Doncaster Council

2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

June 2021

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Executive Summary: Air Quality in Our Area

Air Quality in Doncaster

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].

There are seven areas of poor air quality in Doncaster, these Air Quality Management Areas (AQMAs) are declared due to the pollutant nitrogen dioxide. In 2020, a declaration of a further area of poor air quality close to AQMA7 was made. The village of Marr exceeds the nitrogen dioxide annual average and traffic emissions are the source of this exceedance.

There are no other pollutants in Doncaster that exceed the air quality objectives. A decline in concentrations of nitrogen dioxide over the last 5 – 10 years can be observed in many places across the Borough and particularly in 2019 and then 2020, however parts of the Borough continue to exceed. Monitoring results in 2020 should be viewed with caution because the effect of lockdown, particularly in reducing traffic levels, is unlikely to be sustained.

The AQMAs are located near busy roads in the following areas; Town Centre along Church Way, Balby A630, Hyde Park along Carr House Road A18, Bawtry Road

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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

M18/A638, Conisbrough A630/Low Road, Skellow along the A1 and Hickleton and Marr on the A635. An action plan is in place bringing forward measures to work towards reducing emissions and ultimately achieving compliance with the objectives.

There are no new major sources of pollution in Doncaster that will have a significant impact on the achievement of the air quality objectives however all new proposals are expected to mitigate emissions in line with current best practice thereby minimising cumulative impacts.

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

The progress on the Air Quality Action Plan has been significantly impacted by the Covid-19 pandemic and lockdown across South Yorkshire. While many measures have been delayed or are on hold, it is hoped that actions will be operational again by the end of 2021. In addition, some measures maybe enhanced, if and where, any emergency actions employed to help during lockdown such as temporary bike lanes have been installed these may be incorporated into an accelerated active travel plan.

The priority for the Council is to continue to implement the measures in the air quality action plan and identify further measures that could bring forward compliance, in particular facilitating the change to cleaner vehicles and active travel. The action plan will be

[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

renewed for 2022 and will incorporate any identified measures needed for the new AQMA at Marr.

The risks to implementation remain the same as in previous years and are mainly issues around funding and resource availability. The Clean Air Zones (CAZ) are being implemented over the next 1-2 years and the impact of this on areas without CAZ, such as Doncaster, is still unknown and one the Council is monitoring.

Conclusions and Priorities

In 2020, concentrations of nitrogen dioxide have fallen significantly at roadside and exceedances were identified in only two of the Borough's AQMAs. Trend data continues to show a downward trend across the Borough.

This year's ASR has been complied with the latest data gathered throughout 2020, however due to the impact of lockdown on traffic it is not possible to make any firm conclusions on whether Doncaster's AQMAs should at this point be revoked. It is expected that next year these decisions will be supported by continued and robust monitoring.

At this time, all eight AQMA designations will remain in place.

No developments have been identified that will significantly affect air quality in the Borough.

The Air Quality Action Plan measures have not been progressed in 2020 but activity has re-started in 2021. Additional active travel measures including cycle lanes have been implemented in 2020 using emergency funds provided to the Council. Where possible and suitable to do so these measures will enhance those already within the Plan.

Doncaster Council will prioritise those measures that can be completed within 2021. A new Plan is required for AQMA7A, Doncaster Council will use this opportunity to renew the existing plan and collate measures across the Borough that will work towards improving air quality.

The challenge in 2021 remains obtaining the funding and resources necessary to identify further measures so that Doncaster Council can achieve compliance with the objective in all of the Borough's AQMAs.

Local Engagement and How to get Involved

Doncaster Council publishes the ASR and AQAP on its website. Daily air quality information is published via websites, twitter and regional newspapers as a way to inform residents, schools and businesses of the current levels of air quality. Doncaster Council also engages with a small number of Parish Councils and residents on air quality matters specific to their areas.

A steering group, made up of departments from across the Council, oversees the production and implementation of the Air Quality Action Plan. This group will be widened out to involve other stakeholders as necessary. The Council currently engages with South Yorkshire Passenger Transport Executive and as such bus operators, the Sheffield City Region and individual South Yorkshire Councils and to some extent Highways England. Doncaster Council is also an active member of the Yorkshire and Lincolnshire Pollution Advisory Group (YALPAG).

Local residents, businesses and organisations are key to improving air quality. Individuals can improve air quality by considering the mode of travel they choose carefully, considering purchasing vehicles with the best environmental benefits where possible, sharing knowledge and reducing domestic emissions by considering the impact of choices of heating on the local environment.

Further information can be obtained online at Doncaster Council or through the contact details at the front of this report.

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1 Local Air Quality Management

This report provides an overview of air quality in Doncaster 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 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 Doncaster 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 Doncaster Council can be found in Table 2.1. The table presents a description of the eight AQMAs that are currently designated within Doncaster Council. Appendix D provides maps of AQMAs and the air quality monitoring locations in relation to the AQMA. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO_2 annual mean;
- NO_2 hourly 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
AQMA1	August 1st 2001	NO2 Annual Mean	An area along Church Way through the town centre of Doncaster encompassing the main shopping precinct, transport interchange, college and residential properties.	NO	53	32	Doncaster Air Quality Action Plan 2018	http://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public
AQMA2	August 1st 2001	NO2 Annual Mean	An area along the A630 from Balby to the A1 at Warmsworth encompassing residential properties.	YES	53	40	Doncaster Air Quality Action Plan 2018	http://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public
AQMA3	August 1st 2001	NO2 Annual Mean	An area encompassing residential	NO	43	31	Doncaster Air Quality	http://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public

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
			properties along the A18.				Action Plan 2018	
AQMA4	June 1st 2003	NO2 Annual Mean	An area encompassing a residential estate following the M18 where it crosses the A638.	YES	43	28	Doncaster Air Quality Action Plan 2018	http://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public
AQMA5	April 1st 2012	NO2 Annual Mean	A residential area along the A630 in Conisbrough including the junction with Low Road.	NO	49	36	Doncaster Air Quality Action Plan 2018	http://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public
AQAM6	December 1st 2013	NO2 Annual Mean	A residential area along the A1.	YES	51	30	Doncaster Air Quality Action Plan 2018	http://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public

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
AQMA7	February 1st 2014	NO2 Annual Mean	A village with residential properties along the A635.	YES	86	56	Doncaster Air Quality Action Plan 2018	http://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public
AQMA7A	August 3rd 2020	NO2 Annual Mean	A village with residential properties along the A635.	YES	38	32	No action plan in place - due end of 2021.	-

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

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

2.2 Progress and Impact of Measures to address Air Quality in Doncaster

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

'The report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports.

1. NO_2 concentrations in AQMA 3 and 4 have demonstrated long-term compliance with the annual mean objective. As such, a study commenced in 2020 for AQMA 4 that will be reported on in next year's ASR. As for AQMA 3, monitoring will remain in place to assess the potential revocation of the AQMA. This is supported.

Response: Ongoing monitoring in these areas requires 3 years monitoring to make a final decision on revoking AQMAs. These results are discussed in more detail later in the report.

2. DMBC have compared their local bias adjustment factors to local factors from nearby Councils. This is encouraging to see as it demonstrates that the Council are challenging their own work and questioning whether their local factor is representative. By comparing their local adjustment factor to those of nearby Councils, DMBC can be confident that they are applying a representative factor to their results, thereby providing a reliable insight of air quality within their jurisdiction. This approach is encouraged for future ASRs.

   Response: Doncaster Council continues to review other local bias adjustment factors and is discussed in the appendices.

3. The Council have provided a good discussion of NO_2 trends within each AQMA and outside of the AQMAs. The Council have demonstrated an active engagement with air quality within their AQMAs and are continually reviewing the status of their AQMAs.

Response: It is our intention to maintain and improve upon our reporting, monitoring and engagement activities however, the trend discussion this year will be skewed because of the impact of lockdown.

4. Overall, the Council have provided a good and detailed ASR. They play an active role in monitoring air quality within the borough and in the management of their AQMAs. The Council are encouraged to continue their good work.'

Response: Noted and welcomed.

Doncaster Council has taken forward a limited 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. Fourteen measures are included within Table 2.2, with the type of measure and the progress Doncaster 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.

The table has been colour coded for the purpose of identifying those measures that are expected to be most effective at improving air quality based on potential emission reduction but does not consider deliverability or cost. Those measures highlighted as green are likely to have the biggest impact if delivered, amber for medium impacts and red for small or insignificant.

More detail on these measures can be found in their respective Action Plans, in addition, Doncaster Council has now published its Environment Strategy this will play a key role in forming future measures in the AQAP .

Key measures have been delayed due to resource issues and the need to adhere to lockdown rules at the Local Authority during Covid-19 however, some emergency funding related to active travel has been implemented. The detail on this action is discussed in much more detail in Appendix F: Impact of Covid-19 on LAQM but in brief are:

- Town centre full pedestrianision (temporary)
- Pedestrian priority measures in principal towns including one with an AQMA.
- North Bridge/Trafford Way walking improvements at key pinch point
- Conisbrough to Warmsworth cycle lane
- Thorne Road reallocation of road space on the approach to the town centre
- Balby Road quiet way
- Bennetthopre and South Parade Cycling lane.

- Lakeside encourage walking measures
- Leger Way cycling lane
- Cycle parking

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

- Continuation of all the active travel measures, enhanced by the emergency active travel funds. This incorporates measures 4, 8, 10 and 11. In 2022 a renewed AQAP will be published, at this time it is proposed that these measures be consolidated into one measure in line with other work taking place in the Doncaster Active Travel Alliance.
- Measures 6 and 12 will be removed as the measures are now implemented and will be carried forward as part of business as usual.
- Measure 1 ECO stars is still undergoing consideration for the future steps and further work will be reported on. If funding cannot be found then it is expected this measure will cease altogether next year.
- Measure 14 will be implemented by summer 2021 and evaluation will be undertaken and reported on in the next ASR.
- All other measures will continue to progress in-line with the comments made in Table 2.2.

Doncaster Council's priorities for the coming year are to re-start the activities the Council had implemented prior to Covid-19 but also attempt to capitalise on the opportunities of the lockdown and active travel agenda. In addition, the wider Environment and Sustainability Strategies will play a key role in scaling up efforts to improve air quality and capitalise on co-benefits with the Climate and Biodiversity Emergency declarations.

The principal challenges and barriers to implementation that Doncaster Council anticipates facing are funding and resource issues along with the currently unknown impacts of Covid-19 and CAZ.

Progress on all measures has been slower than expected due to the impact of Covid-19 and lockdown on services and resources.

Doncaster Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in AQMA3, AQMA4 and AQMA7A.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Doncaster Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of AQMA1, AQMA2, AQMA5, AQMA6 and AQMA7.

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	ECO stars Fleet Recognition Scheme	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2010	2021	Doncaster Council, and Barnsley Council.	Air Quality Grant	YES	Fully funded	£100k - £500k	Planning	Low	No. of scheme members.	No progress this year. 173 members 12911 Vehicles registered. The Future Business Case and NRMM work has been completed. Further details provided in the Appendices.	Lack of continuous funding for scheme remains an issue. No current funding identified therefore scheme may be on hold for coming year.
2	Air Quality Planning and Technical Guidance	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2017	2022	Doncaster Council	Doncaster Council	NO	Not Funded	< £10k	Implementation	Low	% of applications with air quality mitigation included.	All relevant applications now screened with this guidance.	Continues to be used on 100% applications that Pollution Control are consulted on.
3	Clean Air Plans	Promoting Low Emission Transport	Low Emission Zone (LEZ)	2017	2022	Doncaster Council	None	NO	Not Funded	£100k - £500k	Planning	High	TBC	Applied for funding but unsuccessful. Measure to be removed until funding identified.	Applied for funding for similar project through Air Quality Grant but unsuccessful due to not being able to demonstrate benefits.
4	Sustainable Travel Access Fund Projects	Promoting Travel Alternatives	Promotion of cycling	2017	2022	Doncaster Council and Sheffield City Region	Sheffield City Region	NO	Partially Funded	£50k - £100k	Implementation	Low	- Dr Bike Services - Cycle Training - Cycle Package	No progress this year due to Covid-19	New funding streams identified and work will continue to progress on various projects going forward all of which will be reported on under this measure.
5	Future Transport (Fleet) Policy	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2017	2022	Doncaster Council	Doncaster Council	NO	Partially Funded	£100k - £500k	Implementation	Medium	% Fleet as Diesel/ Petrol/ ULEV/ Hybrid.	Fleet of electric pool vehicles now available for use across Council Departments and a successful planning approval for solar EV car park.	Funding issues going forward and current working from home policy changes may affect measure.
6	20mph Speed Limits	Traffic Management	Reduction of speed limits, 20mph zones	2017	2021	Doncaster Council	Doncaster Council	NO	Partially Funded	£10k - 50k	Completed	Low	Speed Survey Results	No further progress due to covid-19. 20mph speed limits now implemented in west Bessacarr, parts of Town Moor (Manor Drive/Alderson Drive area) and has commenced in north Wheatley. Preparation work on going for Intake, Thorne (Southfield) and Moorends, and new areas identified as parts of Edlington, Conisbrough and Mexborough.	Implementation to continue but measure to be removed next reporting cycle.

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
8	Cycling Strategy	Promoting Travel Alternatives	Promotion of cycling	2017	2022	Doncaster Council and Sheffield City Region	Sheffield City Region	NO	Funded	< £10k	Implementation	Low	• numbers of people cycling •number of journeys by bicycle • improve health by increasing cycling as part of everyday life	No further progress this year due to covid-19. Strategy currently being updated. Sustrans are developing an implementation to deliver. Get Doncaster Cycling strategy was approved December 2019. The implementation is overseen by the Active Travel Alliance. Recommendations incorporated into Transforming Cities Fund proposals and more recently emergency COVID funding.	Funding and uptake
9	Quality Bus Partnership	Promoting Low Emission Transport	Other	2017	2022	Doncaster Council, SYPTE and Bus Operators	Doncaster Council and Private Business	NO	Not Funded	< £10k	Implementation	Low	% of higher Euro Engine specifications in fleet	Still in place, however nothing further report. Covid-19 likely to have implications moving forward.	Funding and uptake by private companies. Bus de-regulation.
10	Parking Strategy	Policy Guidance and Development Control	Other policy	2017	2022	Doncaster Council	Doncaster Council	NO	Funded	< £10k	Planning	Low	Six EV chargers in Council operated car parks.	Car parking health check completed. Minor increase in EV charging units in Council Car Park and further implementation being considered.	
11	Walking Strategy	Alternatives to private vehicle use	Other	2017	2022	Doncaster Council and Sheffield City Region	Doncaster Council and Sheffield City Region	NO	Funded	< £10k	Implementation	Low	TBC	Activity delayed due to covid-19. 14 Community street audits completed and 44 volunteers trained.	Majority of activity has now paused due to COVID however, some elements considered in the COVID emergency fund.
12	Highways Planned Maintenance Scheme Priority	Traffic Management	Other	2017	2021	Doncaster Council	Doncaster Council	NO	Funded	< £10k	Completed	Low	No. of works co-ordinated	An air quality site rating score has been introduced as part of our scheme priority modelling process; to date no air quality related sites have been identified for planned highway maintenance works in 2019/20.	None.
13	Procurement	Policy Guidance and Development Control	Sustainable Procurement Guidance	2017	2022	Doncaster Council	Doncaster Council	NO	Not Funded	< £10k	Planning	Medium	TBC	None	None.
14	ECO Driver Training	Vehicle Fleet Efficiency	Driver training and ECO driving aids	2018	2022	Doncaster and Barnsley Council	Air Quality Grant	YES	Funded	£10k - 50k	Implementation	Low	No. of companies & No. of drivers	Project delayed due to covid-19.Contract awarded and launch carried out in Doncaster. First sessions carried out prior to covid-19 halting the project. Altered project to online, and designed a module that can be accessed remotely. Currently launched but with limited uptake due to covid but evaluation should be completed by the end of 2021.	

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.

The Public Health Outcomes Framework indicator for Doncaster (2019) for deaths attributable to $PM_{2.5}$ stands at 5.0%, which is lower than the national average (5.1%) but higher than the Yorkshire and Humber average (4.8%).

Doncaster Council is taking the following measures to address $PM_{2.5}$:

- Smoke Control Orders are in place across the Borough with complaint led enforcement and screening of any relevant planning applications
- Promotion of ULEV, modal shift and active travel in the AQAP
- Public Health Action Plan (see appendices).

$PM_{2.5}$ monitoring has been implemented in Doncaster for 2020 and an expansion of monitoring into a further three sites to be rolled out gradually over the next three years. Monitoring data is discussed in Section 3 of this report.

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

This section sets out the monitoring undertaken within 2020 by Doncaster Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a nine-year period between 2012 and 2020 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Doncaster Council undertook automatic (continuous) monitoring at six sites during 2020. In addition, a new station was installed in AQMA7; unfortunately, data from this station was not available for this report but should be available for 2022. Table A.1 in Appendix A shows the details of the automatic monitoring sites.

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

3.1.2 Non-Automatic Monitoring Sites

Doncaster Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 59 sites during 2020. 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.

Outside of the AQMAs there are no exceedances of the objectives where relevant exposure exists in 2020.

All the AQMAs in 2020, with the exception of AQMA7 and one location in AQMA2, are below the objective for the first time however this is expected to be an anomoly related to the Covid-19 lockdown. Further discusson on this can be found in the appendices. Furthermore the exceedence in AQMA2 is at roadside and when distance corrected the predicted concentration at the receptor is in complaince with the objective. .

AQMA 1, 3 and 4 have for some time seen monitored levels fall below the objective at long-term sites and therefore further short-term studies have been carried out since 2018 for 2 of these areas and monitoring implemented in 2020 for the 3rd area.

The data comprises DT60-64 for AQMA 1, DT65-67 for AQMA3 and DT68/DT69 for AQMA4. In AQMA1 monitoring shows compliance with the objective in 2020 however previous years have shown clear exceedences and therefore 2020 is considered an anomoly and the AQMA status remains justified. AQMA3 data has continually shown that all sites are now compliant and below the objective at receptors, in most cases well below. The monitoring will remain in place to establish whether this AQMA can be revoked, normally 3 years data would be enough to indicate that an AQMA could be revoked however given the nature of the extreme conditions of 2020 Doncaster Council intends to collect a further year of monitoring prior to making a final descision. New monitoring data in AQMA4 shows levels well below the objective inline with the longer-term data in this

area. Monitoring will continue for the next 2 years to identify whether compliance is maintained over the period, particularly as there is significant development forecast around this location in the future.

