2021 Air Quality Annual Status Report (ASR)

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

Date: August 2021

Information	Shropshire Council Details
Local Authority Officer	Matthew Clark
Department	Regulatory Services
Address	Shirehall, Abbey Foregate, Shrewsbury, SY2 4ND
Telephone	01743 251708
E-mail	specialist@shropshire.gov.uk
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Executive Summary: Air Quality in Our Area

Air Quality in Shropshire 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 ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

Shropshire Council has two Air Quality Management Areas (AQMAs) in force; Bridgnorth Pound Street AQMA and Shrewsbury No 3 AQMA.

Bridgnorth Pound Street AQMA is still required as nitrogen dioxide (NO2) levels exceed the annual average national objective level. 18 residential properties were found to be likely to be exposed to levels of NO2 above the National Objective Level in previous years. This is likely to have been the same in 2020. A reduction in pollutant was found in 2019 compared to the previous year with the highest recorded annual average of NO2 registering at 47µg/m3, a reduction of 1.7 µg/m3 from 2018. Data from 2020 shows that the national objective level was met with the highest monitored NO2 result being found to be 39.7 µg/m3, just 0.3 units below the objective level. This shows the scale of the challenge given significant vehicle reductions in 2020 due to local and national Covid restrictions and lockdown measures. The AQMA is still required. Monitoring will continue in this area.

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

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

[3] Defra. Air quality appraisal: damage cost guidance, July 2020

[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

Shrewsbury No 3 AQMA, covering Shrewsbury Town Centre, is still required although there is only an exceedance of the national objective level at one monitoring location where there is relevant exposure on Castle Foregate. It is anticipated that there are only a few relevant receptors in the AQMA which are exposed to levels of nitrogen dioxide above the national objective level however the objective level is breached by a considerable amount, around 30%. The highest NO2 level to be recorded at a residential receptor was 52 µg/m3 in 2019 on Castle Foregates opposite the train station. This was the lowest result ever recorded at this location. The previous lowest recorded result was 53.6 µg/m3 in 2014. This is promising news and reinstates a slight downward trend previously bucked by the 2018 result for this location. Despite the welcomed reduction in pollutant the AQMA is still very much required. In 2020 despite significant vehicle reductions in due to local and national Covid restrictions and lockdown measures the National Objective Level was only met by 0.1 unit showing the scale of the challenge in "normal" times.

Overall a downward trend has been noted in the AQMAs. This was expected due to the impact of Covid measures on road vehicle numbers. In terms of trends 2020 is not a reliable year to consider due to the significant abnormalities in vehicle numbers and flows. To date vehicle numbers seem to have recovered and it is expected that in 2021 an increase in pollution will be noted in comparison to 2020. It is hoped that there will have been a reduction compared to previous (2019) monitored years of data.

Shropshire Council continues to consider air quality throughout a number of services and departments with air quality found in many policies across the Council. Most recently LTP4 is being produced. Air quality is noted as one of 12 areas requiring attention.

No significant new sources have been identified except for the potential Shrewsbury North West Relief Road (Shrewsbury NWRR). Detailed design and assessment has been carried out with a planning application currently submitted: 21/00924/EIA. An air quality impact assessment has been submitted and audited in respect of human health impact. It has been found that the NWRR will promote better air quality in the hotspot pollution area in Shrewsbury while creating some increases in areas with headroom below the national objective levels. This balance is considered to be positive in respect of the LAQM regime.

In the past Shropshire Council has worked with partners such as the Environment Agency to gather data on poultry houses. This information is now up to date and no further information has been required. No additional intensive agriculture units have been granted planning permission which met the screening criteria for detailed assessment. Where applications look likely to meet the relevant criteria comments are provided at planning

application stage to ensure that relevant detail is submitted with any planning application. Highways England have previously been contacted over the A49 which runs through Bayston Hill. In 2017 and 2018 the annual average national objective level for NO2 was exceeded at this location on the Highways England road network. In 2019 no exceedance was found with the same occurring in 2020 although little can be inferred from this latest year due to the Covid impact on road vehicle numbers. As such although discussions will continue to be held no projects are underway or required at this time as it is expected that road vehicle emissions will continue to improve over future years. One aspect that may buck this trend is vehicle movements to and from Bayston Hill quarry. Should these rise trends could be reversed.

As the AQMAs in force in Shropshire Council's area are both primarily a result of vehicle emissions on Council managed roads there is no reason for other partners to be significantly involved at this time.

Work has commenced on an AQAP review with quotes being sought to allow this to be commissioned by the Council. It is envisaged that this process will take 12 months to complete and a revised AQAP adopted formally once the commissioned work has commenced.

Details of Shropshire Council AQMAs can be found at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=442

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 Strategy[5] sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero[6] 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

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[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

Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Due to Covid-19 pressures on services no specific measures were carried out within the last 12 months for air quality gains. However, air quality grant work progressed with the release of near real time air quality maps of AQMA areas available to all: https://portal-public.earthsense.co.uk/ShropshirePublic/

Below is an exert from Shrewsbury No 3 AQMA area model output:
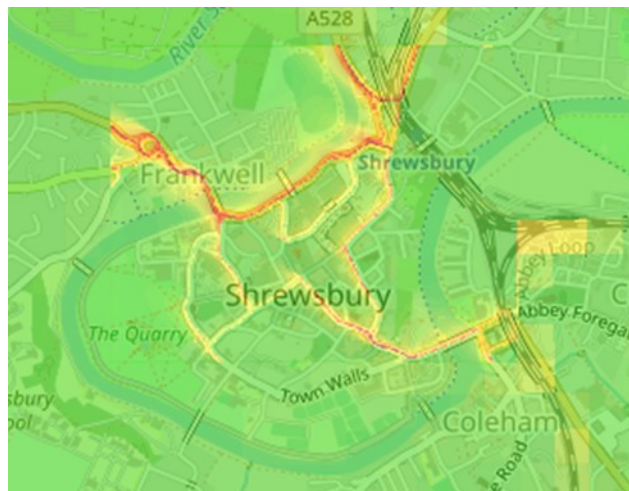
And Bridgnorth AQMA model output.
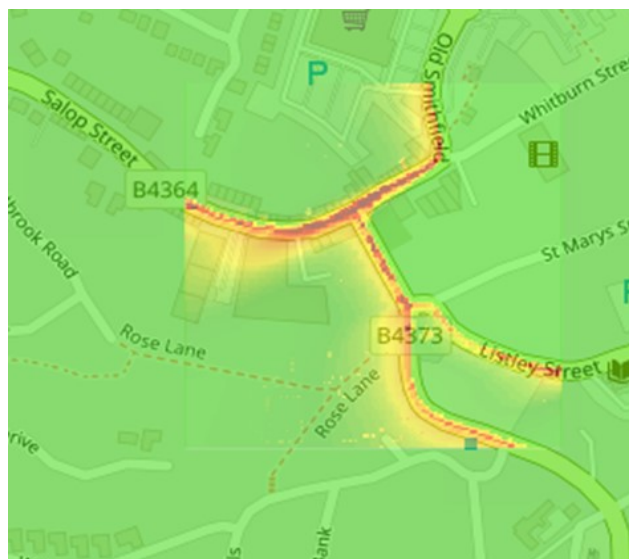
Measures to create additional social distancing potential in some towns may have resulted in betterments in air quality. Although these locations lacked monitors and the monitoring data for 2020 was not a reliable indication of future post Covid-19 pollutant levels these initiatives have gained traction and there is consideration to retain some of these measures going forward. This would provide expected betterments to those living, working or playing in the areas concerned. In addition it provides a step towards a reduction in

motor vehicles in the town centre areas creating potential to carry out future interventions which, due to existing measures, may provide betterments for air quality in hotspot areas without impacting n the same number of individuals as previously.

In recent months a position has been created within the authority of Active Transport Manager. This will firstly lead the creation of LCWIPs to create the documentation required to successfully move forward this workstream in practice.

Conclusions and Priorities

In summary much work has been carried out to position air quality within the many workstreams of the Council as a whole including Levelling Up Fund bids and place shaping work including the Shrewsbury Big Town Plan and Bridgnorth connectivity discussions. Specific measures have included air quality grant work to provide near real time modelling outputs of air quality to the public and data to interested parties. A trial lane closure in Shrewsbury is planned to consider the potential air quality impacts as part of grant work. This is expected in September to October 2021.

2020 data is not considered reliable to provide commentary on trend data given the significant impact on road vehicle levels as a result of national and localised lockdown measures associated with Covid-19. Generally, data to date suggests a downward trend in most areas including areas where AQMAs exist.

Current designated AQMAs are both still necessary due to exceedances of the annual mean NO2 national objective level. No new AMQA areas are necessary based on data captured to date. No new significant sources of pollution have been recorded where they are close enough to receptors to have impact requiring detailed assessment other than the Shrewsbury NWRR which has submitted a detailed assessment as part of the current planning application. This has been audited and the overall impact on human health from air pollutants is considered to be beneficial.

A review of AQAPs is necessary. The decision has been made to consider commissioning of this activity. The AMAP review will take place over the following year and is considered to be the main priority for the next 12 months to allow interventions to take the air quality agenda forward to be identified, checked for feasibility and progressed to design and implementation in future years.

Local Engagement and How to get Involved

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Shropshire Council has engaged with local decision makers and the public through involvement in place shaping workstreams, e.g. Shrewsbury Big Town Plan (SBTP) and Oswestry Masterplan while also ensuring attendance at the LTP4 themed workshops on Air Quality and the Environment. Some of the above contain members from the local community, town council and/or BID groups as well as interested members of the community.

To reduce air pollution and contribute to clean air everyone living, working and visiting the area can contribute. Every individual and business can promote clean air and help make a difference by considering the following actions:

Avoid driving into congested areas: it is good for your health and your wealth.

By planning your journey to avoid congested areas you can make a positive difference. Parking on the edge of town is often cheaper than parking in town centres saving you money. Walking into town from edge of town carparks keeps you active and is good for your family's health. By not driving into congested, polluted areas you reduce your family's exposure to harmful air pollutants and stop your own vehicle emissions contributing to the problem. An alternative to walking and cycling is to use a Park and Ride or a bus service to get you the final mile.

To help plan your journey find Shropshire Council car parks here.

For Park and Ride information in Shropshire click here.

Consider your commute

If you regularly drive to work you may be able to save money by adopting the steps above. You could also reduce the amount of money you spend on fuel and parking by:

- using the Park and Ride service

- cycling or walking to work. By cycling or walking into work once a week you would reduce your emissions by 20%.

- car share: this can be a very effective way of reducing numbers of vehicles on the road and saving money, the further your journey the more you stand to save. The more you share, the more you save.

Doing the school run - not the school sit

Travel to take children to school contributes to the congestion on our roads at a time of day when there are increased vehicle numbers due to people travelling to work. Where the school is within walking/cycling distance we would encourage this method of transport. Not only would this save money in fuel costs and improve air quality by reducing congestion it would also add active travel to your regular journeys helping to improve your family's health by introducing regular exercise. Getting children into the habit of walking can provide lifelong benefits to them and their families in turn.

Consider your fuel

Electric vehicles are on the rise in the UK with some predictions suggesting 90% of registered vehicles in 2025 will be pure electric. In July 2021 more electric powered new vehicle registrations were made than registrations for diesel vehicles showing a shift toward cleaner more sustainable fuel.

With prices falling in line with vehicles powered by other fuels and ranges ever increasing electric powered vehicles could be the way for you and your family or business to make a difference and reduce air pollution and your individual carbon footprint.

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1 Local Air Quality Management

This report provides an overview of air quality in Shropshire Council during 2020. 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 Shropshire 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 Shropshire Council can be found in Table 2.1. The table presents a description of the two AQMAs that are currently designated within Shropshire Council. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMAs and also the air quality monitoring locations in relation to the AQMAs. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO_2 annual mean.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
Shrewsbury No 3 AQMA	Declared 1/5/2003, Amended 1/3/2006	NO2 annual mean	The area comprising Frankwell, part of Bridge Street and Smithfield Road Castle Gates and adjacent land, extending to encompass most of the Town Centre including High Street, Wyle Cop, English Bridge and Coleham Head gyratory.	NO	86µg/m^3	39.9 µg/m^3	Shrewsbury Air Quality Action Plan: 2008	https://www.shropshire.gov.uk/media/5218/shrewsbury-aqap-2008.pdf
Bridgnorth Pound Street AQMA	Declared 1/4/2005	NO2 annual mean	An area encompassing Pound Street and the junction of Whitburn Street and Salop Street.	NO	54.1µg/m^3 (in 2010)	39.7 µg/m^3	Bridgnorth Air Quality Action Plan: 2008	https://www.shropshire.gov.uk/media/5215/bridgnorth-dc-action-plan-pdf.pdf

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

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

2.2 Progress and Impact of Measures to address Air Quality in Shropshire Council

Defra's appraisal of last year's ASR concluded to accept the report. The comments requiring attention for future were:

- "It would be beneficial for the Council to update their pollutant trend graphs so that the NO_2 annual mean objective line is a different colour and not grey. This is so that it is clearer and stands out against the already grey graph lines".
  This aspect will be taken forward in this report and in future.

