181B and DT181C - Annual data provided for DT181C only
DT181B	415845	433041		27.6	45.5	30.9	27.9	25.5	27.5	31.6	32.0	37.3	42.0	40.1	-	-	-	Triplicate Site with DT181A, DT181B and DT181C - Annual data provided for DT181C only
DT181C	415845	433041		31.4	42.8	29.5	29.3	28.3	30.9	29.9	30.0	36.7	40.2	40.6	33.2	27.2	-	Triplicate Site with DT181A, DT181B and DT181C - Annual data provided for DT181C only
DT108A	415891	433045	45.4	30.1	48.0	34.7	31.0	29.4	35.3	35.2	40.1	34.5	37.6	40.5	-	-	-	Triplicate Site with DT108A, DT108B and DT108C - Annual data provided for DT108C only
DT108B	415891	433045	46.5	37.3	45.6	30.8	31.1	30.4	32.5	38.8	37.6	32.9	41.1		-	-	-	Triplicate Site with DT108A, DT108B and DT108C - Annual data provided for DT108C only
DT108C	415891	433045	44.4	33.6	46.7	33.4	30.9	28.5	31.7	36.8	36.9	35.3	39.9	41.8	36.6	30.0	-	Triplicate Site with DT108A, DT108B and DT108C - Annual data provided for DT108C 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 (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT182A	415874	433026	38.1	34.3	42.7	28.4	25.5		26.7	28.2	29.3	33.8	40.7	41.7	-	-	-	Triplicate Site with DT182A, DT182B and DT182C - Annual data provided for DT182C only
DT182B	415874	433026	36.4	32.7	43.5	30.1	23.3	23.7	28.3		30.9	35.0		40.5	-	-	-	Triplicate Site with DT182A, DT182B and DT182C - Annual data provided for DT182C only
DT182C	415874	433026	28.3	30.4	44.6	29.4	27.1	25.2	27.2	28.9	27.7	34.6	41.6	39.5	32.5	26.7	-	Triplicate Site with DT182A, DT182B and DT182C - Annual data provided for DT182C only
DT110	415806	433061	36.6	31.2	39.6	27.5	26.8	27.6	28.6	28.2	29.2	32.8	36.5	40.1	32.0	26.2	-	
DT279	415591	433141								31.8	31.4	32.9		39.9	34.3	26.3	-	
DT280	415665	433175				39.2	33.7	31.7	34.8	37.1	38.0	42.1	43.2	45.1	38.5	31.6	-	
DT183	416215	433059	57.6		56.2	41.0	42.2	40.8	46.2	43.8	48.1	44.8	52.8	51.7	47.4	38.8	**30.5**	
DT184	416217	433071	51.6	42.6	52.3		40.0	40.0	43.0	44.9	47.8	44.1	49.0	49.8	45.7	37.5	**31.1**	
DT167A	416392	433046	46.7	43.0	63.5	42.6	38.3	37.0	39.4	45.6	44.8	51.7	54.9	47.9	-	-	-	Triplicate Site with DT167A, DT167B and DT167C - Annual data provided for DT167C only
DT167B	416392	433046	49.5	44.6	68.6	44.1	43.5	40.4	40.2	47.2	46.6	51.9	54.8	56.8	-	-	-	Triplicate Site with DT167A, DT167B and DT167C - Annual data provided for DT167C only
DT167C	416392	433046	41.5	44.4	62.1	46.0	41.7	38.7	42.7	46.8	45.9	52.8	56.0	55.2	47.7	39.1	**33.0**	Triplicate Site with DT167A, DT167B and DT167C - Annual data provided for DT167C only
DT185A	416381	433054	52.2	44.6	44.6	41.2	36.1	39.7	38.5	41.3		39.5	48.5	49.9	-	-	-	Triplicate Site with DT185A, DT185B and DT185C - Annual data provided for DT185C only
DT185B	416381	433054	58.0	37.0	56.8	40.9	40.4	40.6	42.2	44.6		46.2	48.2	47.6	-	-	-	Triplicate Site with DT185A, DT185B and DT185C - Annual data provided for DT185C only
DT185C	416381	433054		42.7	52.4	39.6	33.2	38.2	38.0	40.7		42.5	48.3	45.2	43.7	35.8	-	Triplicate Site with DT185A, DT185B and DT185C - Annual data provided for DT185C only
DT277	416398	433050				39.2	36.0	36.1	37.7	39.5	40.9	46.9	49.2	46.8	41.4	34.0	-	
DT12A	416970	433259	68.3	64.0	60.2	53.2	59.2	61.8	59.2	58.9	57.5	59.9	59.4	64.1	-	-	-	Triplicate Site with DT12A, DT12B and DT12C - Annual data provided for DT12C only
DT12B	416970	433259	70.1	51.2	64.4	54.1	58.2	63.6	61.4		56.9	63.6	64.5	66.6	-	-	-	Triplicate Site with DT12A, DT12B and DT12C - Annual data provided for DT12C only
DT12C	416970	433259	69.7	61.3	65.0	55.4	56.4	62.6	57.9		50.0	61.3	57.0	56.7	60.1	49.3	**48.3**	Triplicate Site with DT12A, DT12B and DT12C - Annual data provided for DT12C only
DT103A	415925	430572	39.1	31.5	54.7	39.9	36.0	30.6	35.7	45.1	36.1	34.7	41.8		-	-	-	Triplicate Site with DT103A, DT103B and DT103C - Annual data provided for DT103C only
DT103B	415925	430572	34.9	31.9	55.9	43.6	33.3	33.1	36.7	46.0	39.3	37.1	46.8	45.3	-	-	-	Triplicate Site with DT103A, DT103B and DT103C - Annual data provided for DT103C only
DT103C	415925	430572	35.1	27.0	48.4	43.2	32.4	31.6	35.4	44.7	37.6	36.6	46.7	41.9	39.3	32.2	-	Triplicate Site with DT103A, DT103B and DT103C - Annual data provided for DT103C 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 (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT104A	415961	430558	44.3	36.1	58.0	47.9	38.2	36.3	40.3	51.0	44.8	37.9	44.2	46.3	-	-	-	Triplicate Site with DT104A, DT104B and DT104C - Annual data provided for DT104C only
DT104B	415961	430558	45.7	36.9	59.3	39.7		38.5	36.7	52.4	43.4	39.7	26.0	39.7	-	-	-	Triplicate Site with DT104A, DT104B and DT104C - Annual data provided for DT104C only
DT104C	415961	430558	43.1	35.4	54.3	44.6	35.4	36.8	38.9	50.6	42.8	33.6	48.4	43.0	42.4	34.8	-	Triplicate Site with DT104A, DT104B and DT104C - Annual data provided for DT104C only
DT188A	415979	430522		26.5	44.5	34.7	23.6	21.6	25.6	35.0	31.0	26.4	34.3	32.1	-	-	-	Triplicate Site with DT188A, DT188B and DT188C - Annual data provided for DT188C only
DT188B	415979	430522	34.6		45.8	36.5	26.5	23.8	26.0	34.0	33.8	25.4	39.0	36.1	-	-	-	Triplicate Site with DT188A, DT188B and DT188C - Annual data provided for DT188C only
DT188C	415979	430522	39.7	26.9	44.0	35.9	23.7	21.0	27.8	33.6	31.0	27.6	33.6	38.9	31.8	26.1	-	Triplicate Site with DT188A, DT188B and DT188C - Annual data provided for DT188C only
DT189A	415910	430551	41.3		39.6	27.0	25.6	27.0	31.5	34.9	34.2	26.9	33.0	38.1	-	-	-	Triplicate Site with DT189A, DT189B and DT189C - Annual data provided for DT189C only
DT189B	415910	430551		29.1	42.9			28.1	31.6		33.9		33.0	37.9	-	-	-	Triplicate Site with DT189A, DT189B and DT189C - Annual data provided for DT189C only
DT189C	415910	430551			46.2				32.6	36.2		27.0	35.3	38.4	32.8	26.9	-	Triplicate Site with DT189A, DT189B and DT189C - Annual data provided for DT189C only
DT105	415780	430504				52.0	36.3	40.2	45.8	50.3	48.2	52.2	60.0	52.7	48.6	39.9	**35.6**	
DT281	415771	430476				54.3	41.0	38.8	46.7	55.5	51.0	49.3	63.1	52.8	50.3	41.2	**35.8**	
DT186A	415743	430482	23.6	20.0	45.9	25.0	18.8	16.9		26.2	22.4	29.3	36.5	28.6	-	-	-	Triplicate Site with DT186A, DT186B and DT186C - Annual data provided for DT186C only
DT186B	415743	430482			48.0	26.8	20.5	18.2	22.4	29.2	26.9	31.5	36.9	32.3	-	-	-	Triplicate Site with DT186A, DT186B and DT186C - Annual data provided for DT186C only
DT186C	415743	430482	30.6	22.4	48.4	28.3	20.6	18.6	23.3	28.1	23.1	30.8	43.6	36.3	28.1	23.0	-	Triplicate Site with DT186A, DT186B and DT186C - Annual data provided for DT186C only
DT187A	415715	430669	27.3	22.0	49.0	33.0	21.3	24.5	28.0	31.4		30.9		33.2	-	-	-	Triplicate Site with DT187A, DT187B and DT187C - Annual data provided for DT187C only
DT187B	415715	430669	30.8	25.5	48.7		24.9	24.9	28.5	23.8		32.5	41.0	33.3	-	-	-	Triplicate Site with DT187A, DT187B and DT187C - Annual data provided for DT187C only
DT187C	415715	430669			49.5	34.7	25.2	25.9	31.0		28.8	27.8	39.8	36.0	31.3	25.6	-	Triplicate Site with DT187A, DT187B and DT187C - Annual data provided for DT187C only
DT106A	415702	430701	35.0	28.1	45.8	26.3	20.6	22.1	27.0	28.8	25.0	34.1	39.2	33.8	-	-	-	Triplicate Site with DT106A, DT106B and DT106C - Annual data provided for DT106C only
DT106B	415702	430701	32.3	25.5	42.4	26.6	20.8	21.7	22.7		26.1	30.9	38.6		-	-	-	Triplicate Site with DT106A, DT106B and DT106C - Annual data provided for DT106C only
DT106C	415702	430701	30.4	27.2	46.7	26.7	21.8	21.9	26.0	29.2	26.1	32.7	35.4	30.8	29.7	24.4	-	Triplicate Site with DT106A, DT106B and DT106C - Annual data provided for DT106C only
DT192A	416218	430420	30.2	21.3	43.0	26.6	19.9	18.8	20.2	29.2	26.5	26.1	33.2	32.3	-	-	-	Triplicate Site with DT192A, DT192B and DT192C - Annual data provided for DT192C 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 (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT192B	416218	430420	34.7	18.9	46.1	30.8	22.8	20.4	21.4	30.3	28.1	27.5	42.3	35.7	-	-	-	Triplicate Site with DT192A, DT192B and DT192C - Annual data provided for DT192C only
DT192C	416218	430420	30.9	24.8	43.0	28.3	21.0	19.8	23.3	29.7	27.0	27.7	34.3	31.4	28.5	23.4	-	Triplicate Site with DT192A, DT192B and DT192C - Annual data provided for DT192C only
DT193A	416239	430435	46.1	35.6	45.8	31.2	28.6	29.5	34.3	35.8	30.9	34.8	44.3	37.8	-	-	-	Triplicate Site with DT193A, DT193B and DT193C - Annual data provided for DT193C only
DT193B	416239	430435	43.0	28.0	48.6	32.0		30.6	32.4	36.5	30.2	37.5	43.6	37.9	-	-	-	Triplicate Site with DT193A, DT193B and DT193C - Annual data provided for DT193C only
DT193C	416239	430435		31.9	46.7	31.4	26.4	31.0	32.4	32.0	29.3	32.5	41.5		35.6	29.2	-	Triplicate Site with DT193A, DT193B and DT193C - Annual data provided for DT193C only
DT212A	416398	430194	31.3	25.3	40.5	31.4	23.4	19.6		32.7	27.2	27.0	26.6	33.7	-	-	-	Triplicate Site with DT212A, DT212B and DT212C - Annual data provided for DT212C only
DT212B	416398	430194	31.6	24.5	41.9	33.4	24.7	24.0	22.4	33.2	28.6	25.7	33.4	33.6	-	-	-	Triplicate Site with DT212A, DT212B and DT212C - Annual data provided for DT212C only
DT212C	416398	430194	30.6	27.3	41.1	31.2	24.5	22.2	20.8	32.6	27.7	27.3	33.9	35.0	29.2	23.9	-	Triplicate Site with DT212A, DT212B and DT212C - Annual data provided for DT212C only
DT213A	416390	430214	31.4		43.1	20.6	22.8	19.6	23.3		24.2	32.0	35.8	33.6	-	-	-	Triplicate Site with DT213A, DT213B and DT213C - Annual data provided for DT213C only
DT213B	416390	430214	29.9	20.4	44.4	27.4	19.5	21.2	23.9	28.7	22.5	29.3	37.1	34.9	-	-	-	Triplicate Site with DT213A, DT213B and DT213C - Annual data provided for DT213C only
DT213C	416390	430214	32.1	24.3	34.8	26.2	21.2	21.1	22.8	26.4	25.2	31.4	38.3	32.1	28.1	23.0	-	Triplicate Site with DT213A, DT213B and DT213C - Annual data provided for DT213C only
DT210A	415889	431081	26.6	18.2	43.7		21.2	18.6		29.8		29.1			-	-	-	Triplicate Site with DT210A, DT210B and DT210C - Annual data provided for DT210C only
DT210B	415889	431081	30.1	22.6	47.0		22.9	22.1	25.1	30.2		28.9			-	-	-	Triplicate Site with DT210A, DT210B and DT210C - Annual data provided for DT210C only
DT210C	415889	431081	26.8	22.5	46.5		21.9	21.6	23.7	31.6		30.0			27.7	23.8	-	Triplicate Site with DT210A, DT210B and DT210C - Annual data provided for DT210C only
DT211A	415922	431089	59.2	45.8	61.8			49.4	51.4	59.4	50.6	50.8	56.0	55.3	-	-	-	Triplicate Site with DT211A, DT211B and DT211C - Annual data provided for DT211C only
DT211B	415922	431089	57.3	46.8	63.2			51.4	45.4	54.4	45.4	52.3	61.6	55.5	-	-	-	Triplicate Site with DT211A, DT211B and DT211C - Annual data provided for DT211C only
DT211C	415922	431089	61.0	37.3	60.9			49.7	52.2	59.3	48.0	55.3	60.9	56.5	53.8	44.1	**36.8**	Triplicate Site with DT211A, DT211B and DT211C - Annual data provided for DT211C only
DT263	411245	447863	18.0	18.5	29.1	20.0	14.9	10.6	16.0	18.6		16.4	21.5		18.4	15.1	-	
DT264	411600	447618	17.9	16.8	23.8	17.3	13.3	10.7		15.3	15.5		22.2	24.4	17.7	14.5	-	
DT265	411782	447598	25.2	28.8	31.0	22.7	20.5	20.4	22.9	21.7	24.8	30.0	35.0		25.7	21.1	-	
DT266	411704	447666	23.1	20.1	31.9	23.3	19.8	18.9	20.2	21.7		24.9	30.2		23.4	19.2	-	