In conclusion the AQMAs remain valid for the current time but will continue to be reviewed, with a view to revoking those that continue to comply with the objectives.

Non-automatic monitoring identified no locations where annual mean concentrations were above 60µg/m^3 and are therefore likely to lead to an exceedance of the hourly objective. This is considered to revert back to normal patterns in 2021 where some sites within AQMA7 are likely to indicate an exceedance. Doncaster Council will continue to review data in the area. There were no exceedances of the hourly objective recorded by the automatic monitoring stations at any point over the last five years.

Long term trend graphs, Figure A.1. to A.8. have been included in Appendix A and present an overall positive position of annual mean nitrogen dioxide concentrations in Doncaster. The trends do not consider the current 2020 data, while included in the graph, as this is expected to skew any trends. While the 2020 data has not been used to assess trends it should be noted that results from last year are considerably lower than previous years.

The long-term monitoring data outside AQMAs continues to indicate a clear downward trend. This pattern is also seen across all AQMAs with the exception of AQMA7 where the trend is flat over the whole monitoring period. The downward trend is more pronounced in some AQMAs than others however with improvements in AQMA2 in particular being less significant.

3.2.2 Particulate Matter (PM_{10})

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

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

There are no recorded exceedances of PM_{10} across any of the monitoring sites in Doncaster and therefore both the annual and daily mean objectives are considered to be met within the Borough.

Figure A.9. shows the long-term trend of PM_{10} monitoring results in Doncaster and shows a general downward trend; however, an increase can be observed at site CM2 in 2020. New equipment has been installed, that meets with Defra approved standards and is likely to have improved accuracy at this location and may account for this change. Monitoring will continue but the results confirm that concentrations are within the objective.

Upgraded monitoring across several of the air quality monitoring stations is planned for PM_{10} in future.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.8 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for 2020 representing the first year of monitoring conducted in Doncaster.

Doncaster Council has committed to improve the understanding of the concentrations of $PM_{2.5}$ across the Borough and have comitted to four monitoring sites, located alongside existng PM_{10} and NO_x monitoring in the coming three years.

In previous years PM_{10} data has been used to estimate the $PM_{2.5}$ fraction and along with Defra modelling, concentrations of $PM_{2.5}$ across Doncaster were predicted to be low. The limited monitoring at this time supports this conclusion.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
CM1	Unit 1 A18 Carr House Road	Roadside	458027	402475	NO2; PM10	AQMA3	Chemiluminescent Analyser; TEOM	4	1.7	3
CM2	Unit 3 Market Place	Urban centre	457669	403611	NO2; PM10; PM2.5	AQMA1	Chemiluminescent Analyser; BAM	30.7	20	3
CM3	Unit 4 A1/A630 Grosvenor Terrace	Roadside	454964	400745	NO2	AQMA2	Chemiluminescent Analyser	15.7	7.3	3
CM4	Unit 6 A638 Bawtry Road	Roadside	462278	400111	NO2	AQMA4	Chemiluminescent Analyser	20	2.2	3
CM5	Unit 10 A6023 Low Road, Conisbrough	Roadside	451438	398528	NO2; PM10	AQMA5	Chemiluminescent Analyser; TEOM	17	2.95	2
CM6	A1, Skellow	Roadside	452185	410380	NO2	AQMA6	Chemiluminescent	11	2.5	2
CM7	Hickleton	Roadside	448067	405300	NO2; PM10; PM2.5	AQMA7	Chemiluminescent Analyser, FIDAS	16.6	4.6	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.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT1	North Bridge (North)	Kerbside	456946	403763	NO2	N	20+	0.8	No	2.0
DT2	North Bridge (South)	Roadside	457308	403458	NO2	AQMA1	20+	9.2	No	2.0
DT3	Regent Sq.	Kerbside	457952	403123	NO2	N	1.0	0.5	No	2.0
DT4	South Parade	Roadside	457975	403134	NO2	N	20+	2.0	No	2.0
DT5	Bennethorpe Road	Kerbside	459113	402842	NO2	N	20+	0.5	No	2.0
DT6	Carr House Road	Roadside	459533	402768	NO2	AQMA3	20+	6.8	No	2.0
DT7	Sheep bridge Lane	Kerbside	462899	399328	NO2	N	20+	1.0	No	2.0
DT8	Hayfield Lane	Roadside	463023	399428	NO2	N	20+	2.3	No	2.0
DT9	Hurst Lane	Kerbside	463888	398416	NO2	N	20+	0.8	No	2.0
DT10	Hayfield Lane/Hurst Lane	Kerbside	464879	399699	NO2	N	20+	0.7	No	2.0
DT11	Gattison Lane	Roadside	461334	397977	NO2	N	13.3	2.3	No	2.0
DT12	West End Lane	Roadside	461164	398459	NO2	N	23.8	2.0	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT13	Bawtry Road	Roadside	462242	400134	NO2	AQMA3	20+	3.5	No	2.0
DT14	Stoops Lane	Roadside	461362	400777	NO2	N	14.0	3.2	No	2.0
DT15	Dunniwood Avenue	Roadside	461875	400396	NO2	N	9.5	1.5	No	2.0
DT16	Burnham Close	Roadside	460703	400559	NO2	N	10.8	1.2	No	2.0
DT17	Lindrick Close	Roadside	459947	401538	NO2	N	7.5	3.0	No	2.0
DT18	Cantley Lane	Roadside	460342	402108	NO2	N	12.5	1.2	No	2.0
DT19	Gliwice Way (Dome)	Roadside	459745	402638	NO2	N	20+	3.3	No	2.0
DT20	Gliwice Way (Town)	Roadside	459721	402650	NO2	N	20+	2.3	No	2.0
DT21	Hall Flat Junction	Roadside	456164	401227	NO2	AQMA2	6.0	1.5	No	2.0
DT22	Warde Avenue	Roadside	455679	401000	NO2	AQMA2	10.7	2.5	No	2.0
DT23	Low Road	Kerbside	451457	398659	NO2	AQMA5	1.2	1.0	No	2.0
DT24	Clifton Hill Junction	Roadside	451419	398540	NO2	AQMA5	2.7	2.2	No	2.0
DT25	Waverley Avenue	Roadside	455635	401002	NO2	AQMA2	20+	1.5	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT26	High Road	Roadside	456130	401258	NO2	AQMA2	20+	2.5	No	2.0
DT27	Belmont Avenue	Roadside	457010	402056	NO2	AQMA2	1.0	1.5	No	2.0
DT28	Mansfield Road	Roadside	457022	402141	NO2	AQMA2	0.3	3.7	No	2.0
DT29	Airport – Hayfield Lane	Roadside	464986	399697	NO2	N	0.0	8.7	No	2.0
DT30	Airport – Gate House Lane	Roadside	465719	400140	NO2	N	9.3	6.0	No	2.0
DT31	Airport – Mosham Road	Roadside	466895	400405	NO2	N	0.0	11.3	No	2.0
DT32	Airport – Rose Cottage	Roadside	467174	400372	NO2	N	0.0	5.5	No	2.0
DT33	Airport – Hatfield Moors	Background	468629	404336	NO2	N	20+	N/A	No	2.0
DT34	Airport – Hatfield Woodhouse	Roadside	467755	408643	NO2	N	20+	2.3	No	2.0
DT35	Airport - Hollinbridge Lane	Background	469056	407623	NO2	N	20+	N/A	No	2.0
DT36	Market Place	Roadside	457615	403630	NO2	AQMA1	20+	6.3	No	2.0
DT37	Church Way	Roadside	457379	403460	NO2	AQMA1	4.0	4.0	No	2.0
DT38	Stainforth	Urban background	464046	411818	NO2	N	20+	9.3	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT39	Howden Avenue, Skellow	Roadside	452219	410224	NO2	AQMA6	0.0	7.0	No	2.0
DT40	Hill Crest, Skellow	Kerbside	452195	410302	NO2	AQMA6	0.3	7.6	No	2.0
DT41	Five Lane Ends, A1, Skellow	Roadside	452180	410377	NO2	AQMA6	6.7	9.4	No	2.0
DT42	Skellow – Crabgate Lane	Roadside	452180	410402	NO2	AQMA6	15.0	1.0	No	2.0
DT43	Skellow – Hampole Balk	Roadside	452192	410389	NO2	AQMA6	12.0	1.8	No	2.0
DT44	Hickleton – Sue Ryder Care Home	Kerbside	448221	405303	NO2	AQMA7	3.0	1.0	No	2.0
DT45	Hickleton – Doncaster Road	Roadside	447966	405303	NO2	AQMA7	0.0	14.4	No	2.0
DT46	Hickleton – Barnsley Road	Roadside	448149	405296	NO2	AQMA7	0.0	3.6	No	2.0
DT47	Hickleton – Opp. Fir Tree Close	Kerbside	448054	405319	NO2	AQMA7	0.3	0.8	No	2.0
DT48	Hickleton – John O'Gaunts	Kerbside	448218	405320	NO2	AQMA7	0.3	0.8	No	2.0
DT49	Marr	Kerbside	451331	405219	NO2	AQMA7A	0.0	3.1	No	2.0
DT50	Thorne – King Street	Roadside	468749	413300	NO2	N	0.5	2.0	No	2.0
DT51	Willow Street, Conisbrough	Roadside	451446	398582	NO2	AQMA5	20+	2.1	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT52	Doncaster Road (Junction), Conisbrough	Roadside	451485	398514	NO2	AQMA5	2.0	2.0	No	2.0
DT53	27 Low Road, Conisbrough	Kerbside	451453	398632	NO2	AQMA5	0.0	1.9	No	2.0
DT54	32/34 Low Road, Conisbrough	Roadside	451440	398652	NO2	AQMA5	0.3	1.8	No	2.0
DT55	Doncaster Road, Conisbrough	Roadside	451624	398690	NO2	AQMA5	0.0	6.0	No	2.0
DT56	Mason Arms, Mexborough	Roadside	448047	399880	NO2	N	3.0	4.0	No	2.0
DT57	Doncaster Road, Mexbrough	Roadside	448004	399862	NO2	N	13.0	2.0	No	2.0
DT58	Barnsley Road, Marr	Kerbside	451824	405228	NO2	AQMA7A	0.3	1.0	No	2.0
DT59	Bus Stop, Marr	Roadside	451514	405247	NO2	AQMA7A	0.0	18.0	No	2.0
DT60	St Leger Place	Roadside	457870	403839	NO2	AQMA1	0.5	7.0	No	2.0
DT61	Dockin Hill Road	Roadside	457791	403767	NO2	AQMA1	0.5	15.5	No	2.0
DT62	Church Way	Roadside	457733	403740	NO2	AQMA1	0.5	7.0	No	2.0
DT63	Market Road	Roadside	457701	403579	NO2	AQMA1	0.0	1.7	No	2.0
DT64	The Swan	Roadside	457345	403433	NO2	AQMA1	0.0	13.4	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT65	Somerset Road	Roadside	457995	402506	NO2	AQMA3	3.7	8.0	No	2.0
DT66	Carr House 1	Roadside	458142	402563	NO2	AQMA3	0.0	5.8	No	2.0
DT67	Carr House 2	Roadside	458259	402582	NO2	AQMA3	0.0	6.3	No	2.0
DT68	High Grove Court	Roadside	462520	400757	NO2	AQMA4	0.0	4.7	No	2.0
DT69	M18 nr High Grove Court	Roadside	462500	400708	NO2	AQMA4	0.0	12.9	No	2.0

Notes:

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

(2) N/A if not applicable.

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CM1	458027	402475	Roadside		96	20	28.6		20.1	30.3
CM2	457669	403611	Urban centre			**46.8**	26.1	25.6		
CM3	454964	400745	Roadside			**43.1**	23.9		23	
CM4	462278	400111	Roadside				37.2	28.1		
CM5	451438	398528	Roadside		82	31.6	37	30.5	25.4	22.8
CM6	452185	410380	Roadside		96	39.2	**45.8**	37.3	27.9	27.2

☒ **Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16**

☒ **Reported concentrations are those at the location of the monitoring site (annualised, as required), i.e. prior to any fall-off with distance correction**

Notes:

The annual mean concentrations are presented as µg/m^3.

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

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

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

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

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

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
DT1	456946	403763	Kerbside	100	99.7	33.0	33.0	32.0	28.4	22.5
DT2	457308	403458	Roadside	100	99.7	**40.0**	**41.0**	**41.0**	36.8	31.9
DT3	457952	403123	Kerbside	100	99.7	33.0	33.0	31.0	27.2	22.9
DT4	457975	403134	Roadside	100	99.7	**40.0**	**45.0**	39.0	35.2	29.7
DT5	459113	402842	Kerbside	100	99.7	39.0	**43.0**	37.0	34.7	27.8
DT6	459533	402768	Roadside	83%	82.1	30.0	35.0	30.0	28.9	21.4
DT7	462899	399328	Kerbside	100	99.7	35.0	**43.0**	-	30.1	24.6
DT8	463023	399428	Roadside	100	99.7	28.0	26.0	26.0	23.1	17.5
DT9	463888	398416	Kerbside	100	99.7	33.0	37.0	27.0	20.0	15.3
DT10	464879	399699	Kerbside			23.0	25.0	22.0	22.0	-
DT11	461334	397977	Roadside	83	83.0	25.0	24.0	24.0	27.2	21.6
DT12	461164	398459	Roadside			27.0	28.0	27.0	26.4	-
DT13	462242	400134	Roadside	92	92.0	**43.0**	**44.0**	**41.0**	38.3	28.8

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
DT14	461362	400777	Roadside	100	99.7	**41.0**	**44.0**	37.0	37.3	28.9
DT15	461875	400396	Roadside			23.0	**Ceased**	**Ceased**	**Ceased**	-
DT16	460703	400559	Roadside			24.0	**Ceased**	**Ceased**	**Ceased**	-
DT17	459947	401538	Roadside			23.0	**Ceased**	**Ceased**	**Ceased**	-
DT18	460342	402108	Roadside			26.0	**Ceased**	**Ceased**	**Ceased**	-
DT19	459745	402638	Roadside			**41.0**	**Ceased**	**Ceased**	**Ceased**	-
DT20	459721	402650	Roadside			**40.0**	**Ceased**	**Ceased**	**Ceased**	-
DT21	456164	401227	Roadside	100	99.7	**47.0**	**50.0**	**50.0**	**46.2**	36.9
DT22	455679	401000	Roadside	100	99.7	**48.0**	**50.0**	**52.0**	**46.1**	37.5
DT23	451457	398659	Kerbside	100	99.7	37.0	**41.0**	**40.0**	37.6	29.8
DT24	451419	398540	Roadside	92	90.1	**40.0**	**41.0**	**43.0**	39.1	32.0
DT25	455635	401002	Roadside	100	99.7	38.0	**41.0**	**41.0**	37.9	29.9
DT26	456130	401258	Roadside	100	99.7	35.0	38.0	39.0	34.2	27.1
DT27	457010	402056	Roadside	100	99.7	**44.0**	**48.0**	**45.0**	**40.0**	33.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
DT28	457022	402141	Roadside	100	99.7	**52.0**	**52.0**	**57.0**	**49.0**	**40.4**
DT29	464986	399697	Roadside			17.0	19.0	16.0	15.9	-
DT30	465719	400140	Roadside	100	99.7	18.0	18.0	19.0	16.0	13.6
DT31	466895	400405	Roadside	100	99.7	17.0	17.0	16.0	14.1	11.6
DT32	467174	400372	Roadside	100	99.7	20.0	18.0	19.0	15.4	13.0
DT33	468629	404336	Background	92	90.7	10.0	12.0	11.0	8.7	7.9
DT34	467755	408643	Roadside	100	99.7	22.0	23.0	21.0	18.5	14.4
DT35	469056	407623	Background			12.0	12.0	13.0	9.9	-
DT36	457615	403630	Roadside	100	99.7	38.0	**41.0**	37.0	31.9	27.9
DT37	457379	403460	Roadside	83	80.5	**41.0**	**41.0**	**41.0**	39.0	29.9
DT38	464046	411818	Urban background	100	99.7	18.0	18.0	19.0	15.6	13.8
DT39	452219	410224	Roadside	100	99.7	**45.0**	**47.0**	**41.0**	36.7	27.6
DT40	452195	410302	Kerbside	100	99.7	**48.0**	**48.0**	**45.0**	38.1	28.9
DT41	452180	410377	Roadside	100	99.7	**53.0**	**55.0**	**48.0**	**40.8**	30.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
DT42	452180	410402	Roadside	100	99.7	**43.0**	**46.0**	**43.0**	38.0	26.7
DT43	452192	410389	Roadside	100	99.7	**42.0**	**43.0**	**40.0**	34.0	24.4
DT44	448221	405303	Kerbside	100	99.7	**78.0**	**79.0**	**70.0**	**67.0**	**50.7**
DT45	447966	405303	Roadside	92	99.7	23.0	25.0	25.0	22.0	16.8
DT46	448149	405296	Roadside	100	90.7	**41.0**	37.0	**40.0**	35.0	24.9
DT47	448054	405319	Kerbside	100	99.7	**106.0**	**100.0**	**91.0**	**76.0**	**59.4**
DT48	448218	405320	Kerbside	100	99.7	**93.0**	**90.0**	**87.0**	**80.0**	**55.8**
DT49	451331	405219	Kerbside	92	92.3	**44.0**	**46.0**	**43.0**	37.0	27.4
DT50	468749	413300	Roadside	100	99.7	**41.0**	**40.0**	**41.0**	38.0	28.5
DT51	451446	398582	Roadside	100	99.7	32.0	34.0	35.0	31.0	24.3
DT52	451485	398514	Roadside	100	99.7	**42.0**	**43.0**	**44.0**	39.0	30.9
DT53	451453	398632	Kerbside	100	99.7	**42.0**	**42.0**	**43.0**	36.2	29.1
DT54	451440	398652	Roadside	100	99.7	**46.0**	**48.0**	**47.0**	**44.1**	36.1
DT55	451624	398690	Roadside	100	99.7	31.0	36.0	34.0	31.0	23.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
DT56	448047	399880	Roadside	100	99.7	37.0	**40.0**	**41.0**	38.0	28.3
DT57	448004	399862	Roadside	83	82.4	38.0	38.0	**45.0**	37.0	27.0
DT58	451824	405228	Kerbside	100	99.7		**46.0**	**43.0**	38.0	31.6
DT59	451514	405247	Roadside				22.0	23.0	20.0	-
DT60	457870	403839	Roadside	100	99.7			**43.5**	36.9	29.3
DT61	457791	403767	Roadside	100	99.7			**42.0**	37.0	27.4
DT62	457733	403740	Roadside	92	92.0			**53.1**	**45.3**	32.9
DT63	457701	403579	Roadside	83	83.0			**49.7**	**42.3**	28.9
DT64	457345	403433	Roadside	100	99.7			**48.6**	**44.1**	33.2
DT65	457995	402506	Roadside	92	92.0			38.6	34.0	27.7
DT66	458142	402563	Roadside	100	99.7			**42.9**	37.5	30.9
DT67	458259	402582	Roadside	100	99.7			38.0	31.8	26.3
DT68	462520	400757	Roadside	100	99.7					16.4
DT69	462500	400708	Roadside	100	99.7					18.2

☒ **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 µg/m^3.

