



# DISTRICT OF HARBOROUGH

## 2022 Air Quality Annual Status Report (ASR)

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

Date: June, 2022

| Information             | Harborough District Council Details   |
|-------------------------|---|
| Local Authority Officer | Gareth Rees   |
| Department              | Regulatory Services   |
| Address                 | Council Offices<br>The Symington Building<br>Adam and Eve Street<br>Market Harborough<br>Leicestershire<br>LE16 7AG |
| Telephone               | 01858 828282  |
| E-mail                  | airquality@harborough.gov.uk  |
| Report Reference Number | ASR_HDC_2022  |
| Date                    | June 2022   |

# 1 Executive Summary: Air Quality in Our Area

## 1.1 Air Quality in Harborough District Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas<sup>1,2</sup>.

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages<sup>3</sup>, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017<sup>4</sup>.

The Council has two AQMAs:

- One AQMA in Lutterworth declared for exceedances of the annual mean Air Quality Objective (AQO) for Nitrogen Dioxide (NO<sub>2</sub>). Copies of the Air Quality Management Orders and a map showing the area covered is available from the Council website.  
[https://www.harborough.gov.uk/info/20025/environmental\\_health/101/air\\_quality/3](https://www.harborough.gov.uk/info/20025/environmental_health/101/air_quality/3)
- One AQMA in the Kibworths declared for exceedances of the annual mean Air Quality Objective (AQO) for Nitrogen Dioxide (NO<sub>2</sub>). Copies of the Air Quality Management Orders and a map showing the area covered is available from the Council website.  
[https://www.harborough.gov.uk/info/20025/environmental\\_health/101/air\\_quality/2](https://www.harborough.gov.uk/info/20025/environmental_health/101/air_quality/2)

---

<sup>1</sup> Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

<sup>2</sup> Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

<sup>3</sup> Defra. Air quality appraisal: damage cost guidance, July 2021

<sup>4</sup> Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

## 1.2 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<sup>5</sup> sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero<sup>6</sup> 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.

During 2021 the council have

- been working with development control and Leicestershire County Council Highways to determine what funding is available to implement the junction improvements that we modelled in 2019
- worked in partnership with North West Leicestershire District Council and Air Quality Consultants to apply for an air quality grant to monitor the impact of PM2.5 from solid fuel burning and to encourage behaviour change to improve local air quality.
- taken part in clean air day

## 1.3 Conclusions and Priorities

The ASR concludes that

- there are no new areas likely to be exceeding air quality objectives

In 2022 the council plans to

- Continue to monitor in Lutterworth to show that the AQS for NO<sub>2</sub> continues to be met.

---

<sup>5</sup> Defra. Clean Air Strategy, 2019

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

- Work with LCC highways to progress junction improvements in the Kibworths.

## 1.4 Local Engagement and How to get Involved

The main contributions that our community can make to improving air quality are around minimising emissions from traffic and other sources and limiting exposure at times of poor air quality. Specifically, that means avoiding unnecessary car use for short journeys, utilising public transport where possible, buying and maintaining low emissions vehicles and being linked into the national alert system for predicted episodes of poor air quality.

The public can get further information on Air Quality from the following websites

- Harborough District Council Air Quality website  
[http://www.harborough.gov.uk/info/20025/environmental\\_health/101/air\\_pollution](http://www.harborough.gov.uk/info/20025/environmental_health/101/air_pollution)
- DEFRA's UK-AIR: Air Information Resource website  
<https://uk-air.defra.gov.uk/>
- DEFRA's Local Air Quality Management (LAQM) Support website  
<http://laqm.defra.gov.uk/>
- Environmental Protection UK Air Pollution website  
<http://www.environmental-protection.org.uk/policy-areas/air-quality/about-air-pollution/>

## 1.5 Local Responsibilities and Commitment


This ASR was prepared by the Regulatory Services Department of Harborough District Council with the support and agreement of the following officers and departments:

- Regulatory Services

This ASR has been approved by:

- Harborough District Council Cabinet members

This ASR has been signed off by a Director of Public Health.

A handwritten signature in black ink, appearing to be 'Mike Sandys', with a long horizontal stroke extending to the right.

Mike Sandys, Director of Public Health, Leicestershire County Council

If you have any comments on this ASR please send them to Regulatory Services at:

|           |   |
|-----------|---|
| Address   | Council Offices<br>The Symington Building<br>Adam and Eve Street<br>Market Harborough<br>Leicestershire<br>LE16 7AG |
| Telephone | 01858 828282  |
| E-mail    | <a href="mailto:airquality@harborough.gov.uk">airquality@harborough.gov.uk</a>                                      |

## 2 Table of Contents

|          |  |           |
|----------|--|-----------|
| <b>1</b> | <b>Executive Summary: Air Quality in Our Area.....</b>   | <b>i</b>  |
| 1.1      | Air Quality in Harborough District Council .....   | i         |
| 1.2      | Actions to Improve Air Quality .....   | ii        |
| 1.3      | Conclusions and Priorities .....   | ii        |
| 1.4      | Local Engagement and How to get Involved.....  | iii       |
| 1.5      | Local Responsibilities and Commitment .....  | iii       |
| <b>2</b> | <b>Table of Contents .....</b>   | <b>v</b>  |
| <b>3</b> | <b>Local Air Quality Management .....</b>  | <b>8</b>  |
| <b>4</b> | <b>Actions to Improve Air Quality .....</b>  | <b>8</b>  |
| 4.1      | Air Quality Management Areas .....   | 8         |
| 4.2      | Progress and Impact of Measures to address Air Quality in Harborough District Council .....                | 10        |
| 4.2.1    | Lutterworth AQMA .....   | 11        |
| 4.2.2    | Kibworth AQMA .....  | 12        |
| 4.3      | PM <sub>2.5</sub> – Local Authority Approach to Reducing Emissions and/or Concentrations.....              | 16        |
| <b>5</b> | <b>Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance.....</b> | <b>17</b> |
| 5.1      | Summary of Monitoring Undertaken .....   | 17        |
| 5.1.1    | Automatic Monitoring Sites.....  | 17        |
| 5.1.2    | Non-Automatic Monitoring Sites .....   | 17        |
| 5.2      | Individual Pollutants .....  | 18        |
| 5.2.1    | Nitrogen Dioxide (NO <sub>2</sub> ).....   | 18        |
| 5.2.2    | Particulate Matter (PM <sub>10</sub> ) .....   | 19        |
| 5.2.3    | Particulate Matter (PM <sub>2.5</sub> ) .....  | 20        |
|          | <b>Appendix A: Monitoring Results .....</b>  | <b>21</b> |
|          | <b>Appendix B: Full Monthly Diffusion Tube Results for 2021 .....</b>                                      | <b>42</b> |
|          | <b>Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC.....</b>               | <b>45</b> |
|          | New or Changed Sources Identified Within Harborough District During 2021 .....                             | 45        |
|          | Additional Air Quality Works Undertaken by Harborough District Council During 2021 .....                   | 45        |
|          | QA/QC of Diffusion Tube Monitoring .....   | 45        |
|          | Diffusion Tube Annualisation .....   | 45        |
|          | Diffusion Tube Bias Adjustment Factors .....   | 45        |

|  |           |
|--|-----------|
| NO <sub>2</sub> Fall-off with Distance from the Road .....           | 46        |
| QA/QC of Automatic Monitoring .....                                  | 46        |
| PM <sub>10</sub> and PM <sub>2.5</sub> Monitoring Adjustment.....    | 47        |
| Automatic Monitoring Annualisation.....                              | 47        |
| NO <sub>2</sub> Fall-off with Distance from the Road .....           | 47        |
| <b>Appendix D: Map(s) of Monitoring Locations and AQMAs .....</b>    | <b>50</b> |
| <b>Appendix E: Summary of Air Quality Objectives in England.....</b> | <b>51</b> |
| <b>Glossary of Terms .....</b>                                       | <b>52</b> |
| <b>References .....</b>  | <b>53</b> |



## Figures

|   |    |
|---|----|
| Figure A.1 – The Kibworths Trends in Annual Mean NO <sub>2</sub> Concentrations .....     | 31 |
| Figure A.2 – Lutterworth Trends in Annual Mean NO <sub>2</sub> Concentrations .....       | 32 |
| Figure A.3 – Theddingworth Trends in Annual Mean NO <sub>2</sub> Concentrations .....     | 33 |
| Figure A.4 – A5 Trends in Annual Mean NO <sub>2</sub> Concentrations .....                | 34 |
| Figure A.5 – Market Harborough Trends in Annual Mean NO <sub>2</sub> Concentrations ..... | 35 |
| Figure A.6 – Broughton Astley Trends in Annual Mean NO <sub>2</sub> Concentrations .....  | 36 |
| Figure A.7 – Other Locations Trends in Annual Mean NO <sub>2</sub> Concentrations .....   | 37 |
| Figure D.1 – Map of Non-Automatic Monitoring Site .....                                   | 50 |

## Tables

|   |    |
|---|----|
| Table 2.1 – Declared Air Quality Management Areas .....   | 9  |
| Table 2.2 – Progress on Measures to Improve Air Quality .....   | 13 |
| Table A.1 – Details of Automatic Monitoring Sites .....   | 21 |
| Table A.2 – Details of Non-Automatic Monitoring Sites .....   | 22 |
| Table A.3 – Annual Mean NO <sub>2</sub> Monitoring Results: Automatic Monitoring (µg/m <sup>3</sup> ) .....                           | 26 |
| Table A.4 – Annual Mean NO <sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m <sup>3</sup> ) ....                        | 27 |
| Table A.5 – 1-Hour Mean NO <sub>2</sub> Monitoring Results, Number of 1-Hour Means > 200µg/m <sup>3</sup><br>.....                    | 38 |
| Table A.6 – Annual Mean PM <sub>10</sub> Monitoring Results (µg/m <sup>3</sup> ) .....  | 39 |
| Table A.7 – 24-Hour Mean PM <sub>10</sub> Monitoring Results, Number of PM <sub>10</sub> 24-Hour Means ><br>50µg/m <sup>3</sup> ..... | 40 |
| Table A.8 – Annual Mean PM <sub>2.5</sub> Monitoring Results (µg/m <sup>3</sup> ) .....   | 41 |
| Table B.1 – NO <sub>2</sub> 2021 Diffusion Tube Results (µg/m <sup>3</sup> ) .....  | 42 |
| Table C.1 – Bias Adjustment Factor .....  | 46 |
| Table C.2 – Annualisation Summary (concentrations presented in µg/m <sup>3</sup> ) .....  | 48 |
| Table C.4 – NO <sub>2</sub> Fall off With Distance Calculations (concentrations presented in µg/m <sup>3</sup> )                      | 49 |
| Table E.1 – Air Quality Objectives in England .....   | 51 |

### 3 Local Air Quality Management

This report provides an overview of air quality in Harborough District Council during 2021. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

### 4 Actions to Improve Air Quality

#### 4.1 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 Harborough District Council can be found in Table 4.1. The table presents a description of the 2 AQMA(s) that are currently designated within Harborough District. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMA(s) and also the air quality monitoring locations in relation to the AQMA(s). The air quality objectives pertinent to the current AQMA designations are as follows:

- NO<sub>2</sub> annual mean;

**Table 4.1 – Declared Air Quality Management Areas**

| <b>AQMA Name</b> | <b>Date of Declaration</b>                                  | <b>Pollutants and Air Quality Objectives</b> | <b>One Line Description</b>  | <b>Is air quality in the AQMA influenced by roads controlled by National Highways?</b> | <b>Level of Exceedance: Declaration</b> | <b>Level of Exceedance: Current Year</b> | <b>Name and Date of AQAP Publication</b> | <b>Web Link to AQAP</b>   |
|------------------|---|--|--|--|---|--|--|---|
| Lutterworth      | Declared 18/07/2001, Amended 04/04/2011, Amended 16/04/2013 | NO2 Annual Mean                              | An area encompassing dwellings adjacent to Rugby Road, High street and Market Street.  | NO   | 51                                      | 31.9                                     | Apr-13                                   | <a href="http://www.harborough.gov.uk/download/downloads/id/145/lutterworth_air_quality_action_plan.pdf">http://www.harborough.gov.uk/download/downloads/id/145/lutterworth_air_quality_action_plan.pdf</a>       |
| Kibworth         | Declared 28/11/2017   | NO2 Annual Mean                              | Area encompassing dwelling with close proximity to the kerb line along the A6 between the roundabout with Wistow Road south to the junction with church road | NO   | 55                                      | 38                                       | Feb-19                                   | <a href="http://www.harborough.gov.uk/download/downloads/id/5104/2019_kibworth_air_quality_action_plan.pdf">http://www.harborough.gov.uk/download/downloads/id/5104/2019_kibworth_air_quality_action_plan.pdf</a> |

**CLICK HERE THEN PASTE COMPLETED DATA ROWS FROM ASR EXCEL TEMPLATE**

- ☒ Harborough District Council confirm the information on UK-Air regarding their AQMA(s) is up to date.
- ☒ Harborough District Council confirm that all current AQAPs have been submitted to Defra.

