



2021/2022 Combined Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management

Date: June, 2022

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Executive Summary: Air Quality in Our Area

Air Quality in East Staffordshire Borough Council

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 ages³, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁴.

Both of the AQMAs can be viewed at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=93. A map of both AQMAs has been included in Appendix D, Figures D.1. and D.2.

Whilst many monitored locations meet the annual objective $40\mu\text{g}/\text{m}^3$ NO_2 standard in AQMA 1, a small number remain over this limit concentration during 2020-21, with the highest concentration at a relevant receptor during 2020 being $43.4\mu\text{g}/\text{m}^3$. In 2019 however, only one location exceeded the annual objective at $40.8\mu\text{g}/\text{m}^3$. The locations within AQMA 1 with the highest NO_2 concentrations continue to be centred on Derby Turn and Wellington Street.

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

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy⁵ sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero⁶ sets out 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.

- The Burton upon Trent Town Centre Regeneration Project is now complete. Some of these measures are hoped will improve traffic flow through the town.
- Improvements to Burton upon Trent railway station external forecourt were completed in 2020.
- Real time bus passenger information (RTPI) and infrastructure improvements have been undertaken across East Staffordshire.
- The automatic monitoring station cabinet was replaced and upgraded in 2021, thus committing to its future retention and reliability.
- East Staffordshire Borough Council has started to utilise the Defra Damage Cost assessment approach to place a value on the impact that some developments have on air quality which is then used to determine the required amount required to be spent on mitigation.

⁵ Defra. Clean Air Strategy, 2019

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

Conclusions and Priorities

Conclusions:

No new AQMAs have been declared during 2020-21.

Monitoring confirms relevant receptors near the A50 in Uttoxeter are within objective limits over three to four years. No further detailed assessment or consideration to an AQMA declaration is required. East Staffordshire Borough Council will be looking to scale back monitoring in this area at the end of 2022.

Areas of AQMA 1 towards the centre of Burton upon Trent still marginally exceed the annual NO₂ objective, although the long-term trend continues to show reducing NO₂ concentrations.

AQMA 2 at Stapenhill roundabout continues to remain below the annual NO₂ objective at the facades of relevant receptors and has done so since 2011. East Staffordshire Borough Council will start formal proceedings to revoke this AQMA later in 2022 and into 2023.

Priorities for 2022-23 include:

- East Staffordshire Borough Council to publish formal supplementary planning guidance during the 2022-23 financial year.
- To review the Air Quality Action Plan (AQAP) and draw on any synergies with the Climate Change Action Plan
- To liaise with Staffordshire County Council's Highways Authority to identify and advance local transport related projects that will improve air quality. These will be supported by S106 agreements from developments under the damage cost approach adopted in the supplementary planning guidance.
- To consider any Defra grants or Office for Low Emission Vehicles (OLEV) funding as deemed appropriate
- Staffordshire County Councils Highways Authority have identified a number of priorities for 2022-23 and beyond (see Section 2.2.)
- East Staffordshire Borough Council to formally 'revoke' the smaller AQMA 2 during 2022-23, now monitoring for a number of years show consistent compliance with the NO₂ objectives, (see Section 3.2.1 for a breakdown of long-term trends).

- To continue to support and participate the Simulate Live Lab partnership programme in East Staffordshire and across Staffordshire in general (See Section 2.2.).

Local Engagement and How to get Involved

The easiest way for the public to get involved in aiding air quality improvements within the area would be to look at alternative modes of travel. The following are suggested alternatives to private travel that would contribute to improving air quality within the Borough:

Think Before You Drive

- Avoid vehicle idling and/or use of air conditioning running continuously. By switching your engine off you can save fuel, money and improve local air quality
- Consider leaving the car at home one day a week.
- Walk or cycle – From choosing to walk or cycle for your journey the number of vehicles is reduced and also there is the added benefit of keeping fit and healthy. Information on cycle routes within the East Staffordshire District is currently available on Staffordshire County Council's website at the following link <https://www.staffordshire.gov.uk/Transport/cycling/Documents/East-Staffordshire.pdf>;
- East Staffordshire Borough Council endorses the Staffordshire Air Aware scheme established by Staffordshire County Council, which provides more detail on reducing reliance on personal vehicle use. This can be viewed at <https://www.staffordshire.gov.uk/DoingOurBit/Get-Inspired/Clean-green-and-safe/Air-aware/Air-aware.aspx>
- Hold meetings by conference call or Microsoft Teams/ Zoom rather than driving to meetings. This reduces fuel, vehicle maintenance and other travel costs, and increases productivity through reduction in hours lost through unnecessary travel.
- Facilitate Flexible Working Arrangements for staff to work remotely from home or hubs closer to home for one or more days a week thus removing or reducing commuter journeys. This reduces congestion which has beneficial impacts for delivery times, reduced business costs and thus economic benefits. Additionally, it provides social benefits through improved work-life balance for employees and helps to improve local air quality and reduced emergency vehicle response times.

- If you must drive consider fuel efficient driving advice, known as 'Smarter Driving Tips', which ultimately will save you on fuel costs and reduce your emissions. Several websites promote such advice including:

<https://energysavingtrust.org.uk/advice/ecodriving/>

<https://www.theaa.com/driving-advice/fuels-environment/drive-smart>

<https://www.vehicle-certification-agency.gov.uk/fcb/smarter-driving-tips.asp>

Energy Efficiency

Improving the energy efficiency of your home / school / workplace will help reduce energy bills, as well as reducing emissions associated with power generation. The Energy Savings Trust (EST) which is a non-profit organisation, funded by the government and private sector can provide independent and impartial advice to help consumers in lowering emissions and cut their energy bills. For further information, visit the EST website at

<https://www.energysavingtrust.org.uk/>

Around The Home

- Use water-based or low solvent paints, glues, varnishes and wood preservatives, look for brands with a low VOC content.
- Have your central heating system checked regularly to avoid risking exposure to toxic carbon monoxide.
- Most of Burton upon Trent, excluding Branston and parts of Stretton are in a Smoke Control Area. In a Smoke Control Area you need to make sure that any appliance is exempt or is included in the list of authorised fuels. Defra keeps a list of approved appliances and authorised fuels that are permitted for use in smoke control areas at <https://smokecontrol.defra.gov.uk/appliances.php?country=england>

The 'Ready to Burn' scheme was launched by Woodsure in 2017, which promotes the sale and use of good quality dry wood, which has lower emissions than wet wood. This followed on from the launch of the Stove industry Alliance 'Ecodesign ready' scheme in February, which enables consumers to identify stoves tested to the high emission standards of the Ecodesign Directive due to be introduced in 2022. Further information on these two schemes can be found using the links below, in addition to a practical guide produced by the chimney sweeps association providing advice and guidance if using wood-burning stoves or open fires whether you are in a Smoke Control Area or not. In April 2018, the Guild of Master Chimney

Sweeps launched the 'Burn Right' campaign. This provides good practice guidance on using your fire. Wood pellets used in biomass boilers are covered by the ENplus certification scheme; further details are found below.

- [Ready To Burn](#)
- [Dry Firewood | Woodsure | Ready to Burn Firewood Video](#)
- [Practical Guide if using woodburning stoves or open fires](#)
- [Burnright](#)
- [ENplus](#)
- [Open fires and wood-burning stoves - a practical guide \(defra.gov.uk\)](#)
- [Smoke Control Areas: Do you know the rules?](#)

Other Considerations

- When planning days out or journeys to work, check the air pollution forecast at <https://uk-air.defra.gov.uk/forecasting/>
- Be energy efficient - make sure your house is well insulated and use energy efficient appliances <https://www.energysavingtrust.org.uk/home-energy-efficiency>
- Refrain from having bonfires or barbecues when air pollution levels are high.
- Never burn household waste, especially plastics, rubber and treated timber.

Air quality enquiries can be made to Environmental Health:

Tel: 01283 508509 or Email: ehsupport@eaststaffsbc.gov.uk

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of East Staffordshire Borough Council with the support and agreement of the following officers and departments:

- Martyn Manning – Environmental Health, East Staffordshire Borough Council
- Annabelle Chell – Head of Connectivity & Sustainability, Staffordshire County Council
- Rebecca Slinn – Planning Information Officer, East Staffordshire Borough Council

This ASR has been endorsed and signed off by the Director of Health and Care at Staffordshire County Council, see below:

Endorsement from the Director of Health & Care, Staffordshire County Council.

Staffordshire County Council (SCC) is committed to working with partners to ensure that Staffordshire will be a place where improved health and wellbeing is experienced by all. Poor air quality has a negative impact on public health, with potentially serious consequences for individuals, families and communities. Identifying problem areas and ensuring that actions are taken to improve air quality forms an important element in protecting the health and wellbeing of Staffordshire residents. Improving air quality is often a complex issue, presenting a multi-agency challenge – so it is essential that all agencies work together effectively to deliver improvements where they are needed.

As Director of Health and Care across Staffordshire I endorse this Annual Status Report which sets out the position in all the Local Authorities across Staffordshire and Stoke-on-Trent focusing on human made pollution with particulate matter.

The Air Aware project “phase 2” continues through 2022 until March 2023. The project delivers behaviour change to increase active travel, decrease car use and raise awareness of air quality issues through five elements. These are business and school engagement, communications and campaigns, electric vehicles and air quality monitoring in three targeted locations, Burton, Leek and Cannock. Campaigns include Anti-Idling, walking and cycle activities and Clean Air Day. These have been countywide engaging a large number of businesses and schools. The programme will focus on reducing levels of NO and PM, which will be monitored at key locations.

In addition, Officers from Newcastle Borough Council, Stoke City Council and Staffordshire County Council are jointly working under Ministerial Direction to improve transport related air pollution in North Staffordshire.

Dr Richard Harling



Director of Health and Care
Staffordshire County Council

[1 June 2022]

If you have any comments on this ASR please send them to Craig Morris at:

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1 Local Air Quality Management

This combined report provides an overview of air quality in East Staffordshire during 2020 and 2021. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by East Staffordshire Borough Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by East Staffordshire Borough Council can be found in Table 2.1. The table presents a description of the two AQMA(s) that are currently designated within the East Staffordshire Borough. 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

East Staffordshire Borough Council proposes to revoke AQMA 2 over the next 12 months following the publication of this ASR (see monitoring section).

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by National Highways?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
AQMA 1 Burton upon Trent	26/05/2007	NO ₂ Annual Mean	This AQMA includes a number of arterial roads located towards the centre of Burton upon Trent	NO	61.9 µg/m ³ modelled	36.5 µg/m ³	Air Quality Action Plan 2015-2020	http://www.eaststaffsbc.gov.uk/environmental-health/pollution/air-quality
AQMA 2 St Peter's Bridge	25/05/2007	NO ₂ Annual Mean	Small AQMA centred on a roundabout at end of St Peter's Bridge in Stapenhill	NO	43.4 µg/m ³ modelled	30.6 µg/m ³	Air Quality Action Plan 2015-2020	http://www.eaststaffsbc.gov.uk/environmental-health/pollution/air-quality

East Staffordshire Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date

2.2 Progress and Impact of Measures to address Air Quality in East Staffordshire Borough Council

Defra’s original appraisal of the last combined 2019-20 ASR was not accepted in July 2020. Further amendments were made to the combined 2019-20 ASR which was resubmitted to Defra in January 2021, but again was not accepted. The main comments from Defra’s January 2021 commentary, together with an explanation on how these have or will be addressed are outlined below:-

1. Raw averages in Table B.2 (2019 data) still appear to be incorrect, which has led to the presentation of incorrect bias adjusted/annualised concentrations. Please see the example below:

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Appraisal Calculated Raw Average
DT1	425362	323339	43.5	41	32.8	26.6	28	31.9	33.8	33.5	34.7	35.7	N/A	62.3	35.9244	36.7091
DT2	425575	322028	56.7	49.5	42.4	49.9	48	50.6	49.1	48.1	45.9	49.3	52.9	50.1	48.3403	49.3750
DT3	424367	324781	37.9	51	26.3	34.2	28.5	28.3	26.7	31.1	28.1	36.4	42.9	38.9	35.3260	34.1917
DT4	424671	324019	51.8	52.1	38.5	30.8	33.8	41	39.7	44.2	40.6	46	50	40.4	42.4083	42.4083
DT5	424671	324019	53.3	56.6	42.1	30.1	35.2	36.2	39.2	43	42	40	52.8	42.6	42.2025	42.7583
DT6	424671	324019	48.3	55	37	26.8	33.3	37.1	39.8	40.4	39.7	38.3	51.2	46.5	41.1167	41.1167
DT7	423952	323281	47.9	53.7	45.2	43.1	40.6	43.4	38.1	46.3	45.1	43	55.9	46.7	45.1657	45.7500
DT8	424796	323624	39.4	48.8	37.3	51.4	41.7	40.4	38.6	40.2	41.4	42.6	50.6	37.9	42.5250	42.5250
DT10	424636	324037	63.1	63.4	39.3	44.1	42.6	43.9	47.4	51.7	52.3	45.8	54.7	57.8	49.5565	50.5083
DT11	426742	324155	21.9	22.1	11.3	11	9.5	10.3	9.4	10.1	11.7	15.5	25.5	17.9	14.6833	14.6833

This has also been identified in the 2018 dataset:

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Appraisal Calculated Raw Average
DT1	425362	323339	42.9	40.7	49.3	35.2	34.5	29.2	38	32.2	36.7	43.1	35.3	38.5	38	38.0
DT2	425575	322028	54.8	52.5	52.3	48.7	39	54.8	55.7	40.8	52.6	57.3	47.7	54.8	50.9	50.9
DT3	424367	324781	42.3	38.2	39	32	29	29.5	32.6	30.2	33.7	33.9	44	41.6	35.5	35.5
DT4	424671	324019	53.8	51	47.3	46	36.4	29.8	39	43.9	44.5	45.2	40.3	53	44.2	44.2
DT5	424671	324019	54.9	47.2	45.5	46.6	36.6	28.6	39.3	45.8	43.2	49.2	41.4	49.7	44	44.0
DT6	424671	324019	52.9	54.4	44.3	45	37.3	30.8	41.2	43.4	47.3	44.8	44.4	46.9	44.4	44.4
DT7	423952	323281	51.8	I/S	49.4	48.7	43.9	44.9	47.5	42.4	45.2	47.3	47.5	45.1	46.7	46.7
DT8	424796	323624	47.2	46.5	50.6	47.3	48.3	42.8	39.2	38.9	40.3	44.9	46.8	39.9	44.4	44.4
DT10	424636	324037	65	49.2	54.7	57.1	49.8	51.2	57.4	53.3	59.5	51	54.5	56.7	55.2	55.0
DT11	426742	324155	22.5	19	16	12.9	10.4	9.3	11.4	13.6	13.9	16.7	19.9	21.8	16	15.6

East Staffordshire Borough Council Comment: Both 2018 and 2019 data have been corrected as presented in this combined 2020-21 ASR. The previous combined 2019-20 ASR will be submitted separately however.

2. AQMA names should be provided in Table 2.1. These have been detailed in the corresponding Excel spreadsheet so appear to have been omitted from the report in error. Please ensure full tables are copied into the report from the Excel spreadsheet.

East Staffordshire Borough Council Comment: AQMA names have been included in all relevant tables in this combined ASR and again will be in the previous ASR to be re-submitted separately.

3. Supporting calculations for local bias adjustment factor calculation continue to be omitted from the report. The inclusion of this information is required in order for the report to be accepted.

East Staffordshire Borough Council Comment: Details of bias adjustment factors dating back to 2016 are outlined in Appendix C of this combined ASR. The previous ASR will however be re-submitted.

4. The report continues to omit evidence of annualisation despite several sites not achieving 75% data capture. This includes those sites which were discontinued during 2018 or 2019. Where sites have been discontinued mid-year, annual means should still be calculated (if >3 months of data) using the methodology prescribed within TG.16. Results should be discussed and presented within the report.

East Staffordshire Borough Council Comment: Comments noted, annualisation has been applied to all sites achieving less than 75% data capture but more than 25%, which for this ASR was only applicable to 2020 data, but the findings are presented in Appendix C. The previous ASR will however be re-submitted.

The following comments are designed to inform the completion of future reports:

5. Distance correction has been incorrectly applied to all sites. This should only be applied where concentrations >36 µg/m³ and the site is not at relevant exposure.

East Staffordshire Borough Council Comment: Comments noted, all data including historical data going back several years have been corrected to ensure distance corrections are only applied to sites greater than >36 µg/m³ and where it is not at relevant exposure. These are presented in trend data in this ASR going back to 2016. However the previous ASR will be re-submitted separately.

6. The Council continue to be encouraged to include AQMA boundaries and monitoring locations on the same map, for ease of interpretation.

East Staffordshire Borough Council Comment: Comments noted. AQMA boundaries have been highlighted in red for all monitoring locations located within the two AQMAs as shown in Appendix D.

7. The Council's Air Quality Action Plan was published in 2015, and is therefore approaching the 5-year mark, after which it is recommended that the plan be reviewed. The Council are therefore encouraged to undertake a review to ensure all actions remain relevant, and progress continues.

East Staffordshire Borough Council Comment: The council is aware the AQAP is now out of date. The AQAP was originally scheduled to be reviewed in 2020/21 but due to resource constraints from the pandemic and staff shortages the AQAP review has been delayed. East Staffordshire Borough Council remain committed to commence a review of the AQAP over

the coming year which also coincides with the emerging Climate Change Action Plan, thus drawing on any synergies that will also bring air quality improvements.

East Staffordshire Borough Council has taken forward a number of direct measures during the current reporting years of 2020-21 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

More detail on these measures can be found in their respective Action Plans.

The AQMAs were declared in 2007 due to NO₂ from vehicle emissions and as a result, the AQAP originally relied heavily on measures contained within Staffordshire County

Council's East Staffordshire Integrated Transport Strategy

<https://www.staffordshire.gov.uk/Transport/transportplanning/District-integrated-transport-strategies/Documents/East-Staffordshire-Transport.pdf>.

This transport strategy will be reviewed once East Staffordshire Borough Council's Local Plan is reviewed.

Key completed measures since the last ASR are:

- The Burton upon Trent Town Centre Regeneration Project has now been completed. Some of these measures are hoped will improve traffic flow through the town.
- Improvements to Burton upon Trent railway station external forecourt including prioritised access for public transport (i.e. buses and taxis) were completed in 2020.
- Real time bus passenger information (RTPI) and infrastructure improvements have been undertaken across East Staffordshire.
- The automatic monitoring station cabinet was replaced and upgraded in 2021, thus committing to its future retention and reliability.
- East Staffordshire Borough Council has now started to successfully utilise the Defra Damage Cost assessment approach to place a value on the impact that some developments have on air quality which is then used to determine the required amount required to be spent on mitigation. So far this has been applied to a select few applications but it is hoped to roll this out more widely and formalise it within an SPD, yet to be published.

<https://www.gov.uk/government/publications/assess-the-impact-of-air-quality/air-quality-appraisal-damage-cost-guidance>

East Staffordshire Borough Council's priorities for the coming year are:

- To publish formal supplementary planning guidance during the 2022-23 financial year. This will include the requirement for a damage cost to be applied more formally to developments with a significant air quality impact, ensuring a commensurate level of mitigation. This was originally planned for 2020-21 but was delayed due to a combination of impacts from the Covid-19 pandemic and resource constraints from staff shortages.
- To liaise with Staffordshire County Council's Highways Authority to identify and advance local transport related projects that will improve air quality that otherwise may not have been progressed due to funding constraints. This will be supported by S106 agreements from developments under the damage cost approach adopted in the supplementary planning guidance.
- To formally 'revoke' the smaller AQMA in our borough during 2022-23. This was originally scheduled for 2020 but due to resource constraints has been delayed. Un-declaring the smaller AQMA is justified by consistent reductions in NO₂ below the annual mean NO₂ objective over a number of years. More details are provided in Section 3.2.1 and [Figure A.5](#).
- To continue to support and participate the Simulate Live Lab partnership programme in East Staffordshire and across Staffordshire in general. The programme aims to bridge the gap between innovative, technology focussed small to medium enterprises (SMEs) and real world local government infrastructure. This programme will focus on improving air quality and mobility and invites SMEs to bid for funding and support to trial innovative solutions with the opportunity to progress the solution to scale through a network of providers delivering the programme. Project bids include monitoring/modelling, sensor deployment, behavioural change, air scrubbers, green walls, logistics & fuel economy and pollution forecasting. Further information can be found at: <https://simulate-adeptlivelabs.co.uk/>
- To identify opportunities within our future Climate Change Action Plan and other local authority policies such as the emerging Burton Towns Fund to support air quality improvements from our own estate and locally within the Borough. Since the previous ASR was completed, East Staffordshire Borough Council has appointed dedicated Climate Change Officers who we will work more closely with over the coming year and beyond to identify climate change measures that will also bring air quality improvements and which can form part of an updated AQAP.