- The Council last published their Action Plans in 2008, making the plan extremely out of date. It is understood the purpose of the grant work is to engage key stakeholders but publishing a new Action Plans needs to be a priority. Therefore, the Council are encouraged to include an interim list of measures they anticipate enacting.
  The Grant work has engaged some key individuals in the Council. The current plan is to commission the work due to internal resource pressures. As part of the grant work a trial is proposed in the Shrewsbury area. Final details and costings are being considered with an intended timeline of carrying out the trial in October 2021.

- The reinstatement of site DF62 (Low Town Bridgnorth) is supported. The site is outside of an AQMA and an exceedance was recorded here in 2018. Due to an error NO_2 concentrations for 2019 at this site could not be obtained. It is important for the Council to redeploy this monitoring site to determine whether DF62 is a site of concern.
  This has been carried out and data will be available in future years. It is proposed that additional diffusion tubes will be located around the town to enable validation of any model created to proceed with future AQAPs and intervention planning. These may be available in 2021 or 2022 depending on available funding.

Shropshire Council has taken forward a number of direct measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 12 measures are included within Table 2.2, with the type of measure and the progress Shropshire Council have made during the reporting year of 2020 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans which can be found at: https://www.shropshire.gov.uk/environmental-health/environmental-protection-and-prevention/air-quality/shropshire-council-air-quality-reports/. Key completed measures are:

- Shrewsbury North West Relief Road planning application submitted. The proposal finds the impact on air quality impact on human health to be positive by reducing air pollution in hotspots while levels may rise in others with headroom below National Objective Levels.

- The Hackney Carriage and Private Hire Vehicle Policy updated in 2019 provided for an incremental betterment for vehicles entering the fleet. Betterments in emissions will continue throughout the 5-year period that this policy is in effect. Further details can be found at: https://www.shropshire.gov.uk/licensing/licensing-types/taxis/introduction/

- The successful Air Quality grant bid approved by DEFRA has continued. To date it has provided near real time air pollution monitors in the two AQMAs with near real time models produced and made available to the public showing hotspots and differences between exposure at different times of day. A trial intervention in Shrewsbury has been planned (lane closure on Castle Foregates) and is expected to occur within the next year.

- Linear Car Park Strategy continues to promote edge of town car parking reducing travel into town centres.

- A reduction in carpool activity was noted primarily due to Covid related actions removing the need for pool cars and safety measures required to keep staff members safe during this time. Going forward there may be reduced take up should more home working become the norm. Although this may reduce impact of the car pool greater benefit may be achieved by a reduced need to travel into an office with greater flexibility for staff to work from home.

- Electric vehicle charging points. In early 2021 50 EV charging points were installed across the County in ten towns (Shrewsbury (2 locations), Bridgnorth (2 locations), Ellesmere, Bishops Castle, Market Drayton, Oswestry, Whitchurch, Ludlow Much Wenlock and Broseley where off-road parking may not be available to encourage take up of clean technologies. Discussions ongoing to consider infrastructure in Cleobury Mortimer, Wem and Shifnal. This followed the installation of 2 rapid charging points in 2020 off the A49 at Church Stretton and Ludlow: https://newsroom.shropshire.gov.uk/2020/09/electric-vehicle-charging-funding/.

- Discussions have taken place with a provider to consider an electric forecourt as part of the Oswestry Innovation Park at Mile End. Discussions are taking place around fast charging facilities in two additional towns.

- Active Transport Manager appointed providing a dedicated resource to develop LCWIP over the next 12 months.

- Initial discussion have taken place with colleagues looking to take forward the Council's LTP4. To date this has realised air quality as a priority workstream to be considered in the formation of the document.

- Air quality interventions have been discussed and included in Levelling Up Fund bids submitted to Central Government for consideration. Should this be successful the implementation of a scheme to provide interventions in the Shrewsbury hotspot will be carried forward.

- Support for inclusion of air quality consideration in any place shaping activity in Shrewsbury has been established through approval of assistance for actions by a recently established Shrewsbury Programme Board which has been created to consider the many workstreams being considered to transform Shrewsbury to meet its current and future challenges.

- Inclusion of policies into the draft Shropshire Local Plan which strongly support the integration of electric vehicle charging infrastructure into new development.

- Continued input into the Shrewsbury Big Town Plan to ensure place shaping takes on board air quality challenges.

- Social distancing measures introduced into town centre locations as part of Covid response reduced motor vehicle movements through Shrewsbury town centre. The measures have been partly retained in order to continue a focus for social distancing and increase retail space available. In turn this promotes air quality. Potential for some measures to be retained long term.

- Planning application commentary on all relevant applications to consider air quality impacts and ensure no development occurs that will have significant impacts.

Shropshire Council expects the following measures to be completed over the course of the next reporting year:

- It is expected that a decision on the planning application for the **Shrewsbury NWRR** will be made.

- Completion of **DEFRA air quality grant** with reporting to DEFRA of the final outcomes including details of any trials undertaken.

- Completed and adopted **LCWIPs** to provide focus and direction to creating improved infrastructure for cycling and walking.
- A decision from Central Government on **Levelling Up Fund** allocation is expected. Should this be positive air quality interventions may be started in time to be reported on.
- The **LTP4** is expected to be formulated and adopted.
- Commissioning of an **AQAP review** and a start to the process is expected in the next 12 months.
- Funding secured to carry out **modelling air quality in AQMAs** with the ability to interrogate the model to consider the impact of specific interventions and development proposals.
- **Phase 2 of the Linear Car Park Strategy** to be undertaken – residential parking permit schemes in edge of town locations.

Shropshire Council's priorities for the coming year are:

- Progression with **AQAP review** including models of Shrewsbury and Bridgnorth AQMAs to enable consideration of intervention impact allowing prioritisation of interventions in future years.
- Completion of **trial lane closure on Castle Foregates in Shrewsbury** to enable a potential future detailed design and learn about potential impact on air quality.
- **Adoption of LTP4** with inclusion of air quality emphasis.
- **Adoption of LCWIPs** to allow funding streams for active transport to be realised.

The principal challenges and barriers to implementation that Shropshire Council anticipates facing are:

1. Funding: funding streams to carry out required modelling work and intervention development have been difficult to attain. Potential internal funding streams have been considered in Bridgnorth through CIL funding however no capital project exists in the area to enable this bid to be moved forward.
2. Resource through staff time: due to leave of absence the air quality lead was unavailable for 6 months in 2020 resulted in a reduced focus for the air quality agenda and less progress than may otherwise have been expected.
3. Covid-19: this has impacted on carrying out monitoring duties and available resource to undertake air quality duties.

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

- Air Quality DEFRA grant project: covid-19 resource requirements and local elections at a key time to liaise with members.

Shropshire Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in Shrewsbury No 3 AQMA should the NWRR planning decision and lane closure trial in Castle Foregates area result in both interventions being moved forward in full in future along with future gains through continued improved fleet emissions due to national real world driving emissions testing requirements for registration of new vehicles. Should either or both of the measures not be possible additional interventions will be required.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Shropshire Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of Bridgnorth AQMA. A list of interventions is expected to be produced through an AQAP review in the coming 12 months. Feasibility assessments of any potential interventions will then be necessary. Although not stipulated in any plans to date it is considered likely that providing a traffic light junction in the centre of the AQMA will require consideration and feasibility appraisal as a method of creating significant improvements in the area.

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	Hackney Carriage and Private Hire Vehicle Policy	Promoting Low Emission Transport	Taxi Licensing conditions	2019	2024	Shropshire Council	Shropshire Council	NO	Funded	< £10k	Implementation	Reduced vehicle emissions	Progressive cleaner fleet in respect of tailpipe emissions	Second year of new policy bringing in further betterments in tailpipe emissions followed by third year of policy measures starting in April 2021	Access to second hand low emission vehicles
2	Shrewsbury North West Relief Road (NWRR)	Transport Planning and Infrastructure	Other	2017	2024	Shropshire Council, DfT Large Local Majors Fund	Shropshire Council, DfT Large Local Majors Fund	NO	Funded	> £10 million	Planning	6.6µg/m3 at hotspot	A reduction in air pollution in Shrewsbury No 3 AQMA.	Planning application submitted and comments received on air quality human health impact by Regulatory Services.	Approval at planning process
3	Shropshire Council Pool Car Scheme	Alternatives to private vehicle use	Car Clubs	2019	2021	Shropshire Council and Enterprise	Shropshire Council	NO	Funded	£10k - 50k	Implementation	Reduced vehicle emissions	Increased mileage year on year in carpool vehicles	Previously had 5 pool cars and added one hybrid vehicle in 2018 with 64,521 miles carried out in the fleet in 2018. Additional vehicles added in 2019 taking the number of available cars to 13 with over half being hybrids. Increased usage of the fleet with 130,378 miles of use in 2019. Over 400 members of staff have signed up to the scheme. Reduced impact in 2020 due to Covid-19.	Ongoing funding and resource to run the scheme
4	Inclusion of electric vehicle charging points in new developments	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2018	2022	Shropshire Council	Shropshire Council	NO	Not Funded	< £10k	Implementation	Reduction in emissions, uptake of cleaner technologies	Planning conditions on planning application decisions which include provisions for electric vehicle charging points in new developments	Procedures in place and ongoing through time.	

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
5	Local Air Quality Grant project	Public Information	Via the Internet	2016	2022	Shropshire Council and DEFRA	Shropshire Council and DEFRA	YES	Funded	£100k - £500k	Implementation	Awareness raising to reduce emissions through behavioural change	Completion of Key Milestones of the project reported back to DEFRA through grant requirements in quarterly reporting. Currently behind on some Key Milestones however moving forwards and resolving this going forward. DEFRA made aware through quarterly reports.	Currently behind on some Key Milestones however moving forwards and resolving this going forward. DEFRA made aware through quarterly reports. TO date webpages have gone live to public.	Covid-19 focus removing air quality focus. Resource issues in dealing with Covid-19.
6	Car Parking Strategy	Policy Guidance and Development Control	Other policy	2018	2021	Shropshire Council	Shropshire Council	NO	Partially Funded	£10k - 50k	Implementation	Reduce vehicle emissions	Stage 1 - implementation of linear car parking scheme County wide including procurement and installation of new payment meters. Implementation of Stage 2 - to bring residential parking schemes into place.	Stage 1 complete. Stage 2 did not progress in 2019. It is being considered for 2020. Covid-19 removed resource to move this forward. Consideration of Stage 2 in 2021-22	Resource to roll out Phase 2.
7	Electric Vehicle Charging Infrastructure Delivery	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2018	2021	Shropshire Council, OLEV, BEIS	Shropshire Council, OLEV, BEIS	NO	Funded	£100k - £500k	Completed	Reduce vehicle emissions	Provision of EV charging across the county	50 EV charging points installed across 10 towns in the County	
8	Strategic Highway Network Electric Vehicle charging	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2020	2021	Shropshire Council, Highways England	Shropshire Council, Highways England	NO	Funded	£10k - 50k	Completed	Reduce vehicle emissions	Provision of two rapid EV charging points serving the A49 route at Church Stretton and Ludlow	2 new rapid charging points in commissioned.	
9	Active Transport Manager appointment and creation of LCWIPS	Promoting Travel Alternatives	Promotion of cycling	2020	2022	Shropshire Council	Shropshire Council	NO	Funded	£50k - £100k	Planning	Reduce vehicle emissions	Active Transport Manager position created for 2 years to create LCWIPS	Appointment to the post.	