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 (0.82)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT267	411786	447811	24.7	23.5	32.6	27.3	21.9	18.7	25.8	24.1	25.6	25.8	33.4	31.4	26.2	21.5	-	
DT268	411873	447807	22.6	22.0	33.3	27.2	16.7	15.3	22.6	22.9	22.7	23.4	21.0	29.4	23.3	19.1	-	

☐ **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.**

☒ City of Bradford MDC **confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within City of Bradford MDC During 2022

City of Bradford MDC routinely screens planning applications against the West Yorkshire Low Emission Planning Guidance to determine if they are likely to have a minor, medium or major impact on local air quality. Link to West Yorkshire Low Emission Planning Guidance

Until recently all planning applications with new parking spaces were required to provide type 1 mitigation in the form of EV charging points but this requirement has now been updated to reflect the new EV charging Building Regulations (Approved Document S). Under the new requirements all housing applications are required to provide 1 EV charging point per dwelling (unless they can demonstrate a valid exemption under the Building Regulations) and only commercial premises with more than 10 parking spaces need to provide an EV charging strategy.

Applications with the potential to impact on relevant receptor points during the construction and demolition phases are required to provide construction dust risk assessments and management plans. Medium and major applications are expected to provide a travel plan.

Major impact developments additionally require a full air quality impact assessment and damage cost calculation. Some major developments are required to provide additional site specific type 3 emission mitigation strategies.

Where a new development has potential to introduce new relevant receptor points into an area considered at risk of exceeding air quality objectives an exposure assessment is also required.

Table C.1 shows medium and major applications for which mitigation was achieved in 2022. Additional mitigation in the form of EV charging and CEMPS was obtained on many other minor applications not detailed in this table. A total of 45 full planning applications, 63 pre-planning applications and 22 condition discharge consents were considered by the CAP team during 2022.

Table C1: Planning mitigation 2020 and 2021

Planning reference	Proposal	Current status	Mitigation	Further comments
21/004622/MAO	Outline planning with all matters reserved for the erection of a skip waste sorting/recycling facility and B8 storage units	Refused	Not required due to refusal	CAP team raised lack of AQ impact assessment and suitable mitigation measures.
22/00498/MAO	Outline application for a mixed-use scheme comprising up to 307 apartments, petrol filling station, drive-thru and three retail units	Pending decision	EV charging, CEMP, travel plans and emission reduction strategy advised	Detailed AQ assessment /damage cost calculation requested. Concerns raised about traffic impact on neighbouring premises.
21/06324/MAF	New 3-Storey Resource Centre (C2 use)	Granted	EV charging CEMP Travel plan	Detailed AQ impact assessment reviewed. No issues arising.
22/01184/MAF	Development of 140 residential dwellings with open space, associated landscaping and infrastructure works	Pending decision	EV charging CEMP Travel plan Contribution to improved walking and cycling links over A629 Cycle storage units	Cumulative air quality impact assessment and damage cost calculation requested due to numerous developments taking place in this area
22/04280/MAF	Demolition of existing premises and construction of a mixed-use development comprising retail units, food outlets, offices and leisure uses with associated multi-storey car park	Pending consideration	EV charging, CEMP, travel plans and emission reduction strategy advised but subject to acceptable AQ impact assessment being provided	Improvements requested to exposure based air quality impact assessment to consider potential for canyon effect due to new buildings. Full AQ impact assessment requested for

				wider area including Shipley Airedale Road AQMA.
22/04450/MAF	Construction of an energy centre with associated access and landscaping	Withdrawn	Not required due to application being withdrawn	AQ impact assessment reviewed and requested further assessment work to cover maximum possible impact of gas back up plant.
22/04236/MAF	Construction of Class E(a) retail unit including access, servicing, car parking, landscaping and other associated works	Granted	Additional fast EV charging requested.	AQ impact assessment reviewed. No issues arising.
22/03480/MAF	Construction of 17 B2/B8 units	Pending consideration	EV charging (fast) CEMP Travel plan Emission reduction strategy	AQ impact assessment reviewed. No issues arising.
22/04182/MAF	Demolition of former HMRC Office and construction of a mixed use development comprising 289 residential dwellings with flexible ground floor Class E commercial uses	Pending consideration	EV charging CEMP Travel plan Car club space recommended	AQ impact assessment reviewed. No issues arising.
22/03971/FUL	Installation of biomass boiler and flue	Withdrawn	Not specified due to withdrawal of application	Concerns raised regarding potential PM impact on neighbouring domestic premises. AQ impact assessment sent back for several revisions before application withdrawn. An improved AQ impact assessment has since been received and the application recently

				resubmitted for consideration.
22/04637/MCV	Variation of quarry operating conditions to extend period of operation	granted	Reduced limit on number of HGV movements per day achieved	-
22/04989/MAF	Retail development comprising a new Lidl foodstore (Use Class E) and coffee drive-through unit (Use Class E) with associated car parking and landscaping.	Pending consideration	EV charging (rapid) CEMP Travel plan Emission reduction strategy – financial contribution to new bus stop near the store to offset damage costs	Detailed AQ impact assessment and damage cost calculation reviewed. No issues arising. Issues raised with number and location oi EV charging points.

City of Bradford MDC has also considered the air quality impact assessment of the following major improvement schemes

Table C2: Improvement schemes under air quality consideration

Highways Scheme	Scheme overview	Status	Air quality work undertaken
Hard Ings Road improvement scheme	Increased road capacity to reduce congestion and provision of enhanced cycling and walking provision	Completed	Before scheme monitoring completed Post scheme monitoring now in place for 5 years Air quality impact assessments completed by third party and reviewed by CAP team
West Bradford Junctions Improvement Scheme	Upgrades planned at the junctions of Great Horton Road and Horton Grange Road, Thornton Road and Cemetery Road, and Toller Lane and Whetley Hill to reduce congestion	First round of consultation completed 2020 Compulsory Purchase Orders issued during 2021 Second round of consultation 2022 Works scheduled for 23/24	Baseline air quality monitoring completed Air quality impact assessments completed by third party and reviewed by CAP team Post scheme monitoring by CAP team agreed Great Horton Road scheme commenced in February 2023.
Harrogate Road and New Line Junction Improvement Scheme	Substantial widening of all four arms of Greengates junction and new P-Loop junction to facilitate movements from	Completed	Before scheme monitoring completed Post scheme monitoring now in place for 5 years

	Harrogate Road. Improved signalling and facilities for walking and cycling.		Air quality impact assessments completed by third party and reviewed by CAP team
Bradford Interchange Access scheme (Transforming Cities Fund)	New pedestrian access into Bradford Interchange to improve access to the interchange from key development sites in the city centre enhancing the experience and journey times for bus and rail users	Detailed scheme planning in progress	CAP team advising on exposure reduction issues and provision of EV infrastructure. Some long term air quality monitoring already ongoing in the area.
South Bradford Park & Ride and Expressway (Transforming Cities Fund)	Provision of a bus based Park and Ride facility in south Bradford adjacent to M606 motorway	Detailed scheme planning in progress	CAP team advising on air quality impact assessment requirements and provision of EV infrastructure / low emission buses. Air quality monitoring already in place along proposed bus route which will pass through Mayo Avenue AQMA.
West Bradford Supercycle highway extension (Transforming Cities Fund)	Access, safety and amenity improvements for cyclists and pedestrians between Bradford city centre and the West of the city, including the education quarter via creation of a 7km of dedicated cycleway along Thornton Road.	Detailed scheme planning in progress	CAP team advising on air quality impact assessment requirements. Some air quality monitoring already in place along the route. Scheme passes through Thornton Road AQMA

Additional Air Quality Works Undertaken by City of Bradford MDC During 2022

During this reporting year the council has carried out extensive traffic monitoring outside the CAZ, both prior to and following the introduction of the zone to assess potential displacement of traffic.

Traffic data was collected at 21 locations around the district at the following times:

- One week pre-CAZ
- One week immediately following introduction of the zone
- One week in November ~6 weeks after introduction of the zone.

The data was collected by video surveys using wide angled high definition cameras.

Additional manual counts were also taken in the village of East Morton post CAZ introduction (21-25th November 2022)

The traffic counting surveys concluded the following:

- There has been no significant increase in the % of commercial traffic on displacement routes outside of the Clean Air Zone following introduction of the CAZ

- There is a reduction in the overall traffic volumes counted at East Morton compared with data collected by DfT in 2019

These findings are consistent with traffic counts undertaken in other cities where a Class C CAZ has been introduced.

A copy of the full Bradford CAZ Traffic Displacement Monitoring report is available here:

Link to full CAZ traffic displacement monitoring report on Breathe Better Bradford website

No further additional studies were undertaken by City of Bradford MDC during 2022.

