

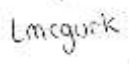

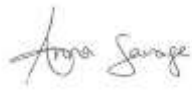

LAQM Review

North Northamptonshire Council
Considering work under the previous districts of Corby,
Kettering, East Northants & Wellingborough

Project number: 60675318

15th February 2022

Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
1	04/02/22	Draft for comment	GC	Gareth Collins	Regional Director
2	09/02/22	Final version_v1	GC	Gareth Collins	Regional Director
3	15/02/22	Final version_v2	GC	Gareth Collins	Regional Director

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1. Executive Summary

- 1.1 This report provides a review of Local Air Quality Management (LAQM) within the former administrative areas of Corby, East Northamptonshire, Kettering and Wellingborough, now part of the newly formed North Northamptonshire Council. The report focuses on the work conducted during 2020 as well as in previous years, provides a review of the current diffusion tube monitoring network to assess whether this is fit for purpose and gives recommendations for further actions or monitoring network changes.
- 1.2 The review has identified that the four authorities have been meeting their statutory obligations under LAQM. None have declared an Air Quality Management Area (AQMA) and all conduct diffusion tube monitoring for nitrogen dioxide across their borough whilst following correct quality assurance and control procedures. Measured concentrations have shown a decreasing trend over the last five years.
- 1.3 The review has provided a number of recommendations that could be taken forward to improve air quality management in 2022. These include:
 - Submitting the 2022 annual report ahead of the submission deadline, to allow for a timely appraisal and the potential to address any comments that may arise;
 - Extending the diffusion tube monitoring network to include selected identified areas and to consider the of particulates;
 - Working in closer collaboration with the relevant public health body and with county working groups; and;
 - Reviewing existing local air quality actions, updating and identifying new measures

1. Introduction

Air Quality Context

- 1.4 Local authorities are required as part of the Local Air Quality Management (LAQM) process under the Environment Act 1995¹ (as amended by the Environment Act 2021²) to review and assess air quality in their locality. Each year, an air quality annual report (Annual Status Report (ASR) in England or Annual Progress Report (APR) in Scotland) is produced, in accordance with the specifications within the Local Air Quality Management Technical Guidance (TG16)³. The aim of the ASR/APR when it was introduced in 2016 was to simplify and streamline the LAQM system, by combining the requirements of the Updating and Screening Assessment (USA) and Progress Report. ASR/APRs may also contain any additional technical information required to support the decision to declare / amend or revoke AQMAs, which were previously required as part of separate Detailed Assessments.
- 1.5 The UK National Air Quality Strategy (AQS) was initially published in 2000⁴, under the requirements of the Environment Act. An addendum was published in 2003⁵ which tightened several of the existing objective and introduced a new objective. A revised AQS was published in 2007⁶ which set objectives for key pollutants as a tool to help Local Authorities manage local air quality improvements in accordance with the EU Air Quality Framework Directive.
- 1.6 The current assessment criteria applicable to the protection of human health and LAQM are outlined in the UK's AQS 2007. The objective values set out in the AQS for the pollutants of relevance for this review are summarised in Table 1.

Table 1. Relevant AQS Objectives (for the Protection of Human Health)

Pollutant	AQS Objective Concentration (µg/m ³)	Measured as
Nitrogen dioxide (NO ₂)	40	Annual mean
	200	1-hour mean, not to be exceeded more than 18 times a year (i.e. 99.79 th percentile)
Particulate Matter (PM ₁₀)	40	Annual mean
	50	24-hour mean, not to be exceeded more than 35 times a year (i.e. 90.4 th percentile)
Particulate Matter (PM _{2.5})	20*	Annual mean

Note: *Amended value as a result of 'The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020'⁷

- 1.7 In 2019, the UK Government released its much-anticipated Clean Air Strategy 2019⁸, part of its 25 Year Environment Plan⁹. The Strategy places greater emphasis on improving air quality in the UK than has been seen before and outlines how it aims to achieve this (including through the development of new enabling legislation).
- 1.8 The focus of air quality management in recent years has primarily related to one pollutant, NO₂, and its principal source in the UK, road traffic. However, the 2019 Strategy broadens the focus to other sources, including domestic emissions from wood burning stoves and from agriculture. This shift in emphasis is part of a goal to reduce concentrations of PM_{2.5} in the air to below the World Health Organisation (WHO) guideline (annual mean 10 µg/m³)¹⁰, which is lower than the current AQS objective. This WHO guideline

¹ The Stationery Office Limited, The Environment Act, 1995

² The Stationery Office Limited, Environment Act, 2021

³ Defra, Local Air Quality Management Technical Guidance (TG16), April 2021

⁴ Defra, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2000

⁵ Defra, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2003

⁶ Defra, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1), 2007

⁷ H.M Government, The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020, 2020

⁸ Defra, The Clean Air Strategy, 2019

⁹ Defra, A Green Future: Our 25 Year Plan to Improve the Environment, 2019

¹⁰ World Health Organisation, Air Quality Guidelines Global Update 2005, 2005

has since been lowered further to 5 µg/m³¹¹. At the time of writing these policies have not yet been transposed into UK law and therefore remain as aspirational objectives.

