



# 2022 Air Quality Annual Status Report (ASR)

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

Date: June, 2022

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# Executive Summary: Air Quality in Our Area

## Air Quality in North Northamptonshire

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>.

In April 2021, Corby Borough Council, Kettering Borough Council, East Northamptonshire District Council and Borough Council of Wellingborough merged to become North Northamptonshire Council, a new unitary authority. This will bring new opportunities to how air quality is managed in the area with the intention of harmonising and uniting the diffusion tube network and ASR process.

In North Northamptonshire, sources of air pollution include recent developments, industry and transportation. There has been notable growth and regeneration in the Corby area in recent years, including the demolition of coal fire power station and former steelworks and the several residential developments. The area surrounding Wellingborough has also experienced high levels of residential development in recent years. The eastern part of the district is predominantly rural. In this area, as well as across the entire district, Nitrogen dioxide (NO<sub>2</sub>) is the key pollutant of concern in the borough, which is primarily produced by road traffic. In 2020, pollutant levels were low in Kettering, Corby, Wellingborough and East

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<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

Northamptonshire and as such there are no plans to introduce an AQMA in any of these areas.

In 2021, North Northamptonshire undertook monitoring at 100 non-automatic (diffusion tube) sites. This report includes the latest NO<sub>2</sub> results from diffusion tube monitoring carried out across the whole area and shows the trends over the last five years. The results of the monitoring highlight an overall decreasing trend in that time. However, the trend between 2020 and 2021 can often contradict this, with some increases in concentrations monitored in some locations. This is likely due to an increase in traffic in 2021 compared to the restrictions on activity in 2020 due to the COVID-19 pandemic. However, no concentrations exceeding the AQS objective value of 40 µg/m<sup>3</sup> were recorded in North Northamptonshire in 2021.

## 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.

As North Northamptonshire Council (NNC) does not have any AQMAs, there is no requirement for a formal AQAP. However, several actions have been taken by the Council to improve air quality. Actions taken chiefly relate to decreasing traffic related NO<sub>2</sub> pollution through promoting alternative travel, and as a consequence of action on climate change.

The Voi Scooter project successfully replaced 244,081 car trips with trips using electric scooters in 2021, which resulted in a reduction in 85,300 Kg of carbon equivalent.

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<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

North Northamptonshire also continues to support projects which aim to reduce emissions and improve air quality, such as the East Northamptonshire Greenway Project. The East Midlands Air Quality Network (EMAQN) 'Air Quality and Emissions Mitigation - Guidance for Developers' also continues to be implemented. The EMAQN guidance is technical planning guidance which aims to improve air quality across the East Midlands, through preventing new emission sources and encouraging emissions reductions.

## Conclusions and Priorities

The air quality in North Northamptonshire is generally good and concentrations remain below the AQS objectives. Although the five-year trend decreases overall, some increases in concentrations can be seen between 2020 and 2021. This is not unexpected, with the increases in traffic after the 2020 COVID-19 pandemic.

As there are no plans to introduce an AQMA in North Northamptonshire, there remains no requirement to publish an AQAP. That said, measures to improve air quality continue to be implemented. Moving forward, the priorities for North Northamptonshire are:

- To continue monitoring and the review of air quality in line with national air quality objectives;
- Continue the streamlining process commenced since the creation of the unitary authority to improve air quality reporting and actions;
- Work together with other departments of the Council i.e. planning and Highways, to manage local air quality and raise awareness on its role in achieving a sustainable environment;
- Continue to review all planning applications that are referred to the Environmental Protection team in terms of national and EMAQN guidance, ensuring any impacts upon local air quality are quantified; and
- Promote initiatives to reduce emissions of air pollution across the district through partnerships with schools, businesses and communities.
- As several areas within North Northamptonshire are developing rapidly it will remain important to monitor air quality and any new sources of pollution.

## Local Engagement and How to get Involved

Air quality continues to move up the political agenda as there is a greater understanding of the issues and complexities around the quality of the air we all breathe. Industry, agriculture,

transport, planning and individuals are being encouraged to look at interventions, behavioural changes and practical actions to improve air quality.

The primary source of air pollution in the North Northamptonshire is NO<sub>2</sub> arising from transport sources. There are many transport alternatives the public can use to help improve air quality:

- **Walking, cycling or electric scooter** – these are the most environmentally friendly modes of transport as well as the added benefit of keeping fit and healthy;
- **Public transport** – the use of public transport reduces the number of private vehicles on the roads, easing congestion therefore reducing concentrations of roadside pollutants;
- **Car-sharing** – if a similar journey is shared with another individual car-sharing is a good way at reducing the number of private vehicles as well as reducing the cost of commuting, if sharing fuel costs This can be promoted via travel plans through the workplace and within schools; and
- **Alternative fuel / more efficient vehicles** – Choosing a vehicle that meets the specific needs of the owner, fully electric, hybrid fuel and more fuel-efficient cars are available. If residents are considering swapping to an electric vehicle, the government offers up to 75% grant funding towards the cost of installing electric vehicle charge points at domestic properties through the Electric Vehicle Homecharge Scheme (EVHS). For information on how to apply, please see the gov.uk website.

An additional way to improve air quality is by considering alternatives to garden waste disposal other than burning and burning smokeless fuels. The public can also assist by reporting pollution incidents within the North Northamptonshire area.

For more information on what the Council is doing to improve air quality in the North Northamptonshire, please get in contact with the local Environmental Health Officer, or go to <https://www.northnorthants.gov.uk/environment>

## Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of North Northamptonshire Council with the support and agreement of the following officers and departments:

This ASR has been approved by:

This ASR has not to date been signed off by a Director of Public Health but consultation will be undertaken.

If you have any comments on this ASR please send them to the report author

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# 1 Local Air Quality Management

This report provides an overview of air quality in North Northamptonshire 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 North Northamptonshire to improve air quality and any progress that has been made.

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

## **2 Actions to Improve Air Quality**

### **2.1 Air Quality Management Areas**

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

North Northamptonshire Council currently does not have any declared AQMAs.

Maps of North Northamptonshire Council's monitoring locations are available in Appendix D.

## 2.2 Progress and Impact of Measures to address Air Quality in North Northamptonshire

2021 is the first year in which an ASR has been produced for the combined North Northamptonshire area. Previous measures and feedback relate to the individual areas of Corby Borough Council, Kettering Borough Council, East Northamptonshire District Council and Borough Council of Wellingborough.

Defra's appraisal of last year's ASRs concluded that:

- The 2020 Corby report was acknowledged but not appraised by Defra due to its lateness, though comments from the 2019 ASR have been considered, and implemented into this year's report where relevant.
- Though there were no AQMAs within Corby, Wellingborough, Kettering or East Northamptonshire, therefore there is no formal requirement for an AQMA, despite this a good level of detail and discussion was provided around measures to reduce and manage air quality.
- Monitoring results for Corby were clearly presented and the context of the effect of COVID-19 on results is discussed.
- For Corby, the October monitoring data for site 10N is much higher than the other months at the same location. Data should be reviewed for anomalous data such as this and commentary provided as to whether there was a reason that concentrations were higher. Should there be no explanation, the Local Authority may consider removing such data.
- In the Corby and East Northamptonshire ASRs, a link was provided to the Public Health Outcomes Frameworks with details and a history of the fraction of mortality attributable to PM<sub>2.5</sub>, this was welcomed.
- Appropriate QA/QC was applied to the Corby, Kettering and East Northamptonshire results; with distance correction and annualisation calculations provided in the Appendix. The inclusion of the output from the Diffusion Tube Data Processing Tool was welcomed.
- Kettering Council recorded an exceedance at RW4 in 2019, however in 2020 there was no longer an exceedance. This could have been influenced by the pandemic. Therefore, the Council should continue to monitor this location and could include more monitoring here to focus in on this potential hotspot.
- For Kettering, it was noted that the Council should consider including a link to the Public Health Outcomes Framework, indicator D01 specifically could be mentioned.

- In East Northamptonshire's ASR, under Table A.2, the report did not confirm that the results presented had been bias adjusted; whilst this appears to have been carried out, and is stated within the text, confirmation of this in the check box provided beneath the table is required in adherence with good practice.
- A discussion of new pollutant sources was provided within Appendix C of the East Northamptonshire ASR, which was commended.
- Diffusion tube mapping was clear in East Northamptonshire's ASR and clearly depicted the locations of all monitoring sites. It would be beneficial for the Council to include an additional map depicting all sites within the district boundary, for completeness. This would also allow the reader to understand the spatial distribution of monitoring sites within the Council's jurisdiction.
- Additional monitoring sites should be deployed on Silver Street in Wellingborough to further assess the annual mean NO<sub>2</sub> concentrations apparent within the street canyon environment. Where possible these should be placed at locations that are relevant to the annual mean objective.
- When the 2022 ASR is completed for North Northamptonshire, the Council should submit their diffusion tube results through the Diffusion Tube Data Entry System (DTDES) within the LAQM Portal. This was not done for Wellingborough 2021 ASR.
- Within the accompanying excel ASR spreadsheet Table A.3 is relevant for automatic annual mean NO<sub>2</sub> results, diffusion tube results are not required within this table.

North Northamptonshire has no active AQMAs and subsequently has produced no AQAP's to date. Despite not having a formal AQAP, North Northamptonshire 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 2.1. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1.

Although an AQAP does not exist, air quality in the district is addressed through the Northamptonshire Transportation Plan (2012) and the Northamptonshire Climate Change Strategy (2020-2023). Since forming in 2021 North Northamptonshire has committed to becoming carbon neutral by 2030.

As the primary source of pollution in North Northamptonshire Council is traffic related NO<sub>2</sub>, a number of air quality measures relate to promoting transport alternatives. Low carbon vehicles are promoted through a taxi age policy and incentives for low carbon taxis. A company vehicle procurement scheme is also in place to encourage local businesses to

replace their fleet with lower emission vehicles. The Office for Low Emission Vehicles (OLEZ) project has also successfully installed electric vehicles charging points across the borough.

The Voi Scooter project aims to expanded electric scooter use in UK towns to encourage tan uptake in this mode of transport with a focus on replacing car journeys in North Northamptonshire. The most up to date data shows that between April 2021 and March 2022, 244,081 car trips were replaced and a reduction of 85,300 Kg CO<sub>2</sub>e was attributed to this. The areas where this project is ongoing is Corby, Kettering, Rushden and Higham Ferrers and Wellingborough.

An additional project to encourage alternative transport is the East Northamptonshire Greenway project. This project is working to create walking and cycling routes in the Nene Valley. The Greenway is being developed in phases, some of which are already completed, and others will follow within the next few years. The Greenway will help connect East Northamptonshire's communities to a central route that will run from Wellingborough Railway Station in the south, to Peterborough railway station in the north, and vice-versa. It will link open spaces together with opportunities for informal recreation and alternative means of transport to services and facilities. The project will also provide safe routes for young people who walk and cycle to school. The Greenway is predominantly for walkers and cyclists, and in parts horse riders are welcome where the route is a bridleway

All new planning applications continue to be directed to the requirements of the EMAQN 'Air Quality and Emissions Mitigation - Guidance for Developers'. The technical planning guidance for East Northamptonshire Council that was prepared in conjunction with the EMAQN and has been developed to supplement the National Planning Policy Framework (NPPF). The requirements of EMAQN ensure there is a consistent and thorough approach to the impact the proposed development may have on air quality and recommends mitigation measures to offset any development.

A Joint Strategic Needs Assessment (JSNA) was undertaken by Northamptonshire County Council, which concluded that air pollution is estimated to account for 3.9% of number of years lost due to ill-health, disability or early death (DALYs) in Northamptonshire. An estimated £2,569 per person per year is spent on dealing with NO<sub>2</sub> in the health and social care system. This rises to £7,569 per person per year for PM. A 'plan on a page' was produced, which is shown in Figure 2.1. This prioritises: securing clean growth and innovation that tackle emissions from industry, vehicles, products, combustion and agriculture and support both improvements in air quality and decarbonisation; protecting the

environment by monitoring the impacts of air pollution on natural habitats; reduce nitrogen oxides emissions from transport; reduce PM<sub>2.5</sub>, sulphur dioxide and Non-methane volatile organic compounds emissions at home; reduce emissions of ammonia from farming; and reduce emissions from industry.

**Figure 2.1 - County JSNA 'Plan on a Page'**

Public Health Plan on a page: Commissioning for Outcomes (Air Quality)				
<p><b>Vision:</b></p> <ul style="list-style-type: none"> <li>Improving air quality to reduce hazardous health impacts that air pollution can have across a person's lifetime, the associated health inequalities, and its burden on NHS and social care costs attributable to air pollution.</li> <li>To ensure that local action plan to reduce air pollution remains robust and relevant to make Northamptonshire cleaner and healthier and attractive place to live, visit, work and play.</li> </ul> <p><b>Priorities:</b> Secure clean growth and innovation that tackle emissions from industry, vehicles, products, combustion and agriculture and support both improvements in air quality and decarbonisation; protecting the environment by monitoring the impacts of air pollution on natural habitats; reduce nitrogen oxides emissions from transport; reduce PM<sub>2.5</sub>, sulphur dioxide and Non-methane volatile organic compounds emissions at home; reduce emissions of ammonia from farming; and reduce emissions from industry.</p>				
<b>Our Approach</b>				
<p><b>Whole system approach:</b> Air quality is just one factor influencing the management of urban environments and travel patterns. Others include: economic development and retail, planning, tourism/ visitor strategies, housing growth, workplace travel needs, access to services including healthcare and access to education.</p> <p><b>Achieved through:</b></p> <ul style="list-style-type: none"> <li>Partnership working (health, local government, roads, planning, workplaces, schools) across the system and for all ages.</li> <li>Clear leadership on air quality issues.</li> </ul>	<p><b>Addressing existing problems and preventing new ones:</b></p> <p>A number of areas in the county have identified/designated Air Quality Management Areas, where air quality is worse than the recommended legal limits. Further such areas may be created due to future housing growth/development and the associated increase in travel.</p> <p><b>Achieved through:</b></p> <ul style="list-style-type: none"> <li>Targeted efforts in known problem areas.</li> <li>Preventative measures to avoid further Air Quality Management Areas being required.</li> </ul>	<p><b>Behavioural Change :</b></p> <p>Assist relevant partners to address air quality and increase sustainable travel, including: environmental health teams, planning departments, transport and highways and major organisations /employers.</p> <p><b>Achieved through:</b></p> <ul style="list-style-type: none"> <li>Social marketing.</li> <li>Influencing on policy.</li> <li>Partnership creation and advocacy.</li> <li>Health promotion.</li> <li>Northamptonshire Health Protection Committee to monitor air quality issues.</li> </ul>	<p><b>Evidence based approach</b></p> <p>There is increasing scientific evidence of the health impacts of air pollution, particularly for vulnerable people such as the elderly, the very young and those with certain health conditions, even at pollution levels within the legal limits. Explore new evidence of effective approaches to reduce and mitigate risks.</p> <p><b>Achieved through:</b></p> <ul style="list-style-type: none"> <li>Joint Strategic Needs Assessment (JSNA).</li> <li>Return on Investment (ROI) tools.</li> <li>Evaluation.</li> </ul>	
<b>Our Commitment/Enablers</b>				
<p><b>Reducing inequalities:</b> services which mitigate inequalities and work to overcome variation - by location, approach and policy.</p>	<p><b>System partnerships:</b> engage and co-produce with partners / stake-holders e.g. NHS, schools, prisons, workplaces and local government.</p>	<p><b>Continued investment in advocacy and policy,</b> and programmes to increase active travel and use of green spaces.</p>	<p><b>Engagement and co-production</b> of research aligning with evidence. Evaluation to monitor and assure service delivery and quality.</p>	<p><b>Embed Health in all Policies:</b> a common way of influencing the wider determinants of health: transport policy, economic development policy including industries and agriculture, planning policy, fuel and poverty management and town centre management.</p>
<b>Measures of Success</b>				
<ul style="list-style-type: none"> <li>All areas meet legal air quality limit values.</li> <li>Adoption of sustainability policies and actions among partners.</li> </ul>	<ul style="list-style-type: none"> <li>Improved Infrastructure for cycling / walking.</li> <li>Increased rates of active/sustainable travel.</li> <li>Reductions in traffic congestion.</li> </ul>	<ul style="list-style-type: none"> <li>Improved air quality measures at key sampling sites.</li> <li>Increased awareness in organisations and the public.</li> <li>Reduced respiratory disease in high traffic areas.</li> </ul>		



With the merger of the four authorities in 2021, a review was conducted into the air quality reporting conducted within each area to ascertain the strengths and weakness of the respective authorities' LAQM work, so that best practices could be taken forward with North Northamptonshire. This report produced several recommendations, which are to be taken forward through NNC's LAQM reporting. This report is submitted alongside this ASR.