QA/QC of Diffusion Tube Monitoring

City of Bradford MDC undertakes diffusion tube monitoring across the district. As far as possible this is normally undertaken in line with the diffusion tube monitoring calendar provided by DEFRA with collections taking place within 2 days of the suggested collection date. The calendar is available on the LAQM helpdesk website. Due to the number of diffusion deployed by City of Bradford MDC tubes are normally collected over four days (Tuesday to Friday of the recommended tube collection week).

On three occasions during 2022 some tube collections had to run into the following week due to staff illness and public holidays. These occasions are detailed in Table C3 below.

Table C3: Diffusion tube collection dates in Bradford in 2022

Target collection date	Actual collection dates	Maximum deviation from target period
5th January 2022	5th January 2022 – 10th January 2022	+5 days
2nd February 2022	1st February 2022 – 4th February 2022	
2nd March 2022	1st March 2022 – 4th March 2022	

30th March 2022	29th March 2022 – 4th April 2022	+5 days
4th May 2022	3rd May 2022 – 6th May 2022	
8th June 2022	7th June 2022 – 10th June 2022	
6th July 2022	4th July 2022 – 7th July 2022	
3rd August 2022	2nd August – 5th August 2022	
31st August 2022	29th August – 2nd September 2022	
28th September 2022	26th September 2022 – 3rd October 2022	+5 days
2nd November 2022	1st November 2022 – 4th November 2022	
30th November 2022	29th November 2022 – 2nd December 2022	

During the 2022 period all diffusion tubes deployed by City of Bradford MDC were supplied and analysed by Gradko using the 50% TEA in acetone method.

Gradko participate in the Inter-Laboratory comparison scheme AIR PT. This is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR PT is a new scheme, started in April 2014, which combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL WASP PT scheme. AIR PT offers a number of test samples designed to test the proficiency of laboratories undertaking analysis of chemical pollutants in ambient indoor, stack and workplace air. One such sample is the AIR NO_2 test sample type that is distributed to participants in a quarterly basis. The results of this scheme are published annually.

The latest available AIR PT NO_2 diffusion tube results for Gradko are shown in Table C.4. At the time of writing AIR reports were only available for the period up to June 2022. Gradko scored 100% for all periods during the last year of testing which provides a good levels of confidence in their results.

Table C.4: AIR PT NO2 diffusion tube results for Gradko 2022

AIR round	Result for Gradko
July – August 2021	100%
September –October 2021	100%
January - February 2022	100%
May to June 2022	100%

Diffusion Tube Annualisation

Defra has developed a diffusion tube data processing tool to assist local authorities in processing their NO_2 diffusion tube monitoring data. More information about the tool is available here Link to LAQM website.

Annualisation of the City of Bradford MDC data (where necessary) for 2022 has been undertaken using this tool. Annualisation is required for any site with data capture less than 75% but greater than 25%.

Annualisation was undertaken using data from the following national monitoring network sites which meet the criteria for annualisation calculations as set out in Box 7.9 of LAQM.TG(22). All these sites lie within 50 miles of the City of Bradford MDC district.

Details of all the City of Bradford MDC diffusion tubes that required annualisation for the 2022 period (along with the annualisation factors calculated using the diffusion tube data processing tool) are shown in Table C.5.

All the real time monitoring sites within the City of Bradford MDC district had data capture greater than 75% during 2022 so no real time data has been annualised for the purpose of this report.

Table C.5 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Leeds City Centre	Annualisation Factor Dewsbury Ashworth Grove	Annualisation Factor Barnsley Gawber	Annualisation Factor Manchester Piccadilly	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	comments
DT76	0.7706	0.7814	0.7580	0.7978	0.7769	32.3	25.1	
DT93	0.9977	1.0580	0.9645	1.0508	1.0177	28.4	28.9	
DT286	0.7768	0.8040	0.7443	0.8136	0.7847	37.5	29.5	
DT71A	1.1222	1.1521	1.0807	1.1238	1.1197	-	-	Triplicate Site with DT71A , DT71B and DT71C - Annual data provided for DT71C only
DT71B	1.1222	1.1521	1.0807	1.1238	1.1197	-	-	Triplicate Site with DT71A , DT71B and DT71C - Annual data provided for DT71C only
DT71C	1.1222	1.1521	1.0807	1.1238	1.1197	37.1	41.5	Triplicate Site with DT71A , DT71B and DT71C - Annual data provided for DT71C only
DT156	0.9442	0.9584	0.8908	0.9923	0.9464	43.5	41.1	
DT283	1.0406	1.1070	1.0157	1.0940	1.0643	21.3	22.7	
DT284	1.0406	1.1070	1.0157	1.0940	1.0643	20.7	22.0	
DT285	1.0406	1.1070	1.0157	1.0940	1.0643	16.7	17.8	
DT50	1.0799	1.1745	1.1150	1.0992	1.1172	42.6	47.6	
DT282	1.0328	1.0993	1.0142	1.0889	1.0588	28.1	29.7	
DT279	0.9456	0.9507	0.8883	0.9635	0.9370	34.3	32.1	
DT210A	1.0091	1.0755	1.0341	1.0752	1.0484	-	-	Triplicate Site with DT210A, DT210B and DT210C - Annual data provided for DT210C only
DT210B	1.0091	1.0755	1.0341	1.0752	1.0484	-	-	Triplicate Site with DT210A, DT210B and DT210C - Annual data provided for DT210C only
DT210C	1.0091	1.0755	1.0341	1.0752	1.0484	27.7	29.1	Triplicate Site with DT210A, DT210B and DT210C - Annual data provided for DT210C only

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 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.

City of Bradford MDC have applied a national bias adjustment factor of 0.82 to the 2022 monitoring data obtained from the National Diffusion Tube Bias Adjustment Factor Spreadsheet version 03/23 which was the latest version available at the time of writing. This factor has been derived from studies at 4 separate locations.

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/23

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

This spreadsheet will be updated at the end of June 2023

LAQM Helpdesk Website

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

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

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List

If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List

If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List

If a year is not shown, we have no data[2]

Step 4:

Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[5] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	50% TEA in Acetone	2022	R	Royal Borough Of Windsor And Maidenhead	12	27	27	-1.0%	G	**1.01**
Gradko	50% TEA in Acetone	2022	R	Sandwell Mbc	12	34	27	27.1%	G	**0.79**
Gradko	50% TEA in Acetone	2022	UB	Sandwell Mbc	12	21	19	11.9%	G	**0.89**
Gradko	50% TEA in acetone	2022		**Overall Factor[3] (14 studies)**				**Use**		**0.82**

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

Table C.6.

During 2020 City of Bradford had to use a locally calculated bias factor using real time and diffusion tube data taken from the Keighley real time air pollution station. This was due to problems with the supply and analysis of diffusion tubes during 2020 which resulted in more than one laboratory providing diffusion tube data during this period.

Table C.6 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.82
2021	National	03/22	0.83
2020	Local	-	0.92
2019	National	04/20	0.80
2018	National	09/19	0.80

Although not used in this report a local bias correction factor for Keighley for 2022 has been calculated using the diffusion tube data processing tool. This returned a value of 0.79 which is lower than the national factor of 0.82. To ensure as much consistency as possible with previous years, and to present the worst-case situation, the national bias correction factor has been used throughout this report.

Table C.7 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	12	-	-	-	-
Bias Factor A	0.79 (0.74 - 0.85)	-	-	-	-
Bias Factor B	26% (17% - 35%)	-	-	-	-
Diffusion Tube Mean (µg/m^3)	25.8	-	-	-	-
Mean CV (Precision)	3.3%	-	-	-	-
Automatic Mean (µg/m^3)	20.5	-	-	-	-
Data Capture	96%	-	-	-	-
Adjusted Tube Mean (µg/m^3)	20 (19-22)	-	-	-	-

Notes:

No local bias adjustment factor has been used to bias adjust the 2022 diffusion tube data. The local bias adjustment value is provided for information only.

NO_2 Fall-off with Distance from the Road

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

The information used in the Diffusion Tube Data Processing Tool to calculate the fall off with distance values for diffusion tubes with annual results greater than 36µg/m^3 during 2022 are summarised in Table C4 below.

During 2022 two additional diffusion tube sites DT131 and DT191 returned values greater than 36µg/m^3 but could not be distance corrected as their distance from relevant receptor points lies outside the limits of the distance correction tools. These tubes are not included in Table C4.

Table C.8 – NO_2 Fall off With Distance Calculations (concentrations presented in µg/m^3)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
DT223A, DT223B, DT223C	2.0	5.0	38.5	20.6	34.6	
DT132	1.1	4.6	37.2	20.9	32.4	
DT278	2.0	9.0	38.8	20.9	32.5	
DT50	2.0	5.4	39.0	14.8	33.4	
DT31	1.6	11.2	40.5	14.8	29.3	
DT161A, DT161B, DT161C	1.8	1.9	40.6	18.6	40.3	Predicted concentration at Receptor above AQS objective.
DT162A, DT162B, DT162C	2.7	2.8	37.1	18.6	37.0	Predicted concentration at Receptor within 10% the AQS objective.
DT163A, DT163B, DT163C	1.7	1.8	36.8	18.6	36.6	Predicted concentration at Receptor within 10% the AQS objective.
DT183	1.1	8.2	38.8	18.6	30.5	
DT184	0.6	3.7	37.5	18.6	31.1	
DT167A, DT167B, DT167C	0.6	3.1	39.1	18.6	33.0	
DT12A, DT12B, DT12C	3.4	3.9	49.3	23.8	48.3	Predicted concentration at Receptor above AQS objective.
DT105	3.1	6.8	39.9	18.9	35.6	
DT281	2.5	6.2	41.2	17.2	35.8	
DT211A, DT211B, DT211C	2.4	7.9	44.1	18.9	36.8	Predicted concentration at Receptor within 10% the AQS objective.

QA/QC of Automatic Monitoring

City of Bradford MDC's air quality analysers are type approved as recommended in LAQM.TG1 (00) *Review and Assessment: Monitoring air quality* and LAQM.TG4 (00) *Review and assessment: Pollutant specific guidance.* All the real time data provided in this report is independently ratified data from council operated analysers with the exception of the Mayo Avenue site (CM4) which is affiliated to the Defra AURN network.

City of Bradford MDC is currently contracted to provide Local Site Operator (LSO) support for the Mayo Avenue site which normally includes the undertaking of fortnightly manual calibrations. Recently calibrations at the Mayo Avenue site have been reduced to 1 per month at the request of the AURN management team. This has been necessary due to a national shortage of calibration gases. Fortnightly calibrations will resume once we are instructed to do so. More information about the operation and management of AURN sites is available here Link to Defra AURN website.

The day to day operation of the Council's own automatic network is managed by the Clean Air Programme (CAP) team. The monitoring officer located within this team undertakes trouble shooting activities associated with the equipment operation (e.g. initial investigation of site malfunctions, communication resets, filter changes etc.) and is also responsible for the maintenance and upkeep of the sites to ensure the inlets remain free from obstacles and any damage to the sites or pest infestations are dealt with promptly. The monitoring officer liaises directly with the data management contractor and is generally able to provide a same day response to any concerns raised with the data or lack of communications during the working week. Where necessary the monitoring officer places a call out to the service and maintenance provider (currently Signal group) and ensures that repairs are carried out promptly and to the council's satisfaction.

Regular manual calibration of the monitoring equipment is essential to ensure the quality of the data collected is of a high standard. Routine calibration of the City of Bradford MDC sites is currently undertaken twice per month. One of these calibrations is undertaken by an independent contractor and the other by trained members of the CBMDC Clean Air Programme team. The independent contractor was previously employed as an air quality officer at the council for many years and has been extensive knowledge of the Bradford air quality monitoring network. Having the independent contractor in place ensures routine calibrations are undertaken regularly and is not impacted on by the varying workload of the permanent members of the CAP team. Additional calibrations are undertaken by the Signal group engineers following any interruption to the systems such as a breakdown or routine service.

During calibration visits a manual zero and span calibration check is performed. The methodology used is essentially that found in the AURN Local Site Operators and the manufacturer's instruction manual.