- To start work on an updated AQAP
- To support Staffordshire County Council in bids to Defra's Air Quality Fund to continue projects.
- To consider locations within the Borough and where appropriate, submit a grant application under the Office for Low Emission Vehicles (OLEV) 'On-street Residential Chargepoint' Scheme.
- To continue to monitor and review NO₂ through our extensive diffusion tube network during 2022 with a view to removing some of the locations in Uttoxeter at the end of 2022 where NO₂ concentrations have now consistently met the annual mean objective over the past 3 years.
- Servicing and data management contracts have been renewed for 2022-23 which helps to ensure good quality, reliable data from our automatic monitoring station at Derby Turn.

Staffordshire County Councils Highways Authority have completed the following measures in 2020-21 and identified the following priorities for 2022-23:

- *A5121 Wellington Road / A5189 Shobnall Road roundabout, Burton* - a feasibility study to be undertaken to determine whether any engineering interventions could be considered whilst understanding the impacts on the wider network. The study potentially could lead to a design being prepared for an agreed scheme to be delivered which initially had been proposed for 2021/22, but now is no longer being taken forward.
- *Waterloo Street, Burton upon Trent*- following a feasibility study, improvement of current speed calming features; provision of tactile paving and improved signing and markings were completed in the spring of 2022 along Waterloo Street between Dallow Street and Byrkley Street.
- *A515 – Minor roads experimental Traffic Regulation Order* - advance signage on the trunk road network is required to keep HCVs on the A50 and the A38. National Highways approval would be required, and the signs would need to be designed and installed under their approval and permission. To date this has not been progressed, but has not been ruled out.

- *A444 Corridor Study, Stapenhill, Burton*- current proposals include a pedestrian crossing on Stapenhill Road, temporary weight restriction on Sycamore Rd and Saxon St, extension of the two lanes on Main Street at the Stapenhill Road junction, feasibility of schemes to improve highway capacity on the A5189, including the signalisation of the junction at Tesco supermarket, and provision of a cycle route to Swadlincote. The cycle route is now under construction and due to be completed in 2022-23.
- *High street gateways, Burton*- following provision of an Automatic Number Plate Recognition (ANPR) bus gate on High Street, an investigation of options for enhancing the gateways into High Street at both New Street and Worthington Way, removing the need for bollards will be undertaken. The current proposal includes altering the layout of the junctions, enhancing the surfacing and appearance of the junctions to make it clearer that pedestrians have priority in High Street. ANPR and footway maintenance along high street have now been delivered. Initial designs have also been completed for a potential junction improvement at New Street/ High Street. The County Council will try and push for the junction improvements to be included in the East Staffordshire Levelling Up Fund.
- *B5017 Corridor Improvements, Burton* – to deliver traffic calming on the B5017 between Wellington Road/ Shobnall Road and Postern Road, taking into account local community concerns, safety concerns around Shobnall Primary School and access to the hospital. Traffic calming was proposed for 2021-22 but has since been delayed due to funding issues. It is hoped to revisit this in the future.
- *Transport improvements associated with Land South of Branston, Burton* - to consider a package of transport measures that could include bus enhancements, Real Time Passenger Information, improving walking/cycling connections from the Branston area linking into those proposed by the development, and improvements to Wellington Rd/Second Ave/Parkway roundabout. RTPI delivery was due to be completed in 2022 but has been delayed. Pedestrian and cycle scheme initial designs have been completed and along with RTPI are expected to be delivered in 2024-25.
- *Bus route hot spot, Burton (St Paul's Street West)* - to deliver traffic management measures in St Paul's Street West to remove obstructions for buses caused by on-street parking, particularly close to the junctions was completed in 2021.
- *Station Street public realm, Burton* - undertake public realm enhancements to Station Street between Worthington Way and High Street. Construction of a cycle route

between Guild Street and the railway station is expected for delivery late in 2022 and into 2023.

The principal challenges and barriers to implementation that East Staffordshire Borough Council anticipates facing during the next 12 months are continued and future indirect impacts from the Covid-19 pandemic in terms of potential funding issues in turn impacting on local authority resources.

Progress on measures has been slower than expected due to competing local authority priorities and demands, as well staff shortages resulting from staff leaving the authority in 2021. East Staffordshire's transport strategies are at least in part linked with Local Plan updates and as a result the speed of implementation of many future air quality improvement measures are determinant on progress of these policies and documents. Many of these transport related measures rely on developer contributions, so implementation is dependent on development progress in East Staffordshire.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, East Staffordshire Borough Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of AQMA 1.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	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	Walton on Trent bypass (third river crossing)	Transport Planning and Infrastructure	Other	TBC	TBC	Staffordshire County Council/Derbyshire County Council	Developers & highway infrastructure funding	NO	Funded		Planning	Medium-high		Drakelow Park development underway but no formal agreed date for the third river crossing (Walton bypass)	Lengthy Timescale
2	Town Centre Regeneration Programme	Traffic Management	Strategic highway improvements, re-prioritising road space away from cars, including access management, selective vehicle priority, bus priority, high vehicle occupancy lane	2016	2031	Staffordshire County Council/East Staffordshire Borough Council	Highway Infrastructure Funding	NO	Funded		Implementation	Medium-high		Town Centre Regeneration Programme now completed with the exception of Station Street regeneration which starts in March 2020. Many of these will then help improve traffic flow within the AQMA	Lengthy Timescale / Funding
3	Improved bus provision/services	Transport Planning and Infrastructure	Bus route improvements	2020	Now completed	Staffordshire County Council	Highway Infrastructure Funding	NO	Funded		Completed	Low-medium		Two re-alignment schemes at Borough Road and New Street delivered 2016-17. Improved bus drop-off point to allow buses to turn and then stop to drop off passengers at hospital. Burton (St Paul's Street West) - about to be delivered	Completed in 2021
4	A5189/A444 network reinforcement & enhanced cycling/pedestrian facilities	Transport Planning and Infrastructure	Other	2018	2031	Staffordshire County Council	Highway Infrastructure Funding	NO	Funded			Low		Current proposals include a pedestrian crossing on Stapenhill Road, temporary weight restriction on Sycamore Rd and Saxon St, extension of the two lanes on Main Street at the Stapenhill Road junction, feasibility of schemes to improve highway capacity on the A5189, including the signalisation of the junction at Tesco's, and provision of a cycle route to Swadlincote. Essential bridge maintenance work now completed	Lengthy Timescale / Funding
5	Local transport corridors	Traffic Management	Strategic highway improvements, re-prioritising road space away from cars, including access management, selective vehicle priority, bus priority, high vehicle occupancy lane	2016	2020	Staffordshire County Council	Highway Infrastructure Funding	NO	Funded		Aborted	Medium		2018/19 B5017 Corridor Improvements between Wellington Road/Shobnall Road and Postern Road (design and investigation). Removal of obstructions on New Street. Bus route hot spot. Has been delayed due to funding issues.	Funding delayed scheme but hoped to be revisited in future

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
6	Completion of National Cycle Route NCN63 through Burton upon Trent	Promoting Travel Alternatives	Promotion of cycling	2017	2018	Staffordshire County Council	Highway Infrastructure Funding	NO	Funded			Low		Currently under construction	
7	Burton rail station forecourt improvements	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2018	2019	Staffordshire County Council / Network Rail	Highway / Network Rail Infrastructure Funding	NO	Funded		Completed	Low		Completed 2020	
8	Eco-stars recognition scheme	Freight and Delivery Management	Other	2016	2018	Staffordshire local authorities	Partnership Funding				Completed	Low		Finished in 2018	
9	Development control policy for air quality management & subsequent environmental supplementary planning document (SPD)	Policy Guidance and Development Control	Other policy	2019	2021	East Staffordshire Borough Council		NO	Not Funded		Planning	Medium	Formal adoption of SPD	Delayed due to Covid-19 pandemic and staff resource constraints	Resource Constraints
10	Investigation of feasibility for S.106 obligations and community infrastructure levy funding for air quality	Policy Guidance and Development Control	Other policy	2019	2021	East Staffordshire Borough Council	Developer Funding	NO	Funded		Implementation	Medium	Formal adoption of SPD	Some initial work undertaken and used for some planning applications, but further work required	
11	Feasibility study for low emission vehicles and associated infrastructure	Policy Guidance and Development Control	Other policy	2020	2020	East Staffordshire Borough Council	Developer and/or OLEV/Defra Grant Funding	YES	Funded		Planning	Low		Electric vehicle charge points considered in review of Council car parks. No local authority charge points installed at present.	
12	Investigation into funding streams for bus operators	Alternatives to private vehicle use	Other	TBC	TBC	East Staffordshire Borough Council					Implementation	Med		No progress	
13	Partnership working with public health	Public Information	Other	2016	2032	East Staffordshire Borough Council					Implementation	Low		Public health presence at Staffordshire Air Quality Forum & projects undertaken. Partnership activities declined during the pandemic due to restrictions, but going forward will reconvene	Resource Constraints
14	Partnership working with Staffordshire County Council in promoting sustainable travel	Promoting Travel Alternatives	Other	2016	2032	East Staffordshire Borough Council					Implementation	Low		As Above	Resource Constraints
15	Enhancement of the Council website for air quality & updating leaflets & other Council publications	Public Information	Other	2016	2032	East Staffordshire Borough Council					Implementation	Low		Ongoing	
16	Ongoing review of the air quality monitoring network	Other	Other	2016	2032	East Staffordshire Borough Council					Implementation	Low		Monitoring network reviewed regularly. Further plans to review network at the end of 2022	
17	Environmental permitting	Environmental Permits	Other	2016	2032	East Staffordshire Borough Council					Implementation	Low	All scheduled inspections completed	Due to restrictions during the pandemic in 2020/21 and resource constraints some scheduled inspections were	Resource Constraints

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	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
														missed, but now on target for 2022-23	
18	Detailed Air Quality Assessment- A50 Uttoxeter	Other	Other	2017	2018	East Staffordshire Borough Council/Highways England (now National Highways)	Internal / National Highways	NO	Funded		Completed	Low	Not required- Objective exceedances ruled out by façade monitoring		
19	AURN site located	Other	Other	2016	2017	Environment Agency	Environment Agency Funding	YES	Funded		Implementation	Low	AURN site located	Monitoring Ongoing	Equipment failures / station breakdowns
20	A515 – Minor roads experimental Traffic Regulation Order (TRO)	Transport Planning and Infrastructure	Other	2019	TBC	Staffordshire County Council	Highway Infrastructure Funding	NO	Funded		Planning	Low	TRO trialed	Advance signage on the Trunk Road network is required to keep HCVs on the A50 and the A38. Highways England approval will be required, and the signs would need to be designed and installed under their approval and permission. Costs include lane closures on the A38.	Funding
21	A5121 Wellington Rd/A5189 Shobnall Rd roundabout, Burton	Transport Planning and Infrastructure	Other	2020	TBC	Staffordshire County Council	Highway Infrastructure Funding	NO	Funded		Aborted	Med		Feasibility study to determine whether any engineering interventions could be considered whilst understanding the impacts on the wider network. The study potentially could lead to a design being prepared for an agreed scheme to be delivered in 2021/22, but has now been aborted and no longer being taken forward.	Funding
22	Real time bus passenger information project management and infrastructure improvements	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	2018	2019	Staffordshire County Council	Highway Infrastructure Funding	NO	Funded		Completed	Low		RTPI project management and co-ordination, including partnership working with bus operators to ensure that they continue to provide vehicle location information. Re-allocation / installation of new infrastructure to accommodate bus service changes. Promotion of the new RTPI information on My Staffs App and work towards income generation. Introducing further sustainable RTPI schemes such as solar RTPI will be considered.	Funding
23	High Street gateways, Burton	Transport Planning and Infrastructure	Other	2019	2020	Staffordshire County Council	Highway Infrastructure Funding	NO	Funded		Completed	Low		Investigate options and consult on the preferred scheme for enhancing the gateways into High Street at both New Street and	Funding

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	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	
															Worthington Way, removing the need for bollards. The current proposal includes altering the layout of the junctions, making access to High Street a minor route; enhancing the surfacing and appearance of the junctions to make it clearer that pedestrians have priority in High Street; improving the siting and design of signs and removing sign clutter; and retaining bus access to the High Street with consideration of Automatic Number Plate Recognition (ANPR) to control access. Designs for junction improvements at New St/High St have been completed, and Staffordshire County Council are looking at including the junction improvements in the Levelling Up Fund	
24	B5017 Corridor Improvements, Burton	Transport Planning and Infrastructure	Other	2019	TBC	Staffordshire County Council	Highway Infrastructure Funding	NO	Funded		Aborted	Low			Consider measures to reduce the impact of development traffic on the B5017 between Wellington Road/Shobnall Road and Postern Road, taking into account local community concerns, safety concerns around Shobnall Primary School and access to the hospital. It is expected that the scheme will improve the carriageway condition and provide gateway features and traffic calming to be considered in conjunction with any maintenance scheme being proposed. Traffic calming was proposed for 2021-22 but overall has been delayed due to funding issues. It is hoped to revisit in future.	Funding
25	Transport improvements associated with	Transport Planning and Infrastructure	Other	2019	2025	Staffordshire County Council	Highway Infrastructure Funding	NO	Funded		Implementation	Low-medium			Consider a package of transport measures that could include bus	Funding

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	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	
	Land South of Branston, Burton														enhancements, RTPI, improving walking/cycling connections from the Branston area linking into those proposed by the development, and improvements to Wellington Rd/Second Ave/Parkway roundabout. RTPI, pedestrian and cycle scheme designs are complete, due to be delivered by 2025.	

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), 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.

Particulate matter, or PM, is the term used to describe particles found in the air, including dust, dirt and liquid droplets. PM comes from both natural and man-made sources, including traffic emissions and Saharan-Sahel dust. These particles can be suspended in the air for long periods of time, and can travel across large distances.

PM less than 10 micrometres in diameter (PM₁₀) pose a health concern because they can be inhaled into and accumulate in the respiratory system. PM less than 2.5 micrometres in diameter (PM_{2.5}) are referred to as "fine" particles and are believed to pose the greatest health risks, as they can lodge deeply into the lungs and also pass into the bloodstream.

PM_{2.5} is the pollutant which has the biggest impact on public health and on which the Public Health Outcomes Framework (PHOF) D01 Fraction of mortality attributable to particulate air pollution (2020), Public Health Outcomes Framework indicator ⁷ is based.

The Royal College of Physicians (RCP) undertook a review in February 2016 ⁸ where they found that long term exposure to air pollution impairs lung function growth in children, and that outdoor exposure is linked to lung cancer in adults. Within Staffordshire it is estimated that 4.9% of all deaths can be attributed to exposure to PM_{2.5}, compared to 5.6% across England (31,750 deaths annually). Overall, the estimated cost to individuals and society is more than £20 billion annually for the UK.

⁷ Public Health England. Public Health Outcomes Framework 1st June https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/3/gid/1000043/pat/6/par/E12000005/ati/102/are/E10000028/iid/30101/age/230/sex/4/cid/4/tbm/1/page-options/car-do-0_ine-yo-1:2019:-1:-1_ine-ct-2_ine-pt-0 © Crown copyright 2021

⁸ [‘Every Breath we Take: The Lifelong Impact of Air Pollution; Report of a working Party, February 2016, ISBN 978-1-86016-567-2],

2.3.1 Particulate Matter (PM_{2.5}) Levels in Staffordshire and Stoke-on-Trent

A number of the Staffordshire Authorities currently monitor locally for PM₁₀. Defra's Automatic Urban and Rural Network (AURN) site, Stoke-on-Trent Centre has a dedicated PM_{2.5} monitor. Table 2.3 presents data on the local level of PM_{2.5} annual mean concentrations for the Staffordshire Authorities. Where the data is derived from PM₁₀ monitoring this has been adjusted by applying a correction factor of 0.7 to derive the PM_{2.5} component. The correction factor has been derived from the average of all ratios of PM_{2.5}/PM₁₀ for the years from 2010 to 2014 for forty sites within the Automatic Urban and Rural Network (AURN) where these substances are measured on an hourly basis and follows the guidance published in LAQM (TG16).

East Staffordshire Borough Council no longer monitors for PM₁₀ and doesn't monitor for PM_{2.5}. The Defra national background maps have been reviewed to determine projected PM_{2.5} concentrations within the East Staffordshire Borough for the 2021 calendar year. The average total PM_{2.5} at 390 locations (centre points of 1km x 1km grids) across the East Staffordshire Borough is 6.84µg/m³, with a minimum concentration of 5.91µg/m³ and a maximum concentration of 9.50µg/m³. This indicates that PM_{2.5} concentrations within the East Staffordshire Borough are well below the annual average EU limit value for PM_{2.5} of 25µg/m³.

Table 2.3 – Annual Mean PM₁₀ and PM_{2.5} results of monitoring by Staffordshire Authorities 2017 to 2021

Annual Mean PM ₁₀ and PM _{2.5}									
Results from monitoring Staffordshire Authorities 2017- 2021									
Authority	Site Type	Monitor Location	OS Grid Ref	(µg/m ³)	Year				
					2017	2018	2019	2020	2021
Newcastle under Lyme	Roadside	Queen`s Gardens	E385057	PM ₁₀	(5)	(5)	(5)	(5)	(5)
			N346137	PM _{2.5}	(5)	(5)	(5)	(5)	(5)
Cannock Chase	Roadside	Cannock A5190	E401392	PM ₁₀	14	18	16	(6)	(6)
			N309954	PM _{2.5}	9.8	12.6	11.2	(6)	(6)
Stoke on Trent	Roadside	Basford	E386288	PM ₁₀	23	23	24	*	19
			N346802	PM _{2.5}	16 ⁽¹⁾	16 ⁽¹⁾	17	*	13
	Roadside	A50 Roadside Meir	E392548	PM ₁₀	18	19	20	17	18
			N342572	PM _{2.5}	13 ⁽¹⁾	13 ⁽¹⁾	14 ⁽¹⁾	12 ⁽¹⁾	14 ⁽¹⁾
	Urban Background	Stoke on Trent Central	E388351	PM ₁₀			12	13	14
			N347895	PM _{2.5}	9	9	9	7	8
East Staffordshire	Roadside	Derby Tum	E424671	PM ₁₀	(4)	(4)	(4)	(4)	(4)
			N324019	PM _{2.5}	(4)	(4)	(4)	(4)	(4)

Notes: ⁽¹⁾ PM_{2.5} results are derived from PM₁₀ monitored results corrected with a 0.7 correction factor in accordance with TG16 – Annex B: Derivation of PM_{2.5} to PM₁₀ Ratio. All other results are directly monitored.
 (4) East Staffordshire`s monitors were decommissioned 2016
 (5) Newcastle under Lyme monitors were decommissioned 2016
 (6) Cannock Chase no longer monitor PM₁₀ nor PM_{2.5}*
 * No data available for 2020.

As can be seen from the results, concentrations of PM_{2.5} within the Staffordshire Authorities are below the 2020 EU limit value of 25µg/m³.