Funding is being pursued to employ two additional officers on a short-term basis, who's roles would be focussed on air quality.



Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Transport plan to promote walking, cycling and public transport in order to support the modal shift away from the private car.	Policy Guidance and Development Control	Other Policy	2020	2025	North Northamptonshire Council	-	-	-	-	Ongoing	-	Publish a cycle strategy, decrease transport CO <sub>2</sub> emissions	Cycling Strategy has Local Government CO <sub>2</sub> Emissions published on Gov.UK	Source: Corby Borough Council's 'Action on Climate Change' 2020-2025
2	Encourage lower carbon transport alternatives and increase the proportion of low-carbon fuelled vehicles.	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2020	2025	North Northamptonshire Council	-	-	-	-	Ongoing	-	Measure occurrences of charging	2020/21 charging episodes had decreased by 27.5% from 2019/20, which we believe is due to the restrictions imposed by the COVID-19 lockdowns	Source: Corby Borough Council's 'Action on Climate Change' 2020-2025
3	Work with taxi companies and licence holders to consider low carbon vehicles	Promoting Low Emission Transport	Taxi emission incentives	2020	2025	North Northamptonshire Council	-	-	-	-	Ongoing	CO <sub>2</sub> /NO <sub>2</sub>	Number of Electric vehicles	There are now 6 LEVC Hackney Carriages licenced in Corby. There was previously 9 in 2019, we estimate this has been reduced due to lack of business through COVID-19.	Source: Corby Borough Council's 'Action on Climate Change' 2020-2025
4	Promote low carbon fleet and staff vehicles schemes in the business sector	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2020	2025	North Northamptonshire Council	-	-	-	-	Ongoing	CO <sub>2</sub> /NO <sub>2</sub>	Number of Electric/hybrid vehicles	There are now 6 LEVC Hackney Carriages licenced in Corby. There was previously 9 in 2019, we estimate this has been reduced due to lack of business through COVID-19.	Source: Corby Borough Council's 'Action on Climate Change' 2020-2025
5	Measure home energy conservation act requirements as part of statutory Home Energy Conservation Act 1995	Policy Guidance and Development Control	Other Policy	2017	2021	North Northamptonshire Council	-	-	-	-	Ongoing	-	Home energy conservation measures	Report published May 2019 – next report due 2021	Source: Corby Borough Council's HECA Report 2019
6	East Midlands Air Quality Network – Engaged	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2016	2016	Regional local authorities – environmental health, planning, public health and transport colleagues; Public Health England	-	NO	Funded	< £10k	Completed - Ongoing	Reduced emissions from transport; reduced exposure to air pollution	Attendance at regional meetings. Completion of Work Plan - health improvement, source reduction, exposure reduction	Ongoing – meet twice per year and share information in between meeting dates	-
7	Implement East Midlands Air Quality Planning Guidance; link to other local and regional policies	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2018	2018	Regional local authorities – environmental health, planning, public health and transport colleagues; Public Health England	-	NO	Funded	< £10k	Ongoing	Reduced emissions from transport; reduced exposure to air pollution	Guidance embedded in local and regional policy	Document has been approved and published by PHE. Local implementation now required. Ongoing discussions with Planners to see how this will be done	COVID-19 has presented issues to implementation timeframes

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
8	Installing Electric Vehicle Charging Points	Promoting Low Emission Transport	Other	2018	2020	Local Authority Environmental Health	OLEZ	NO	Funded	£10k - 50k	Ongoing	Reduced emissions from transport	Number of EV charging points	OLEV application has been approved. Procurement completed and installation is underway	
9	Environmental Permitting – Risk Rating Inspections	Environmental Permitting	Introduction/increase of environment charges through permit systems and economic instruments	2016	2017	Local Authority Environmental Health	Permitting Annual Fees	NO	Funded	£10k - 50k	Ongoing	Reduced industrial emissions	Inspection frequency dependant on risk – higher risk premises are inspected more frequently. Penalty in risk rating for contributing to local air quality issues	Implementation ongoing	Staff numbers and competence/skills for higher risk installations
10	Enforcement of Environmental Permit Conditions	Environmental Permitting	Other measure through permit systems and economic instruments	2016	2016	Local Authority Environmental Health	Permitting Annual Fees	NO	Funded	£10k - 50k	Ongoing	Reduced Industrial Emissions	Enforcement of conditions of permits as required	Implementation ongoing	Staff numbers and competence/skills for higher risk installations
11	Planning conditions requiring construction/demolition management plans to include dust suppression AND enforce dust/mud controls where no planning condition exists through legislation	Policy Guidance and Development Control	Other Policy	2016	2016	Local Authority Environmental Health and Planning	-	NO	Funded	< £10k	Ongoing	Improved dust mitigation reducing PM <sub>10</sub> , PM <sub>2.5</sub> locally and reducing nuisance complaints	Planning conditions/Interaction with developers in response to complaints or proactive visits	Implementation on-going	Environmental Health is not a statutory consultee so can only recommend conditions
12	Age policy for Taxis	Promoting Low Emission Transport	Taxi licensing conditions	2016	2016	Local Authority Environmental Health	-	NO	Not Funded	< £10k	Completed - Ongoing	Reduced traffic emissions including PM <sub>10</sub> and PM <sub>2.5</sub>	Number of taxis licensed	Ongoing	Waiting for Government Guidance to be issued that will require more stringent emission controls - EURO 5
13	Health and Wellbeing Officer/Sports Development Officer in Post	Alternatives	Promotion of cycling and walking	2016	2016	North Northamptonshire	-	NO	Funded	£10k - 50k	Ongoing	Reduced emissions from transport; reduced exposure to air pollution	Increased physical activity	Healthy Walks Programme - volunteer lead monthly walk. Promotion of physical activity on website. Supporting One-You PHE Campaign	-
14	VOI Scooter Project	Promoting Low Emission Transport	Public Vehicle Procurement Prioritising uptake of low emission vehicles	-	-	VOI technology	VOI technology	No	Funded	-	Implemented	1.84kg PM <sub>2.5</sub>	-	Total number of rides since launch is approximately 70k.	-
15	East Northamptonshire Greenway Project	Promoting Travel Alternatives	Promotion of cycling	-	-	North Northamptonshire Council	-	No	-	-	Implemented	-	-	Begun to develop walking and cycling routes in the Nene Valley	-
16	Northamptonshire Climate Change Strategy	Policy Guidance and Development Control	Low Emissions Strategy	-	-	North Northamptonshire Council	-	No	-	-	Implemented	-	-	North Northamptonshire Council (NCC)	-
17	Climate Task and Finish Group	Policy Guidance and Development Control	Other policy	-	-	North Northamptonshire Council	-	-	-	-	-	-	-	Group set up by NNC to facilitate actions to improve climate change.	-
18	Joint Strategic Needs Assessment (JSNA)	Policy Guidance and Development Control	Other policy	2020	2021	Northamptonshire County Council	County	No	Funded	Unknown	Ongoing	Exposure to pollutants	'Plan on a Page' outcomes	Completed, recommendations to be followed up	Brings together information from many different sources and partners relating to the population of Northamptonshire

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
19	LAQM Audit & Streamlining Air Quality Processes post-merger	Policy Guidance and Development Control	Other policy	2021	2022	North Northamptonshire Council	Internal	No	Funded	<£10k	Implemented	N/a	Implementing audit recommendations	Completed	Facilitating merger of processes
20	Air Quality Officer post	Policy Guidance and Development Control	Other policy	2020	2023	North Northamptonshire Council	AQ Grant	Yes	Funded	£20-40k	Ongoing	N/a	Officers in post	Funding being pursued	Funding being granted and Availability of staff

## 2.3 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.

North Northamptonshire does not currently monitor for concentrations of PM<sub>2.5</sub> or PM<sub>10</sub>. However, the following measures address PM<sub>2.5</sub>:

- Environmental Protection team are consulted and comment on planning applications in respect to potential air quality issues generated by traffic, dust and construction.
- Investigation of nuisance complaints for dust and smoke and encouragement of smokeless fuels.
- As part of the National Carbon Reduction Initiative, Kettering is encouraging the planting to reduce concentrations of PM<sub>2.5</sub> in certain areas.
- In Kettering, planning conditions are imposed on planning consents requiring the submission and approval of construction/demolition management plans where the development is likely to generate dust near to an existing residential area the scheme includes dust and mud control such as damping down road areas, proactively planning mitigation measures in response to weather forecasts and proactively carrying out site inspections regularly to assess if further mitigation is needed in response to local conditions.

For more information regarding smoke control visit:

<https://www.northnorthants.gov.uk/environmental-health/bonfires>

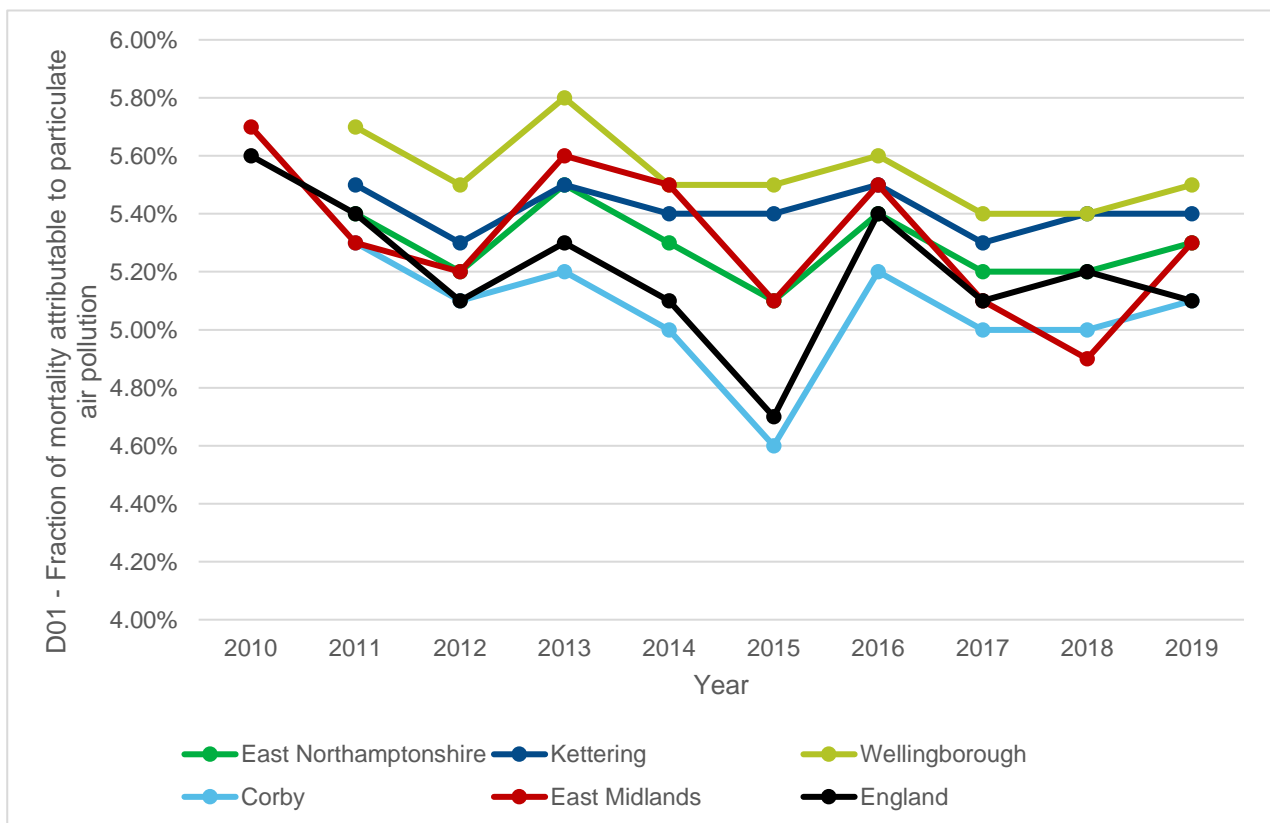
The Public Health Outcomes Framework (PHOF) indicator DO1 – Fraction of mortality attributable to particulate (PM<sub>2.5</sub>) is a useful indicator to determine the impact of PM<sub>2.5</sub> in a region. As North Northamptonshire is a new area in 2021, there is no DO1 indicator data available yet. However, the trend in values for Corby, Kettering, East Northamptonshire and Wellingborough since 2010 are shown in Figure 2.1. Table 1.1 shows that the 2019 values for North Northamptonshire areas are the same or slightly higher than the average DO1 value for England, indicating the fraction of mortality caused by particulate air pollution in North

Northamptonshire is slightly above average. In future years data will be available for North Northamptonshire as a whole.

**Table 2.2 – D01; Fraction of mortality attributable to particulate air pollution (old method) for North Northamptonshire areas, East Midlands and England for 2019**

Year	East Northamptonshire	Kettering	Wellingborough	Corby	East Midlands	England
2019	5.3%	5.4%	5.5%	5.1%	5.3%	5.1%

**Figure 2.2 – D01; Fraction of mortality attributable to particulate air pollution (old method) for North Northamptonshire areas, East Midlands and England between 2010-2019**



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

This section sets out the monitoring undertaken within 2021 by North Northamptonshire 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.

### 3.1 Summary of Monitoring Undertaken

#### 3.1.1 Automatic Monitoring Sites

North Northamptonshire Council did not undertake any automatic (continuous) monitoring in 2021.

#### 3.1.2 Non-Automatic Monitoring Sites

North Northamptonshire Council undertook non-automatic (i.e. passive) monitoring of NO<sub>2</sub> at 100 sites during 2021. Table A. 1 in Appendix A presents the details of the non-automatic sites.

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

### 3.2 Individual Pollutants

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

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

Table A. 2 in Appendix A compares 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 annualisation, 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.

During the monitoring period of 2021, no sites recorded annual concentrations above the objective value of  $40 \mu\text{g}/\text{m}^3$ . As no sites have monitored concentrations greater than  $60 \mu\text{g}/\text{m}^3$ , it is considered unlikely that the 1-hour mean objective was exceeded at any sites within North Northamptonshire.

The highest recorded  $\text{NO}_2$  concentration in 2021 was  $33.4 \mu\text{g}/\text{m}^3$ , which occurred at Site RW4 in Rothwell. The overall trend between 2017 and 2021 is a decreasing one. However, between 2020 and 2021 the trend changes, with some decreases but also some small increases. On average, recorded  $\text{NO}_2$  concentrations increased by  $1.4 \mu\text{g}/\text{m}^3$  between 2020 and 2021, with a maximum increase of  $6.2 \mu\text{g}/\text{m}^3$  and a maximum decrease of  $9.3 \mu\text{g}/\text{m}^3$ . As previously mentioned, this is likely due to the recovery of vehicular traffic numbers post COVID-19 lockdowns.

### **3.2.2 Particulate Matter ( $\text{PM}_{10}$ )**

No  $\text{PM}_{10}$  monitoring was carried out in North Northamptonshire during 2021.

### **3.2.3 Particulate Matter ( $\text{PM}_{2.5}$ )**

No  $\text{PM}_{2.5}$  monitoring was carried out in North Northamptonshire during 2021.

### **3.2.4 Sulphur Dioxide ( $\text{SO}_2$ )**

No  $\text{SO}_2$  monitoring was carried out in North Northamptonshire during 2021.