Local Context

- 1.9 Before April 2021, Corby, East Northamptonshire, Kettering and Wellingborough had been individually reporting on air quality each year. All four of the local authorities have previously submitted separate ASRs, Progress Reports and USAs. However, reports for some years were not submitted by the local authorities. These omissions are detailed in this report.
- 1.10 In April 2021, North Northamptonshire Council was formed by merging these four existing districts following the declaration of a Unitary Authority. North Northamptonshire Council has now absorbed the functions of these districts and going forward there will be one ASR submitted, which is a combination of all four original districts. The new Unitary Authority allows for the streamlining of Council processes, including air quality management.
- 1.11 Following the Unitary Authority being created, political members and senior Officers within the Council met at the Executive Advisory Panel for Climate Change (CEAP) to discuss air quality as a whole in North Northamptonshire (across all four areas), to ensure a consistent approach is taken across the new region. At this panel, Councillors raised concerns that air quality in North Northamptonshire is an issue, despite recent ASR data confirming no exceedances of AQS objectives in 2020.
- 1.12 To instil confidence that North Northamptonshire's air quality review and assessment processes are satisfactory, this review of local LAQM information was commissioned.
- 1.13 The context and scope of this report is as follows:
- A review of the content of all four 2021 ASRs (Corby, Kettering, East Northants & Wellingborough);
 - A review of the current diffusion tube monitoring network to assess whether this is fit for purpose; and
 - Suggestions for further actions or monitoring network changes and recommendations.
- 1.14 To allow an impartial comparison of air quality in the four Council areas, a scoring matrix has been developed. The matrix is based upon twelve scoring metrics, which the Council will either receive a 'one' or 'zero'. The sum of these is then used as the Council's total quality score, based on their 2021 ASR.
- 1.15 Whilst several of the metrics are inherently dependent on monitored concentrations, such as the number of AQMAs or exceedances, it is important to note that this score is primarily reflective of the reporting processes, and not necessarily of air pollutant concentrations. For example, a higher score of 10 does not guarantee that a Council has lower concentrations than a score of 6, rather it is more likely that the LAQM requirements are being met, and therefore that air quality is being managed more effectively.
- 1.16 A summary of the scoring matrix is shown in Table 2.

Table 2. Summary of the scoring matrix developed for comparison between the four local authorities.

Requirement	Description	Scoring System
Declared AQMAs	Summary of the AQMAs within the borough	0 if there are designated AQMAs, 1 if there are no AQMAs
Number of NO ₂ diffusion tubes	The total number of NO ₂ diffusion tubes within the borough	0 if there are no NO ₂ diffusion tubes, 1 if the Council monitors NO ₂ using diffusion tubes.
Additional air quality monitoring	Summary of any additional air quality monitoring (beyond NO ₂ diffusion tubes), such as PM ₁₀ or PM _{2.5}	0 if the Council does not undertake any additional monitoring, 1 if additional monitoring is conducted
Number of exceedances and the highest concentrations	Summary of the number of exceedances in 2020, with the highest concentrations listed in brackets	0 if the Council did record exceedances of the relevant objectives, 1 if there were no exceedances of concentrations
Air quality trends	Summary of the air quality trends in the previous five years	0 if the trend is increasing, 1 if the trend is decreasing

¹¹ World Health Organisation, Air Quality Guidelines 2021

Requirement	Description	Scoring System
Data QA/QC	Summary of the QA/QC in the report	0 if the QA/QC is not present, 1 if it is considered appropriate
Current measures	Summary of the number of measures targeted towards air quality	0 if there are no measures listed, 1 if there are five or more measures
Latest measures update	Summary of whether the measures have been updated in the 2021 ASR	0 if the measures are not up to date, 1 if the measures are updated and relevant
COVID-19 impacts	Summary of the impact of COVID-19 upon LAQM work using the impact matrix	0 if the impact is not summarised or COVID-19 resulted in a large impact, 1 if the impact is summarised and the impact is classified as small or medium
Additional information	Summary of any additional appendices added	0 if there are no additional appendices, 1 if additional appendices are included which add value
Time of submission	Was the 2021 ASR submitted before the original deadline?	0 if submitted after original deadline, 1 if submitted before
Defra appraisal	Was the 2021 ASR accepted or rejected in the appraisal process	-1 if rejected, 0 if not yet appraised due to late submission and 1 if 2021 ASR has been appraised and accepted by Defra