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
10	LTP4 production	Transport Planning and Infrastructure	Other	2021	2022	Shropshire Council	Shropshire Council	NO	Funded	£50k - £100k	Planning	Reduce vehicle emissions	Creation of LTP4 with inclusion of air quality focus adopted by Council	Process has been commissioned and has started in earnest	
11	Shrewsbury Programme Board support	Other	Other	2020	2021	Shropshire Council	Shropshire Council	NO	Not Funded	< £10k	Completed	Reduce vehicle emissions	Air Quality report taken to Shrewsbury Programme Board who supported the proposed actions including having air quality as a theme running through place shaping plans for Shrewsbury.	Report delivered to the board and all areas of support requested granted.	
12	Shrewsbury Big Town Plan (SBTP)	Other	Other	2021	2025	Shropshire Council	Shropshire Council	NO	Not Funded	> £10 million	Planning	Reduce vehicle emissions	SBTP is a vision document for the future look and feel of Shrewsbury including movement plans. Air quality has been highlighted as a theme requiring attention by any work carried out to fulfil this vision.	SBTP document is live. Ongoing revisions and contribution to associated workstreams.	Funding for interventions and a consensus view to allow interventions to be carried forward.

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.

Shropshire Council is taking the following measures to address PM$_{2.5}$:

- Monitoring: two PM2.5 monitors were previously found in Shrewsbury. These allowed Shropshire Council to monitor the pollutant concentrations over time and consider if there is a need for further actions. Monitoring showed that PM2.5 levels are less than 10 μg/m3 as an annual mean. Three years of continuous data concluded levels of PM2.5s were under 10 μg/m3 with results in 2017 finding levels of 7.7 μg/m3. Monitors were discontinued to save resource in January 2018. DEFRA comments on previous ASRs endorsed the removal of monitors.

- No specific measures are being taken solely to address PM2.5s. Actions are being carried out to reduce air pollutants overall and reduce traffic numbers in congested areas. These measures will assist in reducing PM2.5s. For example, measures noted in Table 2.2 that look to reduce congestion will in turn reduce brake pad and tyre ware reducing PM2.5 emissions in the area. Any initiatives that look to calm traffic are likely to have a similar impact.

In considering the need for additional actions relating to PM2.5 it is noted that the Public Health Outcomes Framework (PHOF) Indicator number 3.01 - Fraction of mortality attributable to particulate air pollution for Shropshire Council was noted to be 4.1% in 2019, up from 3.8% in 2018. For more information visit:
https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/0/gid/1000043/pat/6/par/E12000005/ati/102/are/E06000051

Shropshire Council's fraction of mortality attributable to particulate air pollution is the lowest in the West Midlands Region which has an average of 5.3%. The West Midlands region is slightly above the national average of 5.1%.

As the Shropshire Council PHOF indicator concerned with PM2.5 shows that mortality due to PM2.5 is significantly below the national and regional average it is not considered necessary for any specific actions to be carried out while there are other interventions taking place which will contribute to reducing anthropogenic PM2.5. These measures include traffic calming and actions to reduce congestion and improve the emissions of vehicles being used on the road network such as through use of Euro VI carpool vehicles instead of staff owned vehicle and improvement of vehicle emissions from the taxi fleet.

In addition to the measures above a review of relevant information has been carried out. The DEFRA background maps for PM2.5s predict at worst levels of 8.6 µg/m3 centred around grid square 374500, 292500 which is located just to the east of Bridgnorth. In addition an exert from the Public Health Profiles webpages published by PHE (available at https://fingertips.phe.org.uk/search/air%20pollution#page/0/gid/1/pat/6/par/E12000005/ati/102/iid/30101/age/230/sex/4/cid/4/tbm/1) suggests that Shropshire Council's area has an average of 7.3 µg/m3 of PM2.5. These data sources show the likelihood that PM2.5s are found at levels that meet the World Health Organisation target of below 10 µg/m3. No specific measures are required however as previously explained measures being carried out to reduce NO2 in areas of concern and reduce emissions in general will help in reducing PM2.5s over time.

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

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Shropshire Council undertook no automatic (continuous) monitoring at during 2020. Table A.1 in Appendix A shows the details of the automatic monitoring sites. For detail of past monitoring locations please see previous annual reports available at:

https://www.shropshire.gov.uk/environmental-health/environmental-protection-and-prevention/air-quality/shropshire-council-air-quality-reports/

3.1.2 Non-Automatic Monitoring Sites

Shropshire Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 69 sites during 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 33%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO$_2$)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO$_2$ annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

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

Table A.5 in Appendix A compares the ratified continuous monitored NO$_2$ hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

No exceedances of the National Objective Level of 40 µg/m^3 was found in 2020. However, 2021 was not a normal year. National and local lockdowns significantly reduced road vehicle numbers for several months. Despite this the national objective level was achieved by less than 1 unit in both AQMAs. As the annual objective level was not exceeded this suggests the 1-hour objective was not exceeded. No changes are proposed to the AQMA areas given the results obtained. It is likely that 2021 results may be slightly impacted by national lockdown measures however this will wait to be confirmed in next year's report.

A reduction in pollutants was found across all sites. As this year does not represent a typical year limited trend graphs are considered necessary. However, a selection of trend graphs can be found in Figure A.1. The locations chosen to represent graphically are the same locations chosen in last year's ASR to show consistency between reports. Line graphs have been chosen in this year's report. In next years report bar chart style graphs will be used. This year due to resource pressures changing graph format was not considered reasonable.

3.2.2 Particulate Matter (PM$_{10}$)

Shropshire Council do not monitor for PM$_{10}$.

3.2.3 Particulate Matter (PM$_{2.5}$)

Shropshire Council do not monitor for PM$_{2.5}$.

3.2.4 Sulphur Dioxide (SO$_2$)

Shropshire Council do not monitor for SO$_2$

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Shropshire Council does not undertake continuous monitoring with DEFRA approved equipment.

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)
DF13	Pound Street	Roadside	371345	293081	NO2	YES	0.1	0.8	No	2
DF20	Bryan & Knott Bridgnorth	Roadside	371580	293257	NO2	NO		3.75	No	2
DF27	Smithfield	Roadside	371397	293179	NO2	NO	0.1	3.3	No	2
DF29	Adj Rutters	Roadside	371297	293108	NO2	NO	1	3.3	No	2
DF58	8 Underhill Street	Roadside	371795	292947	NO2	NO	0	1.85	No	2
DF59	2A Underhill Street	Roadside	371799	293011	NO2	NO	0	1.6	No	2
DF62	2 Mill Street	Roadside	372031	292993	NO2	NO	0	1	No	2
DF65	49 Mill Street	Roadside	372026	293058	NO2	NO	0	2.1	No	2
DF71	6 Pound Street, (On Pelican Crossing)	Roadside	371346	293086	NO2	YES	0.3	1.1	No	2
DF72	Mini Roundabout Listley Street (lamp column)	Roadside	371375	293066	NO2	YES	4.4	1.6	No	2
DF73	18 Pound Street (Downspout)	Roadside	371354	293089	NO2	YES	0.1	1.2	No	2
DF74	Lamp Column 9 (Steps of new build)	Roadside	371340	293125	NO2	YES	1.9	2	No	2
DF75	Lamp Column 48 (New Build)	Roadside	371345	293106	NO2	YES	1.1	3	No	2
DF76	Higgs/Stanton Ralph (Opp 45 Whitburn Street)	Roadside	371366	293146	NO2	YES	0.1	1.5	No	2
DF77	39/40 Whitburn Street Lamp Column	Roadside	371375	293161	NO2	YES	0.5	2.2	No	2

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DF78	Pedestrian Crossing outside 42 Whitburn Street	Roadside	371360	293152	NO2	YES	0.2	1.65	No	2
DF79	Chill Salon Downspout between green and black door	Roadside	371346	293143	NO2	YES	0.1	1.5	No	2
DF80	48 Whitburn Street Downspout	Roadside	371334	293139	NO2	YES	0.1	1.75	No	2
DF81	Stretton House 3 Salop Street Downspout	Roadside	371288	293119	NO2	YES	0.1	1.2	No	2
DF82	Pedestrian Crossing outside 8 Salop Street	Roadside	371264	293120	NO2	YES	2.5	0.7	No	2
DF216	Wem High street	Roadside	351415	328965	NO2	NO	0.1	2.5	No	2
DF217	Wem Mill Street (No. 10)	Roadside	351235	328802	NO2	NO	0.3	1.6	No	2
DF220	Wem High Street (No. 70)	Roadside	351150	328891	NO2	NO	0.1	1.5	No	2
DF223	Tern Hill Barn	Roadside	363640	332232	NO2	NO	2.15	1.25	No	2
DF305	74 Castle Street	Roadside	328978	329879	NO2	NO	0.1	1.9	No	2
DF306	A483 (1)	Roadside	328922	325981	NO2	NO	0	1.4	No	2
DF314	Downspout on 10 Upper Church Street (Bookbinders)	Roadside	328866	329269	NO2	NO	0.1	1.3	No	2
DF400	A49 Bayston Hill opp 3 Fishes	Roadside	348726	308959	NO2	NO	0	1.4	No	2

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DF403	Smithfield Road Corner of Victoria Avenue	Roadside	348891	312721	NO2	YES	0	2.4	No	2
DF404	Town Walls, opp Murivance	Roadside	348889	312326	NO2	YES	0.4	1.8	No	2
DF407	Dogpole (Car Entrance)	Roadside	349330	312503	NO2	YES	0.2	2.1	No	2
DF413	Ravens Meadow, outside 23 Meadow Terrace	Roadside	349283	312851	NO2	YES	1.7	0.7	No	2
DF417	Meole Brace, between Baileys Island & Retail Park	Roadside	348929	310108	NO2	NO	18.8	1.5	No	2
DF420	Outside 25 Castle Street	Roadside	349396	312742	NO2	YES	1	3	No	2
DF428A	Brittania Inn (Post office lampost)	Roadside	349445	313090	NO2	YES	0.5	2	No	2
DF429	6A Severn Steps adj Lamp Post	Roadside	349237	312900	NO2	YES	0.1	1.5	No	2
DF436 , DF437	The Albert (duplicate)	Roadside	349283	312889	NO2	YES	0	2.8	No	2
DF438	Station Hotel 4 Castle Foregate (façade)	Roadside	349400	312954	NO2	YES	0.1	1.2	No	2
DF448	2 Vaughan's Cottages (downpipe)	Roadside	345769	313223	NO2	NO	0.1	2.8	No	2
DF449	Dalton Drive (Lamp Post)	Roadside	346796	313509	NO2	NO	5.5	0.2	No	2

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DF457A	Traffic light junction Ellesmere Rd/Berwick Rd/ Coton Hill	Roadside	349235	313441	NO2	NO	1.2	0.9	No	2
DF458	Under Railway Bridge Over Castle Foregate	Roadside	349426	313028	NO2	YES	NA	2	No	2
DF459	Post in car park outside railwat station	Roadside	349424	312936	NO2	YES	NA	18	No	2
DF460	On Bellstone opposite the Junction with Claremont St	Roadside	348952	312495	NO2	YES	0.1	3	No	2
DF461	Junction of Dogpole with High St/Wyle Cop	Roadside	349327	312389	NO2	YES	2	2	No	2
DF462	Welshpool Road	Roadside	345203	313427	NO2	NO	NA	1.7	No	2
DF468	Downpipe on Front of Number 3 Witchurch Road	Roadside	350376	314599	NO2	NO	0	7.3	No	2
DF474	Lamp Column, 2 Whiterock Cottages	Roadside	348647	308771	NO2	NO	0.9	1.7	No	2
DF475	Electricity Column outside Windyridge	Roadside	348646	308685	NO2	NO	4.9	1.7	No	2
DF476	Chester Street on street parking bay	Roadside	349360	312962	NO2	YES	0.3	1.4	No	2

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
	height sensor post									
DF477	Bus opp Community Church, Chester St	Roadside	349299	313108	NO2	YES	1	2.1	No	2
DF480	lamp post by takeaway near Britaninia Inn	Roadside	349466	313151	NO2	YES	0.5	2.6	No	2
DF482	Royal Mail Lamp column by Traffic Lights	Roadside	349436	313064	NO2	YES	NA	1	No	2
DF485	Frankwell Terrace	Roadside	348815	312854	NO2	YES	1.4	2.6	No	2
DF487	English Bridge by St Julian Friars (No Entry Sign)	Roadside	349529	312328	NO2	YES	7.7	3	No	2
DF501	Corner of 25 Chester Street/Cross Street	Roadside	349349	313071	NO2	YES	1.8	1.6	No	2
DF502	Post outside Cambrian House	Roadside	349364	312998	NO2	YES	0.5	2.5	No	2
DF600, DF601	Paulbrook drive duplicate	Roadside	371127	293057	NO2	NO	5.5	1.5	No	2
DF28, DF602	50 Whitburn Street duplicate	Roadside	371321	293131	NO2	YES	0.2	1.7	No	2
DF603, DF604	Shrewsbury Cathedral Town Walls duplicate	Roadside	349171	312216	NO2	YES	NA	1.4	No	2
DF605	Quarry Place	Roadside	349023	312211	NO2	YES	1	0.7	No	2