## Appendix A: Monitoring Results

Table A. 1 - 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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
C1	Elizabeth Street	Roadside	488424	288706	NO <sub>2</sub>	No	22.0	1.0	No	3.4
C2	Occupation Road	Roadside	488354	289329	NO <sub>2</sub>	No	0.0	11.0	No	3.1
C3	High Street, Old Village	Roadside	489380	288833	NO <sub>2</sub>	No	0.0	6.0	No	3.6
C4	South Rd	Roadside	489399	288605	NO <sub>2</sub>	No	7.0	1.0	No	2.0
C5	Weldon Road	Roadside	489997	288821	NO <sub>2</sub>	No	0.0	15.0	No	3.1
C6	Little Stanion/A43/A6116 Roundabout	Roadside	490981	287322	NO <sub>2</sub>	No	180.0	3.0	No	3.3
C7	Priors Hall/A43 Roundabout	Roadside	492992	289919	NO <sub>2</sub>	No	168.0	1.0	No	3.3
C8	Kirby Road, Gretton	Urban Background	490063	294032	NO <sub>2</sub>	No	0.0	15.0	No	3.5
C9	Berryfield Road, Cottingham	Urban Background	484133	290194	NO <sub>2</sub>	No	0.0	13.0	No	3.4
C10	Danesholme Road/A6003	Urban Background	485788	287272	NO <sub>2</sub>	No	89.0	5.6	No	3.3
C11	Oldland Road	Roadside	487675	287373	NO <sub>2</sub>	No	68.0	2.3	No	3.4
C12	Beanfield Avenue	Roadside	487039	288292	NO <sub>2</sub>	No	5.0	2.0	No	3.4
C13	Lakeside Health Centre	Roadside	487546	288816	NO <sub>2</sub>	No	317.0	1.5	No	3.4
C14	George Street	Roadside	488135	288494	NO <sub>2</sub>	No	84.0	1.0	No	3.2
C15	Constable Road	Roadside	488180	288325	NO <sub>2</sub>	No	9.0	7.0	No	-
C16	Shannon Court	Roadside	488122	287817	NO <sub>2</sub>	No	0.0	10.0	No	3.4
C17	Gainsborough Rd	Roadside	488387	288122	NO <sub>2</sub>	No	12.0	1.0	No	3.2
KT10	Newlands Street	Roadside	486783	278948	NO <sub>2</sub>	No	2.7	2.7	No	2.4
KT11	London Road/Bowling Green Road	Roadside	486887	278246	NO <sub>2</sub>	No	2.6	2.3	No	2.4
KT12	Victoria Street	Roadside	486974	278895	NO <sub>2</sub>	No	1.5	1.7	No	2.7
KT13	London Road cemetery	Urban background	486956	278338	NO <sub>2</sub>	No	2.0	69.9	No	2.5
KT14	Eden Street/Eskdail St	Roadside	486925	279028	NO <sub>2</sub>	No	1.6	1.9	No	2.4



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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
KT15	Montagu St o/s Pauls	Roadside	486951	278904	NO <sub>2</sub>	No	0.5	3.1	No	2.3
KT16	Montagu Street o/sBostons Diner	Roadside	486869	278877	NO <sub>2</sub>	No	0.4	1.3	No	2.3
KT18	Stamford Road o/s J. Witness	Roadside	487049	278942	NO <sub>2</sub>	No	2.6	3.2	No	2.4
KT20	Bowling Green Road o/s no 9	Roadside	486793	278254	NO <sub>2</sub>	No	1.3	10.7	No	2.4
KT21	London Road/Southlands	Roadside	486954	278099	NO <sub>2</sub>	No	0.5	3.9	No	2.4
KT22	Woodcroft Way by flats	Roadside	487406	277653	NO <sub>2</sub>	No	2.0	5.7	No	2.1
KT23	Bowling Green Road o/s Council offices	Roadside	486787	278276	NO <sub>2</sub>	No	0.6	7.3	No	2.4
KT24	Sheep Street o/s HSS Hire shop	Roadside	486648	278233	NO <sub>2</sub>	No	3.4	6.4	No	2.4
KT25	o/s 47 Bowling Green Road	Roadside	486718	278236	NO <sub>2</sub>	No	1.7	3.7	No	2.4
KT26	112 London Road	Roadside	487146	277860	NO <sub>2</sub>	No	2.8	4.1	No	2.4
KT28	London Rd/St Mary's Road Junction	Roadside	486929	278204	NO <sub>2</sub>	No	1.4	18.4	No	2.4
KT29	opp 1 St Mary's Road	Roadside	486972	278223	NO <sub>2</sub>	No	1.0	5.9	No	2.3
KT31	London Rd o/s pocket park	Roadside	486910	278240	NO <sub>2</sub>	No	2.9	42.3	No	2.4
KT32	London Rd o/s cemetery	Roadside	486890	278322	NO <sub>2</sub>	No	2.0	14.1	No	2.4
KT33	o/s 15 London Road	Roadside	486846	278497	NO <sub>2</sub>	No	0.4	6.1	No	2.4
KT34	Horsemarket Bus Stop	Roadside	486786	278599	NO <sub>2</sub>	No	0.8	19.5	No	2.3
KT35	Silver Street opp Café Culture	Roadside	486778	278779	NO <sub>2</sub>	No	0.8	4.0	No	2.3
KT36	O/S Simpson & Partners	Roadside	486799	278850	NO <sub>2</sub>	No	2.0	5.6	No	2.4
KT38	O/S 157 St Marys Rd	Roadside	487718	278679	NO <sub>2</sub>	No	1.5	6.2	No	2.2
KT39	O/S 144 Windmill Ave	Roadside	487751	278505	NO <sub>2</sub>	No	2.3	19.5	No	2.3
KT40	O/S 141 Windmill Ave	Roadside	487725	278388	NO <sub>2</sub>	No	0.8	11.3	No	2.2
KT41	Windmill Ave Junc Barton Rd	Roadside	487893	277471	NO <sub>2</sub>	No	1.7	18.4	No	2.1
KT43	Lower St/junc Northfield Ave	Roadside	486153	278930	NO <sub>2</sub>	No	3.2	8.0	No	2.4

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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
KT44	O/S St Edwards Church London Rd	Roadside	486894	278216	NO <sub>2</sub>	No	2.3	5.0	No	2.5
KT45	Pytchley Road o/s No 6	Roadside	487563	277433	NO <sub>2</sub>	No	3.0	24.0	No	2.5
KT46	Northfield Av opp Carpet Right	Roadside	486161	279067	NO <sub>2</sub>	No	1.2	7.1	No	2.6
KT47	Northampton Road/Drill Hall Court flats	Roadside	486398	278274	NO <sub>2</sub>	No	4.0	1.3	No	2.5
KT48	Hawthorn Road o/s School	Roadside	486871	277840	NO <sub>2</sub>	No	2.4	3.0	No	2.3
BL1	Higham Rd junc Finedon Rd	Roadside	490048	274399	NO <sub>2</sub>	No	5.4	2.0	No	2.4
RW1	Opposite Old Bank	Roadside	481465	281208	NO <sub>2</sub>	No	1.6	2.1	No	2.3
RW2	Post Office High St	Roadside	481550	281233	NO <sub>2</sub>	No	1.8	1.8	No	2.4
RW3	O/S Wheelwright House Squires Hill	Roadside	481498	281096	NO <sub>2</sub>	No	2.8	1.5	No	2.3
RW4	O/S ST Flooring	Façade	481481	281149	NO <sub>2</sub>	No	2.1	0.3	No	2.4
RW5	O/S Something Special Bridge St	Roadside	481515	281217	NO <sub>2</sub>	No	0.5	2.5	No	2.3
ENC 1	Oakleas Rise (no.37)	Urban Background	499867	278066	NO <sub>2</sub>	No	1.0	1.5	No	3.0
ENC 2	Traffic light on bridge, Bridge St (no.34)	Roadside	499161	278629	NO <sub>2</sub>	No	3.0	1.7	No	2.5
ENC 3	Huntingdon Rd	Roadside	500208	278510	NO <sub>2</sub>	No	18.0	3.0	No	2.8
ENC 4	Market Rd, corner of Grove Road (no.32)	Roadside	499573	278515	NO <sub>2</sub>	No	1.0	1.5	No	2.7
ENC 5	Junction Way (no.36)	Urban Background	499792	277873	NO <sub>2</sub>	No	N/A	1.6	No	2.5
ENC 6	Brick Kiln Road	Roadside	499119	273561	NO <sub>2</sub>	No	14.0	2.0	No	2.3
ENC 7	Wheelwright Close (no. 8)	Urban Background	500193	273219	NO <sub>2</sub>	No	5.0	1.0	No	2.9
ENC 8	London Road adj to 60 Titty Ho	Roadside	499103	272329	NO <sub>2</sub>	No	2.0	2.4	No	2.5
ENC 9	High Street	Roadside	494525	270591	NO <sub>2</sub>	No	5.0	1.6	No	2.5
ENC 10	Kestrel Close (opp no.23)	Urban Background	496068	269885	NO <sub>2</sub>	No	5.0	37.0	No	2.6
ENC 11	Elizabeth Way (no.34)	Roadside	496320	269420	NO <sub>2</sub>	No	8.0	1.6	No	3.0
ENC 12	High St	Roadside	495920	268317	NO <sub>2</sub>	No	6.0	1.3	No	2.9
ENC 13	High St outside 18/20	Kerbside	495962	268388	NO <sub>2</sub>	No	6.0	0.9	No	2.7

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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
ENC 14	Higham Rd (no.16)/Washbrook Rd junction	Roadside	495587	267402	NO <sub>2</sub>	No	7.0	1.9	No	2.5
ENC 15	Beaconsfield Terrace	Roadside	495711	267120	NO <sub>2</sub>	No	3.0	1.6	No	2.6
ENC 16	Newton Road (no.42)	Roadside	496039	266643	NO <sub>2</sub>	No	7.0	1.8	No	2.4
ENC 17	Newton Road (no.18)	Roadside	495924	266621	NO <sub>2</sub>	No	1.0	1.5	No	2.7
ENC 18	Park Place (nr entrance)	Roadside	495883	266560	NO <sub>2</sub>	No	3.0	1.5	No	2.9
ENC 19	Newton Rd	Roadside	495849	266613	NO <sub>2</sub>	No	2.0	1.3	No	2.9
ENC 20	Newton Rd, over A6 (Outside Lodge Farm)	Roadside	497127	266143	NO <sub>2</sub>	No	13.0	2.3	No	2.4
ENC 21	A6/Spire Way Roundabout	Roadside	496682	267872	NO <sub>2</sub>	No	N/A	3.3	No	2.2
ENC 22	Hayden Road	Urban Background	496772	266967	NO <sub>2</sub>	No	10.0	1.6	No	2.6
ENC 23	Farnham Drive (no.64)	Roadside	494895	265669	NO <sub>2</sub>	No	12.0	2.1	No	2.8
ENC 24	Washbrook Road crossroads (217 Wellingborough Road)	Roadside	494963	266988	NO <sub>2</sub>	No	3.0	1.7	No	2.5
ENC 25	Washbrook Road crossroads (218 Wellingobrough Rd)	Roadside	494936	267014	NO <sub>2</sub>	No	5.0	1.6	No	2.6
ENC 26	Ditchford Road	Roadside	493108	267347	NO <sub>2</sub>	No	N/A	1.5	No	2.2
ENC 27	Wentworth Drive (opp no.19)	Roadside	503209	289307	NO <sub>2</sub>	No	10.0	1.5	No	2.6
ENC 28	North St (no.58)	Roadside	504272	288433	NO <sub>2</sub>	No	3.0	1.8	No	2.8
ENC 29	St Osyths Lane	Roadside	504222	288110	NO <sub>2</sub>	No	1.3	1.1	No	2.8
ENC 30	5 Laamas Cottages	Roadside	497862	289284	NO <sub>2</sub>	No	7.0	1.3	No	2.8
ENC 31	Top Road	Roadside	501961	290525	NO <sub>2</sub>	No	15.0	1.5	No	2.1
ENC 32	Woodfield, Collyweston	Urban Background	499960	302429	NO <sub>2</sub>	No	6.0	1.9	No	2.4
ENC 33	Outside Stables 123 Northampton Road	Roadside	494755	267911	NO <sub>2</sub>	No	7.0	0.8	No	2.7
W1	Silver Street	Urban Centre	489131	267820	NO <sub>2</sub>	No	0.0	2.9	No	2.9
W2	Alma Street	Kerbside	489382	266144	NO <sub>2</sub>	No	0.3	1.7	No	2.5
W3	Northampton Road	Roadside	487831	267169	NO <sub>2</sub>	No	2.4	3.8	No	2.6
W4	Finedon Road	Kerbside	489868	268204	NO <sub>2</sub>	No	2.3	1.5	No	2.4
W5	Butlin Court	Roadside	49033	266433	NO <sub>2</sub>	No	0.5	1.5	No	2.6

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) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube Co-located with a Continuous Analyser?	Tube Height (m)
W6	Mill Road	Urban Background	490002	268946	NO <sub>2</sub>	No	0.0	3.1	No	2.6
W7	Ultra Close	Roadside	490351	267400	NO <sub>2</sub>	No	4.5	2.8	No	2.9
W8	Kettering Road	Roadside	488431	274049	NO <sub>2</sub>	No	0.0	3.4	No	2.5
W9	Market Street	Urban Background	489226	267829	NO <sub>2</sub>	No	N/A	3.4	No	2.9
W10	Irthlingborough Road	Roadside	429372	271928	NO <sub>2</sub>	No	2.3	1.5	No	2.4
W11	Broad Green	Roadside	488788	268215	NO <sub>2</sub>	No	-	2.3	No	2.7

**Notes:**

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

(2) N/A if not applicable.

Table A. 2 - Annual Mean 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
C1	488424	288706	Roadside	91.7	91.7	26.4	33.8	21.6	17.6	16.8
C2	488354	289329	Roadside	91.7	91.7	15	18.3	15.5	13.1	12.3
C3	489380	288833	Roadside	91.7	91.7	19.5	20.6	20.2	16.4	16.9
C4	489399	288605	Roadside	91.7	91.7	22.3	25.9	24.6	24.3	15.1
C5	489997	288821	Roadside	91.7	91.7	24.5	26.2	24.3	20.3	19.8
C6	490981	287322	Roadside	91.7	91.7	-	-	20.9	17.6	17.8
C7	492992	289919	Roadside	91.7	91.7	-	-	17.9	16.1	16.7
C8	490063	294032	Urban Background	91.7	91.7	11.6	12.6	14.5	9.8	9.4
C9	484133	290194	Urban Background	91.7	91.7	9.5	9.6	9.3	6.7	6.6
C10	485788	287272	Urban Background	91.7	91.7	-	-	18.4	19.2	15.8
C11	487675	287373	Roadside	91.7	91.7	-	-	25.5	21.9	26.9
C12	487039	288292	Roadside	91.7	91.7	-	-	17.2	14.3	14.7
C13	487546	288816	Roadside	91.7	91.7	-	-	18.6	16.7	16.4
C14	488135	288494	Roadside	91.7	91.7	25.8	31.9	28.7	22	24.4
C15	488180	288325	Roadside	91.7	91.7	15.2	17.8	15.3	22.1	23.9
C16	488122	287817	Roadside	91.7	91.7	15	20	17.5	14.1	14.2
C17	488387	288122	Roadside	91.7	91.7	22.6	22.6	20.9	16	16.4
KT10	486783	278948	Roadside	92.3	92.3	26.5	28.1	24.4	18	20.4
KT11	486887	278246	Roadside	100.0	100.0	<b>40.2</b>	38.3	37.3	26.9	30.9
KT12	486974	278895	Roadside	100.0	100.0	31.2	26.6	27.3	19.9	23.3
KT13	486956	278338	Urban background	100.0	100.0	18.4	15.6	15.2	11.4	13.2
KT14	486925	279028	Roadside	75.0	75.0	-	21.8	26.1	20.7	22.8
KT15	486951	278904	Roadside	100.0	100.0	-	28	30	22.1	24.8
KT16	486869	278877	Roadside	100.0	100.0	-	29.4	30	23.4	26.6
KT18	487049	278942	Roadside	100.0	100.0	-	27.3	29.6	22	25.3
KT20	486793	278254	Roadside	100.0	100.0	-	38	35	26.4	29.8
KT21	486954	278099	Roadside	100.0	100.0	-	35.8	32.9	23.9	28.6
KT22	487406	277653	Roadside	100.0	100.0	-	22.7	22	15.3	17.9
KT23	486787	278276	Roadside	100.0	100.0	-	-	34.1	23.9	30.1
KT24	486648	278233	Roadside	82.7	82.7	-	-	25.3	18.8	22.2
KT25	486718	278236	Roadside	100.0	100.0	-	-	29.9	21.9	25.6
KT26	487146	277860	Roadside	100.0	100.0	-	-	26.3	20	22.9
KT28	486929	278204	Roadside	100.0	100.0	-	-	30.4	20.7	24.6
KT29	486972	278223	Roadside	100.0	100.0	-	-	25.7	18.6	22.9