The basic steps are:

- Pre-calibration check of the general site condition and status of the analyser, before the zero and span checks are performed.
- Zero check to verify the performance of the analyser in the absence of the gas being monitored.
- Span check to verify the response of the analyser to gas of a known concentration.
- Post calibration check of the general site condition and status of the analyser on completion of all calibration routines.

A record of each analyser zero and span check is fully documented and sent to the data management contractor. Records of a calibrations are kept for up to 5 years.

The gases used for onsite span calibration checks at the Bradford owned air pollution stations are supplied by Air Liquide Ltd. Calibration gases for the Mayo Avenue AURN site are supplied by BOC Ltd. Calibration gases are traceable via European Accreditation DIN EN 45001 and DIN EN ISO 900. The tolerance of the nitrogen dioxide and nitric oxide in air mixes is typically ±5%. Zero air is generated internally in the Ambirak, and the scrubbers are changed when necessary in accordance with manufacturer's recommendations and the LSO Site Manual for the Ambirak.

Signal Group (the equipment supplier) provide six monthly routine service and maintenance visits and provide an emergency repair and breakdown service for the Bradford monitoring network. They normally respond to any call outs within 24 to 48 hours of the call being placed. Having a high quality service and maintenance contract in place is essential to maintain high levels of good quality data capture across the Bradford monitoring network.

All data generated by the Bradford automatic analysers is independently collected and ratified by an external contractor. The current data management service provider is Air Quality Data Management (AQDM), a well-established and respected air quality data management supplier. More information about AQDS can be found here: Link to Air Quality Data Management website AQDM remotely checks the operational status of all the Bradford monitoring sites on a daily basis (apart from the Mayo Avenue AURN site) and provide regular updates to the council on air quality conditions around the district. At the end of each year they provide a fully verified and ratified data set for every site to be used as the basis for ASR reporting. Having an independent data management contractor in place ensures the Bradford air quality data is of a high standard and any problems with

the equipment are identified early thereby minimising data loss and ensuring high percentage data capture at all sites.

Daily air quality data from the Bradford Council operated network can be viewed daily on the Air Quality Net website operated by AQDS here: Link to Air Quality Net website

Daily and summary air quality data from the Mayo Avenue AURN site can be viewed daily on the Air Quality England website here: Link to Mayo Avenue data on Air Quality England website

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

The type of PM10/PM2.5 monitor(s) utilised within City of Bradford MDC do not require the application of a correction factor. The data has been subject to independent ratification and verification checks by Air Quality Data Management.

Automatic Monitoring Annualisation

All automatic monitoring locations within City of Bradford MDC recorded data capture of greater than 75% during 2022 therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

NO_2 Fall-off with Distance from the Road

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

During 2022 only one automatic monitoring site CM6 (Shipley Airedale Road) exceeded 36 µg/m^3 at the monitoring position. This is the only automatic site for which distance correction has been undertaken. Details of the distance calculation for this site are shown below and the results included in Table C.4.

Distance correction calculation for CM6 Shipley Airedale Road 2022

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	4	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	23.8	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	37	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	34.9	µg/m^3