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

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

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.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 NO_2 Concentrations – AQMA1

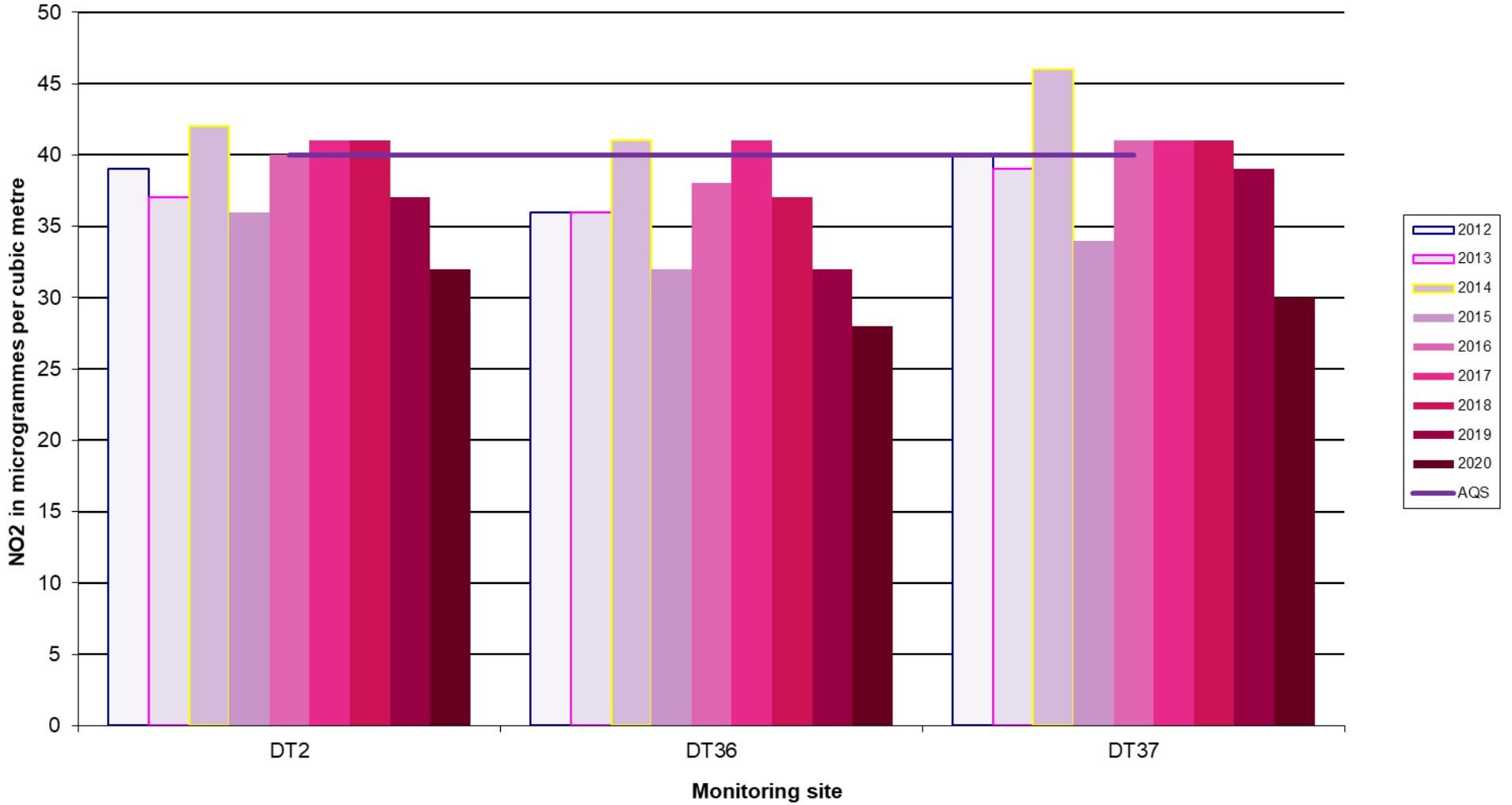


Figure A.2 – Trends in Annual Mean NO_2 Concentrations – AQMA2

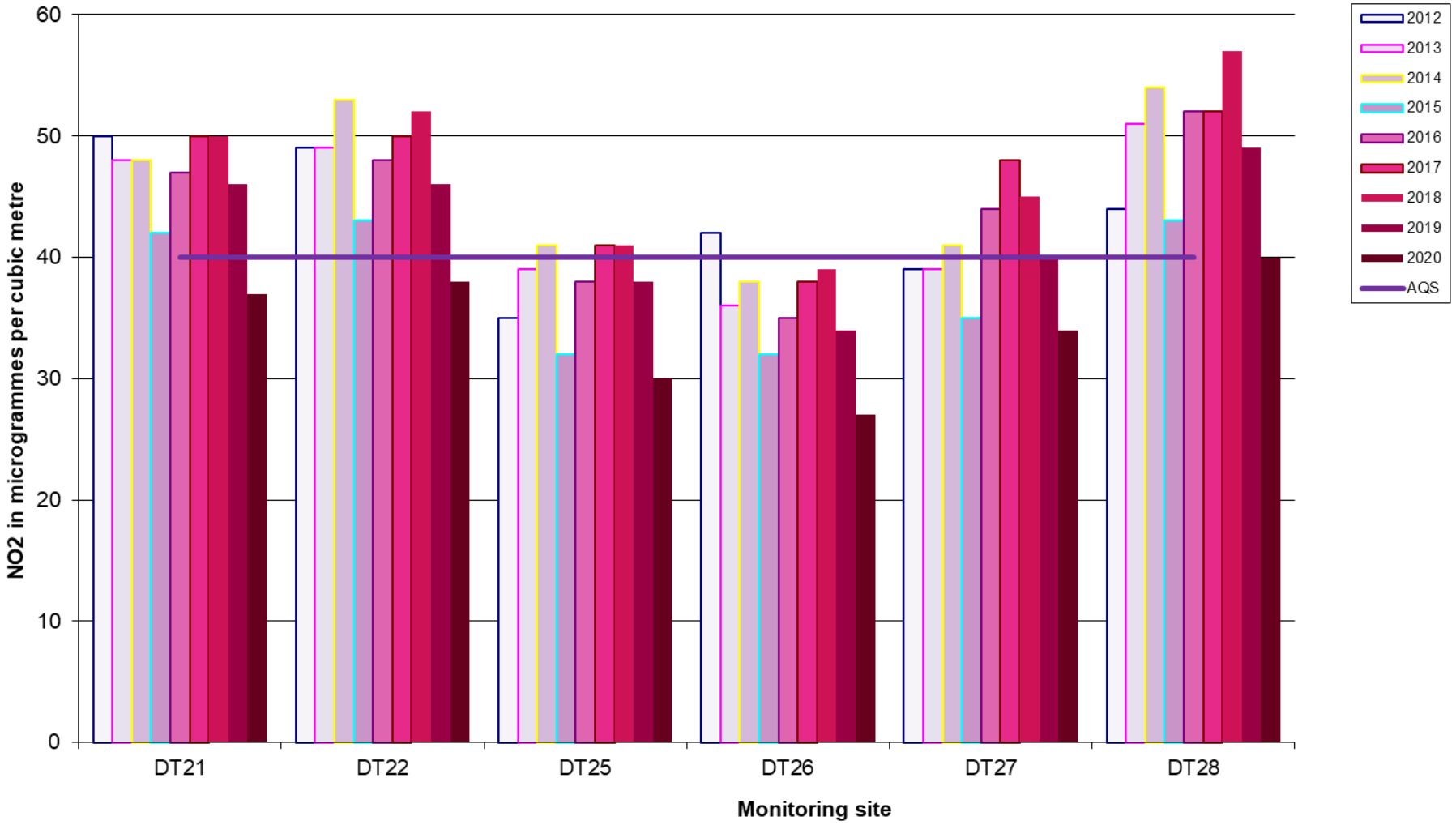


Figure A.3 – Trends in Annual Mean NO_2 Concentrations – AQMA3

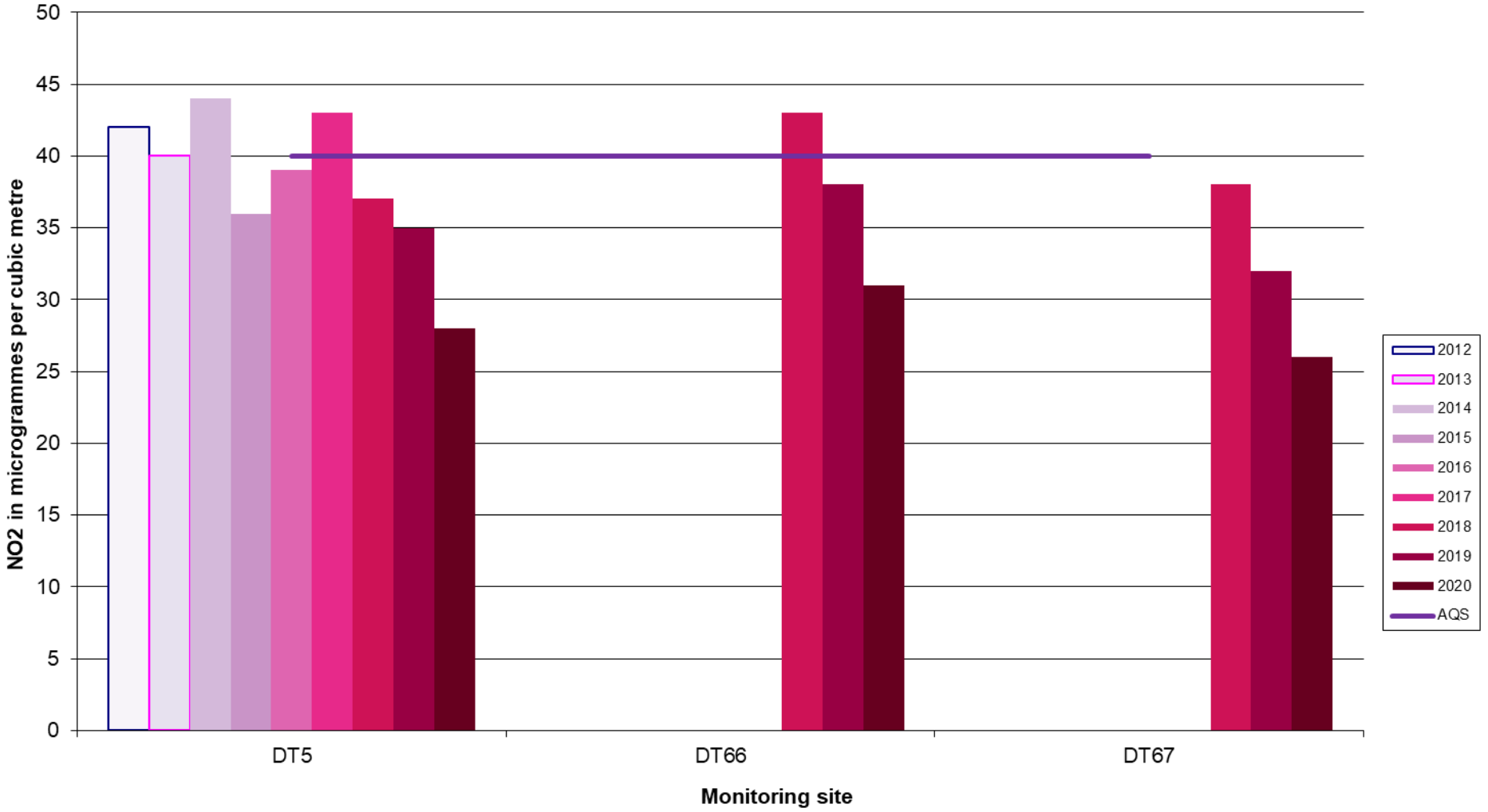


Figure A.4 – Trends in Annual Mean NO_2 Concentrations – AQMA4

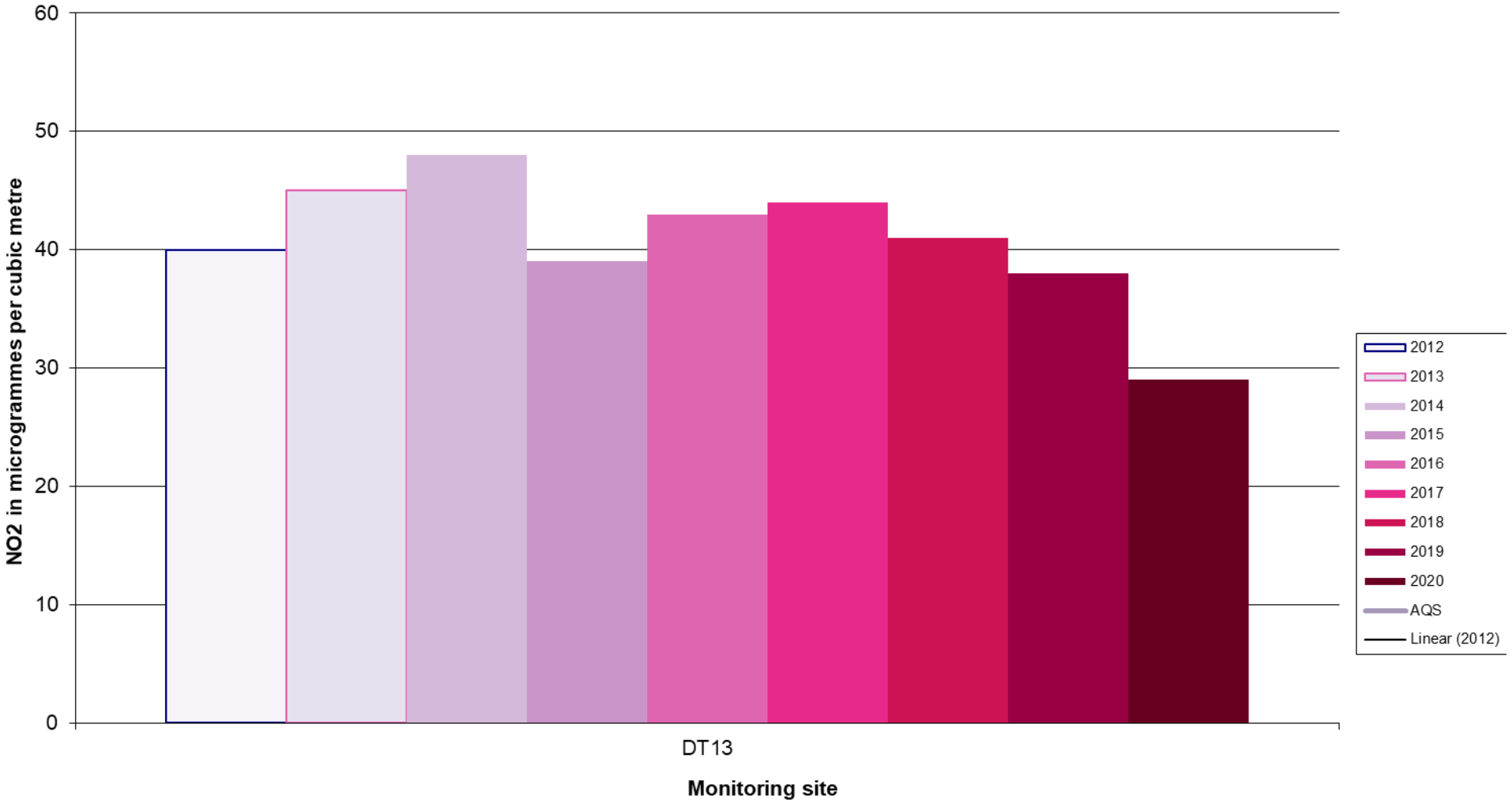


Figure A.5 – Trends in Annual Mean NO_2 Concentrations – AQMA5

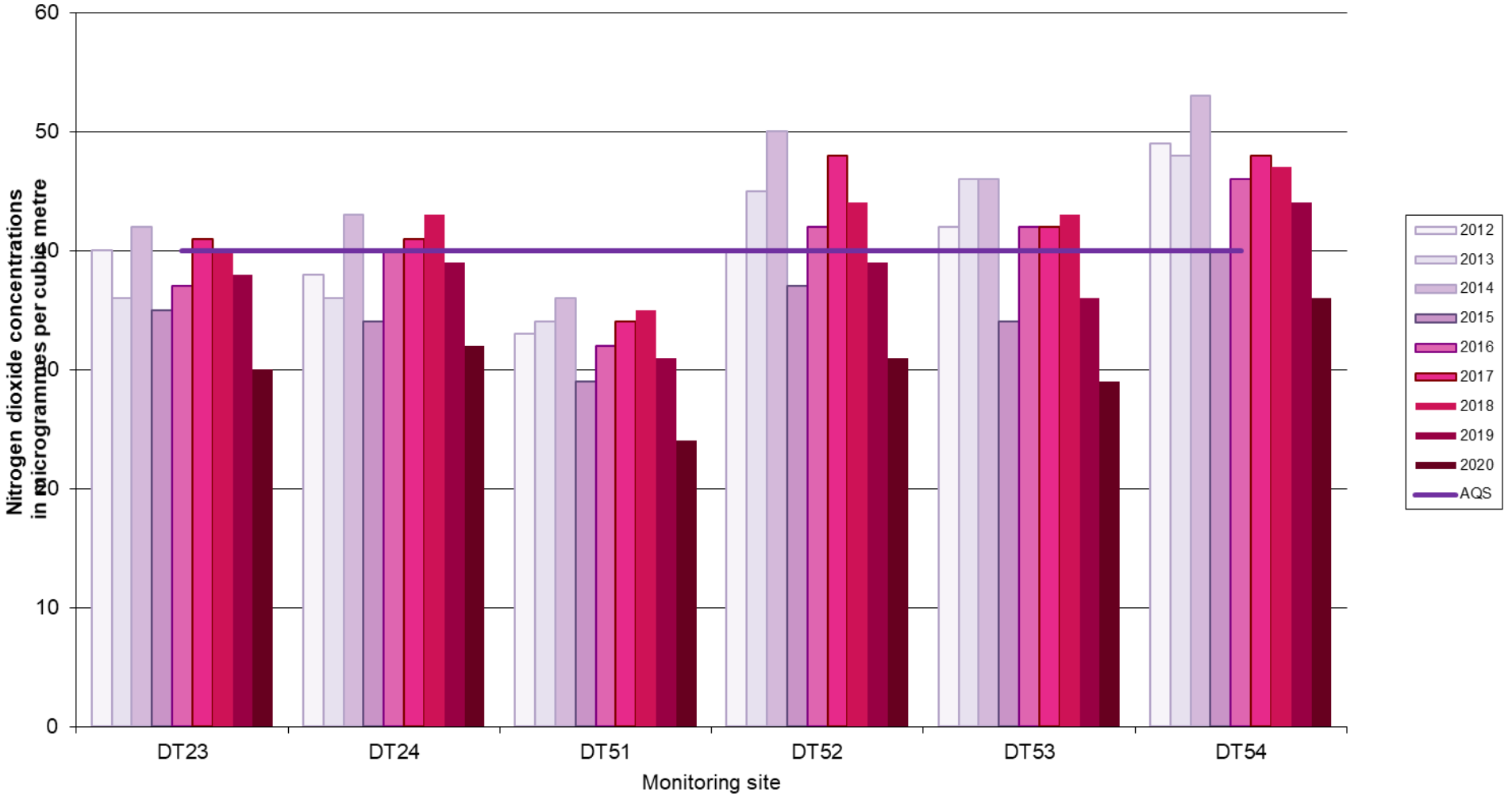


Figure A.6 – Trends in Annual Mean NO_2 Concentration – AQMA6