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
KT31	486910	278240	Roadside	92.3	92.3	-	-	28.3	22.5	24.6
KT32	486890	278322	Roadside	92.3	92.3	-	-	29.1	22.6	25.9
KT33	486846	278497	Roadside	92.3	92.3	-	-	25.1	18.9	22.3
KT34	486786	278599	Roadside	100.0	100.0	-	-	28.8	18.9	22.7
KT35	486778	278779	Roadside	100.0	100.0	-	-	30.2	22.2	25.0
KT36	486799	278850	Roadside	100.0	100.0	-	-	28.6	21.3	23.4
KT38	487718	278679	Roadside	100.0	100.0	-	-	28.5	18.9	22.6
KT39	487751	278505	Roadside	100.0	100.0	-	-	24.6	17.9	19.3
KT40	487725	278388	Roadside	100.0	100.0	-	-	25.8	17.7	21.7
KT41	487893	277471	Roadside	42.3	42.3	-	-	39.5	25.4	20.5
KT43	486153	278930	Roadside	75.0	75.0	-	-	-	23.3	23.9
KT44	486894	278216	Roadside	100.0	100.0	-	-	-	24.3	23.6
KT45	487563	277433	Roadside	100.0	100.0	-	-	-	22.9	21.1
KT46	486161	279067	Roadside	100.0	100.0	-	-	-	24.7	23.2
KT47	486398	278274	Roadside	75.0	75.0	-	-	-	26.5	26.8
KT48	486871	277840	Roadside	100.0	100.0	-	-	-	16.5	14.6
BL1	490048	274399	Roadside	100.0	100.0	-	-	-	16.3	15.4
RW1	481465	281208	Roadside	100.0	100.0	38.5	34.8	32.6	21.7	26.1
RW2	481550	281233	Roadside	100.0	100.0	26.9	29.9	28.5	21.3	25.8
RW3	481498	281096	Roadside	100.0	100.0	-	-	28.2	18.4	21.5
RW4	481481	281149	Roadside	100.0	100.0	-	-	<b>42</b>	28.8	33.4
RW5	481515	281217	Roadside	100.0	100.0	-	-	29.9	19.8	22.3
ENC 1	499867	278066	Urban Background	100.0	100.0	19.7	17.5	16.3	12.3	12.9
ENC 2	499161	278629	Roadside	100.0	100.0	22.6	22.2	20.8	14.5	14.9
ENC 3	500208	278510	Roadside	100.0	100.0	24.1	20.8	21.8	16.0	18.4
ENC 4	499573	278515	Roadside	100.0	100.0	19.4	17.1	16.9	11.4	12.0
ENC 5	499792	277873	Urban Background	100.0	100.0	-	19.7	20.2	14.0	15.0
ENC 6	499119	273561	Roadside	100.0	100.0	28.8	29.8	29.8	19.2	23.7
ENC 7	500193	273219	Urban Background	100.0	100.0	15.8	13.5	13.2	12.1	9.8
ENC 8	499103	272329	Roadside	100.0	100.0	-	16.8	16.0	12.1	13.5
ENC 9	494525	270591	Roadside	100.0	100.0	22.4	20.3	20.1	14.9	15.8
ENC 10	496068	269885	Urban Background	100.0	100.0	21.7	21.4	19.9	14.3	15.6
ENC 11	496320	269420	Roadside	100.0	100.0	19.7	18.3	18.1	13.0	13.6
ENC 12	495920	268317	Roadside	100.0	100.0	35.7	32.8	32.1	24.4	25.3
ENC 13	495962	268388	Kerbside	100.0	100.0	-	36.4	36.3	26.4	26.6
ENC 14	495587	267402	Roadside	100.0	100.0	32.2	33.3	32.3	23.7	25.6

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
ENC 15	495711	267120	Roadside	90.4	90.4	28.2	28.0	26.1	20.9	23.6
ENC 16	496039	266643	Roadside	100.0	100.0	25.3	22.1	20.6	15.1	16.1
ENC 17	495924	266621	Roadside	90.4	90.4	37.1	33.4	32.6	26.0	28.0
ENC 18	495883	266560	Roadside	100.0	100.0	19.7	16.6	17.9	11.9	12.9
ENC 19	495849	266613	Roadside	100.0	100.0	33.9	33.2	29.9	24.1	25.7
ENC 20	497127	266143	Roadside	100.0	100.0	17.4	15.7	16.1	11.5	11.0
ENC 21	496682	267872	Roadside	90.4	90.4	-	23.2	21.4	16.3	18.0
ENC 22	496772	266967	Urban Background	100.0	100.0	-	16.6	16.6	12.0	12.4
ENC 23	494895	265669	Roadside	100.0	100.0	17.1	15.5	14.8	9.8	11.0
ENC 24	494963	266988	Roadside	100.0	100.0	-	36.8	36.8	26.9	29.7
ENC 25	494936	267014	Roadside	100.0	100.0	36.3	34.6	32.3	24.4	27.1
ENC 26	493108	267347	Roadside	100.0	100.0	-	24.0	21.0	15.6	17.3
ENC 27	503209	289307	Roadside	100.0	100.0	14.0	11.2	10.9	7.6	7.7
ENC 28	504272	288433	Roadside	100.0	100.0	23.5	21.4	19.5	13.5	15.0
ENC 29	504222	288110	Roadside	100.0	100.0	-	21.2	17.3	12.2	12.6
ENC 30	497862	289284	Roadside	100.0	100.0	-	13.3	11.8	9.1	9.5
ENC 31	501961	290525	Roadside	100.0	100.0	-	9.9	10.0	6.9	7.1
ENC 32	499960	302429	Urban Background	100.0	100.0	14.4	11.5	10.7	8.2	8.2
ENC 33	494755	267911	Roadside	92.3	92.3	-	-	20.1	15.9	19.0
W1	489131	267820	Urban Centre	92.3	92.3	<b>41.4</b>	35.8	42.3	30.2	32.2
W2	489382	266144	Kerbside	92.3	92.3	29.3	22.7	28.6	20.5	22.9
W3	487831	267169	Roadside	92.3	92.3	28.4	22.8	25.8	18.8	20.5
W4	489868	268204	Kerbside	92.3	92.3	24.8	18.9	25.2	16.1	16.0
W5	49033	266433	Roadside	92.3	92.3	24.4	20.2	21.4	15.9	16.5
W6	490002	268946	Urban Background	92.3	92.3	19.9	15.7	18.7	13.8	14.0
W7	490351	267400	Roadside	92.3	92.3	30.0	25.1	27.8	20.6	22.0
W8	488431	274049	Roadside	92.3	92.3	25.9	21.6	24.2	17.0	17.0
W9	489226	267829	Urban Background	92.3	92.3	24.9	21.0	23.3	15.8	17.0
W10	429372	271928	Roadside	92.3	92.3	31.2	25.6	31.6	21.1	24.0
W11	488788	268215	Roadside	92.3	92.3	30.8	24.3	29.8	21.4	24.3

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  $\mu\text{g}/\text{m}^3$ .

Exceedances of the  $\text{NO}_2$  annual mean objective of  $40\mu\text{g}/\text{m}^3$  are shown in **bold**.

$\text{NO}_2$  annual means exceeding  $60\mu\text{g}/\text{m}^3$ , indicating a potential exceedance of the  $\text{NO}_2$  1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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



Figure A. 1 – Trends in Annual Mean NO<sub>2</sub> Concentrations in Corby (1)

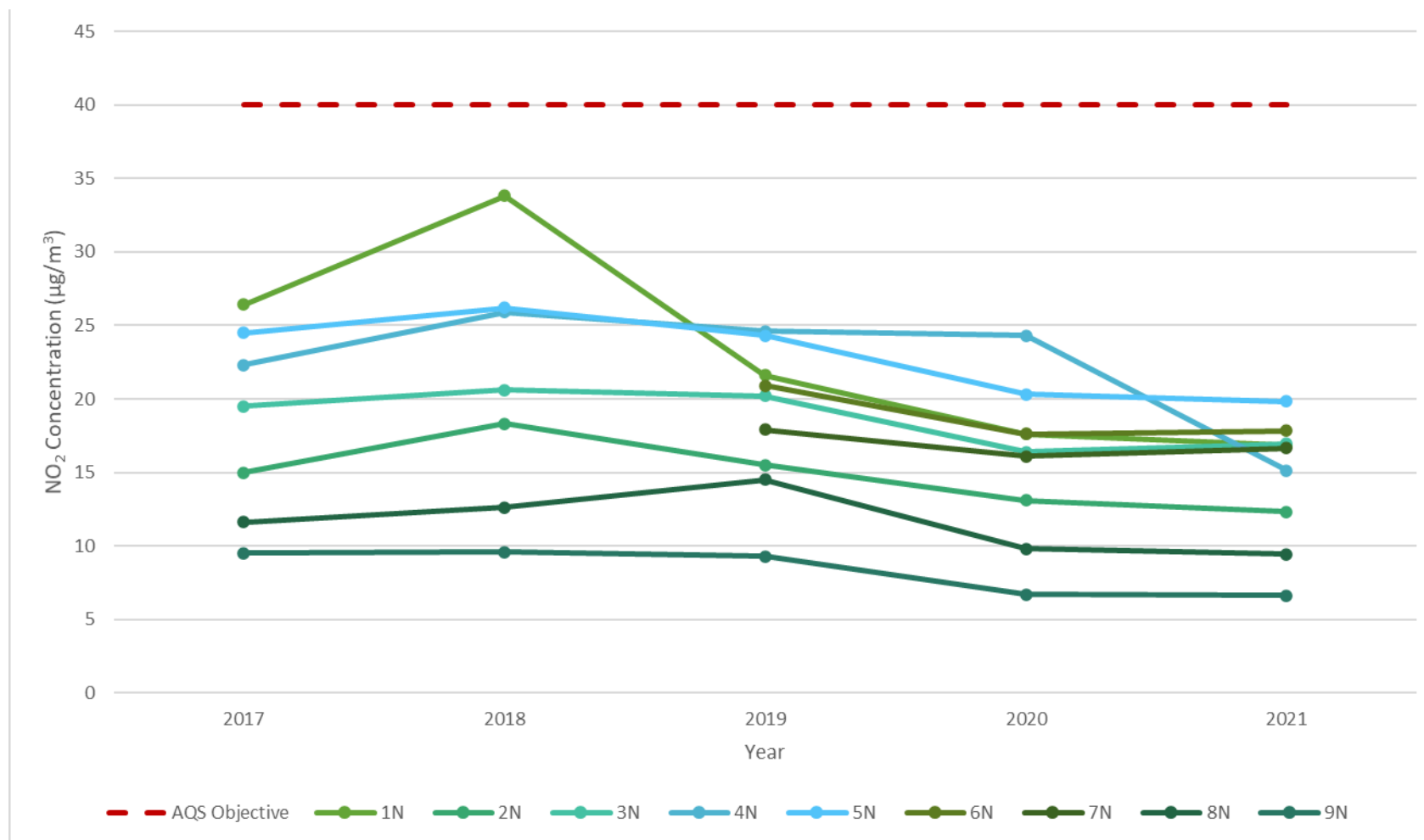


Figure A. 2 – Trends in Annual Mean NO<sub>2</sub> Concentrations in Corby (2)

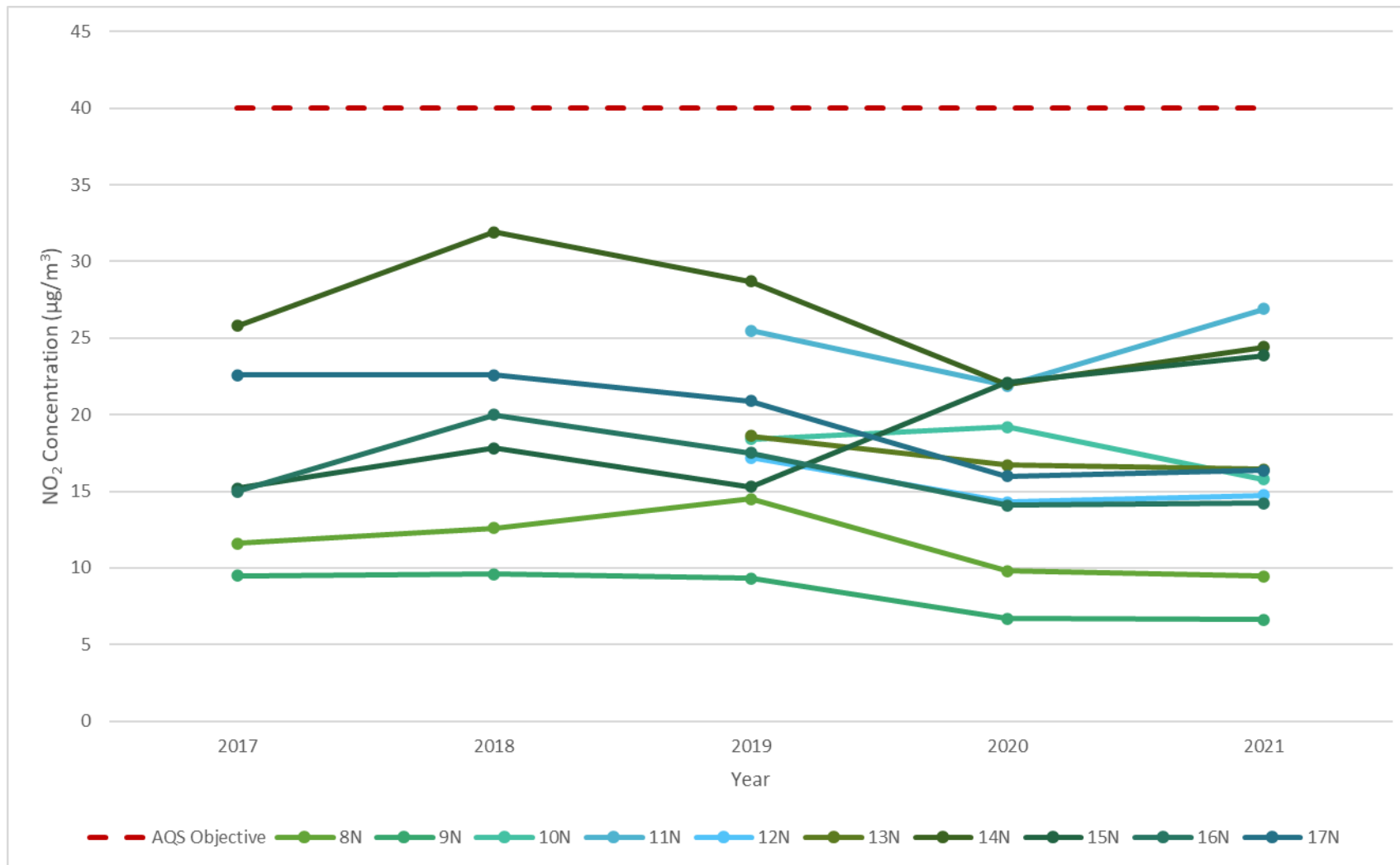


Figure A. 3 – Trends in Annual Mean NO<sub>2</sub> Concentrations in Kettering (1)

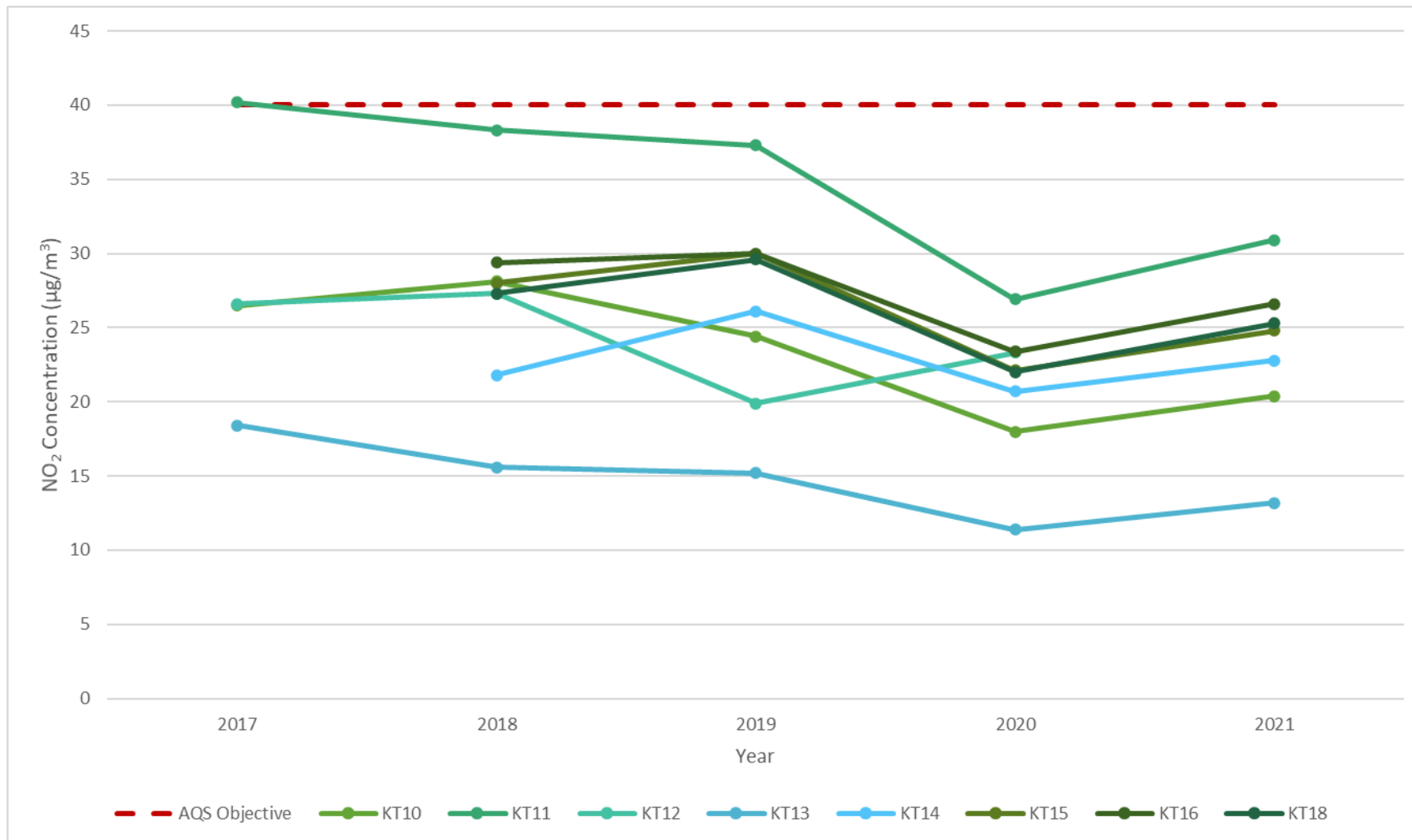


Figure A. 4 – Trends in Annual Mean NO<sub>2</sub> Concentrations in Kettering (2)