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DF606, DF607	Railway station car park opp DF438 duplicate	Roadside	349411	312944	NO2	YES	NA	2.4	No	2
DF608, DF609	Post in front of Olive Tree, Frankwel duplicate	Roadside	348676	312955	NO2	YES	3.5	0.6	No	2

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)

Shropshire Council do not undertake continuous monitoring of NO₂

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 2020 (%) [2]	2016	2017	2018	2019	2020
DF13	371345	293081	Roadside	83	84.6	**41.5**	**44.0**	**40.5**	35.6	30.3
DF20	371580	293257	Roadside	83	84.6	22.9	31.8	22.7	20.8	15.0
DF27	371397	293179	Roadside	83	84.6	27.8	28.2	26.0	25.8	19.7
DF29	371297	293108	Roadside	83	84.6	29.7	29.4	28.9	28.5	21.6
DF58	371795	292947	Roadside	83	84.6	35.8	31.7	33.1	28.5	26.2
DF59	371799	293011	Roadside	83	84.6	33.0	34.2	29.6	28.5	23.4
DF62	372031	292993	Roadside	83	84.6	39.1	29.7	**40.2**		25.2
DF65	372026	293058	Roadside	83	84.6	34.7	34.2	33.4		24.6
DF71	371346	293086	Roadside	83	84.6		**58.5**	**50.9**	**49.1**	**40.8**
DF72	371375	293066	Roadside	83	84.6			30.0	28.2	22.4
DF73	371354	293089	Roadside	83	84.6			34.1	34.2	26.5

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
DF74	371340	293125	Roadside	83	84.6			30.9	29.4	22.7
DF75	371345	293106	Roadside	83	84.6			30.9	27.6	22.4
DF76	371366	293146	Roadside	83	84.6			33.8	31.8	28.4
DF77	371375	293161	Roadside	83	84.6			**40.3**	38.7	30.4
DF78	371360	293152	Roadside	83	84.6			39.9	38.5	32.2
DF79	371346	293143	Roadside	83	84.6			**48.8**	**42.3**	35.3
DF80	371334	293139	Roadside	83	84.6			**50.3**	**43.6**	37.2
DF81	371288	293119	Roadside	83	84.6			28.8	26.7	20.1
DF82	371264	293120	Roadside	83	84.6			27.4	22.7	17.0
DF216	351415	328965	Roadside	83	84.6	28.5	27.7	28.0	24.4	18.7
DF217	351235	328802	Roadside	83	84.6	34.4	22.4	24.8	22.3	17.6
DF220	351150	328891	Roadside	83	84.6	26.2	24.9	23.9	23.3	19.6
DF223	363640	332232	Roadside	75	75.0	**42.5**	**50.4**	**53.6**	**42.8**	**43.1**
DF305	328978	329879	Roadside	83	84.6	27.8	28.3	29.0	27.2	19.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
DF306	328922	325981	Roadside	75	75.0	34.2	31.3	28.7	27.2	20.4
DF314	328866	329269	Roadside	83	84.6			38.1	33.9	27.2
DF400	348726	308959	Roadside	83	84.6	32.0	34.0	33.2	29.3	22.5
DF403	348891	312721	Roadside	75	76.9	31.0	29.3	30.5	30.8	23.0
DF404	348889	312326	Roadside	83	84.6	18.1	15.8	16.9	18.2	12.0
DF407	349330	312503	Roadside	83	84.6	27.4	24.8	24.1	23.4	18.1
DF413	349283	312851	Roadside	83	84.6	31.7	28.6	29.5	26.3	21.2
DF417	348929	310108	Roadside	83	84.6	31.1	24.7	27.8	26.4	20.9
DF420	349396	312742	Roadside	75	75.0	29.2	28.0	27.8	26.3	21.2
DF428A	349445	313090	Roadside	83	84.6			38.3	36.1	29.4
DF429	349237	312900	Roadside	83	84.6	27.5	28.2		28.8	21.8
DF436 , DF437	349283	312889	Roadside	83	84.6	37.0	35.1	36.2	32.3	25.7
DF438	349400	312954	Roadside	83	84.6	**58.5**	**54.0**	**58.8**	**53.0**	**40.2**
DF448	345769	313223	Roadside	83	84.6	10.3	9.0	9.6	9.1	7.2

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
DF449	346796	313509	Roadside	83	84.6	20.7	20.4	20.1	17.2	13.5
DF457A	349235	313441	Roadside	75	76.9					25.7
DF458	349426	313028	Roadside	83	84.6	**53.9**	**53.6**	**55.0**	**48.6**	38.5
DF459	349424	312936	Roadside	83	84.6	37.4	38.6	**42.1**	35.6	26.6
DF460	348952	312495	Roadside	58	57.7	26.4	30.5	25.7	24.2	18.5
DF461	349327	312389	Roadside	75	76.9	31.7	30.5	30.9	26.2	18.7
DF462	345203	313427	Roadside	67	69.2	21.5	20.5	19.3	18.7	13.6
DF468	350376	314599	Roadside	83	84.6	23.0	20.6	21.8	20.9	27.5
DF474	348647	308771	Roadside	83	84.6	**41.5**	**46.3**	**46.4**	**42.1**	36.3
DF475	348646	308685	Roadside	83	84.6	39.9	**43.8**	**53.0**	**42.1**	36.9
DF476	349360	312962	Roadside	75	76.9	30.6	31.2	33.1	29.1	22.5
DF477	349299	313108	Roadside	83	84.6	31.2	33.5	31.3	29.8	23.1
DF480	349466	313151	Roadside	83	84.6	34.2	32.7	31.8	31.6	24.8
DF482	349436	313064	Roadside	83	84.6		31.6	**45.7**	38.2	32.3

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
DF485	348815	312854	Roadside	83	84.6		28.4	30.9	26.1	20.3
DF487	349529	312328	Roadside	75	76.9			22.7	21.9	17.5
DF501	349349	313071	Roadside	58	76.9			38.2	33.5	24.6
DF502	349364	312998	Roadside	83	84.6			31.2	26.3	18.4
DF600, DF601	371127	293057	Roadside	83	84.6					7.2
DF28 , DF602	371321	293131	Roadside	83	84.6	**52.9**	**40.3**	**48.2**	**43.4**	35.4
DF603, DF604	349171	312216	Roadside	75	76.9					12.8
DF605	349023	312211	Roadside	83	84.6					8.2
DF606, DF607	349411	312944	Roadside	83	84.6					28.7
DF608, DF609	348676	312955	Roadside	67	67.3					22.1

☒ **Annualisation has been conducted where data capture is <75% and >33% 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 $\mu g/m^3$.

Exceedances of the NO_2 annual mean objective of $40\mu g/m^3$ are shown in **bold**.

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

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%).
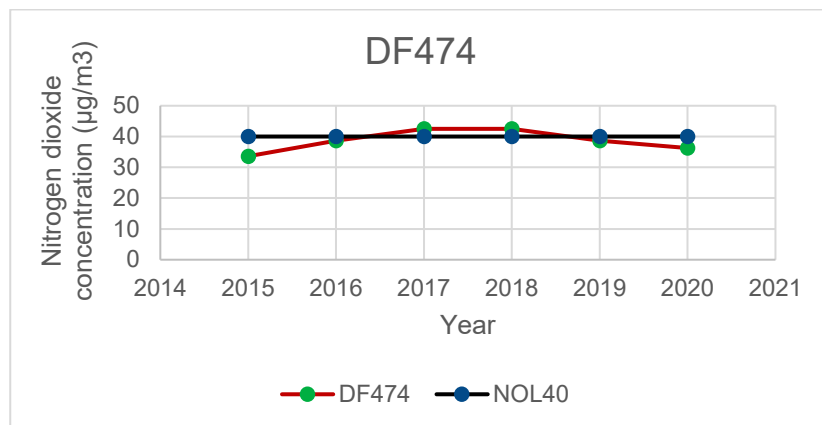
Figure A.1 – Trends in Annual Mean NO₂ Concentrations
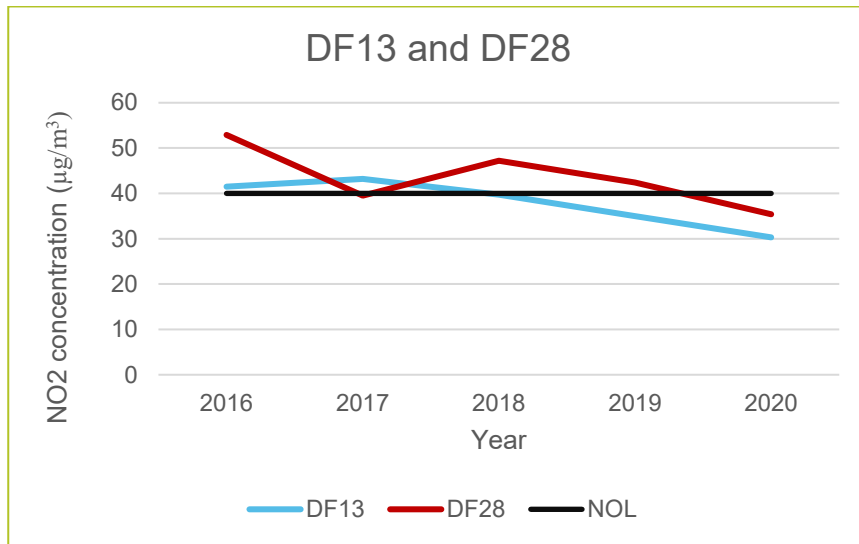
Trends of representative monitoring locations in the Bridgnorth AQMA
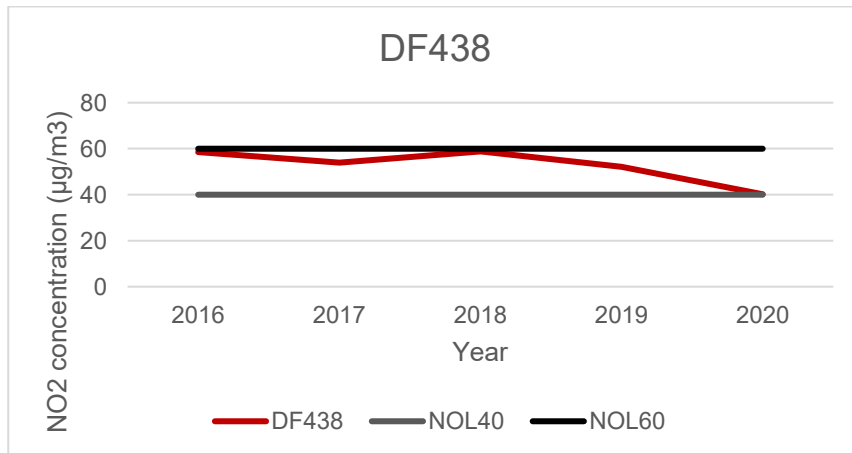
Trends of the hotspot pollution monitoring location situated in the Shrewsbury No 3 AQMA

Trends of a monitoring location in the revoked Shrewsbury No 1 AQMA

NB Next year's reports will contain additional trend graphs. The report has taken additional time to prepare this year due to additional diffusion tube work in the form of the data handling tool and inclusion of Covid-19 impacts.

