2020 Air Quality Annual Status Report (ASR)

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

November, 2020

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Report Reference number	2020 -1
Date	November 2020

Executive Summary: Air Quality in Our Area

Air Quality in Telford and Wrekin 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 and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

Air quality in the borough of Telford and Wrekin is overall very good however there are locations where pollutants build close to the kerbside of busy roads. The main pollutant of concern in the borough is nitrogen dioxide (NO_2) which is mainly linked to road traffic emissions.

The borough of Telford and Wrekin is a predominantly rural area on the north-eastern edge of Shropshire. The borough has a population of 166,641 (2011 census, Office for National Statistics) covering 29,000 hectares with its major settlement being Telford, which incorporated the existing towns of Dawley, Madeley, Oakengates and Wellington upon its construction as a 'new town'.

The M54 traverses the borough across the main central urban area, and the majority of the main roads within the borough are also focussed in this area, including the A41, the A518, the A5, A442, A4169, and the A4640. There is a main railway line crossing the centre of the borough, as well as an unused rail freight terminal.

In 2019, there were 11 Part A2 permitted processes and 60 part B permitted processes (including petrol filling stations, dry cleaners and mobile plant) within the borough, which are regulated for emissions to the environment by Telford and Wrekin Council. There are more permitted sites that are regulated by the Environment Agency.

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[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Monitoring undertaken for 2019 shows that air quality within the borough is on the whole below the national objective levels set out in law. There is a hotspot for higher pollutant levels for nitrogen dioxide at the Mill Bank in Wellington, near to the Watling Street Junction and again at Coach Central, the bus station in Telford Town centre. Neither of these sites are considered to expose the public to long term exposure of pollutants such as a school or a person's home would.

Telford and Wrekin do not have any AQMAs but there is an Air Quality Strategy, which ensures that air quality is given due consideration and demonstrates the Council's commitment to air quality review and management.

Many methods employed to improve air quality are council wide initiatives and cross over a number of teams including Public Protection, Public Health, Transport and Highways.

Actions to Improve Air Quality

Telford and Wrekin Council is committed to ensuring that the air quality within our borough remains wholesome, as previous monitoring has indicated.

Additional monitoring and Traffic Management Measures

In 2017, the Council introduced additional diffusion tubes at four locations that represent relevant exposure in close proximity to Coach Central near the town centre where NO_2 concentrations were identified as some of the highest in the borough.

After liaising with DEFRA, we understood that the individual diffusion tube located at Coach Central in 2016 monitoring did not represent relevant exposure based the NAQO. These additional four monitoring locations were Withywood Drive, Lawnswood, Deercote (top) and Deercote (bottom). Further monitoring in these locations show that relevant exposure is well below the NAQO NO_2 Annual Mean Concentration of 40 µg/m^3 (Appendix E). As a result, it has been decided that the four diffusion tubes in this area are going to be removed in 2020 with no further review or measures deemed necessary at these locations. This will allow for resources to be focused at priority locations.

At this time, a further five diffusion tubes were introduced on each of the roads that intersect the B5061 Junction by Watling Street, Wellington. This was to support the pre-existing monitoring location which was introduced in 2016. These locations were

Mill Bank, Holyhead Road, Watling Street, Dawley Road and Watling Street/ Regent Street Junction. This decision was made as NO_2 concentrations in 2017 raised concern. The Council has obtained further data from these monitoring locations which identified Mill Bank and Watling Street/ Regent Street Junction, two of the roads that intersect this junction, as having the highest NO_2 levels within the borough. Although the NAQO was not exceeded, this has prompted the Council to take further action.

The actions taken so far at the B5061 Junction have included Intelligent Traffic Management through the introduction of intelligent signalling and also anti-idling signage. The introduction of the intelligent signalling aims to improve traffic flow at the junction by allowing the traffic lights to prioritise the roads at the intersection with the most traffic. This is to facilitate regular traffic flow and reduce the amount of time vehicles spend in this location. The aim of the anti-idling signage is to encourage motorists to turn off their engines whilst stationary at the junction in a bid to reduce preventable emissions. It is envisaged this will change motorist's behaviour.

These measures have been in place for 2 years and monitoring results from these locations are still fluctuating annually; as a result it does not provide strong evidence of improvements in NO_2 concentrations at this location as a direct result of such measures. The Council will continue to monitor at these locations to understand if the measures introduced are having any long-term impact.

Schemes and funding

The Council have taken measures to encourage the use and make more accessible public transport as an alternative to private vehicle use. The Council have worked with owners of Telford Shopping Centre and secured Local Enterprise Partnership Growth Deal funding which has been used to fund a new bus station at Telford Shopping Centre which is now complete.

The Council also have a Cycling and Walking Strategy which was implemented in September 2017. The strategy was introduced in recognition of Telford's walking and cycling infrastructure to encourage residents and those who work in the borough to utilise this infrastructure while promoting the health benefits of cycling and walking. It is intended to support the vision of the overarching Local Transport Plan for 2011-2026. The strategy can be accessed via

http://www.telford.gov.uk/downloads/file/7995/cycling_and_walking_strategy

The implementation of the updated action plan of the Cycling and Walking strategy will complement the delivery of the borough's Local Transport Plan for 2011-2026; furthermore by encouraging more people to take regular exercise will contribute to people in Telford and Wrekin enjoying healthier, happier and longer lives.