Figure A. 5 – Trends in Annual Mean NO<sub>2</sub> Concentrations in Kettering (3)

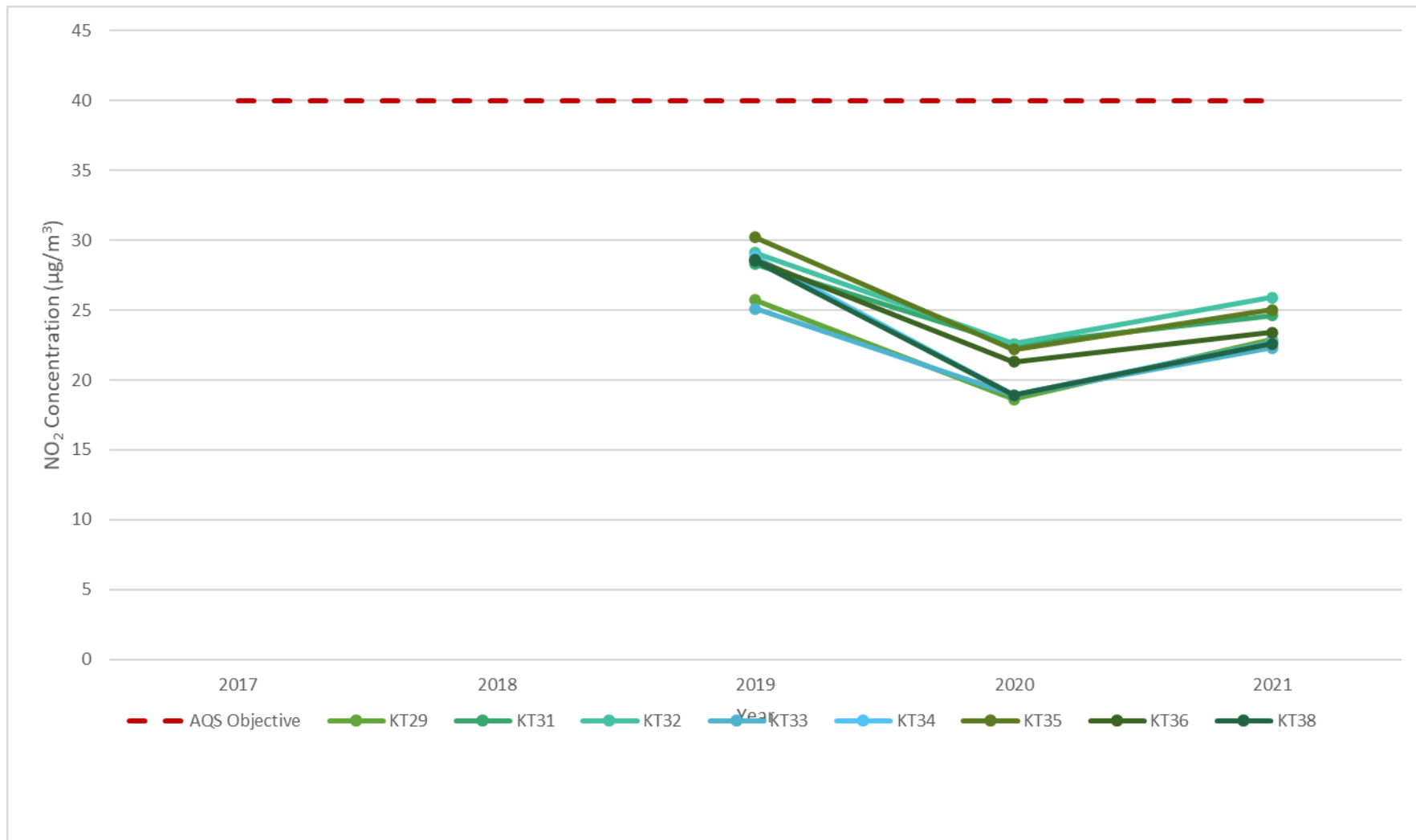


Figure A. 6 – Trends in Annual Mean NO<sub>2</sub> Concentrations in Kettering (4)

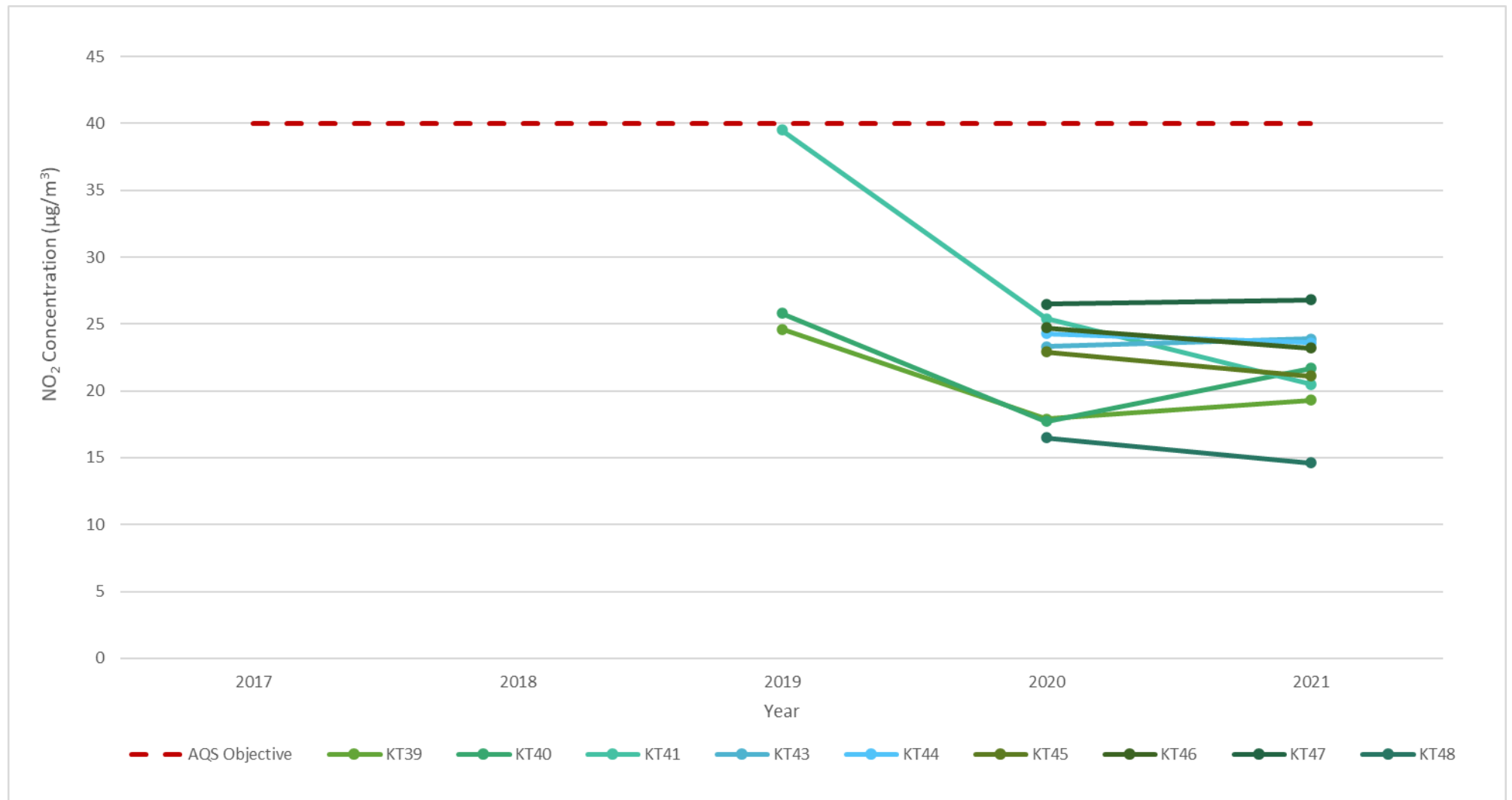


Figure A. 7 – Trends in Annual Mean NO<sub>2</sub> Concentrations in Burton Latimer and Rothwell

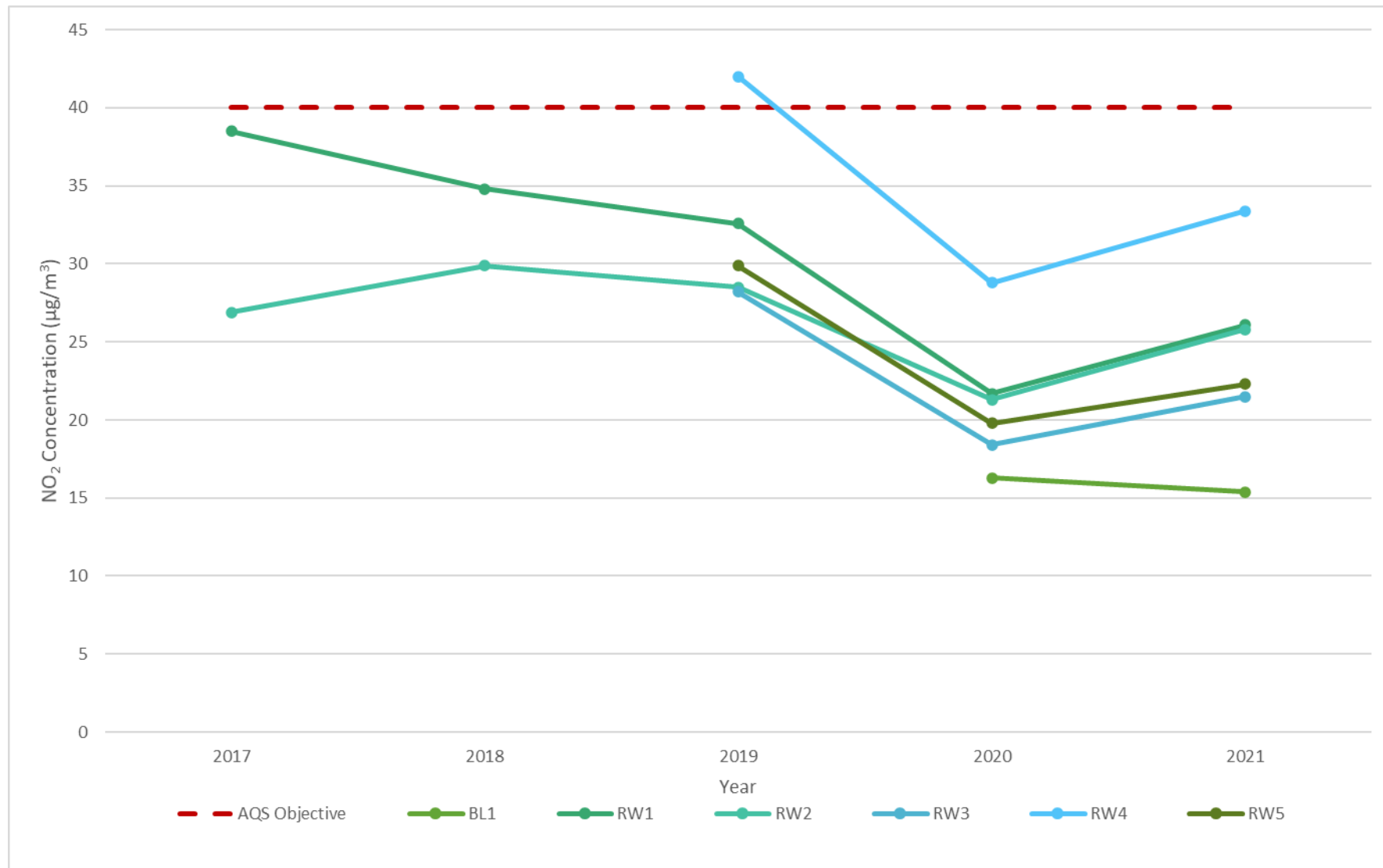


Figure A. 8 – Trends in Annual Mean NO<sub>2</sub> Concentrations in East Northamptonshire (1)

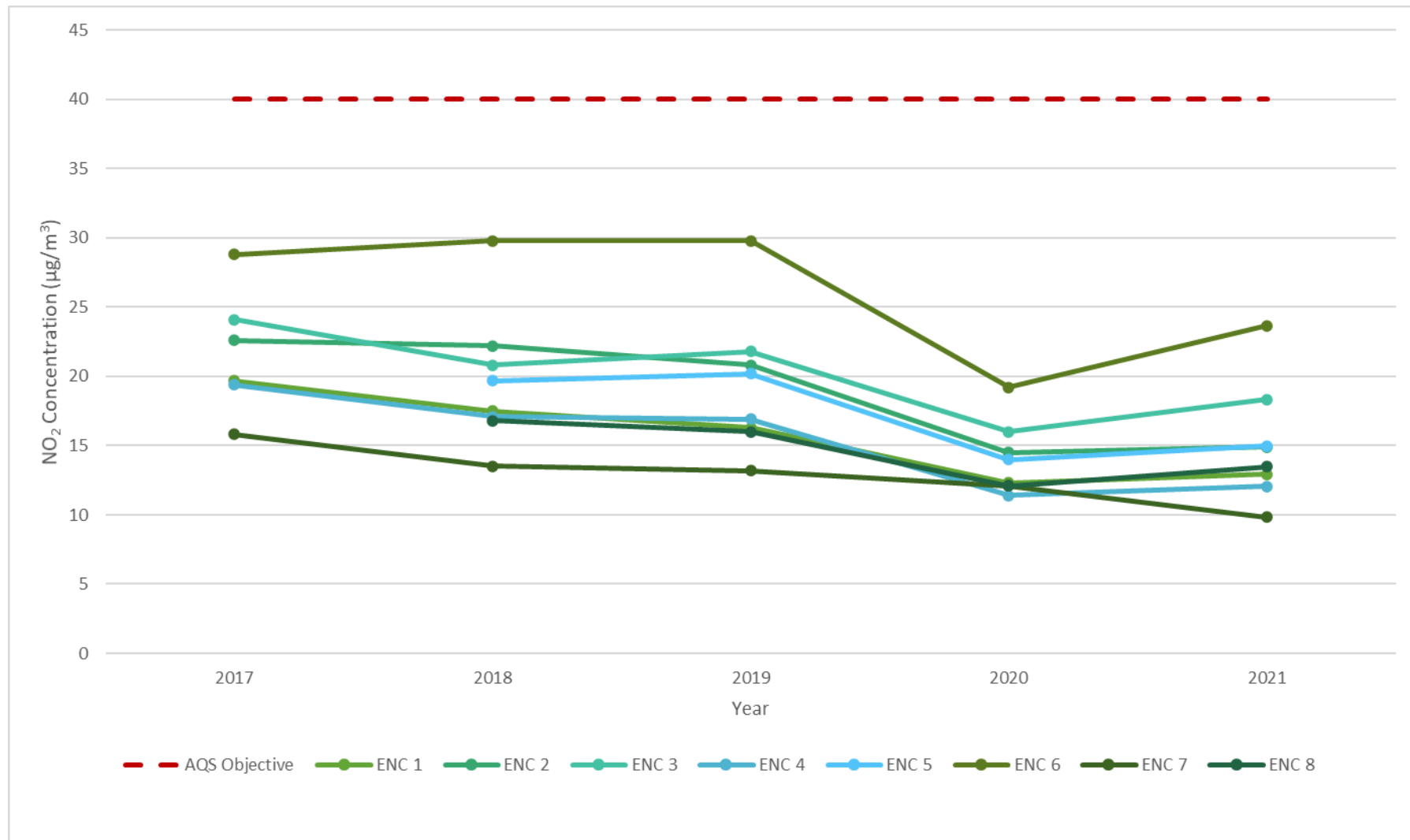




Figure A. 9 – Trends in Annual Mean NO<sub>2</sub> Concentrations in East Northamptonshire (2)