2.3.2 PM_{2.5} and Mortality in Staffordshire & Stoke-on-Trent

Although the levels of PM_{2.5} within the County and City of Stoke on Trent are below the 2020 EU Limit value, the impact on adult mortality directly attributable to PM_{2.5} is nonetheless still an important public health issue within Staffordshire and Stoke-on-Trent. This is revealed in data obtained from Public Health England used to inform Public Health Outcomes Framework indicator D017, as shown in Table 2.4

The estimated percentage number of deaths attributable to PM_{2.5} in adults over 30 has been translated into the estimated number of attributable deaths for each local authority area within Staffordshire, and are shown in Table 2.5. The data presented to 2020 is the latest data available at time of publication of this report. Approximately on average 6.0% of deaths from 2018 to 2020 within the County can be attributed to PM_{2.5}. (Note the method for calculating this figure has changed we only have the data for 2018, 2019 & 2020 using this new method).

Table 2.4 - Estimated percentage number of deaths by local authority area attributable to PM_{2.5} within Staffordshire for adults over 30 (2018 to 2020)

District/County	Percentage
Newcastle-under-Lyme	5.7%
Stafford	5.7%
East Staffordshire	6.2%
South Staffordshire	6.1%
Lichfield	6.3%
Staffordshire Moorlands	5.4%
Cannock Chase	6.2%
Tamworth	6.7%
Stoke on Trent	6.1%
Staffordshire County	6.0%
England	6.6%

Table 2.5 - Public Health Outcomes Framework Indicator 3.01 - Fraction of annual all cause adult mortality attributable to anthropogenic (human made) particulate air pollution (measured as fine particulate matter, PM_{2.5}) for Staffordshire Authorities 2018 to 2020⁷

	2018			2019			2020		
District/County	Deaths - all causes persons 30+	%*	Estimated attributable deaths	Deaths - all causes persons 30+	%*	Estimated attributable deaths	Deaths - all causes persons 30+	%*	Estimated attributable deaths
Newcastle-under-Lyme	1334	5.7	80	1282	6.8	90	1548	4.7	70
Stafford	1336	5.8	80	1315	6.8	90	1565	4.5	70
East Staffordshire	1093	6.3	70	1128	7.3	80	1355	5.1	70
South Staffordshire	1211	6.3	80	1212	7.0	90	1418	4.9	70
Lichfield	1087	6.4	70	1093	7.2	80	1272	5.2	70
Staffordshire Moorlands	1108	5.2	60	1080	6.6	70	1276	4.5	60
Cannock Chase	976	6.4	60	908	7.2	70	1046	5.1	50
Tamworth	653	6.9	50	678	7.7	50	752	5.6	40
Stoke on Trent	2746	6.1	170	2490	7.2	180	3034	5.0	150
Staffordshire	8798	6.1	530	8692	7.0	610	10227	4.9	500

2.3.3 Actions being taken within Staffordshire to reduce PM_{2.5}

A number of the Staffordshire Authorities are currently involved in implementing measures to reduce levels of NO₂ within their areas, which are detailed elsewhere in this report. Whilst there is currently no statutory duty imposed on Local Authorities in England to reduce PM_{2.5}, a number of the measures are complementary. A mapping exercise completed by the Staffordshire Air Quality Forum members details the measures currently in place which are considered to have an impact in reducing PM_{2.5} within the County. These are produced in Table 2.6 Table 2.6 below;

East Staffordshire Borough Council is taking the following measures as outlined in Table 2.6 and Section 2.3.4 in conjunction with our partners at the county council and other partners identified in Table 2.6 to address PM_{2.5}.

Table 2.6 – Actions being taken within Staffordshire to reduce PM_{2.5}

Measures category	Measure Classification	Effect on reducing NO _x and PM ₁₀ emissions (low, medium, high)	Reduces PM _{2.5} emissions	Local Authority						
				Staffordshire Moorlands DC	Newcastle under -Lyme BC	Stafford BC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
Traffic Management	Urban Traffic Control systems, Congestion management, traffic reduction	low	✓	UTC in Leek Town Centre	UTC in areas of Newcastle Town Centre AQMA and Kidsgrove AQMA. Live labs monitoring work linked to congestion in Newcastle.	UTC in Stafford Town Centre	Town Centre Regeneration Programme & a number of schemes are currently being progressed which will aid traffic management. Many of these will help improve traffic flow within the AQMA. Live labs monitoring work linked to congestion in Burton.	LDC is liaising with Midlands Connect to increase volume of traffic using M6 Toll to reduce congestion on the A5 as well as lobbying Highways England to upgrade the A38 & A5 to expressways.		UTC in Tamworth Town Centre at Ventura Park
	Reduction of speed limits, 20mph zones	low	✓	Advisory 20mph zones near some schools in residential areas		20mph zones near some schools in residential areas	20 mph zones near some schools in residential areas		20mph zones in Trysull, Bradley, Kinver and Bilbrook	
	Road User Charging (RUC)/ Congestion charging	low	✓			No		M6 Toll	M6 Toll	Campaign only Air Aware project
	Anti-idling enforcement	low	✓	Campaign only Air Aware project	Campaign only Air Aware project	No	Campaign only Air Aware project	Campaign only Air Aware project	Campaign only Air Aware project	
	Other		✓							
Promoting Travel Alternatives	Workplace Travel Planning	low	✓	https://www.staffordshire.gov.uk/Business/Workplace-health/Active-travel-and-air-quality-in-the-workplace.aspx						
	Encourage / Facilitate home-working	low	✓	Agile working policy adopted		Homeworking Policy adopted	Homeworking Policy adopted	Homeworking policy adopted	Agile working policy adopted	Homeworking policy adopted
	School Travel Plans	low	✓	https://www.staffordshire.gov.uk/Education/Schooltransport/Active-school-travel/Travel-to-School-Action-Plans-September-2020.aspx						
	Promotion of cycling	low	✓	https://www.staffordshire.gov.uk/Transport/transportplanning/Walking-and-cycling.aspx Additional Capability Funded activities in Burton & Stafford Town areas only, linked to infrastructure improvements. Social prescribing bid to be submitted for Newcastle to improve fitness and health through prescribing waling & cycling.					South Staffordshire Cycling Scheme	Same as other Staffs authorities
	Promotion of walking	low	✓	https://www.staffordshire.gov.uk/Transport/transportplanning/Walking-and-cycling.aspx Additional Capability Funded activities in Burton & Stafford Town areas only, linked to infrastructure improvements. Social prescribing bid to be submitted for Newcastle to improve fitness and health through prescribing waling & cycling.					Walking for health scheme	Same as other Staffs authorities
	Staffordshire Share a Lift Scheme		✓	Staffordshire share a lift scheme "on hold" during 2020/21 – plans to update in 2022.						
	Promote use of rail and inland waterways	medium	✓	North Staffordshire Community Rail Partnership operating along the North Staffordshire Line includes Blythe Bridge station.	North Staffordshire Community Rail Partnership operating along the North Staffordshire Line includes Kidsgrove station. Kidsgrove station to be fully accessible and regenerated through Town Deal.	Redevelopment of Stafford Station into a gateway associated with HS2 works.	Burton Forecourt improvements recently completed.	Lichfield Trent Valley access for all works recently completed including lifts.	Brinsford Park and Ride - Parkway Station business case ongoing	
Transport Planning & Infrastructure	Local Transport Plans and District Strategies	high	✓	https://www.staffordshire.gov.uk/Transport/transportplanning/District-integrated-transport-strategies/districtintegratedtransportstrategies.aspx						
	Public transport improvements- interchanges stations and services	low	✓	Proposed reinstatement of Leek rail connection. Planning application approved during 2021.	Kidsgrove will be multi-modal	New services with S106 funding provided in Stone to new estates in Walton and Yarnfield. Stafford Gateway will be multi- modal		Lichfield Bus Station resurfaced, repainted and new coach parking bays provided. Alternative location for bus station currently under consideration	Parkway station will be multi- modal	Planned improvements at Tamworth station
	Public cycle hire scheme	low	✓		e-scooter trials	e-scooter trials NOW ENDED AWAITING CONCLUSIONS				
	Cycle network	low	✓	https://www.staffordshire.gov.uk/Transport/cycling/cyclemaps.aspx Newcastle town deal includes a town centre permeability theme which includes new walk & cycle infrastructure going on from Active Travel fund 2 scheme, Business case to be complete soon.						
	Bus route improvements	high	✓	Potential bus stop upgraded in Cheadle Town Centre	RTPI on key routes in Newcastle Town Centre. Improved future bus services to Chatterley Valley	Improved bus priority and interchange on key routes in Stafford post-SWAR	Improvements in Burton town centre	RTPI introduced at key stops in Lichfield City.	Consideration of future bus stop upgrades on key routes	Corporation Street interchange improvements planned for future delivery discussions ongoing with TBC

Measures category	Measure Classification	Effect on reducing NOx and PM ₁₀ emissions (low, medium, high)	Reduces PM _{2.5} emissions	Local Authority							
				Staffordshire Moorlands DC	Newcastle under -Lyme BC	Stafford BC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC	
Alternatives to private vehicle use	Bus based Park & Ride	medium	✓						New bus central station as part of Friarsgate development scheme		
	Car Clubs	low	✓	✓							
Policy Guidance and Development Control	Planning applications to require assessment of exposure / emissions for development requiring air quality impact assessment	high	✓	✓		http://www.staffordbc.gov.uk/planning/planning-policy/local-plan-2012-2031	http://www.eaststaffsbc.gov.uk/planning/planning-policy/local-plan-2012-2031	https://www.lichfielddc.gov.uk/Council/Planning/The-local-plan-and-planning-policy/Planning-policy.aspx	South Staffordshire Local Plan South Staffordshire Council (sstaffs.gov.uk)	Local & National Validation requirements 2017: http://www.tamworth.gov.uk/sites/default/files/planning_docs/National-and-Local-Validation-requirements-2017.pdf	
	Air Quality Strategy			In development		2019-2022 Air Quality Strategy					
	Planning Guidance for developers		✓	In development		http://www.stafforddc.gov.uk/planning/planning-policy/supplementary-planning-policy-documents	Informal guidance in place		Sustainable Development	https://www.tamworth.gov.uk/sites/default/files/planning_docs/Tamworth_Design_SPD_July_2019_v1-0.pdf	
	Developer Contributions based on damage cost calculation		✓	Damage cost assessment has been used for applicable applications.		Damage cost assessment now required for applicable applications.	Damage cost assessment now required for applicable applications.				
	Planning Policies		✓	• Policy T1: Development and Sustainable Transport • Policy SD2: Renewable/Low-Carbon Energy		http://www.staffordbc.gov.uk/planning/planning-policy/local-plan-2012-2031	Supplementary planning document in development	https://www.lichfielddc.gov.uk/Council/Planning/The-local-plan-and-planning-policy/Planning-policy.aspx	Planning policies and guidance	https://www.tamworth.gov.uk/local-plan	
	STOR Sites (Short Term Operating Reserve) Energy Generation . Regulation via planning / permitting regime	high	✓	✓							
	Low Emissions Strategy	high	✓	In development		In development as part of Climate Change Policy					

Measures category	Measure Classification	Effect on reducing NOx and PM ₁₀ emissions (low, medium, high)	Reduces PM _{2.5} emissions	Local Authority						
				Staffordshire Moorlands DC	Newcastle under -Lyme BC	Stafford BC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
Freight and Delivery Management	Freight Consolidation Centre	medium	✓			X				
	Route Management Plans/ Strategic routing strategy for HGV's	high	✓	https://www.staffordshire.gov.uk/Transport/transportplanning/localtransportplan/home.aspx						
	Quiet & out of hours delivery	low	✓			✓				
	Delivery and Service plans	medium	✓			x				
	Freight Partnerships for city centre deliveries	high	✓			x				
Vehicle Fleet Efficiency	Driver training and ECO driving aids	medium	✓	✓		✓				
	Promoting low emission public transport	high	✓	X		x				
	Vehicle retrofitting programmes	medium	✓		Bus retrofit for vehicles using A53 service 4	x		Retrofitting of old Council owned HGVs and Buses with pollution abatement equipment will be considered by the Council where technically and financially feasible		
	Fleet efficiency and recognition schemes	medium	✓	<u>Staffordshire membership of ECO Stars Scheme</u>						
Promoting low emission transport	Low emission zone (LEZ) Clean Air Zone (CAZ)	high	✓			X				
	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	high	✓	Procurement Strategy in development; phase 1 "spend analysis completed"		Waste fleet vehicles comply with Euro VI.				
	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	high	✓	Energy Saving Trust (EST) have reviewed current fleet and issued draft The majority comply with are highest EURO emission standard tween with the rest completed between 2022/ 2023		In pgress as part of Climate Change Action Plan		LDC looking to replacing old vehicles within the fleet with more modern cleaner vehicles, which comply with the prevailing EURO standard. This will be extended to all Council owned vehicles.		
	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	high	✓	EV strategy on council car parks included in new car parking strategy. Trial alternative fuels; Electric and hydrated vegetable oil are currently being tested by waste fleet	Newcastle towns deal includes EV charging infrastructure.	Procurement of EV on staff carparks				
	Priority parking for LEV's	high	✓	✓		✓		Electric Vehicle charging spaces	Electric Vehicle charging spaces at offices	EV charging spaces being investigated
	Taxi Licensing conditions	medium	✓	In development		✓				
	Taxi emission incentives	medium	✓			✓				

Measures category	Measure Classification	Effect on reducing NOx and PM ₁₀ emissions (low, medium, high)	Reduces PM _{2.5} emissions	Local Authority						
				Staffordshire Moorlands DC	Newcastle under -Lyme BC	Stafford BC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
Environmental permits	Introduction/increase of environment charges through permit systems and economic instruments (Permit fees set centrally)	medium	✓			✓				
	Measures to reduce pollution through IPPC Permits going beyond BAT	medium	✓	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/211863/env-permitting-general-guidance-a.pdf (Chapter 15)						
	Large Combustion Plant Permits and National Plans going beyond BAT	high	✓			Nil				
	Other		✓			Nil				
Other measures	Smoky Diesel Hotline		✓	https://www.gov.uk/report-smoky-vehicle						
	A5 and M6 Partnership		✓			x		Strategy for the A5 2011-2026	Strategy for the A5 2011-2026	
	Domestic Smoke Control advice and Enforcement		✓	✓	-	https://www.staffordbc.gov.uk/environment/smoke-control.cfm	Provided via ESBC Website & other literature	https://www.lichfielddc.gov.uk/home-garden/bonfires-barbecues-smoke/1	Bonfires and Smoke South Staffordshire Council (sstaffs.gov.uk)	
	Garden Bonfires - Advice and nuisance enforcement		✓	✓	-	http://www.staffordbc.gov.uk/environmental-health/pollution/bonfires	Provided via ESBC Website & other literature	https://www.lichfielddc.gov.uk/home-garden/bonfires-barbecues-smoke/1	Smokey Bonfire Leaflet (sstaffs.gov.uk)	http://www.tamworth.gov.uk/air-quality
	Commercial burning advice and enforcement		✓	✓	-	http://www.staffordbc.gov.uk/environmental-health/pollution/bonfires	Provided via ESBC Website & other literature	https://www.lichfielddc.gov.uk/home-garden/bonfires-barbecues-smoke/1	Bonfires and Smoke South Staffordshire Council (sstaffs.gov.uk)	http://www.tamworth.gov.uk/air-quality
	Multi agency working with Fire Service and Environment Agency for trade burning		✓	✓	-	✓	Information shared as appropriate	Information shared as appropriate	Information shared as appropriate	Information shared as appropriate
	Multi agency working with Staffordshire Fire Service and Local Authority Building Control regarding chimney fires and complaints about DIY domestic heating systems		✓	✓	-	✓	Information shared as appropriate	Information shared as appropriate	Information shared as appropriate	
	Stoke-on-Trent Low Carbon District Heat Network		✓	-	-	Nil	Information shared as appropriate			

2.3.4 PM_{2.5} in Staffordshire & Stoke-on-Trent - Next steps

As PM_{2.5} is an issue requiring collaboration between the district, county and city authorities within Staffordshire, the following actions are proposed in addition to those outlined in the action plan. Progress on these and the action plan will be detailed in this combined 2021/22 ASR. This has been delayed due to the Covid-19 Pandemic

- To agree a target for reducing the fraction of All-Cause Mortality from PM_{2.5} in each district, city and county authority by 2020 **this was delayed due to disruption caused by the Covid-19 Pandemic**
- To agree a target for reducing PM_{2.5} exposure (calculated from PM₁₀ exposure / background maps / local monitoring where available) **this was delayed due to disruption caused by the Covid-19 Pandemic**
- To maintain compliance with the 2020 EU limit value of 25µg/m³
- To include Public Health Outcome Framework Indicator D01 in the Staffordshire and District Authority and City Council Joint Strategic Needs Assessment for 2019/2020 onwards and to report progress to the relevant Health and Wellbeing Boards. **This was delayed due to disruption caused by the Covid-19 Pandemic**
- To continue to identify risks affecting PM_{2.5} which need to be addressed at a national level
- A number of authorities within Staffordshire are receiving applications for STOR (Short Term Operating Reserve) sites to supplement power to the National Electricity Grid at times of peak demand. These sites typically operate during the autumn / winter months and can be high emitters of PM.

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

This section sets out the monitoring undertaken within 2020 and 2021 East Staffordshire Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a six-year period between 2016 and 2021 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

East Staffordshire Borough Council undertook automatic (continuous) monitoring at one site during 2020 & 2021. Table A.1 in Appendix A shows the details of the automatic monitoring sites.

National monitoring results are available at <https://uk-air.defra.gov.uk/networks/>

National Highways operate an automatic monitoring site in Uttoxeter (Ref: CM2 in Table A.1) and although this is not a local authority station, the data is available to us.

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

East Staffordshire Borough Council undertook non- automatic (i.e. passive) monitoring of NO₂ at 48 and 47 sites respectively during 2020 and 2021. Table A.2 in Appendix A presents the details of the non-automatic sites.

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

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater

than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

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

For diffusion tubes, the full 2020 and 2021 datasets of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 and Table B.2 includes distance corrected values, only where relevant.

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

For consistency, diffusion tubes were bias corrected using a local factor derived from our Derby Turn automatic station for 2020. The local correction factor for 2020 was 0.90 compared to 0.85 using the national factor. The local factor has been used for a number of years and it was felt appropriate to continue to use, plus the higher local bias factor for 2020 produced slightly higher NO₂ results, thus it was deemed prudent to follow a more conservative approach. The local bias correction factor for 2021 was 0.65 compared to 0.86 using the national bias factor. There are no obvious reasons for the difference in bias factors for 2021. In contrast to previous years, the national bias factor was used to correct diffusion tube data for 2021 as this produced noticeably higher NO₂ results, so again a more conservative approach has been followed.

Graphical representations of the monitored NO₂ annual mean concentrations for the past six years are shown in Figures A.1 to A.4 in Appendix A.

AQMA 1 - Burton upon Trent

For the larger AQMA 1 as shown in Figure A.1 , located towards the centre of Burton upon Trent, whilst many monitored locations (not corrected for distance) meet the annual NO₂ objective of 40µg/m³, a small number of locations remain over this limit concentration, with 3 exceedances during 2020 and 4 during 2021. This compares to 7 exceedances during 2019 and 11 during 2018, thus demonstrating a continued long-term air quality improvement. The highest concentration during 2020 and 2021 was 43.4µg/m³ and 42.4µg/m³ respectively. The locations within AQMA 1 with the highest NO₂ concentrations are historically centred on Derby Turn and Wellington Street.

