2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: August, 2021

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Executive Summary: Air Quality in Our Area

Air Quality in Charnwood

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].

Notwithstanding the impact of Covid-19 on traffic impact during this reporting period; the data collated in Charnwood during 2020 indicates that the borough's continuing trend in meeting the Air Quality Objectives continue.

In reference to those locations that had historically exhibited concentrations of concern in terms of air quality; Loughborough town centre concentrations of NO_2 around the main retail zone and along parts of the inner relief road saw the majority of monitoring sites reporting beneath 20 μgm^{-3}, with only the High Street location (DT14) being the exception at a slightly higher level of 20.1 μgm^{-3}. All of these locations exhibited site reductions in the range of 27-35% in annual mean concentrations relative to 2019 levels which can largely be attributed to the reduction in traffic volume as mentioned. It will be of interest to see how future concentrations are impacted upon following the gradual return to a post-pandemic environment.

[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

For similar underlying reasons, 2020 monitoring at Syston returned much reduced concentrations that maintain NO_2 levels consistently beneath the Air Quality Objectives. This continues to support the Council's view that a future revocation of the Syston AQMA in this area is a feasible option, however we will continue to listen to the views of local Councillors and residents in their concerns around this stretch of road. Consideration was due to be given to reassessing this AQMA during 2020, however the continuing impact of Covid-19 has placed considerable service pressure on the Environmental Health team and this area of work has been unfortunately delayed.

An approach to the LAQM Helpdesk was made during January 2021 to confirm their position in terms of the level of future monitoring requirements needed to support the revocation of the Syston AQMA. This was partly in view of the number years for which our data supports compliance with the NAQOs, but also having now removed our automatic NO_2 analyser from the town due to a combination of existing age/reliability issues and financial considerations going forward. We were advised that future monitoring using diffusion tube(s) only would be acceptable and that the data we already hold will be sufficient to progress any revocation application when undertaken.

The work with Mountsorrel Quarry (Tarmac) continues to monitor, appraise and scrutinise PM_{10} data obtained around the local area with reference to the normal associated activities inherent with quarry operations. Relevant partners to the quarry Dust Management and Monitoring Plan (DMMP) i.e. Charnwood Borough Council Environmental Health staff, Leicester County Council Planning staff, Tarmac management team and external consultants continue to regularly meet to ensure that any sources of on-site fugitive dust emissions are continually identified and addressed through appropriate mechanisms to reduce impact to the local community.

Whilst PM_{10} levels have markedly lowered since the introduction of the quarry DMMP, and are now being reported consistently within NAQO targets, it is apparent that residents still experience episodic concentration impact from local activities; we can however support the suggestion that transboundary movements are still continuing to play a part in a number of the 24-hour exceedances experienced at Mountsorrel.

It is encouraging that we have again seen complaint SO_2 concentrations around the Great Central Railway (GCR) engine sheds that are indicating stable and long-term adherence with the NAQO's. It should be noted that data capture rates for 2020 were down on previous years for the reasons discussed later in the report and that monitoring is expected to continue at this location for the foreseeable future.

Further information about the work of the Council in respect to Local Air Quality Management can be found on our webpages at:

http://www.charnwood.gov.uk/pages/airpollution

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.

Charnwood Borough Council continues to work with partners across the county to collaborate and deliver actions in relation to air quality and health.

Over the past 12 months stronger ties have been made with Public Health colleagues at Leicestershire County Council. A 6 weekly update meeting is held under the '*Air Quality and Health Partnership*' that was initiated to discuss emerging issues and to provide a formal forum to update the Action Plan delivery as part of the Public Health Outcomes Framework

[5] Defra. Clean Air Strategy, 2019

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

Conclusions and Priorities

2020 monitoring throughout the borough has been fully in compliance with the air quality objectives, both inside and outside of the existing AQMAs. It is acknowledged that results, primarily for NO_2 but also likely to be reflected in the industrial related pollutants, recorded during this period will be heavily influenced by the Covid-19 pandemic due to the associated reduction in general road traffic and the partially restricted site working patterns at the monitored industrial processes i.e., Mountsorrel Quarry and GCR, all linked to the national lockdown

Overall trends for NO_2 therefore are continuing to show a long-term downward trend, although it is expected that 2021 levels will again rise relative to 2020 when this data becomes available.

We continue to be committed to the work at Mountsorrel Quarry. Whilst we have demonstratable data for several years now that both the annual average concentration of PM_{10} is significantly down (currently by ~32% from pre-AQMA data) and daily exceedances are now within the permitted maximum objective of 35, the nature and scale of the operations on-site continue to remain an environmental focus for both the public and ward Councillors.

The challenge for both the quarry (and the regulators) here continues to be the promotion of the extensive work and financial investment already undertaken by the operators. Complaints to the Council concerning perceived dust emissions from the site, whilst anecdotally fewer, do continue to be received often with the comments that "*nothing is being done*" to address the (primarily nuisance) emissions.

Monitoring data from our SO_2 monitor located close to the Great Central Railway engine sheds continues to suggest that concentrations are compliant within the required objective levels of this pollutant. Whilst data capture rates were lower than previous years during 2020 the monitor appears to be now supporting a longer-term trend that may determine the future status of the AQMA.

We continue to handle a considerable number of queries from Members in respect to the air quality in their respective wards. Whilst we have no reason to believe there are any areas of concern currently within Charnwood we will still consider, where appropriate and practicable, to cater for the re-siting of a small number of existing diffusion tubes to specific areas where coverage will enhance our network.

One request that we are now supporting is in relation to the proposed development of a new town cemetery off Nanpantan Road, Loughborough. As this area is one that, whilst holding the belief of there being issues relating to the LAQM objectives, is acknowledged to be an area of the town where no monitoring has been conducted previously.

A diffusion Tube (DT60) in respect of request was deployed in January 2021 with results to be presented in the 2022 ASR.

Another emerging priority issue is in relation to advance planning of future monitoring concerning the commissioning and operation of the Newhurst Energy-from-Waste (EfW) facility at Shepshed. The 42MW operation will be able to process up to 350,000 tonnes of non-recyclable waste annually and expected to generate enough electricity to power around 80,000 homes a year. Whilst plant discharges for the facility itself will fall under the remit of the Environment Agency as part of separate Environmental Permitting regulations, any wider impact on ambient air quality is the responsibility of CBC to monitor. We will continue to liaise with the Leicestershire Incinerator Scrutiny Group (LISG) and relevant partner agencies as to how best to achieve this within the scope of our LAQM responsibilities.

As discussed in our ASR of 2020; we have now taken the decision to decommission the remaining NO_2 chemiluminescent continuous analysers that we were operating. 2021 saw the existing 3-year service contract come to an end and it was felt from both a financial and practical viewpoint that any renewal of this service would be uneconomical under current circumstances, especially considering the age and recent reliability of the units themselves and their associated ancillary equipment i.e. air conditioning units.

Resources have instead been directed into the purchase of 2 portable ‘Zephyr’ monitors that are anticipated to allow greater flexibility in our monitoring commitments. 1 unit is expected to be utilised specifically in connection with the Newhurst EfW facility as mentioned above, although specifics of its siting location are yet to be finalised. The 2nd unit is currently co-located alongside our Partisol monitor (CM1) in relation to Mountsorrel Quarry. This is to enable additional $PM_{2.5}$ data to be evaluated on behalf of CBC as a comparison against similar data already studied by the quarry’s consultants.

Both units were acquired with a longer-term view of meeting new monitoring objectives likely to be brought in with the anticipated Environment Bill.

Local Engagement and How to get Involved

In order to help local people and visitors to travel easily in and around Charnwood and Leicestershire as well as to reach places further afield, all whilst reducing the burden on the environment; more information about the local buses, cycling paths, car share schemes, local air travel and road traffic and weather conditions can be found on our public transport and sustainable travel website pages at:

Public transport and sustainable travel.

Alternatively, follow the direct links below for information on:

- Cycling, pedestrian and other pathways located within Charnwood.
- Leicestershire Sustainable Travel
- The 'Chose How You Move' Car share scheme

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1 Local Air Quality Management

This report provides an overview of air quality in Charnwood during 2020. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Charnwood Borough Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

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

- NO_2 annual mean for Loughborough and Syston;
- PM_{10} 24-hour mean for Mountsorrel;
- SO_2 15 minute mean for Great Central Railway (GCR)

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
Loughborough	Declared 2001, Amended 2004	NO_2 annual mean	An area encompassing a number of properties around the town centre	No	Unknown (in excess of 40 µg/m3)	23.2 µg/m3 (Leicester Rd)	Charnwood Local Air Quality Management – Final Action Plan 2006	CBC AQAP
Syston	Declared 2001, Amended 2004	NO_2 annual mean	Residential properties along Melton Rd and Sandford Rd	No	Unknown (in excess of 40 µg/m3)	23.7 µg/m3 (1116 Melton Rd)	Charnwood Local Air Quality Management – Final Action Plan 2006	CBC AQAP
Great Central Railway (GCR)	2001	SO_2 15-minute mean	An area encompassing residential properties near The Great Central Railway	No	Unknown (in excess of 266 µg/m3 more than 35 times a year)	No exceedances of the objective level recorded during the 2020 monitoring period	Charnwood Local Air Quality Management – Final Action Plan 2006	CBC AQAP
Mountsorrel	2011	PM_{10} 24 hour mean	An area encompassing residential properties near Mountsorrel Quarry	No	60 recorded exceedences (from 313 valid samples) of the 24 Hr Mean	Insufficient data for 2020 (although 5 exceedances recorded from 88 samples)	Dust Management and Monitoring Plan (Revised 2017)	DMMP 2017

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

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

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

Progress and Impact of Measures to address Air Quality in Charnwood

Defra's appraisal of last year's ASR concluded that both automatic and passive monitoring within the borough continued to confirm that there were no results, or recent evidence of exceedances above objectives limits for:

- Loughborough AQMA
- Syston AQMA
- Mountsorrel AQMA
- Great Central Railway AQMA

Many measures which Charnwood continue to seek to implement to address air quality/climate change issues are not thought of in isolation at departmental level, for which evidencing within in this document would be unfeasible, but rather form an integral but broader strategic approach by both the Council and across the County of Leicestershire. There are several detailed strategic documents that are monitored and reported on elsewhere.

Local Plan (2011-2028) Core Strategy. This is a multi-faceted document that is strategically developed to acknowledge the wider perspective with consideration given to current national and local legislative and economic challenges, but still charting a level of control over sustainable development and means to reduce environmental impact throughout the borough.

More information on the adopted Local Plan and details towards its measure of progress can be viewed on the Council website through the following link:

Charnwood Local Plan 2011 to 2028 Core Strategy

The latest review of the Charnwood Local Plan Core Strategy can be found in the linked document below:

- Local Plan Review – November 2020

At the time of writing the Council is continuing to consider all comments it received during the consultation in respect of the **Draft Charnwood Local Plan 2019-2036.** Proposed policies on Sustainable Construction (LP30) and Sustainable Transport (LP33) seek to address activities that can detrimentally affect air quality such as promote the health benefits of walking and cycling for healthier lifestyles and improved well-being. More people walking and cycling will also mean less congestion and emissions on our roads, improving air quality for our local communities.

Comments received and additional evidence will inform an update of the plan ready for further consultation during 2021.

As part of this process, experienced consultants (AECOM) were appointed to undertake an assessment of air quality issues within the borough to inform the preparation of the final Charnwood Local Plan. See '*Additional Air Quality Works Undertaken by Charnwood Borough Council During 2020*' later in the report.

Climate Change Strategy. The Climate Change Strategy 2018-2030 sets out the Council's aim of influencing and empowering residents, community groups, schools and businesses in the borough to help them to mitigate climate change by reducing their carbon emissions and also aims to implement carbon reduction projects to reduce the carbon emissions of its own buildings.

More information on the Strategy can be found at:

https://www.charnwood.gov.uk/pages/climate_change_strategy

With the Action Plan available to download from:

https://www.charnwood.gov.uk/files/documents/climate_change_strategy_and_action_plan/Climate%20change%20strategy%202018-2030.pdf

Work continues with Leicestershire Public Health colleagues and other county-wide partners to address outcomes in respect of the Action Plan as implemented under the **Leicestershire Joint Strategic Needs Assessment – Air Quality and Health Chapter (May 2019).** This work links back to part of the Public Health Outcomes Framework that examines indicators that help us understand trends in public health.

The Schedule from the Action Plan has been reproduced under Table 2.2

Table 2.2 – Progress on Measures to Improve Air Quality

Air Quality and Health action plan

JSNA objective	*Focus area*	*Multiagency commitments*	*Partnership actions*	*Update*
Consideration of air quality and health in planning and development	Planning and development strategies and proposals	- Consider the impact on air quality and health of all relevant organisational and cross Leicestershire strategies such as Transport plan - Integration of sustainability and health into local planning and design frameworks	Resource to routinely deliver specialist public health support for strategic spatial planning, local area plan development and work on major developments will be formalised.	Post recruited to. Need to formalise implementation of health in all polices approach
		- Develop a joined-up process to ensure all appropriate planning and development proposals that have an impact on air quality are rigorously and systematically scrutinised - using Health Impact Assessments for major developments, and using a Health in All Policies approach to influence wider policies and plans	- Air quality issues will be considered as part of planning policy as well as policies that influence strategic and local development plans - A programme to support local planners to consider the health impacts of planning proposals and urban re-development will be scoped, designed, delivered and evaluated - Public Health to formalise its commitment to provide support to Planning and Highways Authorities within the planning process	As above Need to work with local planners to understand the support they need to consider health impact assessment as part of any planning proposal – set of principles. Should be parting of day job – head of national policy Public Health to determine what support planning and highways authorities need

				Minerals and waste local plan – Development brief – whetstone pastures Hinckley rail hub interchange – green walls and green roofs
Alignment of air quality and health with environment and transport decisions	Active and Sustainable Travel	- Prioritise investment in walking and cycling infrastructure to enable modal change, especially where this would encourage and facilitate active travel to schools (consider 20 mph zones) and workplaces in areas of high urban density - Optimisation of green spaces to reduce people's exposure to poor air quality and encourage active and sustainable travel for air quality and health benefits	- Opportunities to make the case for investment and obtain further funding for infrastructure that promotes the use of active travel and electric vehicles will be identified and optimised - Development of a Cycling and Walking Strategy for Leicestershire; which will set out LCC's overarching strategy for cycling and walking in Leicestershire, in support of meeting targets set out in the Government's Cycling and Walking Investment Strategy (CWIS) and LCC's Environment Strategy - Planning and Highways Authorities should seek to	Check attached

			consider a hierarchy of transport provision prioritising walking and cycling where appropriate - Consider air quality alerting systems in areas with poorer air quality - Look at the Council own fleet vehicles including grey fleet vehicles - Consider increasing secure cycle parking	
		- Scale up activity to adopt sustainable and active travel solutions in Leicestershire. - Develop organisational travel plans, support staff to use sustainable forms of transport and promote active and sustainable travel by customers and the public.	- A network of sustainable travel planners will be established. - Opportunities to promote active and sustainable travel of staff, customers and the public will be identified and optimised	-
General communication with the public and organisations about air quality and health,	Information sharing, and behaviour change campaigns	- Standardise communication with the public, professionals and other organisations on the short and long-term impacts on health of poor air quality - Alignment of public health messages across the partnership around air quality and active and sustainable travel choices	- Provision of clear and consistent messages about air quality and health across a range of communication channels - Key messages on air quality and health will be included on existing (relevant) partner branded information sheets, websites and other mediums	Clear Air Day Campaign - behaviour change pledges ?

		- Increase knowledge about the prevalence of multi fuel stoves across Leicestershire and negative impacts on air quality and health.	- A series of behaviour change campaigns to promote active and sustainable travel, anti-idling, Clean Air Day and reduced multi fuel stove use will be scoped, designed, delivered and evaluated - Work with communities to understand the barriers to improving air quality in their areas.	Anti-idling campaign completed every year outside schools Need to work with LACs
Targeted communication and campaigns with priority, groups and key organisations about air quality and health		- Empower local people and businesses to take action to reduce their emissions. - Clearer methods for engaging regularly with the public or organisations	- Information about air quality and health will be shared with residents, local businesses, health organisations, local early year's settings, schools' colleges and universities in a variety of formats; as appropriate to the audience. This will explain how people and organisations can minimise emissions of pollutants and exposure to poor air quality - A programme to support front line staff to deliver messages around air quality and health (as part of their daily roles) will be scoped, designed, delivered and evaluated.	Has this been completed?

$PM_{2.5}$ – 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.

Charnwood Borough Council considers some of the following measures (either independently or in combination) when assessing $PM_{2.5}$ levels within the borough:

As no local $PM_{2.5}$ monitoring or modelling data is directly undertaken by CBC, there are several sources of existing information that may assist in evaluating $PM_{2.5}$ at the local level. This includes, but is not limited to:

***National $PM_{2.5}$ Monitoring*.** There are approximately eighty $PM_{2.5}$ monitoring stations within the AURN. Monitoring data from sites located either close to, or within the local authority area, these will provide a good indicator as to likely $PM_{2.5}$ concentrations within the Council area.

***National $PM_{2.5}$ Modelling*.** Defra maintains national background maps, which are provided for each 1km × 1km grid square across the UK. By plotting the $PM_{2.5}$ mapped data for the appropriate base year, $PM_{2.5}$ concentrations can be identified within the local authority area. Although considered quite coarse resolution, such information may prove useful to local authorities in directing actions to areas that are most in need of reductions in $PM_{2.5}$ levels.

***Ratio of PM_{10} to $PM_{2.5}$*.** In the absence of any $PM_{2.5}$ monitoring data, local authorities can use one of the methodologies provided in LAQM.(TG16) Chapter 7 Section 1 (paras 7.107 to 7.111) to provide an indication of $PM_{2.5}$ concentrations.

Whilst CBC do not currently undertake their own $PM_{2.5}$ monitoring at this time, third-party data is collated in connection with monitoring under the Mountsorrel Quarry DMMP through our collaboration with Tarmac Trading Ltd and their consultants, DustScanAQ. A summary of their latest results/comments is provided under section 3.2.3.