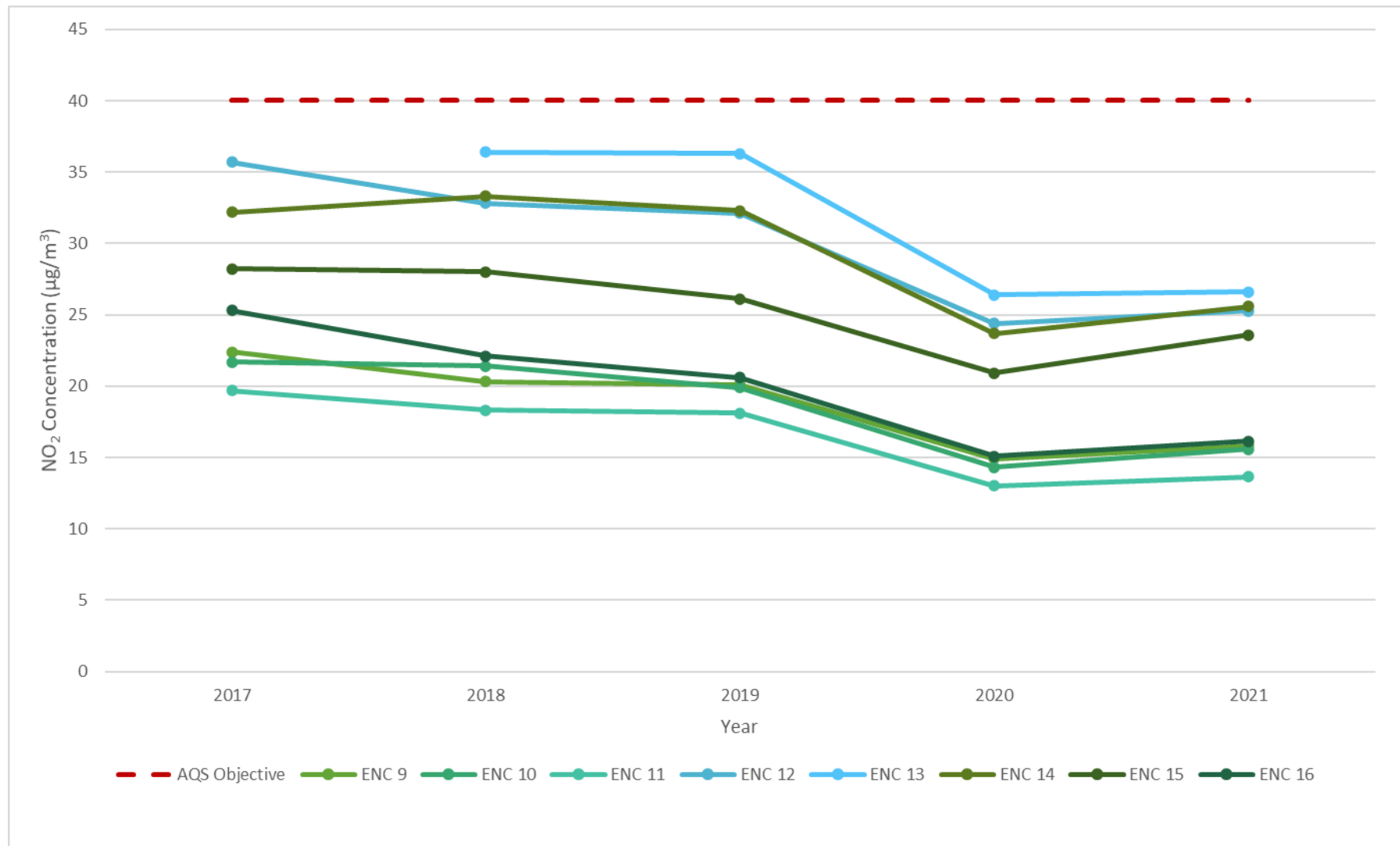


Figure A. 10 – Trends in Annual Mean NO<sub>2</sub> Concentrations in East Northamptonshire (3)

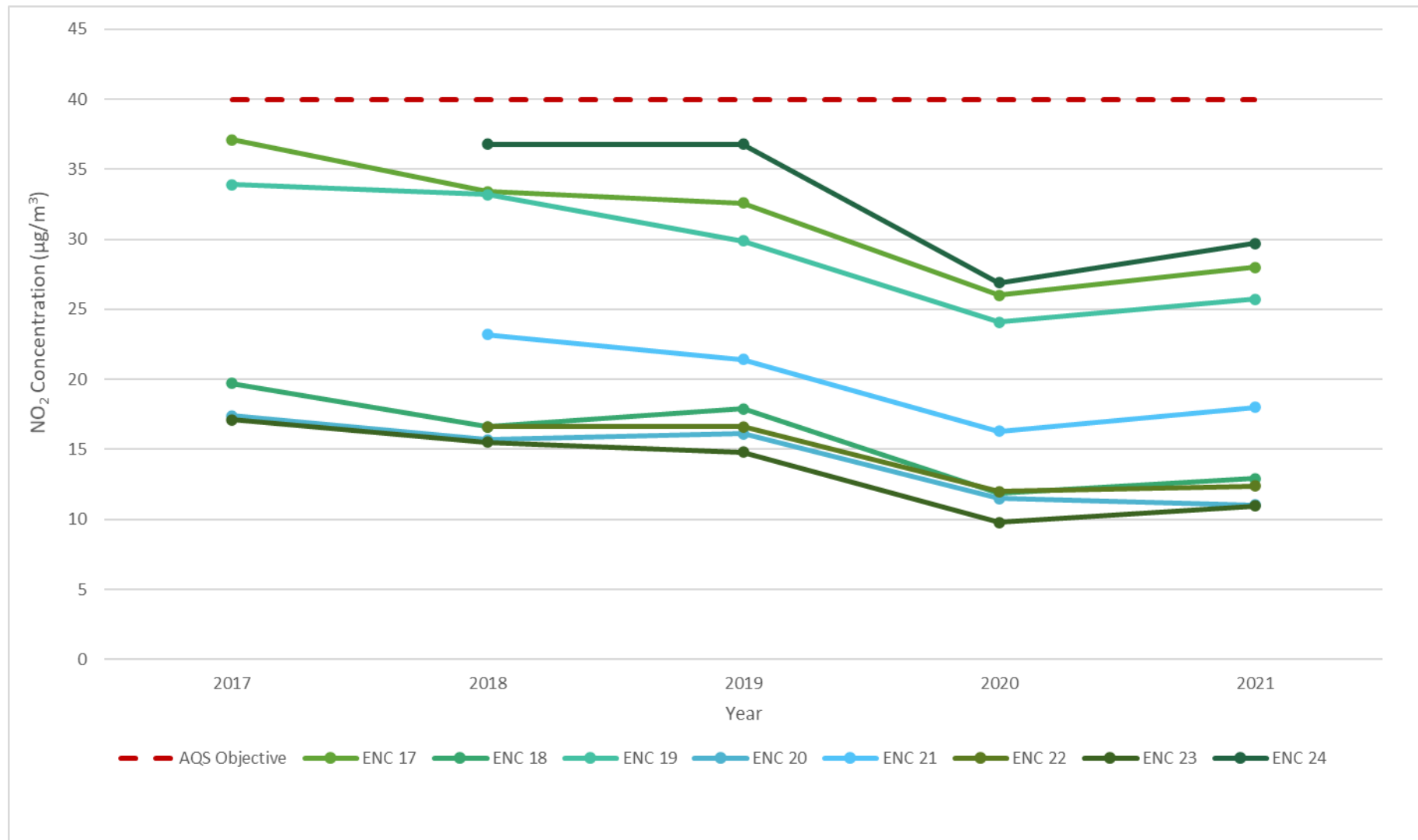


Figure A. 11 – Trends in Annual Mean NO<sub>2</sub> Concentrations in East Northamptonshire (4)

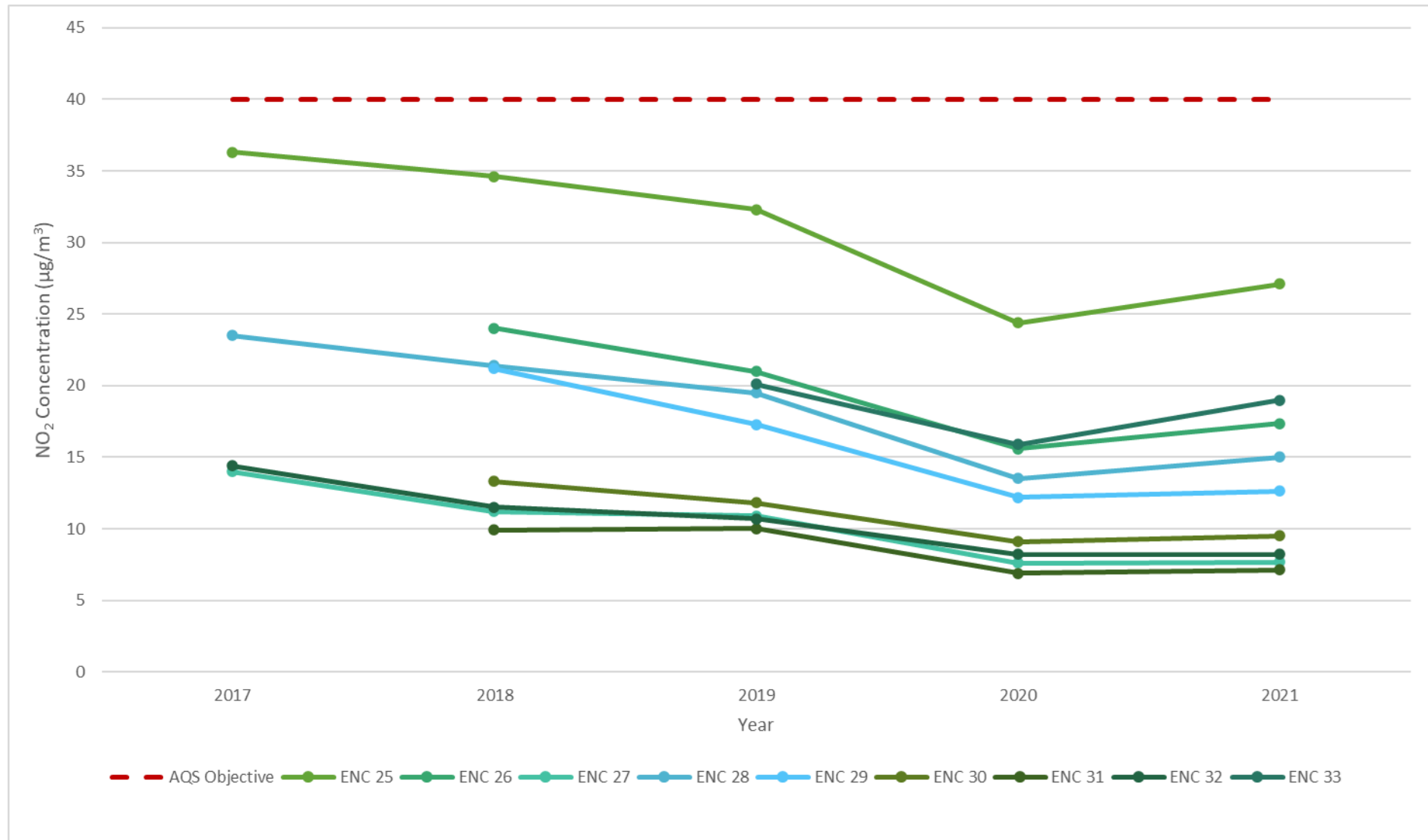
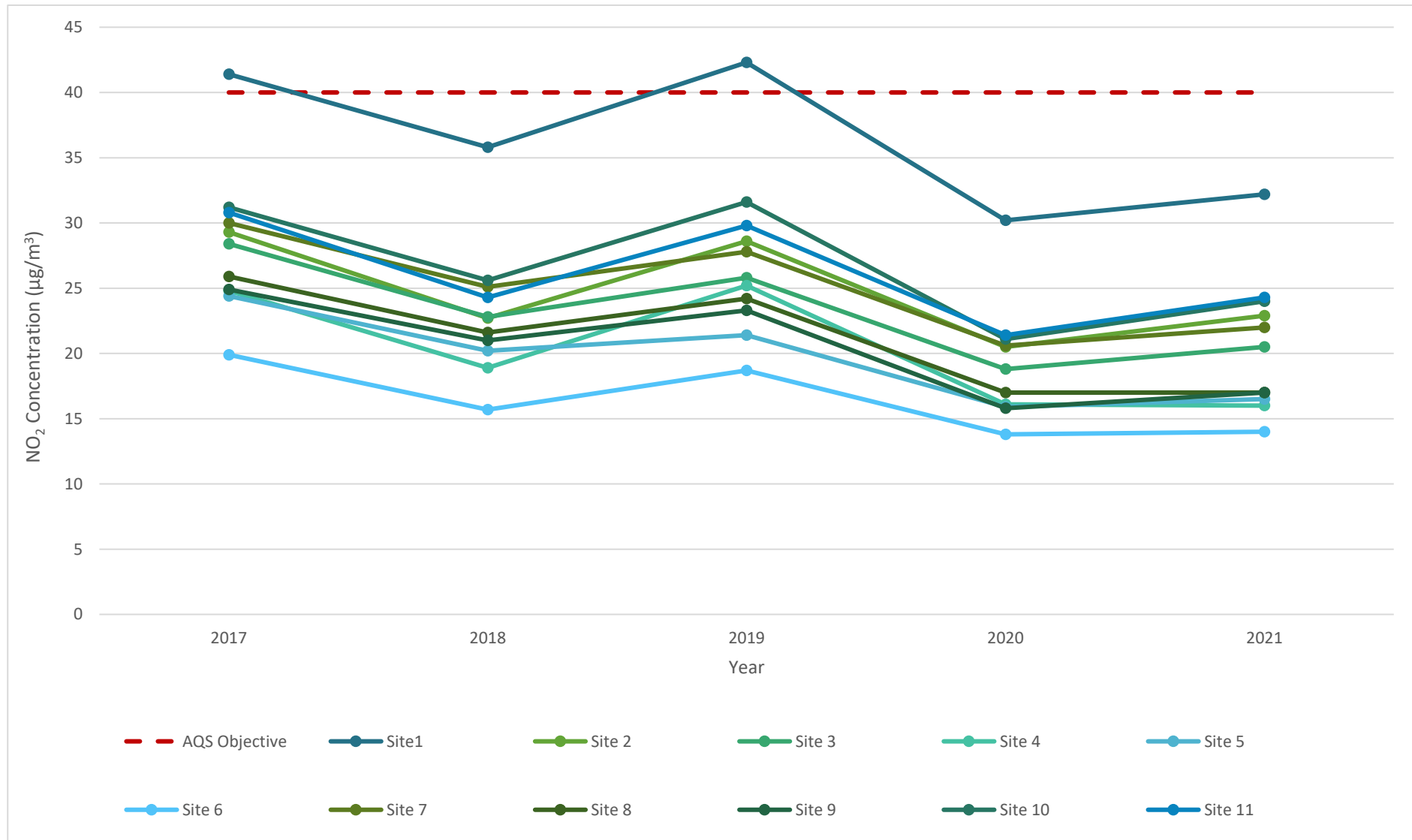


Figure A. 12 – Trends in Annual Mean NO<sub>2</sub> Concentrations in Wellingborough (1)