## 4.2 Progress and Impact of Measures to address Air Quality in Harborough District Council

Defra's appraisal of last year's ASR concluded

1. The AQAP for the Lutterworth AQMA was published in 2013 and is therefore out of date. The Council are encouraged to update the AQAP and develop a new set of targeted actions to improve air quality in Lutterworth should the Council wish to retain the designation.

The Lutterworth AQMA has been compliant for the last 3 years unless there is significant change in concentration in the next 3-4 years the AQMA would be suitable to be undeclared as such resources spent drafting a replacement AQAP would be better spent elsewhere

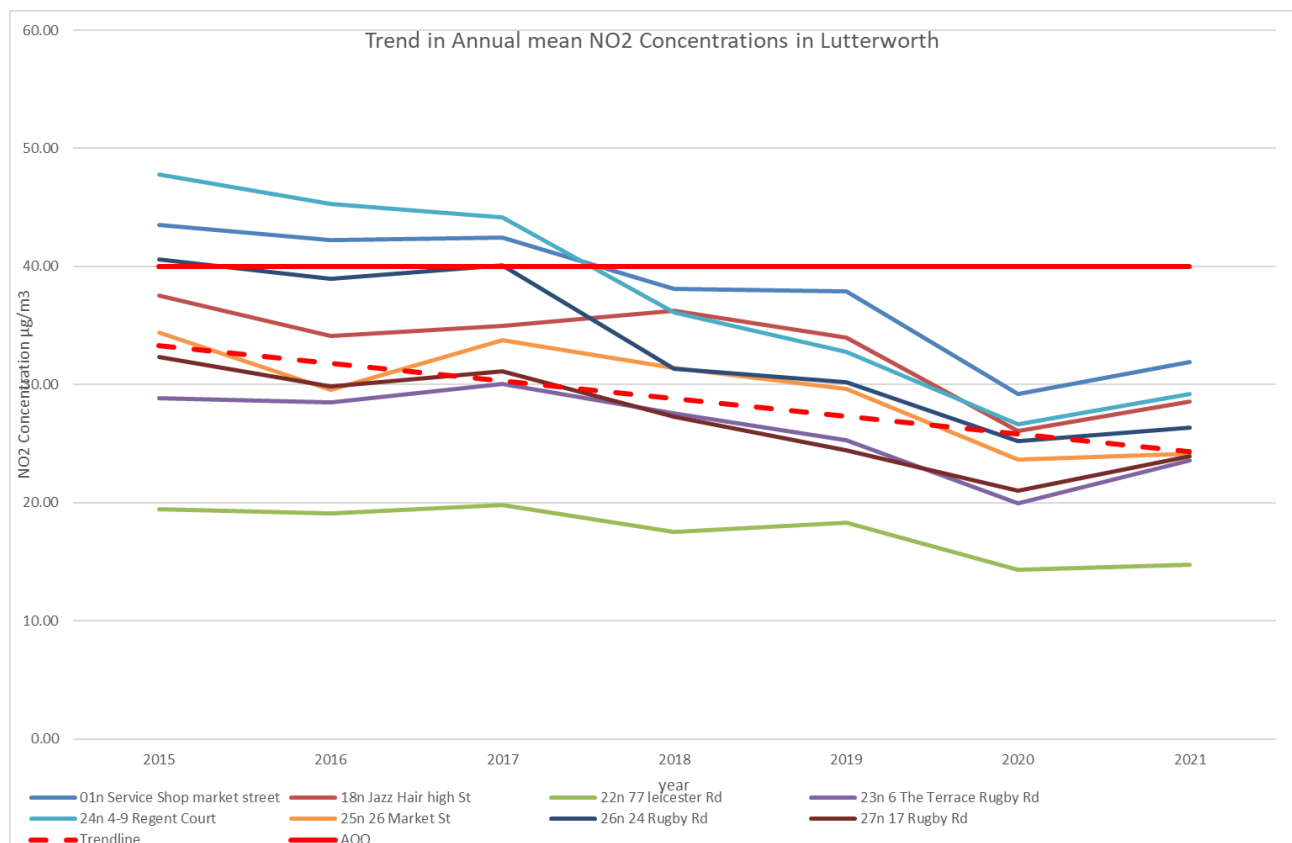
2. Whilst a significant decline in concentrations has been identified in Harborough during 2020, it is important to note that this decline is likely attributable to reduced traffic flows as a result of national lockdowns during the COVID-19 pandemic. It is therefore important that monitoring data for 2020 be interpreted with caution. Moreover, NO<sub>2</sub> concentrations recorded during 2020 should not be used in isolation to determine the success of any existing AQAP measures, nor should they solely be used as grounds for progressing amendments to existing AQMAs or justifications ceasing of interventions. This is acknowledged by HDC.
3. The inclusion of results from short-term continuous monitoring using Zephyr sensors is commended. The additional monitoring will enable a greater understanding of air quality within the District.
4. All the relevant sections of the Action Plan Measures table have been completed where possible. The Council continue to split the measures up into separate tasks, which gives more clarity on the progress of the measures, and which tasks are currently active. This continues to be commended.
5. The council applied the national bias adjustment factor to their 2020 monitoring results, using a factor of 0.77 for tubes prepared by Socotec (Didcot) using the 50% TEA in Acetone method. This factor was obtained from the 03/21 version of the national bias adjustment factor spreadsheet. Based on the submission date of the report, the 09/21 version should have been used, which would have provided a factor of 0.76. As the correct factor is lower than that which has been applied, this is not

considered to be grounds for rejection. However, please be advised that the most recently published version of the spreadsheet should be used at the time of submission.

Harborough District Council has taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 4.2. 7 measures are included within Table 4.2, with the type of measure and the Harborough District Council have made during the reporting year of 2021 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 4.2.

#### 4.2.1 Lutterworth AQMA

Concentrations of NO<sub>2</sub> have been below the Annual Mean air quality Objective for the 4<sup>th</sup> year running since the HGV gating system has been implemented. No specific actions beyond monitoring have been undertaken in Lutterworth.



#### 4.2.2 Kibworth AQMA

Progress on the implementation of junction improvements in Kibworth has been slower than expected due to negotiations with Leicestershire County Council Highways.

Whilst the measures stated above and in Table 4.2 will help to contribute towards compliance, Harborough District Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of Kibworth AQMA.

Table 4.2 – 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  |
|---------------|--|---------------------------------------|--|-------------------------|------------------------------------|---|-----------------------------|------------------------|------------------|---------------------------|----------------|---|---|------------------|--|
| Lutterworth 1 | 20mph zone   | Traffic Management                    | Reduction of speed limits, 20mph zones | Apr-18                  | Apr-18                             | Harborough District Council, Leicestershire County Council Highways | LA, Funding: Defra AQ grant | NO                     | Funded           |                           | Completed      |   | Determine reduction in traffic emissions  | Complete         | Lengthy Timescale  |
|               |  |                                       |  |                         |                                    |   |                             |                        |                  |                           |                |   | Determine impact on air quality   | Complete         |  |
|               |  |                                       |  |                         |                                    |   |                             |                        |                  |                           |                |   | Determine exact area of the speed reduction (likely required to be larger than AQMA by Highway authority) and costs of implementation and undertake cost benefit analysis | none             | First phase successful, second phase complete. LCC Highways require further evidence of likely reduction before they would be willing to consider implementation   |
| Kibworth 1    | Impact assessment of local traffic management options. | Transport Planning and Infrastructure | Other                                  | 2018                    | 2018                               | Harborough District Council, Leicestershire County Council Highways | Harborough District Council | NO                     | Partially Funded |                           | Completed      | Cannot be quantified as work is to identify works and the potential benefit | To publish findings   |                  | The modelling has been completed and found that implementing the proposed junction improvements will improve air quality within the AQMA by approximately 4 µg.m-3 |
|               | 1. Detailed traffic surveys.                           |                                       |  |                         |                                    |   |                             |                        |                  |                           | Completed      |   |   |                  |  |
|               | 2. Undertake traffic simulation of proposed junction   |                                       |  |                         |                                    |   |                             |                        |                  |                           | Completed      |   |   |                  |  |

| 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 |
|-------------|---|---|--|-------------------------|------------------------------------|------------------------------|------------------------------|------------------------|----------------|---------------------------|----------------|---|---------------------------|------------------|---------------------------------------|
|             | improvements.   |   |  |                         |                                    |                              |                              |                        |                |                           |                |   |                           |                  |                                       |
|             | 3. Undertake air quality impact assessment of junction improvements.  |   |  |                         |                                    |                              |                              |                        |                |                           | Completed      |   |                           |                  |                                       |
| Kibworth 2  | Continue consultation between Regulatory Services and Development Management. Establish mechanism for consultation between the two parties to ensure Regulatory Services are consulted on all relevant planning applications and policy documents | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | 2018                    |                                    | Harborough District Council, | Harborough District Council, | NO                     | Funded         |                           | Implementation | Unlikely to provide improvements to air quality but will limit potential negative impacts |                           | ongoing          |                                       |
| Kibworth 3  | Provide Guidance and Training to members. Provide guidance and training to the members on assessing air quality impacts and their significance when considering planning applications.  | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | 2018                    |                                    | Harborough District Council, | Harborough District Council, | NO                     | Funded         |                           | Implementation |   |                           | ongoing          | Local plan adopted April 2019         |



| 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 |
|-------------|---|---|--|-------------------------|------------------------------------|------------------------------|------------------------------|------------------------|----------------|---------------------------|----------------|--|---------------------------|------------------|---------------------------------------|
| Kibworth 4  | Ensure air quality policies in Local Plan documents and evidence base. Provide information on air quality to residents in an accessible format.                           | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | 2018                    |                                    | Harborough District Council, | Harborough District Council, | NO                     | Funded         |                           | Implementation |  |                           | ongoing          | Local plan adopted April 2019         |
| Kibworth 5  | Provide information about the AQMA to local residents. Provide information on air quality to residents in an accessible format.   | Public Information                      | Via the Internet                         | 2018                    |                                    | Harborough District Council, | Harborough District Council, | NO                     | Funded         |                           | Implementation |  |                           | ongoing          |                                       |
| Kibworth 6  | Development of local air quality monitoring. Retain monitoring at relevant locations within and adjacent to the AQMA and to install real time monitoring within the AQMA. | Public Information                      | Via the Internet                         | 2017                    |                                    | Harborough District Council, | Harborough District Council, | NO                     | Funded         |                           | Implementation |  |                           | ongoing          |                                       |

### 4.3 PM<sub>2.5</sub> – 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<sub>2.5</sub> (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM<sub>2.5</sub> has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

The Public Health Outcomes Framework (PHOF)

(<https://www.gov.uk/government/collections/public-health-outcomes-framework>) is a Department of Health data tool for England, intended to focus public health action on increasing healthy life expectancy and reducing differences in life expectancy between communities. The tool uses indicators to assess improvements. Recognising the significant impact that poor air quality can have on health, the PHOF includes an indicator relating to fine particulate matter (PM<sub>2.5</sub>).

The indicator in the PHOF reports the estimates fraction of all-cause adult mortality attributable to anthropogenic particulate air pollution (measured as fine particulate matter).