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

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

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Charnwood Borough Council undertook automatic (continuous) monitoring at 2 sites during 2020. 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.

Due to the impact of COVID-19 during this period of reporting that resulted in restrictions being placed upon routine operational visits, we have unfortunately experienced data collection rates that are beneath reportable levels.

Furthermore, a decision to de-commission our 2 existing NO_2 analysers was taken during the year with only historic results being presented for reference.

3.1.2 Non-Automatic Monitoring Sites

Charnwood Borough Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 47 sites (53 tubes) 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.

Individual Pollutants

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

3.1.3 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored 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.

There were no exceedances of the annual air quality objective in 2020.

3.1.4 Particulate Matter (PM_{10})

Charnwood Borough Council continues to monitor PM_{10} levels in the vicinity of Mountsorrel Quarry. Recent monitoring has shown that levels are in compliance with the air quality objectives. Further areas of site improvement and methods for on-site monitoring are detailed within the sites Dust Management and Monitoring Plan, available at: Mountsorrel Quarry Dust Management and Monitoring Plan

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 were no exceedances of the annual mean air quality objectives in 2020.

3.1.5 Particulate Matter ($PM_{2.5}$)

Charnwood Borough Council do not undertake any local monitoring of $PM_{2.5}$ themselves.

As outlined in section 2.3; consideration is taken via several available indicative data sources as well as local knowledge for us to identify any localised 'hot-spots' that may be, or become, potential areas of concern.

It is important to note however that due to its extremely small size, $PM_{2.5}$ can travel for long distances in the air and it is estimated that as much as 40% to 50% of the levels found in any given area can be from sources outside a local authority's direct boundary[7].

Whilst typically we would provide an updated estimation of $PM_{2.5}$ concentrations using the nationally derived correction factor from recorded PM_{10} observations at the Mountsorrel PM_{10} monitoring site (as considered to be the 'worst-case' location for public exposure to dust within the borough), unfortunately insufficient data capture rates during 2020 prevent us from doing so for this reporting period. As an indicative value the 2019 is again re-presented from our 2020 ASR here:

The recorded annual mean concentration of PM_{10} at the Mountsorrel site in 2019 was 22.6µg/m^3. The PM2.5 concentration at this location can be estimated as follows:

The recorded annual mean PM10 concentration multiplied by the nationally derived correction factor: 22.6 x 0.7 = 15.8

Estimated annual mean PM2.5 = 15.8µg/m^3

We are however able to supplement any estimates with third-party figures as collated in connection with monitoring under the Mountsorrel Quarry DMMP through our collaboration with Tarmac Trading Ltd and their consultants, DustScanAQ, as follows:

DustScanAQ Report Date: 25 May 2021

"For the 12 months up to 26 March 2021, there were 355 daily PM2.5 readings taken by the Osiris at Stn 9, representing a 97.3 % data collection rate. From the available data the annual average daily PM2.5 concentration for the 12 months was 8.31 µg/m3, which is approximately 33.2 % of the annual average PM2.5 concentration objective (25 µg/m3)."

[7] Fine Particulate Matter (PM2.5) in the United Kingdom. Air Quality Expert Group (AQEG) Report, 2012

3.1.6 Sulphur Dioxide (SO_2)

Table A.8 in Appendix A compares the ratified continuous monitored SO_2 concentrations for 2020 with the air quality objectives for SO_2.

Results for 2020 would indicate that receptor exposure continues to be within the required objective levels for this particular pollutant, however we will continue to monitor levels to build a longer-term picture of concentrations at this site.

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	Mountsorrel	Industrial	457355	315396	PM_{10}	YES (Mountsorrel)	Volumetric Gravimetric	~34	N/A	~1.5
CM2	Great Central Railway	Industrial	454380	319768	SO_2	YES (GCR)	Electrochemical Sensor	0	N/A	~1.5

Notes:

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

(2) N/A if not applicable

Table A.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	Ratcliffe Rd (L'boro)	Roadside	454087	320392	NO2	YES. Loughborough AQMA	0.0	3.0	No	2.3
DT2	Shelthorpe Rd (L'boro)	Roadside	454234	318657	NO2	NO	8.0	3.0	No	2.3
DT3	Forest Rd (L'boro)	Roadside	452833	318776	NO2	NO	0.0	6.0	No	1.8
DT4	Haydon Rd (L'boro)	Roadside	452314	319620	NO2	YES. Loughborough AQMA	8.0	6.0	No	2.0
DT5	Alan Moss Rd / Epinal Way (L'boro)	Roadside	452173	319924	NO2	YES. Loughborough AQMA	0.0	15.0	No	1.8
DT6	Epinal Way / Ling Rd (L'boro)	Roadside	453678	318678	NO2	NO	0.0	9.0	No	2.3
DT7	Leicester Rd (L'boro)	Roadside	454002	319253	NO2	YES. Loughborough AQMA	0.0	3.0	No	2.3
DT8	Derby Rd (L'boro)	Roadside	453231	320028	NO2	YES. Loughborough AQMA	3.0	3.0	No	2.3
DT9	Derby Rd / Briscoe Avn (L'boro)	Roadside	452670	320527	NO2	YES. Loughborough AQMA	3.0	4.0	No	2.3
DT10, DT11, DT12	Durham Rd 3 (L'boro)	Urban Background	452352	320697	NO2	NO			No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT13	Alan Moss Rd / A6 Derby Rd (L'boro)	Roadside	452903	320212	NO2	YES. Loughborough AQMA	0.0	8.0	No	1.8
DT14	High St (L'boro)	Roadside	453730	319596	NO2	YES. Loughborough AQMA	0.0	3.0	No	2.3
DT15	Market Place (L'boro)	Urban Centre	453611	319540	NO2	YES. Loughborough AQMA			No	2.3
DT16	Ashby Rd (L'boro)	Roadside	453189	319709	NO2	YES. Loughborough AQMA	0.0	4.0	No	2.3
DT17	Cow Hill Lodge (Shepshed)	Roadside	448876	318307	NO2	NO	0.0	10.0	No	1.8
DT18	Roseberry St (L'boro)	Roadside	452697	319921	NO2	NO	3.0	3.0	No	2.3
DT19	Melton Rd Town Centre (Syston)	Roadside	462777	311692	NO2	YES. Syston AQMA	3.0	3.0	No	2.3
DT20	1123 Melton Rd (Syston)	Roadside	46235	311213	NO2	YES. Syston AQMA	0.0	6.0	No	1.8
DT21	1116 Melton Rd (Syston)	Roadside	462373	311254	NO2	Yes. Syston AQMA	0.0	6.0	No	2.0
DT22	Loughborough Rd (Birstall)	Roadside	459233	309233	NO2	NO	0.0	15.0	No	1.8
DT23	A6 (Birstall)	Roadside	459178	309890	NO2	NO	2.0	5.0	No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT24	21 Humberstone Lane (Thurmaston)	Roadside	460821	308757	NO2	NO	0.0	6.0	No	1.8
DT25	43 Humberstone Lane (Thurmaston)	Roadside	460861	308824	NO2	NO	0.0	5.0	No	1.8
DT26	22 Humberstone Lane (Thurmaston)	Roadside	460835	308784	NO2	NO	0.0	5.0	No	1.8
DT27	Ashby Rd Central (Shepshed)	Roadside	448121	318257	NO2	NO	12.0	2.0	No	2.3
DT28	Loughborough Rd (Hathern)	Roadside	450260	321922	NO2	NO	30.0	3.0	No	2.3
DT29	Barrow Street (L'boro)	Roadside	453901	319488	NO2	NO	0.0	10.0	No	2.0
DT30	School Street (L'boro)	Urban Background	453946	319619	NO2	NO	5.0	3.0	No	2.3
DT31	Fennel Street (L'boro)	Roadside	453694	319890	NO2	NO	0.0	3.0	No	2.3
DT32	High Street (Syston)	Roadside	462369	311809	NO2	YES. Syston AQMA	0.0	4.0	No	2.3
DT33, DT34, DT35	Syston AQMS 3	Roadside	462540	311428	NO2	YES. Syston AQMA	10.0	3.0	No	1.8
DT36, DT37, DT38	Baxter Gate AQMS 3	Kerbside	453687	319672	NO2	YES. Loughborough AQMA		1.0	No	1.8

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	Nottingham Rd (L'boro)	Roadside	454154	320116	NO2	NO	0.0	3.0	No	2.3
DT40	156 Ratcliffe Rd (L'boro)	Roadside	454285	320294	NO2	NO	0.0	6.0	No	1.8
DT41	156 Meadow Lane (L'boro)	Roadside	453933	320663	NO2	NO	0.0	8.0	No	1.8
DT42	31 Station Boulevard (L'boro)	Roadside	454142	320593	NO2	NO	0.0	9.0	No	1.8
DT43	91 Wharncliffe Rd (L'boro)	Roadside	454250	319682	NO2	NO	0.0	4.0	No	1.8
DT44	3 Simpson Cl (Syston)	Suburban	461499	310459	NO2	NO	0.0	30.0	No	1.8
DT45	1 Brackenfield Way (Thurmaston)	Suburban	461994	309975	NO2	NO	0.0	8.0	No	1.8
DT46	74 Hathern Rd (Shepshed)	Roadside	448311	320511	NO2	NO	0.0	8.0	No	1.8
DT47	7 Shepshed Rd (Hathern)	Roadside	449935	322227	NO2	NO	0.0	11.0	No	1.8
DT48	37 Darwin Crescent (L'boro)	Suburban	450942	321076	NO2	NO	0.0	15.0	No	1.8
DT49	Far Street (Wymeswold)	Roadside	460313	323521	NO2	NO	1.0	2.0	No	2.3
DT50	Cropston Rd (Anstey)	Roadside	455141	308686	NO2	NO	1.0	3.0	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)
DT51	15 Leicester Rd (Anstey)	Roadside	455167	308549	NO2	NO	0.0	4.0	No	2.3
DT52	22 Main Street (Barkby)	Rural	463483	309880	NO2	NO	0.0	4.0	No	2.3
DT53	Frederick Street (L'boro)	Roadside	453277	319248	NO2	NO	0.0	4.0	No	2.3

Notes:

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

(2) N/A if not applicable.

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

No automatic monitoring in respect of NO2 was undertaken in 2020. Historic data for 2 sites (analysers now removed / site details in previous reports) is presented for information purposes only.

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
CM3	453687	319672	Kerbside	N/A	N/A	-	29.45	29.05	-	-
CM4	462540	311428	Roadside	N/A	N/A	-	34.87	27.64	-	-

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

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

Notes:

The annual mean concentrations are presented as µg/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	454087	320392	Roadside	83.3	100.0	24.3	24.3	20.9	21.8	16.0
DT2	454234	318657	Roadside	83.3	100.0	23.1	21.0	20.0	20.7	14.2
DT3	452833	318776	Roadside	83.3	100.0	28.6	26.7	24.1	25.7	18.3
DT4	452314	319620	Roadside	83.3	100.0	27.8	30.0	23.1	25.7	18.4
DT5	452173	319924	Roadside	83.3	100.0	23.7	24.8	20.4	21.4	14.9
DT6	453678	318678	Roadside	75	92.3	26.7	29.1	26.0	27.7	19.0
DT7	454002	319253	Roadside	83.3	100.0	37.9	36.0	33.5	33.0	23.2
DT8	453231	320028	Roadside	75	90.4	33.4	33.3	28.8	27.0	16.7
DT9	452670	320527	Roadside	83.3	100.0	26.8	27.0	22.5	23.3	16.2
DT10, DT11, DT12	452352	320697	Urban Background	83.3	100.0	19.1	19.9	17.2	18.1	12.4
DT13	452903	320212	Roadside	66.6	67.3	27.4	27.5	24.9	25.3	17.8
DT14	453730	319596	Roadside	75	92.3	32.4	33.0	28.4	30.8	20.1
DT15	453611	319540	Urban Centre	83.3	100.0	21.2	21.3	17.3	19.1	12.4

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
DT16	453189	319709	Roadside	75	90.4	28.0	31.6	28.0	30.2	20.0
DT17	448876	318307	Roadside	83.3	100.0	27.1	25.4	23.3	26.6	17.8
DT18	452697	319921	Roadside	83.3	100.0	19.7	19.4	17.0	17.6	12.4
DT19	462777	311692	Roadside	83.3	100.0	31.7	33.2	26.1	27.0	19.1
DT20	46235	311213	Roadside	83.3	100.0	27.3	29.8	24.1	24.1	17.5
DT21	462373	311254	Roadside	83.3	100.0	35.8	37.2	32.1	34.2	23.7
DT22	459233	309233	Roadside	66.6	84.6	32.3	33.7	26.3	27.1	19.5
DT23	459178	309890	Roadside	66.6	84.6	34.1	35.6	29.4	26.0	17.1
DT24	460821	308757	Roadside	66.6	84.6	33.9	35.3	28.3	30.6	21.0
DT25	460861	308824	Roadside	66.6	84.6	32.6	34.2	29.7	30.4	20.5
DT26	460835	308784	Roadside	66.6	84.6	27.3	30.9	24.1	24.1	16.0
DT27	448121	318257	Roadside	83.3	100.0	39.0	34.9	33.9	22.2	21.2
DT28	450260	321922	Roadside	83.3	100.0	30.1	28.3	25.0	20.3	16.9
DT29	453901	319488	Roadside	83.3	100.0	26.3	26.0	23.3	25.2	18.5

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
DT30	453946	319619	Urban Background	83.3	100.0	22.1	22.4	19.6	20.6	14.5
DT31	453694	319890	Roadside	83.3	100.0	31.4	30.5	28.9	28.3	19.8
DT32	462369	311809	Roadside	83.3	100.0	28.5	32.2	26.0	25.7	18.3
DT33, DT34, DT35	462540	311428	Roadside	83.3	100.0	29.8	34.1	26.8	28.1	21.1
DT36, DT37, DT38	453687	319672	Kerbside	83.3	100.0	31.0	28.8	28.8	28.1	19.1
DT39	454154	320116	Roadside	75	92.3	35.2	32.6	32.6	29.7	20.3
DT40	454285	320294	Roadside	83.3	100.0	24.8	22.9	22.2	22.0	15.6
DT41	453933	320663	Roadside	83.3	100.0	24.6	23.6	22.8	21.7	15.4
DT42	454142	320593	Roadside	83.3	100.0	25.8	25.8	22.5	23.4	16.1
DT43	454250	319682	Roadside	83.3	100.0	28.2	25.7	24.0	28.3	18.0
DT44	461499	310459	Suburban	83.3	100.0	26.5	28.0	20.8	21.5	15.2
DT45	461994	309975	Suburban	83.3	100.0	22.2	24.5	19.6	19.2	14.9
DT46	448311	320511	Roadside	83.3	100.0	22.2	21.5	20.4	19.8	13.9
DT47	449935	322227	Roadside	83.3	100.0	22.9	24.2	21.9	22.6	15.7

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
DT48	450942	321076	Suburban	83.3	100.0	17.6	15.8	14.3	13.9	8.6
DT49	460313	323521	Roadside	83.3	100.0	31.6	29.4	27.7	25.7	17.3
DT50	455141	308686	Roadside	83.3	100.0				31.3	24.1
DT51	455167	308549	Roadside	83.3	100.0	26.2	27.5	23.6	22.8	14.8
DT52	463483	309880	Rural	83.3	100.0	20.8	23.1	17.7	17.7	12.5
DT53	453277	319248	Roadside	83.3	100.0				26.2	17.3

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

☒ **Diffusion tube data has been bias adjusted.**

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

Notes:

The annual mean concentrations are presented as µg/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 – A.11 Trends in Annual Mean NO_2 Concentrations

The following plots show the trends in Annual Mean concentrations measured at selected diffusion tube (DT) monitoring sites

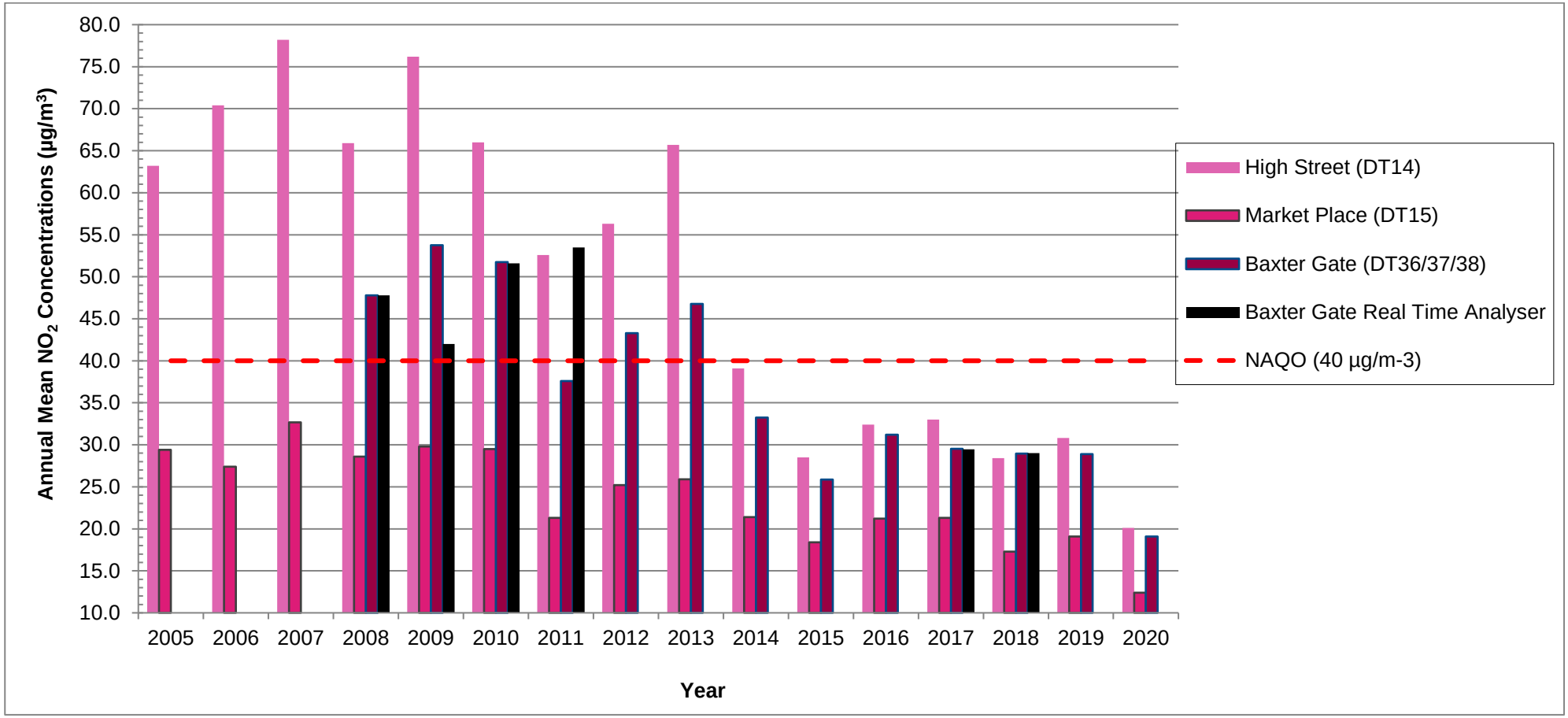


Figure A.1 Plot of NO_2 Concentration against Year for Loughborough Town Centre (i) sites