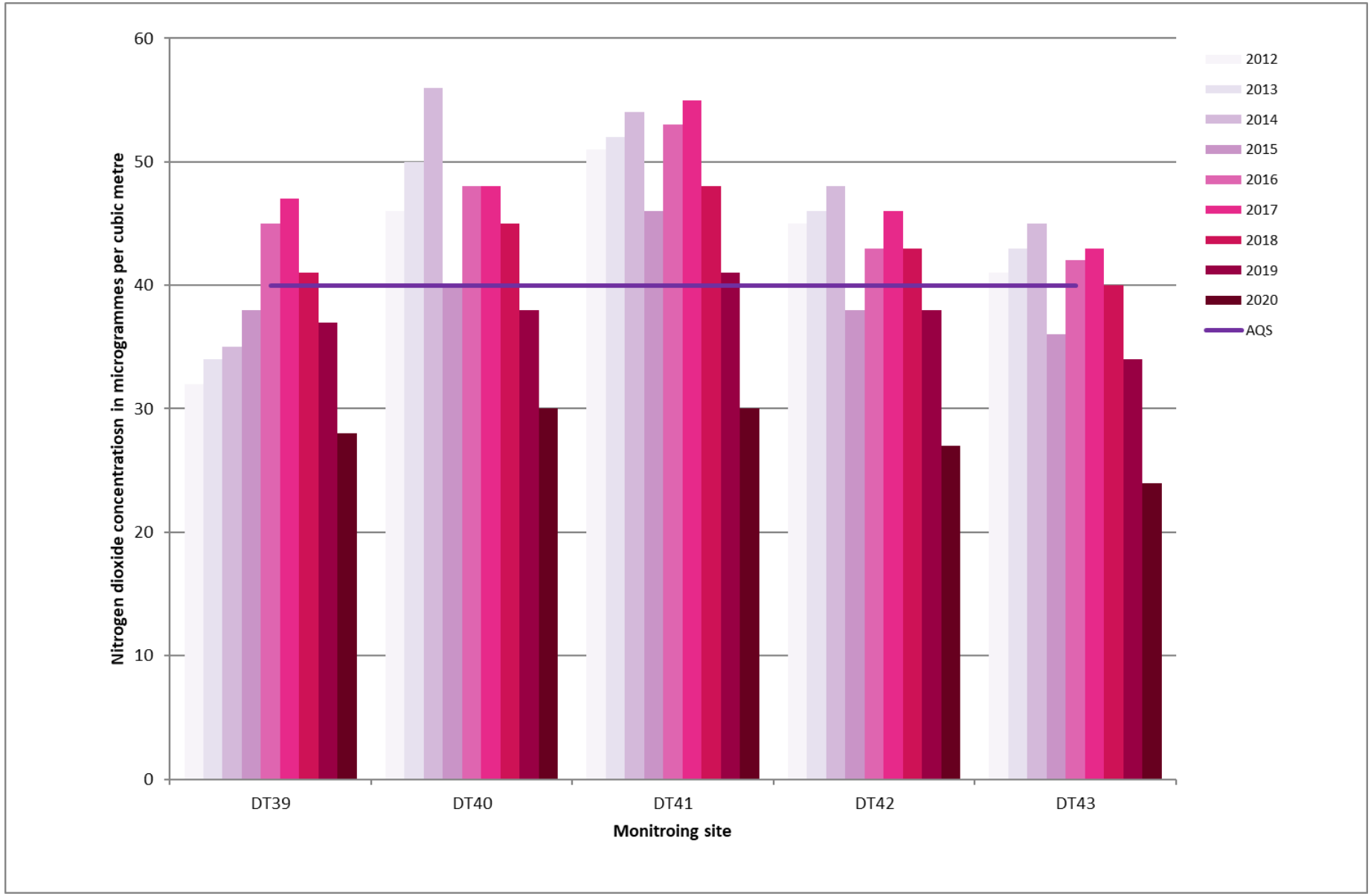


Figure A.7 – Trends in Annual Mean NO_2 Concentrations – AQMA7

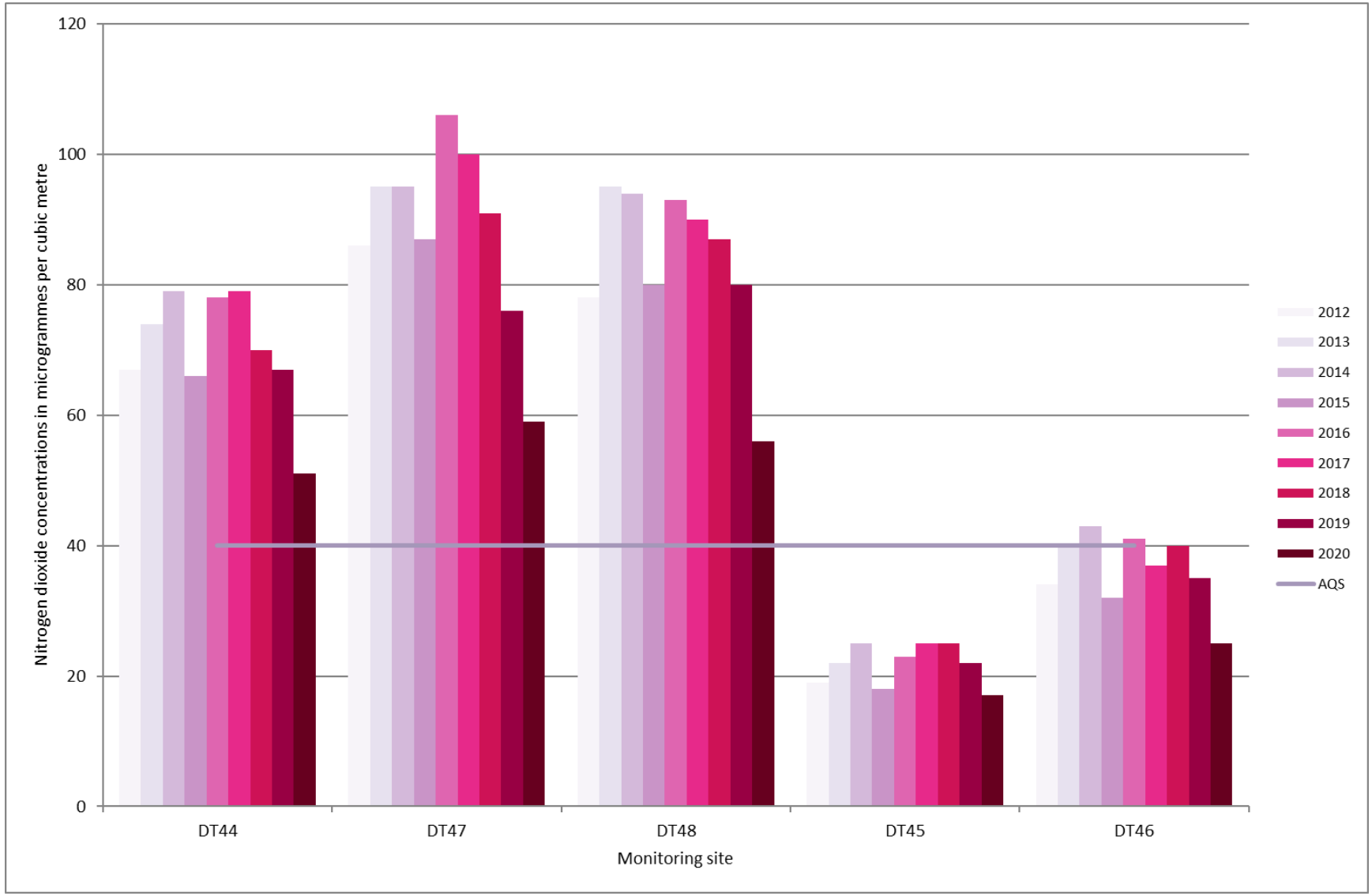


Figure A.8 – Trends in Annual Mean NO_2 Concentrations –AQMA7A

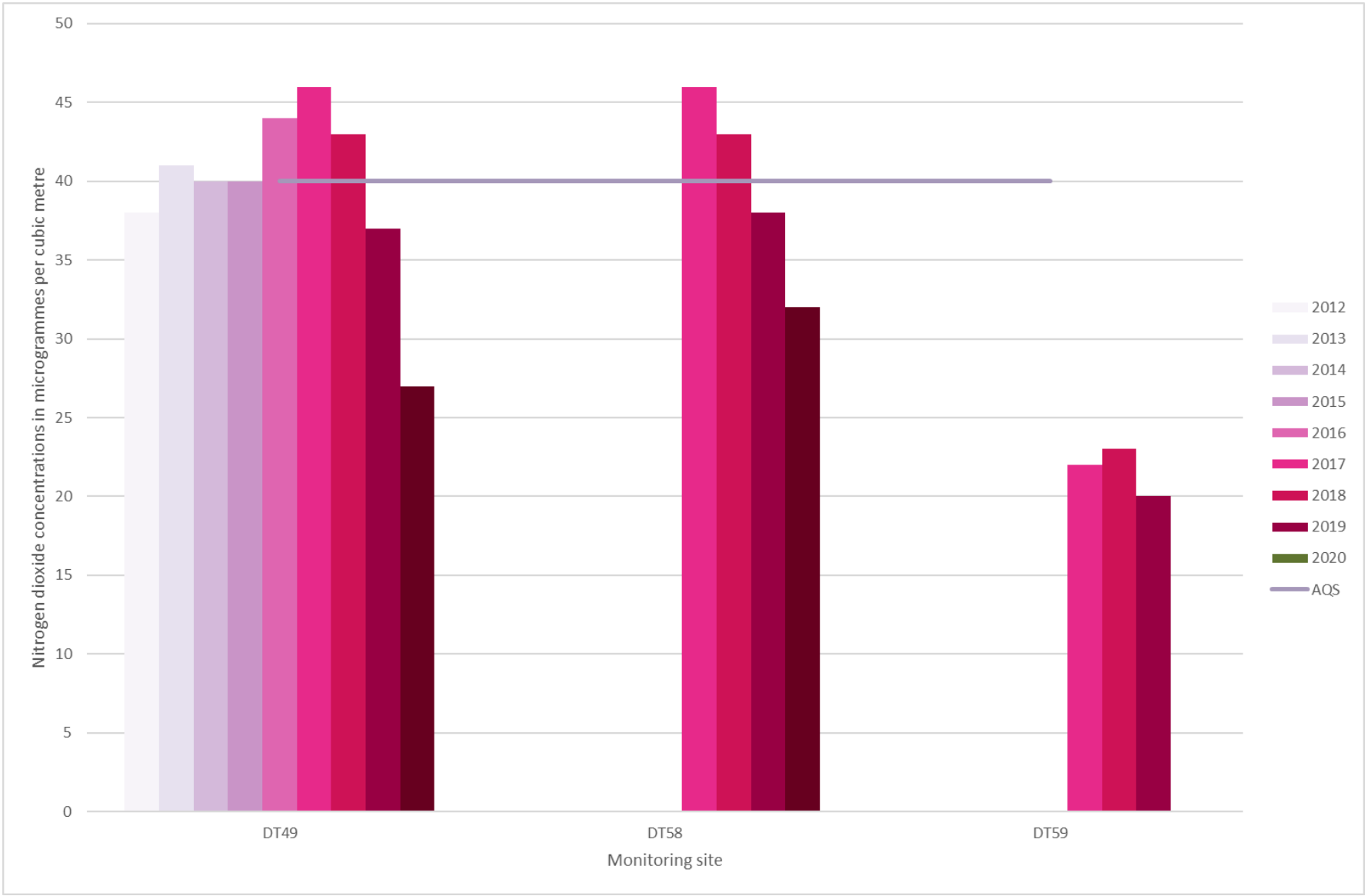


Figure A.8 – Trends in Annual Mean NO_2 Concentrations – Out of Doncaster's AQMAs

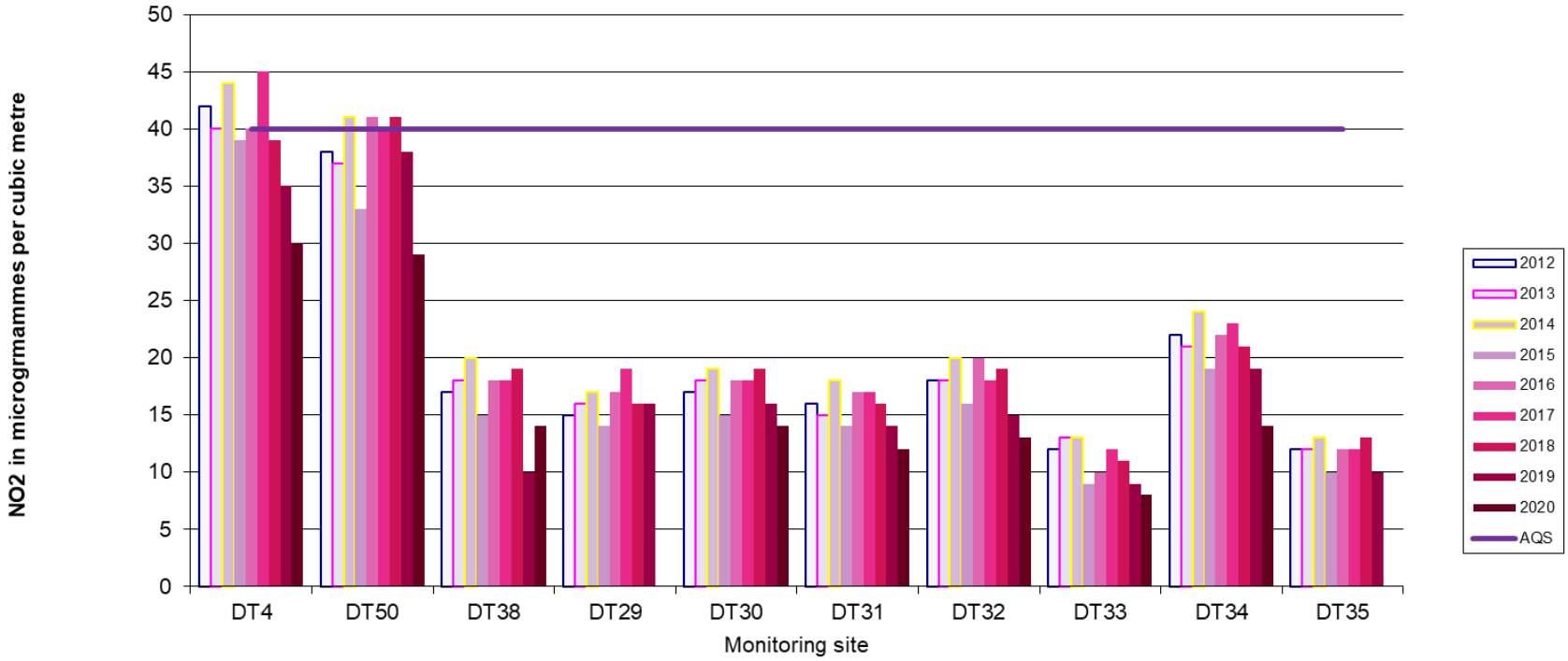


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CM1	458027	402475	Roadside		96	0(45.5)	0 (93.6)	-	0 (48.7)	0
CM2	457669	403611	Urban centre			0(126.6)	0	0	-	-
CM3	454964	400745	Roadside			3 (153.09)	0	-	0 (114)	-
CM4	462278	400111	Roadside			0(21.5)	0 (114.4)	0	-	-
CM5	451438	398528	Roadside		82	0(62.1)	0 (115.6)	0	0 (57.8)	2
CM6	452185	410380	Roadside		96	0 (61.3)	6	0	0	7

Notes:

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

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

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

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

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

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CM1	458027	402475	Roadside			17.7	17.4	18.4	15.3	-
CM2	457669	403611	Urban Background	100	49.8	18.5	17.7	16.7	-	22.1
CM5	451438	398528	Roadside			19	18.8	21.8	17.4	-

☒ **Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16.**

Notes:

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

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

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

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

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

Figure A.9 – Trends in Annual Mean PM_{10} Concentrations

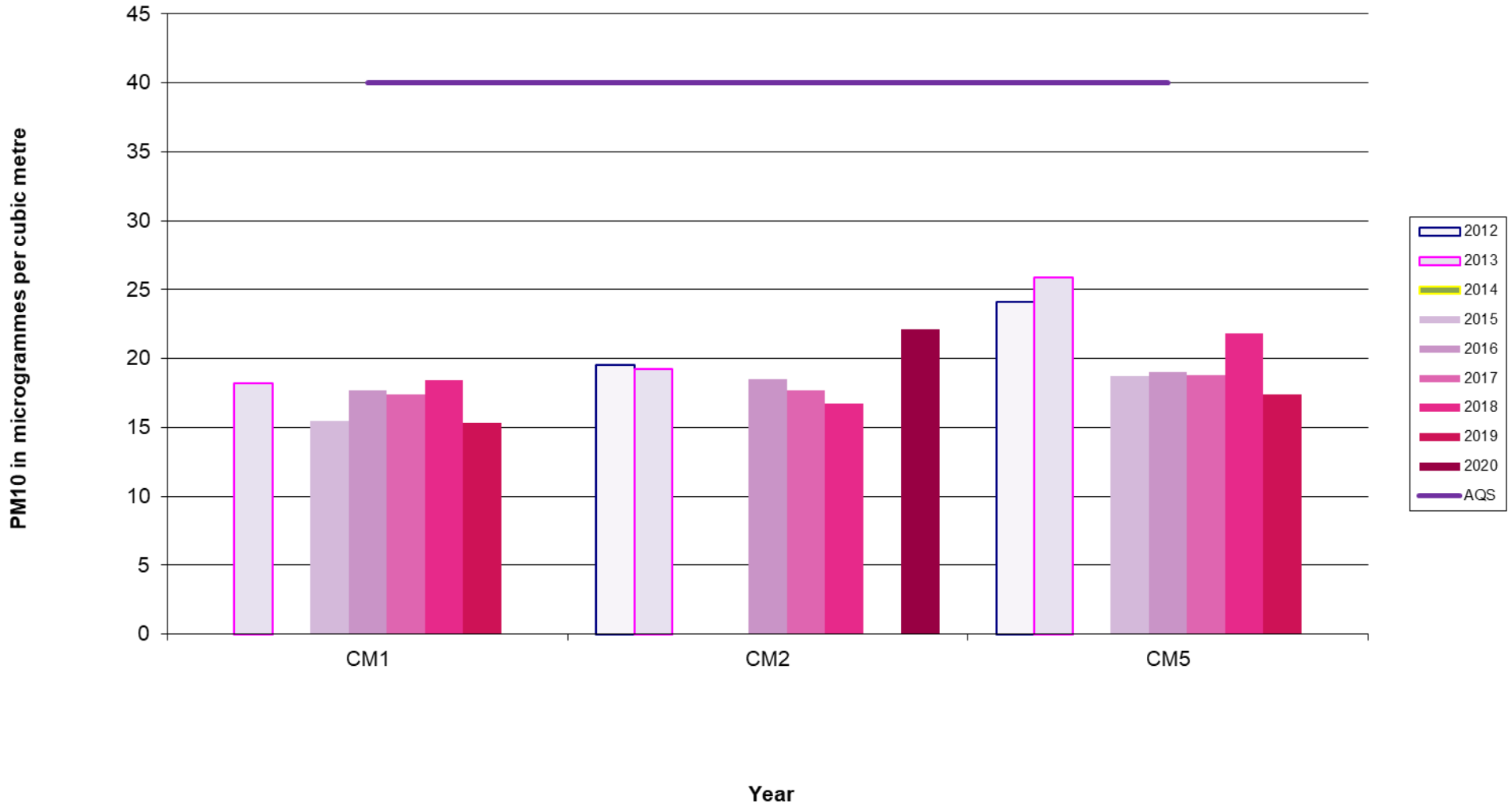


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CM1	458027	402475	Roadside			0 (27.3)	3	2	0	-
CM2	457669	403611	Urban Background	100	49.8	0 (32.4)	4	2	-	0 (12.6)
CM5	451438	398528	Roadside			3	4	3	1	-

Notes:

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

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

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

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

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

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

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CM2	457669	403611	Urban centre		93.4	-	-	-	-	9.2

☒ **Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16.**

Notes:

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

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.

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO_2 2020 Diffusion Tube Results ($\mu g/m^3$)

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 (0.92)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT1	456946	403763	33.0	25.0	20.0	16.0	19.0	23.0	16.2	23.0	26.0	25.7	37.7	32.0	24.6	22.5	-	
DT2	457308	403458	46.0	38.0	31.0	25.0	25.0	38.0	24.4	34.0	39.0	34.6	43.4	42.1	34.7	31.9	-	
DT3	457952	403123	41.0	30.0	20.0	15.0	16.0	18.0	20.5	23.0	28.0	27.0	30.6	32.2	25.0	22.9	-	
DT4	457975	403134	49.0	44.0	29.0	17.0	22.0	26.0	25.7	31.0	35.0	35.8	37.1	39.8	32.4	29.7	-	
DT5	459113	402842	41.0	33.0	29.0	21.0	23.0	33.0	22.1	31.0	32.0	35.7	38.2	29.0	30.3	27.8	-	
DT6	459533	402768	NR	29.0	22.0	14.0	17.0	20.0	20.9	NR	27.0	29.6	31.4	24.1	23.3	21.4	-	
DT7	462899	399328	40.0	32.0	20.0	15.0	21.0	19.0	23.9	26.0	31.0	27.4	38.0	31.0	26.8	24.6	-	
DT8	463023	399428	25.0	20.0	16.0	16.0	16.0	20.0	10.2	21.0	20.0	21.0	23.4	20.6	19.1	17.5	-	
DT9	463888	398416	23.0	19.0	13.0	9.0	13.0	13.0	16.3	15.0	19.0	19.7	26.6	16.2	16.7	15.3	-	
DT10	464879	399699														-	-	
DT11	461334	397977	29.0	28.0	22.0	22.0	22.0	17.0	17.4	27.0	26.0	NR	NE	23.2	23.5	21.6	-	
DT12	461164	398459														-	-	
DT13	462242	400134	41.0	NR	26.0	24.0	22.0	33.0	28.0	33.0	34.0	37.4	42.2	28.4	31.4	28.8	-	
DT14	461362	400777	46.0	39.0	28.0	19.0	21.0	30.0	30.2	29.0	34.0	35.9	43.5	28.4	31.5	28.9	-	
DT15	461875	400396														-	-	
DT16	460703	400559														-	-	
DT17	459947	401538														-	-	
DT18	460342	402108														-	-	

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 (0.92)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT19	459745	402638														-	-	
DT20	459721	402650														-	-	
DT21	456164	401227	51.0	46.0	36.0	32.0	27.0	42.0	32.5	37.0	43.0	46.4	56.9	38.7	40.2	36.9	26.7	
DT22	455679	401000	53.0	50.0	35.0	32.0	30.0	39.0	36.5	44.0	42.0	44.1	48.0	39.7	40.9	37.5	25.3	
DT23	451457	398659	42.0	38.0	29.0	23.0	22.0	34.0	25.7	32.0	35.0	32.5	43.5	36.9	32.5	29.8	-	
DT24	451419	398540	43.0	40.0	28.0	NR	21.0	35.0	23.8	38.0	33.0	44.2	43.8	34.4	34.9	32.0	-	
DT25	455635	401002	40.0	35.0	29.0	30.0	23.0	38.0	22.5	34.0	36.0	32.1	39.8	35.1	32.6	29.9	-	
DT26	456130	401258	43.0	38.0	28.0	23.0	20.0	31.0	21.3	28.0	33.0	31.2	30.8	31.0	29.5	27.1	-	
DT27	457010	402056	46.0	41.0	33.0	29.0	32.0	36.0	29.1	33.0	38.0	36.6	48.2	40.3	36.6	33.6	-	
DT28	457022	402141	54.0	49.0	40.0	39.0	33.0	51.0	33.8	52.0	48.0	45.7	40.3	45.1	44.1	**40.4**	39.7	
DT29	464986	399697														-	-	
DT30	465719	400140	20.0	14.0	14.0	12.0	10.0	13.0	6.6	16.0	14.0	15.6	21.1	20.7	14.8	13.6	-	
DT31	466895	400405	21.0	16.0	12.0	7.0	8.0	12.0	10.6	8.2	10.0	11.8	20.4	17.5	12.6	11.6	-	
DT32	467174	400372	21.0	16.0	13.0	9.0	11.0	12.0	11.7	11.3	16.0	13.3	21.6	16.0	14.1	13.0	-	
DT33	468629	404336	15.0	12.0	7.0	5.0	NR	5.0	5.8	5.8	6.0	8.0	13.0	12.4	8.6	7.9	-	
DT34	467755	408643	26.0	18.0	15.0	12.0	12.0	15.0	9.7	12.4	14.0	14.2	23.6	18.8	15.7	14.4	-	
DT35	469056	407623														-	-	
DT36	457615	403630	43.0	32.0	30.0	20.0	26.0	28.0	24.7	25.0	34.0	27.4	37.5	40.6	30.4	27.9	-	
DT37	457379	403460	47.0	42.0	35.0	21.0	23.0	31.0	24.6	NR	33.0	NR	39.6	34.1	32.6	29.9	-	
DT38	464046	411818	23.0	20.0	15.0	10.0	14.0	13.0	9.1	11.4	11.0	14.6	23.5	17.2	15.0	13.8	-	
DT39	452219	410224	46.0	37.0	28.0	18.0	27.0	27.0	26.6	26.4	34.0	31.1	34.1	30.2	30.1	27.6	-	

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 (0.92)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT40	452195	410302	47.0	32.0	32.0	22.0	28.0	27.0	25.4	30.4	32.0	27.8	38.6	37.7	31.5	28.9	-	
DT41	452180	410377	46.0	39.0	32.0	18.0	29.0	26.0	24.0	32.4	37.0	39.0	44.3	33.1	33.1	30.4	-	
DT42	452180	410402	44.0	36.0	28.0	18.0	26.0	24.0	24.2	26.9	31.0	23.6	40.5	31.3	29.1	26.7	-	
DT43	452192	410389	42.0	33.0	28.0	15.0	21.0	22.0	24.5	22.2	26.0	25.9	34.1	29.9	26.6	24.4	-	
DT44	448221	405303	64.0	62.0	56.0	40.0	56.0	69.0	50.6	53.7	56.0	55.1	57.5	52.2	55.3	**50.7**	38.8	
DT45	447966	405303	24.0	23.0	19.0	14.0	13.0	17.0	10.6	15.8	19.0	16.0	26.7	23.2	18.3	16.8	-	
DT46	448149	405296	31.0	22.0	34.0	25.0	30.0	34.0	19.7	24.6	29.0	NR	24.6	26.5	27.1	24.9	-	
DT47	448054	405319	68.0	61.0	63.0	48.0	66.0	79.0	58.8	64.4	61.0	75.4	75.4	62.6	64.7	**59.4**	**56.2**	
DT48	448218	405320	69.0	59.0	56.0	48.0	67.0	77.0	58.7	59.6	66.0	59.7	58.7	58.4	60.8	**55.8**	**52.9**	
DT49	451331	405219	NR	33.0	32.0	21.0	29.0	27.0	29.7	27.6	33.0	27.0	40.4	31.2	29.8	27.4	-	
DT50	468749	413300	42.0	30.0	32.0	23.0	27.0	32.0	25.8	27.4	32.0	29.8	39.8	35.7	31.1	28.5	-	
DT51	451446	398582	40.0	32.0	24.0	16.0	18.0	26.0	20.6	22.8	27.0	24.1	39.3	32.7	26.5	24.3	-	
DT52	451485	398514	45.0	34.0	34.0	23.0	31.0	39.0	26.8	35.3	35.0	27.6	38.1	39.7	33.7	30.9	-	
DT53	451453	398632	42.0	32.0	31.0	19.0	26.0	36.0	23.3	30.8	33.0	38.7	37.7	35.1	31.7	29.1	-	
DT54	451440	398652	55.0	41.0	39.0	23.0	31.0	40.0	30.3	39.0	37.0	42.0	46.0	51.2	39.3	36.1	35.1	
DT55	451624	398690	39.0	29.0	24.0	16.0	19.0	21.0	21.1	22.8	25.0	27.1	36.1	28.3	25.5	23.4	-	
DT56	448047	399880	41.0	33.0	30.0	21.0	27.0	27.0	23.8	29.8	32.0	31.7	40.2	35.7	30.9	28.3	-	
DT57	448004	399862	45.0	32.0	28.0	20.0	23.0	25.0	21.6	25.8	NR	30.3	47.8	NR	29.4	27.0	-	
DT58	451824	405228	59.0	30.0	36.0	28.0	33.0	35.0	30.3	32.3	33.0	28.2	42.9	31.5	34.5	31.6	-	
DT59	451514	405247														-	-	
DT60	457870	403839	46.0	34.0	34.0	24.8	24.0	28.0	23.9	28.3	32.0	32.8	40.6	37.4	31.9	29.3	-	

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 (0.92)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT61	457791	403767	43.0	33.0	31.0	20.8	25.0	25.0	24.9	25.2	30.0	30.2	34.9	37.0	29.8	27.4	-	
DT62	457733	403740	55.0	41.0	36.0	25.1	28.0	34.0	29.4	37.5	36.0	35.7	NR	40.2	35.9	32.9	-	
DT63	457701	403579	47.0	32.0	32.0	27.9	25.0	32.0	23.6	37.6	32.0	NR	NE	27.8	31.5	28.9	-	
DT64	457345	403433	50.0	34.0	37.0	28.0	25.0	40.0	27.8	41.4	34.0	37.8	46.1	37.0	36.2	33.2	-	
DT65	457995	402506	47.0	NR	29.0	24.1	22.0	29.0	22.6	29.5	31.0	32.1	31.8	36.3	30.2	27.7	-	
DT66	458142	402563	48.0	34.0	33.0	25.2	29.0	31.0	26.9	35.2	34.0	35.2	37.5	36.7	33.7	30.9	-	
DT67	458259	402582	44.0	31.0	28.0	23.4	24.0	29.0	22.6	29.5	28.0	25.3	30.2	31.6	28.7	26.3	-	
DT68	462520	400757	29.0	19.0	18.0	16.5	11.0	18.0	11.9	17.5	15.0	15.8	22.1	22.4	17.9	16.4	-	
DT69	462500	400708	29.0	18.0	19.0	16.5	14.0	21.0	12.0	19.5	18.0	19.3	27.5	25.4	19.8	18.2	-	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1.**

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

☒ **Doncaster Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Doncaster Council During 2020

Doncaster Council has identified new sources relating to air quality within the reporting year of 2020 as follows;

- Outline application for the extension of West Moor Distribution Park comprising of buildings of use within class B8 with ancillary B1 (all matters reserved)
- Installation of a biofuel generator and associated infrastructure, Middlebank, Doncaster.

These new sources have been identified through consultation with the Local Planning Authority and assessed for air quality impacts accordingly. There were no significant air quality impacts identified. All Planning Applications in Doncaster can be viewed using the online portal.

Additional Air Quality Works Undertaken by Doncaster Council During 2020

Doncaster Council completed the declaration for AQMA7A along the A635 in Marr within the reporting year of in 2020. The details of which can be found online.

QA/QC of Diffusion Tube Monitoring

The tubes are supplied and analysed by South Yorkshire Air Quality Samplers (SYAQS). The tubes are prepared by spiking acetone:triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes are then desorbed with distilled water and the extract analysed using a segmented flow auto analyser with ultraviolet detection.

The Laboratory Performance in AIR NO2 Proficiency Testing scheme report covering 2019 lists South Yorkshire Air Quality Samplers as having 94% of samples rated as **Satisfactory.**

In 2009, procedures have been amended so that the laboratory is in line with the harmonisation procedures.

SYAQS participated in the 2020 Precision Study and obtained Good rating for performance.

Monitoring was completed in line with the calendar except on one occasion in June where the diffusion tube exposure period was shorter than the recommended 4 weeks by 4 days.

The national factor for 2020 was 0.77 based on one study.

The results were downloaded on the 23 June 2021 from; http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Doncaster Council recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 33% do not require annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2021 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.

Doncaster Council have applied a local bias adjustment factor of 0.92 to the 2020 monitoring data. A summary of bias adjustment factors used by Doncaster Council over the past five years is presented below.

National factors had been used during review and assessment in Doncaster until 2014. The use of national bias had provided consistency, however on recommendations from previous review and assessment feedback a local co-location study was implemented.

The national factor is consistently low and with one of the sites being kerbside in London, it was felt that this became unrepresentative.

In 2020, Doncaster Council conducted a co-location study within Doncaster and was completed in line with guidance provided within LAQM.TG16 Chapter 7: NO_x and NO_2 Monitoring, NO_2 by Diffusion Tubes and using the Diffusion Tube Data Processing Tool.

The most important factors to be considered when deciding which bias-adjustment factor to use are:

- Tube exposure time (in our case 1 month)
- Length of the monitoring study (one year)
- QA/QC of the chemiluminescence analyser (carried out locally be NPL)
- QA/QC of diffusion tubes (Air PT NO2)
- Siting of the co-location study (if roadside tubes are being factored it is important to use a roadside factor)
- Siting of other tubes in the survey

The locally derived factor in Doncaster is 0.92.

This compares well with other local South Yorkshire bias adjustment factors with

Sheffield's bias of 0.94.

As you can see all the Doncaster and Sheffield BAF (2020) are very similar which gives confidence to the results. All SY Authorities use the same laboratory and participate in joint monitoring studies across South Yorkshire reporting to the Sheffield City Region Air Quality and Climate group.

The data in the ASR has been corrected with the local factor as a more conservative bias.