Cabinet adopted the Ultra-low vehicle emission strategy in August 2018 which sets out how the Council will support and encourage growth in the ULEV market. The strategy's action plan will guide priorities and funding to those measures that are considered to be the most effective methods to encourage and support ULEVs.

Conclusions and Priorities

Monitoring data from 2019 has shown overall that air quality in relation to NO_2 concentrations is fairly stable. NO_2 concentrations are not completely stable and do fluctuate slightly year to year due to many influencing factors i.e. weather conditions and road use.

Although this year there has been no exceedances of the National Air Quality Objectives at locations of relevant exposure, the Council is we are making progress in identifying areas of poorer air quality within the borough through air quality review. The Council's main priorities for the coming year are to continue diffusion tube monitoring for NO_2. The Council will continue to take a pragmatic approach in addressing any further locations identified to have poorer air quality and where necessary liaise with DEFRA. The main aims for the coming year are;

- Expand smart bus travel timetabling across the Borough, via the use of QR codes for real time updates. It is envisaged that this will lead to long term continued bus use increase across the borough;

- Expand parking enforcement across the remaining parish councils with the intention that parked vehicles do not disrupt traffic flow and cause congestion.

- Introduction of the new cycle parking scheme to provide an extra 300 cycle parking places across the borough;

- Inspection and maintenance review of the borough cycling and walking routes to identify immediate and longer term improvements as part of the £2.6m Travel Telford Sustainable Transport Fund;

- Consideration and engagement with external stakeholders to improving our electric vehicle charging network across the borough; and

- To introduce new monitoring locations and extend existing which have shown air quality to be poorer.

The Council will continue to review air quality at existing locations where pollutant levels are being, or are likely to be exceeded for example at Mill Bank in Wellington. On review, the monitoring locations with consistently low NO_2 concentrations will be discontinued from further monitoring to allow for resources to be focused effectively.

Local Engagement and How to get Involved

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

- Consider using walking, cycling or using public transport for trips including to school, when moving around the borough

- Utilise waking and cycling route maps (available here https://www.telford.gov.uk/downloads/file/1743/walking_and_cycling_map_of_telford_and_wrekin)

- Consider car sharing where possible

- Consider electric/low emission/hybrid vehicle as an option for your next car purchase.

- When travelling by vehicle, try to utilise less busy and congested routes.

- Switch engine off and don't leave it running when your car is waiting stationary.

- Maintain your vehicle by having it serviced regularly and ensure an optimum tyre pressure

For further information please see the information on Telford and Wrekin's website:

http://www.telford.gov.uk/info/20150/pollution/104/air_quality

https://www.telford.gov.uk/info/20465/walking/3621/cycling_and_walking_strategy

Or contact us by phone on 01952 381818

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1 Local Air Quality Management

This report provides an overview of air quality in the Borough of Telford and Wrekin during 2019. 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 the Borough of Telford and Wrekin to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

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 must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

The Borough of Telford and Wrekin currently does not have any AQMAs but there is a network of diffusion tubes used to monitor the air quality in the Borough. For reference, a map of the Borough of Telford and Wrekin's monitoring locations is available in Appendix D.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
N/A	N/A	N/A	N/A	N/A	N/A	-	-	-	-	-	-	-

☒ **The Borough of Telford and Wrekin 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 the Borough of Telford and Wrekin

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

- It would be useful if Section 2.3 could make reference to the Public Health Outcomes Framework, and the local indicator for PM2.5 in the district.

- It is recommended that for future reports the Council discuss their results and also present the trends in NO_2 concentrations over the last 5 years.

- It would be beneficial for the Council to provide the calculations for distance correction and annualisation performed.

- It would be beneficial for the Council to also include a map displaying the location of all their monitoring sites.

All of the above have been included in this years' report.

Telford and Wrekin Council has taken forward a number of direct measures during the current reporting year of 2019 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:

- Telford and Wrekin Ultra-Low Emission Vehicle Strategy 2018 which sets out how the Council will support and encourage growth in the ULEV market. The Action Plan will guide priorities and funding to those measures that are considered to be the most effective methods to encourage and support ULEVs.

- Telford and Wrekin Local Plan which is the overarching planning policy document for the Borough and forms the basis for decision making process in relation to all planning applications looking forward to 2031, or such a time as it, or elements of it are superseded, whichever comes first.

- Telford and Wrekin Local Transport Plan which covers all forms of travel including car and motorcycle based travel, public transport, walking and cycling.

- Telford and Wrekin Transport Growth Strategy which sets out the transport infrastructure and investment that is required to accommodate future housing, business and population growth within Telford & Wrekin ensuring that Telford

retains its competiveness to attract inward investment, create jobs and improve quality of life for residents and visitors.

Telford and Wrekin Council expects the following measures to be completed over the course of the next reporting year:

- Monitoring locations have been re-evaluated and the siting of diffusion tube monitoring has been considered based on sites with relevant exposure close to pollution hotspot locations. This change will be implemented in Dec 2019.