Table A.5 – 1-Hour Mean NO$_2$ Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Shropshire do not undertake 1-hour monitoring of NO$_2$

Table A.6 – Annual Mean PM$_{10}$ Monitoring Results (µg/m^3)

Shropshire do not undertake PM$_{10}$ monitoring

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

Shropshire do not undertake PM10 monitoring

Table A.8 – Annual Mean PM₂.₅ Monitoring Results (µg/m³)

Shropshire do not undertake PM2.5 monitoring

Table A.9 – SO$_2$ 2020 Monitoring Results, Number of Relevant Instances

Shropshire do not undertake SO2 monitoring

Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO₂ 2020 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 (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DF13	371345	293081	45.7	36.0			30.7	35.9	33.5	34.3	39.2	40.2	38.3	39.9	37.4	30.3		
DF20	371580	293257	22.5	19.3			10.3	21.4	12.1	16.3	17.4	18.8	22.6	24.7	18.5	15.0		
DF27	371397	293179	35.2	25.4			15.2	15.3	15.8	21.9	25.4	25.3	31.0	32.6	24.3	19.7		
DF29	371297	293108	35.0	23.9			24.5	24.6	21.0	25.0	23.2	26.7	29.3	33.1	26.6	21.6		
DF58	371795	292947	35.9	33.1			24.8	30.4	27.2	32.3	32.3	35.6	34.1	37.5	32.3	26.2		
DF59	371799	293011	44.3	27.7			17.9	26.2	22.0	25.0	29.1	31.8	30.1	34.6	28.9	23.4		
DF62	372031	292993	36.7	26.0			26.8	29.7	25.7	29.5	34.9	30.3	32.7	38.6	31.1	25.2		
DF65	372026	293058	28.2	22.2			29.6	28.8	29.5	32.4	33.1	34.8	30.8	34.7	30.4	24.6		
DF71	371346	293086	65.3	51.7			40.6	52.5	45.9	49.9	54.0	54.2	52.5	37.5	**50.4**	**40.8**	39.1	
DF72	371375	293066	32.1	23.5			22.4	24.5	20.3	27.4	32.8	30.1	29.2	34.3	27.7	22.4		
DF73	371354	293089	40.8	29.0			28.9	30.5	25.3	32.1	36.2	35.0	32.0	37.0	32.7	26.5		
DF74	371340	293125	35.7	25.8			22.5	27.0	21.4	29.3	29.7	28.7	27.8	32.7	28.0	22.7		
DF75	371345	293106	35.7	26.1			23.8	24.6	21.2	28.6	31.5	29.2	25.9	30.2	27.7	22.4		
DF76	371366	293146	46.2	34.6			27.5	32.6	26.8	31.5	36.2	37.8	39.7	37.5	35.0	28.4		
DF77	371375	293161	55.2	37.5			28.7	29.7	32.4	31.8	39.6	40.3	37.6	42.6	37.5	30.4		
DF78	371360	293152	51.4	39.3			34.4	33.9	35.0	36.6	42.3	44.5	37.4	42.5	39.7	32.2		
DF79	371346	293143	53.9	42.9			37.6	38.4	36.8	42.7	47.8	46.8	43.5	45.9	**43.6**	35.3		
DF80	371334	293139	60.2	44.9			41.9	39.9	36.2	43.3	50.7	51.4	41.9	48.5	**45.9**	37.2	36.8	
DF81	371288	293119	29.2	19.7			24.3	20.9	20.1	25.6	30.3	25.5	23.6	28.6	24.8	20.1		
DF82	371264	293120	20.3	17.0			19.5	18.0	16.5	22.6	24.7	23.5	21.8	26.5	21.0	17.0		
DF216	351415	328965	25.7	0.6			21.5	22.0	20.7	28.2	30.4	25.1	28.6	27.5	23.0	18.7		
DF217	351235	328802	32.3	20.8			13.4	15.6	13.4	21.9	26.6	22.0	26.4	25.0	21.7	17.6		
DF220	351150	328891	32.4	24.5			18.7	22.2	17.8	24.9	23.0	23.5	26.1	29.5	24.3	19.6		
DF223	363640	332232	49.8	42.5				53.5	46.7	65.3	50.6	47.3	74.2	49.4	**53.3**	**43.1**	35.2	
DF305	328978	329879	34.7	24.0			14.0	17.9	19.1	31.9	27.0	25.7	32.8	18.1	24.5	19.9		
DF306	328922	325981	31.2	26.3			15.7	21.2	21.3	28.5	29.0		26.2	26.9	25.1	20.4		
DF314	328866	329269	48.3	35.3			18.0	24.2	27.5	31.9	35.9	34.6	37.9	41.5	33.5	27.2		
DF400	348726	308959	36.2	25.9			16.5	23.2	22.5	30.9	34.8	27.0	30.5	30.4	27.8	22.5		
DF403	348891	312721	37.1				17.1	24.1	25.9	28.1	30.3	29.1	32.8	31.4	28.5	23.0		
DF404	348889	312326	18.1	13.2			8.6	12.9	10.6	14.7	17.2	17.2	17.0	19.2	14.9	12.0		
DF407	349330	312503	30.2	20.2			17.0	17.1	15.6	22.3	23.6	22.7	28.1	26.4	22.3	18.1		

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 (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DF413	349283	312851	33.2	26.9			15.9	22.3	20.1	28.2	27.8	27.0	30.1	30.3	26.2	21.2		
DF417	348929	310108	29.3	19.8			16.6	23.4	16.1	31.9	32.0	24.7	31.7	32.3	25.8	20.9		
DF420	349396	312742	30.8	25.5			19.8	22.0	18.5		24.0	29.8	32.1	32.6	26.1	21.2		
DF428A	349445	313090	38.7	36.7			28.8	33.4	26.2	37.8	33.4	37.8	43.9	46.9	36.3	29.4		
DF429	349237	312900	34.3	28.2			16.7	22.6	19.9	25.9	27.3	28.6	32.2	33.9	27.0	21.8		
DF436, DF437	349283	312889	36.6	30.7			20.5	25.1	25.6	34.1	32.3	30.9	38.1	35.2	31.7	25.7		
DF438	349400	312954	57.7	44.7			42.2	43.7	44.9	54.1	53.0	51.1	50.1	55.1	**49.7**	**40.2**	39.7	
DF448	345769	313223	12.9	8.5			4.4	5.5	5.2	8.0	7.8	8.9	14.5	12.6	8.8	7.2		
DF449	346796	313509	20.8	13.7			10.3	12.6	10.1	18.7	20.6	16.7	21.8	21.4	16.7	13.5		
DF457A	349235	313441	37.3				21.0	26.4	25.2	33.4	33.7	33.5	36.7	38.0	31.7	25.7		
DF458	349426	313028	52.8	45.7			43.6	45.7	44.5	49.7	49.6	41.3	50.3	52.3	**47.5**	38.5		
DF459	349424	312936	45.6	38.8			24.0	26.4	25.3	33.4	34.0	34.5	27.1	39.4	32.9	26.6		
DF460	348952	312495	31.7	22.3			14.2	15.5	12.3	17.8	22.8				19.5	18.5		
DF461	349327	312389	30.4	23.5			20.5	16.4		20.1	20.9	19.8	28.4	27.6	23.1	18.7		
DF462	345203	313427					10.1	12.1	14.6	17.2	18.4	15.0	22.8	21.3	16.4	13.6		
DF468	350376	314599	26.2	17.7			13.9	19.9	132.4	24.2	28.6	21.4	27.4	27.7	33.9	27.5		
DF474	348647	308771	56.2	48.8			27.0	36.3	40.0	52.5	50.0	40.4	48.3	48.0	**44.8**	36.3	33.3	
DF475	348646	308685	45.6	45.5			32.1	39.9	41.6	52.5	56.6	41.9	44.4	55.5	**45.6**	36.9	27.3	
DF476	349360	312962	35.9				19.9	24.6	23.8	29.7	27.2	28.3	31.7	29.1	27.8	22.5		
DF477	349299	313108	38.7	24.2			15.4	21.4	23.5	29.7	30.1	32.9	34.0	35.2	28.5	23.1		
DF480	349466	313151	36.2	29.3			24.3	27.7	21.2	30.0	27.9	32.4	38.7	38.5	30.6	24.8		
DF482	349436	313064	43.2	44.5			28.7	34.7	32.3	39.7	35.8	43.2	48.5	48.3	39.9	32.3		
DF485	348815	312854	29.8	22.1			19.0	20.3	18.7	28.7	28.4	24.9	27.0	31.5	25.0	20.3		
DF487	349529	312328	25.6				14.5	24.0	14.0	22.1	23.9	21.9	23.3	25.2	21.6	17.5		

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 (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DF501	349349	313071	34.4	27.5			17.3	15.6		35.4	33.5	36.2	38.2	35.0	30.3	24.6		
DF502	349364	312998	25.6	19.6			17.8	22.4	15.6	28.9	24.0	24.1	25.8	23.7	22.8	18.4		
DF600, DF601	371127	293057	11.6	7.4			6.2	6.5	4.9	7.1	8.4	9.6	12.3	15.4	8.8	7.2		
DF28, DF602	371321	293131	55.5	42.2			36.6	41.9	30.3	39.2	44.1	46.4	44.8	48.2	**43.7**	35.4		
DF603, DF604	349171	312216	21.4				8.8	11.7	13.6	16.1	16.9	16.2	16.9	21.0	15.8	12.8		
DF605	349023	312211	12.9	9.3			6.8	7.9	5.6	9.8	10.9	10.3	12.7	14.6	10.1	8.2		
DF606, DF607	349411	312944	44.0	39.2			28.4	30.6	25.9	38.4	36.8	33.0	36.7	39.3	35.5	28.7		
DF608, DF609	348676	312955	40.5				17.5	21.6	20.6	29.8	28.7		31.6	32.6	27.5	22.1		

☒ **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 >33% 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**

☒ **Shropshire Council confirm that all 2020 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 Shropshire Council During 2020

Shropshire Council has not identified any new sources relating to air quality within the reporting year of 2020. Some additional locations within Shrewsbury No 3 AQMA were highlighted as potentially exceeding national objective levels during a modelling exercise to consider the impact of a Shrewsbury North West Relief Road. As such monitoring has been installed in order to capture information in these areas for future years reporting. The areas are within the existing AQMA or within a couple of meters of the existing AQMA. As such this may require some extension to the AQMA in future should monitoring confirm modelled predictions.

Additional Air Quality Works Undertaken by Shropshire Council During 2020

Shropshire Council has not completed any additional works within the reporting year of 2020.

QA/QC of Diffusion Tube Monitoring

The supplier used for NO2 diffusion tubes in 2020 was Gradko International Ltd. Tubes were prepared using the 20% TEA in water method. The diffusion tube monitoring was carried out in line with the DEFRA 2020 Diffusion Tube Monitoring Calendar.

Gradko carry out analysis using Ultraviolet/visible spectroscopy under a UKAS accredited method. AIR-PT results for 2020 showed 75% of results were satisfactory in Round 36 and 40 which were the only rounds carried out in 2020 due to rounds 37 and 39 being cancelled due to pandemic. Previous Rounds 31, 33 and 34 found 100% satisfactory results. The average over this 5 round period is 90% which is not considered substantially below 95% stated as the figure in the AIR-PT document as the standard to be aimed for .Link to AIR-PT results:

https://laqm.defra.gov.uk/documents/LAQM%20NO2%20Performance%20data_Up%20to%20March%202021_v2.pdf

The Gradko 20% TEA in water precision results for 2020 found that there was good precision on 27 out of 27 tested occasions, 100% of occasions. This is a very high proportion of good results. Given this the diffusion tubes are considered to be reasonably precise. For confirmation visit:

https://laqm.defra.gov.uk/documents/Tube_Precision_2020_version_06_21%20Final%20REDUCED%20FINAL.pdf

As a result, it is considered that the QA/QC element for these monitors is satisfied.

Diffusion Tube Annualisation

Four diffusion tube locations captured less than 75% data but more than 33% data over the 2020 period. These diffusion tubes were DF460, DF462, DF608 and DF609.

Annualisation was undertaken using AURN monitor information from monitors within reasonable distance from Shropshire Council as no monitors exist within the County. For this reason, the Telford and Walsall AURN monitors were used. They were chosen due to proximity and a knowledge of their setting. Annualisation was carried out within the Diffusion Tube Data Processing Tool in line with guidance.

Annualisation was necessary in all instances due to a two month period in March and April where data was not available.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2020 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/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Shropshire Council have applied a national bias adjustment factor of 0.81 to the 2020 monitoring data. A summary of bias adjustment factors used by Shropshire Council over

the past five years is presented in The bias adjustment factor used was that found in the National Diffusion Tube Bias Adjustment Factor Spreadsheet v06/21. This provided a bias adjustment factor of 0.81. It was at this time, before any further updates to the bias adjustment factor had been made through subsequent revisions, that all work on diffusion tube results was carried out. It should be noted to the reader that further adjustment factors may become available in future versions of the Adjustment Factor Spreadsheet however the information used for the report was the latest information at the time of submission.

Table C.1.

The bias adjustment factor used was that found in the National Diffusion Tube Bias Adjustment Factor Spreadsheet v06/21. This provided a bias adjustment factor of 0.81. It was at this time, before any further updates to the bias adjustment factor had been made through subsequent revisions, that all work on diffusion tube results was carried out. It should be noted to the reader that further adjustment factors may become available in future versions of the Adjustment Factor Spreadsheet however the information used for the report was the latest information at the time of submission.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	06/21	0.81
2019	National	03/20	0.93
2018	National	06/19	0.92
2017	National	03/18	0.89
2016	National	06/17	0.92

NO_2 Fall-off with Distance from the Road

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

Severn monitoring locations were noted in the Diffusion Tube Data Processing Tool as necessary for fall-off-with-distance calculation. Details are provided below:

DF71 and DF80 – these locations are within the Bridgnorth AQMA and are found on street furniture close to receptors where location on receptors is not possible.