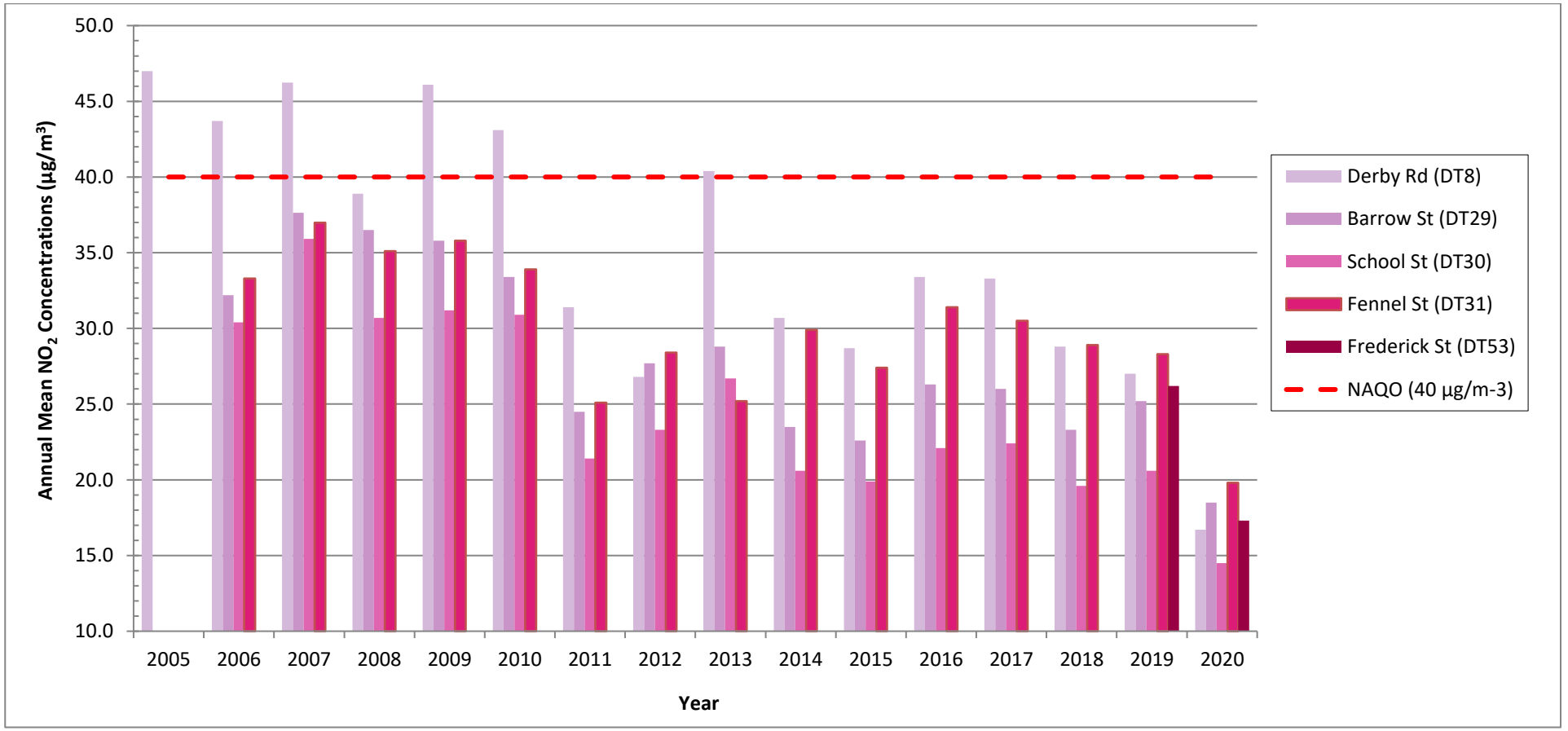


Figure A.2 Plot of NO_2 Concentration against Year for Loughborough Town Centre (ii) sites