- Move to electric vehicles within Neighbourhood and Enforcement Services

- Continued development of UTC, which is a LA funded initiative to improve traffic flow rates and reduce congestion.

- Expand smart bus travel timetabling across the Borough, via the use of h the use of QR codes for real time updates. It is hoped that this will continue to see bus use increase across the borough.

- Expand parking enforcement across town/parish councils with the expectation that parked vehicles do not disrupt traffic flow and cause congestion.

- Introduction of the new cycle parking scheme to provide an extra 300 cycle parking places across the borough.

- Inspection and maintenance review of the borough cycling and walking routes to identify immediate and longer term improvements as part of the £2.6m Travel Telford Sustainable Transport Fund.

- Ensure air quality comments are provided to the development team of the Local Plan to help prioritise potential development sites and highlight methods to ensure future developments do not negatively impact the local air quality.

- Consideration and engagement with external stakeholders to improving our electric vehicle charging network across the borough.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Telford and Wrekin Council anticipates that further additional measures not yet prescribed will be required in subsequent years to maintain compliance, particularly at hotspot locations and continue to improve air quality across the Borough of Telford and Wrekin as a whole.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Organisations involved	Funding Source	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Ironbridge Park and Ride	Alternatives to private vehicle use	Bus based Park & Ride	2012	Telford and Wrekin Council	Local Authority, Funding	No. of people using the service	Reduced vehicle emissions	This scheme is completed and continues to be well used.	Implemented	The Ironbridge park and ride scheme aims to lower the amount of veicles entering the Ironbridge Gorge. In 2019, 2369 of passengers utilised this service on the 28 days of operation.
2	Watling Street Signal Upgrade	Traffic Management	UTC, Congestion management, traffic reduction	2018	Telford and Wrekin Council	Local Authority Funded	National Objective Level for NO_2 not exceeded at location.	Reduced vehicle emissions	The improvements to traffic signals has seen a reduction in congestion in this area when compared with before.	Implemented	There are no planned changes to this scheme currently.
3	Watling Street Anti-idling signage	Traffic Management	Anti-idling enforcement	2018	Telford and Wrekin Council	Local Authority Funded	National Objective Level for NO_2 not exceeded at location.	Reduced vehicle emissions	Implemented and on-going	Implemented	N/A
4	Improvements to Telford Central Train Station	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	2019	Railway Service Provider	Externally Funded	No. of people using the service	Reduced vehicle emissions	Implemented	Implemented	In 2019, 1.2M of passengers utilised this service. This has remained constant for the past few years but will be reviewed.
5	Education and promotion around cycling	Promoting Travel Alternatives	Promotion of cycling	2019	Telford and Wrekin Council	Local Authority Funded	Increased number of people cycling within the borough	Reduced vehicle emissions	Implemented and ongoing	ongoing	In 2019, there were 330 educational sessions undertaken for both children and adults.
6	Borough wide Advisory speed limit at schools (20mph)	Traffic Management	Reduction of speed limits, 20mph zones	2019	Telford and Wrekin Council	Local Authority Funded	National Objective Level for NO_2 not exceeded at location.	Reduced vehicle emissions	Implemented and ongoing	Implemented	Reduced road accidents at these locations and no evidence to demonstrate that Nat. objective level for NO_2 is exceeded at these locations
7	UTC is being further developed	Traffic Management	UTC, Congestion management, traffic reduction	2018	Telford and Wrekin Council	Local Authority Funded	Improved traffic flows reduced congestion	Reduced accumulative effect of vehicle emissions	Develop/planning stages	ongoing	There is a UTC system in place currently but is being considered for expansion

8	Parking Enforcement	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	2019	Telford and Wrekin Council	Local Authority, Police and Crime and Town and Parish Council funding	Improved traffic flows reduced congestion	Reduced accumulative effect of vehicle emissions	Implemented and ongoing in certain areas of the borough	ongoing	There are plans to extend this to borough wide.
9	Real time bus service information	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	2019	Telford and Wrekin Council	Local Authority Funded	Increased number of people using buses	Reduced vehicle emissions	Implemented and ongoing	ongoing	Currently at Telford Central and Oakengates but will be extended borough wide.
10	Driver efficiency for fleet staff members	Vehicle Fleet Efficiency	Driver training and ECO driving aids	2016	Telford and Wrekin Council	Local Authority Funded	Reduced fuel consumption	Reduced vehicle emissions	Implemented and ongoing	ongoing	Training updated and refreshed every 4 years.

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.

Telford and Wrekin Council is taking the following measures to address PM$_{2.5}$:

- All actions noted in Table 2.2 that look to reduce congestion will in turn reduce brake pad and tyre ware reducing some anthropogenic (human-made) PM$_{2.5}$ emissions in the area associated with vehicle use. Any initiatives that look to allow steady traffic flow are likely to have a similar impact.