DF223 is located on the only piece of street furniture available to place a monitor. No locations on the receptor façade are available. This year results show after fall-off with-distance calculations the result was more than 10% below the national objective level and no further attention is required at this stage.

DF438 is within the Shrewsbury No 3 AQMA. It is the current hotspot for localised pollution in the area. The diffusion tube is located on a down spout that stands proud of the receptor façade hence the need for calculations.

DF458 is situated underneath the railway bridges at Shrewsbury train station. There is no relevant receptor for the annual mean objective. The monitoring location is there to consider short term exposure which needs no further consideration given the results obtained.

DF474 and DF475 are located in Bayston Hill to the south of Shrewsbury on the A49. There used to be an AQMA in this area hence the continued monitoring. DF475 is located on street furniture with the receptor located high up behind a wall and dense conifer hedge. The receptor is set back from the road by several meters and there is a need to apply suitable fall-off-with-distance calculation. DF474 is located on a lamp column close to properties that are again set back from the road but where past monitoring results have been high. Currently no exceedance of the objective and no further action required at this point in time.

QA/QC of Automatic Monitoring

No automatic monitoring sites were used in 2020

Table C.2 – Annualisation Summary (concentrations presented in μg/m³)

Site ID	Annualisation Factor Telford AURN	Annualisation Factor Walsall AURN	Annualisation Factor (NA)	Annualisation Factor (NA)	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
DF460	1.1992	1.1373			1.1683	19.5	22.8	*Only two locations were used to annualise against. Reason: the sites were closest in areas which given local knowledge could be considered reasonably representative. This was not the case with other AURN monitoring locations. This applies to all of the diffusion tube locations below.*
DF462	1.0194	1.0301			1.0247	16.4	16.8	
DF608	0.9869	0.9988			0.9928	-	-	*Duplicate Site with DF608 and DF609 - Annual data provided for DF609 only*
DF609	0.9869	0.9988			0.9928	27.5	27.3	*Duplicate Site with DF608 and DF609 - Annual data provided for DF609 only*

Table C.3 – Local Bias Adjustment Calculation

A national bias adjustment factor has been used. As such there is no information to submit in this paragraph.

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

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
DF71	1.1	1.4	40.8	6.5	*39.1*	*Predicted concentration at Receptor within 10% the AQS objective. Monitoring location is within an existing AQMA (Bridgnorth AQMA)*
DF80	1.8	1.9	37.2	6.5	*36.8*	*Predicted concentration at Receptor within 10% the AQS objective. Monitoring location is within an existing AQMA (Bridgnorth AQMA)*
DF223	1.3	3.4	43.1	5.4	35.2	*Located on street sign post available for monitoring purposes. Receptor has no means of fixing a monitoring location. Result suggests receptor façade at least 10% below objective level and no further action required at this stage.*
DF438	1.2	1.3	40.2	9.5	*39.7*	*Predicted concentration at Receptor within 10% the AQS objective. This is the known hotspot in the existing Shrewsbury No 3 AQMA.*
DF458	2.0		38.5	9.5	-	*No receptor present on this side of the road within 50m making distance calculation unnecessary as distances would fall outside of the tool's working parameters.*

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
DF474	1.7	2.6	36.3	5.5	33.3	*Suggests receptor façade at least 10% below objective level and no further action required at this stage.*
DF475	1.7	6.6	36.9	5.5	27.3	*Suggests receptor façade at least 10% below objective level and no further action required at this stage.*

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

Figure D.1 – Maps of AQMAs and Non-Automatic Monitoring Site

Map of Shrewsbury AQMA No 3 (nitrogen dioxide).

Map of Bridgnorth Pound Street AQMA
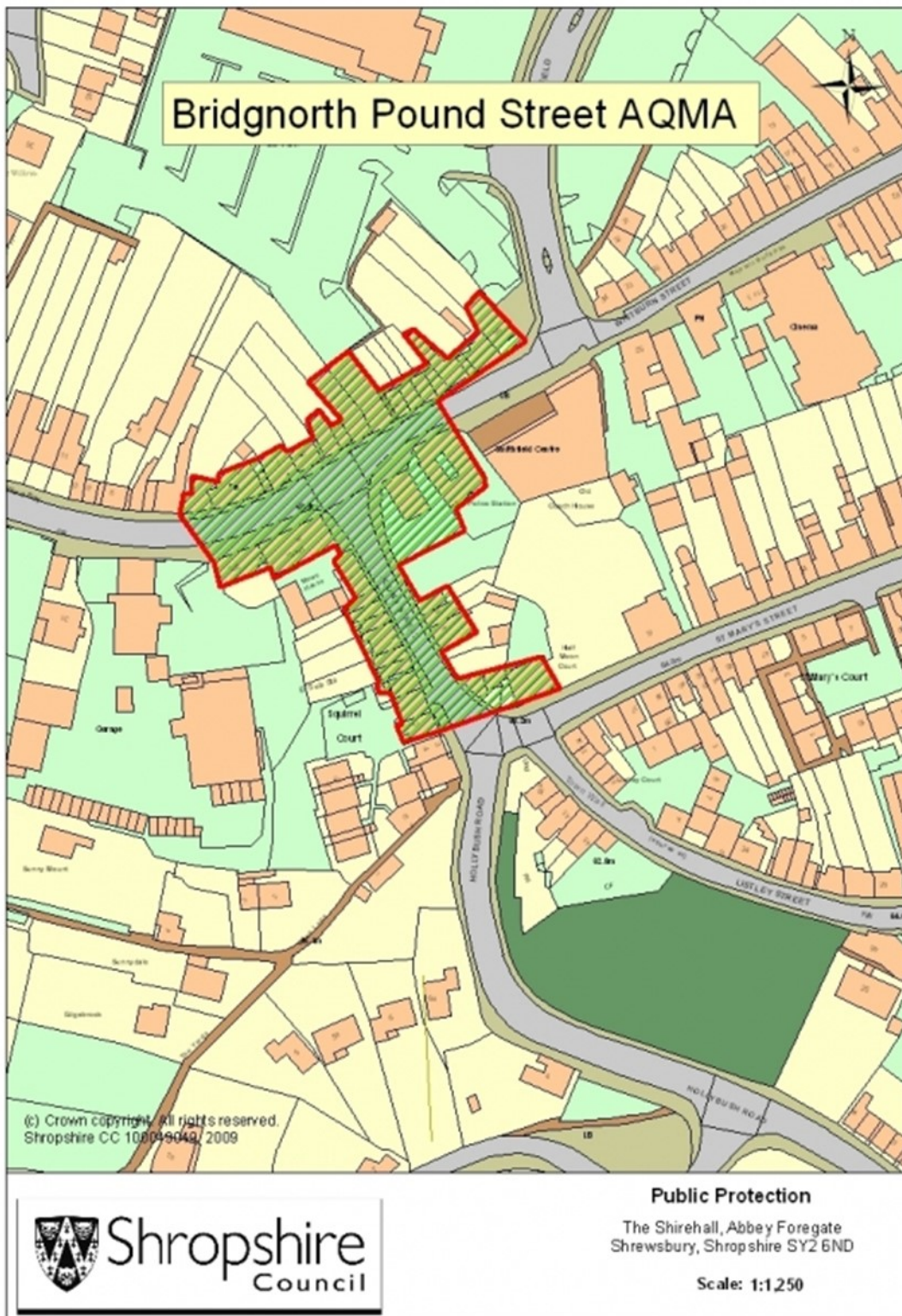
Diffusion tube location maps.
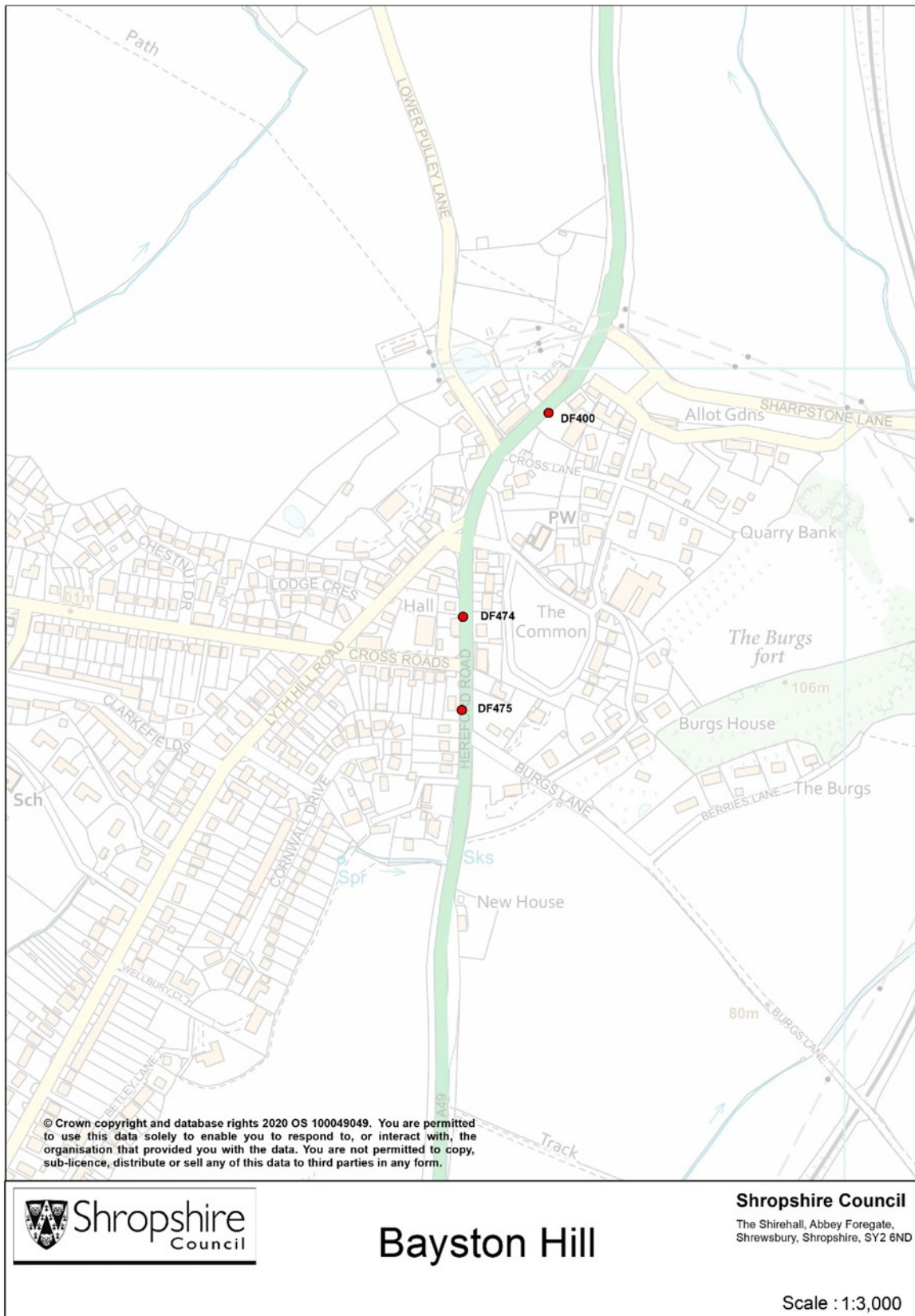
Bayston Hill

Shropshire Council
The Shirehall, Abbey Foregate,
Shrewsbury, Shropshire, SY2 6ND