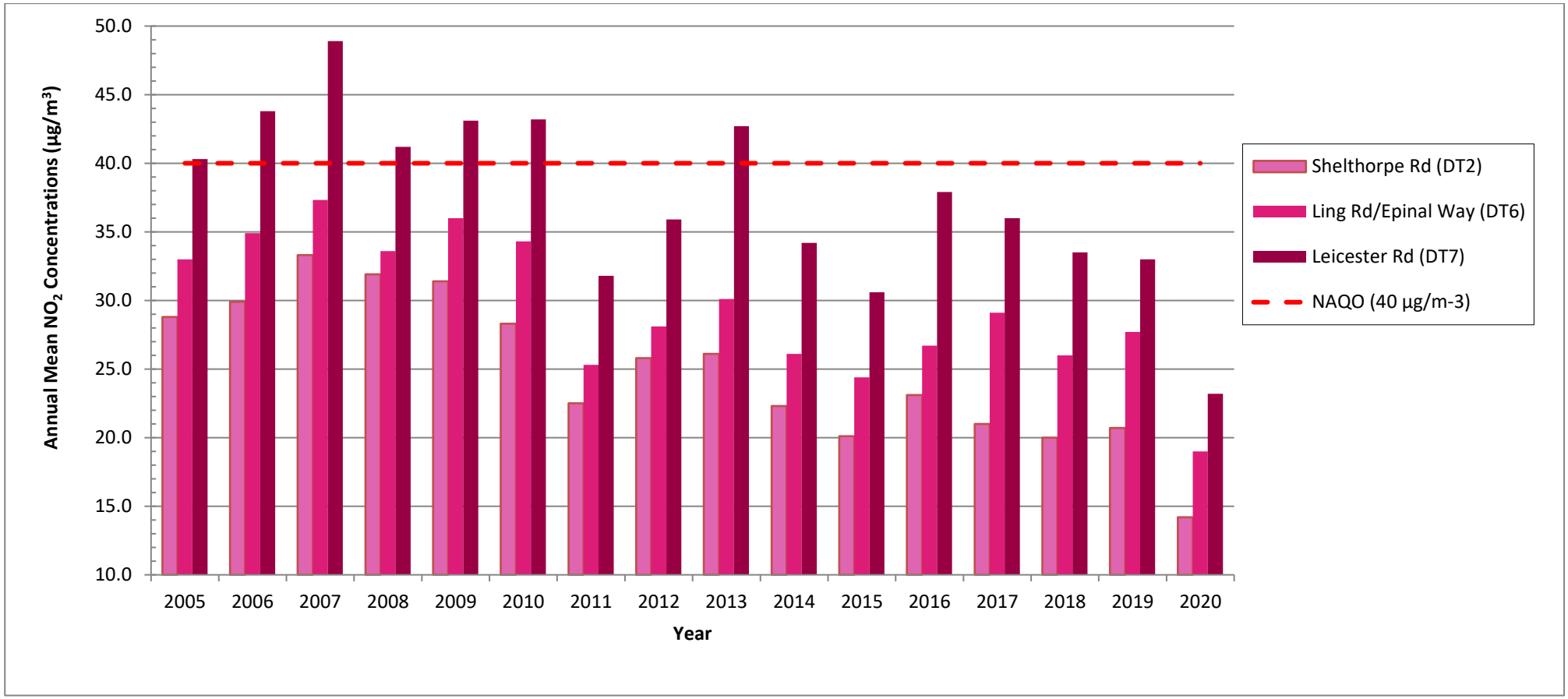


Figure A.3 Plot of NO_2 Concentration against Year for Loughborough South sites

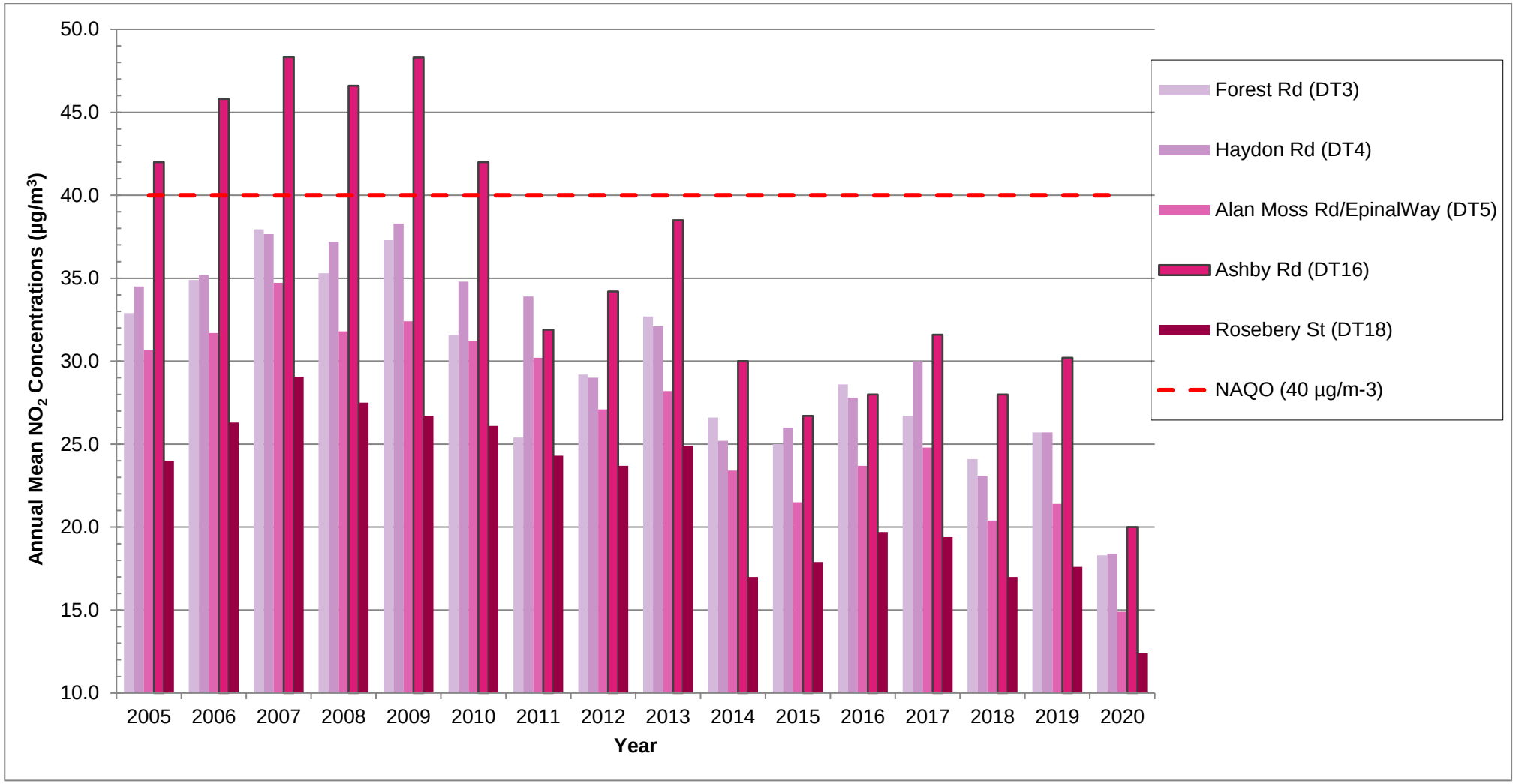


Figure A.4 Plot of NO_2 Concentration against Year for Loughborough West sites

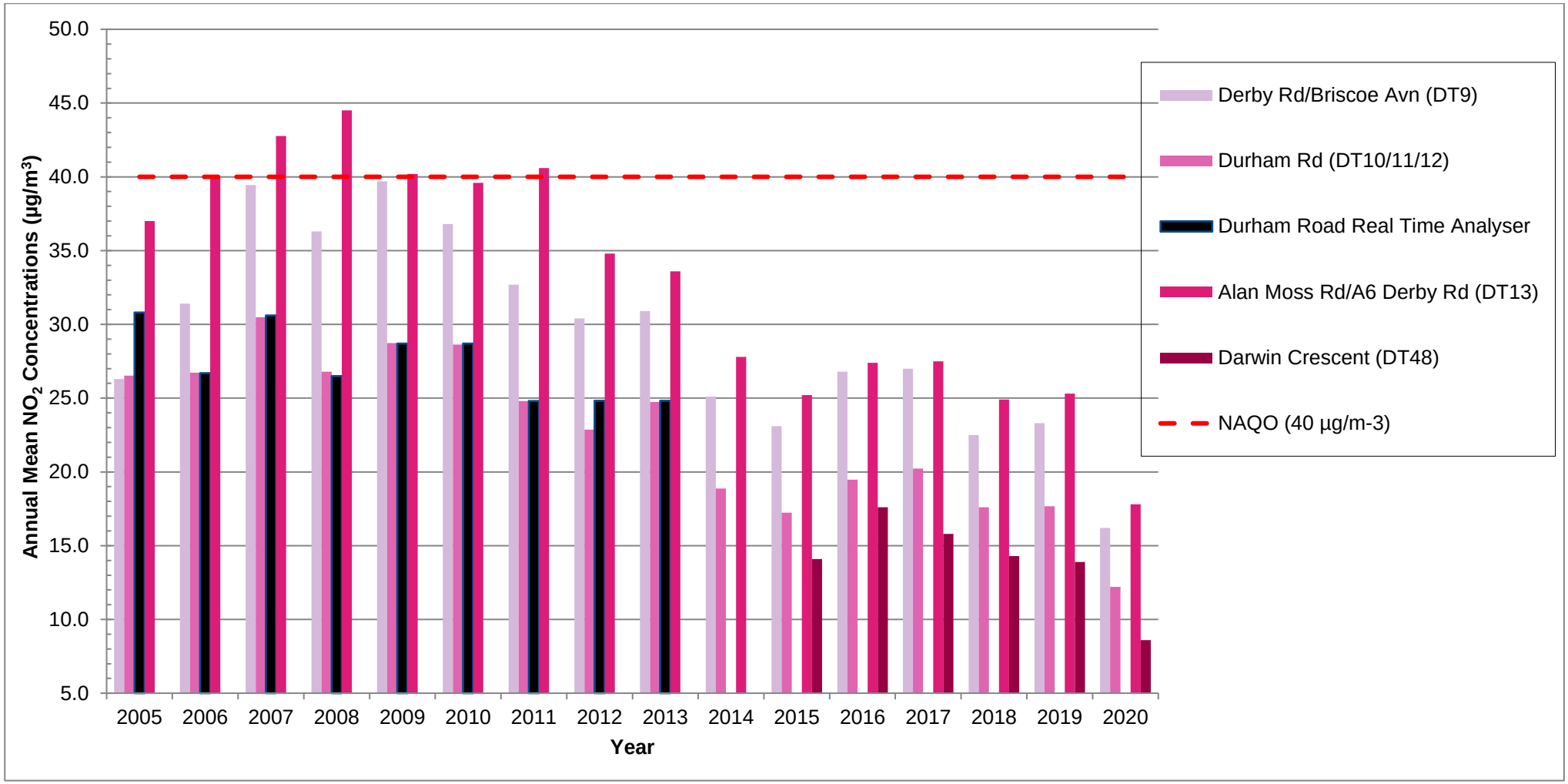


Figure A.5 Plot of NO_2 Concentration against Year for Loughborough North sites

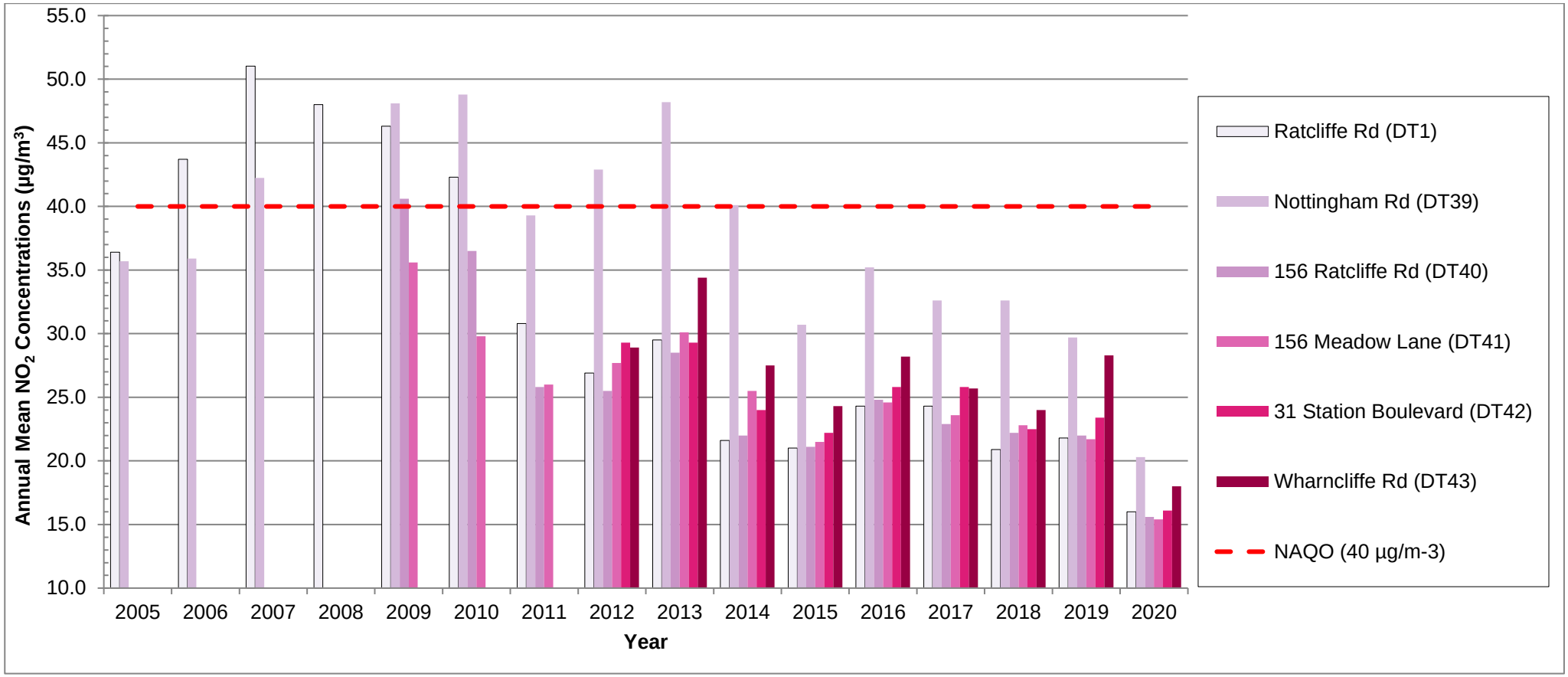


Figure A.6 Plot of NO_2 Concentration against Year for Loughborough East sites

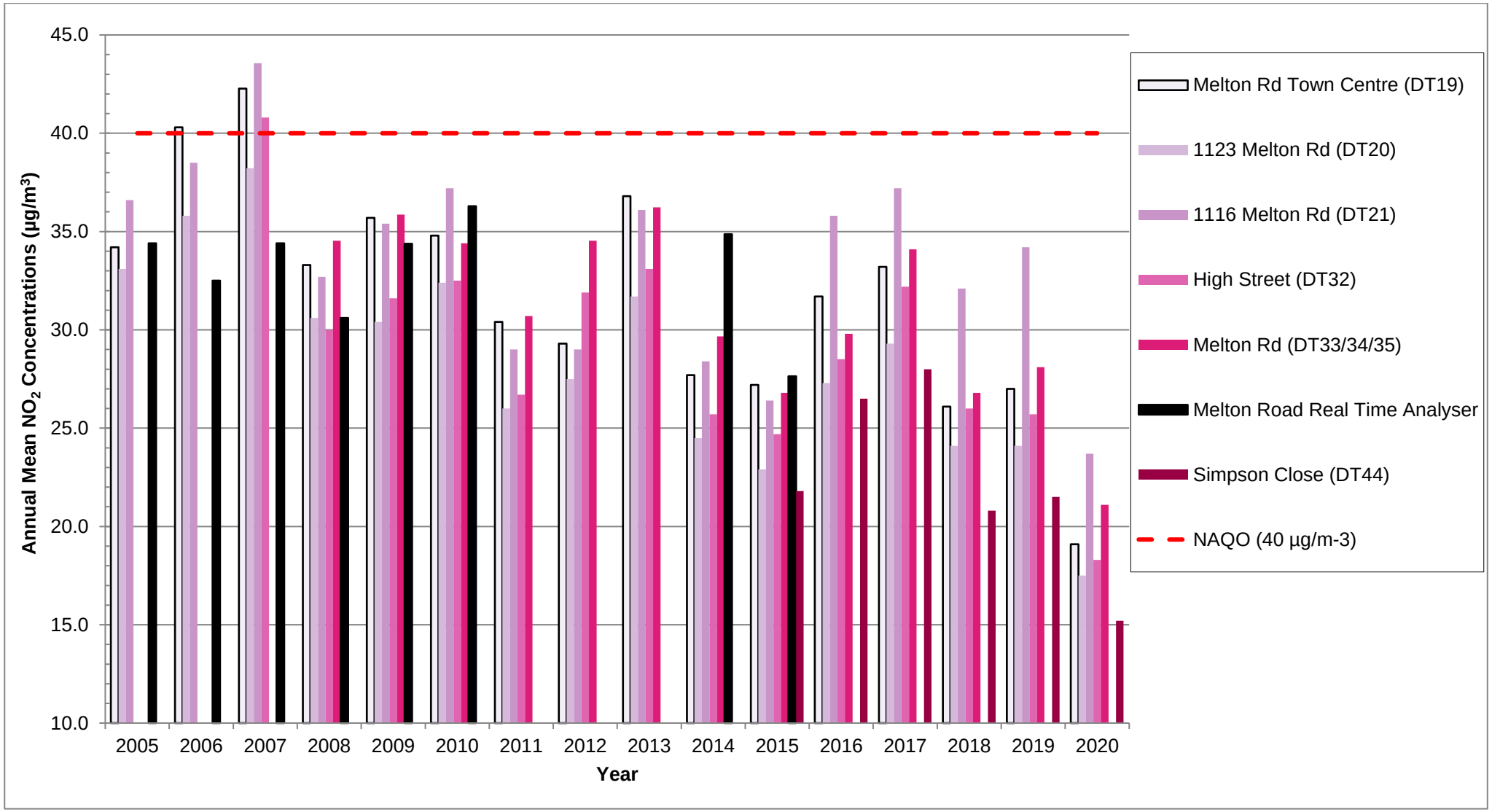


Figure A.7 Plot of NO_2 Concentration against Year for Syston sites

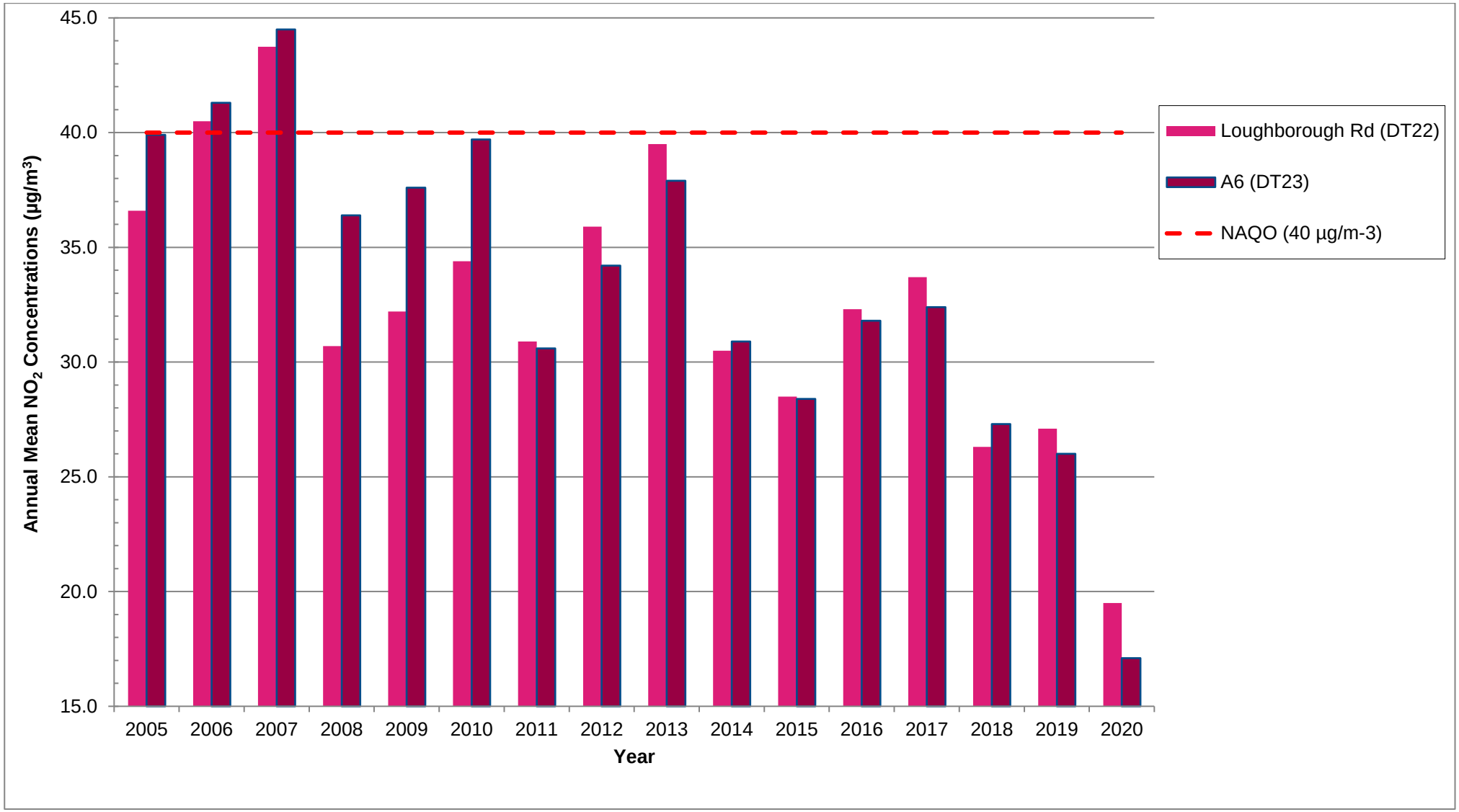


Figure A.8 Plot of NO_2 Concentration against Year for Birstall sites

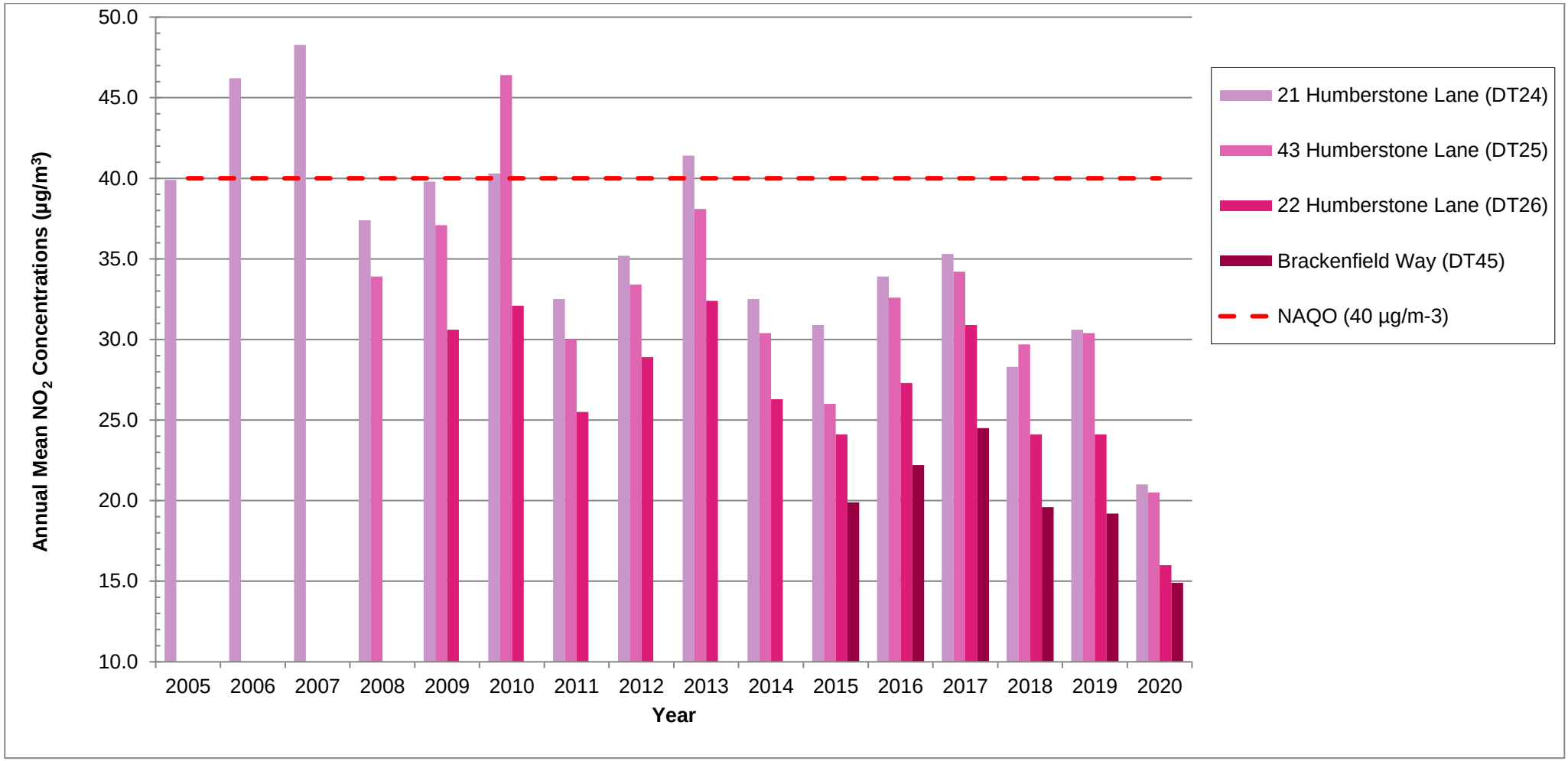


Figure A.9 Plot of NO_2 Concentration against Year for Thurmaston sites

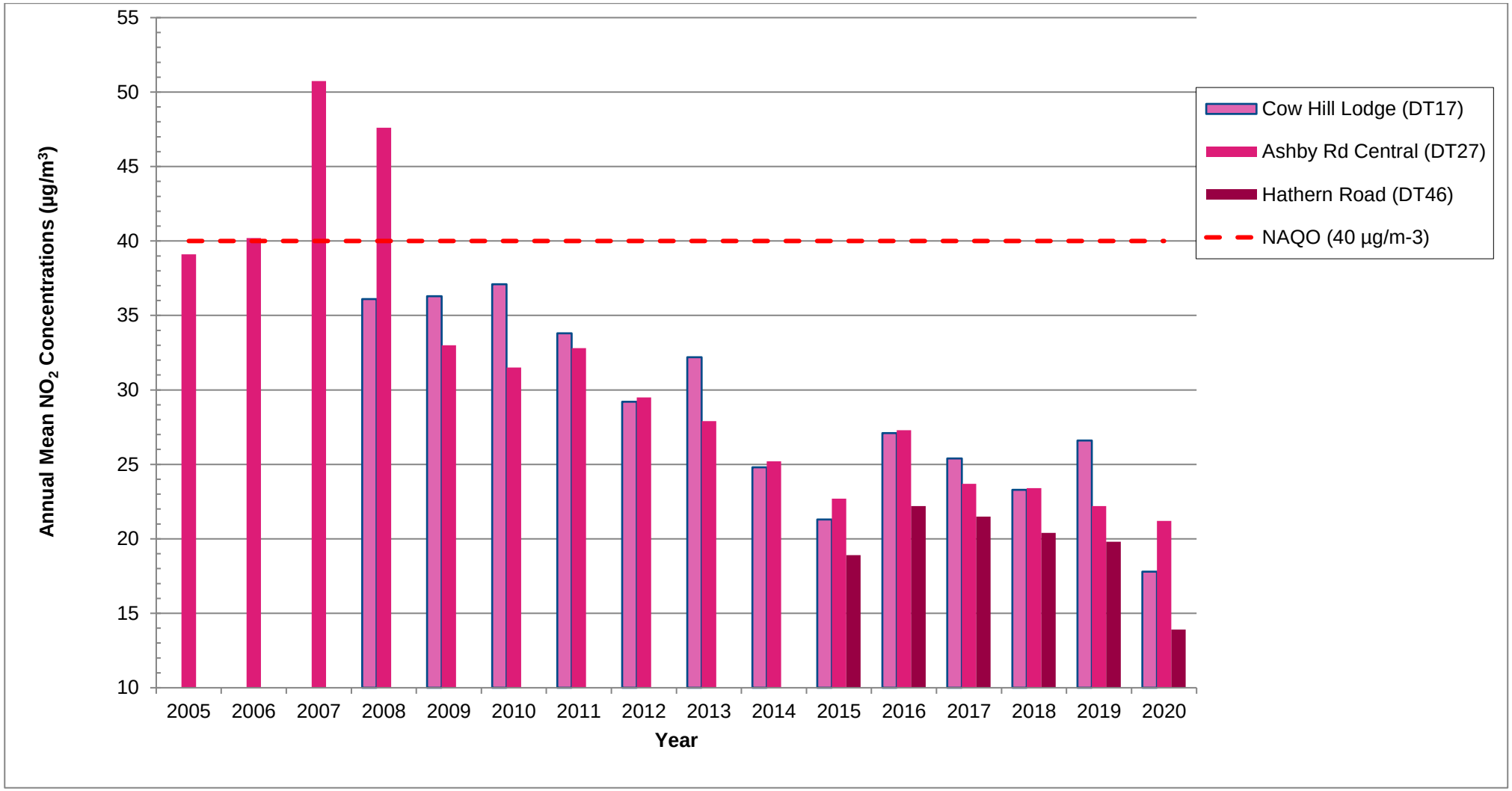


Figure A.10 Plot of NO_2 Concentration against Year for Shepshed sites

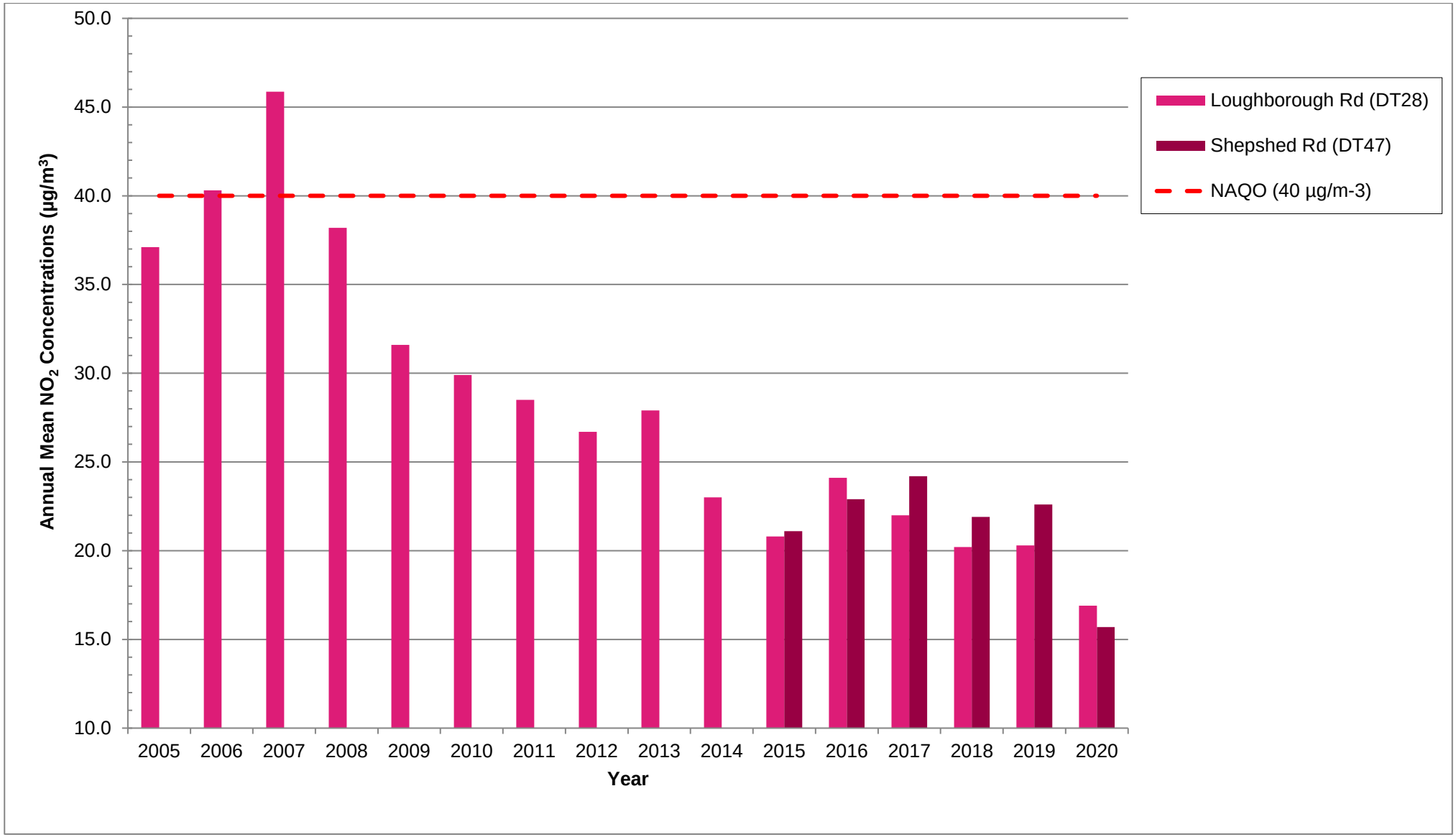


Figure A.11 Plot of NO_2 Concentration against Year for Hathern sites

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

No automatic monitoring in respect of NO2 was undertaken in 2020. Historic data for 2 sites (analysers now removed / site details in previous reports) is presented for information purposes only.

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
CM3	453687	319672	Kerbside	N/A	N/A	-	0	[95.9]	-	-
CM4	462540	311428	Roadside	N/A	N/A	-	[11.46]	0	-	-

Notes:

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

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

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

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

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

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

88 valid samples = insufficient data capture rate at <25% for 2020 No results presented.

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	457355	315396	Industrial	24	24	24.65	24.84	24.66	22.6	-

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

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.12 – Trends in Annual Mean PM_{10} Concentrations

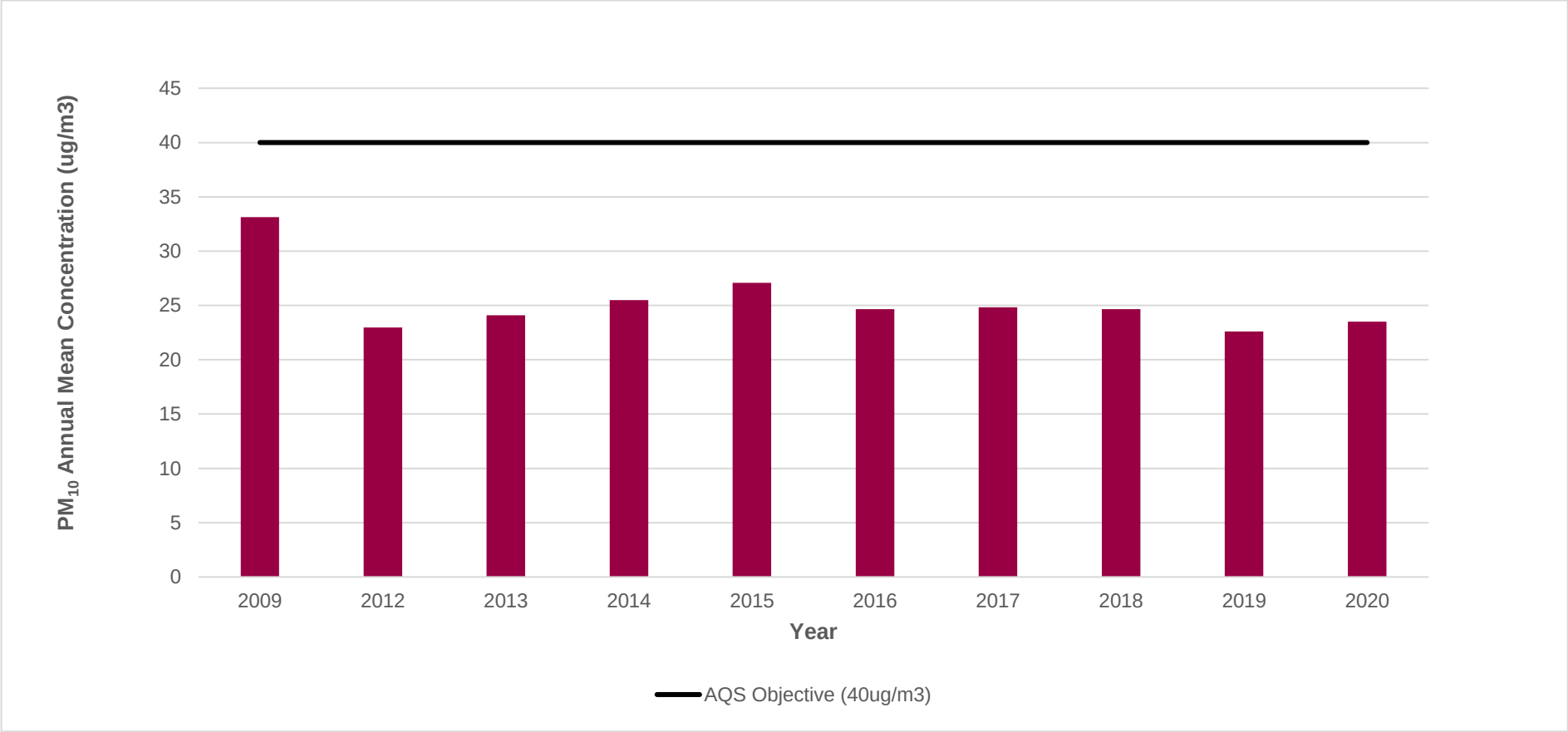


Figure A.12 Plot of PM_{10} Annual Mean Concentration against Year for the Mountsorrel Quarry monitoring site (CM1)

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	457355	315396	Industrial	24	24	[46.9]	[46.9]	[46.3]	[43.1]	[40.7]

Notes:

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

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

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

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

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

Figure A.13 – Trends in the 90.4th Percentile of 24-Hour Mean PM_{10} Results > 50µg/m^3

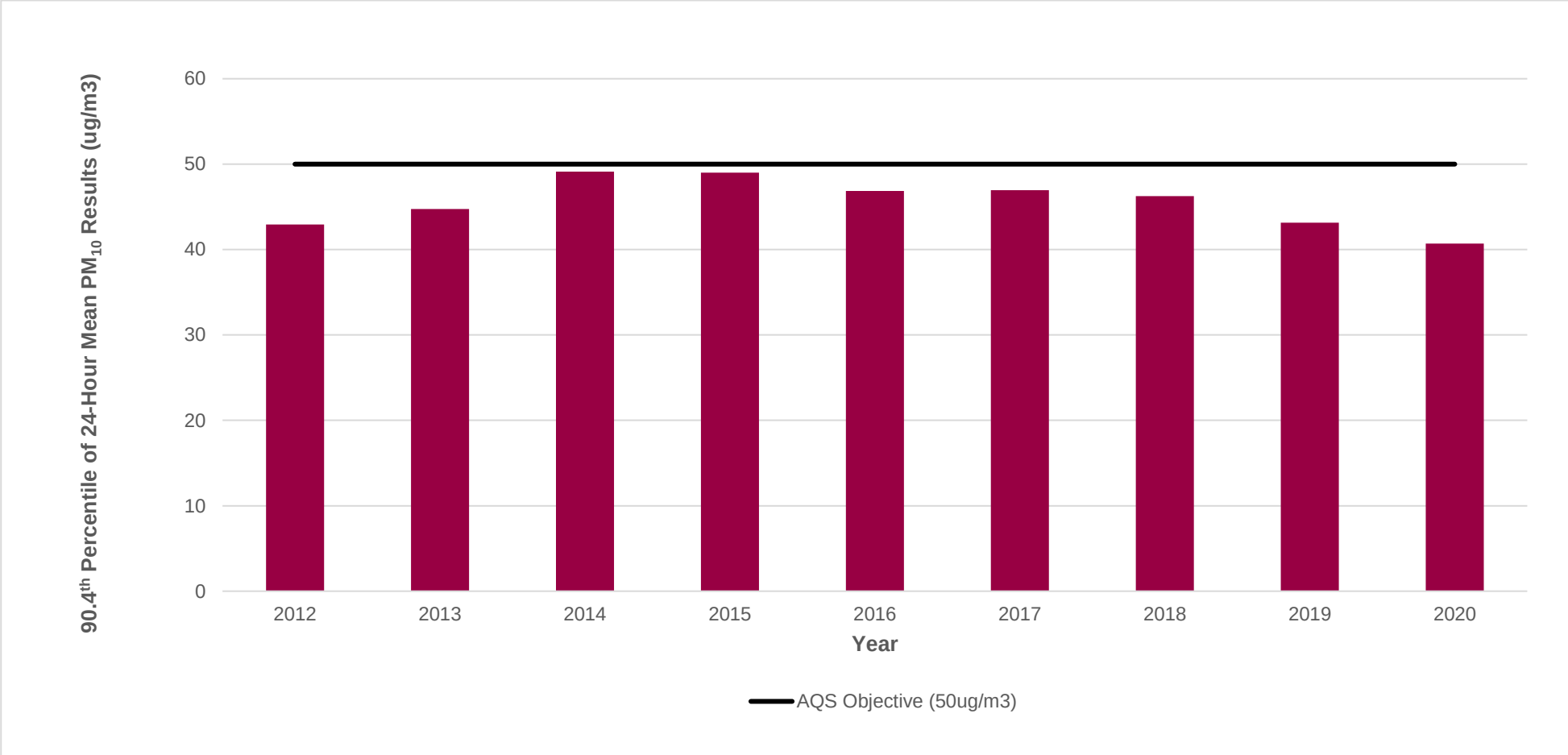


Figure A.13 Plot of the 90.4th Percentile of 24-Hour Mean Concentration against Year for the Mountsorrel Quarry monitoring site (CM1)

Table A.8 – SO_2 2020 Monitoring Results, Number of Relevant Instances

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	Number of 15-minute Means > 266µg/m^3	Number of 1-hour Means > 350µg/m^3	Number of 24-hour Means > 125µg/m^3
CM2	454380	319768	Industrial	64	64	[46.87]	[45.94]	[17.53]

Notes:

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

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

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO_2 2020 Diffusion Tube Results (µg/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 (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT1	454087	320392	29.8	24.0	13.0			15.0	14.8	16.2	21.3	20.4	30.6	26.5	19.7	16.0	-	
DT2	454234	318657	25.0	19.3	11.8			14.1	12.0	15.7	18.9	19.1	27.7	23.3	17.5	14.2	-	