AQMA 2 - Stapenhill

The smaller AQMA 2, located at St Peters Bridge Island in Stapenhill has also showed long term reductions in NO₂, with concentrations at the monitoring locations falling below the NO₂ annual objective of 40µg/m³ for the first time through 2020 and 2021. However when corrected for distance to take account of concentrations at relevant receptors, NO₂ concentrations are even lower and have been below the 40µg/m³ standard since 2011. On this basis, East Staffordshire Borough Council will start the process to formally 'revoke' AQMA 2. This was originally scheduled for 2020, but has been delayed due to resource constraints resulting from staff leaving the Authority. East Staffordshire Borough Council will continue to monitor at the current locations however.

Figure A.5 in Appendix A demonstrates this long term improvement in air quality within AQMA 2 dating back to 2007 to show the rationale behind un-declaring AQMA 2. Please note the data presented in Figure A.5 is distance corrected to show concentrations at the facades of relevant exposure with respect to the annual mean NO₂ objective, whereas Figure A.2 and the data presented in Table A.4 is the NO₂ concentration at the monitoring location itself, as required by Defra for the purpose of this ASR.

Burton upon Trent sites outside of AQMAs

Burton upon Trent locations monitored outside of the AQMAs have continued to remain well below the NO₂ Objective levels over the past six years as shown in Figure A.3.

Uttoxeter sites

Although the National Highways (formerly Highways England) diffusion tube monitoring along the A50 has now ceased, East Staffordshire Borough Council extended the monitoring network to include A50 receptor façade locations in 2017.

As shown in Figure A.4 and Table A.4, three monitoring locations exceeded the annual mean NO₂ objective, with the highest concentrations being 64µg/m³ in 2020 and 59.8µg/m³ in 2021. However, when corrected to the nearest façade as shown in Table B.1 and Table B.2 in Appendix B, NO₂ concentrations are lower. Although some of the Uttoxeter diffusion tubes, still show NO₂ concentrations in excess of 40µg/m³, when corrected to the nearest façade, the receptors in question are not residential and not subject to the relevant exposure criteria in line with this annual objective. No relevant exposure location exceeds 60µg/m³ which would be indicative of potential exceedences of the hourly 200 µg/m³ objective.

General

No new pollutant sources that could affect air quality objectives have been identified during 2020-21.

No new receptors have been identified as exceeding any objectives during 2020-21.

Monitoring data from 2020 and to a certain degree 2021 does not represent a normal year due to the Covid-19 pandemic, with the first lockdown in March 2020, tier restrictions and subsequent lockdowns that followed into the first half of 2021. With a significant reduction in vehicle journeys, NO₂ concentrations dropped noticeably more in 2020 at a number of locations within the District when compared with previous years, whereas other locations showed a decline consistent with previous years or little or no change. The results should be treated with some caution. Despite, results from 2016 to 2019 showing a general downward trend in NO₂ concentrations, there were still some marginal exceedences of the annual mean objective at some sites in AQMA 1 during 2020 and 2021, hence AQMA 1 should remain in force. However there is still justification for revoking AQMA 2 as explained above.

3.2.2 Particulate Matter (PM₁₀)

East Staffordshire Borough Council no longer monitors for PM₁₀. The PM₁₀ monitor was decommissioned in 2017.

3.2.3 Particulate Matter (PM_{2.5})

East Staffordshire Borough Council does not monitor for PM_{2.5}

3.2.4 Sulphur Dioxide (SO₂)

East Staffordshire Borough Council does not monitor for SO₂.

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)
CM1	Derby Turn	Urban Centre	424671	324019	NO ₂	YES	Chemiluminescent	8.2	5	1.8
CM2	Uttoxeter (National Highways Monitoring site)	Roadside	408521	334694	NO ₂	No	Chemiluminescent	9.5	3.25	1.8

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)
DT1	Trent Bridge (Rs)	Roadside	425362	323339	NO2	AQMA1	0.5	2.1	No	1.5
DT2	St Peters Bridge (Rs)	Roadside	425575	322028	NO2	AQMA2	6.5	3.0	No	1.5
DT3	Horninglow Croft (Rs)	Roadside	424367	324781	NO2	AQMA1	2.2	1.6	No	1.5
DT4, 5, 6	Monitoring Station Derby Turn (Rs) (Triplicates)	Urban Centre	424671	324019	NO2	AQMA1	8.2	5.0	Yes	1.5
DT7	Wellington St (Ks)	Kerbside	423952	323281	NO2	AQMA1	1.7	0.5	No	1.5
DT8	Horninglow St (Rs)	Roadside	424796	323624	NO2	AQMA1	2.0	2.7	No	1.5
DT10	Derby Turn (Ks)	Kerbside	424636	324037	NO2	AQMA1	3.2	0.5	No	1.5
DT11	Winshill - Brookside (B)	Urban Background	426742	324155	NO2	Outside AQMAs	0.0	0.0	No	1.5
DT13	Horninglow Rd - nr Shakespeare Rd junction (Rs)	Roadside	424416	324483	NO2	AQMA1	2.8	1.8	No	1.5
DT15	Derby St-Antique shop (Rs)	Roadside	424581	323963	NO2	AQMA1	0.5	1.8	No	1.5
DT17	Derby St- Lidl (Rs)	Roadside	424212	323473	NO2	AQMA1	3.8	1.7	No	1.5
DT18	A444- Glebe School (Rs)	Roadside	425706	321902	NO2	AQMA2	3.2	1.5	No	1.5
DT20	Derby Rd – opp. Coytes (Rs)	Roadside	425161	324737	NO2	AQMA1	5.7	4.0	No	1.5
DT22	Derby Rd – Delter Hotel (Rs)	Roadside	424708	324140	NO2	AQMA1	6.0	3.2	No	1.5
DT23	Derby St – approaching Bevan Building Supplies (Rs)	Roadside	424547	323940	NO2	AQMA1	3.4	2.0	No	1.5
DT24	Derby St - Maltings Court (Rs)	Roadside	424351	323660	NO2	AQMA1	2.8	2.3	No	1.5
DT25	Derby St – Briggs (Rs)	Roadside	424453	323794	NO2	AQMA1	7.0	3.0	No	1.5

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)
DT26	Waterloo St – Byrkley Arms (Ks)	Kerbside	424129	323505	NO2	AQMA1	0.5	4.1	No	1.5
DT27	Derby St – Furniture King (Ks)	Kerbside	424149	323344	NO2	AQMA1	2.9	0.5	No	1.5
DT28	Wellington St – crossing (Ks)	Kerbside	423993	323308	NO2	AQMA1	2.0	0.5	No	1.5
DT29	Wellington St – Imex Business Park (Rs)	Roadside	423812	323077	NO2	AQMA1	12.9	2.5	No	1.5
DT30	Wellington St – opp Protrade (Rs)	Roadside	423807	323115	NO2	AQMA1	0.5	1.9	No	1.5
DT31	Wellington St – Carlton Court (Rs)	Roadside	423784	323099	NO2	AQMA1	8.7	2.8	No	1.5
DT33	Horninglow St - Charrington House (Rs)	Roadside	424984	323388	NO2	AQMA1	1.3	1.5	No	1.5
DT34	Horninglow St – Jee Ja Jees (Rs)	Roadside	425270	323346	NO2	AQMA1	0.6	3.5	No	1.5
DT35	Horninglow St – Spirit Games (Rs)	Roadside	425275	323327	NO2	AQMA1	0.5	2.7	No	1.5
DT37	Evershed Way / Anglesey Rd (Rs)	Roadside	424096	322774	NO2	Outside AQMAs	2.2	1.9	No	1.5
DT39	Branston Rd / St Peters Bridge (Rs)	Roadside	424648	322300	NO2	Outside AQMAs	9.1	3.2	No	1.5
DT40	Grange St / Shobnall Rd Corner (Rs)	Roadside	423611	323176	NO2	Outside AQMAs	7.6	2.9	No	1.5
DT41	Shobnall Rd - Marstons (Rs)	Roadside	423264	323358	NO2	Outside AQMAs	3.8	1.5	No	1.5
DT42	Forest Rd - Fred Brewer Way (Rs)	Roadside	422129	323906	NO2	Outside AQMAs	2.1	1.0	No	1.5
DT43	Hawkins Lane - opp. Pipe Centre (Rs)	Roadside	424969	323802	NO2	Outside AQMAs	1.7	1.5	No	1.5

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)
DT49	A50 Travelodge – Uttoxeter (Rs)	Roadside	408609	334703	NO2	Outside AQMAs	12.5	5.5	No	1.5
DT51	A50 near McDonalds – Uttoxeter (Rs)	Roadside	408875	334742	NO2	Outside AQMAs	8.5	3.0	No	1.5
DT52	Badgery Close – Uttoxeter (Rs)	Roadside	408415	334622	NO2	Outside AQMAs	12.0	63.0	No	1.5
DT55, 56, 57	A50 monitoring station (Triplicates)	Other	408545	334699	NO2	Outside AQMAs	5.0	14.5	Yes	1.5
DT60	Uttoxeter 60	Other	408624	334698	NO2	Outside AQMAs	0.0	11.5	No	1.5
DT61	Uttoxeter 61	Other	408624	334698	NO2	Outside AQMAs	0.0	11.5	No	1.5
DT62	Uttoxeter 62	Other	408624	334698	NO2	Outside AQMAs	0.0	11.5	No	1.5
DT67	Uttoxeter 67	Other	408344	334664	NO2	Outside AQMAs	0.0	16.0	No	1.5
DT68	Uttoxeter 68	Other	408344	334664	NO2	Outside AQMAs	0.0	16.0	No	1.5
DT69	Uttoxeter 69	Other	408344	334664	NO2	Outside AQMAs	0.0	16.0	No	1.5
DT70	Uttoxeter 70	Other	408305	334662	NO2	Outside AQMAs	0.0	14.0	No	1.5
DT71	Uttoxeter 71	Other	408299	334649	NO2	Outside AQMAs	0.0	25.5	No	1.5
DT74	A50 roundabout southbound	Other	408873	334750	NO2	Outside AQMAs	0.0	11.6	No	1.5
DT75	A50 roundabout southbound	Other	408873	334750	NO2	Outside AQMAs	0.0	11.6	No	1.5

Notes:

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

(2) N/A if not applicable.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2016	2017	2018	2019	2020	2021
CM1	424671	324019	Urban Centre	97.8	97.8	51	46	39	37	32	25.2

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.

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/m³.

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

Table A.4 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2016	2017	2018	2019	2020	2021
DT1	425362	323339	Roadside	100	100	34.7	40.1	34.2	32.3	27.1	25.9
DT2	425575	322028	Roadside	100	100	47.3	49.8	45.8	43.5	38.4	37.8
DT3	424367	324781	Roadside	100	100	33.8	35.9	32.0	30.1	26.2	24.8
DT4, 5, 6	424671	324019	Urban Centre	100	100	43.5	47.1	39.8	37.0	34.4	33.4
DT7	423952	323281	Kerbside	90.4	90.4	47.1	48.7	42.0	40.3	36.3	36.1
DT8	424796	323624	Roadside	100	100	40.1	43.0	40.0	37.4	30.9	32.3
DT10	424636	324037	Kerbside	92.3	92.3	49.6	57.8	49.7	44.4	43.4	42.2
DT11	426742	324155	Urban Background	100	100	15.0	17.3	14.4	12.9	11.8	10.5
DT13	424416	324483	Roadside	82.7	82.7	40.6	41.0	38.4	34.8	30.9	32.4
DT15	424581	323963	Roadside	100	100	48.3	47.8	43.8	40.0	37.5	37.4
DT17	424212	323473	Roadside	100	100	52.6	47.1	51.0	45.0	42.1	42.4
DT18	425706	321902	Roadside	100	100	43.0	42.7	39.3	33.4	30.3	30.6
DT20	425161	324737	Roadside	100	100	34.0	36.0	33.2	30.3	29.9	28.0
DT22	424708	324140	Roadside	100	100	39.3	45.0	38.3	36.6	36.0	32.9
DT23	424547	323940	Roadside	100	100	44.1	45.6	40.0	36.7	36.2	34.0
DT24	424351	323660	Roadside	100	100	41.5	43.8	39.3	35.6	32.0	32.2
DT25	424453	323794	Roadside	100	100	38.0	37.4	34.0	29.4	27.2	27.3
DT26	424129	323505	Kerbside	75 (2020 Data Capture)	75 (2020 Data Capture)	39.3	41.2	38.7	35.7	33.0	
DT27	424149	323344	Kerbside	100	100	48.8	51.7	45.2	42.5	38.8	40.3
DT28	423993	323308	Kerbside	100	100	55.6	59.3	53.7	48.4	42.5	44.1
DT29	423812	323077	Roadside	100	100	37.9	45.1	39.3	36.4	33.1	31.7
DT30	423807	323115	Roadside	100	100	41.7	43.1	40.9	37.0	36.1	35.0
DT31	423784	323099	Roadside	100	100	46.3	48.3	44.6	40.3	34.4	35.2
DT33	424984	323388	Roadside	100	100	41.4	47.9	39.7	37.1	34.5	33.4
DT34	425270	323346	Roadside	100	100	39.3	41.6	36.1	32.5	29.2	30.6
DT35	425275	323327	Roadside	100	100	42.1	48.0	41.0	32.4	37.0	34.0
DT37	424096	322774	Roadside	100	100	36.9	38.6	31.7	31.7	32.0	30.3
DT39	424648	322300	Roadside	100	100	37.0	35.8	38.3	32.4	29.9	28.0
DT40	423611	323176	Roadside	100	100	33.9	39.6	34.0	31.2	31.2	27.3
DT41	423264	323358	Roadside	100	100	38.0	38.5	34.2	32.0	27.9	29.5
DT42	422129	323906	Roadside	100	100	29.9	29.9	25.2	23.4	23.0	21.7
DT43	424969	323802	Roadside	100	100	34.6	34.8	31.2	27.2	26.5	25.0
DT49	408609	334703	Roadside	100	100	74.0	66.8	60.8	53.2	49.1	46.0

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 2021 (%) ⁽²⁾	2016	2017	2018	2019	2020	2021
DT51	408875	334742	Roadside	100	100	83.4	92.3	82.7	72.3	64.0	59.8
DT52	408415	334622	Roadside	100	100	25.2	22.7	23.2	19.9	17.0	18.2
DT55, 56, 57	408545	334699	Other	100	100			65.5	58.9	49.8	48.4
DT60	408624	334698	Other	100	100			42.7	37.5	32.2	28.3
DT61	408624	334698	Other	100	100			37.5	32.0	26.8	27.5
DT62	408624	334698	Other	100	100			30.6	25.5	19.2	22.8
DT67	408344	334664	Other	100	100			31.7	27.6	21.0	24.9
DT68	408344	334664	Other	100	100			33.7	29.5	21.9	25.6
DT69	408344	334664	Other	100	100			28.3	22.1	17.5	19.9
DT70	408305	334662	Other	100	100			24.7	21.3	22.0	18.8
DT71	408299	334649	Other	100	100			23.6	20.5	15.3	17.5
DT74	408873	334750	Other	15.4 (2020 Data Capture)	15.4 (2020 Data Capture)			37.3	34.7	-	
DT75	408873	334750	Other	23.1 (2020 Data Capture)	23.1 (2020 Data Capture)			35.8	36.3	34.0	

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.

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/m³.

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

Figure A.1 – Trends in Annual Mean NO₂ Concentrations (AQMA1)

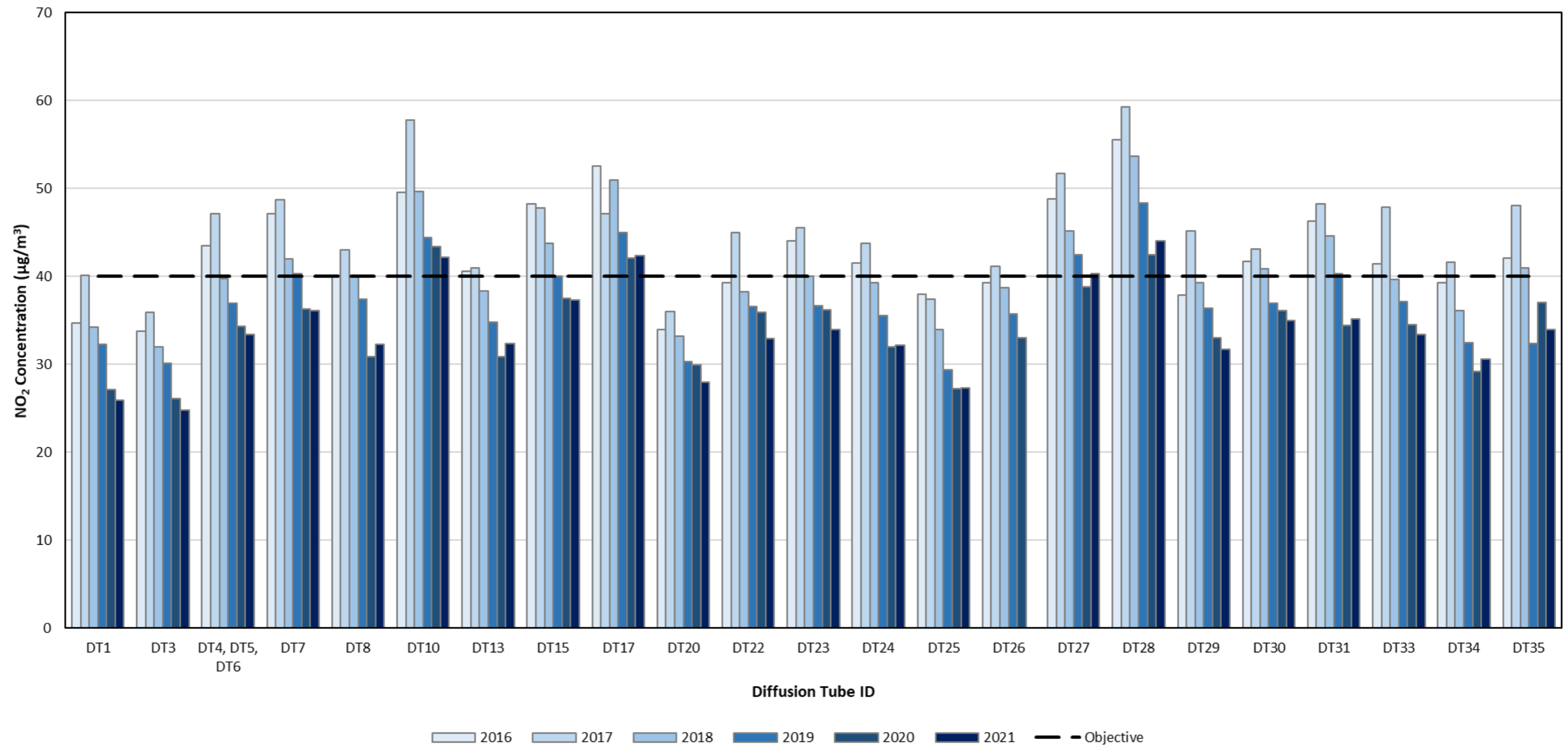


Figure A.2 – Trends in Annual Mean NO₂ Concentrations (AQMA 2)