Scale : 1:3,000
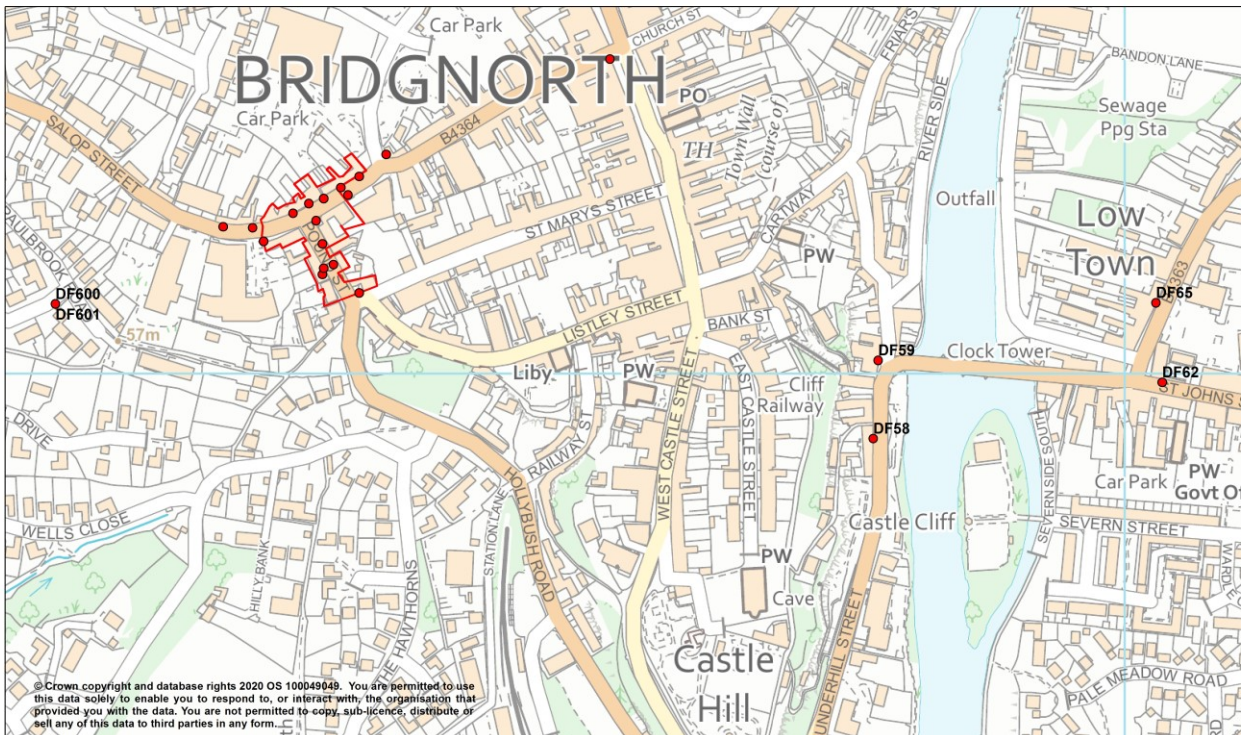
Bridgnorth (inc. Pound St AQMA)

Shropshire Council

The Shirehall, Abbey Foregate,
Shrewsbury, Shropshire, SY2 6ND

Scale : 1:2,500
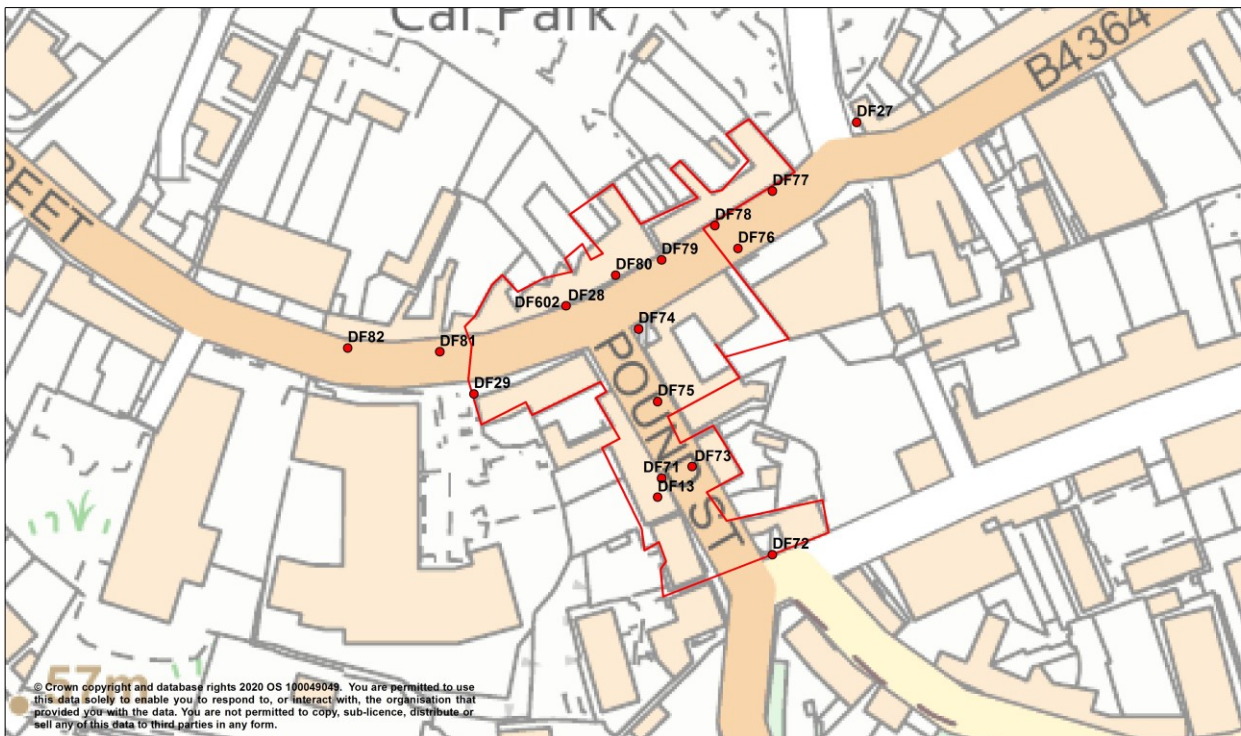
Bridgnorth Pound St AQMA

Shropshire Council

The Shirehall, Abbey Foregate,
Shrewsbury, Shropshire, SY2 6ND

Scale : 1:800
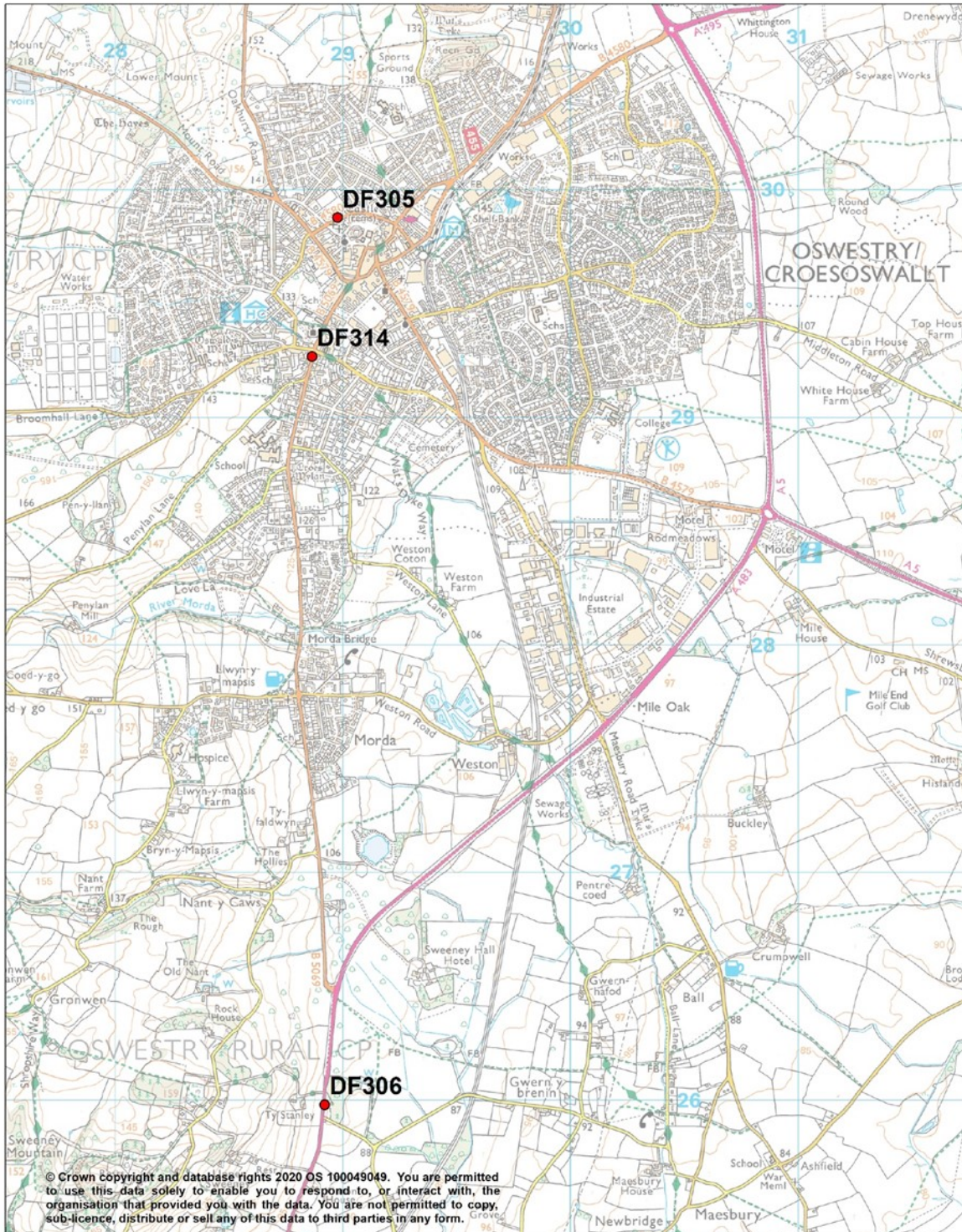
Oswestry

Shrewsbury

Shropshire Council

The Shirehall, Abbey Foregate,
Shrewsbury, Shropshire, SY2 6ND

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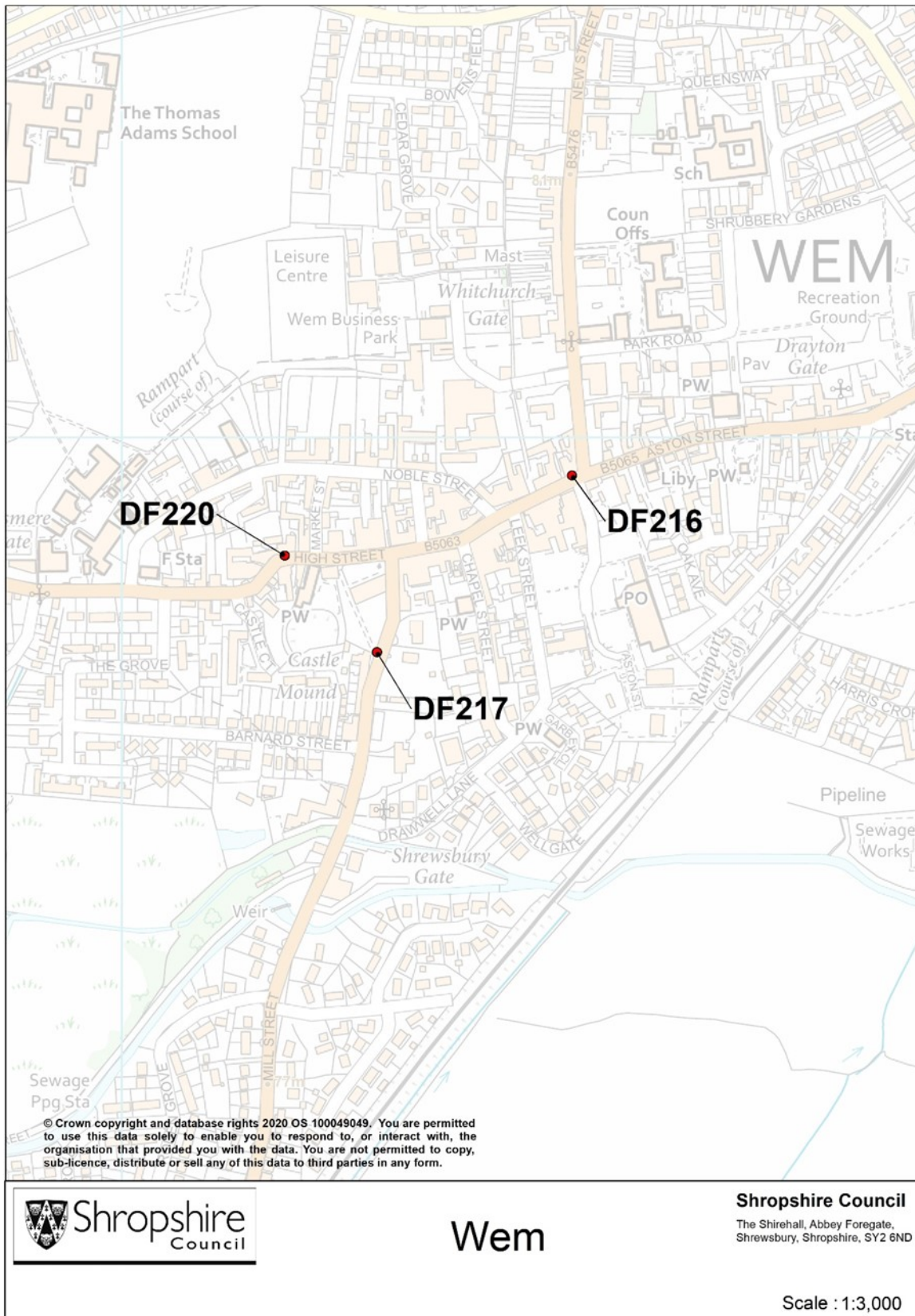
Shrewsbury AQMA