Based on the latest available figures the position in Harborough District has the joint lowest fraction of attributable deaths to particulate air pollution in Leicestershire.

(<https://fingertips.phe.org.uk/indicator-list/view/SnpYsREYp0#page/3/gid/1/pat/402/ati/401/are/E07000131/iid/30101/age/230/sex/4/cid/4/tbm/1/page-options/car-do-0>)

Harborough District Council is not currently taking any specific measures to address PM<sub>2.5</sub>. However the following measures and activities undertaken by Harborough District Council will improve PM<sub>2.5</sub> concentrations:

- The Council controls dust and combustion emissions from permitted processes within the district
- Promoting the use of green waste collection and Leicestershire County Council run waste bring sites over bonfires to dispose of garden waste
- Robust planning process

## 5 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

This section sets out the monitoring undertaken within 2021 by Harborough District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2017 and 2021 to allow monitoring trends to be identified and discussed.

### 5.1 Summary of Monitoring Undertaken

#### 5.1.1 Automatic Monitoring Sites

Harborough District Council undertook automatic (continuous) monitoring at 1 site during 2021. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The [https://www.harborough.gov.uk/info/20025/environmental\\_health/101/air\\_quality/2](https://www.harborough.gov.uk/info/20025/environmental_health/101/air_quality/2) page presents automatic monitoring results for Harborough District Council.

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.

Harborough District Council also placed a Zephyr analyser at 1 location during 2021,

- A6 in Kibworth from 01/01/2021 to 31/12/2021

#### 5.1.2 Non-Automatic Monitoring Sites

Harborough District Council undertook non- automatic (i.e. passive) monitoring of NO<sub>2</sub> at 34 sites during 2021. Table A.2 in Appendix A presents the details of the non-automatic sites.

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

## 5.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualization (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.

### 5.2.1 Nitrogen Dioxide (NO<sub>2</sub>)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualization, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2021 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<sub>2</sub> hourly mean concentrations for the past five years with the air quality objective of 200µg/m<sup>3</sup>, not to be exceeded more than 18 times per year.

Briefly describe any exceedances of the air quality objectives here, relating to both annual mean and 1-hour (where applicable) objectives. Detail where monitored exceedances are located - are these within a current AQMA, close to an AQMA boundary or located away from any current AQMA(s). What are the conclusions of the monitoring following the most recent results - will there be any changes to existing AQMAs or the declaration of a new AQMA? Are there any proposed changes to the monitoring network?

Where relevant, consider annual means greater than 60µg/m<sup>3</sup>, which indicates that an exceedance of the 1-hour mean objective is also likely at these sites.

#### 5.2.1.1 The Kibworths

There are 10 long term diffusion tube monitoring locations within the Kibworths. During 2021 all locations were below the Annual mean Air quality Standard for NO<sub>2</sub>, however location 34n did exceed 36µg.m<sup>-3</sup>. The low results are likely the result of reduced traffic caused by the COVID19.

The automatic monitor and the Zephyr low cost monitor did not detect any exceedances of either the hourly or annual mean air quality objectives for NO<sub>2</sub>.

#### **5.2.1.2 Lutterworth**

There are 10 long term diffusion tube monitoring locations in and around the Lutterworth AQMA. All locations were significantly below the annual mean air quality standard for NO<sub>2</sub>. This is the 4th year that the air quality standard has been achieved however,

- results were substantially lower in 2020 and 2021 than in previous years this is likely still a result of the COVID19.
- Results in 2021 were slightly higher than in 2020 but still generally lower than 2018/19

#### **5.2.1.3 Theddingworth**

There are 2 long term diffusion tube monitoring locations in Theddingworth both were below the annual mean air quality standard for NO<sub>2</sub>.

#### **5.2.1.4 A5**

There are 2 long term diffusion tube monitoring locations along the A5, both were below the annual mean air quality standard for NO<sub>2</sub>.

#### **5.2.1.5 Market Harborough**

There are 5 long term diffusion tube monitoring locations within Market Harborough, all locations were below the annual mean air quality standard for NO<sub>2</sub>.

#### **5.2.1.6 Broughton Astley**

There are 2 long term diffusion tube monitoring locations within Broughton Astley, both locations were below the annual mean air quality standard for NO<sub>2</sub>.

#### **5.2.1.7 Other Locations**

3 other locations have been monitored Walcote (45n) Fleckney (50n) and Bushby (51n) all locations recorded concentrations below the Annual mean air quality objective for NO<sub>2</sub>.

### **5.2.2 Particulate Matter (PM<sub>10</sub>)**

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM<sub>10</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>.

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

#### **5.2.2.1 The Kibworths**

The zephyr low cost analyser has been located in Kibworth since 3/6/2020. During that time. The Annual mean air quality objective for PM<sub>10</sub> and no exceedances of the daily mean air quality objective for PM<sub>10</sub> were detected.

### **5.2.3 Particulate Matter (PM<sub>2.5</sub>)**

Table A.8 in Appendix A presents the ratified and adjusted monitored PM<sub>2.5</sub> annual mean concentrations for the past five years.

#### **5.2.3.1 The Kibworths**

The zephyr low cost analyser has been located in Kibworth since 3/6/2020. During that time. The Annual mean air quality objective for PM<sub>2.5</sub> was achieved.

## 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) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Inlet Height (m) |
|---------|-----------|-----------|-------------------------|--------------------------|----------------------|----------------------|----------------------|--|---|------------------|
| A1      | Kibworth  | Roadside  | 468114                  | 294353                   | NO2                  | yes Kibworth         | chemiluminescence    | 9  | 2.5   | 1.8              |
| Z2      | Kibworth  | Roadside  | 468309                  | 294352                   | NO2 PM2.5<br>PM10    | yes Kibworth         | Zephyr               | 0  | 1.4   | 2.5              |

**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<br>Tube ID | Site Name                                   | Site Type | X OS<br>Grid Ref<br>(Easting) | Y OS Grid<br>Ref<br>(Northing) | Pollutants<br>Monitored | In<br>AQMA?<br>Which<br>AQMA? | Distance<br>to<br>Relevant<br>Exposure<br>(m) <sup>(1)</sup> | Distance<br>to kerb<br>of<br>nearest<br>road (m)<br><sup>(2)</sup> | Tube Co-<br>located<br>with a<br>Continuous<br>Analyser? | Tube<br>Height<br>(m) |
|----------------------|---|-----------|-------------------------------|--------------------------------|-------------------------|-------------------------------|--|--|--|-----------------------|
| 01n                  | Lut. Service Shop                           | Roadside  | 454475                        | 284560                         | NO2                     | yes<br>Lutterworth            | 0.0  | 4.2  |  | 2.0                   |
| 11n                  | Day Nursery                                 | Roadside  | 454539                        | 284932                         | NO2                     |                               | 9.0  | 1.3  |  | 2.0                   |
| 12n                  | A6 Kibworth                                 | Roadside  | 468425                        | 294314                         | NO2                     | yes<br>kibworth               | 10.7   | 1.3  |  | 2.0                   |
| 18n                  | Jazz Hair                                   | Roadside  | 454443                        | 284348                         | NO2                     | yes<br>Lutterworth            | 0.0  | 3.0  |  | 2.0                   |
| 22n                  | 77 leicester road                           | Roadside  | 454533                        | 284872                         | NO2                     |                               | 0.0  | 13.5   |  | 2.0                   |
| 23n                  | 6 The Terrace<br>Rugby Road                 | Roadside  | 454428                        | 284274                         | NO2                     | yes<br>Lutterworth            | 0.0  | 2.5  |  | 2.0                   |
| 24n                  | regent court                                | Roadside  | 454410                        | 284326                         | NO2                     | yes<br>Lutterworth            | 2.0  | 1.0  |  | 2.0                   |
| 25n                  | 26 Market Street<br>Lutterworth             | Roadside  | 454497                        | 284618                         | NO2                     | yes<br>Lutterworth            | 1.6  | 4.8  |  | 2.0                   |
| 26n                  | 24 Rugby Road<br>Lutterworth                | Roadside  | 454432                        | 284229                         | NO2                     | yes<br>Lutterworth            | 0.0  | 2.0  |  | 2.0                   |
| 27n                  | 17 Rugby road<br>Lutterworth                | Roadside  | 454476                        | 284178                         | NO2                     | yes<br>Lutterworth            | 3.7  | 5.2  |  | 2.0                   |
| 28n                  | Spencerdene main<br>street<br>theddingworth | Roadside  | 466535                        | 285545                         | NO2                     |                               | 1.2  | 0.2  |  | 2.0                   |



| Diffusion<br>Tube ID | Site Name   | Site Type | X OS<br>Grid Ref<br>(Easting) | Y OS Grid<br>Ref<br>(Northing) | Pollutants<br>Monitored | In<br>AQMA?<br>Which<br>AQMA? | Distance<br>to<br>Relevant<br>Exposure<br>(m) <sup>(1)</sup> | Distance<br>to kerb<br>of<br>nearest<br>road (m)<br><sup>(2)</sup> | Tube Co-<br>located<br>with a<br>Continuous<br>Analyser? | Tube<br>Height<br>(m) |
|----------------------|---|-----------|-------------------------------|--------------------------------|-------------------------|-------------------------------|--|--|--|-----------------------|
| 29n                  | Homeside main street<br>Theddingworth                   | Roadside  | 466651                        | 285607                         | NO2                     |                               | 0.2  | 1.4  |  | 2.0                   |
| 30n                  | 40 regent street<br>lutterworth                         | Roadside  | 466651                        | 285607                         | NO2                     |                               | 0.2  | 1.4  |  | 2.0                   |
| 31n                  | 69 leicester road<br>Kibworth                           | Roadside  | 467933                        | 294660                         | NO2                     | yes<br>Lutterworth            | 3.5  | 4.0  |  | 2.0                   |
| 32n                  | Alma House,<br>Watling Street<br>Claybrooke Parva       | Roadside  | 448065                        | 287719                         | NO2                     |                               | 0.0  | 7.0  |  | 2.0                   |
| 33n                  | sign post outside<br>White House Farm<br>Watling street | Roadside  | 448948                        | 286554                         | NO2                     |                               | 14.0   | 1.0  |  | 2.0                   |
| 34n                  | sign outside 64<br>Leicester Road<br>Kibworth           | Roadside  | 468143                        | 294351                         | NO2                     | yes<br>kibworth               | 0.5  | 2.3  |  | 2.0                   |
| 35n                  | lamppost outside<br>78 leicester road<br>kibworth       | Roadside  | 468022                        | 294450                         | NO2                     | yes<br>kibworth               | 3.1  | 6.4  |  | 2.0                   |
| 36n                  | signpost just north<br>of 11 Leicester road<br>Kibworth | Roadside  | 468309                        | 294352                         | NO2                     | yes<br>kibworth               | 0.0  | 1.4  |  | 2.0                   |
| 37n                  | pizza Express st<br>marys road                          | Roadside  | 473749                        | 287214                         | NO2                     |                               | 0.0  | 1.4  |  | 2.0                   |
| 38n                  | coach and horse<br>kibworth                             | Roadside  | 468403                        | 294298                         | NO2                     | yes<br>kibworth               | 2.2  | 2.5  |  | 2.0                   |
| 39n                  | lamppost 29 church<br>road kibworth                     | Roadside  | 468412                        | 294218                         | NO2                     |                               | 10.2   | 2.0  |  | 2.0                   |