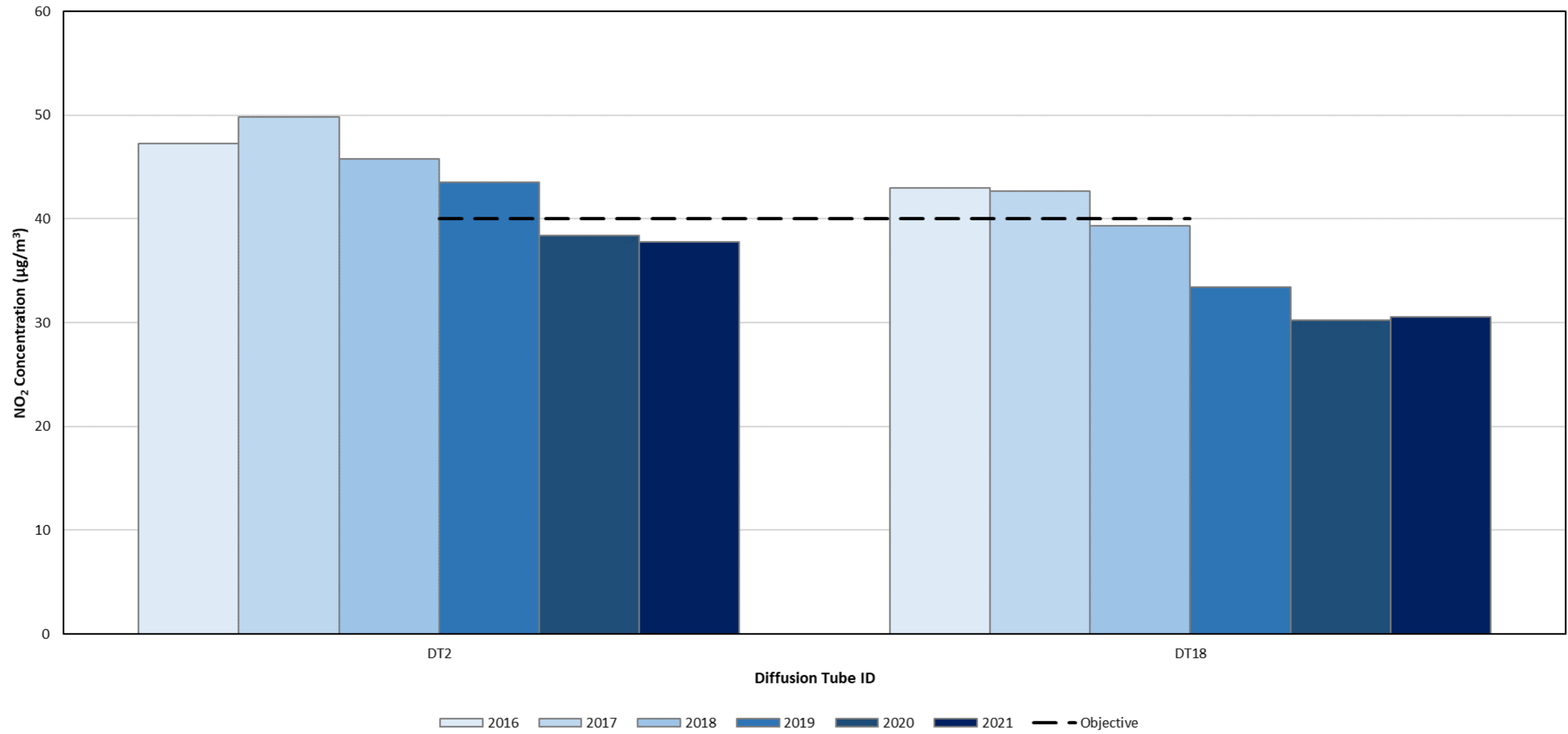


Figure A.3 – Trends in Annual Mean NO₂ Concentrations (Burton sites, outside AQMAs)

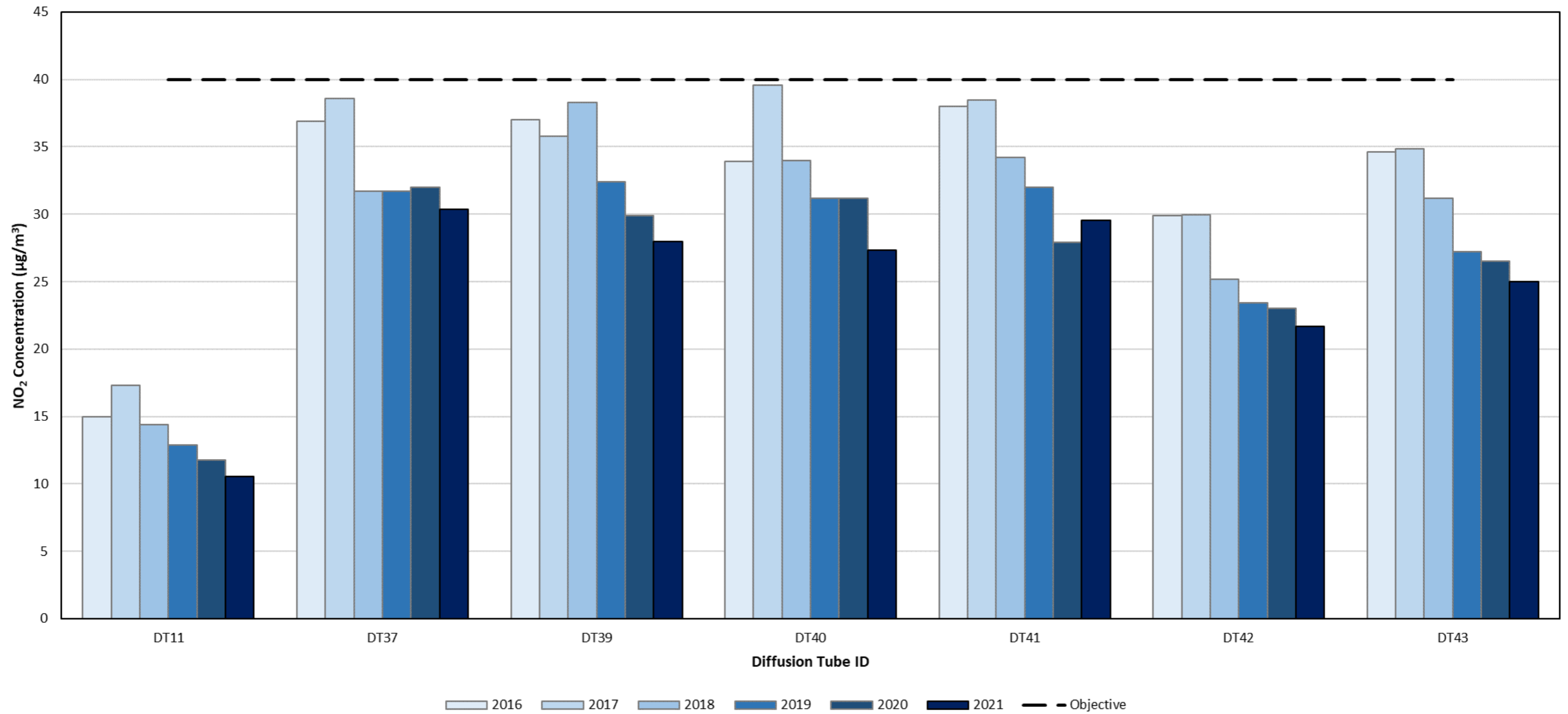


Figure A.4 – Trends in Annual Mean NO₂ Concentrations (Uttoxeter sites)

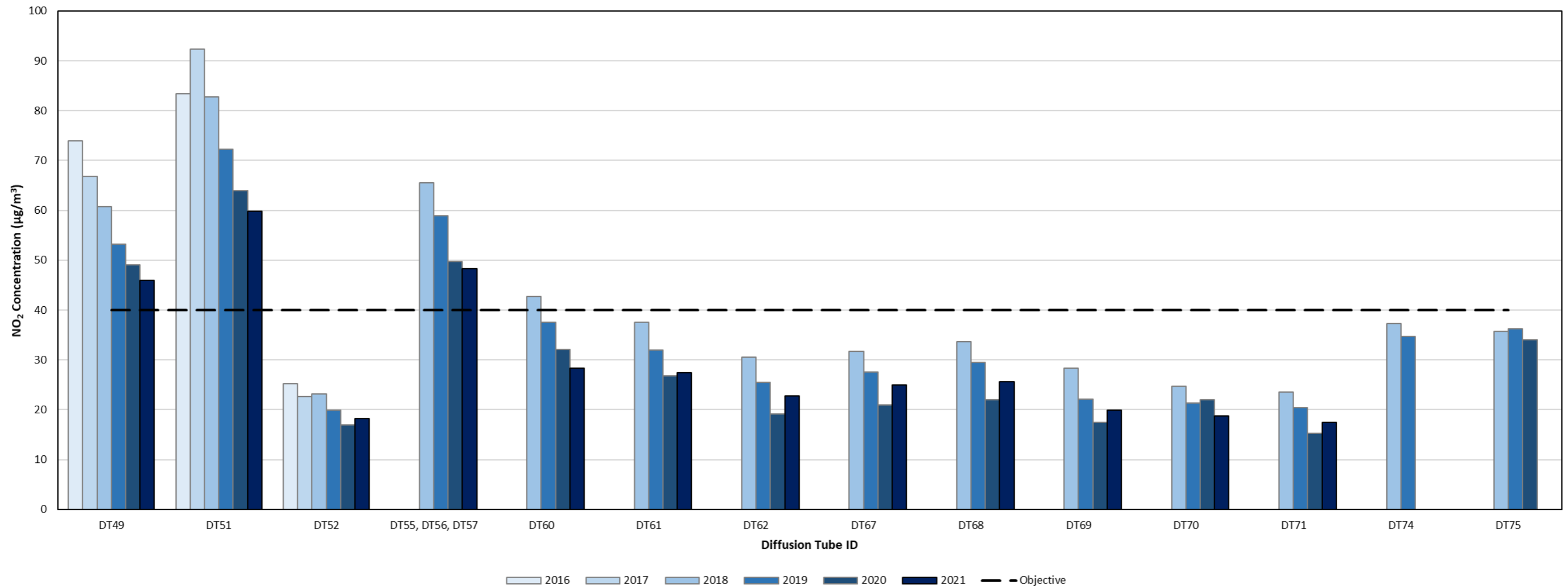


Figure A.5 – Long-term trends in Annual Mean NO₂ Concentrations in AQMA 2 at relevant exposures

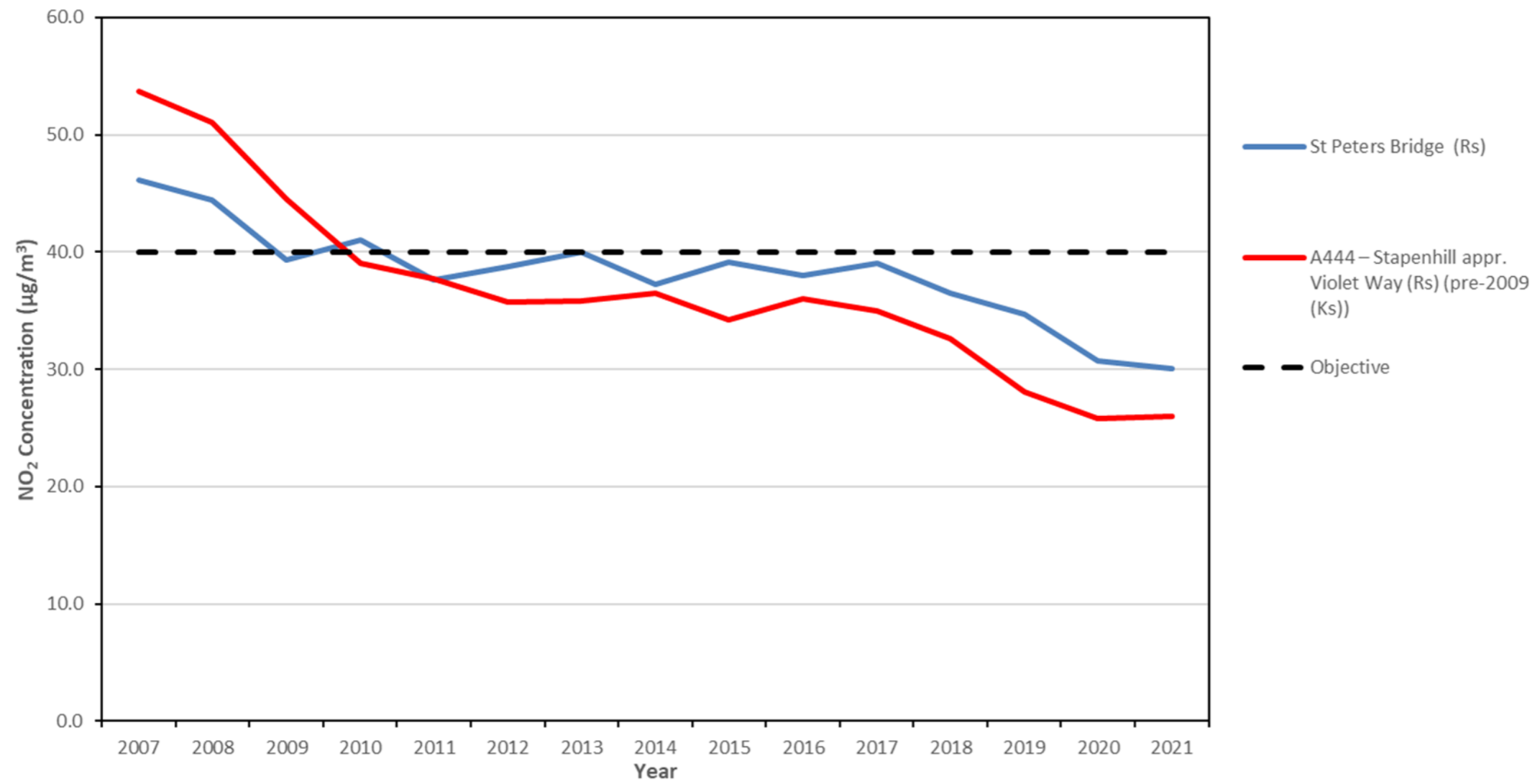


Table A.5 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2016	2017	2018	2019	2020	2021
CM1	424671	324019	Urban Centre	97.8	97.8	0	0	4	0	0	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m³ have been recorded.

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ 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%).

DT61	408624	334698	33.5	30.9				28.8	25.5	30.6	30.3	27.4	30.6	30.0	29.7	26.8		
DT62	408624	334698	23.4	18.0				23.2	21.4	26.7	26.4		20.9	24.9	23.1	19.2		
DT67	408344	334664	25.5	20.0				24.9	21.4	31.3	28.8		24.3	26.0	25.3	21.0		
DT68	408344	334664	30.8	23.4					26.2	31.5	30.9		24.3	28.3	27.9	21.9		
DT69	408344	334664	21.8	17.8				20.1	16.6	23.0	22.1	18.8	22.0		20.3	17.5		
DT70	408305	334662	21.6	17.0				60.2	16.6	20.4	20.8	19.8	20.8	23.0	24.5	22.0		
DT71	408299	334649	23.2	16.0				16.3	14.3	17.6	18.9		19.8	20.9	18.4	15.3		
DT74	408873	334750		46.5				28.0							-	-		
DT75	408873	334750	53.2	48.0				28.7							43.3	34.0		

- All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.
- Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.
- Local bias adjustment factor used.
- National bias adjustment factor used.
- Where applicable, data has been distance corrected for relevant exposure in the final column.
- East Staffordshire Borough Council confirm that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

Table B.2 – NO₂ 2021 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.86)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT1	425362	323339	33.8	26.3	33.2	22.9	33.1	27.4	26.1	27.4	33.8	32.2	36.3	28.6	30.1	25.9	-	
DT2	425575	322028	40.6	42.6	44.5	39.0	45.9	45.8	43.2	41.7	55.5	42.2	47.7	38.7	44.0	37.8	30.1	
DT3	424367	324781	36.1	34.4	28.5	21.8	29.0	21.5	24.5	22.1	36.6	37.1	37.3	17.8	28.9	24.8	-	
DT4	424671	324019	39.0	29.7	41.4	27.4	38.1	40.9	34.3	34.6	46.8	42.8	43.3	38.2	-	-	-	Triplicate Site with DT4, DT5 and DT6 - Annual data provided for DT6 only
DT5	424671	324019	46.6	37.3	39.6	26.7	36.8	38.0	36.3	35.0	47.9	37.7	47.4	37.8	-	-	-	Triplicate Site with DT4, DT5 and DT6 - Annual data provided for DT6 only
DT6	424671	324019	46.5	37.6	37.3	28.3	40.5	36.0	36.4	36.4	48.2	42.1	47.0	38.3	38.8	33.4	-	Triplicate Site with DT4, DT5 and DT6 - Annual data provided for DT6 only
DT7	423952	323281	47.8	40.1	40.6		41.9	36.0	40.1	40.8	50.3	39.1	47.4	38.1	42.0	36.1	30.4	
DT8	424796	323624	40.6	37.2	33.2	36.4	41.5	38.7	35.9	36.8	44.8	35.6	37.3	33.1	37.6	32.3	-	
DT10	424636	324037	54.4	46.8	48.8	37.6	52.4	47.5	50.2	43.3	59.9	51.9		46.8	49.1	42.2	32.8	
DT11	426742	324155	18.5	12.5	13.7	8.8	9.0	8.8	8.9	8.0	12.1	13.2	17.2	16.5	12.3	10.5	-	
DT13	424416	324483	45.1	41.4	34.6		36.3	33.4	37.2	30.8	44.1	36.9		36.5	37.6	32.4	-	
DT15	424581	323963	46.9	48.6	36.8	39.1	49.3	38.9	43.7	40.1	54.7	43.5	38.4	41.4	43.5	37.4	36.4	
DT17	424212	323473	50.0	51.7	45.7	40.4	56.0	45.8	49.4	48.1	58.3	48.8	49.2	47.8	49.3	42.4	36.3	
DT18	425706	321902	47.0	34.4	33.5	31.8	33.0	33.7	35.5	32.0	40.8	34.2	37.6	32.9	35.5	30.6	-	
DT20	425161	324737	42.6	35.7	31.3	24.5	29.1	30.1	26.9	29.2	37.7	32.8	35.1	35.3	32.5	28.0	-	
DT22	424708	324140	48.5	38.5	38.3	28.6	37.2	35.9	32.7	34.2	44.5	42.6	42.8	35.2	38.3	32.9	-	
DT23	424547	323940	48.3	38.6	37.0	31.7	39.1	37.8	35.3	36.5	43.9	39.8	47.3	39.1	39.5	34.0	-	
DT24	424351	323660	47.0	39.6	34.7	27.9	37.2	32.6	36.0	33.5	40.8	41.3	40.5	38.1	37.4	32.2	-	
DT25	424453	323794	39.8	34.7	37.0	29.1	28.3	27.8	26.9	28.1	33.4	32.4	32.0	32.1	31.8	27.3	-	
DT27	424149	323344	60.8	37.2	43.9	38.1	48.0	47.8	47.1	47.6	55.1	46.4	51.5	39.1	46.9	40.3	33.2	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.86)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT28	423993	323308	55.7	49.8	45.2	42.9	55.4	50.3	51.3	48.7	62.4	51.7	52.0	49.9	51.3	44.1	35.6	
DT29	423812	323077	44.9	37.1	39.0	30.1	35.5	29.2	34.2	29.9	42.8	39.9	42.5	37.7	36.9	31.7	-	
DT30	423807	323115	55.0	41.8	36.7	30.7	42.3	40.0	38.4	40.9	49.5	35.5	41.8	35.6	40.7	35.0	-	
DT31	423784	323099	48.9	38.0	34.5	31.3	43.5	38.4	39.4	37.1	52.6	42.0	44.5	40.8	40.9	35.2	-	
DT33	424984	323388	44.7	38.7	35.2	26.6	40.3	34.3	36.9	29.3	48.3	41.7	43.4	47.0	38.9	33.4	-	
DT34	425270	323346	38.9	31.9	34.2	32.0	36.5	36.7	36.0	35.3	40.3	32.7	39.0	33.5	35.6	30.6	-	
DT35	425275	323327	43.5	39.3	31.4	33.7	39.3	39.3	39.6	38.3	46.7	40.0	44.0	39.3	39.5	34.0	-	
DT37	424096	322774	40.0	34.8	32.0	27.0	34.2	36.8	30.9	32.1	41.6	40.3	39.0	34.7	35.3	30.3	-	
DT39	424648	322300	36.4	28.8	33.7	30.9	35.0	33.3	34.6	30.6	36.9	28.5	31.6	29.8	32.5	28.0	-	
DT40	423611	323176	23.6	30.8	35.7	22.8	34.0	29.4	28.6	25.9	42.3	44.5	35.5	28.5	31.8	27.3	-	
DT41	423264	323358	39.8	35.1	33.9	24.6	33.8	33.7	32.5	31.1	41.1	36.2	36.5	33.7	34.3	29.5	-	
DT42	422129	323906	28.8	28.3	22.0	18.1	24.3	21.9	24.1	21.7	30.6	28.0	29.9	24.7	25.2	21.7	-	
DT43	424969	323802	36.0	30.6	27.7	23.5	26.5	26.2	24.6	26.5	32.3	30.1	33.6	31.1	29.1	25.0	-	
DT49	408609	334703	51.9	50.4	49.7	39.8	61.1	56.0	54.8	57.3	64.0	59.6	51.8	45.5	53.5	46.0	33.4	
DT51	408875	334742	71.3	64.3	60.6	51.7	75.1	70.0	71.8	72.1	92.2	83.4	67.0	55.5	69.6	59.8	43.0	
DT52	408415	334622	24.9	20.0	20.6	20.7	29.3	19.5	19.1	19.4	21.7	18.2	22.0	18.6	21.2	18.2	-	
DT55	408545	334699	60.6	53.5	61.5	46.0	65.7	65.8	63.3	58.5	63.5	50.2	21.2	39.5	-	-	-	Triplicate Site with DT55, DT56 and DT57 - Annual data provided for DT57 only
DT56	408545	334699	56.8	53.7	60.9	47.8	66.1	60.7	62.9	59.7	60.5	47.8	58.6	47.7	-	-	-	Triplicate Site with DT55, DT56 and DT57 - Annual data provided for DT57 only
DT57	408545	334699	59.3	54.6	56.6	43.6	66.0	64.3	61.2	59.6	64.7	51.3	61.4	49.2	56.2	48.4	43.6	Triplicate Site with DT55, DT56 and DT57 - Annual data provided for DT57 only
DT60	408624	334698	27.2	33.1	36.1	30.5	37.1	35.1	31.4	34.4	40.8	29.8	31.6	28.4	33.0	28.3	-	
DT61	408624	334698	33.4	32.3	34.1	36.6	35.0	31.9	30.9	29.9	36.2	27.4	30.4	25.0	31.9	27.5	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.86)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT62	408624	334698	27.3	23.0	28.0	30.6	18.7	29.4	31.8	30.3	30.7	22.0	26.6	20.2	26.6	22.8	-	
DT67	408344	334664	29.4	24.4	27.6	33.1	32.2	32.7	34.3	32.6	34.1	22.2	24.8	20.4	29.0	24.9	-	
DT68	408344	334664	31.4	21.3	31.2	25.3	30.5	32.5	34.2	35.9	34.7	27.0	30.1	23.7	29.8	25.6	-	
DT69	408344	334664	26.2	26.2	23.8	23.2	20.0	24.3	24.6	24.3	27.0	21.1	21.1	16.3	23.2	19.9	-	
DT70	408305	334662	24.1	20.2	22.5	20.9	23.3	22.0	22.7	21.5	24.5	19.7	22.0	19.1	21.9	18.8	-	
DT71	408299	334649	22.5	16.7	21.5	23.6	20.4	18.9	19.9	19.8	23.2	19.1	20.0	18.6	20.4	17.5	-	