DT3	452833	318776	29.5	27.9	15.2			22.4	16.3	20.4	25.2	27.6	30.2	27.0	22.6	18.3	-	
DT4	452314	319620	36.9	33.2	12.0			17.5	18.2	19.8	25.3	26.3	32.6	27.5	22.7	18.4	-	
DT5	452173	319924	28.6	26.7	12.1			13.9	14.0	15.4	20.4	20.0	26.0	20.4	18.3	14.9	-	
DT6	453678	318678	31.8	29.6	14.6				18.1	21.9	23.7	23.8	33.6	31.9	23.4	19.0	-	
DT7	454002	319253	31.9	30.2	20.8			29.5	21.9	30.2	35.7	30.2	38.4	33.6	28.7	23.2	-	
DT8	453231	320028	23.8	26.0	13.8			18.5	15.2		23.1	22.8	31.8	24.6	20.6	16.7	-	
DT9	452670	320527	28.5	23.9	13.2			15.6	14.0	17.7	21.7	22.0	28.6	27.6	20.0	16.2	-	
DT10	452352	320697	21.2	18.3	10.6			12.7	10.4	12.9	17.1	16.1	19.8	23.6	-	-	-	Triplicate Site with DT10, DT11 and DT12 - Annual data provided for DT12 only
DT11	452352	320697	21.3	17.8	10.8			12.3	10.4	12.8	17.0	16.7	22.7	20.5	-	-	-	Triplicate Site with DT10, DT11 and DT12 - Annual data provided for DT12 only
DT12	452352	320697	21.6	15.8	11.0			11.9	9.8	12.8	17.1	16.0	23.7	21.3	15.3	12.4	-	Triplicate Site with DT10, DT11 and DT12 - Annual data provided for DT12 only
DT13	452903	320212	28.0	25.8				20.3	16.2	20.8		23.8	30.9	26.4	24.0	17.8	-	
DT14	453730	319596		36.2	14.8			19.2	18.5	23.6	30.0	31.1	35.8	33.4	24.8	20.1	-	
DT15	453611	319540	22.9	19.0	9.5			10.4	9.5	12.2	17.1	16.9	24.7	22.3	15.3	12.4	-	
DT16	453189	319709	35.8	31.5	15.4			21.7	19.9	22.1	30.2	29.0	36.5		24.6	20.0	-	
DT17	448876	318307	30.6	26.6	16.1			21.4	16.0	20.7	24.5	23.3	31.0	22.4	22.0	17.8	-	
DT18	452697	319921	22.6	18.4	10.1			14.7	11.2	11.7	16.1	17.1	22.2	20.1	15.3	12.4	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT19	462777	311692	33.3	30.9	15.2			20.5	18.3	19.7	26.7	27.7	29.8	30.4	23.5	19.1	-	
DT20	46235	311213	30.8	26.9	15.2			18.9	15.4	18.9	27.2	22.9	28.1	25.1	21.6	17.5	-	
DT21	462373	311254	42.9	38.9	19.6			22.9	24.3	23.3	34.7	33.2	39.2	34.3	29.2	23.7	-	
DT22	459233	309233	38.0	35.1	15.7					21.5	27.6	29.7	32.8	28.9	25.9	19.5	-	
DT23	459178	309890	34.9	30.8	18.4					23.4	27.5	21.4		32.6	22.7	17.1	-	
DT24	460821	308757	39.3	35.0	16.9					23.8	31.9	30.3	35.8	34.1	27.9	21.0	-	
DT25	460861	308824	37.2	31.8	18.5					24.1	29.0	28.6	37.2	31.7	27.3	20.5	-	
DT26	460835	308784	22.0	26.4	14.9					17.4	22.4	24.4	26.4	28.5	21.2	16.0	-	
DT27	448121	318257	34.0	29.7	19.9			28.5	22.2	22.9	29.4	27.4	34.8	27.6	26.2	21.2	-	
DT28	450260	321922	27.9	21.3	13.6			18.0	15.7	19.6	23.9	23.5	31.3	28.4	20.9	16.9	-	
DT29	453901	319488	31.4	25.7	16.6			19.7	14.9	19.2	24.0	26.0	32.3	30.3	22.8	18.5	-	
DT30	453946	319619	26.4	22.2	11.5			12.8	13.1	12.8	20.5	20.6	27.9	24.6	17.9	14.5	-	
DT31	453694	319890	32.6	27.5	16.4			22.5	18.2	24.2	26.5	27.2	34.6	30.2	24.4	19.8	-	
DT32	462369	311809	36.2	30.0	14.3			16.4	16.7	16.8	25.4	25.4	34.4	28.0	22.6	18.3	-	
DT33	462540	311428	41.6	36.5	17.9			21.3	22.4	21.9	30.2	29.1	37.2	31.2	-	-	-	Triplicate Site with DT33, DT34 and DT35 - Annual data provided for DT35 only
DT34	462540	311428	38.1	32.6	17.2			20.5	22.5	22.0	28.5	29.8	33.5	29.3	-	-	-	Triplicate Site with DT33, DT34 and DT35 - Annual data provided for DT35 only
DT35	462540	311428	39.0	36.1	17.0			20.2	22.2	21.4	28.8	28.6	35.3	27.1	26.1	21.1	-	Triplicate Site with DT33, DT34 and DT35 - Annual data provided for DT35 only
DT36	453687	319672	32.2	20.9	18.1			21.9	13.8	23.5	26.6	25.3	35.1	31.1	-	-	-	Triplicate Site with DT36, DT37 and DT38 - Annual data provided for DT38 only
DT37	453687	319672	30.5	24.9	17.4			21.3	13.5	24.1	25.7	24.4	33.9	31.6	-	-	-	Triplicate Site with DT36, DT37 and DT38 - Annual data provided for DT38 only
DT38	453687	319672	30.0	24.1	17.2			20.1	13.7	24.2	28.3	24.9	35.1	29.1	23.6	19.1	-	Triplicate Site with DT36, DT37 and DT38 - Annual data provided for DT38 only
DT39	454154	320116	32.3		17.4			22.6	19.1	23.7	28.1	29.7	36.9	30.8	25.1	20.3	-	