## 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 (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.84)	Comment
C1	488424	288706	27.0	22.1	19.8	16.5	16.6	16.2	16.7	9.9	missing	25.0	27.0	26.0	20.1	16.8	
C2	488354	289329	20.0	18.5	13.1	13.7	12.4	12.5	12.7	8.0	missing	17.5	16.3	17.7	14.7	12.3	
C3	489380	288833	28.4	24.2	19.1	20.2	16.5	16.7	17.7	8.7	missing	23.4	23.4	24.1	20.2	16.9	
C4	489399	288605	27.4	24.2	17.0	16.3	13.5	13.5	13.9	9.1	missing	23.3	21.2	19.9	18.0	15.1	
C5	489997	288821	34.2	24.7	22.9	22.8	20.5	18.9	19.6	9.8	missing	30.5	30.5	26.2	23.6	19.8	
C6	490981	287322	27.1	26.2	20.7	22.3	17.9	20.2	19.3	9.9	missing	22.9	22.6	24.4	21.2	17.8	
C7	492992	289919	26.7	20.5	17.5	17.5	17.8	13.8	16.4	9.4	missing	26.3	23.4	30.9	19.8	16.7	
C8	490063	294032	16.0	13.7	11.0	9.3	7.1	6.4	5.8	5.1	missing	12.2	13.6	25.1	11.2	9.4	
C9	484133	290194	13.7	9.1	7.5	6.3	4.5	5.1	5.2	4.6	missing	9.2	11.2	11.6	7.9	6.6	
C10	485788	287272	25.6	19.5	20.0	19.1	14.6	18.8	17.0	9.1	missing	28.8	22.6	10.3	18.8	15.8	
C11	487675	287373	75.3	25.9	26.0	27.1	22.7	23.8	23.9	41.8	missing	33.3	34.7	22.2	32.0	26.9	
C12	487039	288292	24.2	21.1	17.3	16.3	12.8	12.4	12.6	8.3	missing	18.9	20.6	29.8	17.5	14.7	
C13	487546	288816	29.7	24.2	20.7	17.0	15.5	15.2	16.6	9.3	missing	23.9	23.6	20.7	19.6	16.4	
C14	488135	288494	36.1	30.9	30.3	33.0	24.4	29.4	25.8	23.2	missing	31.0	29.8	23.7	29.1	24.4	
C15	488180	288325	31.6	32.1	29.6	30.5	29.5	31.0	28.1	8.9	missing	36.4	27.9	26.1	28.4	23.9	
C16	488122	287817	20.6	22.9	16.6	18.3	14.3	14.6	15.0	10.6	missing	18.4	16.3	18.0	16.9	14.2	
C17	488387	288122	27.8	22.8	19.3	19.3	14.9	15.4	15.7	8.1	missing	23.6	24.1	23.7	19.5	16.4	
KT10	486783	278948	Missing	24.8	22.5	22.6	21.0	21.5	27.6	25.5	27.9	20.2	30.8	22.4	24.3	20.4	
KT11	486887	278246	36.5	36.0	31.9	30.6	32.2	35.3	41.3	41.2	41.8	35.7	45.2	33.7	36.8	30.9	
KT12	486974	278895	32.6	26.0	24.4	28.0	23.1	24.1	31.7	29.5	30.1	26.9	31.2	25.8	27.8	23.3	
KT13	486956	278338	15.6	16.7	12.9	11.5	10.2	10.5	15.1	17.7	20.4	16.5	25.7	15.8	15.7	13.2	
KT14	486925	279028	31.1	28.8	23.6	26.4	19.7	21.9	missing	missing	missing	27.2	34.5	30.6	27.1	22.8	
KT15	486951	278904	35.3	27.8	28.4	29.5	25.2	27.1	33.1	31.4	31.7	23.4	34.1	26.9	29.5	24.8	
KT16	486869	278877	36.8	31.5	28.8	30.5	25.8	25.6	29.9	33.3	37.3	33.0	38.9	28.0	31.6	26.6	
KT18	487049	278942	34.9	30.1	28.9	31.3	26.2	27.1	17.7	32.8	36.2	30.8	35.8	30.3	30.2	25.3	
KT20	486793	278254	39.9	36.4	32.7	37.0	30.0	32.1	38.8	36.3	35.9	32.5	42.4	32.2	35.5	29.8	
KT21	486954	278099	33.5	35.2	32.8	34.2	27.0	29.6	35.4	36.2	41.1	30.4	41.5	31.5	34.0	28.6	
KT22	487406	277653	24.8	19.0	18.7	20.2	12.9	17.8	23.4	24.7	23.6	20.5	29.5	21.1	21.3	17.9	
KT23	486787	278276	37.0	34.9	37.8	31.4	30.2	33.8	38.7	34.3	40.9	34.8	44.8	31.0	35.8	30.1	
KT24	486648	278233	29.7	27.6	25.1	25.0	22.0	22.5	missing	missing	31.8	26.2	34.9	19.7	26.5	22.2	
KT25	486718	278236	32.8	30.2	33.1	29.5	25.3	27.9	33.3	30.6	36.2	28.4	37.0	22.1	30.5	25.6	
KT26	487146	277860	30.1	28.3	27.8	25.4	15.7	22.0	26.5	27.1	32.6	26.5	40.0	25.8	27.3	22.9	
KT28	486929	278204	31.6	31.8	28.6	26.2	25.3	25.6	22.0	30.7	38.4	29.1	42.3	19.8	29.3	24.6	
KT29	486972	278223	27.7	27.0	25.0	25.2	21.0	22.7	25.3	32.9	32.1	28.0	36.9	23.5	27.3	22.9	
KT31	486910	278240	30.3	31.9	25.8	28.7	13.1	26.6	29.9	missing	39.3	29.2	37.4	29.3	29.2	24.6	
KT32	486890	278322	30.2	33.7	26.1	28.9	19.4	25.9	28.8	missing	40.5	29.8	44.4	31.4	30.8	25.9	
KT33	486846	278497	29.6	25.8	25.0	22.6	20.0	21.9	26.5	missing	33.7	26.2	38.1	22.3	26.5	22.3	
KT34	486786	278599	33.5	26.4	29.6	27.0	21.0	21.7	30.6	27.6	32.0	26.2	29.5	18.8	27.0	22.7	
KT35	486778	278779	31.8	30.1	26.1	25.7	21.8	26.9	28.8	34.2	34.8	26.3	40.2	31.2	29.8	25.0	
KT36	486799	278850	36.1	27.4	29.6	27.0	18.0	25.7	30.2	31.1	32.2	17.2	33.7	26.8	27.9	23.4	
KT38	487718	278679	26.4	25.7	27.1	28.8	21.0	21.9	28.0	29.6	31.3	22.4	37.1	23.4	26.9	22.6	
KT39	487751	278505	26.0	23.6	27.0	20.0	20.6	19.9	24.4	20.3	25.8	18.9	31.1	18.8	23.0	19.3	
KT40	487725	278388	27.2	27.8	22.0	19.9	15.5	19.1	39.0	25.0	32.4	21.6	35.3	25.6	25.9	21.7	
KT41	487893	277471	27.4	missing	24.3	34.6	missing	28.6	missing	missing	missing	missing	missing	29.0	28.8	20.5	
KT43	486153	278930	30.6	30.3	27.4	27.8	25.7	26.8	missing	missing	missing	25.9	36.4	25.2	28.5	23.9	
KT44	486894	278216	34.3	26.8	31.1	28.9	25.2	27.1	31.9	16.9	28.9	28.5	35.3	21.8	28.1	23.6	
KT45	487563	277433	31.2	24.8	25.9	23.7	21.2	23.7	29.1	27.8	23.7	23.4	28.2	18.4	25.1	21.1	



- ☒ 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.
- ☒ North Northamptonshire confirm that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

**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 North Northamptonshire During 2021**

North Northamptonshire has not identified any new sources relating to air quality within the reporting year of 2021.

### **Additional Air Quality Works Undertaken by North Northamptonshire During 2021**

North Northamptonshire has not completed any additional works within the reporting year of 2021 that have not already been mentioned.

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

Diffusion tubes were provided by Gradko during the 2021 monitoring year with the preparation method of 20% TEA in Water. Gradko international laboratory takes part in the LAQM Air PT scheme. They received a score of 75% for September to October 2020 (AR040) and 25% for January to March 2021 (AR042).

The diffusion tube survey has been completed in adherence with the 2021 Diffusion Tube Monitoring Calendar. In Corby, diffusion tubes were exposed for slightly longer than the Defra recommended timescales.

### **Diffusion Tube Annualisation**

Annualisation is required for any site with data capture less than 75% but greater than 25%. In addition, any sites with a data capture below 25% do not require annualisation. Annualisation was required for one site in North Northamptonshire; KT41. Annualisation was undertaken in line with LAQM.TG16 with the calculation method detailed in Table C.2.

The following urban background automatic monitors were used to inform the annualisation process:



- Coventry;
- Leamington Spa;
- Leicester University; and
- Northampton

All other diffusion tube monitoring locations within North Northamptonshire recorded data capture of 75% therefore annualization was not required.

### 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.

North Northamptonshire have applied a National bias adjustment factor of 0.84 to the 2021 monitoring data, as per Figure C. 1. A summary of bias adjustment factors used by North Northamptonshire over the past five years is presented in Table C. 1. Version 3/22 of the national bias adjustment factor spreadsheet was used in 2021. Prior to 2021, the borough areas of Corby, Kettering, East Northamptonshire and Wellingborough used the same diffusion tubes and used national bias adjustment factors. The 2020 bias adjustment factor is also included in Table C. 1.

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

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	03/22	0.84
2020	National	03/21	0.81
2019	-	-	-
2018	-	-	-
2017	-	-	-

**Figure C. 1 – National Diffusion Tube Bias Adjustment Factor Spreadsheet, 2021**

Follow the steps below in the correct order to show the results of relevant co-location studies							This spreadsheet will be updated at the end of June 2022			
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods							LAQM Helpdesk Website			
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet							Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.			
This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.										
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.										
Step 1:		Step 2:		Step 3:		Step 4:				
Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Select a Preparation Method from the Drop-Down List		Select a Year from the Drop-Down List		Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor shown in blue at the foot of the final column.				
If a laboratory is not shown, we have no data for this laboratory.		If a preparation method is not shown, we have no data for this method at this laboratory.		If a year is not shown, we have no data.		If you have your own co-location study then see footnote <sup>1</sup> . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953				
Analysed By <sup>1</sup>	Method	Year	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m <sup>3</sup> )	Automatic Monitor Mean Conc. (Cm) (µg/m <sup>3</sup> )	Bias (B)	Tube Precision <sup>2</sup>	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2021	R	Bedford Borough Council	11	34	31	7.6%	G	0.93
Gradko	20% TEA in water	2021	R	Bedford Borough Council	11	19	17	11.7%	G	0.90
Gradko	20% TEA in water	2021	R	Blackburn with Darwen Borough Council	12	27	20	32.3%	G	0.76
Gradko	20% TEA in water	2021	R	Brent Council	12	51	46	9.9%	G	0.91
Gradko	20% TEA in water	2021	R	Gateshead Council	10	23	19	23.8%	G	0.81
Gradko	20% TEA in water	2021	R	Gateshead Council	12	25	22	13.7%	G	0.88
Gradko	20% TEA in water	2021	R	Gateshead Council	11	27	25	9.8%	G	0.91
Gradko	20% TEA in water	2021	R	Gateshead Council	12	31	25	26.8%	G	0.79
Gradko	20% TEA in water	2021	R	Gateshead Council	12	32	34	-4.1%	G	1.04
Gradko	20% TEA in water	2021	KS	Marylebone Road Intercomparison	11	53	42	25.0%	G	0.80
Gradko	20% TEA in water	2021	R	Monmouthshire County Council	11	35	29	21.8%	G	0.82
Gradko	20% TEA in water	2021	R	Belfast City Council	12	25	20	24.3%	G	0.80
Gradko	20% TEA in water	2021	UC	Belfast City Council	12	25	20	28.5%	G	0.78
Gradko	20% TEA in water	2021	R	Belfast City Council	12	42	35	19.8%	G	0.84
Gradko	20% TEA in water	2021	R	Belfast City Council	12	38	27	39.4%	G	0.72
Gradko	20% TEA in water	2021	LIB	Dudley MBC	12	20	15	36.0%	G	0.74
Gradko	20% TEA in water	2021	R	Dudley MBC	12	30	29	4.2%	G	0.96
Gradko	20% TEA in water	2021	R	Dudley MBC	12	42	40	5.5%	G	0.95
Gradko	20% TEA in water	2021	R	Lambeth	10	31	62	46.6%	G	0.68
Gradko	20% TEA in water	2021	R	Lancaster City Council	13	38	32	18.4%	G	0.84
Gradko	20% TEA in water	2021	R	Lancaster City Council	13	28	27	4.9%	G	0.95
Gradko	20% TEA in water	2021		<b>Overall Factor<sup>3</sup> (32 studies)</b>				<b>Use</b>		<b>0.84</b>

**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.

No diffusion tube NO<sub>2</sub> monitoring locations within North Northamptonshire required distance correction during 2021, due to the low concentrations monitored.

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

Site ID	Annualisation Factor Lemington Spa	Annualisation Factor Northampton Spring Park	Annualisation Factor Leicester University	Annualisation Factor Coventry Allesley	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
KT41	0.8539	0.8750	0.7821	0.8735	0.8461	28.8	24.4	