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

Figure D.2 – Map of AQMA locations in Bradford

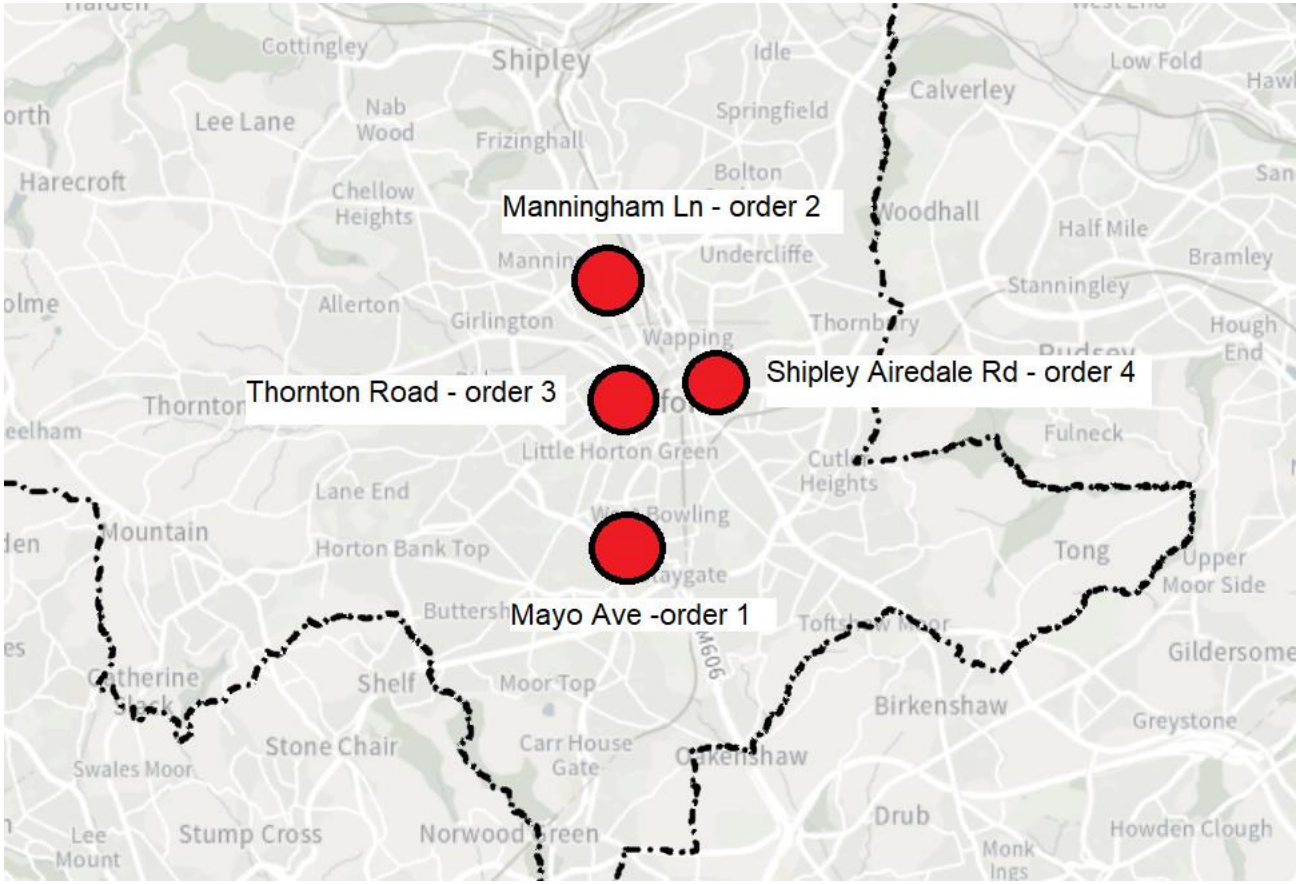


Figure D.2 – Map of Bradford CAZ location

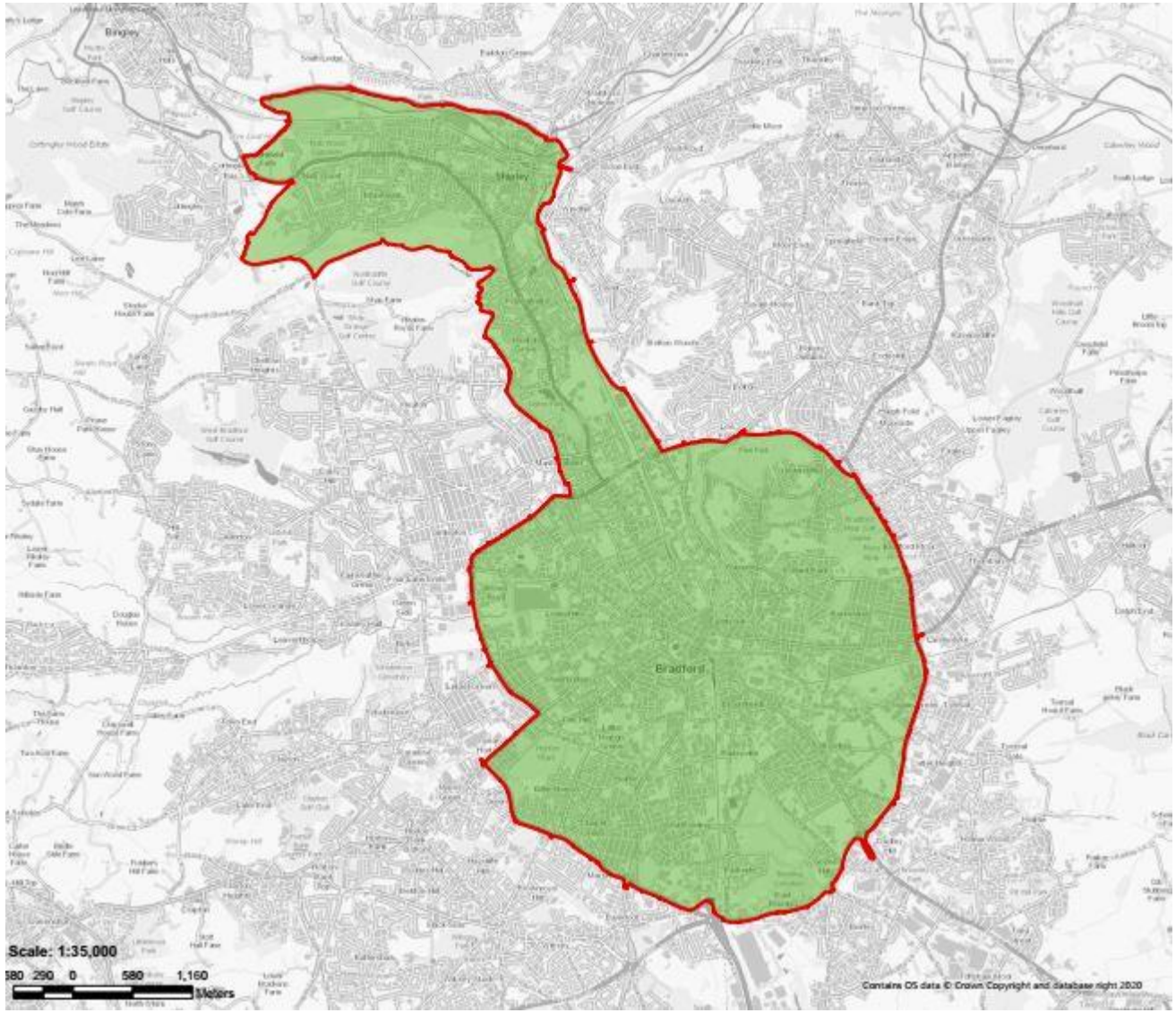


Figure D.3 – Map of areas of previous air quality concern in Bradford

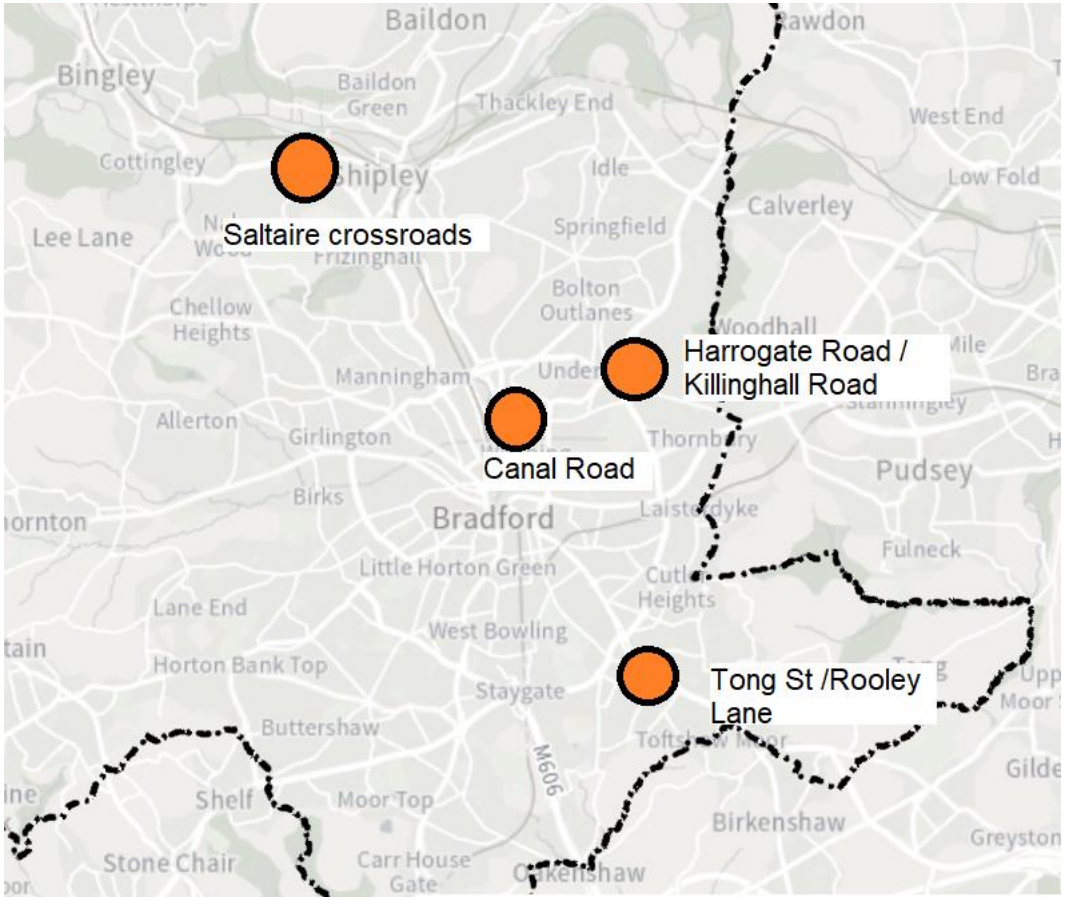
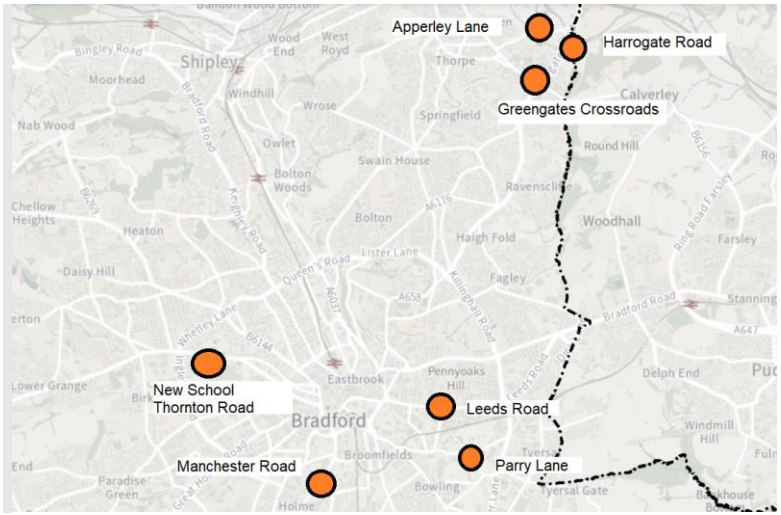
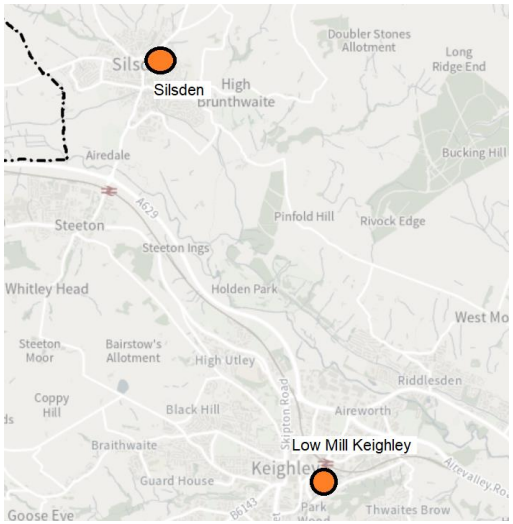


Figure D.4 – Map of other locations discussed in the report





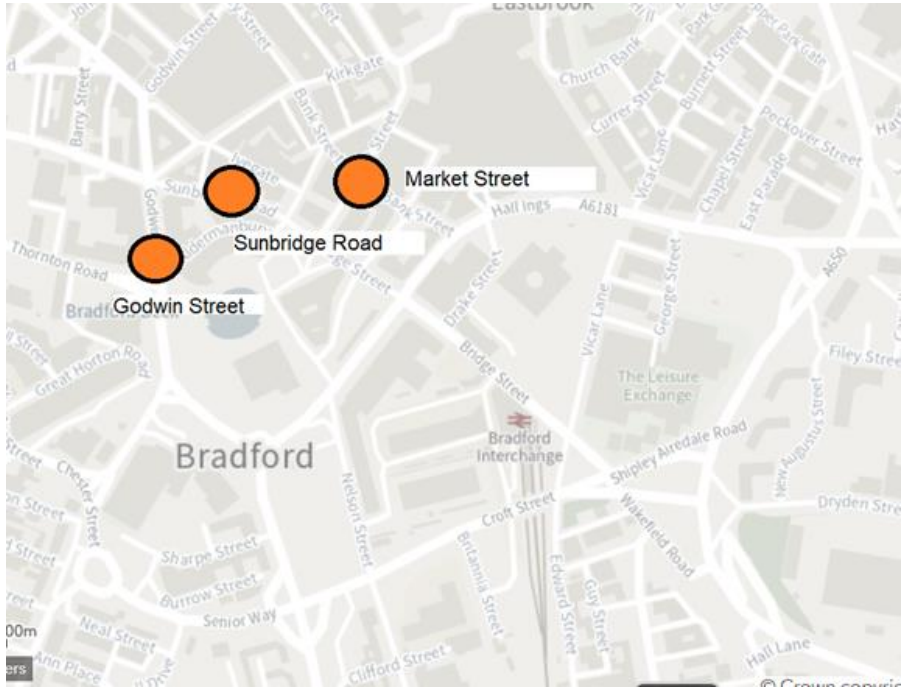

Market Street
Sunbridge Road
Godwin Street
Bradford
Bradford Interchange
The Leisure Exchange
Thornton Road
Great Horton Road
Chester Street
Sharpe Street
Burrow Street
Senior Way
Neal Street
Clifford Street
Nelson Street
Britannia Street
Edward Street
Croft Street
Wakefield Road
Shipley Airedale Road
Hall Lane
Drake Street
Vicar Lane
George Street
Bridge Street
Hall Ings
A6181
A650
Church Bank
Currer Street
Burnett Street
Peckover Street
Chapel Street
East Parade
New Augustus Street
Dryden Street
Filey Street
Kirkgate
Barry Street
Godwin Street

Figure D.5 – Map of Automatic Monitoring sites in Bradford 2022

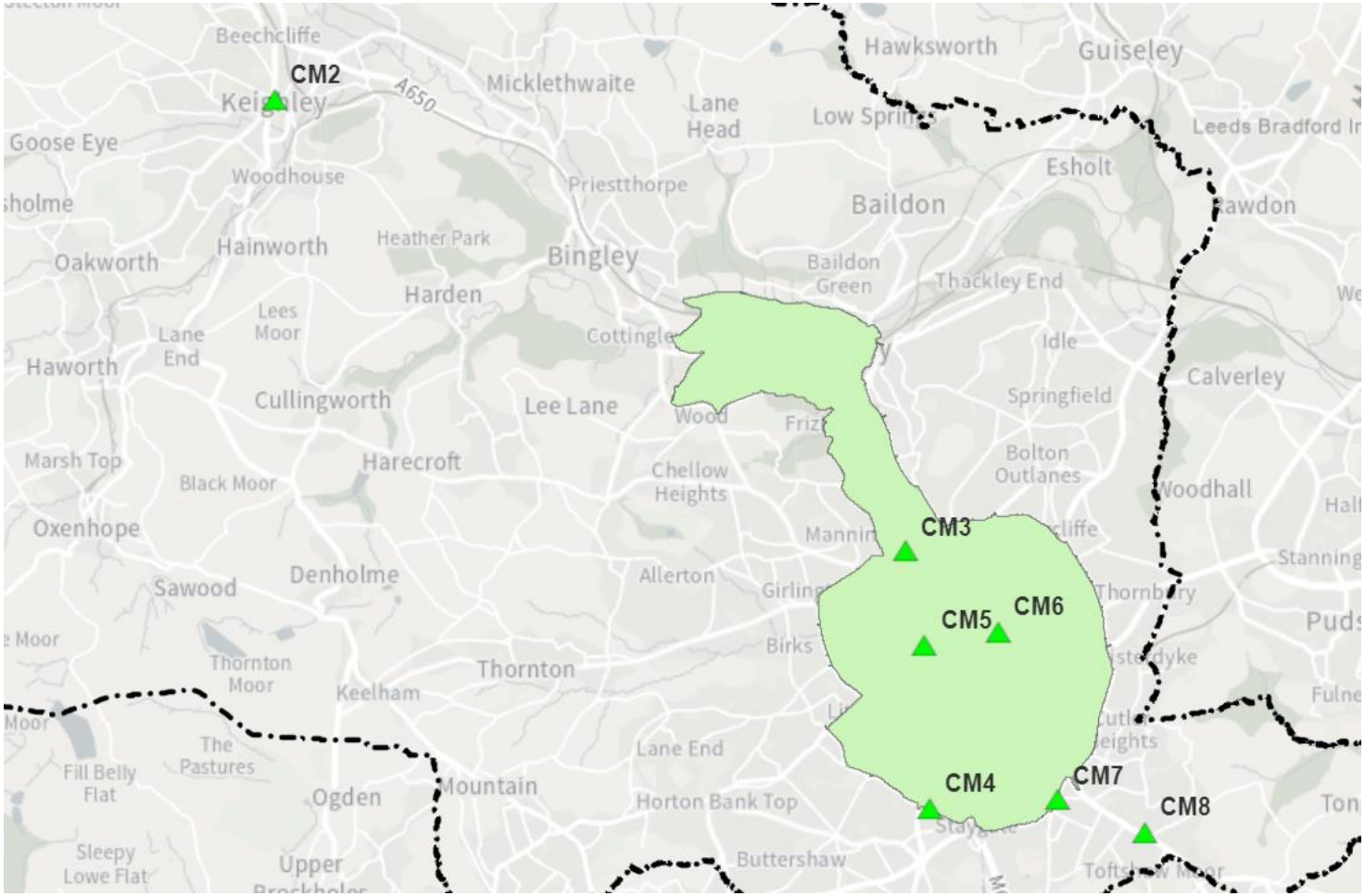


Figure D.6 – Map of Non-Automatic Monitoring Sites in Mayo Avenue AQMA (order 1)

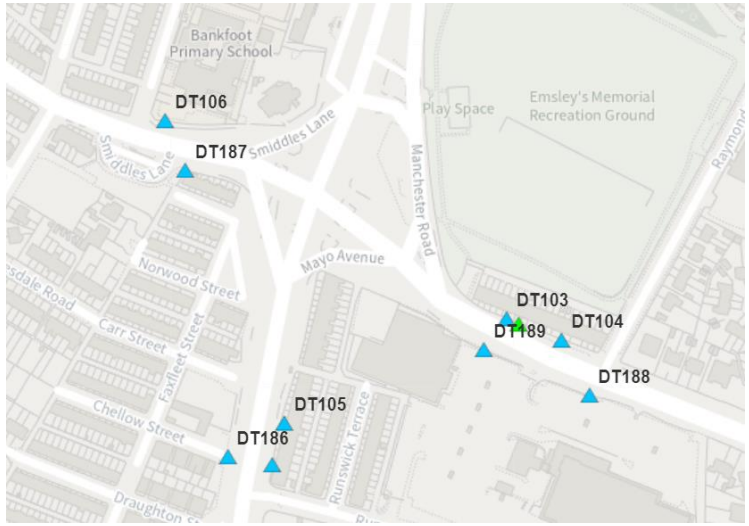


Figure D.7 – Map of Non-Automatic Monitoring Sites in Manningham Lane AQMA (order 2)