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 (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT40	454285	320294	23.9	23.4	15.0			15.3	15.3	16.9	22.2	22.5	21.1	24.9	19.2	15.6	-	
DT41	453933	320663	26.4	26.0	12.7			15.5	12.1	16.3	19.4	21.0	28.9	24.6	19.0	15.4	-	
DT42	454142	320593	28.1	22.4	14.5			17.1	15.1	17.4	22.4	21.1	27.4	24.5	19.9	16.1	-	
DT43	454250	319682	26.2	25.4	15.2			21.0	14.2	26.9	24.9	23.0	31.6	26.9	22.2	18.0	-	
DT44	461499	310459	28.0	25.7	13.3			14.0	10.8	15.0	20.1	22.1	24.4	25.7	18.8	15.2	-	
DT45	461994	309975	30.4	22.7	12.0			13.5	12.3	13.3	19.4	20.1	30.3	23.7	18.4	14.9	-	
DT46	448311	320511	22.6	15.1	12.3			18.9	10.6	18.3	18.5	18.7	23.8	21.5	17.1	13.9	-	
DT47	449935	322227	29.3	24.1	12.6			15.7	14.2	18.0	22.6	21.4	27.8	23.1	19.4	15.7	-	
DT48	450942	321076	18.9	14.2	2.9			8.6	7.1	8.4	11.4	12.5	20.4	17.7	10.6	8.6	-	
DT49	460313	323521	29.1	23.4	15.6			19.1	17.3	21.5	23.3	22.7	28.6	24.7	21.4	17.3	-	
DT50	455141	308686	44.5	36.1	21.3			23.8	22.0	28.0	31.8	33.5	38.4	35.4	29.8	24.1	-	
DT51	455167	308549	25.4	22.0	13.9			15.8	14.0	15.1	19.3	20.8	23.9	22.4	18.3	14.8	-	
DT52	463483	309880	24.6	19.8	9.9			10.9	11.3	11.1	17.5	18.2	22.0	20.8	15.4	12.5	-	
DT53	453277	319248	31.7	25.4	14.0			19.8	14.1	21.5	21.9	24.1	27.1	27.6	21.3	17.3	-	

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

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.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 (confirm by selecting in box).**

☒ **Charnwood Borough 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 Charnwood During 2020

Charnwood Borough Council have not identified any new sources relating to air quality within the reporting year of 2020. However, we will continue to review our monitoring programme within the borough to consider any arising issues, or concerns from Members / the public

Additional Air Quality Works Undertaken by Charnwood Borough Council During 2020

To inform the preparation of the Charnwood Local Plan 2021-2037, an Air Quality Study of the borough was commissioned for AECOM to inform the air quality and climate change elements of the Draft version of the Plan.

The purpose of the Project was to inform the preparation of the Charnwood Local Plan in accordance with the National Planning Policy Framework and National Planning Practice Guidance. This included assessing the potential cumulative air quality impacts of the development strategy in the emerging local plan and making policy recommendations on opportunities to improve air quality, or potential mitigation measures to minimise impacts. It also considered the opportunities to influence air quality through the development plan and take into account Air Quality Management Areas, Clear Air Zones and other areas including sensitive habitats or sites with specific air quality requirements.

The key conclusions and recommendations in respect to the ASR reporting regime were that (AECOM, 2020):

- Air Quality in the borough is generally improving, with no exceedances of relevant objectives in 2018, despite four AQMAs remaining in situ. It is expected that the current trend of improvement will continue in future years;

- Legislative reform is currently ongoing, and CBC will need to be cognisant of the Environment Bill as enacted, and possibly update their LAQM procedures when this happens, including potentially the Air Quality Action Plan

The full report, conclusions and recommendations can be found at:

Charnwood Local Plan Air Quality Study (prepared by AECOM)

QA/QC of Diffusion Tube Monitoring

All NO_2 diffusion tubes for 2020 were supplied and analysed by Gradko using 20% TEA in water preparation.

As part of their provision of support to Local Authorities for air quality management, Defra and the Devolved Administrations provide a set of centralised QA/QC services, to assist Local Authorities using diffusive samplers for monitoring of ambient nitrogen dioxide (NO_2) concentration, as part of their Local Air Quality Management process.

This is aimed at the analytical laboratories that supply and analyse the diffusion tubes, and currently comprises:

Promotion of the independent AIR-PT scheme, operated by LGC Standards and supported by the Health and Safety Laboratory, with yearly assessment against agreed performance criteria. AIR-PT combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL Workplace Analysis Scheme for Proficiency (WASP) PT scheme. For more information the AIR-PT scheme, please click **here**.

Performance summaries in the AIR-PT scheme for the laboratory chosen to prepare and analyse diffusion tubes on behalf of Charnwood Borough Council (Gradko), prepared by AEA, are as per the following link:

AIR-PT-Rounds AR0030, 31, 33, 34, 36. 37, 39 and 40 (Jan 2019 - Oct 2020) (PDF 228KB)

Results submitted were determined to be **satisfactory**

Diffusion Tube Annualisation

Diffusion tubes at the following locations returned less than 75% data capture (but greater than 25%) during 2021. Table C.2 provides details of annualisation calculation method.

- DT13 – Alan Moss Road / A6 Derby Road (L'boro)

- DT22 – Loughborough Road (Birstall)
- DT23 – A6 (Birstall)
- DT24 – 21 Humberstone Lane (Thurmaston)
- DT25 – 43 Humberstone Lane (Thurmaston)
- DT26 – 22 Humberstone Lane (Thurmaston)

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2020 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Charnwood Borough Council have applied a national bias adjustment factor of 0.81 (derived from 18 studies) to the 2020 monitoring data. A summary of bias adjustment factors used by Charnwood Borough Council over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	03/21	0.81 (from 18 studies)
2019	National	03/20	0.93 (from 27 studies)
2018	Local	-	0.93 (northern sites) 0.91 (southern sites)
2017	Local	-	0.96 (northern sites) 1.06 (southern sites)
2016	National	03/17.v2	0.94 (from 21 studies)

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.

No diffusion tube NO_2 monitoring locations within Charnwood required distance correction during 2020.

QA/QC of Automatic Monitoring

Our Partisol PM_{10} analyser is serviced under schedule by 'Matt's Monitors'. Where necessary any servicing/calibration/support in respect of our AQMesh SO2 analyser is via the supplier i.e. Acoem UK (previously Air Monitors Ltd.)

Any validation and ratification procedures follow Technical Guidance LAQM.TG(16)

PM_{10} Monitoring Adjustment

The type of PM_{10} monitor utilised within Charnwood does not require the application of a correction factor.

Automatic Monitoring Annualisation

Automatic PM_{10} monitoring within Charnwood recorded data capture of less than 25% during 2020, therefore it was not required to annualise any monitoring data in respect to the Annual Mean concentration.

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.

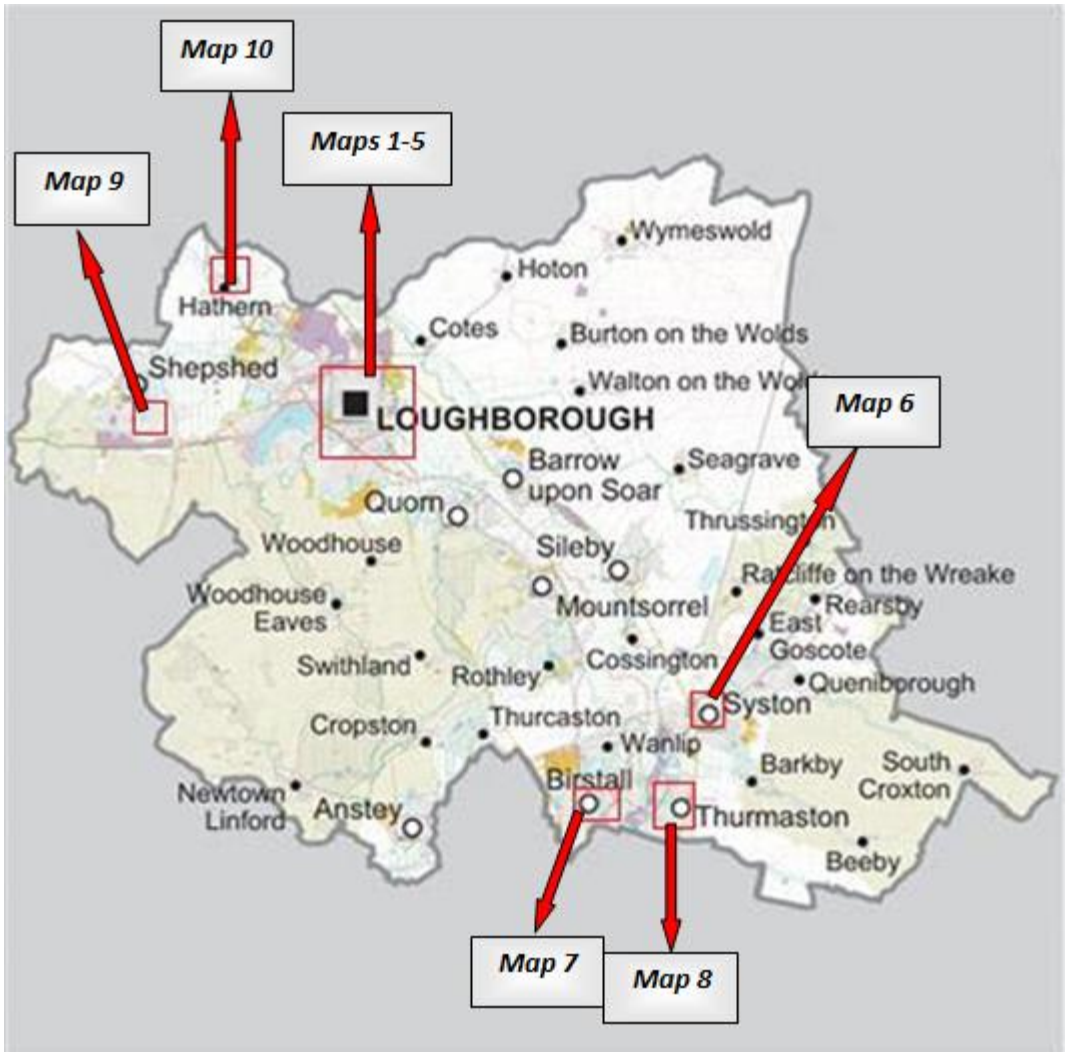
Charnwood no longer operate any NO_2 automatic monitors, therefore there is no requirement for distance correction during 2020.

Table C.2 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Burton-on-Trent Horninglow	Annualisation Factor Leicester A594 Roadside	Annualisation Factor Leicester University	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
DT13	0.9169	0.9098	0.9237	0.9168	24.0	22.0	
DT22	0.9257	0.9384	0.9205	0.9282	25.9	24.0	
DT23	0.9257	0.9384	0.9205	0.9282	22.7	21.1	
DT24	0.9257	0.9384	0.9205	0.9282	27.9	25.9	
DT25	0.9257	0.9384	0.9205	0.9282	27.3	25.4	
DT26	0.9257	0.9384	0.9205	0.9282	21.2	19.7	

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

The Borough of Charnwood



Loughborough Area Overview (Maps 1-5)

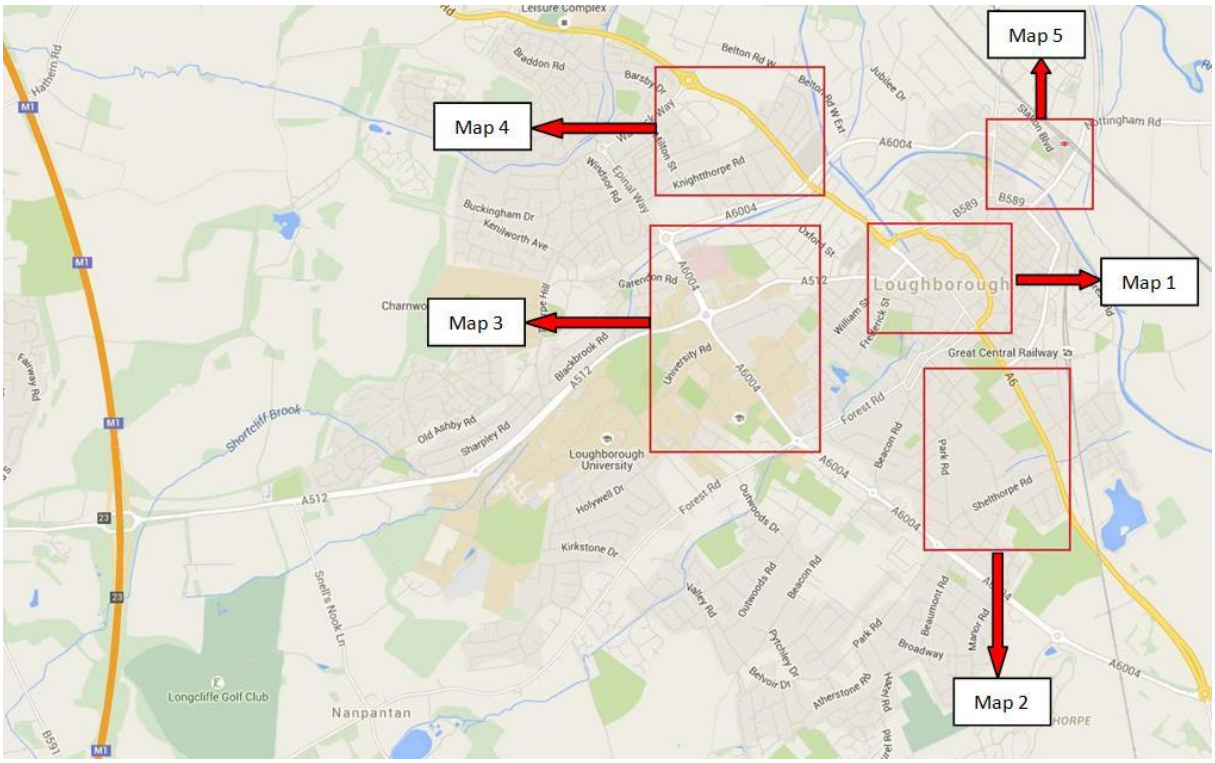
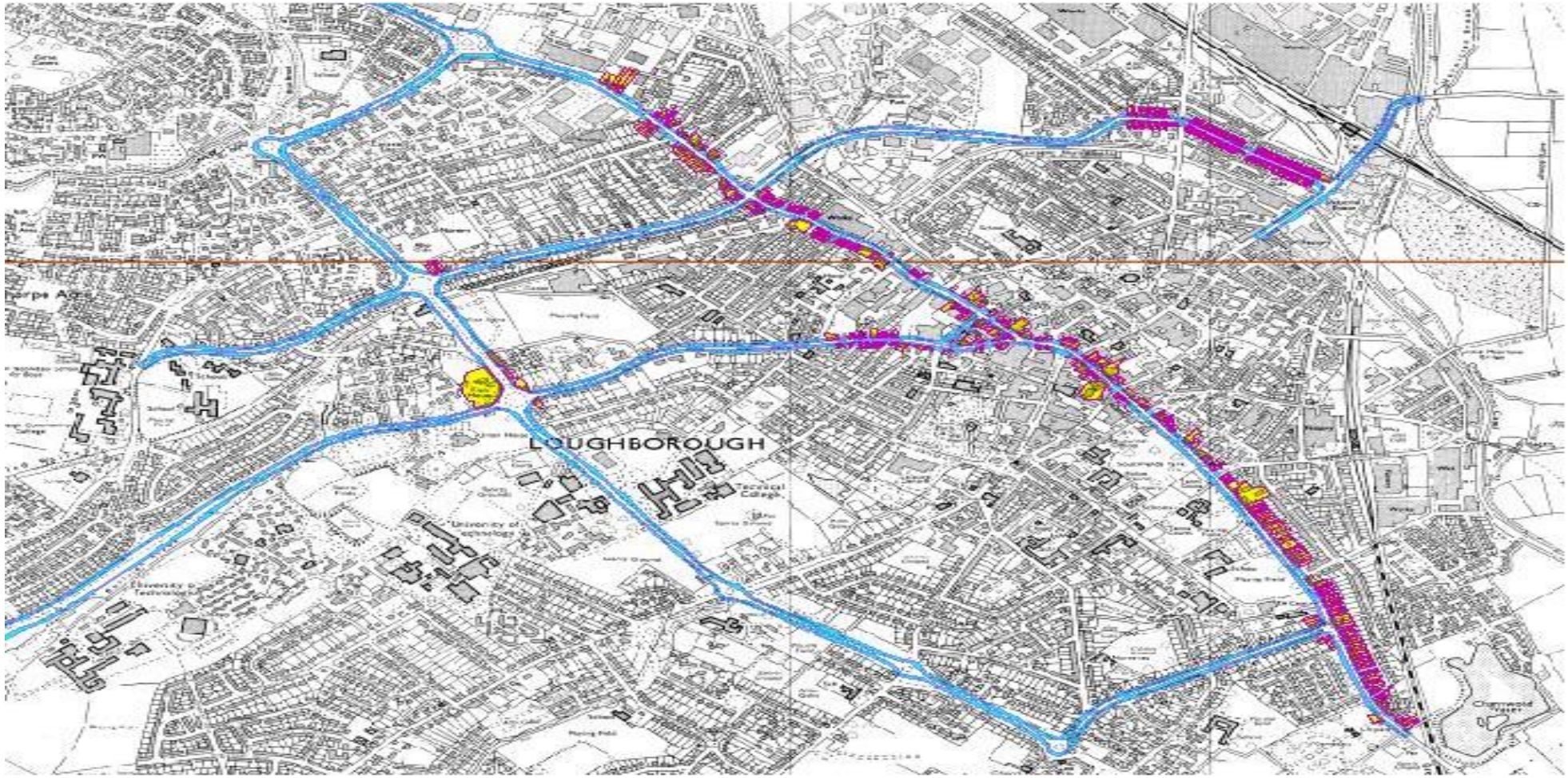


Figure D.1 – Map of the Loughborough AQMA



The area is designated in relation to a likely breach of the nitrogen dioxide (annual mean) objective as specified in the Air Quality Regulations (England)(Wales) 2000.