PM$_{2.5}$ emissions are regulated across the Borough through various legislative framework. This includes the LAPPC and LA-IPPC regimes under the provision of the Environmental Permitting (England and Wales) Regulations 2016 and smoke control areas brought in under the Clean Air Act 1993. More information relating the locations of Telford and Wrekin Council Smoke Control Areas are found here: https://www.telford.gov.uk/info/20358/pollution/1038/smoke_control_zones/2

In considering the need for additional actions relating to PM$_{2.5}$ it is noted that the Public Health Outcomes Framework Indicator number 3.01 – Fraction of mortality attributable to particulate air pollution for the borough of Telford and Wrekin was noted to be 4.1% in 2018 (2019 data is not available currently). This is the second lowest for the whole of the West Midlands region which has an average of 5.0% for 2018. The two authorities, both with values of 3.8% are Shropshire Council and Staffordshire Moorlands. The West Midlands figure is slightly lower that England's average of 5.2%. As the PHOF indicator for PM2.5 shows the mortality due to human-made PM$_{2.5}$, the fraction is significantly below the national and regional levels and as such it is not considered necessary for any specific actions to be carried out while there are other non-specific interventions taking place which will contribute to reducing anthropogenic PM$_{2.5}$.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

The Borough of Telford and Wrekin does not have any automatic monitoring sites operated by Telford and Wrekin Council.

3.1.2 Non-Automatic Monitoring Sites

Telford and Wrekin Council undertook non- automatic (passive) monitoring of NO_2 at 25 sites during 2019. Table A. in Appendix A shows the details of the 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[4], "annualisation" (where the data capture falls below 75%), and distance correction[5]. Further details on adjustments are provided in Appendix C.

3.2.1   Nitrogen Dioxide (NO_2)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 4 years with the air quality objective of 40µg/m^{3}. Note that the concentration data presented in Table A.2 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 2019 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.

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[4] https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html
[5] Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

Full data sets are only aviable for 2017, 2018, 2019, for some of the locations data is available for 2016. It is well documented that trends are only reliable when considered across 5 years; that said comment will be made on the data sets available.

There was one excedence of air quality objectives for NO$_2$ at DT22 at Mill Bank in Wellington with an annual mean concentration of 40µg/m^3, this is slightly lower than last years (2018 42.15 µg/m^3) and is slightly higher that the year before that (2017 38.22 µg/m^3). This monitoring location is at a roadside of a busy junction to the main road into one of the market towns (Wellington) within the Borough. The location is not within an AQMA, as there are none declared wthin the borough. It is also not representative of relevant exposure, when distance corrected, the annual means is calcuted to be 34.2 µg/m^3.

Interestingly, this location has 4 other locations nearby covering the feeder roads for the same junction, DT10 Watling Street (outside Swan PH), DT21 Watling Street, DT23 Holyhead Road and DT25 Dawley Road. Annual mean concentrations at these locations are all well below the national air quality objective level for NO$_2$.

All monitoring data has been raitifed and anaysised as required. DT15 has been subject to annualisation due to having less than 75% data capture. The national bias adjustment has been applied to annual mean and distance correction has been undertaken fro DT22 to account for relevant exposure.

At this time, based on the data collected during 2019 it would not be considered appropriate to declare an AQMA.

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

Telford and Wrekin Council do not currently monitor for this pollutant. There is no evidence that PM$_{10}$ annual mean concentrations for the past 5 years is likely to exceed the air quality objective of 40µg/m^3.

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

Telford and Wrekin Council do not currently monitor for this pollutant.

3.2.4   Sulphur Dioxide (SO$_2$)

Telford and Wrekin Council do not currently monitor for this pollutant. There are no concerns that air quality objectives for SO$_2$ are likely to be exceeded.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?	Height (m)
DT1	Newport Car Park	Other	374737	319160	NO2	NO	3.1	2.6	NO	2.5
DT2	Barrack Lane	Roadside	373202	316555	NO2	NO	5.13	2.1	NO	2.3
DT4	Richmond Avenue	Roadside	369553	312682	NO2	NO	6.4	1.3	NO	2.7
DT5	New Road	Kerbside	370013	312166	NO2	NO	13.2	0.1	NO	2.4
DT6	Horton Road	Kerbside	368742	312775	NO2	NO	4.2	0.4	NO	2.6
DT7	Sommerfield Road	Roadside	368382	312251	NO2	NO	18.1	1.8	NO	2.4
DT9	Apley Road	Roadside	365095	312402	NO2	NO	41.4	2.5	NO	2.4
DT10	Watling Street (outside Swan)	Roadside	365918	311056	NO2	NO	5.4	2.3	NO	2.5
DT12	Mossey Green	Roadside	368727	310040	NO2	NO	25	1.5	NO	2.4
DT13	Shifnal Road	Roadside	371117	309458	NO2	NO	33	1.5	NO	2.5
DT14	Checkley Lane	Kerbside	371284	311165	NO2	NO	16.8	1	NO	2.6
DT15	Newdale/Lawley Junction	Kerbside	367560	308854	NO2	NO	11.2	1	NO	2.5
DT16	Dudmaston	Kerbside	370990	308497	NO2	NO	7.1	0.5	NO	2.5
DT17	Coach Central	Urban Centre	369893	308650	NO2	NO	239	1.3	NO	2.7