All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.2.

Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.

Local bias adjustment factor used.

National bias adjustment factor used.

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

East Staffordshire Borough Council confirm that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within East Staffordshire Borough Council During 2021 & 2022

As in previous years a number of large housing and commercial developments have been subject to air quality assessments through the planning process in 2020-21.

All planning developments subject to air quality assessments were predicted to have a negligible contribution to NO₂ both within and outside of the AQMAs.

In the case of residential developments in the AQMAs, particularly the smaller sites or where there is “infilling” of a property on an established street then mitigation has been required to protect the occupants from existing poor air quality. This mitigation is normally in the form of mechanical ventilation as an alternative to having open windows with an air inlet drawing cleaner air into the property.

Additional Air Quality Works Undertaken East Staffordshire Borough Council During 2020-21

East Staffordshire Borough Council has not completed any additional works within the reporting year of 2020-21.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes have historically been supplied and analysed by Staffordshire Scientific Services utilising the 20% triethanolamine (TEA) in water preparation method. However, the analysis service moved over to Staffordshire Highways Laboratory early in 2018. Staffordshire Scientific Services / Staffordshire Highways Laboratory is a UKAS accredited laboratory and participates in the AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO₂ tube analysis and the Annual Field Inter-Comparison Exercise <https://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>. Their lab code is 1017. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre. The laboratory follows the procedures set out in the Harmonisation Practical Guidance. In 2020, the laboratory scored 100% in AIR-PT round AR036 (January-

February 2020) but just 50% for round AR040 (September-October 2020). Rounds AR037 and AR039 were cancelled due to the Covid-19 pandemic. The percentage score reflects the results deemed to be satisfactory based upon the z- score of $< \pm 2$. An issue with the doping method of the diffusion tubes was found to be the reason behind the lower performance score in round AR040. This issue was flagged up and has since been resolved with a performance score of 100% in rounds AR042, AR044 and AR046 covering the whole of 2021.

The laboratory also takes part in the field inter-comparison scheme. Based on 15 diffusion tube studies, all local authority co-location studies in 2020 were rated as 'Good' (tubes are considered to have "satisfactory" precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more periods during the year is less than 20%). Based on 14 diffusion tube studies, all local authority co-location studies in 2021 were rated as 'Good' with the exception of one study. A summary of precision results for Staffordshire Scientific Services against some other laboratories is available from

<http://laqm.defra.gov.uk/diffusion-tubes/precision.html>

Diffusion tube results for March to May 2020 were not reported due to the pandemic. Furthermore, due to resource constraints posed by the pandemic, monitoring was only partially completed in adherence with the 2020 Diffusion Tube Monitoring Calendar, but was adhered to during 2021.

Diffusion Tube Annualisation

Annualisation was required for twelve non-automatic monitoring sites in the East Staffordshire Borough during 2020 as data capture for these sites dropped below 75%. Data from three AURN monitoring sites; Burton on Trent – Horninglow Urban Background, Stoke on Trent Centre, and Nottingham Centre were selected from the [DEFRA UK Air data selector](#) resource to provide location specific diffusion tube average annualisation factors to apply to the raw data annual mean for each of the twelve locations in accordance with LAQM.TG16 Box 7.9. More details are provided in Table C.2

All diffusion tube monitoring locations within East Staffordshire Borough Council recorded data capture of 75% or more during 2021, therefore it was not required to annualise any 2021 monitoring data.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2020-21 combined 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.TG16 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/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

East Staffordshire Borough Council have applied a local bias adjustment factor of 0.90 to all diffusion tube sites for 2020. The local bias adjustment factor was derived from the Derby Turn automatic monitoring station co-location study for 2020. The national bias adjustment factor for Staffordshire Highways Laboratory for 2020 was 0.85. A locally derived bias factor has been used for a number of years and it was felt appropriate to continue to use, plus the higher local bias factor for 2020 produced slightly higher NO₂ results, thus it was deemed prudent to follow a more conservative approach.

Local bias correction factors were also used for the diffusion tube data using the Derby Turn automatic monitoring station for all of the Burton upon Trent sites in 2018 and 2019, with factors of 0.90 and 0.88 applied respectively. The National Highways automatic monitoring station in Uttoxeter was used to derive the factor in 2018 for the Uttoxeter sites and was 0.97 but due to insufficient data collection was not used in 2019 and the Derby Turn factor was used instead.

The local bias correction factor derived from the Derby Turn automatic monitoring station for 2021 was 0.65 compared to 0.86 using the national bias factor. There are no obvious reasons for the difference in bias factors for 2021. In contrast to previous years, the national bias factor was used to correct diffusion tube data for all sites during 2021 as this produced noticeably higher NO₂ results, so again a more conservative approach has been followed.

A summary of bias adjustment factors used by East Staffordshire Borough Council over the past five years is presented in Table C.1

Figure C.1 presents a screenshot of the national bias adjustment factor spreadsheet for Staffordshire Scientific Services compared with other laboratories for 2021. Meanwhile

Table C.3 presents more details of the local bias factor used to correct 2020 diffusion tube data.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	03/22	0.86 (based on 14 studies, applied to all sites)
2020	Local	-	0.90 (applied to all sites)
2019	Local	-	0.88 (applied to all sites)
2018	Local	-	0.90 for Burton sites 0.97 for Uttoxeter sites
2017	National	Not Recorded	0.85 (applied to all sites)
2016	National	03/17 v2	0.88 (based on 11 studies applied to all sites)

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website. Distance correction should be considered at any monitoring site where the annual mean concentration is greater than 36µg/m³ and the monitoring site is not located at a point of relevant exposure, which for the most recent reporting year of 2021 was applied to ten diffusion tube sites. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1 for 2020 and Table B.2 for 2021.

More details on the distance correction calculations for 2020 and 2021 are presented in Table C.4 and Table C.5 respectively.

QA/QC of Automatic Monitoring

East Staffordshire Borough Council has a contract with a company called Air Quality Data Management (AQDM) for data collection in relation to our automatic monitoring station at Derby Turn. AQDM ensures that our data is fully ratified to the standards highlighted in the LAQM Technical Guidance standards. Performance of the monitoring station is

checked daily, seven days a week. Alerts are issued if there are problems and the engineers fully briefed about the symptoms and likely actions. This helps maximise the data capture and data quality. Live data is also disseminated on AQDMs UK website for public viewing at <http://www.UKAirQuality.net> and enables comparison with other monitoring sites and identification of pollution episodes.

East Staffordshire Borough Council also has a service contract with a company called ESU1 Ltd for the maintenance of the monitoring station. We also undertake our own routine calibrations at least monthly.

The Uttoxeter automatic monitoring site is subject to full QA/QC procedures although this is independent of East Staffordshire Borough Council. National Highways contract out the QA/QC of their monitoring stations.

Automatic Monitoring Annualisation

All automatic monitoring locations within the jurisdiction of East Staffordshire Borough Council recorded data capture of greater than 75% during 2020 and 2021 therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1 and Table B.2.

No automatic NO₂ monitoring locations within the East Staffordshire Borough required distance corrections during 2020 and 2021.

Figure C.1 – National Bias Adjustment Calculation 2021

National Diffusion Tube Bias Adjustment Factor Spreadsheet							Spreadsheet Version Number: 03/22			
<p>Follow the steps below in the correct order to show the results of relevant co-location studies</p> <p>Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods</p> <p>Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet</p> <p>This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.</p>							<p>This spreadsheet will be updated at the end of June 2022</p> <p>LAQM Helpdesk Website</p>			
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.					Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.					
Step 1:		Step 2:	Step 3:	Step 4:						
Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	<p>Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution.</p> <p>Where there is more than one study, use the overall factor³ shown in blue at the foot of the final column.</p>						
If a laboratory is not shown, we have no data for this laboratory.		If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data ²	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	Year ⁵	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) ($\mu\text{g}/\text{m}^3$)	Automatic Monitor Mean Conc. (Cm) ($\mu\text{g}/\text{m}^3$)	Bias (B)	Tube Precision ⁶	Bias Adjustment Factor (A) (Cm/Dm)
Aberdeen Scientific Services	20% TEA in water	2021		Overall Factor ³ (7 studies)				Use		0.75
Edinburgh Scientific Services	50% TEA in acetone	2021		Overall Factor ³ (1 study)				Use		0.87
Glasgow Scientific Services	20% TEA in water	2021		Overall Factor ³ (6 studies)				Use		1.12
Gradko	20% TEA in water	2021		Overall Factor ³ (32 studies)				Use		0.84
Gradko	50% TEA in acetone	2021		Overall Factor ³ (14 studies)				Use		0.83
Lambeth Scientific Services	50% TEA in acetone	2021		Overall Factor ³ (5 studies)				Use		0.97
Milton Keynes Council	20% TEA in water	2021		Overall Factor ³ (1 study)				Use		0.74
SOCOTEC Didcot	20% TEA in water	2021		Overall Factor ³ (5 studies)				Use		0.76
SOCOTEC Didcot	50% TEA in acetone	2021		Overall Factor ³ (23 studies)				Use		0.78
SOCOTEC Glasgow	20% TEA in water	2021		Overall Factor ³ (1 study)				Use		0.78
SOCOTEC Glasgow	50% TEA in acetone	2021		Overall Factor ³ (1 study)				Use		0.80
Somerset County Council	20% TEA in water	2021		Overall Factor ³ (2 studies)				Use		0.77
South Yorkshire Air Quality Samplers	50% TEA in acetone	2021		Overall Factor ³ (1 study)				Use		0.77
Staffordshire Scientific Services	20% TEA in water	2021		Overall Factor ³ (14 studies)				Use		0.86
Tayside Scientific Services	20% TEA in water	2021		Overall Factor ³ (1 study)				Use		0.77

Table C.2 – Annualisation Summary (concentrations presented in $\mu\text{g}/\text{m}^3$) for 2020 (diffusion tube data only)

Site ID	Annualisation Factor AURN Burton on Trent, Hornonglow	Annualisation Factor AURN Stoke on Trent Centre	Annualisation Factor AURN Nottingham Centre	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
DT1	0.9635	0.9553	0.9473	0.9554	31.5	30.1	
DT28	0.9859	0.9363	0.9499	0.9574	49.3	47.2	
DT31	0.8886	0.8733	0.8711	0.8777	43.6	38.2	
DT37	0.9859	0.9363	0.9499	0.9574	37.1	35.5	
DT41	0.9590	0.9319	0.9268	0.9392	33.0	31.0	
DT60	0.9635	0.9553	0.9473	0.9554	37.4	35.7	
DT62	0.9389	0.9171	0.9107	0.9222	23.1	21.3	
DT67	0.9389	0.9171	0.9107	0.9222	25.3	23.3	
DT68	0.8905	0.8695	0.8569	0.8723	27.9	24.4	
DT69	0.9635	0.9553	0.9473	0.9554	20.3	19.4	
DT71	0.9389	0.9171	0.9107	0.9222	18.4	16.9	
DT75	0.8869	0.8737	0.8553	0.8720	43.3	37.8	

Table C.3 – Local Bias Adjustment Calculation 2020

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	8				
Bias Factor A	0.9 (0.61 – 1.73)				
Bias Factor B	11% (-42% - 64%)				
Diffusion Tube Mean ($\mu\text{g}/\text{m}^3$)	38.4				
Mean CV (Precision)	4.4%				
Automatic Mean ($\mu\text{g}/\text{m}^3$)	34.7				
Data Capture	100%				
Adjusted Tube Mean ($\mu\text{g}/\text{m}^3$)	35 (23 – 66)				

Notes:

A single local bias adjustment factor has been used to bias adjust the 2020 diffusion tube results.

Table C.4 – NO₂ Fall off With Distance Calculations (concentrations presented in µg/m³) 2020

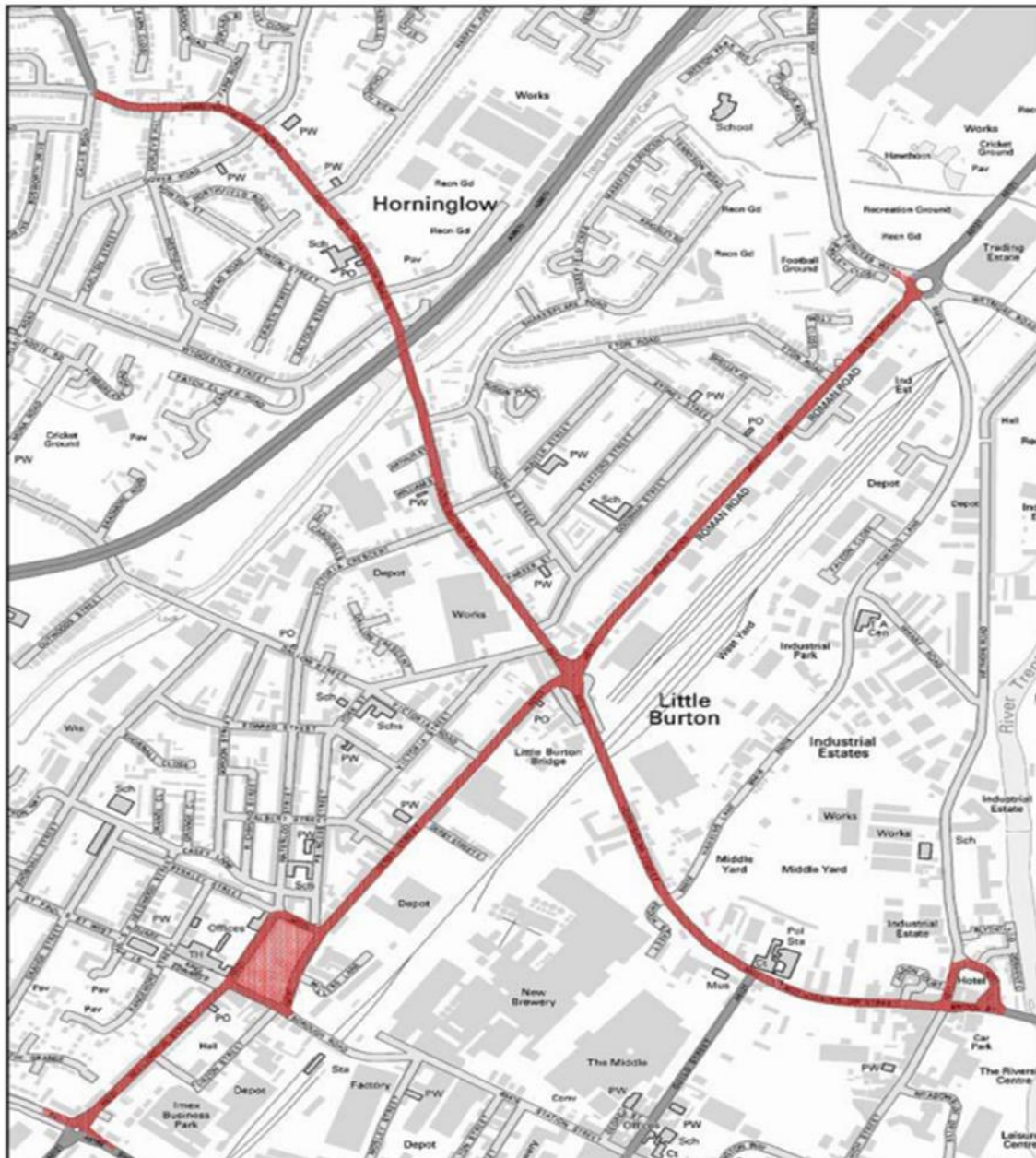
Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted)	Background Concentration	Concentration Predicted at Receptor	Comments
DT2	3.0	9.5	38.4	12.4	30.7	
DT7	0.5	2.2	36.3	14.5	30.6	
DT10	0.5	3.7	43.4	16.3	33.8	
DT15	1.8	2.3	37.5	19.8	36.5	<i>Predicted concentration at Receptor within 10% the AQS objective.</i>
DT17	1.7	5.5	42.1	19.8	36.2	<i>Predicted concentration at Receptor within 10% the AQS objective.</i>
DT23	2.0	5.4	36.2	19.8	32.4	
DT27	0.5	3.4	38.8	19.8	32.3	
DT28	0.5	2.5	42.5	14.5	34.5	
DT30	1.9	2.4	36.1	14.5	35.0	
DT35	2.7	3.2	37.0	14.3	36.0	<i>Predicted concentration at Receptor within 10% the AQS objective.</i>
DT49	5.5	18.0	49.1	11.9	35.6	
DT51	3.0	11.5	64.0	11.9	45.8	<i>Predicted concentration at Receptor above AQS objective.</i>
DT55, 56, 57	14.5	19.5	49.8	11.9	44.9	<i>Predicted concentration at Receptor above AQS objective. Warning: your monitor is more than 10m further from the kerb than your receptor - treat result with caution.</i>