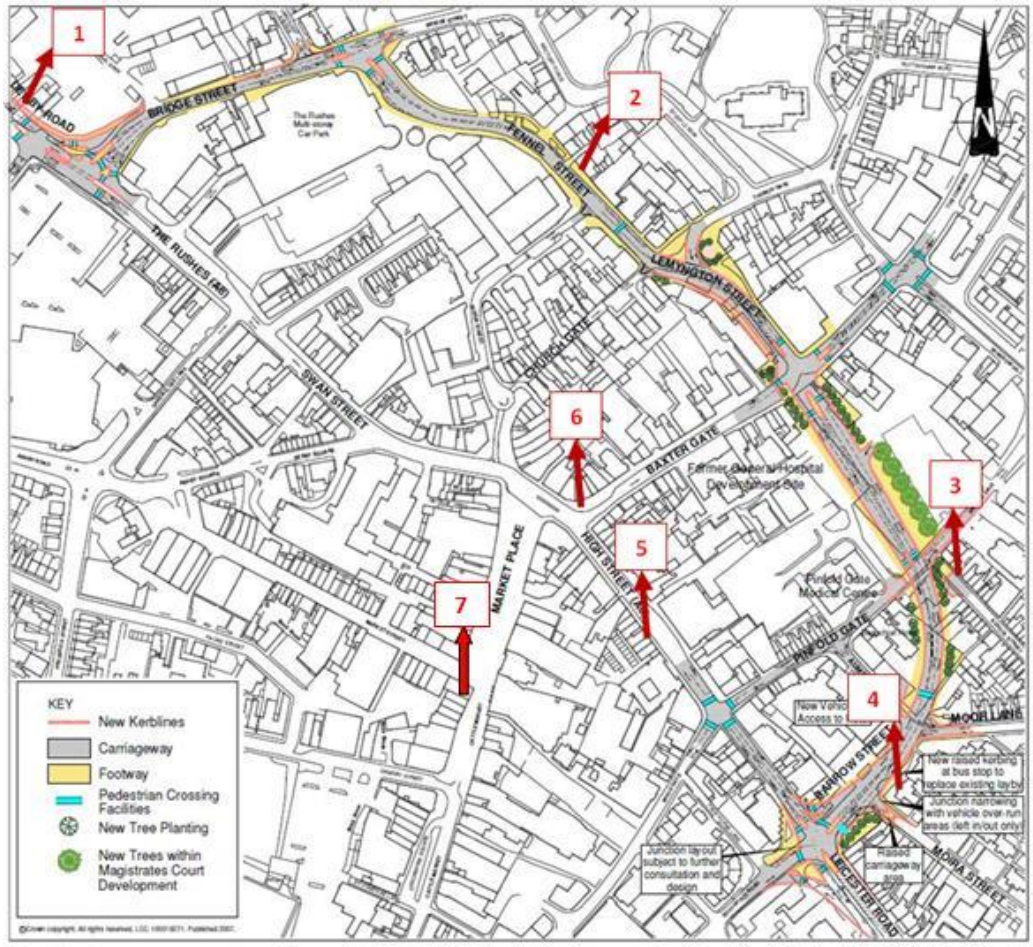
The land of the following highways and all publicly owned land within 10 meters of the kerbside of each highway:

- Leicester Road, High Street, Swan Street, The Rushes, Derby Road (From The Rushes to Warwick Way), Warwick Way, Epinal Way (From Warwick Way to Shelthorpe Road), Epinal Way Extension, Ashby Road (From Greenclose Lane to Epinal Way), Alan Moss Road (From Epinal Way to Derby Road), Greenclose Lane, Belton Road, Ratcliffe Road, Nottingham Road (From Brush Works entrance to Queens Road).

The following privately owned properties are included because we understand they are used for residential purposes and have a building facade less than 10 meters from the kerbside of the roads listed above:

- Leicester Road 2, 5a, 36-44, 58-94, 166
- High Street 3, 35
- Burton Walks The Lodge
- The Rushes 4-21, 41
- Ashby Road 31-59, 67-75, 85-95, 99-115, 119-125, 219, 20-46, 62a-92, 96-108, 142, 148, 150-172, 176, 190-192
- Ratcliffe Road 8-154, 3-141
- Glebe Street 32-36
- Storer Road 1
- Haydon Road 1&2
- Brisco Avenue 1&3
- Derby Road Station Hotel, 25a, 35, 107-151, 187, 191-209, 215-219, 223-225, 46-114, 120-124, 130-142, 156-162
- Cliffe Avenue 12b, 12d

Map 1: Loughborough Town Centre

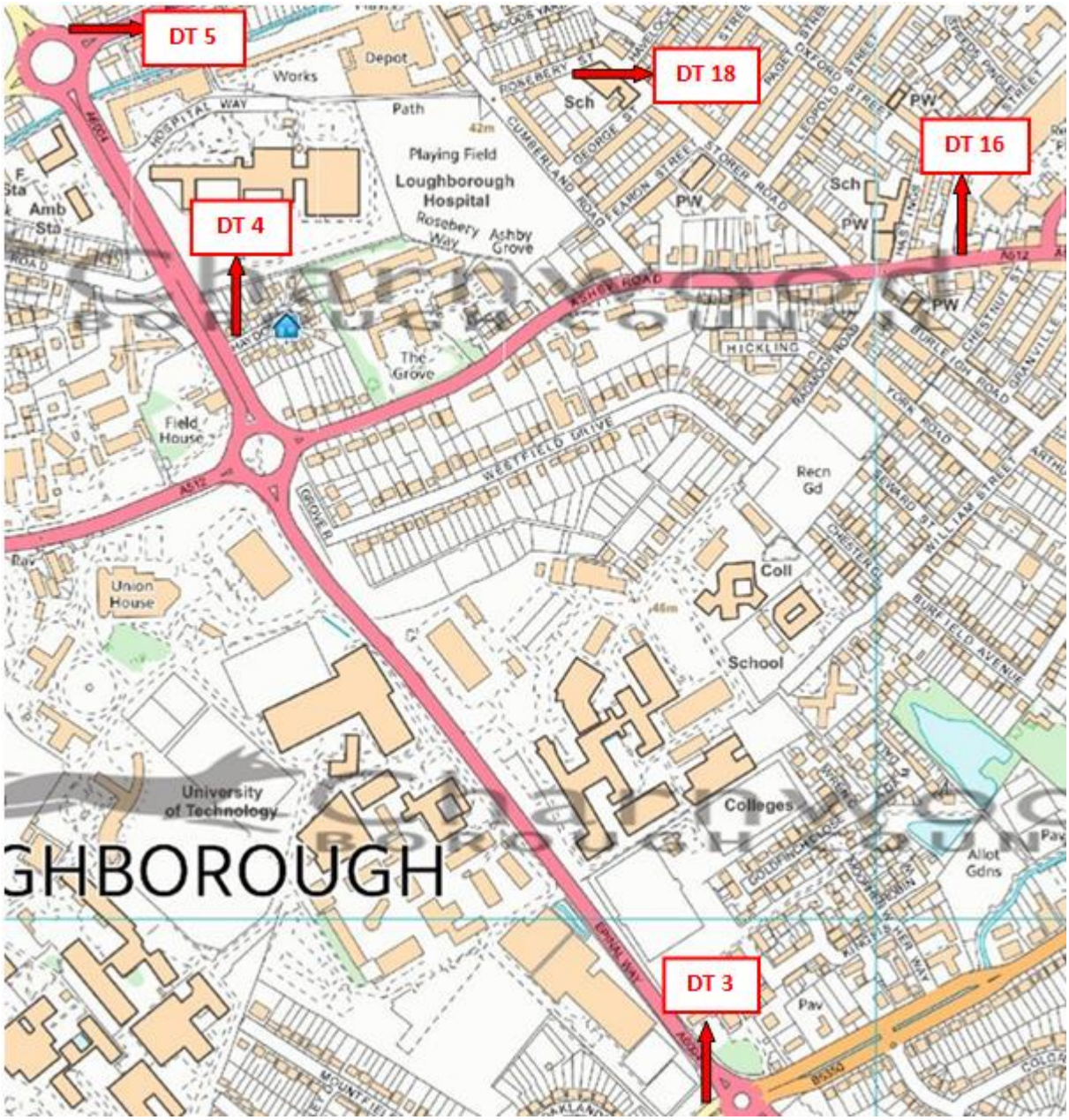


Map Position	Site ID	Site Name	Pollutant
1	DT8	Derby Road	NO_2
2	DT31	Fennel Street	NO_2
3	DT30	School Street	NO_2
4	DT29	Barrow Street	NO_2
5	DT14	High Street	NO_2
6	DT36, DT37, DT38	Baxter Gate AQMS 1, 2, and 3	NO_2
7	DT15	Market Place	NO_2

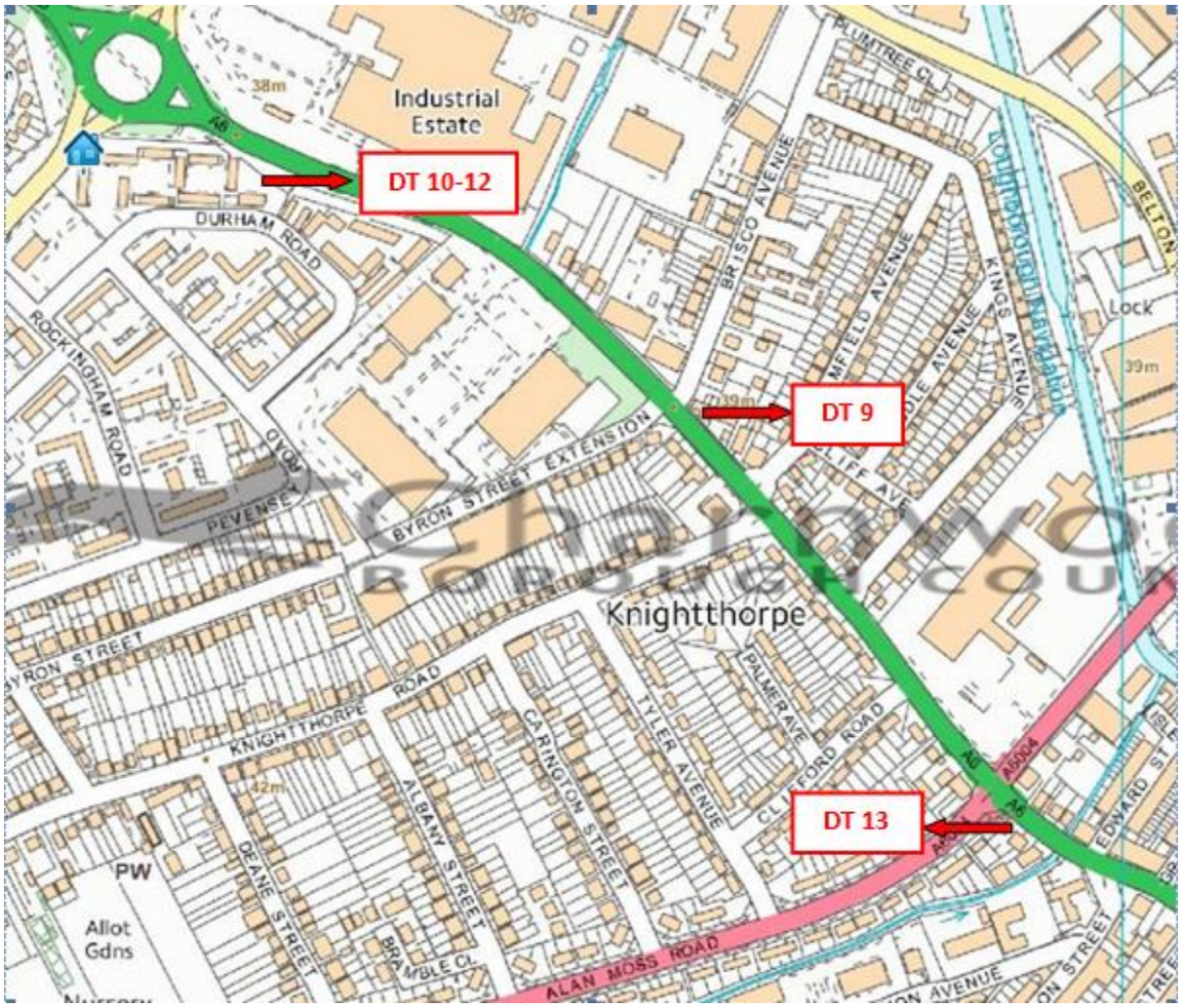
The above map shows the route of the Inner Relief Road which opened in November 2014. Traffic is now routed away from the town centre.

Map 2: Loughborough South

Map 3: Loughborough West



Map 4: Loughborough North



Map 5: Loughborough East

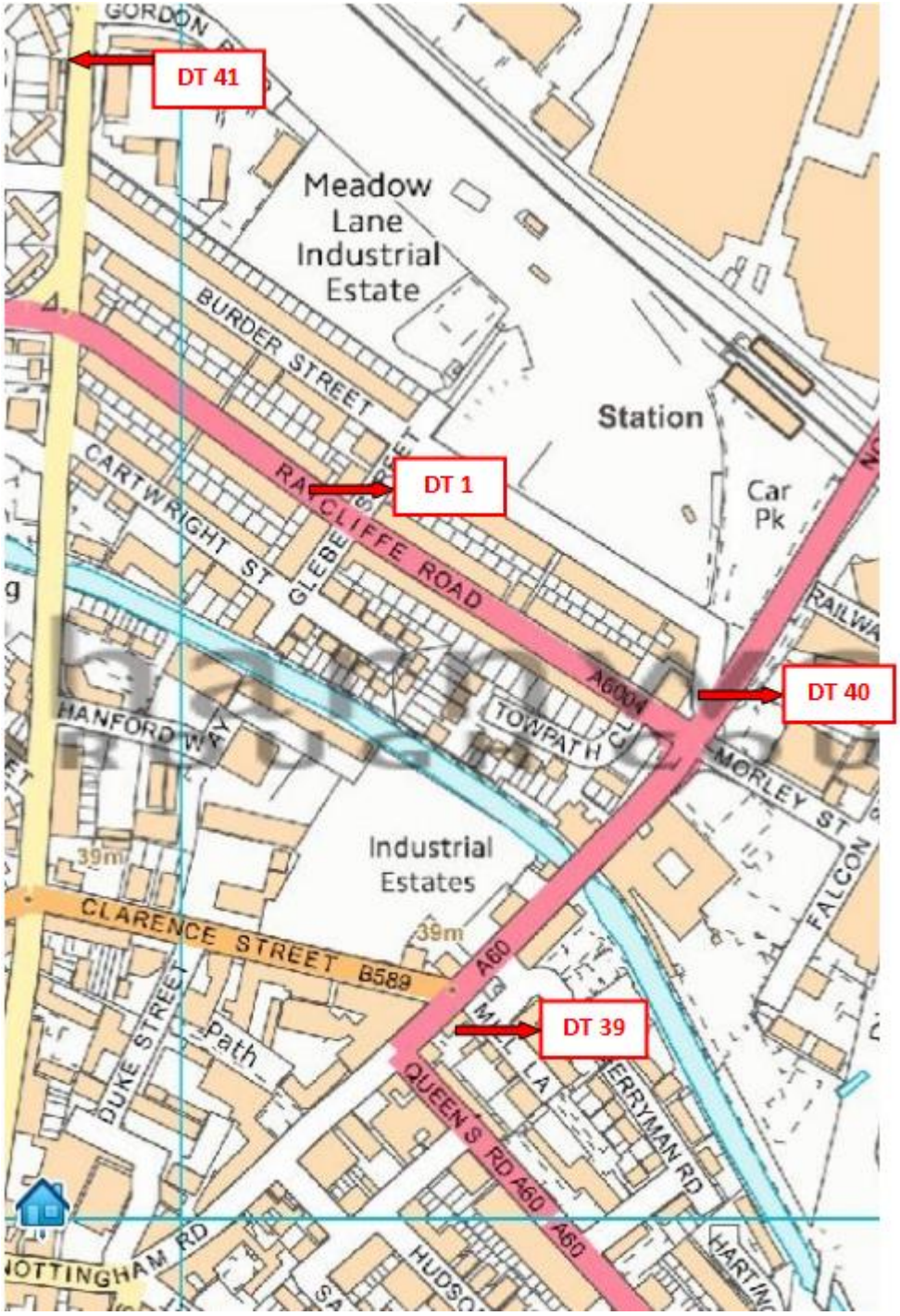


Figure D.2 – Map of the Syston AQMA

The location of monitoring sites are represented as follows:

- **DT33-35 (+ historically CM4)**
- **DT21**
- **DT20**
- **DT19**

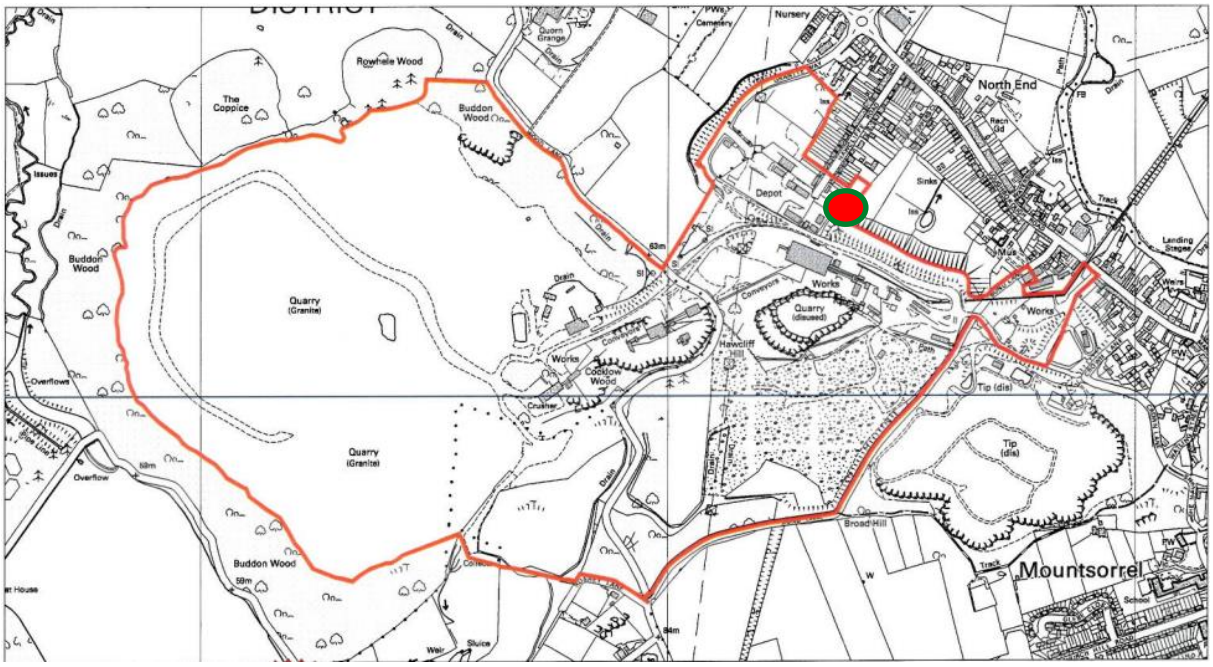
This area is designated in relation to a likely breach of the nitrogen dioxide (annual mean) objective as specified in the Air Quality Regulations (England & Wales) 2000.