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	Local - Doncaster	-	0.92
2019	Local - Doncaster	-	0.97
2018	Local - Doncaster	-	1.1
2017	Local - Barnsley	-	1.03
2016	Local – Barnsley	-	0.94

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.

Those results that show an exceedance at receptors, once corrected for distance, are within AQMA7, where the other locations do not show an exceedance and are within AQMAs these will continue to be reviewed in future years but it is not considered indicative of a need to review the AQMA status at this time.

No distance correction has been necessary for automatic data in Doncaster.

QA/QC of Automatic Monitoring

The QA/QC procedure usually consists of bi-monthly calibrations performed manually on-site by the Local Site Operator (Doncaster Council). Daily data checks are carried out remotely. During lockdown, calibrations were conducted for part of the year only one per month.

An outside contractor performs six-monthly services and all units are covered by a service and maintenance agreement including call-out services.

The last independent audit was carried out in 2020 with the overall conclusion being;

'In general, your instrumentation was found to be working well, with the following points being noted:

At Skellow the NOx analyser was showing a cooler temperature alarm on arrival. The initial zeroes were 12 and 13 ppb. However, a second measurement of zero response was carried out at the end of the audit, giving zeroes of 2 ppb on both channels. This is likely to have been due to the analyser coolers reaching optimum temperature, having been cooled by the cold ambient conditions as a result of the site enclosure doors remaining open during the audit.

At Carr House Road, the TEOM temperature sensor was not working, and the unit appeared to be operating in "Standard Flow" mode. This will have minimal effect on data quality.

The PM10 analyser at Conisbrough was leaking and had flow controller offsets. In sampling mode, measured flows were 2.12 and 14.21 l/min (main and total), and with the inlet blocked the reported flows were 0.84 and 6.4 l/min (main and auxiliary) respectively. With the pump switched off, the reported flows were 0.11 and 3.25 l/min main and auxiliary.

Other than these items, your equipment was working well, and, subject to ongoing calibration and other QA/QC activities, it would be expected to give reliable air pollution data.'

Data is scaled, validated and ratified in house and includes removing erroneous data and applying relevant calculations in line with the technical guidance LAQM TG(16) to obtain the final data set.

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

The new type of PM_{10}/$PM_{2.5}$ monitor(s) utilised within Doncaster Council do not required the application of a correction factor. The VCM model was previously used to correct the TEOM results but this is no longer possible due to the lack of FDMS data as per Helpdesk advice therefore TEOM data has been omitted from this year's report.

Automatic Monitoring Annualisation

The PM_{10} results for site CM2 was annualised and data is presented in Table C.2. The data capture at site was 46%. All other automatic monitoring locations within Doncaster Council recorded data capture of greater than 75% therefore it was not necessary to annualise any monitoring data. In addition, any sites with a data capture below 33% do not require annualisation.

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 NO_2 fall-off with

distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No automatic NO_2 monitoring locations within Doncaster Council required distance correction during 2020.

Table C.1 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor AURN Leeds	Annualisation Factor AURN York	Annualisation Factor AURN Leeds Head	Annualisation Factor	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
CM2	1.063	1.102	0.997	-	1.054	21.01	22.13	PM10 Bam results corrected following data loss for last 6 months of 2020.

Table C.2 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	11				
Bias Factor A	0.92 (0.86 - 0.98)				
Bias Factor B	9% (2% - 16%)				
Diffusion Tube Mean (µg/m^3)	26.2				
Mean CV (Precision)	5.9%				
Automatic Mean (µg/m^3)	24.1				
Data Capture	100%				
Adjusted Tube Mean (µg/m^3)	24 (23 - 26)				

Notes:

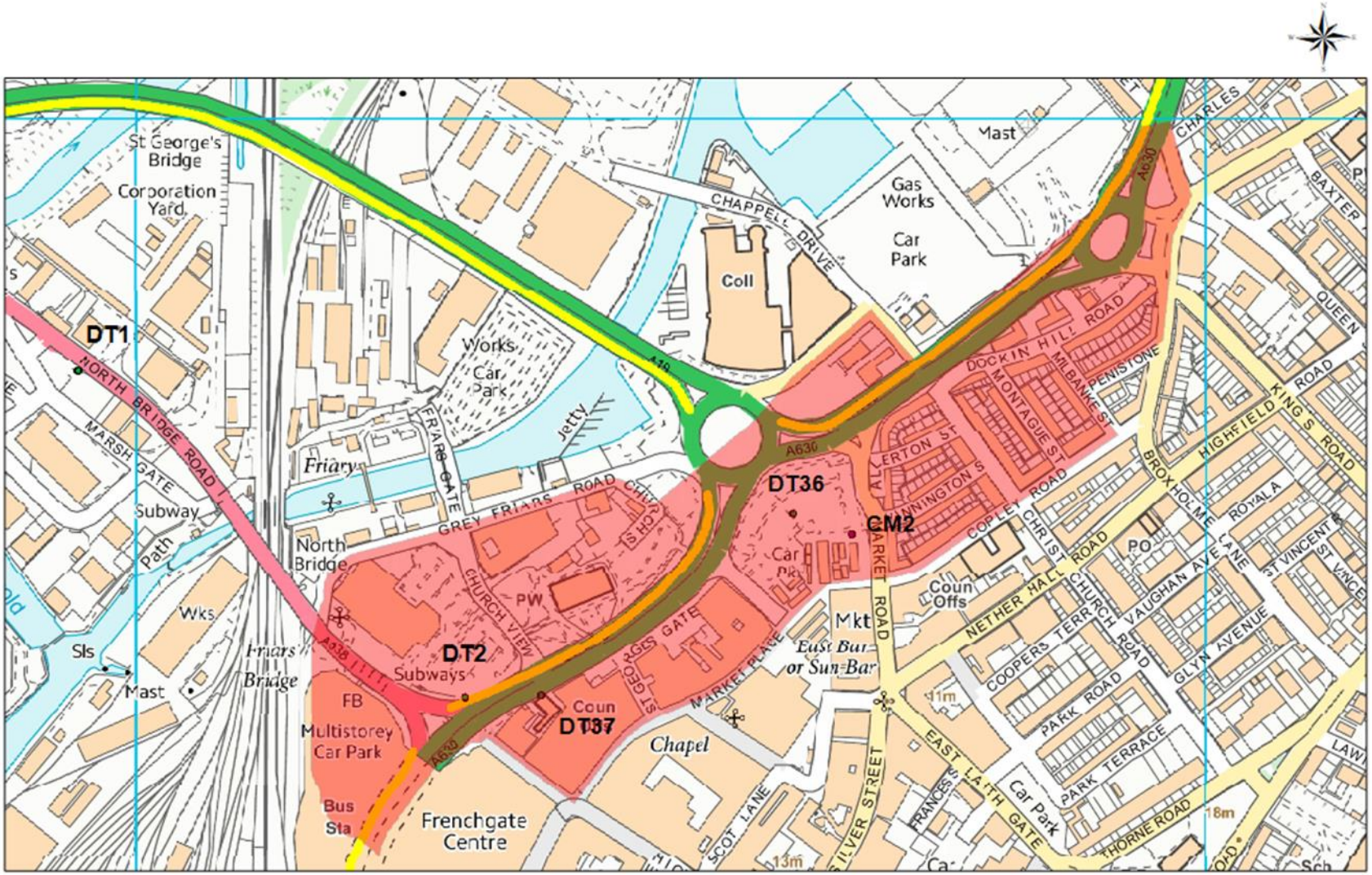
A single local bias adjustment factor has been used to bias adjust the 2020 diffusion tube results.

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

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
DT21	1.5	7.5	36.9	7.9	26.7	
DT22	2.5	13.2	37.5	7.9	25.3	
DT28	3.7	4.0	40.4	7.9	*39.7*	*Predicted concentration at Receptor within 10% the AQS objective.*
DT44	1.0	4.0	50.7	7.9	*38.8*	*Predicted concentration at Receptor within 10% the AQS objective.*
DT47	0.8	1.1	59.4	7.9	**56.2**	*Predicted concentration at Receptor above AQS objective.*

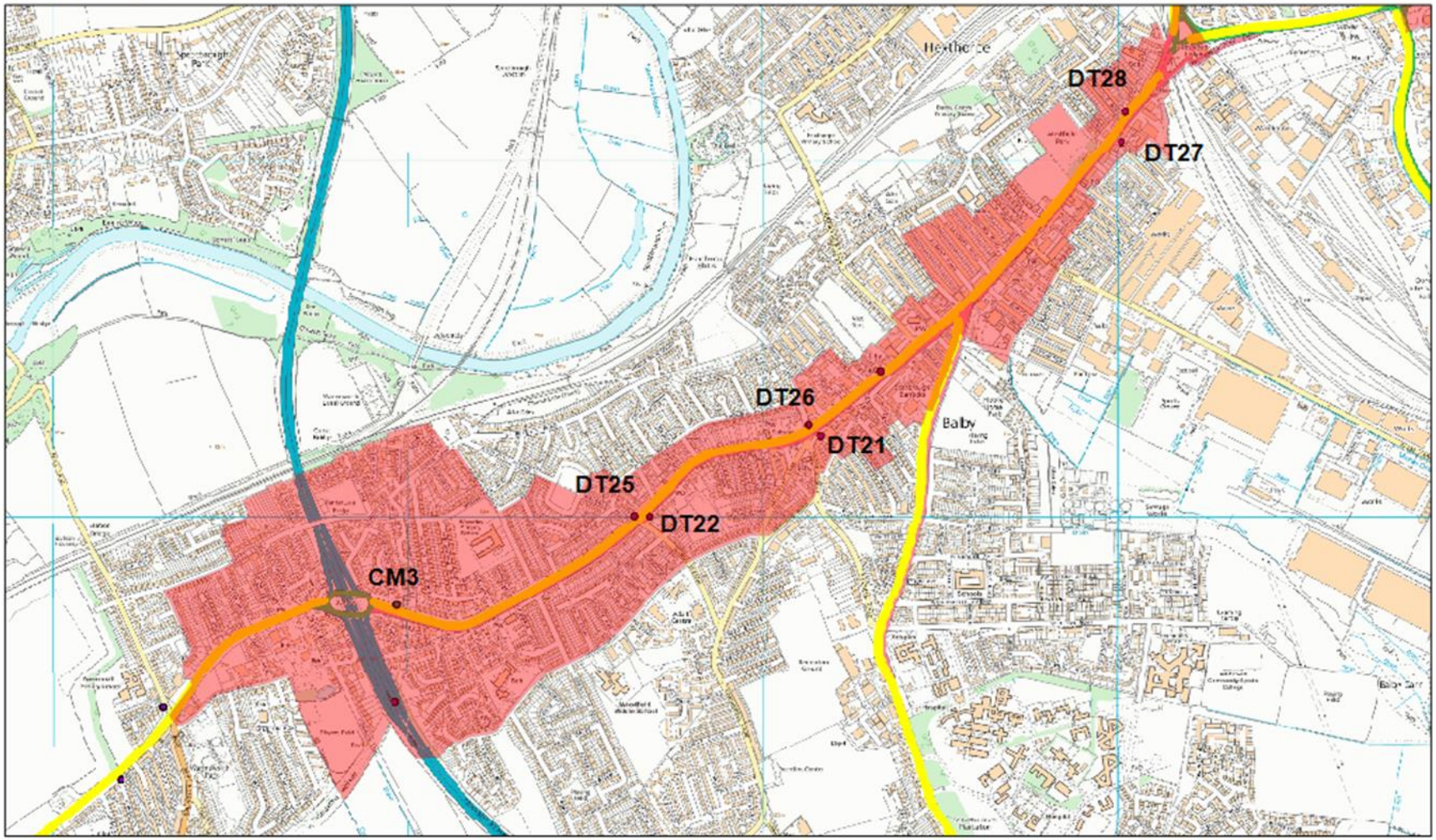
Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
DT48	0.8	1.1	55.8	7.9	**52.9**	*Predicted concentration at Receptor above AQS objective.*
DT54	1.8	2.1	36.1	7.9	35.1	