| Diffusion<br>Tube ID | Site Name   | Site Type | X OS<br>Grid Ref<br>(Easting) | Y OS Grid<br>Ref<br>(Northing) | Pollutants<br>Monitored | In<br>AQMA?<br>Which<br>AQMA? | Distance<br>to<br>Relevant<br>Exposure<br>(m) <sup>(1)</sup> | Distance<br>to kerb<br>of<br>nearest<br>road (m)<br><sup>(2)</sup> | Tube Co-<br>located<br>with a<br>Continuous<br>Analyser? | Tube<br>Height<br>(m) |
|----------------------|---|-----------|-------------------------------|--------------------------------|-------------------------|-------------------------------|--|--|--|-----------------------|
| 40n                  | 106 main street<br>kibworth                                     | Roadside  | 468027                        | 294570                         | NO2                     |                               | 0.0  | 1.7  |  | 2.0                   |
| 41n                  | lampost outside 52<br>Leicester Road                            | Roadside  | 468982                        | 293824                         | NO2                     | yes<br>kibworth               | 9.0  | 2.2  |  | 2.0                   |
| 42n                  | road sign on<br>leicester road, rear<br>of 9 Milestone<br>Close | Roadside  | 469037                        | 293796                         | NO2                     |                               | 12.0   | 2.0  |  | 2.0                   |
| 43n                  | 3 dunton road BA  | Roadside  | 453583                        | 292002                         | NO2                     |                               | 2.9  | 1.5  |  | 2.0                   |
| 44n                  | 26 Dunton Road<br>BA  | Roadside  | 453625                        | 291935                         | NO2                     |                               | 2.0  | 0.2  |  | 2.0                   |
| 45n                  | lampost est of 5<br>Lutterworth road<br>Walcote                 | Roadside  | 456575                        | 283605                         | NO2                     |                               | 3.0  | 0.2  |  | 2.0                   |
| 46n                  | sw junction welland<br>park road and<br>northampton road<br>MH  | Roadside  | 473596                        | 286821                         | NO2                     |                               | 14.0   | 2.3  |  | 2.0                   |
| 47n                  | 53 northampton road<br>MH                                       | Roadside  | 473598                        | 286851                         | NO2                     |                               | 9.0  | 1.0  |  | 2.0                   |
| 48n                  | 7 leicester road MH   | Roadside  | 473172                        | 287534                         | NO2                     |                               | 2.6  | 2.9  |  | 2.0                   |
| 49n                  | lamppost outside<br>12 Springfield<br>Street MH                 | Roadside  | 473678                        | 286931                         | NO2                     |                               | 2.1  | 1.9  |  | 2.0                   |

| Diffusion<br>Tube ID | Site Name  | Site Type | X OS<br>Grid Ref<br>(Easting) | Y OS Grid<br>Ref<br>(Northing) | Pollutants<br>Monitored | In<br>AQMA?<br>Which<br>AQMA? | Distance<br>to<br>Relevant<br>Exposure<br>(m) <sup>(1)</sup> | Distance<br>to kerb<br>of<br>nearest<br>road (m)<br><sup>(2)</sup> | Tube Co-<br>located<br>with a<br>Continuous<br>Analyser? | Tube<br>Height<br>(m) |
|----------------------|--|-----------|-------------------------------|--------------------------------|-------------------------|-------------------------------|--|--|--|-----------------------|
| 50n                  | lamppost carpark<br>adjacent Fleckney<br>Fish bar, High<br>street Fleckney | Roadside  | 464971                        | 293501                         | NO2                     |                               | 0.1  | 2.0  |  | 2.0                   |
| 51n                  | lamppost outside<br>thurnby memorial<br>hall, main street,<br>bushby       | Roadside  | 464773                        | 303914                         | NO2                     |                               | 1.6  | 3.8  |  | 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<sub>2</sub> Monitoring Results: Automatic Monitoring (µg/m<sup>3</sup>)**

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2021 (%) <sup>(2)</sup> | 2017 | 2018 | 2019         | 2020  | 2021  |
|---------|-------------------------|--------------------------|-----------|---|--|------|------|--------------|-------|-------|
| A1      | 468114                  | 294353                   | Roadside  | 99.8%   | 99.8%                                      |      |      | <b>43.97</b> | 30.64 | 32.22 |
| Z2      | 468309                  | 294352                   | Roadside  | 87.02%  | 87.02%                                     |      |      |              | 34.47 | 35.01 |

☒ 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<sup>3</sup>.

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> 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<sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m<sup>3</sup>)**

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2021 (%) <sup>(2)</sup> | 2017        | 2018 | 2019        | 2020 | 2021 |
|-------------------|-------------------------|--------------------------|-----------|---|--|-------------|------|-------------|------|------|
| 01n               | 454475                  | 284560                   | Roadside  | 90.4  | 90.4                                       | <b>42.4</b> | 38.1 | 37.9        | 29.2 | 31.7 |
| 11n               | 454539                  | 284932                   | Roadside  | 66.1  | 66.1                                       | 26.6        | 30.1 | <b>41.8</b> | 21.6 | 22.9 |
| 12n               | 468425                  | 294314                   | Roadside  | 90.4  | 90.4                                       | 23.8        | 28.4 | 29.4        | 20.7 | 22.7 |
| 18n               | 454443                  | 284348                   | Roadside  | 90.4  | 90.4                                       | 35.0        | 36.2 | 34.0        | 26.1 | 28.4 |
| 22n               | 454533                  | 284872                   | Roadside  | 90.4  | 90.4                                       | 19.8        | 17.6 | 18.3        | 14.3 | 14.6 |
| 23n               | 454428                  | 284274                   | Roadside  | 90.4  | 90.4                                       | 30.1        | 27.6 | 25.3        | 19.9 | 23.3 |
| 24n               | 454410                  | 284326                   | Roadside  | 82.5  | 82.5                                       | 37.1        | 36.1 | 32.8        | 26.7 | 28.8 |
| 25n               | 454497                  | 284618                   | Roadside  | 90.4  | 90.4                                       | 32.0        | 31.4 | 29.7        | 23.6 | 24.3 |
| 26n               | 454432                  | 284229                   | Roadside  | 90.4  | 90.4                                       | <b>40.1</b> | 31.4 | 30.2        | 25.2 | 26.2 |
| 27n               | 454476                  | 284178                   | Roadside  | 90.4  | 90.4                                       | 28.0        | 27.3 | 24.4        | 21.0 | 23.8 |
| 28n               | 466535                  | 285545                   | Roadside  | 90.4  | 90.4                                       | 16.5        | 16.4 | 17.5        | 14.5 | 12.2 |
| 29n               | 466651                  | 285607                   | Roadside  | 90.4  | 90.4                                       | 27.9        | 22.2 | 21.6        | 14.6 | 17.7 |
| 30n               | 466651                  | 285607                   | Roadside  | 85.0  | 85.0                                       | 22.6        | 17.1 | 17.6        | 12.7 | 14.1 |

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2021 (%) <sup>(2)</sup> | 2017        | 2018        | 2019        | 2020 | 2021 |
|-------------------|-------------------------|--------------------------|-----------|---|--|-------------|-------------|-------------|------|------|
| 31n               | 467933                  | 294660                   | Roadside  | 90.4  | 90.4                                       | 33.6        | 31.0        | 28.6        | 23.6 | 25.2 |
| 32n               | 448065                  | 287719                   | Roadside  | 80.3  | 80.3                                       | 29.2        | 25.1        | 23.9        | 18.8 | 20.6 |
| 33n               | 448948                  | 286554                   | Roadside  | 90.4  | 90.4                                       | 18.8        | 24.4        | 21.9        | 16.4 | 17.8 |
| 34n               | 468143                  | 294351                   | Roadside  | 90.4  | 90.4                                       | <b>56.9</b> | <b>49.3</b> | <b>52.0</b> | 37.6 | 38.0 |
| 35n               | 468022                  | 294450                   | Roadside  | 90.4  | 90.4                                       | 32.5        | 32.0        | 38.5        | 26.2 | 30.7 |
| 36n               | 468309                  | 294352                   | Roadside  | 90.4  | 90.4                                       | <b>44.3</b> | 34.4        | 34.5        | 24.8 | 26.8 |
| 37n               | 473749                  | 287214                   | Roadside  | 90.4  | 90.4                                       | 29.7        | 25.9        | 27.7        | 20.3 | 20.7 |
| 38n               | 468403                  | 294298                   | Roadside  | 80.3  | 80.3                                       | 22.5        | 19.4        | 19.8        | 15.0 | 15.3 |
| 39n               | 468412                  | 294218                   | Roadside  | 90.4  | 90.4                                       |             | 18.1        | 17.7        | 13.9 | 14.9 |
| 40n               | 468027                  | 294570                   | Roadside  | 90.4  | 90.4                                       | 24.4        | 21.0        | 21.1        | 16.1 | 16.3 |
| 41n               | 468982                  | 293824                   | Roadside  | 90.4  | 90.4                                       |             |             | 19.3        | 13.4 | 14.9 |
| 42n               | 469037                  | 293796                   | Roadside  | 90.4  | 90.4                                       |             |             | 21.6        | 15.3 | 16.8 |
| 43n               | 453583                  | 292002                   | Roadside  | 90.4  | 90.4                                       |             |             | 19.1        | 15.4 | 18.4 |

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2021 (%) <sup>(2)</sup> | 2017 | 2018 | 2019 | 2020 | 2021 |
|-------------------|-------------------------|--------------------------|-----------|---|--|------|------|------|------|------|
| 44n               | 453625                  | 291935                   | Roadside  | 65.0  | 65.0                                       |      |      | 22.8 | 15.3 | 16.0 |
| 45n               | 456575                  | 283605                   | Roadside  | 90.4  | 90.4                                       |      |      | 18.1 | 13.0 | 13.3 |
| 46n               | 473596                  | 286821                   | Roadside  | 57.9  | 57.9                                       |      |      | 31.4 | 22.0 | 24.1 |
| 47n               | 473598                  | 286851                   | Roadside  | 90.4  | 90.4                                       |      |      | 27.0 | 21.9 | 25.9 |
| 48n               | 473172                  | 287534                   | Roadside  | 90.4  | 90.4                                       |      |      | 26.1 | 18.5 | 22.4 |
| 49n               | 473678                  | 286931                   | Roadside  | 56.0  | 56.0                                       |      |      | 26.0 | 17.9 | 22.8 |
| 50n               | 464971                  | 293501                   | Roadside  | 63.4  | 63.4                                       |      |      |      | 12.8 | 14.9 |
| 51n               | 464773                  | 303914                   | Roadside  | 73.2  | 73.2                                       |      |      |      | 10.3 | 11.8 |

☒ 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<sup>3</sup>.

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 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 – The Kibworths Trends in Annual Mean NO<sub>2</sub> Concentrations