The land of the A607 highway between the junctions with Wanlip Road and High Street, Syston and all publicly owned land within 10 meters of the kerbside of the highway.

The following privately owned properties are included because we understand they are used for residential purposes and have a building facade less than 10 meters from the kerbside of the roads listed above:

- Melton Road 1108-1126, 1182-1190, 1238-1260, 1091-1109, 1121-1141, 1163
- Midland Railway Hotel and Sandford Road number 2A

Figure D.3 – Map of the Mountsorrel AQMA



The properties and area declared in the Mountsorrel AQMA are bounded by the red border.

The location of automatic monitoring site CM1 is represented by the

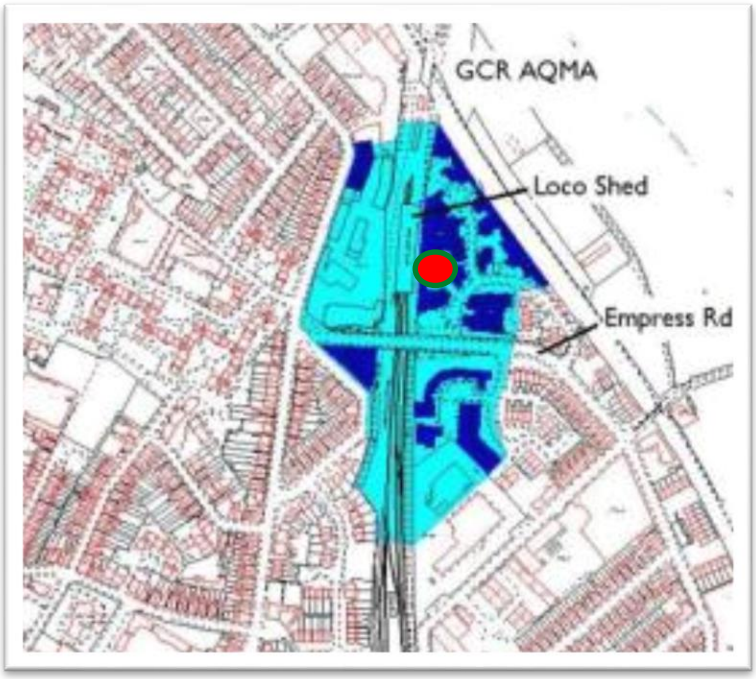
This area is designated in relation to a likely breach of the particulate matter (PM10) 24 hour mean National Air Quality Objective as specified in the Air Quality Regulations (England)(Wales) 2000.

- Hawcliffe Road 49-55 (odd) and 84 & 86 (even)
- Farnham Court, Bond Lane: 13-24

The designated area also incorporates sections of highways including all publicly owned land within 10 meters of the kerbside of each;

- Granite Way, Wood Lane, Rushey Lane, Bond Lane

Figure D.4 – Map of the Great Central Railway AQMA



The location of automatic monitoring site CM2 is represented by the

This area is designated in relation to a likely breach of the sulphur dioxide (fifteen minute mean) objective as specified in the Air Quality Regulations (England)(Wales) 2000.

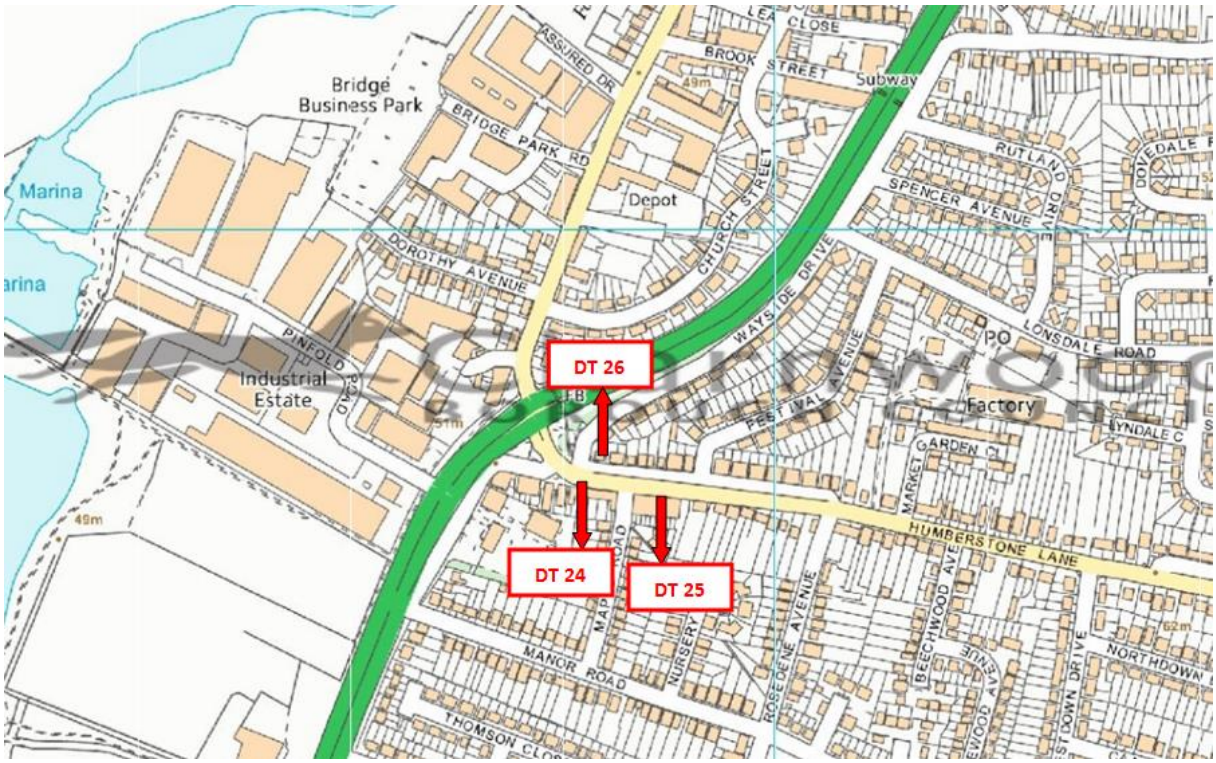
The area around the Great Central Railway that has been declared is based on computer modelling of the emissions from the railway locomotives at the engine sheds.

The private residential properties contained within the Area are:

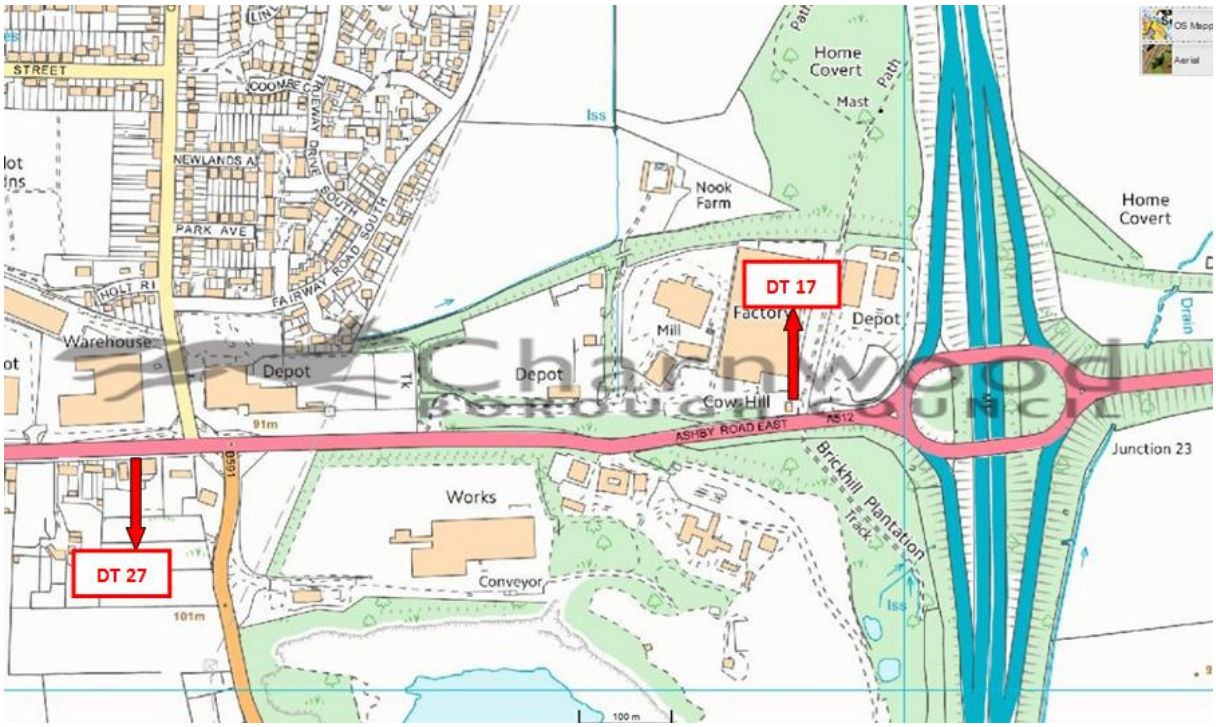
- Queens Road 62-74
- Warner Place 33-39
- Morris Close 5-65, Taylor House
- Holbein Close 2-18, 1-39
- Wolsey Way 19-45, 18-40

Map 7: Birstall

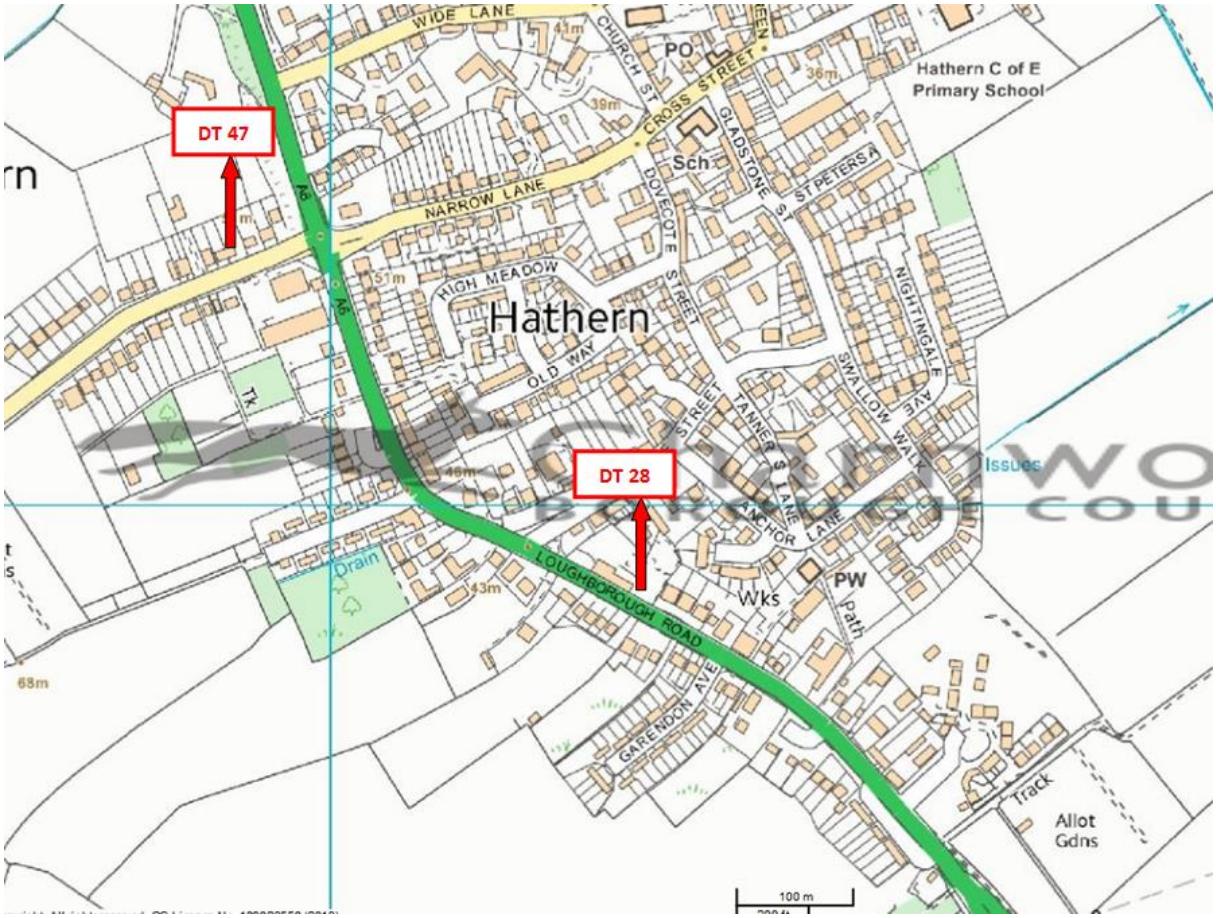
Map 8: Thurmaston



Map 9: Shepshed



Map 10: Hathern



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 Charnwood

Whist national restrictions (and later continuing restrictions across some local areas of Leicestershire) were placed on Officer movement during the initial lockdown period of 2020 which prevented the collection/deployment of diffusion tubes across the borough; we can see that from the monthly data obtained in the latter months, once some restrictions were eased, that reductions of NO_2 concentrations through until August were still being considerably (positively) affected by fewer traffic on the roads.

This contributed to site reductions of approx. 25 to 35% in annual mean concentrations relative to 2019, with an overall average reduction across the borough of 30%.

Opportunities Presented by COVID-19 upon LAQM within Charnwood

No LAQM related opportunities have arisen as a consequence of COVID-19 within Charnwood

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

- During 2020, access to diffusion tube monitoring sites was restricted due to national lockdown restrictions. Therefore, it was not possible to maintain diffusion tube exposure periods for April to June (and until August for some further sites covered by the continuing local Leicestershire lockdown) in line with the national monitoring

calendar for a number of sites. This has affected data capture within 2020, resulting in monitoring sites having to be annualised. **Medium Impact**

- Lockdown restrictions impacted on ensuring daily filter provision was able to continue at our PM10 monitor (CM1) at Mountsorrel. The unit was 'mothballed' to prevent potential issues arising whilst no Officer attendance to site could be guaranteed. Upon reactivation of the unit a number of service issues were noted and the resulting delay in resolving meant data capture rates for 2020 fell beneath 25%. **Large Impact**

- A combination of issues relating to the impact on data collection from the GCR SO_2 monitor (CM2) occurred during 2020 that are likely to have been at least partially attributable to the effects of the Covid-19 situation. With Council staff moving to a 'working from home' model, with the accompanying impact on evolving internal procedures; unfortunately, an invoice for the associated data subscription remained unpaid resulting in 'disconnection' from our service. This interrupted data collection had been overlooked due to the continuing service pressures relating to Covid-19. When the issue had finally been acknowledged and the data connection re-established, the data for the period outside of contract was unavailable. Shortly afterwards it was noted that data collection had again discontinued. Initial supplier communications suggested the issue was now likely due to battery failure and the unit required shipment back to them. An extended timescale, continuing into 2021, finally identified a motherboard failure on the monitor. It is supposition that the protracted time for diagnosis and subsequent repair/return of the unit, may have been related to Covid-19 related circumstances with the supplier who have otherwise always been excellent in their service provision. **Small Impact**

- A review of existing AQMA's, especially the revocation of the Syston AQMA, has been delayed due to the continuing service pressures placed on Council resources as an on-going continuation of the Covid-19 situation. Current estimates are that these will be considered during the next reporting period of LAQM. **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: Large
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
CBC	Charnwood Borough Council
Defra	Department for Environment, Food and Rural Affairs
DMMP	Dust Management and Monitoring Plan
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
GCR	Great Central Railway
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- AECOM (2020), *Charnwood Local Plan Air Quality Study - Charnwood Borough Council*. Project number: 60624815, 28 August 2020. Available at: https://www.charnwood.gov.uk/files/documents/charnwood_local_plan_air_quality_study_2020/Charnwood%20Local%20Plan%20Air%20Quality%20Study%202020.pdf [Accessed 27th July 2021].