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



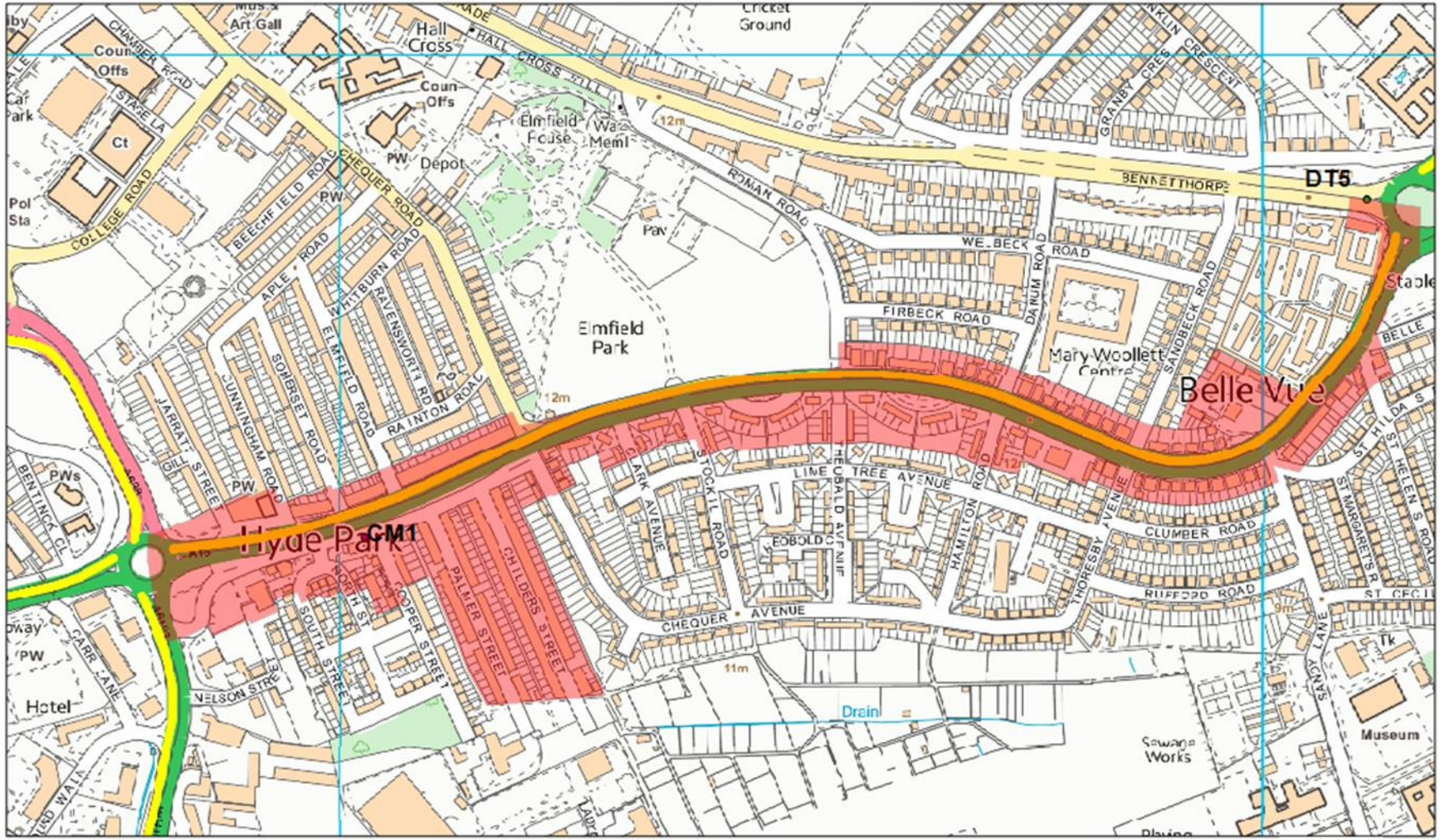
Doncaster

AQMA2



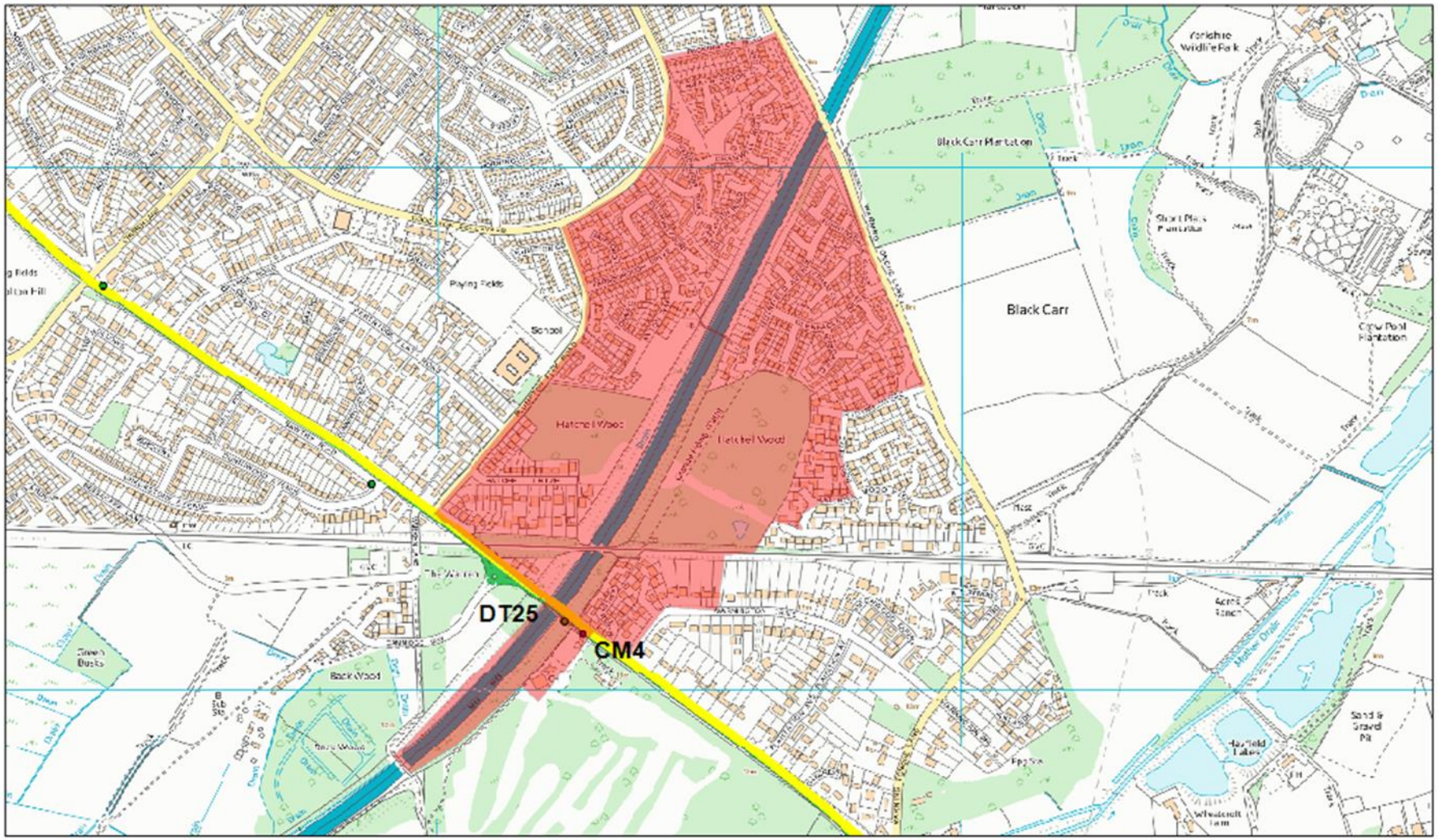
Doncaster

AQMA3

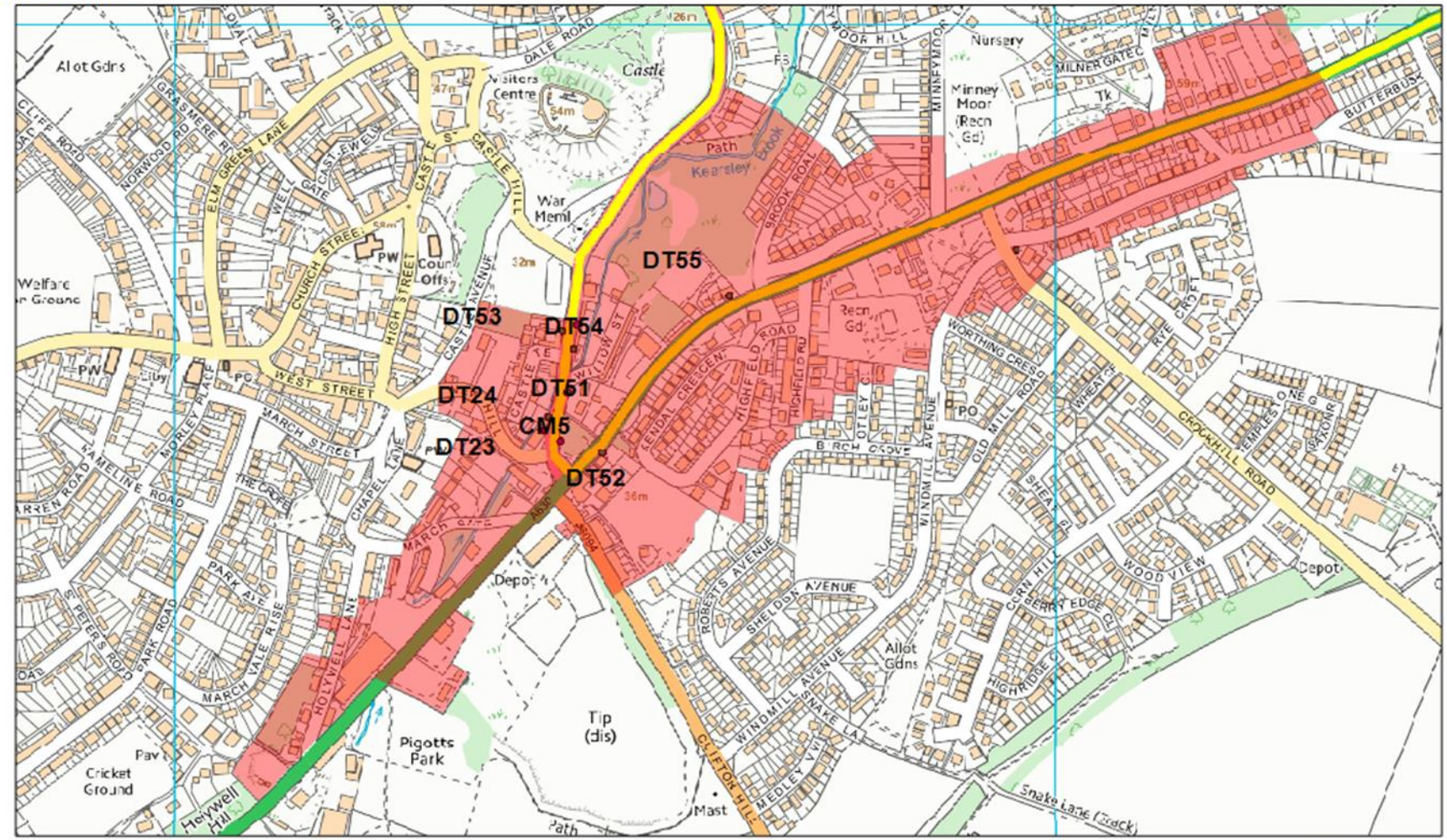


Doncaster

AQMA4

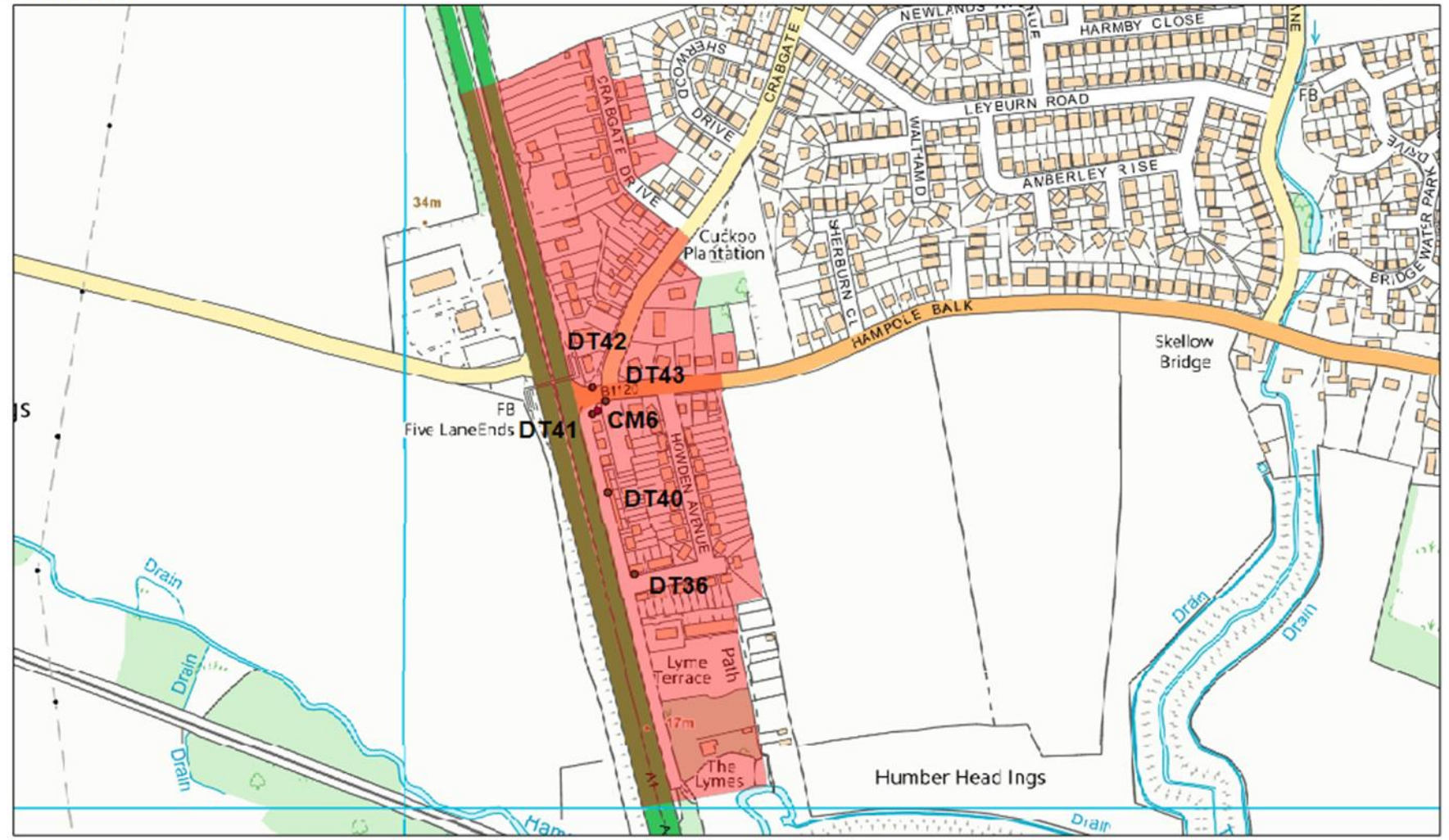


AQMA5

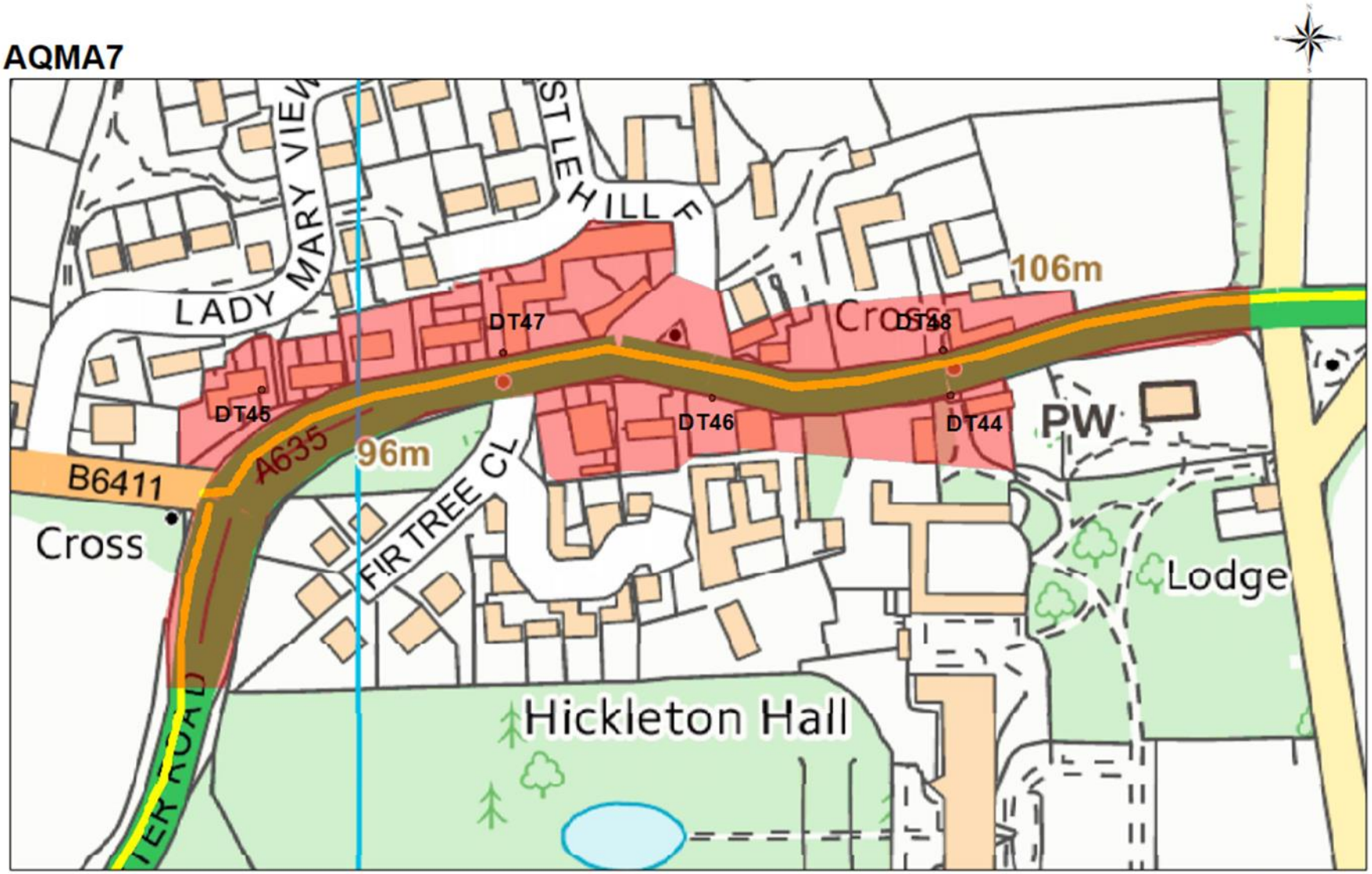


Doncaster

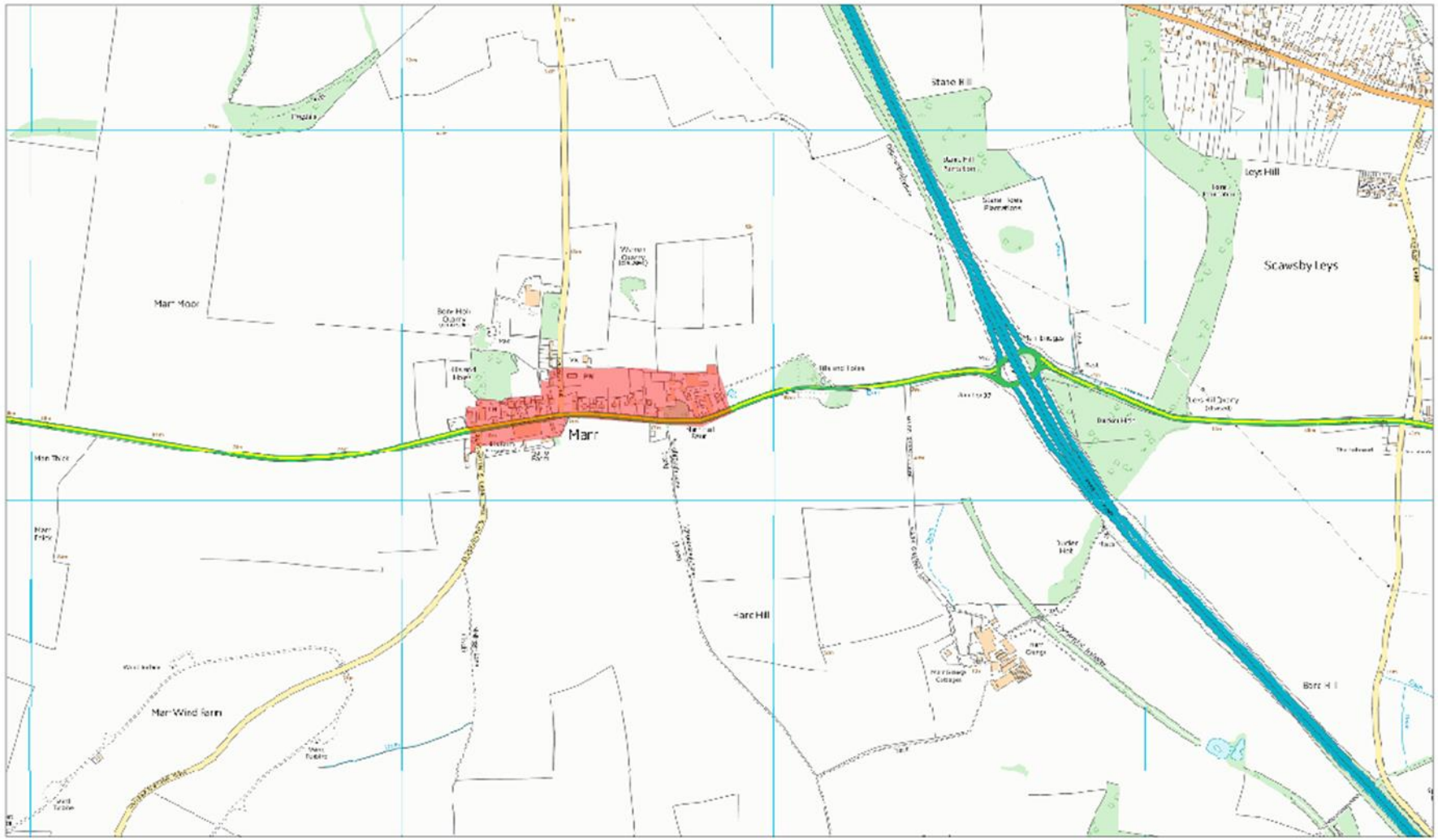
AQMA6



AQMA7



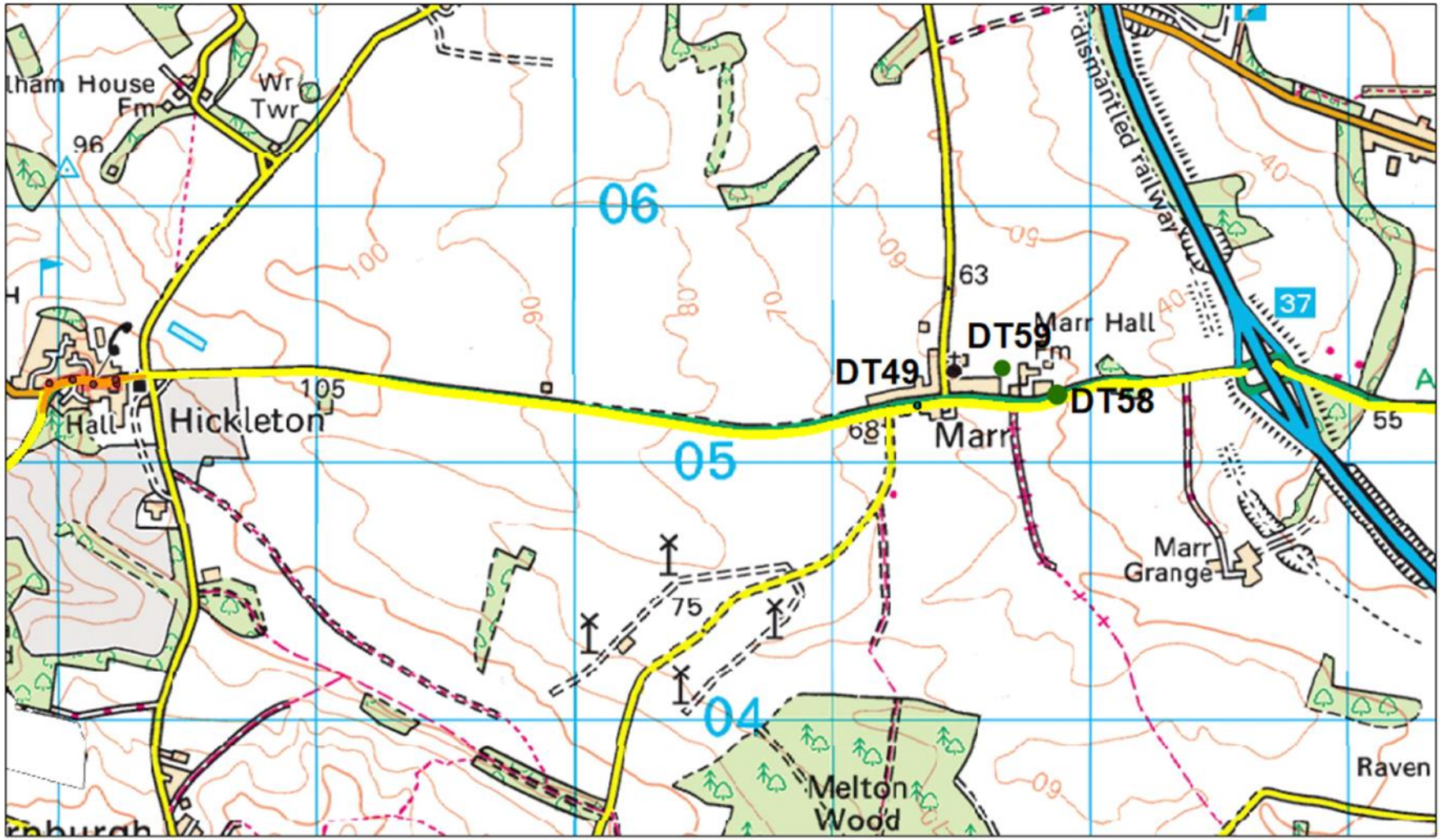
AQMA7A



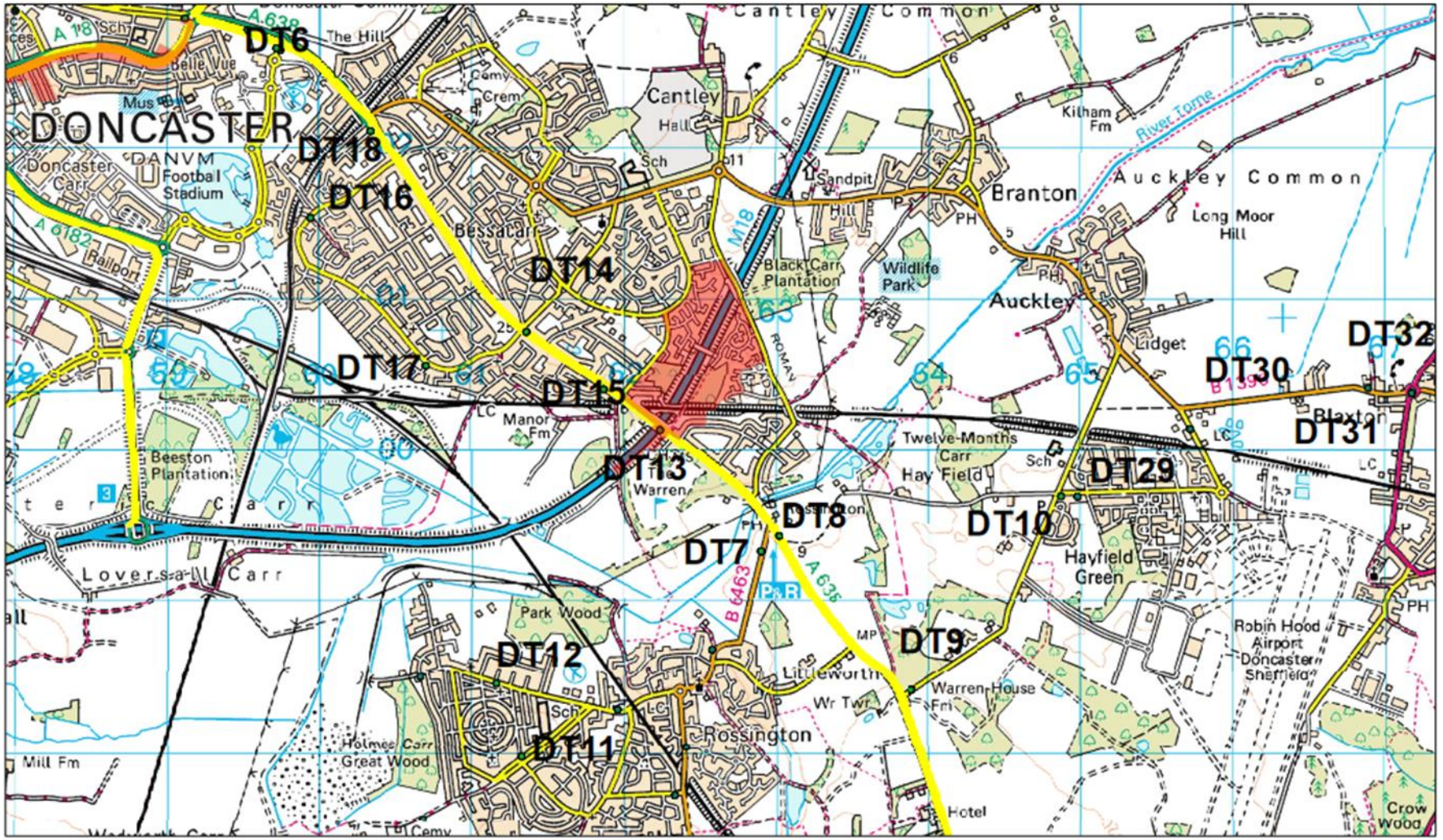
(c) Crown copyright. License Number 100019782. 2013. (c) Copyright GeoInformation Group 1997, 2002, 2005 and 2007.	Completed By : geraldinep	Map Reference: MARR boundary map LC	Date : 13/06/2019	Scale : 1:3,314

Doncaster

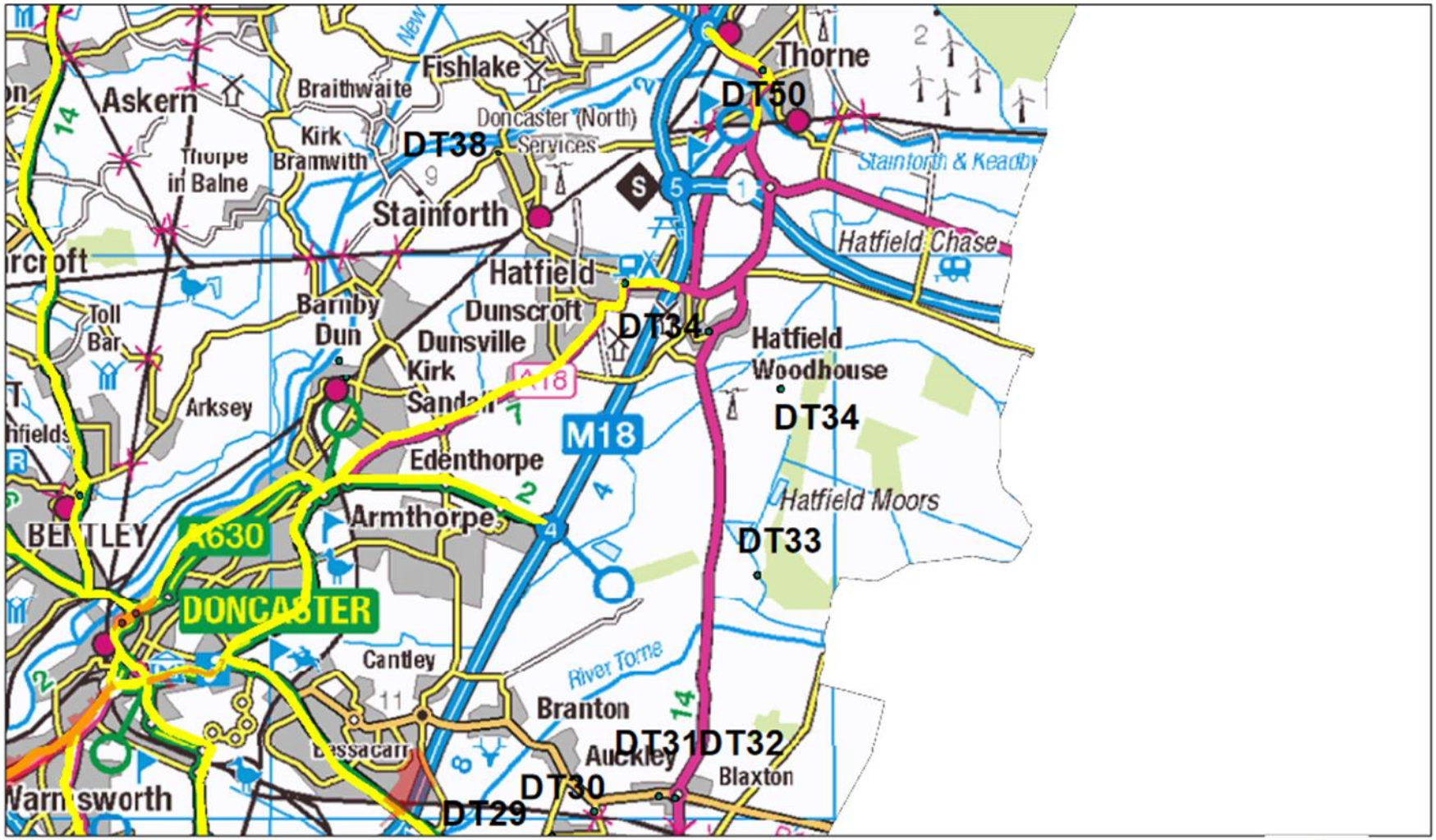
Marr Diffusion Tube Study



Non-AQMA Monitoring Sites



Non-AQMA Monitoring Sites



Doncaster

Appendix E: Summary of Air Quality Objectives in England

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

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

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

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

[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.

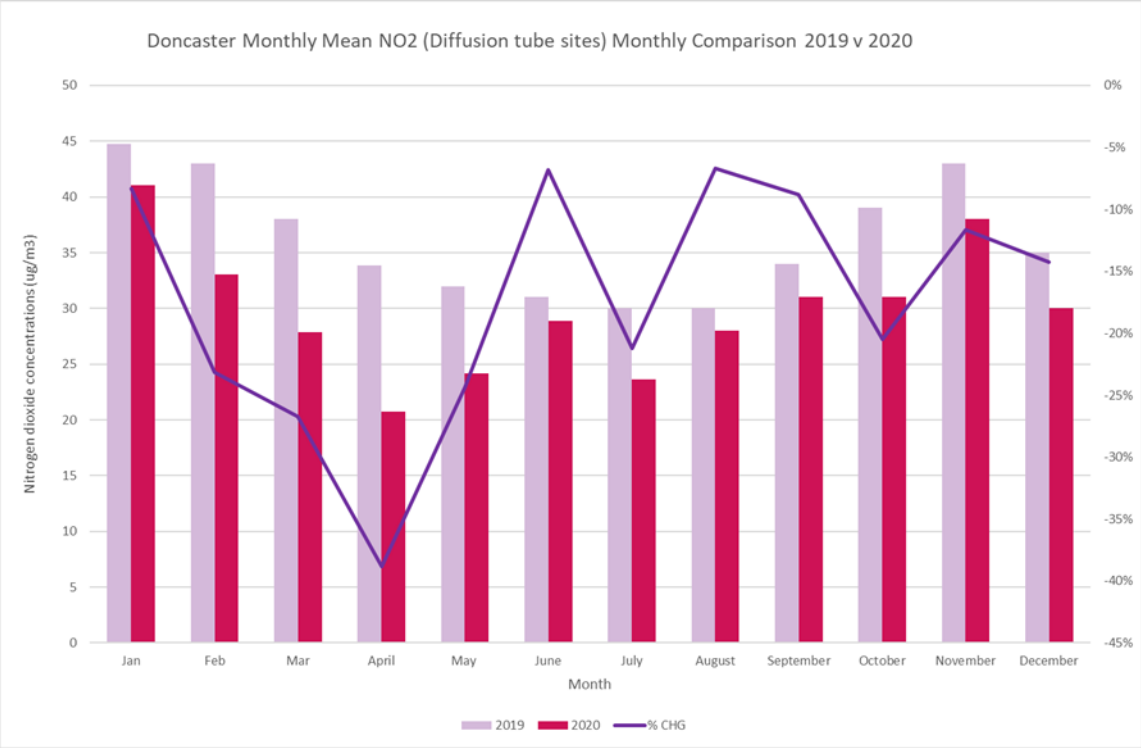
As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of COVID-19 on Air Quality within Doncaster

Air quality monitoring was largely unaffected in Doncaster, other than a reduction in calibration visits to the automatic sites to once per month rather than twice and one incidence of deploying tubes outside of the approved dates. Therefore, there is good coverage of data across the Borough in 2020.

Figure F.1. Presents a comparison of monthly NO2 means between 2019 and 2020. All Doncaster Council's long-term diffusion tube-monitoring sites have been used to present an average figure for easy comparison. This is to be used as an indication of the impact of lockdown on air quality. This graph shows a reduction in all months in 2020 compared with 2019. The first lockdown at the end of March shows a significant decrease on the previous year of nearly 40%, with an overall average reduction over the year of just over 20%. This data has been bias adjusted using local bias of 0.97 and 0.92 in 2019 and 2020 respectively. The data does not take account of weather, as the relevant statistical packages used to perform these calculations cannot be used by Doncaster Council due to cybersecurity procedures. It is therefore worth noting that in the first quarter of monitoring concentrations in 2020 were lower than 2019 prior to lockdown and this is likely due to weather conditions.

Figure F.1 Averaged Monthly Mean NO2 Concentrations in Doncaster



While it has not been possible to obtain a summary of localised traffic reductions in Doncaster, it has been possible to do so across the wider Sheffield City Region (SCR), as follows;

'During COVID-19 lockdown, traffic levels were greatly reduced in the first 2 months and although they have steadily increased, the weekday volumes are still measured at 80-85% of pre-COVID levels. Public transport usage reduced markedly but has rebuilt to about 40% of pre-COVID, but a combination of social distancing measures, remote working and low confidence is likely to continue to supress patronage. Active travel usage is likely to have peaked at the end of May, as the patterns shifted to much more local trips. National indicators (Sport England) have shown that cycling once a week peaked at 16% is still undertaken by 14%, running peaked at 22% and is now 20% and walking peaked at 65% and has returned to 58% (all values as at 3rd August 2020). Automated Cycle counters have shown considerable variation (probably due to weather changes) but in some locations are back to pre-COVID levels.' (Dft Emergency Active Travel Fund Bid, Tranche 2, SCR 2020)