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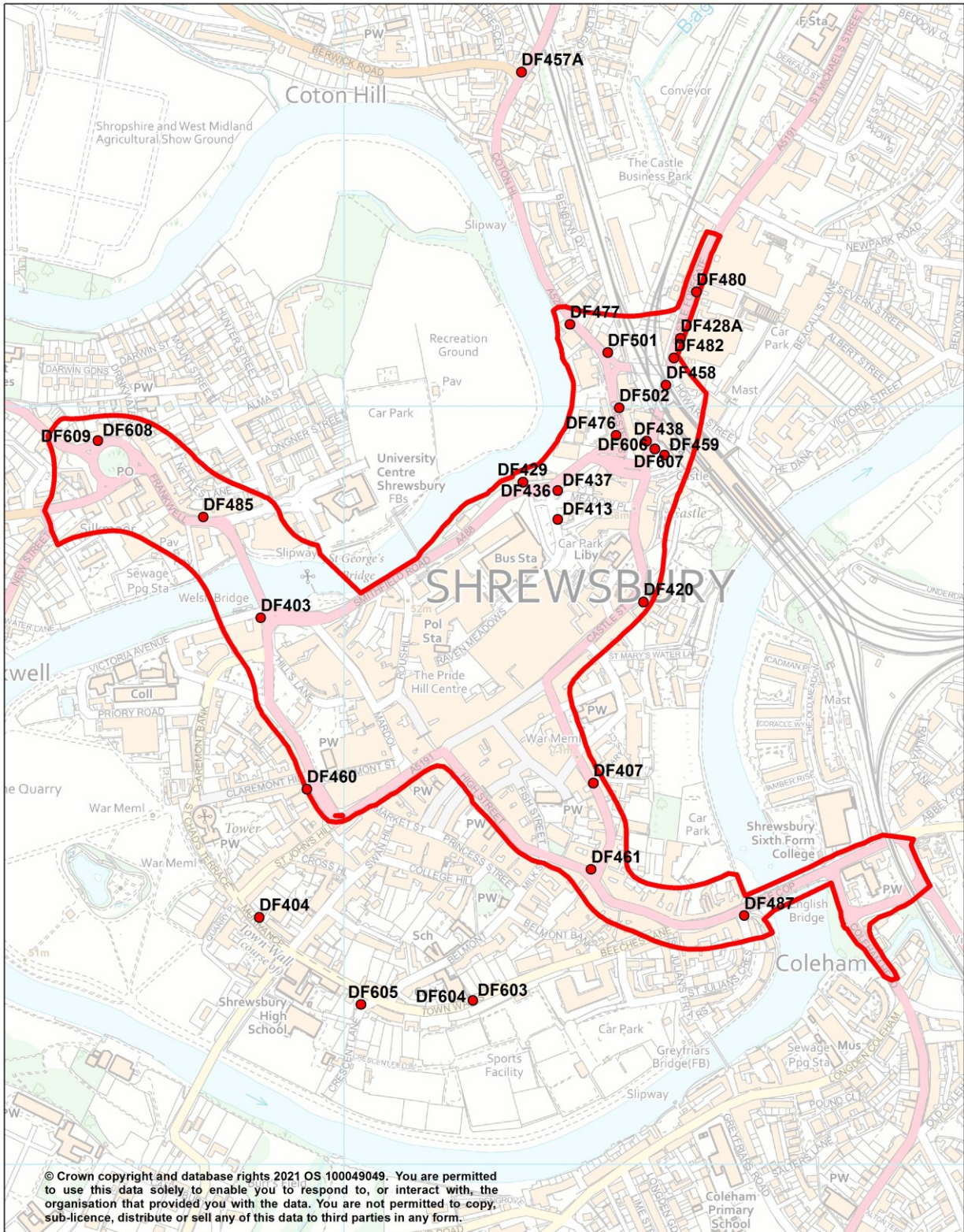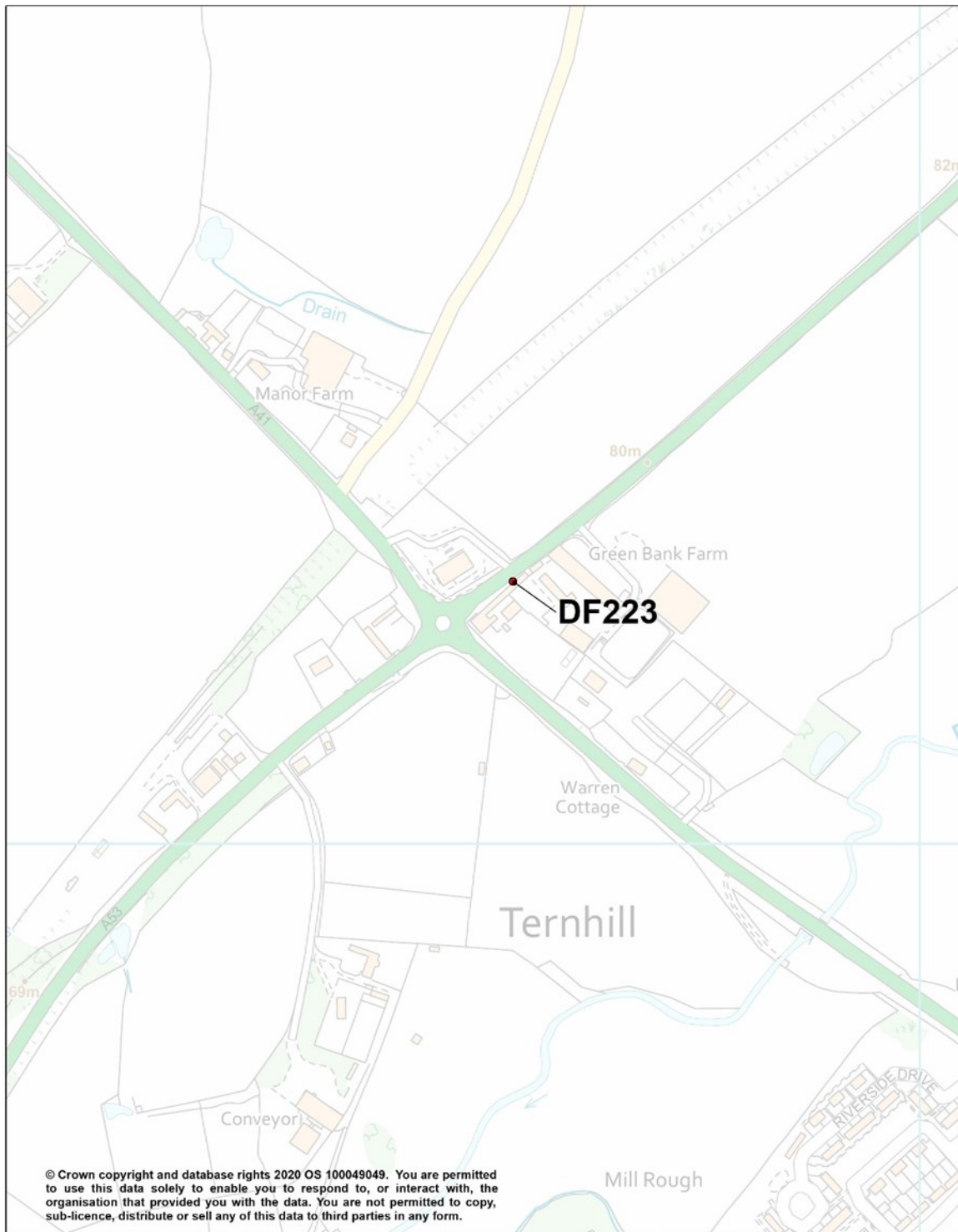
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Shropshire Council

Ternhill Crossroads

Shropshire Council
The Shirehall, Abbey Foregate,
Shrewsbury, Shropshire, SY2 6ND

Scale : 1:3,000

Wem

Scale : 1:3,000

Appendix E: Summary of Air Quality Objectives in England

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

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO$_2$)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO$_2$)	40µg/m^3	Annual mean
Particulate Matter (PM$_{10}$)	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM$_{10}$)	40µg/m^3	Annual mean
Sulphur Dioxide (SO$_2$)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO$_2$)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO$_2$)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

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

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 the 2021 reporting year. 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 (NO_2) 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) data[8] 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)[9] has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO_2 annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

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

[9] 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 20µg/m^3 if expressed relative to annual mean averages. During this period, changes in PM$_{2.5}$ concentrations were less marked than those of NO$_2$. 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 5µg/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 Shropshire Council

The local impact of COVID-19 on air quality is not known as traffic counts were not conducted within the initial or later lockdown periods. In addition, diffusion tube monitoring for NO2 was disrupted in March and April with no valid results available to consider the impacts. This was due to diffusion tubes being left out beyond the length of time that the accredited lab (Gradko International Ltd) used to provide analysis of diffusion tubes can vouch for the reliability of results.

Annual average data suggests a 20% reduction in NO2 pollution was found over the year in the hotspot locations of Bridgnorth AQMA and Shrewsbury No 3 AQMA. This is likely to be short lived with traffic levels considered back to normal by spring 2021 when restrictions started to be lifted. The results of monitoring in 2020 found that the national objective levels were met in 2020 by less than 1 microgram/square meter. This suggests that interventions on the scale of the national and local lockdown would be require with current fleet emissions to meet the air quality challenge in these areas.

Opportunities Presented by COVID-19 upon LAQM within Shropshire Council

Temporary social distancing measures were carried out in several towns around the County including Shrewsbury within the AQMA. The measures diverted traffic out of the town centre to allow road space to be dedicated to pedestrians. These measures are being continued in part however have limited impact on AQMA status as vehicles are not diverted away from the area where national objective levels are exceeded.

Temporary one-way movement for pedestrians during busy market days with road closures in the High Street in Bridgnorth were carried out. This area is on the edge of an AQMA however has no impact on the AQMA itself as vehicles were not restricted from this area and continued to pass through the AQMA to reach desired destinations such as car parking for town centre access.

A one-way scheme to increase social distancing was introduced in Oswestry on Church Street. Although no air quality monitoring takes place in this location it is considered likely to have reduced air pollution in this direct area. This intervention is set to be maintained going forwards.

Challenges and Constraints Imposed by COVID-19 upon LAQM within Shropshire Council

- The implementation of a DEFRA grant project 24571 has been delayed due to COVID-19 resource constraints. Work continues and is expected to be completed in the next 6 months. **Medium**

- As with previous years, a national bias adjustment factor has been utilised to adjust the diffusion tube results for 2020. Within 2019 there were 27 co-location studies that were utilised to calculate the bias factor for the laboratory and preparation method used. For 2020, this number has reduced to only 18 studies. There is therefore the potential for there to be a greater degree of uncertainty associated with the resultant annual mean NO_2 concentrations in 2020 than in previous years. **Large Impact**

- During 2020, access to a number of diffusion tube monitoring sites was restricted due to their locations on residential buildings. Therefore, it was not possible to maintain diffusion tube exposure periods for March to April in line with the national monitoring calendar for a number of sites. This has affected data capture within 2020, resulting in monitoring sites having to be annualised. **Small Impact**

- A revised AQAP is being considered for Shrewsbury No 3 AQMA and Bridgnorth AQMA. However, owing to the reallocation of Council resources during 2020, the development and implementation of the AQAP has been delayed. Current estimates are that the revised AQAP will be prepared in and sent out for draft consultation in 2022. Resource is still being consumed by COVID-19 duties in July

2021. As such rather than carry out the AQAP internally the approach is to commission the work. **Small 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: High
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 Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.