DT19	Waverley	Kerbside	369019	304799	NO2	NO	4.2	0.5	NO	2.3
DT20	Kemberton	Roadside	370139	304546	NO2	NO	23.5	1.9	NO	2.4
DT21	Watling Street	Roadside	366011	311063	NO2	NO	10.6	1.4	NO	2.3
DT22	Mill Bank	Roadside	365911	311061	NO2	NO	2.8	1.2	NO	2.4
DT23	Holyhead Road	Roadside	365895	311024	NO2	NO	20	1.6	NO	2.4
DT24	Dawley Road	Roadside	365939	311013	NO2	NO	7.8	1.6	NO	2.4
DT25	Watling Street/Regent Street	Roadside	366092	311083	NO2	NO	4.4	3.9	NO	2.4
DT26	Deercote Top	Urban Background	370449	308478	NO2	NO	24.2	48.6	NO	2.5
DT27	Deercote Bottom	Urban Background	370154	308687	NO2	NO	30.3	42.6	NO	2.5
DT28	Withywood Drive	Urban Background	369431	308364	NO2	NO	7.4	49.4	NO	2.4
DT29	Lawnswood	Urban Background	369433	308286	NO2	NO	19.2	48.2	NO	2.3

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 – Annual Mean NO₂ Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO₂ Annual Mean Concentration (µg/m³) (3) (4)				
							2015	2016	2017	2018	2019
DT1	374737	319160	Other	Diffusion Tube	92	92	No data	18.6	19.78	21.63	22.55
DT2	373202	316555	Roadside	Diffusion Tube	100	100	No data	24.56	17.16	18.15	16.95
DT4	369553	312682	Roadside	Diffusion Tube	92	92	No data	16.55	15.07	16.95	16.47
DT5	370013	312166	Kerbside	Diffusion Tube	92	92	No data	17.89	16.01	17.46	13.94
DT6	368742	312775	Kerbside	Diffusion Tube	100	100	No data	16.68	15.55	17.4	16.23
DT7	368382	312251	Roadside	Diffusion Tube	100	100	No data	19.08	18.33	20.36	21.9
DT9	365095	312402	Roadside	Diffusion Tube	100	100	No data	24.24	23.9	25.36	24.21
DT10	365918	311056	Roadside	Diffusion Tube	92	92	No data	34.62	32.46	33.87	31.18
DT12	368727	310040	Roadside	Diffusion Tube	100	100	No data	30.14	38.22	28.47	27.49
DT13	371117	309458	Roadside	Diffusion Tube	100	100	No data	25.46	18.55	23.98	24.85
DT14	371284	311165	Kerbside	Diffusion Tube	92	92	No data	21.46	21.58	22.05	18.93
DT15	367560	308854	Kerbside	Diffusion Tube	67	67	No data	17.17	32.02	19.66	15.69
DT16	370990	308497	Roadside	Diffusion Tube	100	100	No data	18.3	16.84	18.29	18.31
DT17	369893	308650	Other	Diffusion Tube	100	100	No data	36.35	27.02	37.04	36.54

DT19	369019	304799	Kerbside	Diffusion Tube	83	83	No data	13.35	17.91	14.34	13.07
DT20	370139	304546	Roadside	Diffusion Tube	100	100	No data	17.13	17.03	22.91	21.62
DT21	366011	311063	Roadside	Diffusion Tube	92	92	No data	No data	23.49	25.81	25.58
DT22	365911	311061	Roadside	Diffusion Tube	100	100	No data	No data	38.22	42.15	40
DT23	365895	311024	Roadside	Diffusion Tube	100	100	No data	No data	18.55	20.46	20.01
DT24	365939	311013	Roadside	Diffusion Tube	100	100	No data	No data	21.58	23.88	22.42
DT25	366092	311083	Roadside	Diffusion Tube	100	100	No data	No data	32.12	33.87	32.23
DT26	370449	308478	Urban Background	Diffusion Tube	75	75	No data	No data	16.01	17.47	16.71
DT27	370154	308687	Urban Background	Diffusion Tube	92	92	No data	No data	16.18	17.78	17.16
DT28	369431	308364	Urban Background	Diffusion Tube	100	100	No data	No data	10.6	13.02	11.33
DT29	369433	308286	Urban Background	Diffusion Tube	100	100	No data	No data	10.11	12.62	10.84

☒ **Diffusion tube data has been bias corrected**

☒ **Annualisation has been conducted where data capture is <75%**

☒ **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 adjustment**

Notes:

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

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

(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%).