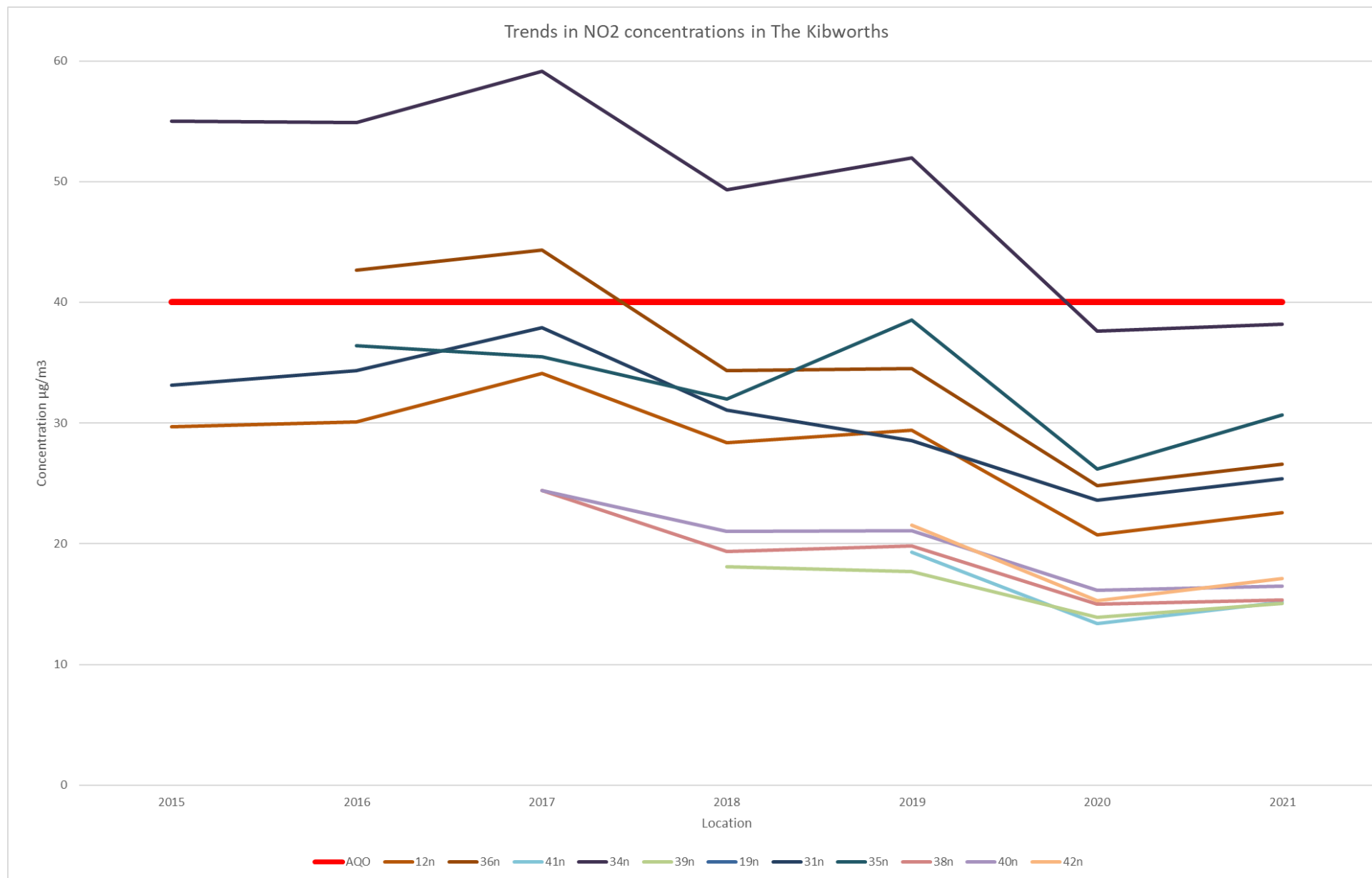
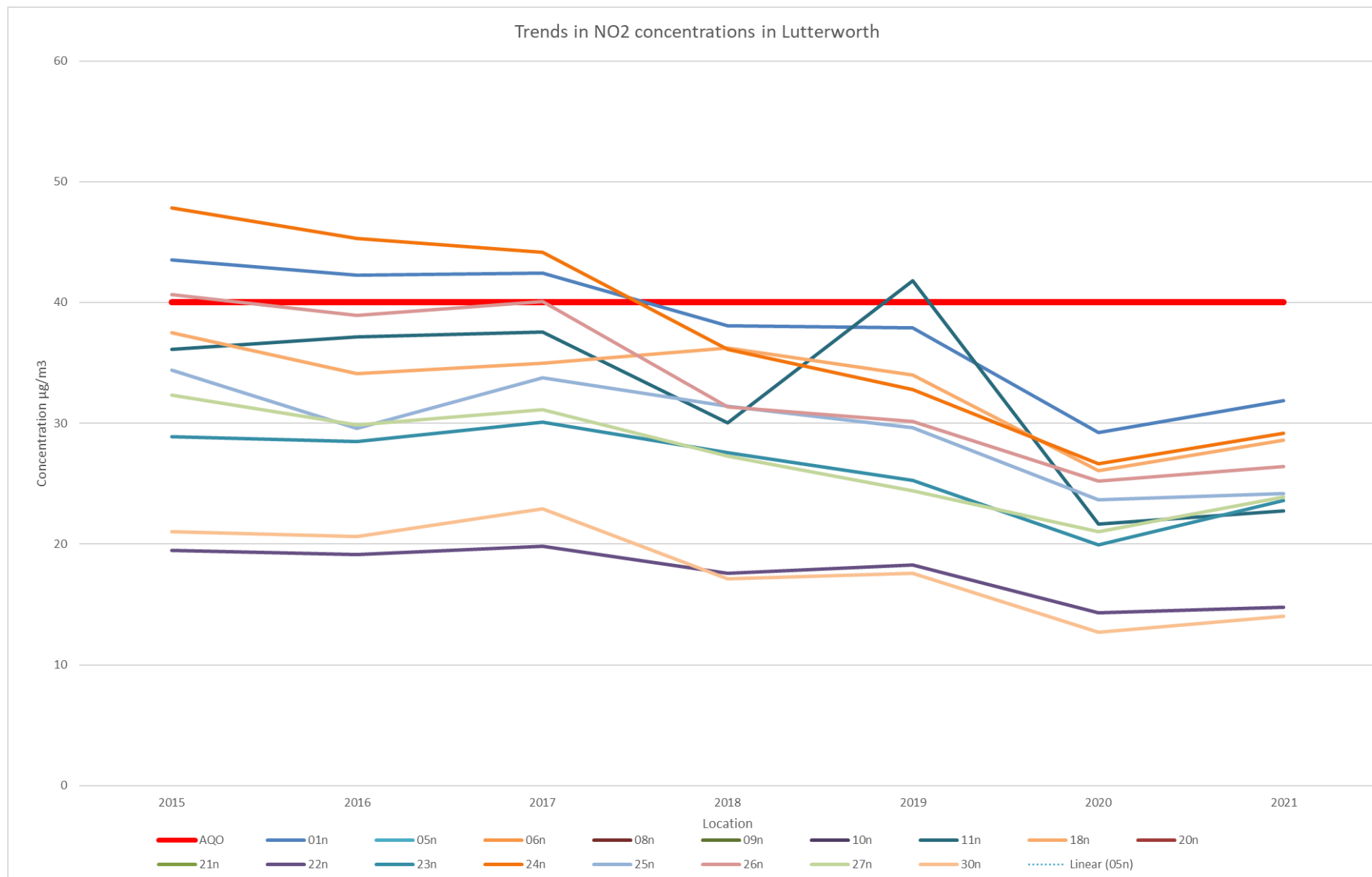
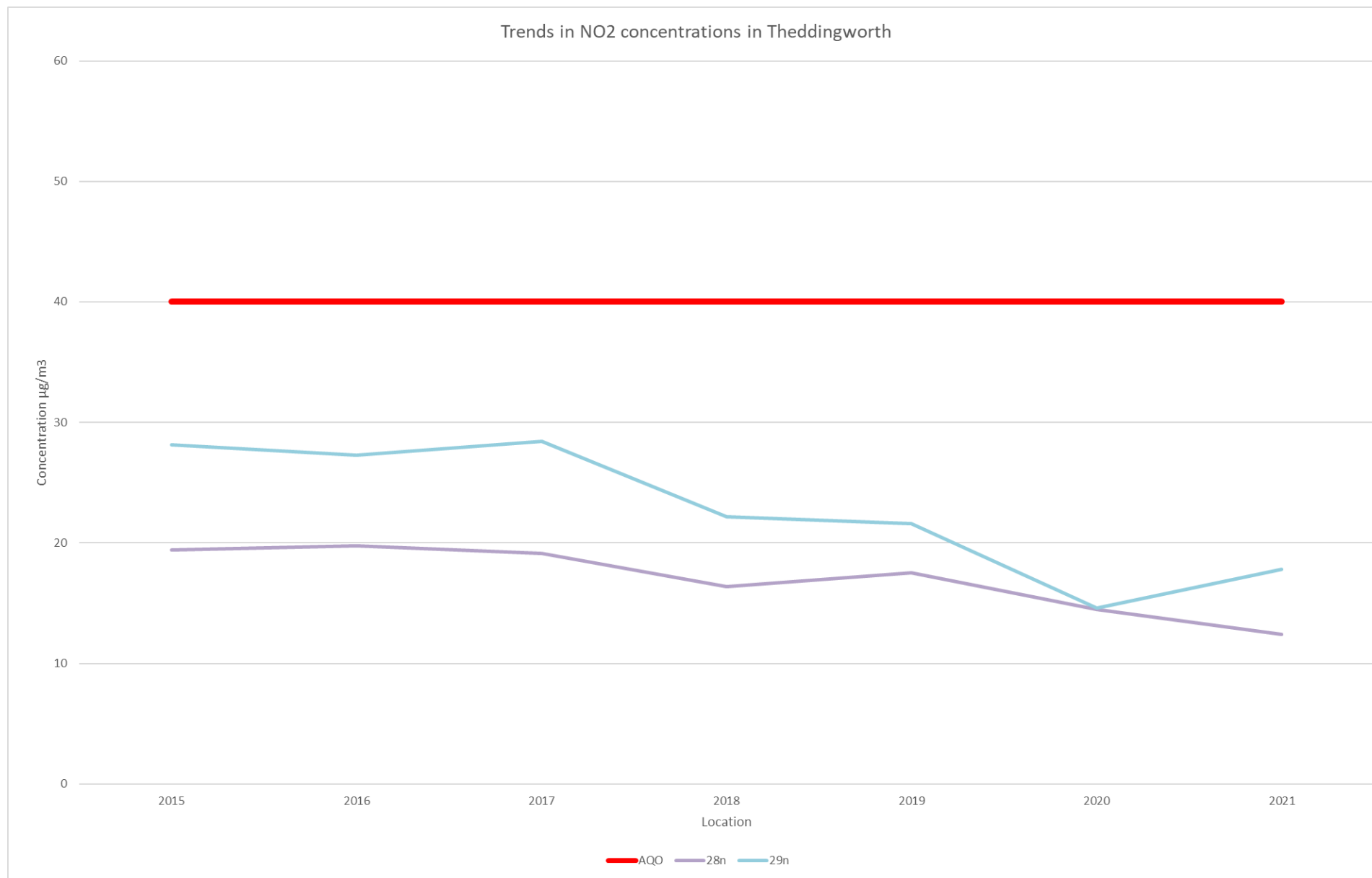


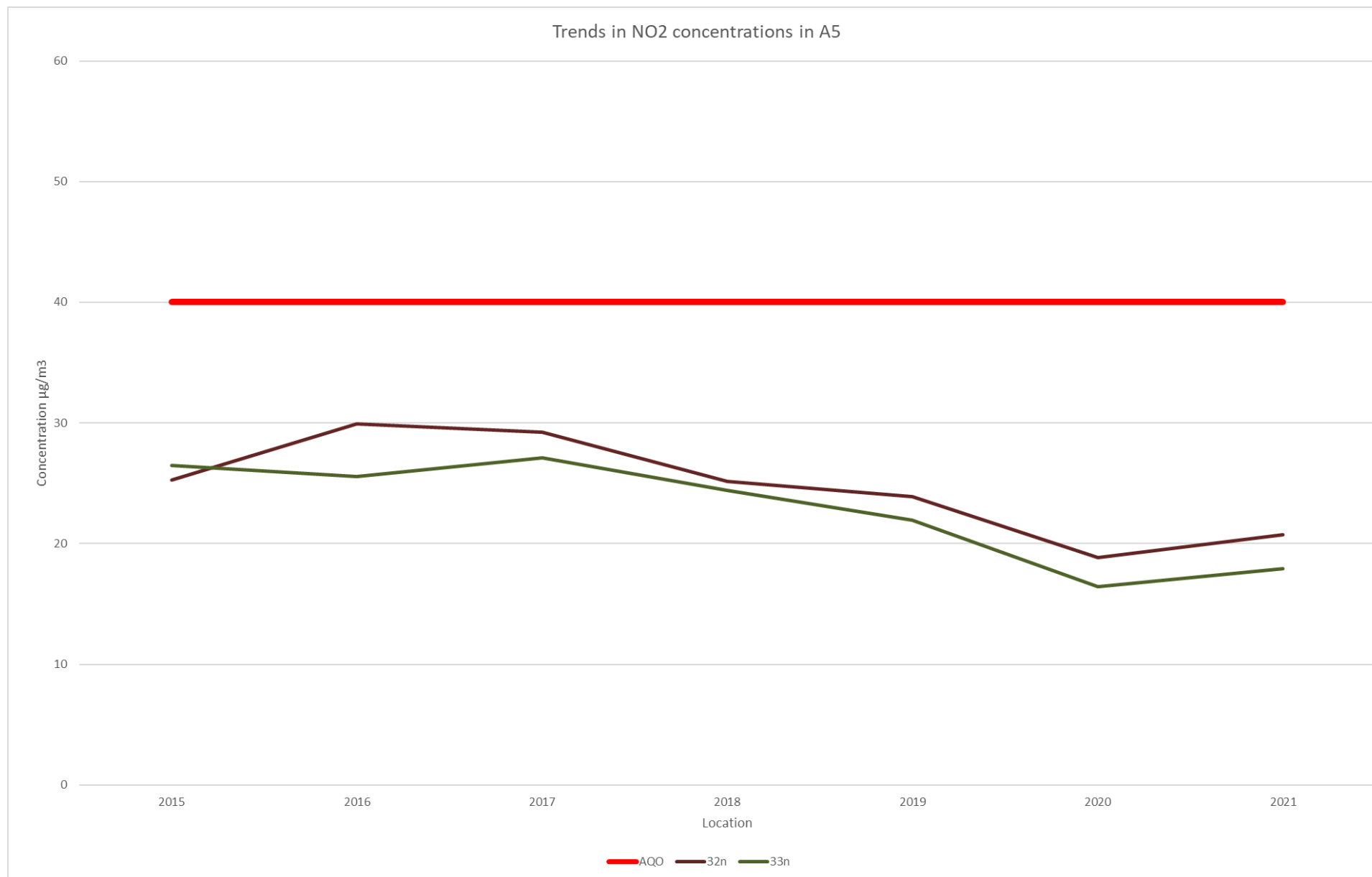
Figure A.2 – Lutterworth Trends in Annual Mean NO<sub>2</sub> Concentrations