Table C.5 – NO₂ Fall off with Distance Calculations (concentrations presented in µg/m³) 2021

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
DT2	3.0	9.5	37.8	12.1	30.1	
DT7	0.5	2.2	36.1	14.1	30.4	
DT10	0.5	3.7	42.2	15.8	32.8	
DT15	1.8	2.3	37.4	19.3	36.4	<i>Predicted concentration at Receptor within 10% the AQS objective.</i>
DT17	1.7	5.5	42.4	19.3	36.3	<i>Predicted concentration at Receptor within 10% the AQS objective.</i>
DT27	0.5	3.4	40.3	19.3	33.2	
DT28	0.5	2.5	44.1	14.1	35.6	
DT49	5.5	18.0	46.0	11.4	33.4	
DT51	3.0	11.5	59.8	11.4	43.0	<i>Predicted concentration at Receptor above AQS objective.</i>
DT55, DT56, DT57	14.5	19.5	48.4	11.4	43.6	<i>Predicted concentration at Receptor above AQS objective. Warning: your monitor is more than 10m further from the kerb than your receptor - treat result with caution.</i>

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

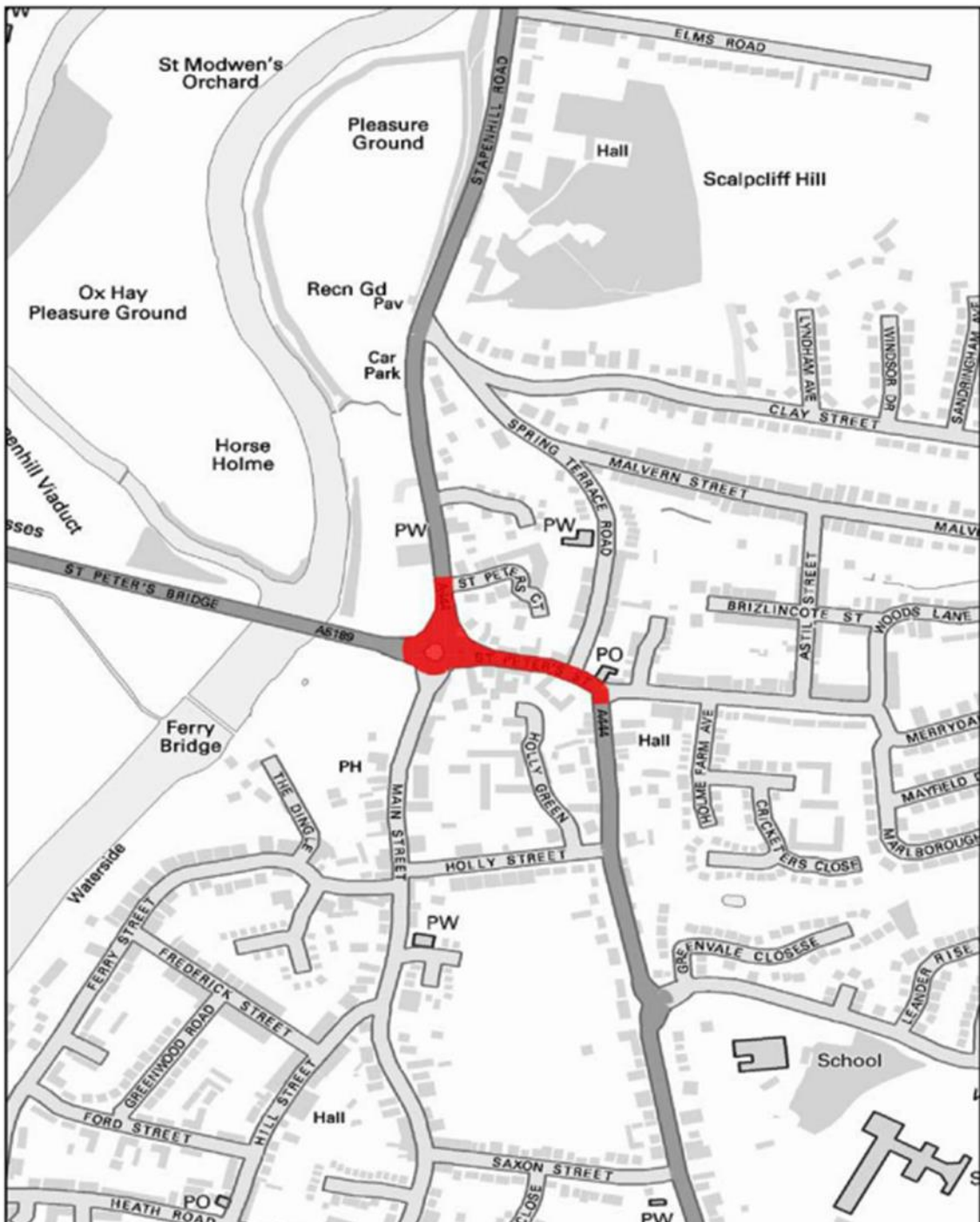
Figure D.1 – AQMA 1 Burton upon Trent



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Derby Rd, Derby St, part of Princess Way roundabout, Horninglow St, Horninglow Rd, Bridge St, Wellington St, part of Borough Road, part of Wellington St roundabout, part of Waterloo St and part of Byrkley St.

Figure D.2 – AQMA 2 Stapenhill



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St Peters Bridge roundabout and part of St Peters St, Stapenhill, Burton upon Trent

Figure D.3 – The automatic monitoring station at Derby Turn, Burton upon Trent



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Figure D.4 – Diffusion tubes - Burton upon Trent, AQMA 1 – Derby Turn



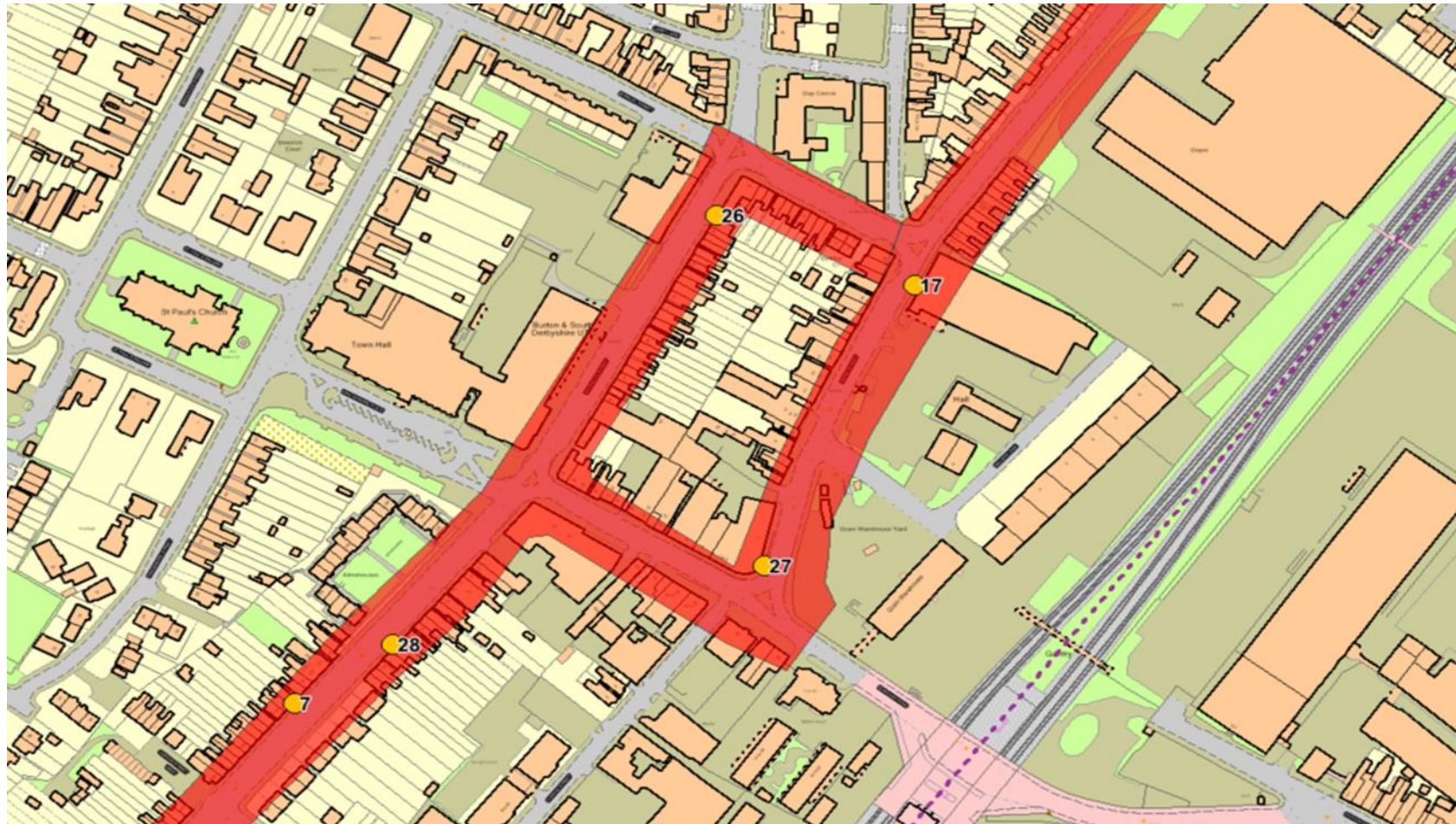
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Figure D.5 – Diffusion tubes - Burton upon Trent, AQMA 1 – Derby Street



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Figure D.6 – Diffusion tubes - Burton upon Trent, AQMA 1 – Wellington Street/ Waterloo Street/ Derby Street



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Figure D.7 – Diffusion tubes - Burton upon Trent, AQMA 1 – Derby Road



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Figure D.8 – Diffusion tubes - Burton upon Trent, AQMA 1 – Horninglow Road



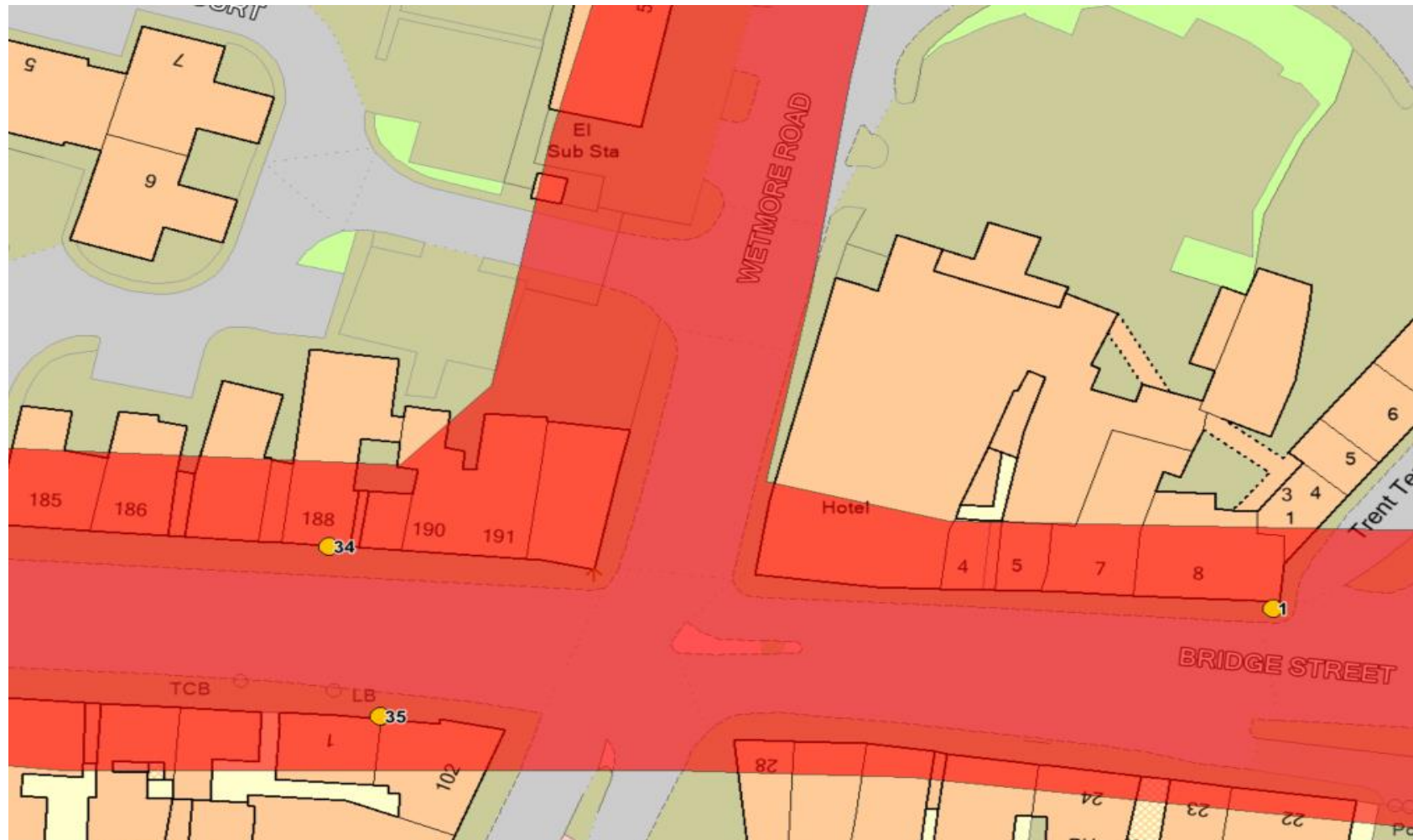
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Figure D.9 – Diffusion tubes - Burton upon Trent, AQMA 1 – Horninglow Street



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Figure D.10 – Diffusion tubes - Burton upon Trent, AQMA 1 – Bridge Street



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Figure D.11 – Diffusion tubes - Burton upon Trent, AQMA 1 – Horninglow Croft



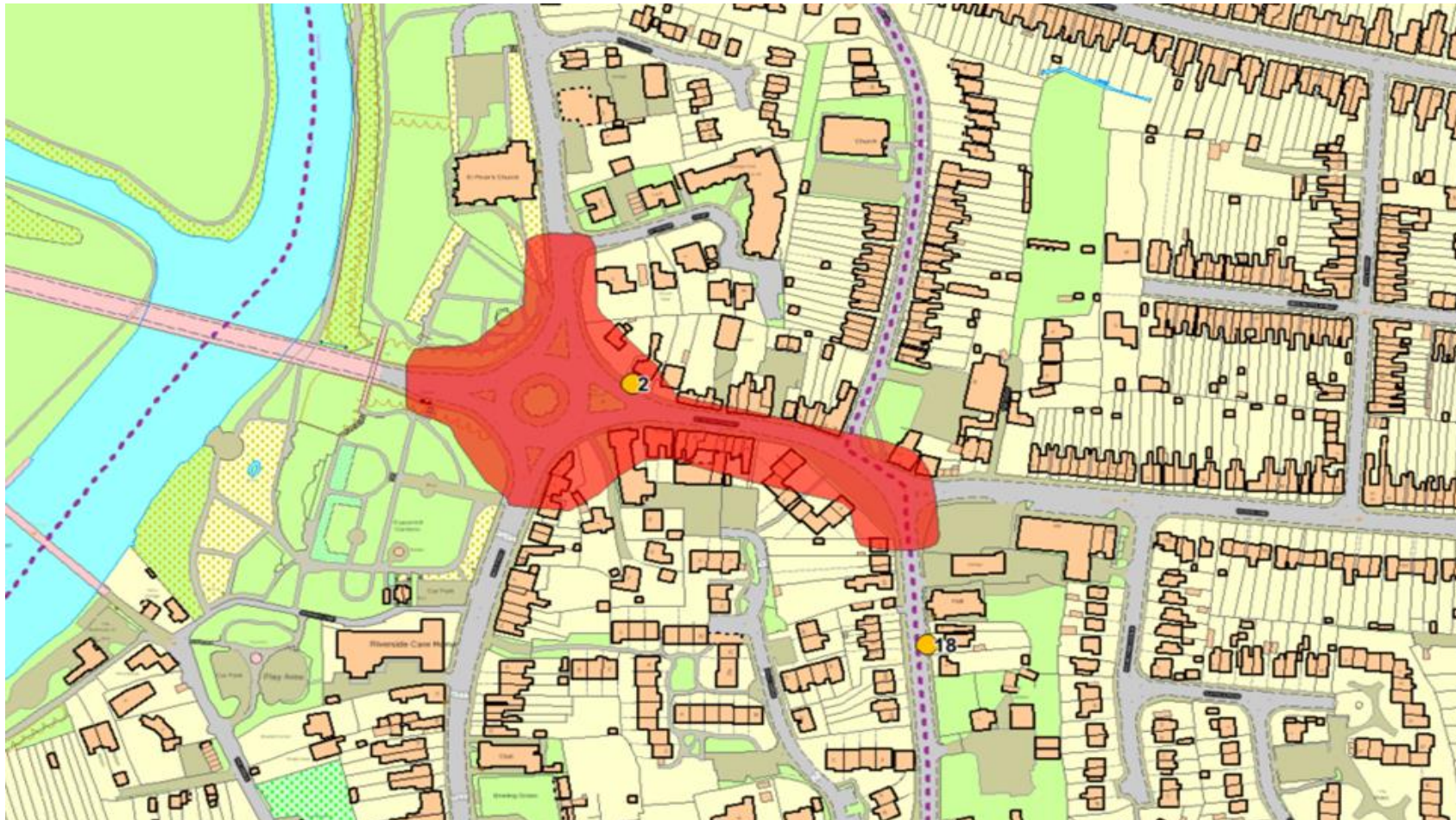
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Figure D.12 – Diffusion tubes - Burton upon Trent, AQMA 1 – Wellington Street/ Shobnall Road



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Figure D.13 – Diffusion tubes - Stapenhill, AQMA 2 – St Peters Bridge Roundabout/A444 St Peters Street



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Figure D.14 – Diffusion tubes – Burton upon Trent, Outside AQMAs – Winhill, Brookside Urban Background