(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

Figure A.1 – Trends in Annual Mean NO₂ Concentrations
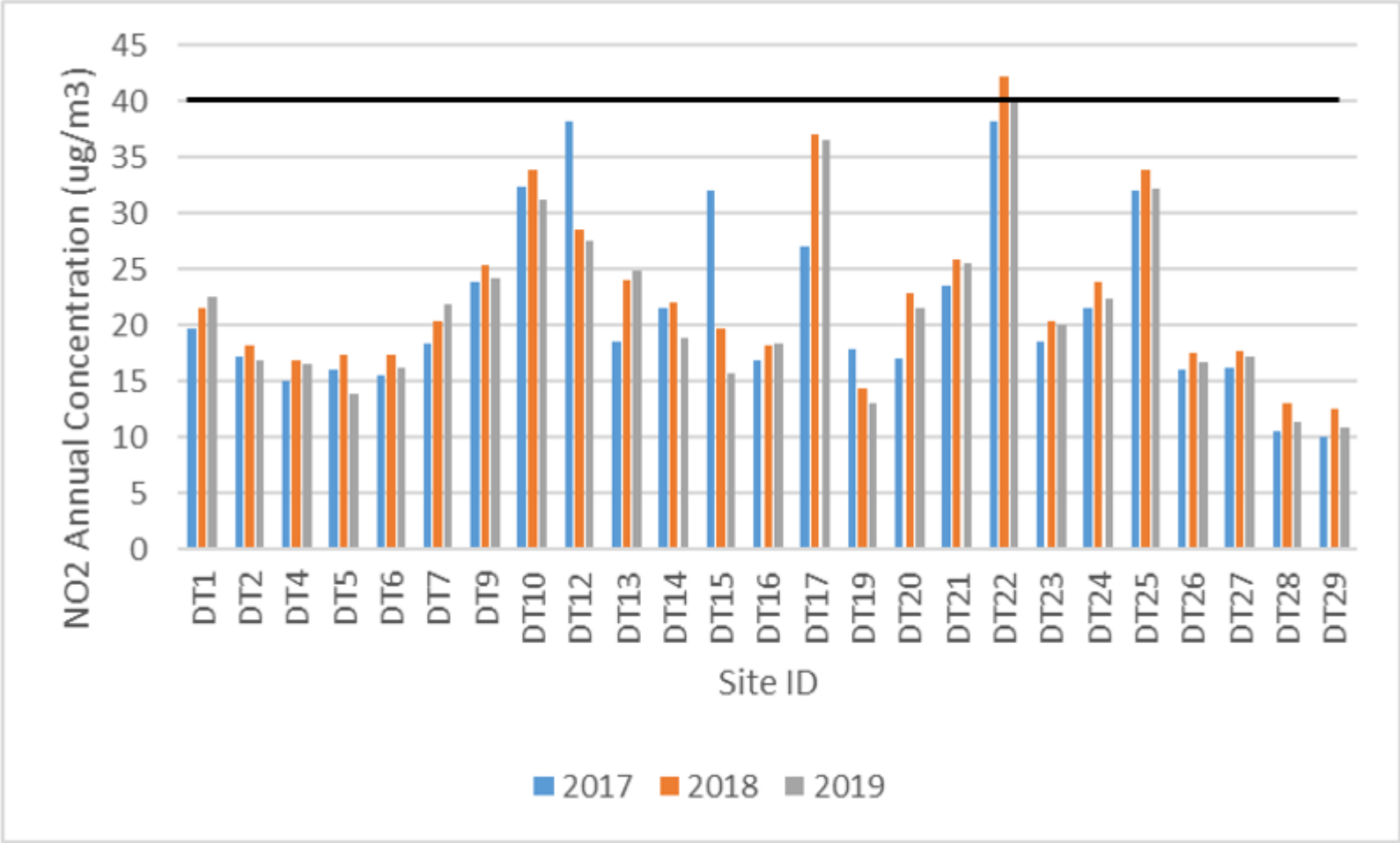
Appendix B: Full Monthly Diffusion Tube Results for 2019

Table B.1 - NO₂ Monthly Diffusion Tube Results - 2019

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO₂ Mean Concentrations (µg/m³)												Annual Mean		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.92) and Annualised [1]	Distance Corrected to Nearest Exposure [2]
DT 1	374737	319160	30.6	28.4	25.9	19.5	19.3	21.2	19.6	18.3	20.9	19.6	46.3	-	24.5	22.55	-
DT 2	373202	316555	25.3	19.5	21.2	16.1	16.6	14.7	15.4	13.9	18.8	16.7	26.0	17.0	18.4	17.0	-
DT 4	369553	312682	26.39	23.4	16.15	17.88	11.68	12.8	-	10.88	16.21	19.06	22.25	20.2	17.9	16.5	-
DT 5	370013	312166	25.65	17.86	16.56	-	4.49	14.98	6.1	8.84	15.97	16.01	23.31	16.93	15.2	13.9	-
DT 6	368742	312775	27.99	24.67	16.58	16.76	13.1	12.97	11.01	10.33	16.4	17.82	24.03	20.11	17.7	16.2	-
DT 7	368382	312251	30.4	29.53	20.75	24.08	15.96	17.89	15.71	15.12	22.93	23.61	46.56	23.13	23.8	21.9	-
DT 9	365095	312402	30.13	35.28	17.84	39.61	21.76	22.97	21.92	21.95	25.17	24.01	26.98	28.22	26.3	24.2	-
DT 10	365918	311056	39.77	37.7	31.58	42.78	32.66	34.42	26.21	28.16	34.25	34.52	32.97	31.72	33.9	31.2	-
DT 12	368727	310040	36.74	39.34	27.65	37.8	23.16	26.31	24.54	20.09	29.96	32.19	34.49	26.29	29.9	27.5	-
DT 13	371117	309458	29.13	40.2	26.13	27	18.87	18.89	19.94	26.73	26.36	28.05	30.6	32.18	27.0	24.9	-