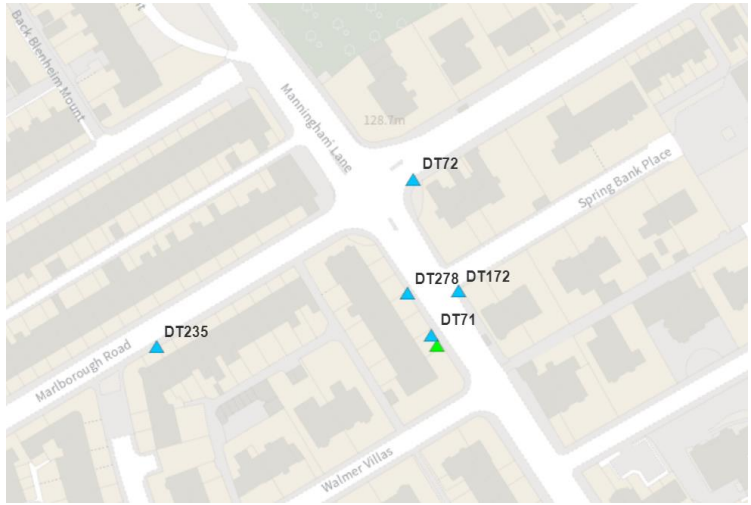
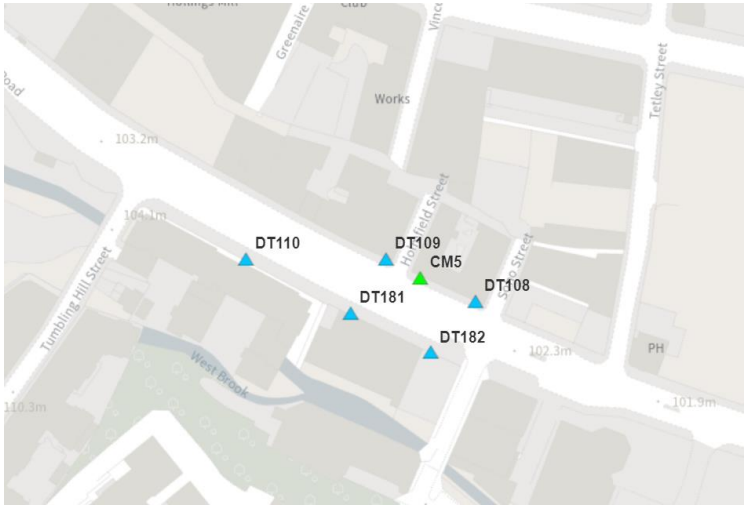


Figure D.8 – Map of Non-Automatic Monitoring Sites in and near Thornton Road AQMA (order 3)



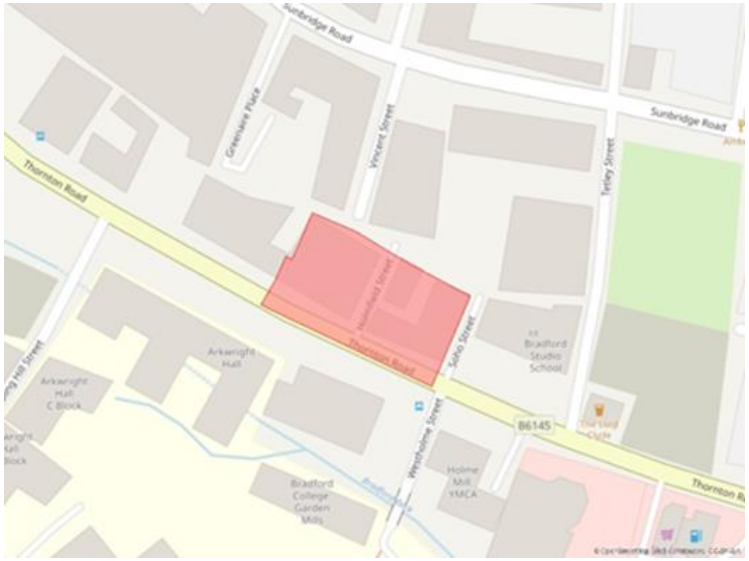


Figure D.9 – Map of Non-Automatic Monitoring Sites in and near Shipley Airedale Road AQMA (order 4)

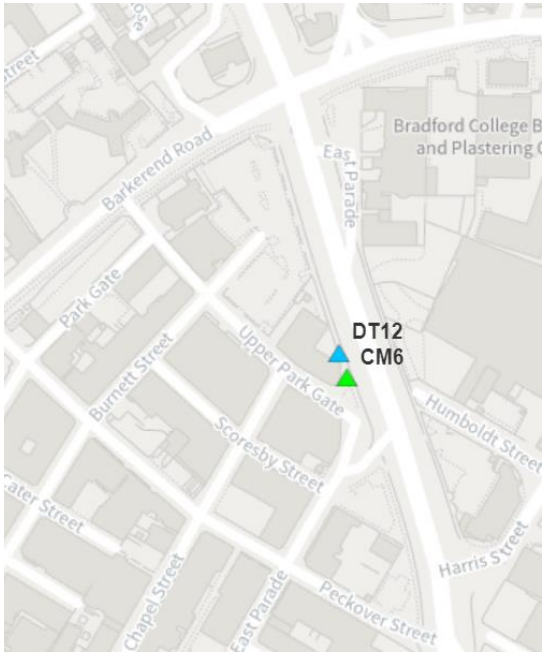


Figure D.10 – Map of Non-Automatic Monitoring Sites in and around CAZ

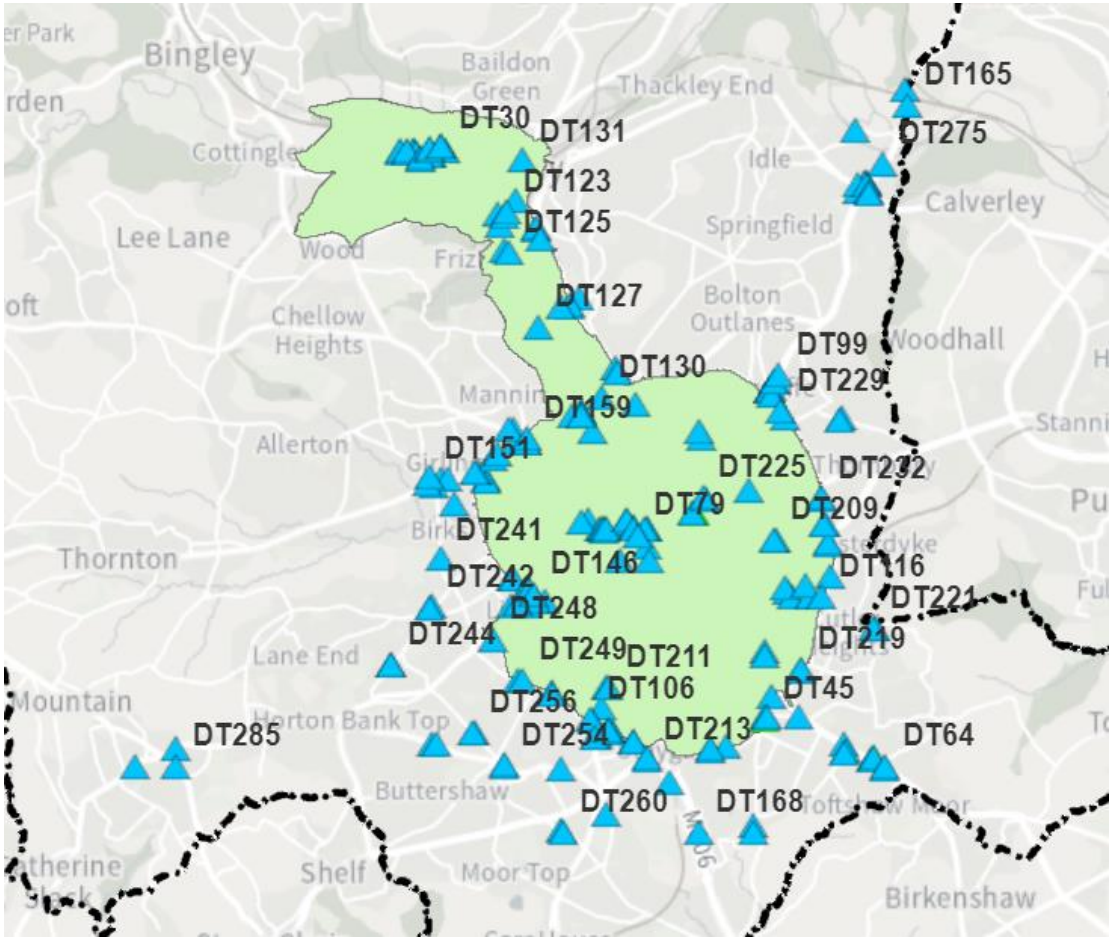
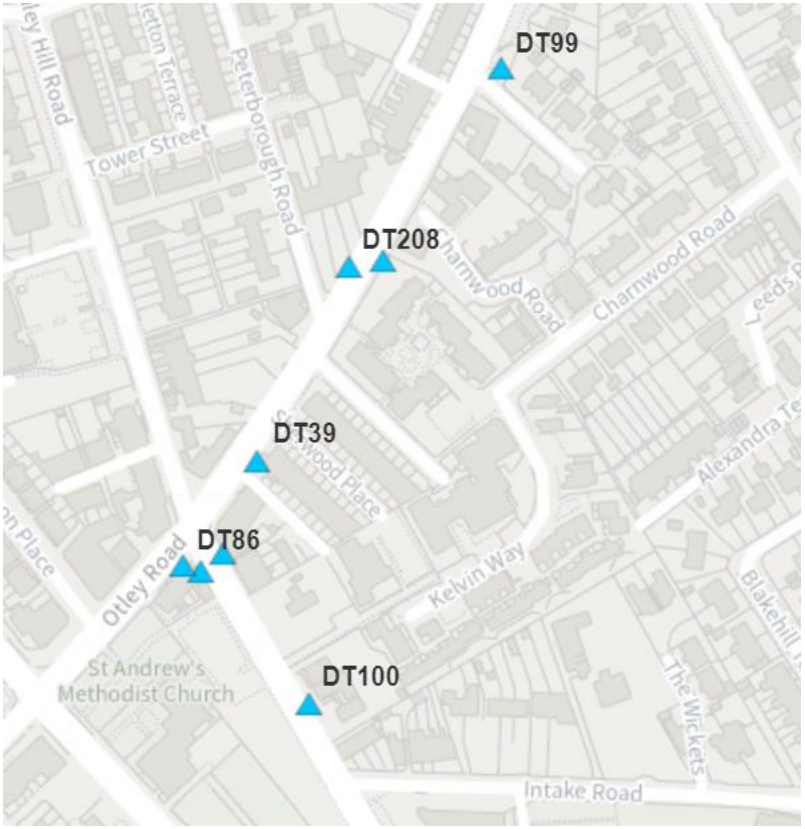


Figure D.11 – Map of Non-Automatic Monitoring Sites near Harrogate Road / Killinghall Road