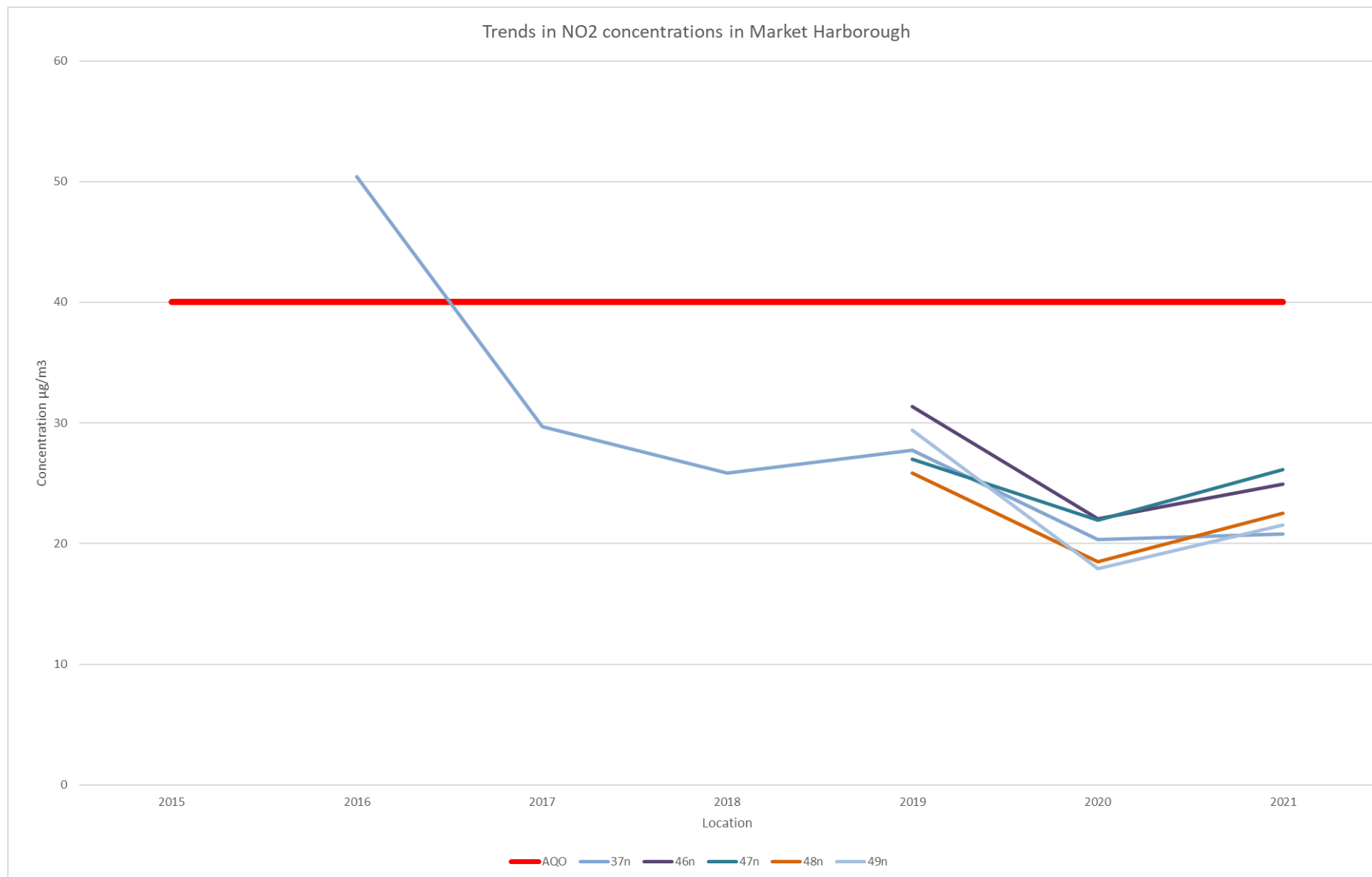
**Figure A.3 – Theddingworth Trends in Annual Mean NO<sub>2</sub> Concentrations**



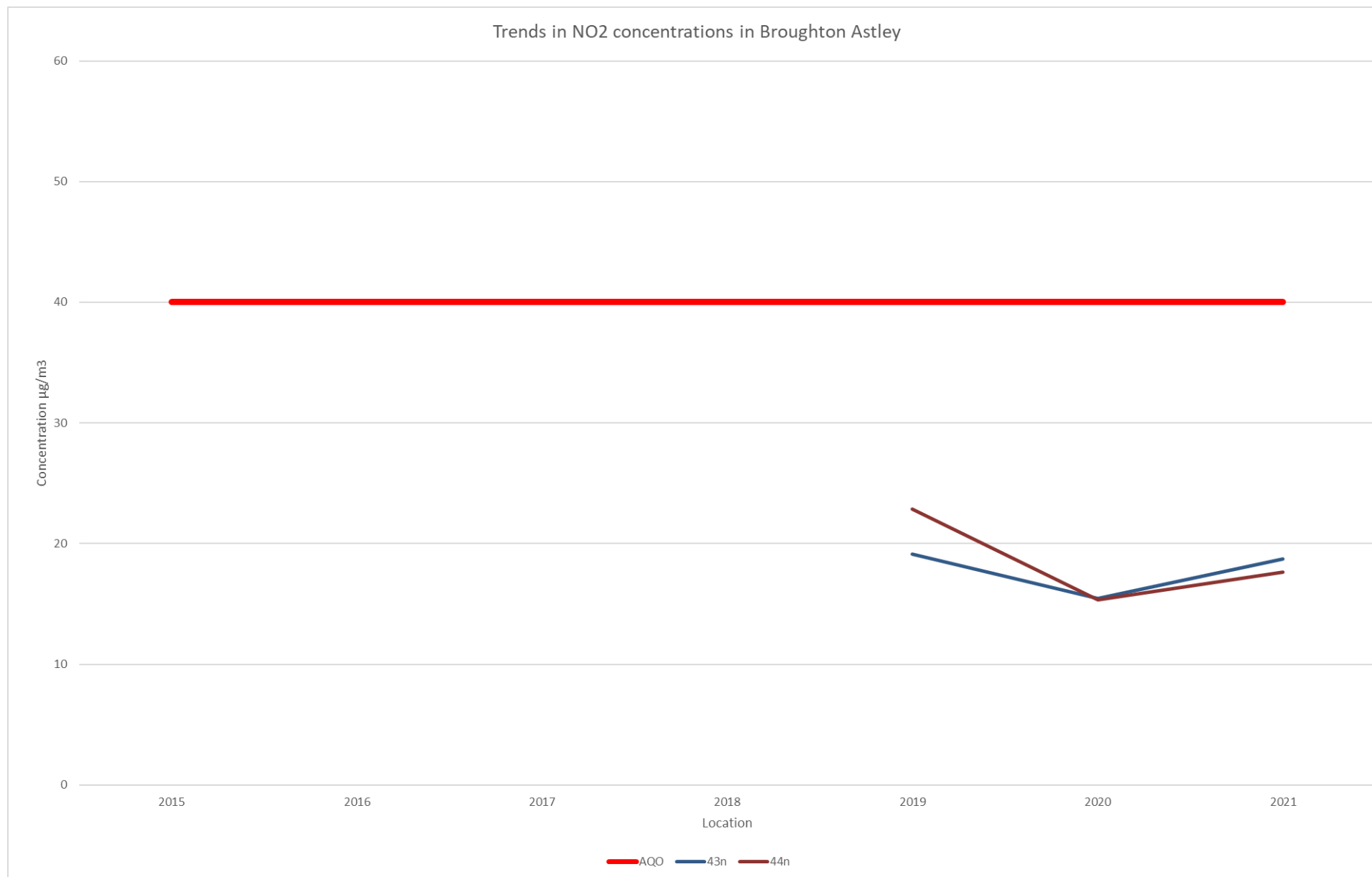
**Figure A.4 – A5 Trends in Annual Mean NO<sub>2</sub> Concentrations**



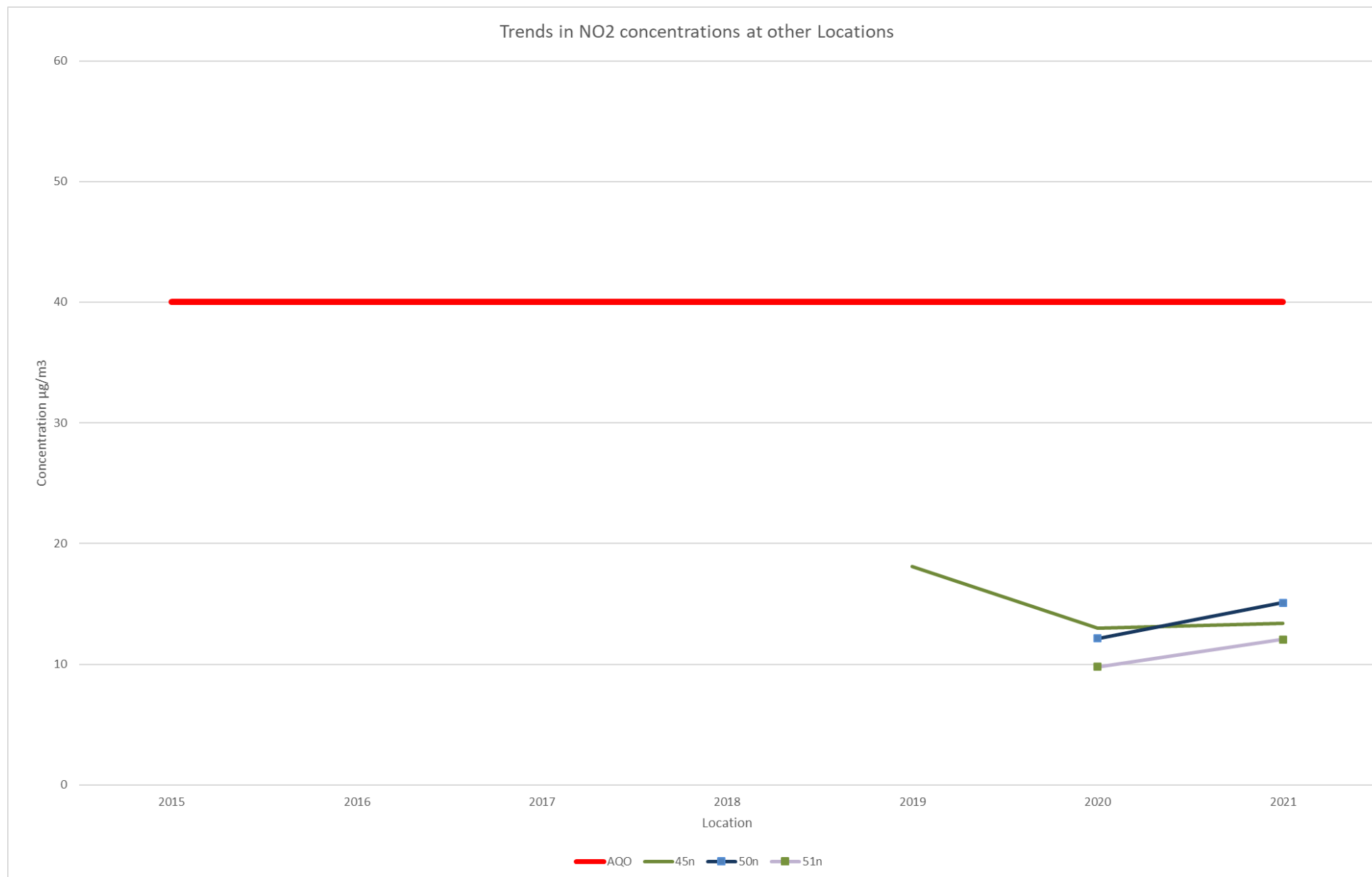
**Figure A.5 – Market Harborough Trends in Annual Mean NO<sub>2</sub> Concentrations**