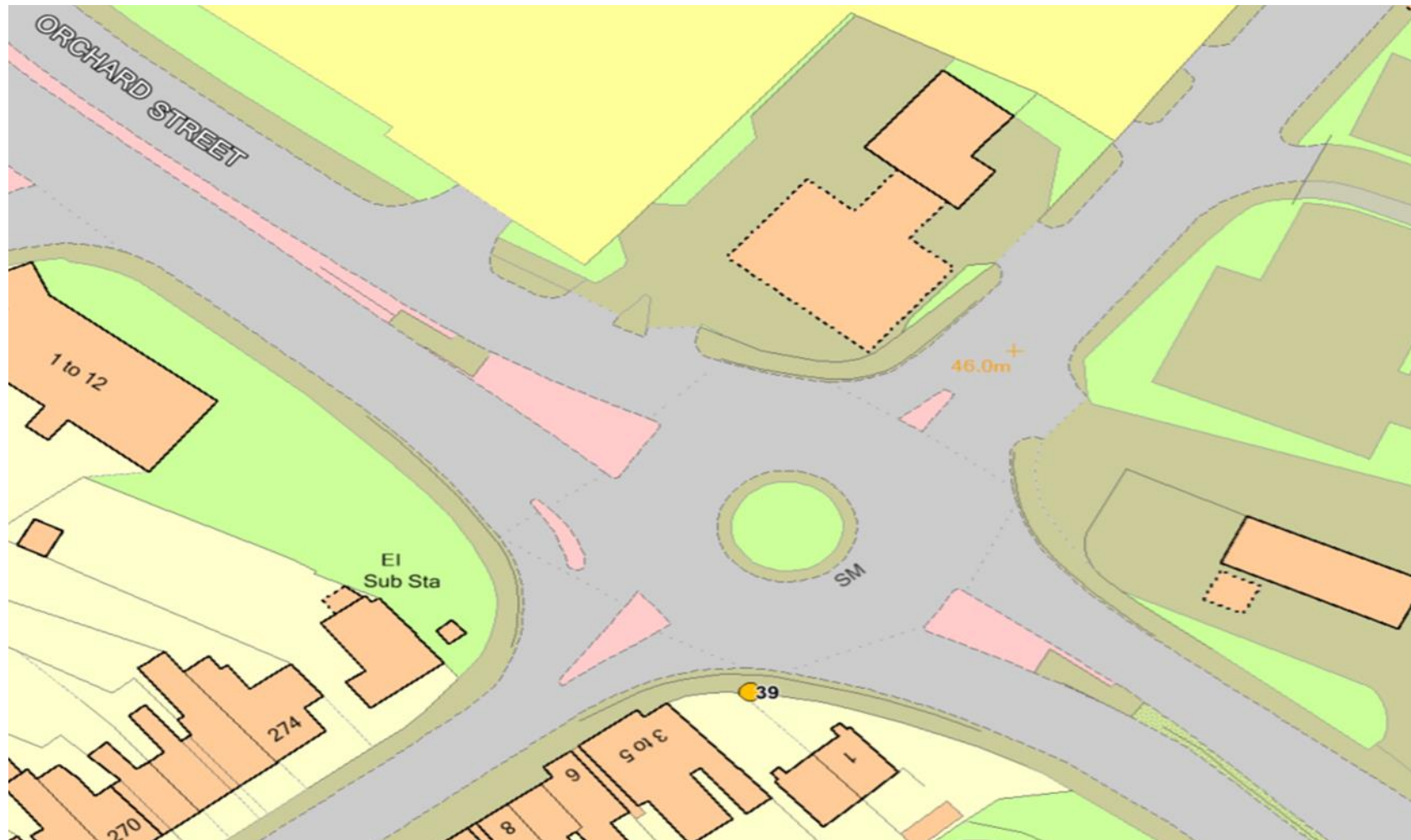
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Figure D.15 – Diffusion tubes - Burton upon Trent, Outside AQMAs – Anglesey Road/Evershed Way junction



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Figure D.16 – Diffusion tubes - Burton upon Trent, Outside AQMAs – Orchard Street/Branston Road junction



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Figure D.17 – Diffusion tubes - Burton upon Trent, Outside AQMAs – Shobnall Road



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Figure D.18 – Diffusion tubes - Burton upon Trent, Outside AQMAs – Forest Road



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Figure D.19 – Diffusion tubes - Burton upon Trent, Outside AQMAs – Hawkins Lane



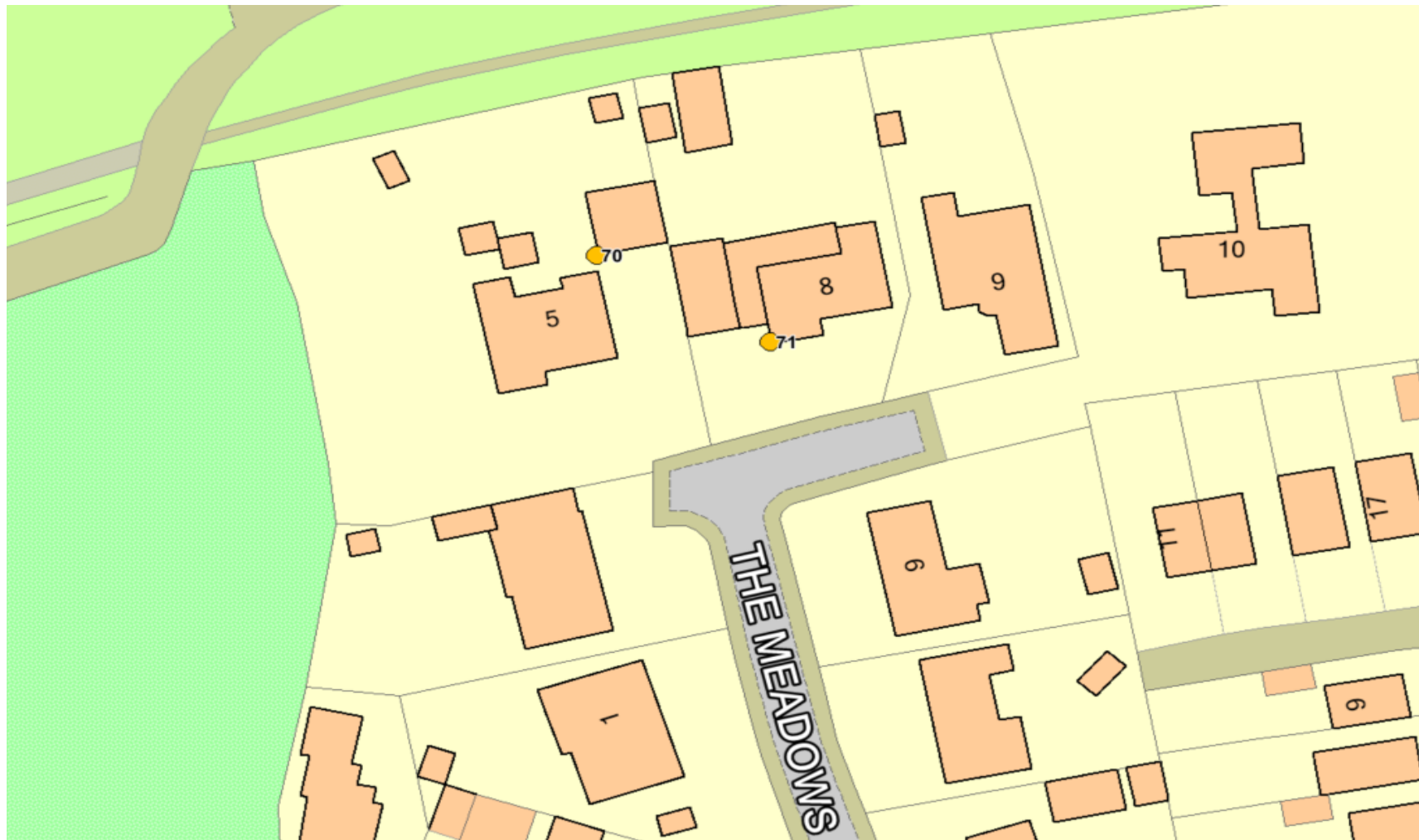
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Figure D.20 – Diffusion tubes – Uttoxeter A50



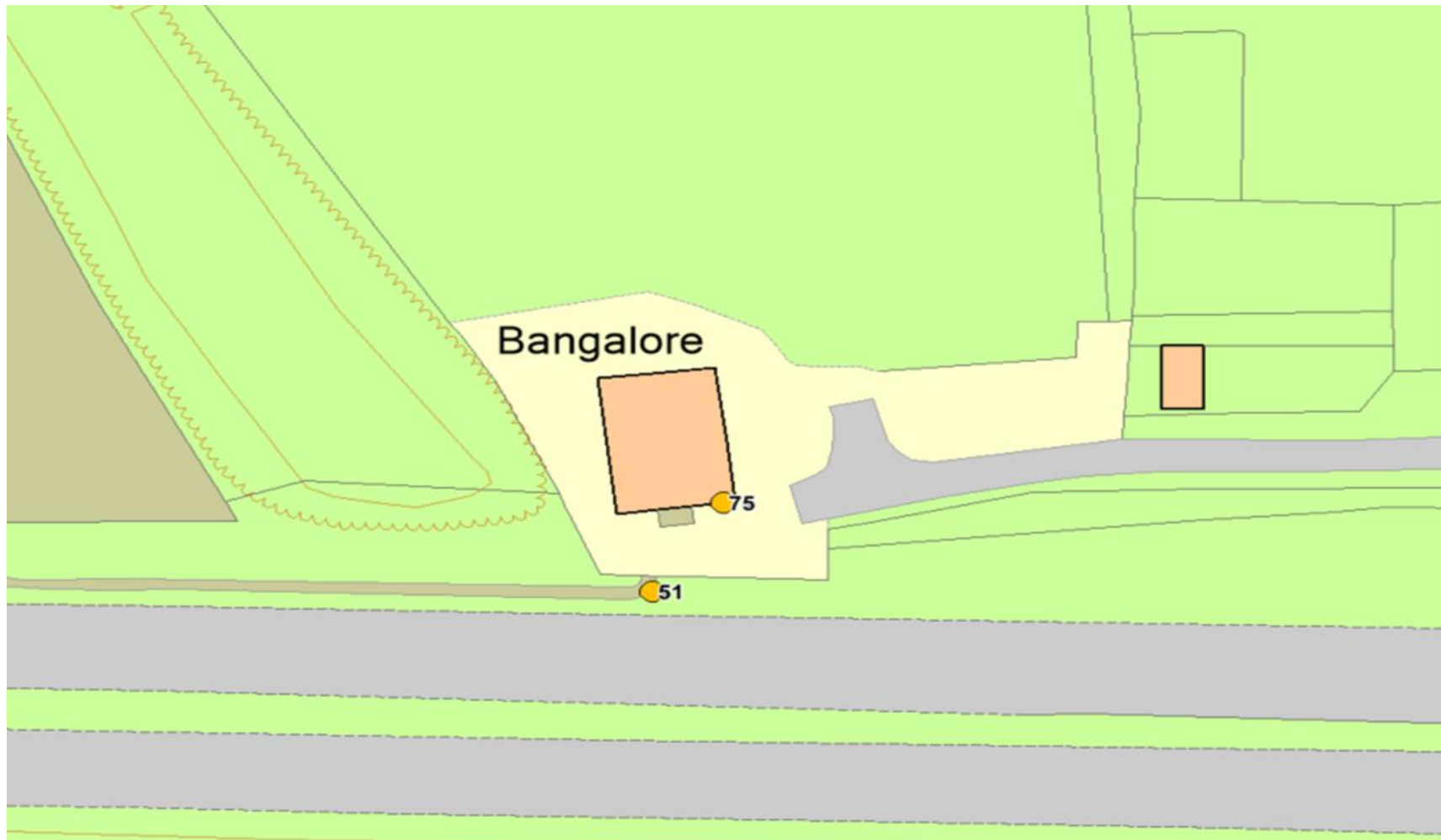
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Figure D.21 – Diffusion tubes – Uttoxeter A50



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Figure D.22 – Diffusion tubes – Uttoxeter A50



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Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁷

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO ₂)	200µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO ₂)	40µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM ₁₀)	40µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO ₂)	125µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO ₂)	266µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁷ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Appendix F: Impact of COVID-19 upon LAQM

Covid-19 has had a significant impact on society. Inevitably, Covid-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

Covid-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in 2020 and 2021. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO₂) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data¹⁷ suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre Covid-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)¹⁸ has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO₂ annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

¹⁷ Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

¹⁸ Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

represents an absolute reduction of between 10 to 20 $\mu\text{g}/\text{m}^3$ if expressed relative to annual mean averages. During this period, changes in PM_{2.5} concentrations were less marked than those of NO₂. PM_{2.5} concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that PM_{2.5} concentrations during the initial lockdown period are of the order 2 to 5 $\mu\text{g}/\text{m}^3$ lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of Covid-19 on Air Quality within East Staffordshire Borough Council

Measured air pollution levels of nitrogen dioxide (NO₂) at monitoring locations both inside and outside of the two AQMAs experienced a greater rate of decline in 2020 than they have been at any time in the last decade for some locations, whereas others showed a decline consistent with previous years. This overall rate of decline plateaued in 2021. Reductions of annual mean NO₂ concentrations averaged at 7.3% for all roadside diffusion tube monitoring sites within AQMA 1 during 2020 relative to 2019. For AQMA 2, percentage reductions of annual mean NO₂ concentrations averaged at 10.5% during 2020 relative to 2019. Traffic data for 2019 and 2020 has been sourced from the Department for Transport (DfT) to give an indication of the impact of Covid-19 lockdowns and restrictions on traffic flows and travel behaviours in both AQMA 1 and AQMA 2. For AQMA 1, the total volume of traffic expressed as an estimated annual average daily traffic flow (AADT) dropped by approximately 21.9% during 2020 relative to 2019. For AQMA 2, an even greater decline in traffic volume of approximately 22.3% was experienced in 2020 relative to 2019. Correlations between reductions in traffic volumes and annual mean NO₂ concentrations (uncorrected for distance to relevant receptors) are demonstrated in Figure F.1 and Figure F.2 for AQMA 1 and AQMA 2 respectively.

The reduction in traffic volumes and corresponding NO₂ concentrations experienced within 2020 provides some evidence that reductions in traffic can go some way to meeting objectives, albeit only in AQMA 2. A further reduction in traffic would be required to bring a reduction in NO₂ levels below the objective in AQMA 1.

Figure F.1 - Correlations between reduction in annual mean NO₂ concentrations and traffic volume in AQMA 1.

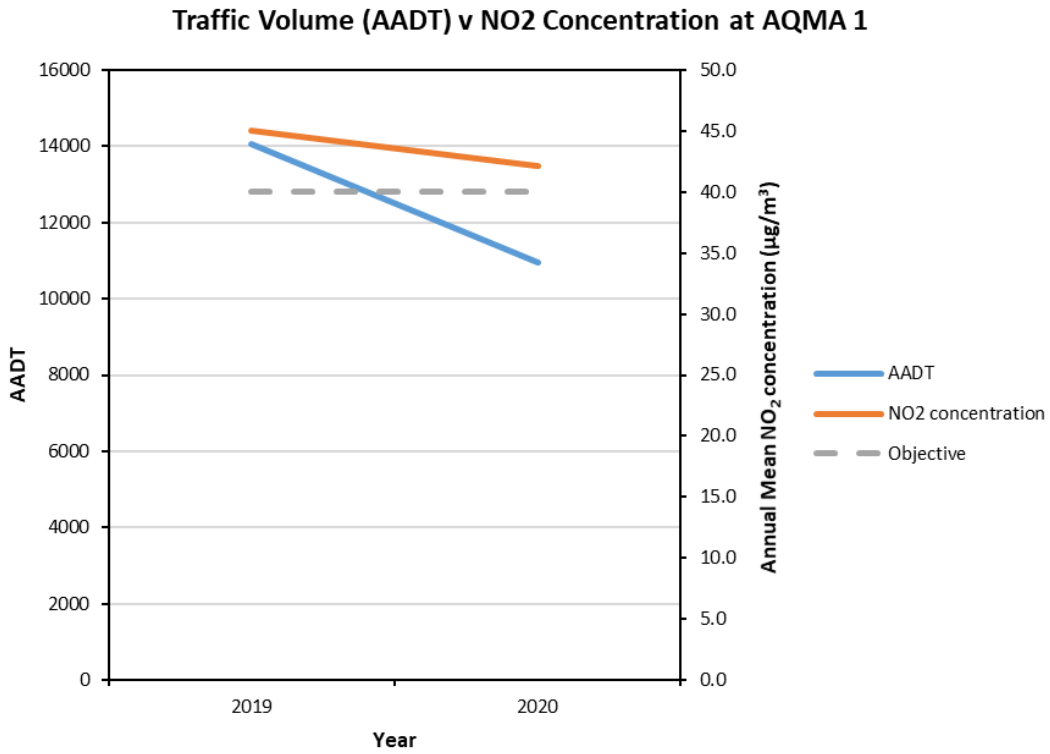
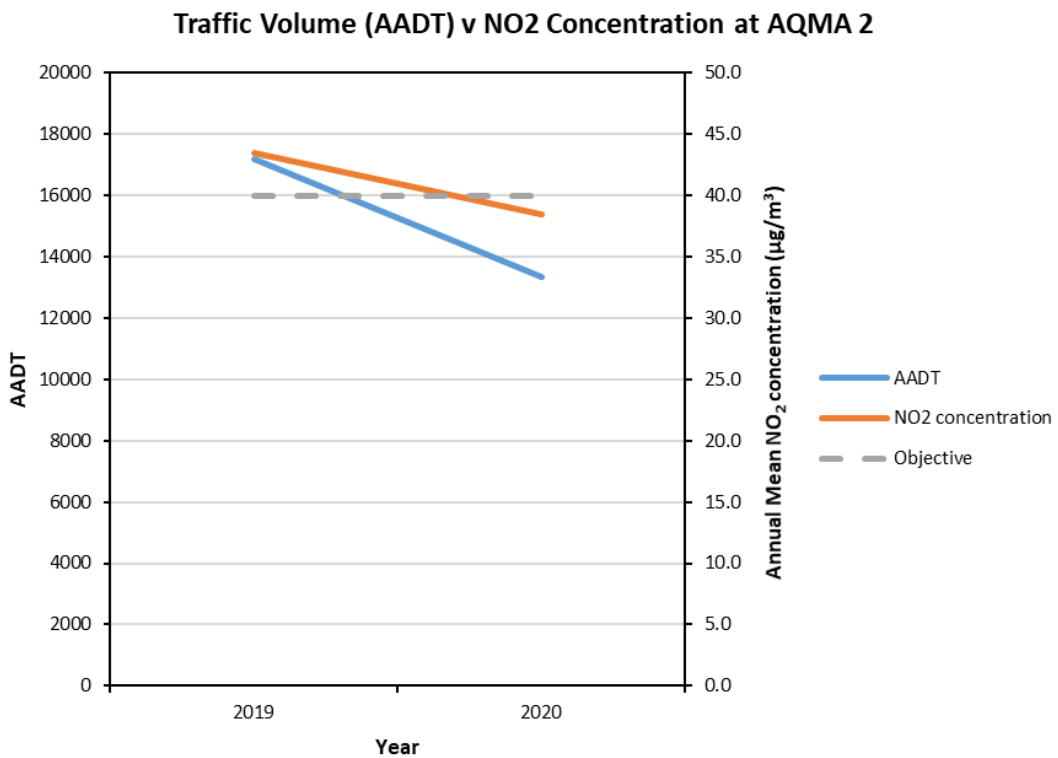


Figure F.2 - Correlations between reduction in annual mean NO₂ concentrations and traffic volume in AQMA 2.



Opportunities Presented by COVID-19 upon LAQM within East Staffordshire Borough Council

Potentially, the pattern of flexible working arrangements (homeworking or hybrid working patterns) presented by the pandemic will continue to some extent as the technology and experience has become established. This will reduce the level of commuter traffic and associated emissions. The current cost of living crisis with rising fuel costs will also have an impact of travel behaviours.

Challenges and Constraints Imposed by COVID-19 upon LAQM within East Staffordshire Borough Council

The following challenges and constraints imposed by Covid-19 impacted the LAQM work of the Council:

- Automatic Monitoring Data Capture (%) – During 2020, data capture from the automatic monitoring station at Derby Turn was good at 97.5% and was consistent with previous years. The impact of the pandemic on data capture in this instance is deemed as **No Impact**.
- Automatic Monitoring (QA/QC Regime) – During 2020, calibrations were undertaken fairly frequently outside of the initial lockdown albeit not to normal regime. Audits were also undertaken alongside service and maintenance programmes therefore the impact is deemed as **Small/Medium**.
- Passive Monitoring Data Capture (%) and Adherence to Diffusion Tube Calendar - During 2020, a combination of staff constraints and limited access to a number of diffusion tube monitoring sites meant it was not possible to adhere strictly to the national monitoring calendar for all sites. This was especially true between March and June 2020, when all diffusion tubes were exposed for more than 3 months as staff were not available to be deployed. In accordance with the impact matrix (Table F.1) the impact can be classed as **Medium**. A combination of limited access to some sites and missing tubes, the latter of which can happen in any normal year affected data capture within 2020. This resulted in some monitoring sites needing to be annualised. A total of twelve sites experienced a data capture of between 25% and 75% therefore the impact can be classed as **Medium**.

- Passive Monitoring (Storage of Tubes) - During the months where diffusion tubes were sent for analysis they were stored and analysed in accordance with laboratory guidance. **No impact**

The impacts as presented above are aligned with the criteria as defined in Table F.1, with professional judgement considered as part of their application.

Table F.1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: Large
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

Glossary of Terms

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