Site DT100 no longer in operation

Figure D.12 – Map of Non-Automatic Monitoring Sites near Saltaire crossroads

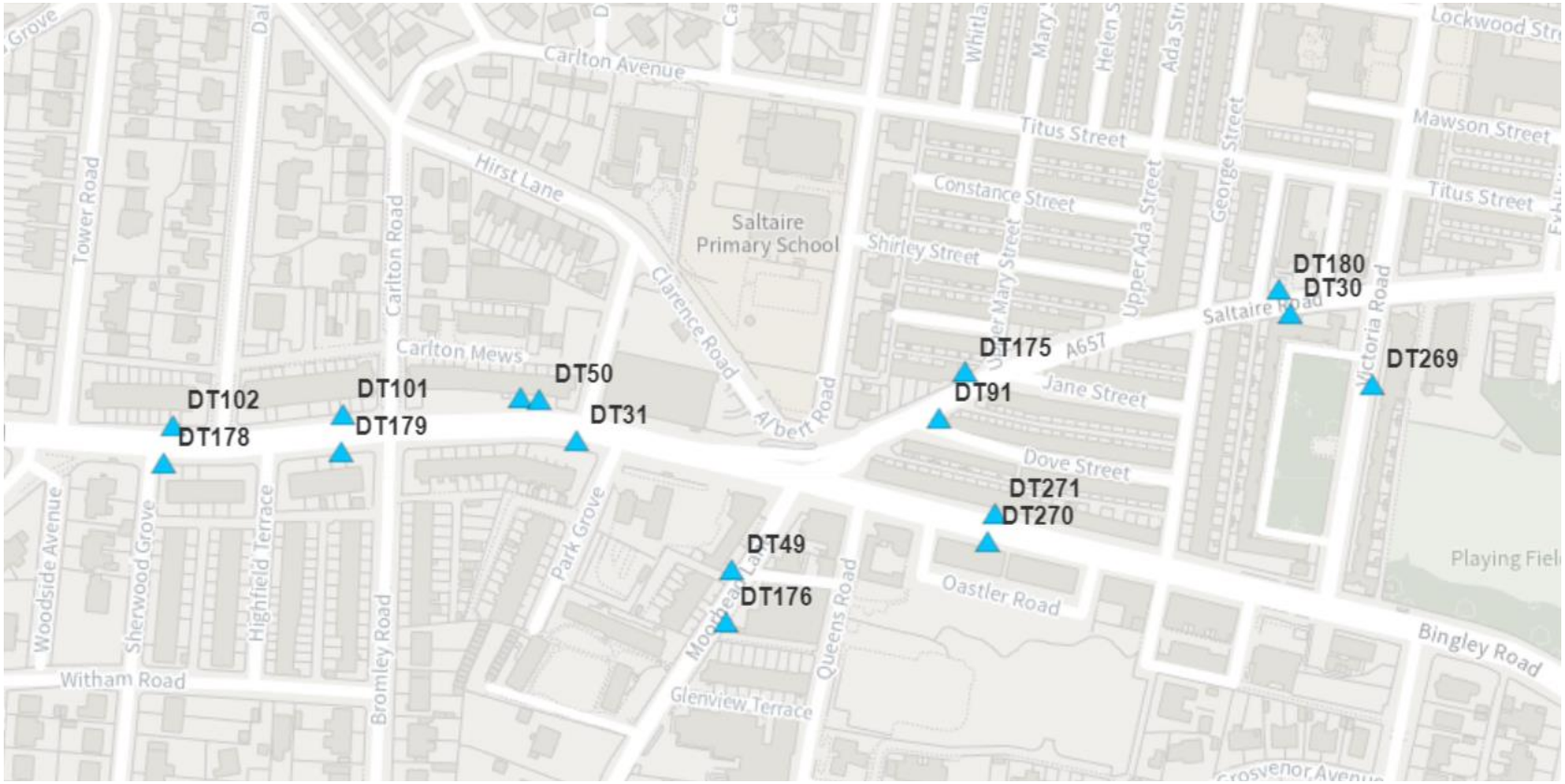


Figure D.13 – Map of Non-Automatic Monitoring Sites on Canal Road

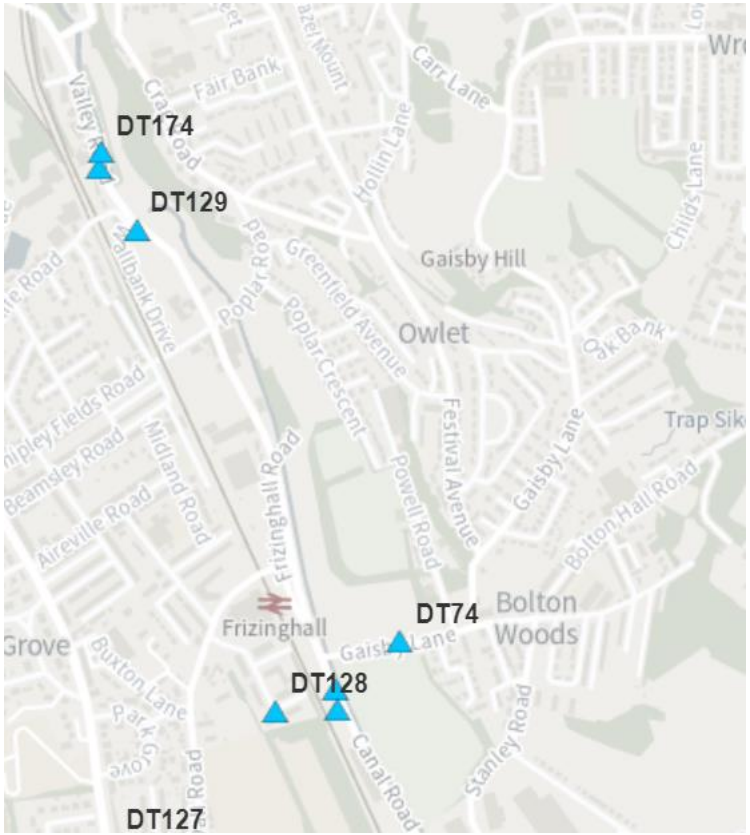


Figure D.14 – Map of Non-Automatic Monitoring Sites on Rooley Lane / Tong Street

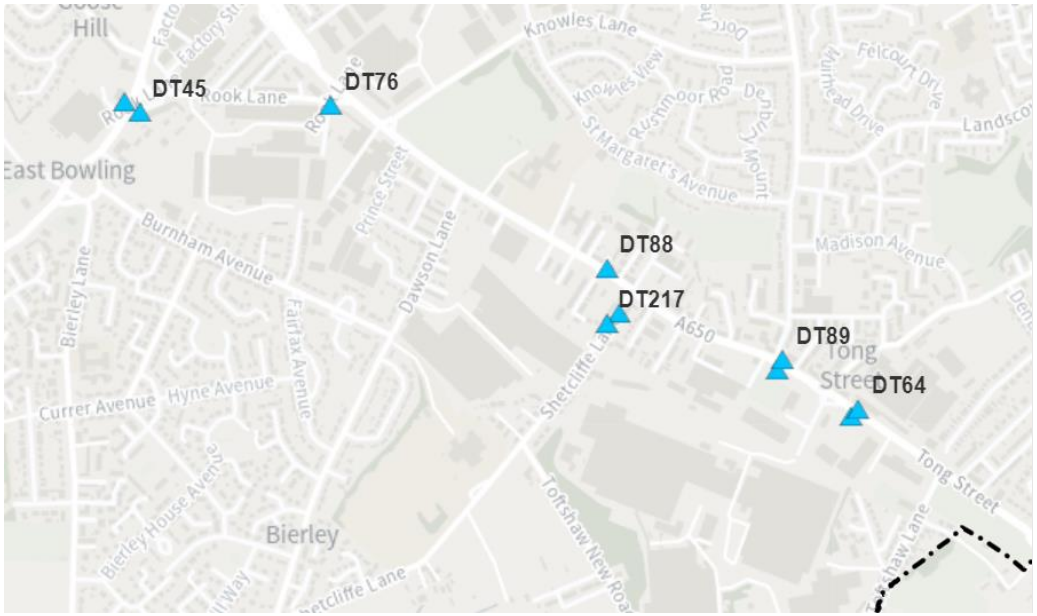


Figure D.15 – Map of Non-Automatic Monitoring Sites in the city centre

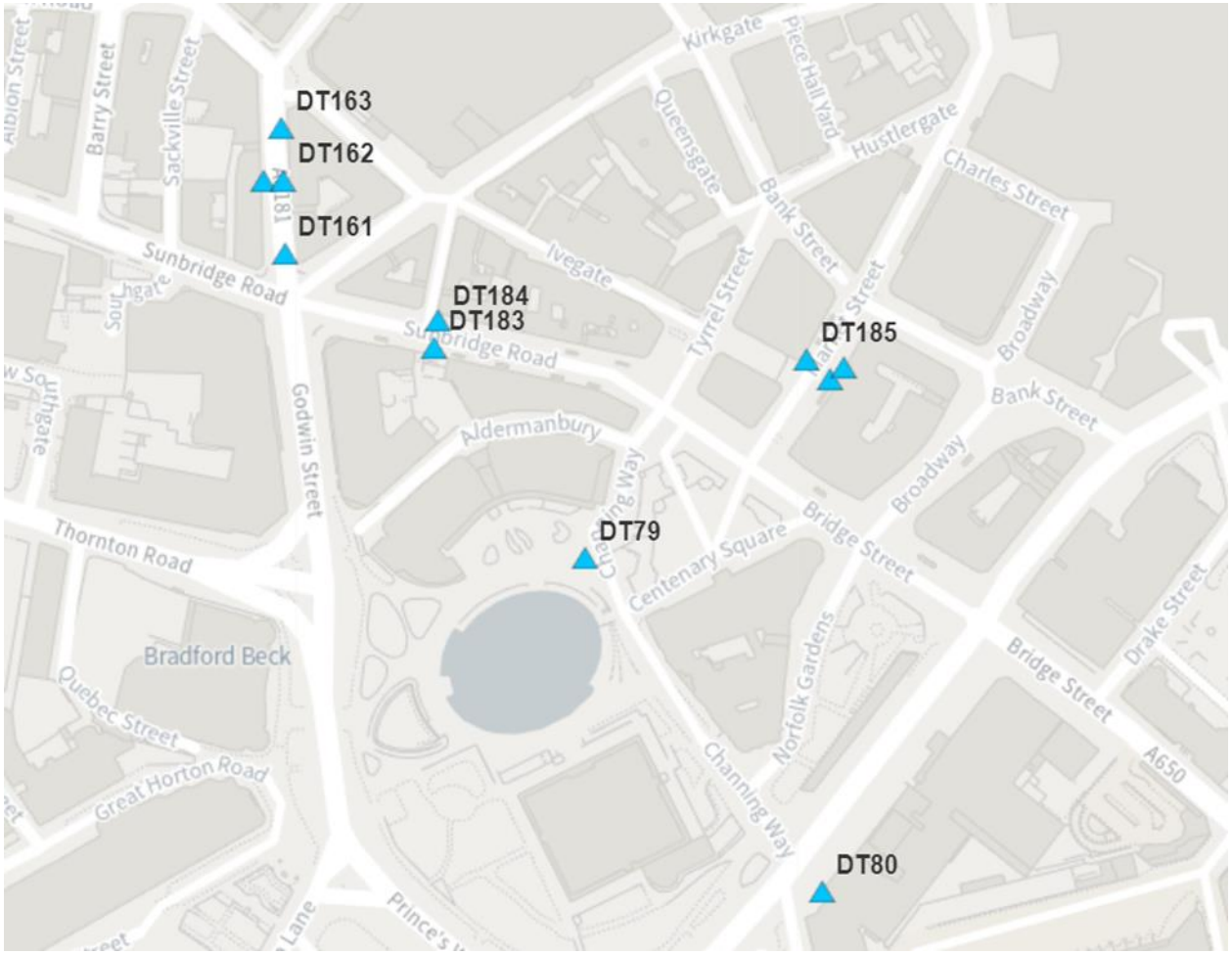


Figure D.16 – Map of Non-Automatic Monitoring Sites in Ilkley

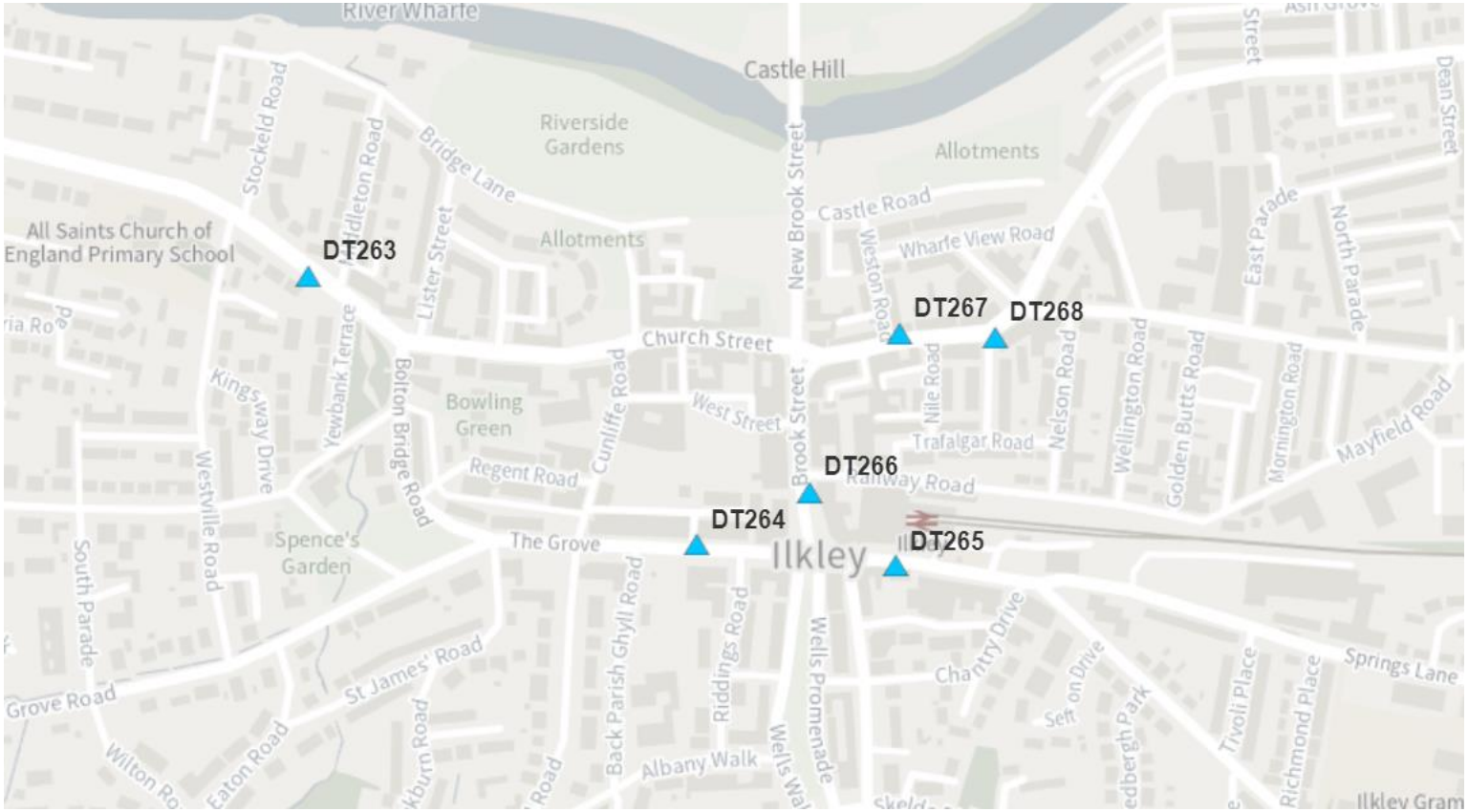


Figure D.17 – Map of Non-Automatic Monitoring Sites around Keighley

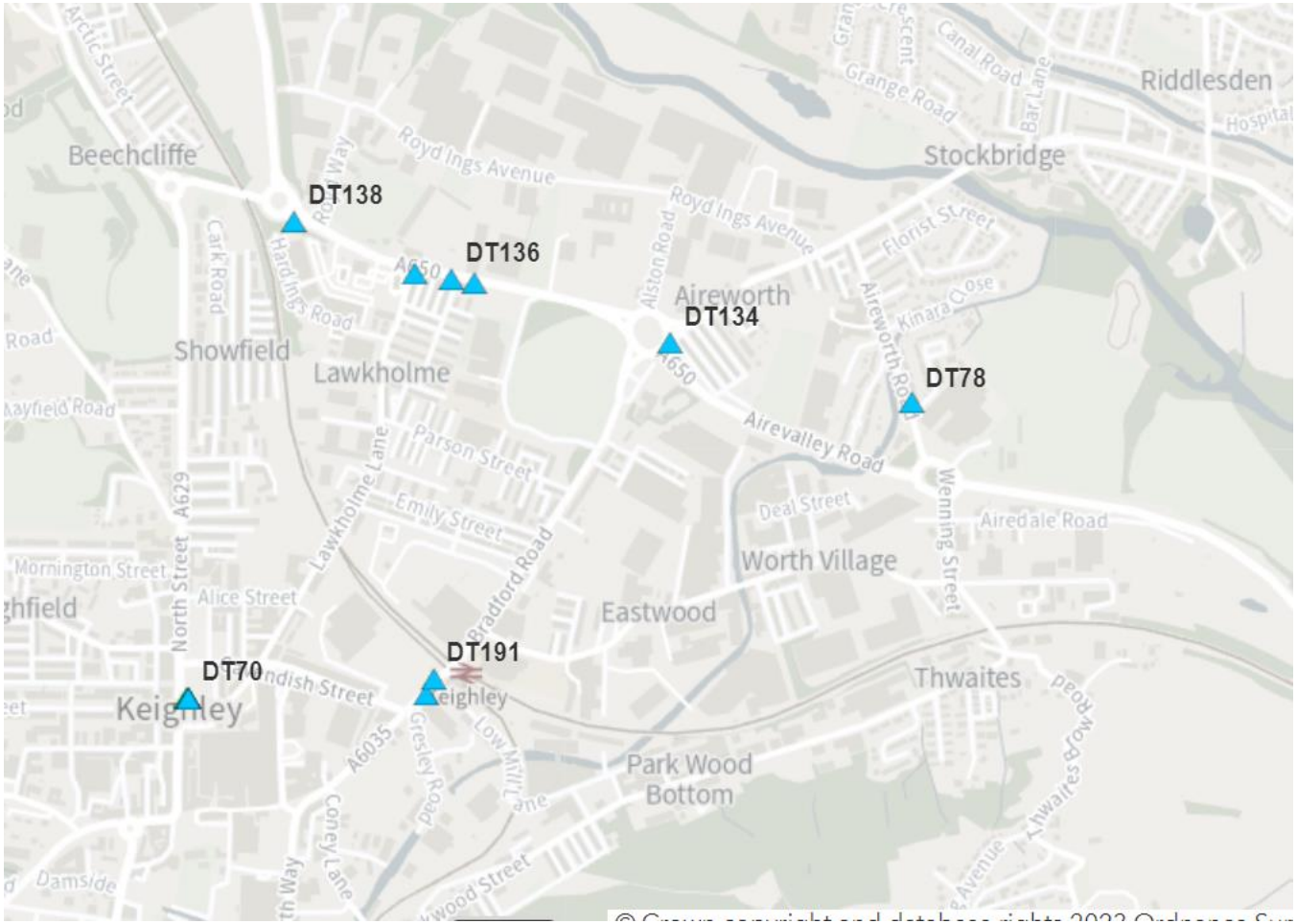
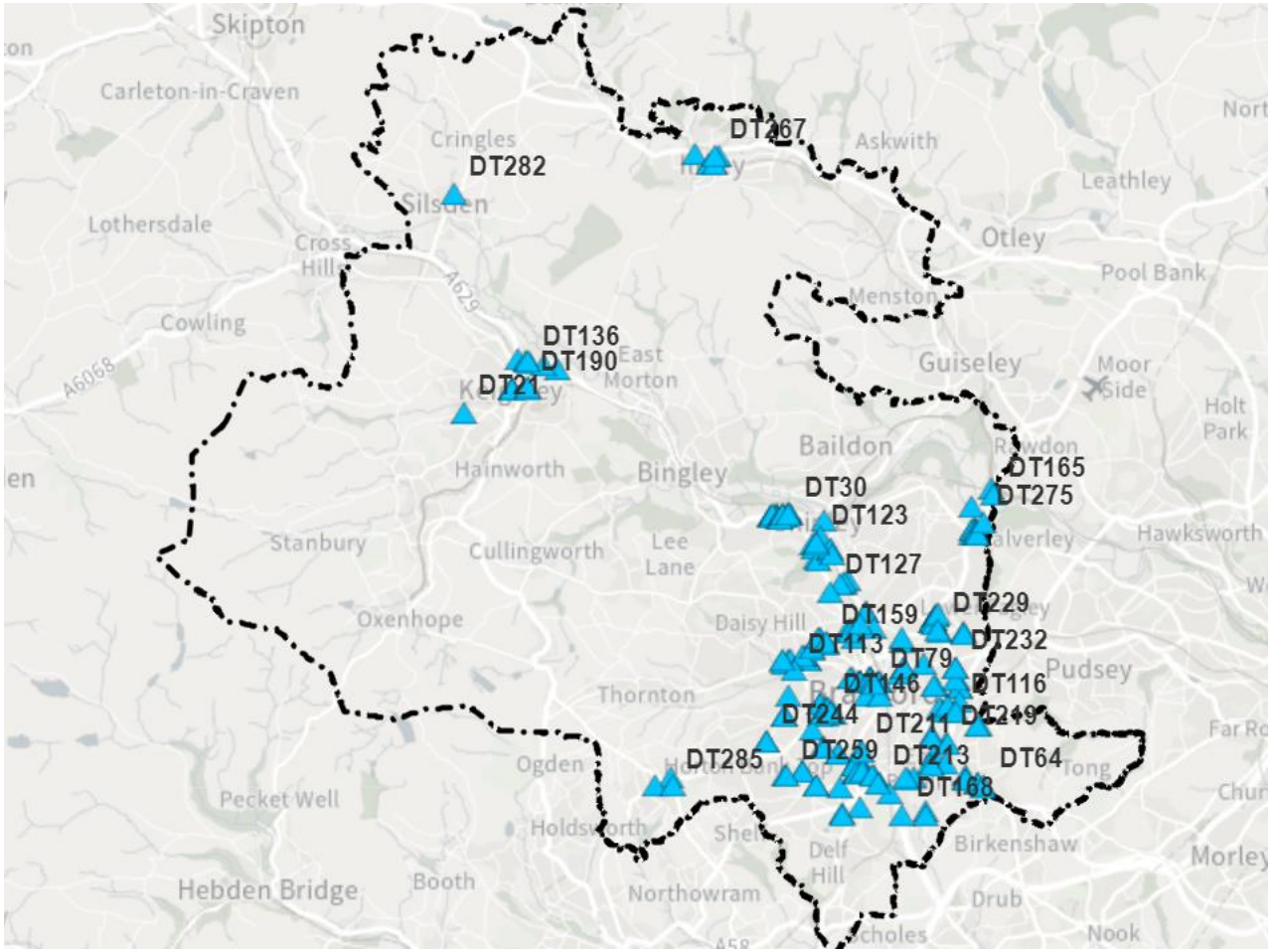


Figure D.18 – Map showing extent of all Non-Automatic Monitoring Sites in Bradford district



Appendix E: Summary of Air Quality Objectives in England

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

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

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report – Statutory annual report on air quality and action planning required to be submitted by all local authorities
BiB	Born in Bradford – an internationally recognised research programme which aims to find out what keeps families health and happy by tracking the lives of over 40,000 Bradfordians.
CAF	Clean Air Fund – Central government fund to support individuals and businesses affected by local nitrogen dioxide plans.
CAP	Clean Air Programme
CASP	Clean Air Schools Programme – a new Bradford initiative that will fund and deliver air quality improvements at local schools
CAZ	Clean Air Zone – an area where the allowed emission level of specified vehicles is controlled
CBMDC	City of Bradford Metropolitan District Council
Defra	Department for Environment, Food and Rural Affairs
DHN	District Heat Network
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
JAQU	Joint Air Quality Unit (an amalgamation of the Government departments of DfT and Defra)
LAQM	Local Air Quality Management
NHS	National Health Service
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NRMM	Non-Road Mobile Machinery
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less

Abbreviation	Description
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
PRS	Particle Reduction Strategy
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
TCF	Transforming Cities Fund
ZEB	Zero Emission Bus

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.