**Figure A.6 – Broughton Astley Trends in Annual Mean NO<sub>2</sub> Concentrations**



**Figure A.7 – Other Locations Trends in Annual Mean NO<sub>2</sub> Concentrations**



**Table A.5 – 1-Hour Mean NO<sub>2</sub> Monitoring Results, Number of 1-Hour Means > 200µg/m<sup>3</sup>**

| Site ID | X OS Grid Ref (Eastin g) | Y OS Grid Ref (Northin g) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2021 (%) <sup>(2)</sup> | 2017 | 2018 | 2019 | 2020           | 2021     |
|---------|--------------------------|---------------------------|-----------|---|--|------|------|------|----------------|----------|
| A1      | 468114                   | 294353                    | Roadside  | 99.8%   | 99.8%                                      |      |      |      | 0              | 0        |
| Z2      | 468309                   | 294352                    | Roadside  | 87.02%  | 87.02%                                     |      |      |      | <b>3 (153)</b> | <b>0</b> |

**CLICK HERE THEN PASTE COMPLETED DATA ROWS FROM ASR EXCEL TEMPLATE**

**Notes:**

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

Exceedances of the NO<sub>2</sub> 1-hour mean objective (200µg/m<sup>3</sup> 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<sub>10</sub> Monitoring Results (µg/m<sup>3</sup>)**

| Site ID | X OS Grid Ref (Eastin g) | Y OS Grid Ref (Northin g) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2021 (%) <sup>(2)</sup> | 2017 | 2018 | 2019 | 2020 | 2021        |
|---------|--------------------------|---------------------------|-----------|---|--|------|------|------|------|-------------|
| Z2      | 468309                   | 294352                    | Roadside  | 87.47%  | 87.47%                                     |      |      |      | 16.2 | <b>9.18</b> |

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

**Notes:**

The annual mean concentrations are presented as µg/m<sup>3</sup>.

Exceedances of the PM<sub>10</sub> annual mean objective of 40µg/m<sup>3</sup> 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%).

**Table A.7 – 24-Hour Mean PM<sub>10</sub> Monitoring Results, Number of PM<sub>10</sub> 24-Hour Means > 50µg/m<sup>3</sup>**

| Site ID | X OS Grid Ref (Eastin g) | Y OS Grid Ref (Northin g) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2021 (%) <sup>(2)</sup> | 2017 | 2018 | 2019 | 2020             | 2021     |
|---------|--------------------------|---------------------------|-----------|---|--|------|------|------|------------------|----------|
| Z2      | 468309                   | 294352                    | Roadside  | 87.47%  | 87.47%                                     |      |      |      | <b>0 (20.63)</b> | <b>0</b> |

**CLICK HERE THEN PASTE COMPLETED DATA ROWS FROM ASR EXCEL TEMPLATE**

**Notes:**

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

Exceedances of the PM<sub>10</sub> 24-hour mean objective (50µg/m<sup>3</sup> 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<sub>2.5</sub> Monitoring Results (µg/m<sup>3</sup>)**

| Site ID | X OS Grid Ref (Eastin g) | Y OS Grid Ref (Northin g) | Site Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2021 (%) <sup>(2)</sup> | 2017 | 2018 | 2019 | 2020 | 2021        |
|---------|--------------------------|---------------------------|-----------|---|--|------|------|------|------|-------------|
| Z2      | 468309                   | 294352                    | Roadside  | 87.47%  | 87.47%                                     |      |      |      | 9.21 | <b>6.82</b> |

**CLICK HERE THEN PASTE COMPLETED DATA ROWS FROM ASR EXCEL TEMPLATE**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16 (confirm by selecting in box).**

**Notes:**

The annual mean concentrations are presented as µg/m<sup>3</sup>.

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 2021

Table B.1 – NO<sub>2</sub> 2021 Diffusion Tube Results (µg/m<sup>3</sup>)

| DT ID | X OS Grid Ref (Eastin g) | Y OS Grid Ref (Eastin g) | Jan  | Feb | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Annual Mean: Raw Data | Annual Mean: Annualised and Bias Adjusted (0.78) | Annual Mean: Distance Corrected to Nearest Exposure | Comment |
|-------|--------------------------|--------------------------|------|-----|------|------|------|------|------|------|------|------|------|------|-----------------------|--|---|---------|
| 01n   | 454475                   | 284560                   | 45.3 |     | 44.8 | 39.1 | 40.0 | 33.0 | 36.2 | 29.3 | 43.5 | 45.5 | 51.6 | 41.6 | 40.7                  | 31.7   | -   |         |
| 11n   | 454539                   | 284932                   | 42.1 |     | 28.8 | 30.2 | 28.8 | 26.0 | 25.6 | 21.3 |      |      |      | 30.3 | 28.7                  | 22.9   | -   |         |
| 12n   | 468425                   | 294314                   | 25.3 |     | 31.0 | 24.3 | 28.6 | 20.6 | 23.7 | 19.5 | 26.2 | 37.4 | 46.0 | 35.5 | 29.1                  | 22.7   | -   |         |
| 18n   | 454443                   | 284348                   | 46.5 |     | 36.0 | 45.6 | 41.1 | 24.8 | 34.3 | 16.0 | 44.3 | 34.9 | 42.5 | 37.0 | 36.4                  | 28.4   | -   |         |
| 22n   | 454533                   | 284872                   | 29.3 |     | 19.7 | 18.2 | 16.9 | 14.0 | 15.5 | 5.7  | 19.4 | 20.7 | 25.1 | 23.6 | 18.7                  | 14.6   | -   |         |
| 23n   | 454428                   | 284274                   | 41.0 |     | 32.2 | 31.9 | 23.9 | 28.3 | 24.3 | 33.1 | 25.3 | 29.4 | 33.0 | 30.5 | 29.9                  | 23.3   | -   |         |
| 24n   | 454410                   | 284326                   | 46.4 |     | 41.5 | 40.7 | 31.6 | 23.4 | 34.7 |      | 39.6 | 33.3 | 47.5 | 35.5 | 37.0                  | 28.8   | -   |         |
| 25n   | 454497                   | 284618                   | 37.0 |     | 33.6 | 34.7 | 30.7 | 24.8 | 28.1 | 19.6 | 23.5 | 34.6 | 37.7 | 36.5 | 31.1                  | 24.3   | -   |         |
| 26n   | 454432                   | 284229                   | 42.7 |     | 39.5 | 32.0 | 29.2 | 25.3 | 29.7 | 28.9 | 31.2 | 39.3 | 39.7 | 34.7 | 33.6                  | 26.2   | -   |         |
| 27n   | 454476                   | 284178                   | 40.9 |     | 30.7 | 29.5 | 27.1 | 24.8 | 37.4 | 15.9 | 32.0 | 32.6 | 35.3 | 31.1 | 30.5                  | 23.8   | -   |         |
| 28n   | 466535                   | 285545                   | 21.3 |     | 15.6 | 14.5 | 15.7 | 11.8 | 14.5 | 10.1 | 16.3 | 14.6 | 22.0 | 18.4 | 15.7                  | 12.2   | -   |         |
| 29n   | 466651                   | 285607                   | 26.5 |     | 25.4 | 21.5 | 20.1 | 16.7 | 19.5 | 16.2 | 22.8 | 25.2 | 32.0 | 25.3 | 22.7                  | 17.7   | -   |         |
| 30n   | 466651                   | 285607                   |      |     | 19.6 | 14.8 | 15.3 | 10.6 | 15.0 | 14.8 | 20.6 | 21.2 | 25.0 | 23.1 | 18.0                  | 14.1   | -   |         |
| 31n   | 467933                   | 294660                   | 36.9 |     | 35.8 | 37.4 | 28.8 | 29.8 | 29.5 | 15.6 | 30.5 | 32.8 | 47.8 | 32.8 | 32.4                  | 25.2   | -   |         |
| 32n   | 448065                   | 287719                   | 31.7 |     | 25.0 | 29.3 | 24.0 | 21.6 | 24.3 | 20.5 | 28.1 |      | 34.1 | 27.0 | 26.4                  | 20.6   | -   |         |
| 33n   | 448948                   | 286554                   | 29.3 |     | 22.7 | 20.0 | 21.8 | 18.1 | 20.5 | 15.4 | 21.7 | 24.7 | 31.0 | 27.2 | 22.8                  | 17.8   | -   |         |
| 34n   | 468143                   | 294351                   | 50.0 |     | 53.7 | 41.7 | 48.9 | 40.8 | 48.7 | 40.7 | 52.7 | 46.2 | 60.9 | 53.9 | 48.7                  | 38.0   | 36.6  |         |