DT 14	371284	311165	29.86	24.61	18.26	29.41	-	17.54	14.9	10.09	19.57	20.62	24.05	17.48	20.6	18.9	-
DT 15	367560	308854	-	18.7	-	-	-	15.59	11.47	10.82	16.41	20.12	22.27	18.63	16.8	15.7	-
DT 16	370990	308497	25.44	24.7	15.6	29.86	17.53	17.52	13.78	8.8	19.54	21.53	26.1	18.46	19.9	18.3	-
DT 17	369893	308650	39.38	52.3	40.69	40.55	33.62	34.29	33.34	36.9	39.01	35.61	39.38	51.51	39.7	36.5	-
DT 19	369019	304799	19.54	18.16	8.78	-	-	10.25	8.84	8.7	13.04	15.75	23.93	15.09	14.2	13.1	-
DT 20	370139	304546	31.48	26.57	20.41	29.54	20.61	20.48	17.11	17.48	22.61	25.28	26.06	24.39	23.5	21.6	-
DT 21	366011	311063	30.87	30.39	28.69	35.68	30.37	25.75	21.19	20.48	26.79	-	30.91	24.77	27.8	25.6	-
DT 22	365911	311061	54.26	50.84	46.67	47.67	40.74	41.38	36.16	40.48	37.45	42.32	38.27	45.15	43.5	40.0	34.2
DT 23	365895	311024	24.23	27.23	20.27	29.23	18.67	19.61	15.39	15.86	20.34	23.55	25.77	20.89	21.8	20.0	-
DT 24	365939	311013	29.27	26.21	26.62	27.37	24.18	23.44	16.97	16.95	27.03	23.45	29.9	20.99	24.4	22.4	-
DT 25	366092	311083	43.54	41.22	30.14	45.46	30.28	38.06	30.35	27.73	34.66	26.94	37.97	34.04	35.0	32.2	-
DT 26	370449	308478	24.24	22.52	16.96	19.32	-	13.71	12.57	-	-	18.98	15.64	19.54	18.2	16.7	-
DT 27	370154	308687	26.84	24.65	14.96	21.22	-	13.06	12.24	12.66	18.56	19.03	21.88	20.08	18.7	17.2	-
DT 28	369431	308364	19.48	14.99	9.74	13.58	9.23	10.08	7.7	6.9	11.88	14.11	20.24	9.86	12.3	11.3	-
DT 29	369433	308286	16.86	14.15	9.96	12.03	8.89	10.29	7.92	6.58	11.88	12.48	17.07	13.35	11.8	10.8	-

☒ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

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

Notes:

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

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

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

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

Bias Adjustment

Telford and Wrekin Council do not have any co-location studies, neither are triplicated diffusion tube locations utilised. Therefore, the nationally derived factor is used for bias adjustment for Gradko 20xTEA in Water method in 2019. 30 studies have been used to determine the bias adjustment factor of 0.92.

Annualisation

In 2019, there was only one tube that had less than 9 months were of data capture, DT 15. For the annualisation, tubes DT 28 and DT 29 were both selected as they had 100% data capture and are both urban background monitoring locations within the borough.

State Date	End Date	DT28	DT15	DT28 when DT15 is available		DT29	DT15	DT29 when DT15 is Available
9.01.2019	6.2.2019	19.48				16.86		
6.2.2019	6.3.2019	14.99	18.7	14.99		14.15	18.7	14.15
6.3.2019	3.4.2019	9.74				9.96		
3.4.2019	1.5.2019	13.58				12.03		
1.5.2019	5.6.2019	9.23				8.89		
5.6.2019	3.7.2019	10.08	15.59	10.08		10.29	15.59	10.29
3.7.2019	7.8.2019	7.7	11.47	7.7		7.92	11.47	7.92
7.8.2019	4.9.2019	6.9	10.82	6.9		6.58	10.82	6.58
4.9.2019	2.10.2019	11.88	16.41	11.88		11.88	16.41	11.88
2.10.2019	6.11.2019	14.11	20.12	14.11		12.48	20.12	12.48
6.11.2019	4.12.2019	20.24	22.27	20.24		17.07	22.27	17.07
4.12.2019	8.1.2020	9.86	18.63	9.86		13.35	18.63	13.35
	Average:	12.31583	16.75125	11.97	Average:	11.78833	16.75125	11.715
	Ratio:	1.028892			Ratio:	1.00626		
	Raverage:	1.017576			Raverage:	1.017576		
Annualisation of DT15		17.04567						

Distance Correction Calculation

For data captured in 2019, distance correction was applied for location DT 22 (Mill Bank), the annual mean concentration for NO_2 was 40µg/m³ which is the limit set within the National Objective Levels for NO_2. However this kerbside location is not representative of relevant exposure due to public exposure being short term. The closest building façade that relates to long term public exposure is 2.83m away. Once bias adjusted, the predicted annual mean concentration for NO_2 was 34.2µg/m³ at this location.