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

Figure D.1 – Map of Non-Automatic Monitoring Sites across North Northamptonshire

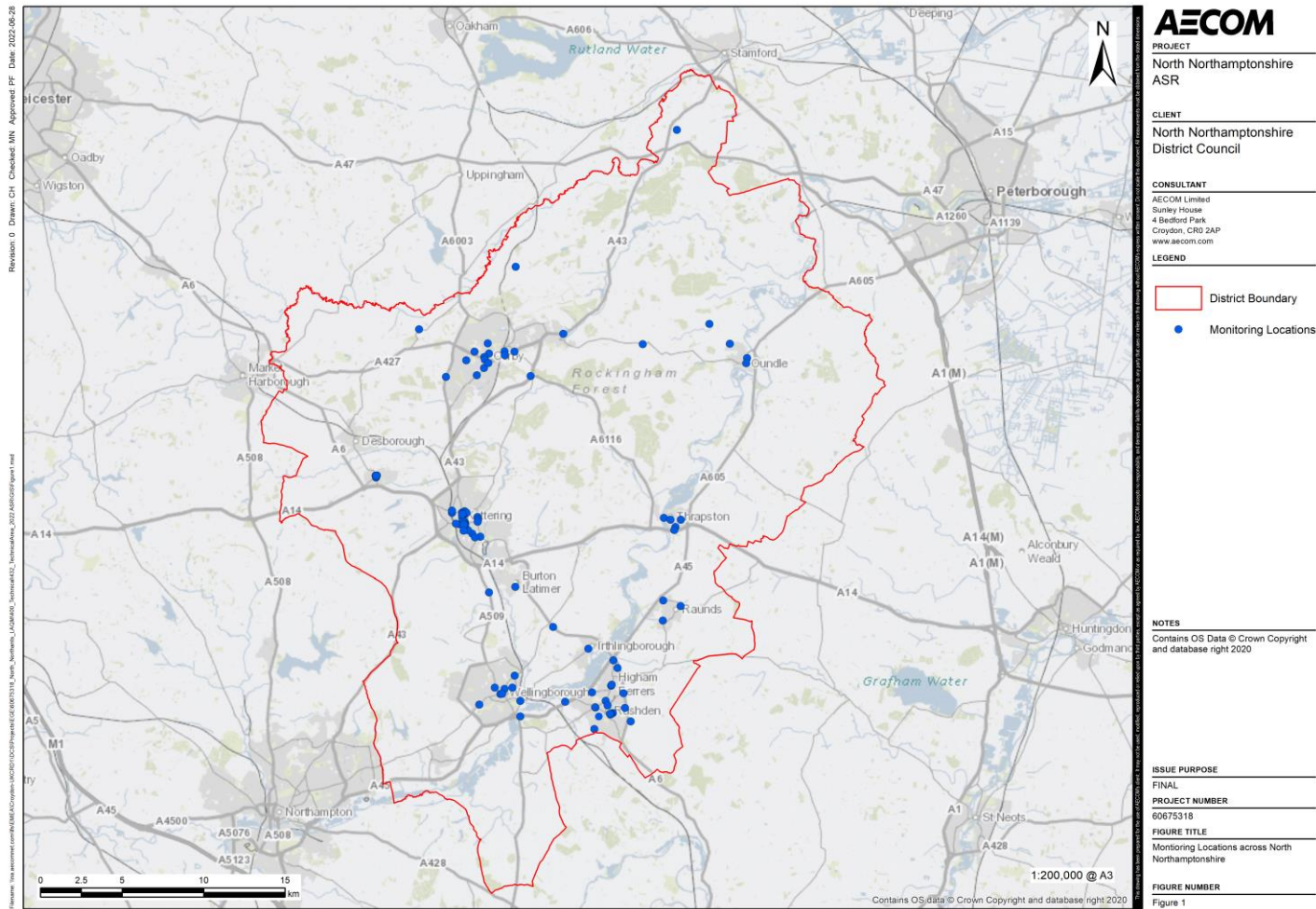


Figure D.2 - Map of Non-Automatic Monitoring Sites in Corby and Oundle

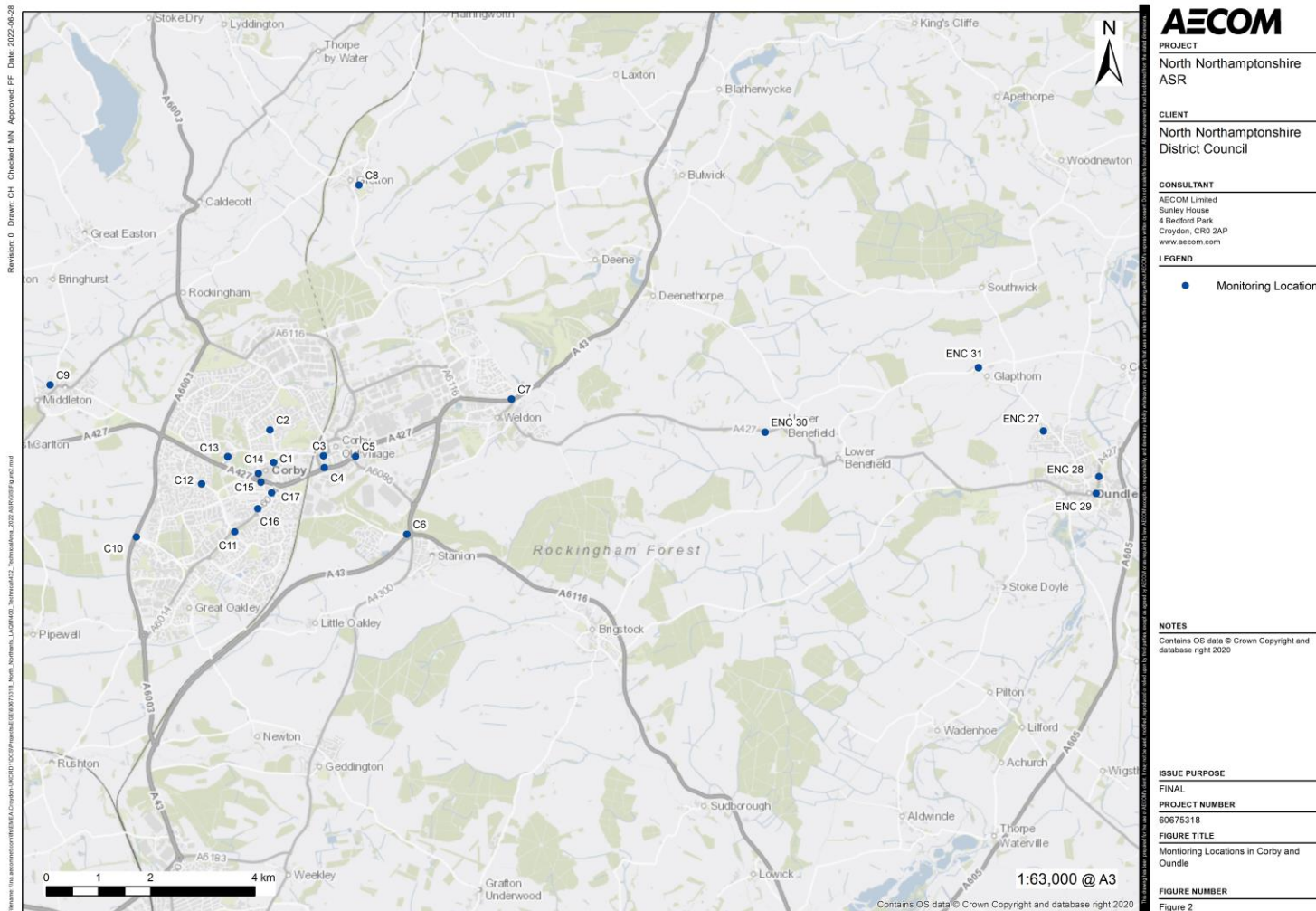


Figure D.3 - Map of Non-Automatic Monitoring Sites in Thrapston and Raunds

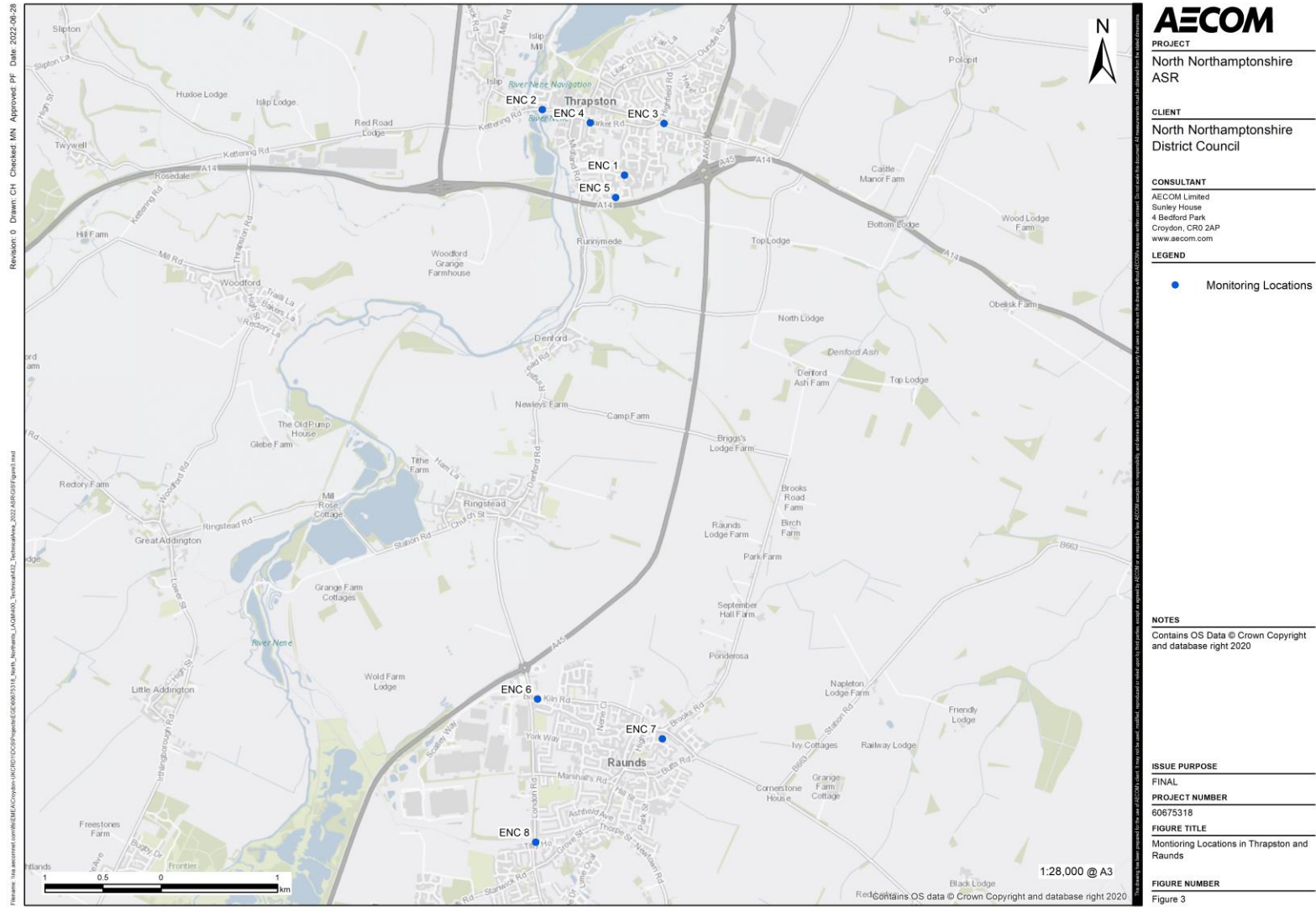


Figure D.4 - Map of Non-Automatic Monitoring Sites in Kettering

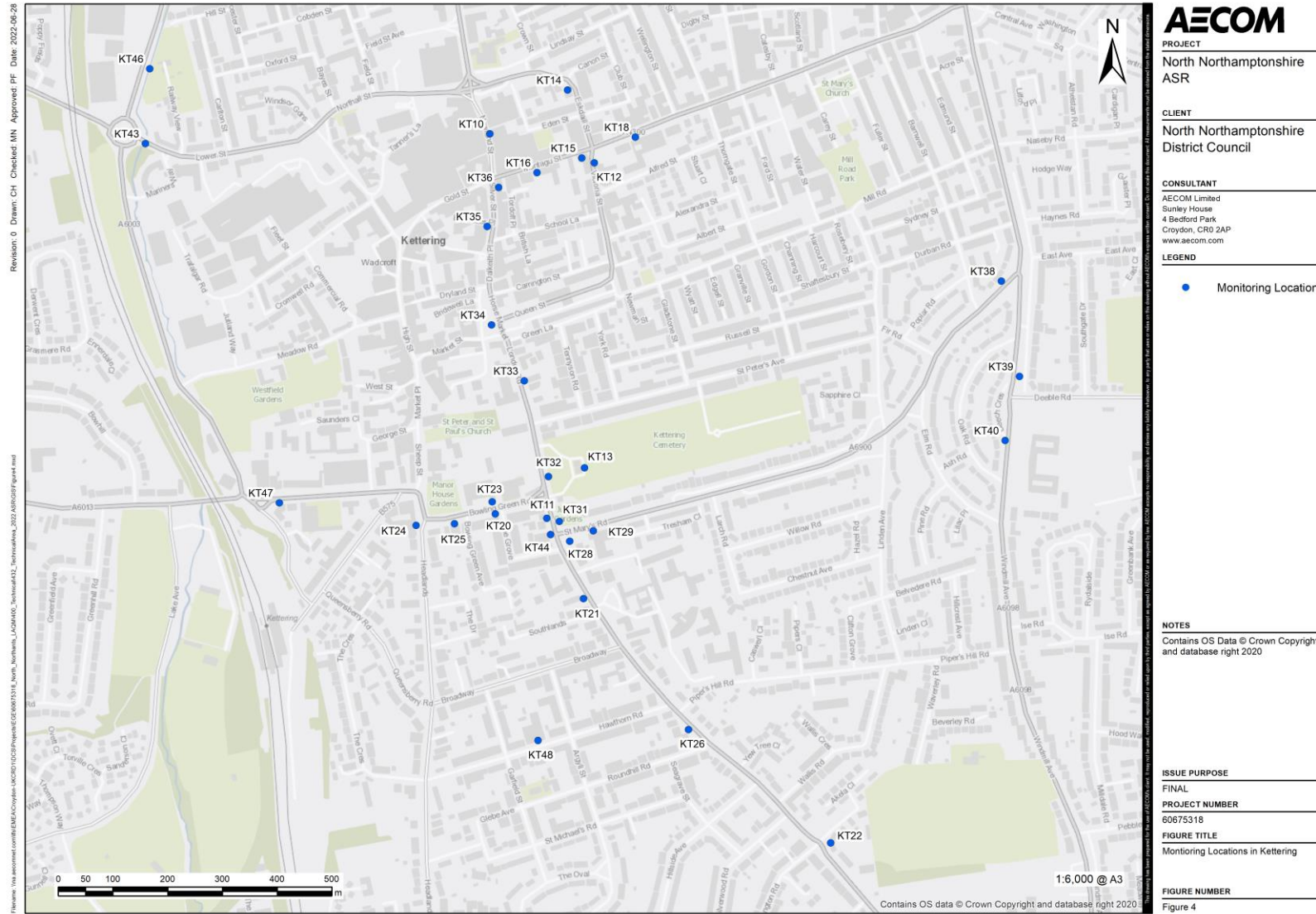
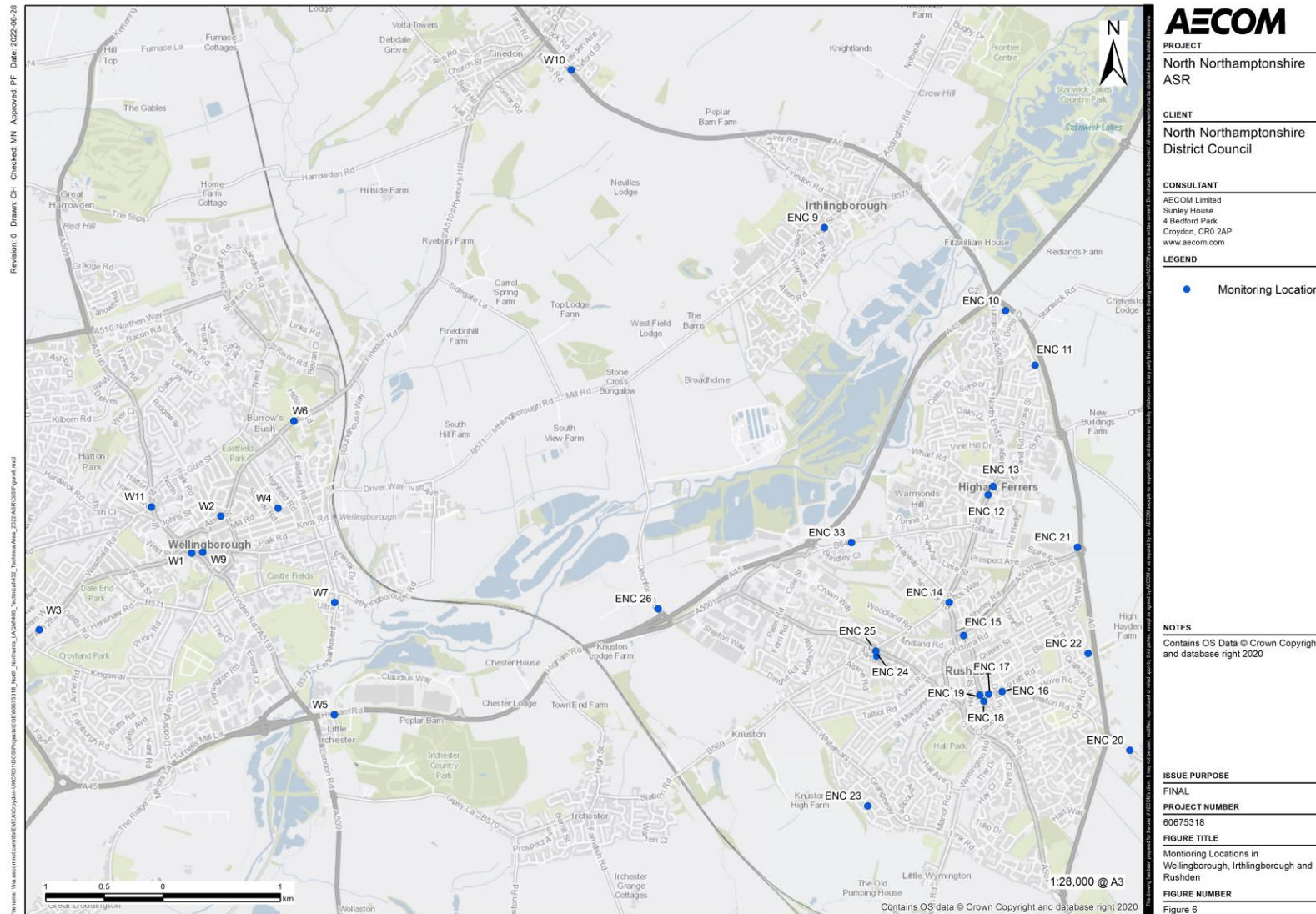


Figure D.5 - Map of Non-Automatic Monitoring Sites in Rothwell and Burton Latimer





Figure D.6 - Map of Non-Automatic Monitoring Sites in Wellingborough, Irthlingborough and Rushden



## 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
EMAQN	East Midlands Air Quality Network
EU	European Union
EVHS	Electric Vehicle Homecharge Scheme
FDMS	Filter Dynamics Measurement System
JSNA	Joint Strategic Needs Assessment
LAQM	Local Air Quality Management
NNC	North Northamptonshire Council
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

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