| DT ID | X OS Grid Ref (Eastin g) | Y OS Grid Ref (Eastin g) | Jan  | Feb | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Annual Mean: Raw Data | Annual Mean: Annualised and Bias Adjusted (0.78) | Annual Mean: Distance Corrected to Nearest Exposure | Comment |
|-------|--------------------------|--------------------------|------|-----|------|------|------|------|------|------|------|------|------|------|-----------------------|--|---|---------|
| 35n   | 468022                   | 294450                   | 34.6 |     | 42.1 | 37.8 | 40.1 | 28.1 | 39.7 | 32.0 | 47.3 | 41.6 | 49.8 | 39.8 | 39.4                  | 30.7   | -   |         |
| 36n   | 468309                   | 294352                   | 32.8 |     | 35.2 | 32.5 | 33.1 | 28.9 | 34.9 | 18.6 | 32.2 | 41.5 | 45.0 | 40.7 | 34.4                  | 26.8   | -   |         |
| 37n   | 473749                   | 287214                   | 29.6 |     | 27.1 | 25.5 | 26.7 | 18.3 | 24.4 | 18.2 | 30.4 | 29.1 | 33.6 | 30.0 | 26.6                  | 20.7   | -   |         |
| 38n   | 468403                   | 294298                   | 22.1 |     | 20.3 | 20.7 | 17.0 | 14.8 | 16.3 | 12.6 | 22.2 |      | 27.7 | 23.2 | 19.6                  | 15.3   | -   |         |
| 39n   | 468412                   | 294218                   | 25.3 |     | 21.8 | 16.0 | 15.3 | 14.1 | 14.3 | 14.1 | 18.8 | 20.2 | 27.6 | 24.6 | 19.1                  | 14.9   | -   |         |
| 40n   | 468027                   | 294570                   | 29.2 |     | 22.8 | 16.8 | 17.0 | 9.1  | 15.9 | 16.8 | 21.7 | 24.4 | 32.4 | 26.6 | 20.9                  | 16.3   | -   |         |
| 41n   | 468982                   | 293824                   | 27.4 |     | 21.8 | 18.1 | 17.1 | 15.6 | 14.4 | 14.7 | 21.2 | 18.1 | 25.4 | 20.3 | 19.1                  | 14.9   | -   |         |
| 42n   | 469037                   | 293796                   | 28.8 |     | 22.8 | 24.3 | 20.6 | 19.6 | 18.5 | 17.0 | 23.7 | 19.5 | 26.9 | 19.8 | 21.6                  | 16.8   | -   |         |
| 43n   | 453583                   | 292002                   | 34.5 |     | 25.3 | 25.1 | 20.4 | 20.5 | 18.3 | 17.0 | 25.5 | 22.3 | 29.3 | 25.6 | 23.6                  | 18.4   | -   |         |
| 44n   | 453625                   | 291935                   | 31.0 |     |      | 20.6 | 17.8 | 17.5 |      |      | 21.5 | 19.0 | 27.4 | 26.1 | 22.2                  | 16.0   | -   |         |
| 45n   | 456575                   | 283605                   | 23.5 |     | 16.9 | 13.9 | 14.9 | 12.0 | 14.3 | 11.7 | 19.1 | 18.7 | 22.6 | 21.6 | 17.0                  | 13.3   | -   |         |
| 46n   | 473596                   | 286821                   | 37.9 |     | 29.9 |      |      | 25.1 | 29.7 |      | 26.9 | 39.6 |      | 34.5 | 32.1                  | 24.1   | -   |         |
| 47n   | 473598                   | 286851                   | 45.6 |     | 33.7 | 39.2 | 33.5 | 30.7 | 30.4 | 24.9 | 32.3 | 30.1 | 34.5 | 33.5 | 33.2                  | 25.9   | -   |         |
| 48n   | 473172                   | 287534                   | 34.2 |     | 29.2 | 34.0 | 32.3 | 29.5 | 25.3 | 26.0 | 19.9 | 25.9 | 33.0 | 27.9 | 28.7                  | 22.4   | -   |         |
| 49n   | 473678                   | 286931                   | 37.9 |     | 29.0 | 29.2 | 26.2 | 23.7 | 26.2 | 21.0 |      |      |      |      | 27.2                  | 22.8   | -   |         |
| 50n   | 464971                   | 293501                   | 26.4 |     | 19.1 |      | 15.8 | 14.6 | 16.1 | 16.2 |      |      | 24.1 | 22.6 | 19.1                  | 14.9   | -   |         |
| 51n   | 464773                   | 303914                   | 21.5 |     | 16.7 | 13.5 | 10.9 | 9.9  | 9.0  | 10.4 |      |      | 27.5 | 19.8 | 15.1                  | 11.8   | -   |         |

**CLICK HERE THEN PASTE COMPLETED DATA ROWS FROM LAQM DATA PROCESSING TOOL (IF UTILISED)**

☒ All erroneous data has been removed from the NO<sub>2</sub> 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.

☒ Harborough District Council confirm that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System (confirm by selecting in box).

**Notes:**

Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 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 Harborough District During 2021**

Harborough District Council has not identified any new sources relating to air quality within the reporting year of 2021.

### **Additional Air Quality Works Undertaken by Harborough District Council During 2021**

Harborough District Council has not completed any additional works within the reporting year of 2021.

### **QA/QC of Diffusion Tube Monitoring**

Diffusion tubes for 2021 were supplied by Socotec (Didcot) prepared using 50% TEA in acetone. The laboratories QA/QC information is attached as appendix C1.

### **Diffusion Tube Annualisation**

Annualisation of 5 diffusion tubes (11n, 44n, 46n, 49n and 50n) was required as they only had 55-70% data coverage for 2021.

### **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<sub>x</sub>/NO<sub>2</sub> continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Harborough District Council have applied a National bias adjustment factor 0.78 to the 2021 monitoring data. A summary of bias adjustment factors used by Harborough District Council over the past five years is presented in Table C.1.

**Table C.1 – Bias Adjustment Factor**

| Monitoring Year | Local or National | If National, Version of National Spreadsheet | Adjustment Factor |
|-----------------|-------------------|--|-------------------|
| <b>2021</b>     | National          | 03/22-                                       | 0.78              |
| <b>2020</b>     | National          | 03/21-                                       | 0.77              |
| <b>2019</b>     | National          | 03/20  | 0.75              |
| <b>2018</b>     | National          | 03/19  | 0.76              |
| <b>2017</b>     | National          | 03/18  | 0.77              |
| <b>2016</b>     | National          | 03/17  | 0.77              |

### **NO<sub>2</sub> Fall-off with Distance from the Road**

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO<sub>2</sub> concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table B.1.

1 diffusion tube location (34n) required distance correction in 2021, details of the calculations are included in the Diffusion tube processing tool attached as appendix C2

### **QA/QC of Automatic Monitoring**

#### Chemiluminescence analyser

- LSO calibration of the councils Chemiluminescence analyser is undertaken by environmental technologies limited.
- Data ratification and QA/QC is undertaken by Air Quality Data Management. AQDMs 2020 report and QA/QC procedures are attached as appendix C4

#### Zephyr analyser



- The analyser is provided by and data is managed by EarthSense Systems Limited

### **PM<sub>10</sub> and PM<sub>2.5</sub> Monitoring Adjustment**

No adjustments of the Zephyr PM<sub>10</sub> and PM<sub>2.5</sub> data have been made as a result of the method of monitoring.

### **Automatic Monitoring Annualisation**

All automatic monitoring locations within Harborough District recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

### **NO<sub>2</sub> Fall-off with Distance from the Road**

No automatic NO<sub>2</sub> monitoring locations within Harborough District required distance correction during 2021.

**Table C.2 – Annualisation Summary (concentrations presented in  $\mu\text{g}/\text{m}^3$ )**

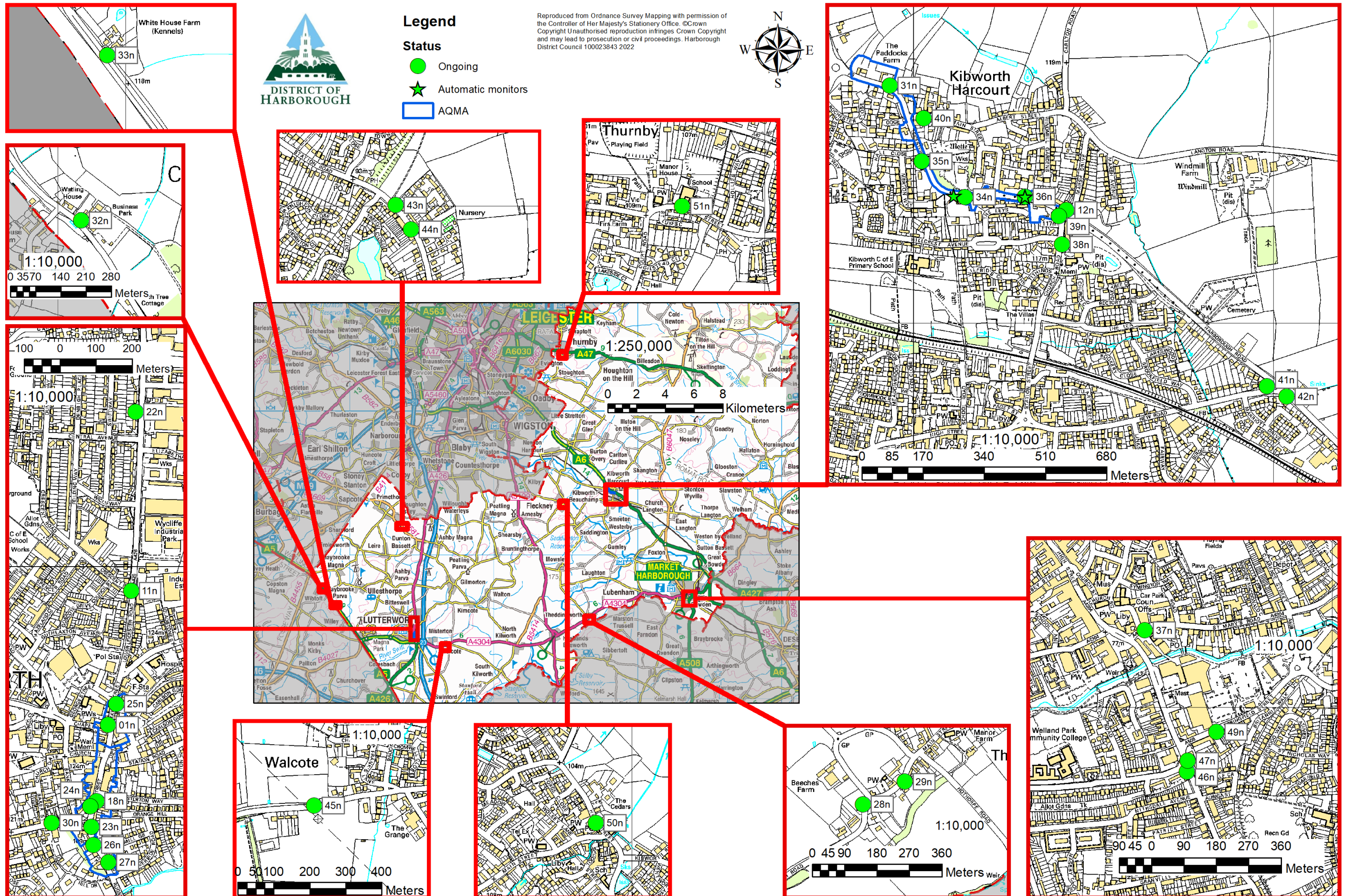
| Site ID | Annualisation Factor Cannock A5190 Roadside | Annualisation Factor Coventry Allesley | Annualisation Factor Leamington Spa Rugby Road | Annualisation Factor Leicester University | Average Annualisation Factor | Raw Data Annual Mean | Annualised Annual Mean | Comments |
|---------|---|--|--|---|------------------------------|----------------------|------------------------|----------|
| 11n     | 1.0142                                      | 1.0702                                 | 1.0605   | 0.9555                                    | 1.0251                       | 28.7                 | 29.4                   |          |
| 44n     | 0.9234                                      | 0.9429                                 | 0.9463   | 0.8822                                    | 0.9237                       | 22.2                 | 20.5                   |          |
| 46n     | 0.9638                                      | 0.9629                                 | 1.0011   | 0.9220                                    | 0.9624                       | 32.1                 | 30.9                   |          |
| 49n     | 1.0570                                      | 1.1324                                 | 1.1227   | 0.9796                                    | 1.0729                       | 27.2                 | 29.2                   |          |
| 50n     | 1.0165                                      | 1.0275                                 | 1.0428   | 0.9159                                    | 1.0007                       | 19.1                 | 19.1                   |          |

**Table C.3 – NO<sub>2</sub> Fall off With Distance Calculations (concentrations presented in µg/m<sup>3</sup>)**

| 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   |
|---------|---------------------------------------|--------------------------------|--|--------------------------|-------------------------------------|--|
| 34n     | 2.3                                   | 2.8                            | 38.0   | 8.2                      | 36.6                                | <i>Predicted concentration at Receptor within 10% the AQS objective.</i> |



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





## Appendix E: Summary of Air Quality Objectives in England

**Table E.1 – Air Quality Objectives in England<sup>7</sup>**

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

<sup>7</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## Glossary of Terms

| Abbreviation      | Description   |
|-------------------|---|
| AQAP              | Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'    |
| AQMA              | Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives |
| ASR               | Annual Status Report  |
| Defra             | Department for Environment, Food and Rural Affairs  |
| DMRB              | Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways  |
| EU                | European Union  |
| FDMS              | Filter Dynamics Measurement System  |
| LAQM              | Local Air Quality Management  |
| NO <sub>2</sub>   | Nitrogen Dioxide  |
| NO <sub>x</sub>   | Nitrogen Oxides   |
| PM <sub>10</sub>  | Airborne particulate matter with an aerodynamic diameter of 10µm or less  |
| PM <sub>2.5</sub> | Airborne particulate matter with an aerodynamic diameter of 2.5µm or less   |
| QA/QC             | Quality Assurance and Quality Control   |
| SO <sub>2</sub>   | 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.
- National Diffusion Tube Bias Adjustment Factor Spreadsheet. March 2022. Published by DEFRA.
-