Opportunities Presented by COVID-19 upon LAQM within Doncaster

Doncaster Council approved spending (Corporate Report) of the DfT Emergency Active Travel Fund in June 2020. The following schemes were approved;

- Town centre - full pedestrianision
- Pedestrian priority measures in principal towns including one with an AQMA.
- North Bridge/Trafford Way - walking improvements at key pinch point
- Thorne Road –reallocation of road space on the approach to the town centre
- Balby Road - quiet way and 20mph zones
- Bennetthopre and South Parade - cycling lane.
- Lakeside -encourage walking scheme
- Leger Way - cycling lane
- Cycle parking

Additionally funding for the following has been sought;

- A3. Conisbrough to Warmsworth Cycle superhighway running alongside the A630 between Conisbrough and Warmsworth. This ties into the LCWIP Corridor of Balby Quiet way works to be completed as part of the TCF, creating a route to town centre. This is a permanent scheme
- B3. Thorne Doncaster North Station, Eastern Rd, Queen Street and Union Rd in Thorne to receive filtering measures. This is a trial measure with a view to making permanent through alignment with TCF. The works area also includes provision of a school street is at West Road Primary.

There is some opportunity for negligible/minor improvements to air quality in AQMA2 and AQMA5 if some of these schemes remain following easing of Covid-19 restrictions.

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Challenges and Constraints Imposed by COVID-19 upon LAQM within Doncaster

Challenges and/or constraints that have been experienced in relation to LAQM within 2020 that can be attributed to the pandemic are:

- **Automatic Monitoring – Data Capture (%) - i**ssues with data capture at all but one site are not related to Covid-19. **No Impact.**
- **Automatic monitoring - QA/QC regime** – calibrations were reduced to monthly following lockdown; this has led to some issues with instrument drift and had an impact on data capture at some sites. However, servicing and audits have continued as normal. **Small Impact.**
- **Passive Monitoring – Data Capture** (%) – a minority of diffusion tubes with locations on residential/educational buildings became inaccessible due to covid-19 restrictions. Therefore, it was not possible to maintain diffusion tube exposure periods for April to December in line with the national monitoring calendar for a those sites. At these locations data capture was less than 33% and could not be annualised. This was minor because it amounted to a small percentage of overall monitoring sites available. **Small Impact**.
- **Passive Monitoring** – Bias Adjustment Factor – bias adjustment undertaken as normal. **No Impact.**
- **Passive Monitoring – Adherence to Changeover Dates** - Defra diffusion tube exposure calendar adhered to, one occasion where the changeover date exceeded the +/- 2 day recommended deadline. **No Impact.**
- **Passive Monitoring – Storage of Tubes** - tubes unable to be stored according to laboratory guidance but analysed prior to expiry date. **Small Impact.**
- **AQAP – Measure Implementation** - the implementation of all the remaining measures in the action plan have been delayed. These have largely restarted in 2021 and will be reported on next year. **Medium Impact.**
- **AQAP – New AQAP Development** - development of the new action plan for AQMA7A and revision of the current action plan is likely to be delayed, but this delay is expected to be by no more than six months. **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
SCR	Sheffield City Region

References

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