BUREAU VERITAS		**Enter data into the pink cells**	
Step 1	How far from the KERB was your measurement made (in metres)?	1.24	metres
Step 2	How far from the KERB is your receptor (in metres)?	2.83	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m³)?	6.8	µg/m³
Step 4	What is your measured annual mean NO_2 concentration (in µg/m³)?	40	µg/m³
Result	The predicted annual mean NO_2 concentration (in µg/m³) at your receptor	34.2	µg/m³

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

Legend

🔴 Diffusion Tube Locations

▭ AQMA Boundary

Location: Various across the borough

Title:
Diffusion Tube Locations

Date: 2019
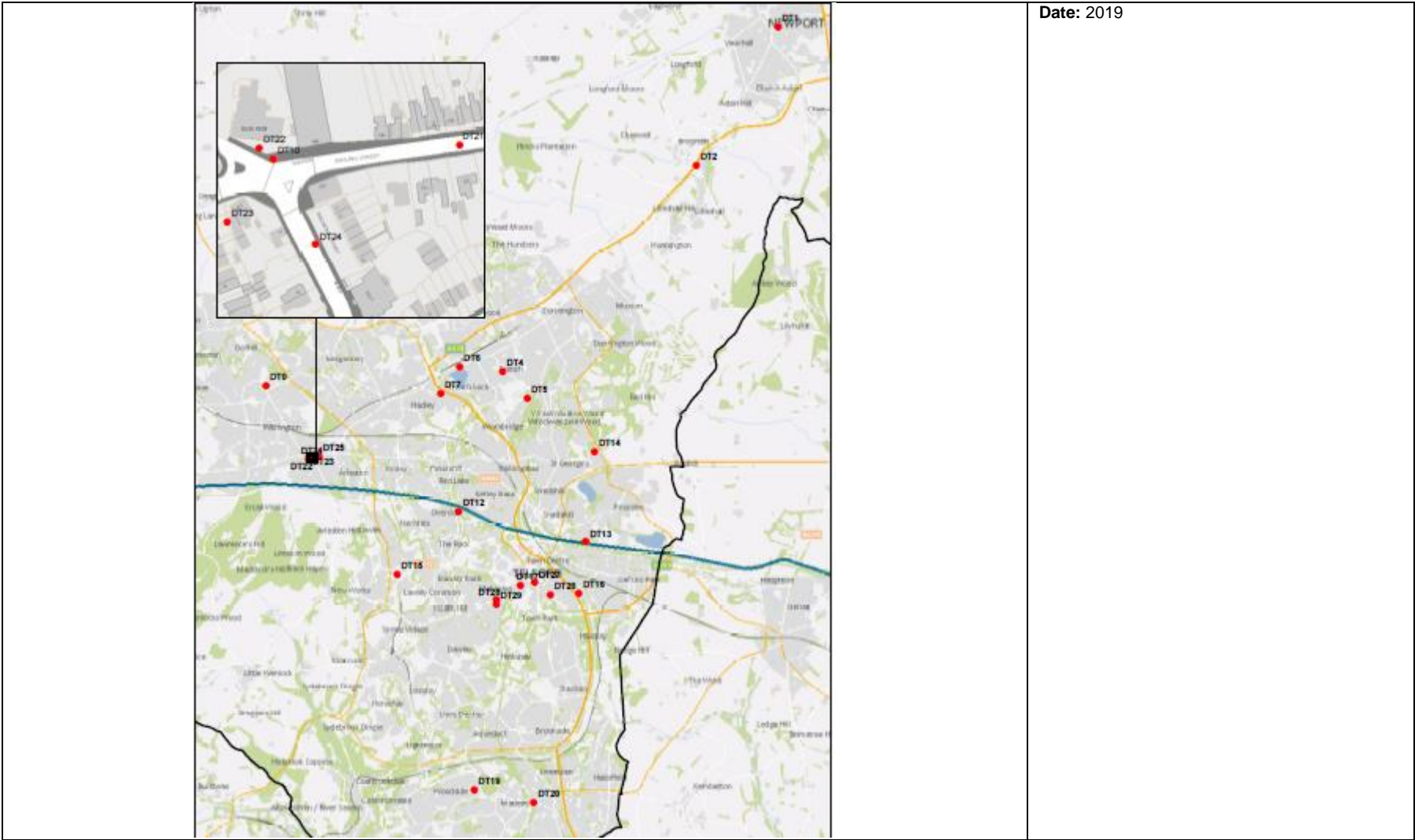
Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[6]	
	Concentration	**Measured as**
Nitrogen Dioxide (NO$_2$)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM$_{10}$)	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO$_2$)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality 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 (micrometres or microns) 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

- Department for Environment Food & Rural Affairs (DEFRA) (2018) *Part IV of the Environment Act 1995 Environment (Northern Ireland) Order 2002 Part III Local Air Quality Management Technical Guidance (TG16) February 2018* Available at: https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf

- Department for Environment Food & Rural Affairs (DEFRA) (2019) National Diffusion Tube Bias Adjustment Factor Spreadsheets. Available at: https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html