2. Summary by District

Corby

Corby LAQM History

2.1 The summary of Corby Borough Council's (CBC) LAQM reporting to date is detailed as follows:

- Stage 1 Report (2000) - Six Part A and fourteen Part B processes were identified.
- Stage 2 Report (2002) - Part A and B processes identified in the previous stage required no further assessment. The report also identified the A427, the A6003 and the Eurohub road-rail interchange as potential emission sources, which could affect local air quality, but no assessments were required at this stage.
- USA (2003) - An increase in NO₂ concentrations was reported. Higher levels were also observed nationally due to adverse meteorological conditions. Therefore, it was concluded that further assessment was not required at this stage. No exceedances of any other AQS objective within the borough.
- Progress Report (2004/2005) - No exceedances of the AQS objective within the borough. Further NO₂ diffusion tube monitoring was commissioned. Future new developments which could impact on local air quality were identified, these were recommended to be assessed in future LAQM reports.
- USA (2006) - All AQS objectives were achieved, no likely exceedances of any objectives identified.
- Progress Report (2007) - New road schemes were identified, although air quality assessments identified no significant impacts on local air quality. All AQS objectives were achieved, no likely exceedances of any objectives identified.
- Between 2008 and 2011, CBC produced two Progress Reports and one USA. These reports concluded that all AQS objectives were achieved, and that there were no likely exceedances of any objectives identified.
- USA (2012) - All AQS objectives were achieved, no likely exceedances of any objectives identified. Proposed developments within the borough were identified in the 2011 Progress Report, for which air quality assessments identified no significant impacts on local air quality.
- Progress Report (2013) – NO₂ concentrations increased at many sites in 2012 compared to 2011, however concentrations were within the AQS objectives. A few proposed developments were identified in the borough which may affect local air quality, including three large scale housing developments with the potential to provide over 9620 dwellings.
- Progress Report (2014) - All AQS objectives were achieved, no likely exceedances of any objectives identified. Potential developments were highlighted as potentially affecting local air quality such as a cinema application. CBC were also considering changing the locations of some NO₂ diffusion tubes.
- USA (2015) - All AQS objectives were achieved, no likely exceedances of any objectives identified. CBC also intended to relocate a number of diffusion tubes to villages surrounding Corby, to represent a 'worst-case' exposure.
- ASR (2016) – All AQS objectives were achieved, no likely exceedances of any objectives identified. Regeneration plans for Corby are expected to increase the population by two-fold in the next 30 years.
- ASR (2017/2018) - All AQS objectives were achieved, no likely exceedances of any objectives identified. CBC suggested that NO₂ diffusion tubes may need to be relocated in the future to reflect shifts in traffic flows as a result of new housing and employment sites, and consideration may need to be given to measuring PM₁₀ and PM_{2.5}.
- ASR (2019) - All AQS objectives were achieved, no likely exceedances of any objectives identified. NO₂ diffusion tubes were relocated in January 2019 to reflect shifts in traffic flows within the borough. CBC also identified nine new potential sources of emissions.
- ASR (2020) - All AQS objectives were achieved, no likely exceedances of any objectives identified. Six new diffusion tube sites were introduced, and consideration may need to be given to measuring PM₁₀ and PM_{2.5} in the future.

- ASR (2021) - All AQS objectives were achieved, no likely exceedances of any objectives identified. The COVID-19 pandemic resulted in a reduction of NO₂ concentrations in the borough.

Corby 2021 ASR

2.2 The Local Authority officer responsible for the production of the CBC 2021 ASR was Amy Plank. The 2021 ASR was produced by AECOM.

Corby AQMA

2.3 CBC does not currently have any AQMA. The Stage 1 & 2 Air Quality Review and Assessment^{12,13} concluded no pollutants were likely to breach the Air Quality Objectives and therefore no AQMA was deemed necessary.

Corby NO₂ Diffusion Tubes

2.4 CBC undertook non-automatic (i.e. passive) monitoring of NO₂ at 17 sites during 2020. In the past five years, CBC has expanded its diffusion tube monitoring network from 14 to 17 sites. 14 of these sites were classified as 'roadside', whereas 3 of the sites were classified as 'urban background'.

Corby Additional Monitoring

2.5 CBC does not undertake any additional monitoring of PM₁₀, PM_{2.5} or SO₂. In addition, CBC has not undertaken automatic monitoring within their borough at any point in time, so there is a lack of data for pollutants beyond NO₂. In CBC 2017/2018 ASR, the Council was considering the monitoring of PM₁₀ and PM_{2.5}. However, this was never implemented due to financial constraints.

Corby Exceedances

2.6 No exceedance of the NO₂ annual mean objective was recorded at any of the monitoring sites in 2020. The highest concentration monitored was 24.3 µg/m³ at Scott Road (4N), which is well below the AQS value.

Corby Air Quality Trends

2.7 Over the previous five years, annual mean NO₂ concentrations have shown an overall decrease in the concentrations recorded, which is reflective of the national trend. In the previous five years, there have been no exceedances of the annual mean NO₂ objective at any of the sites monitored. However, it should be noted that concentrations in 2020 may have been impacted by restrictions on activities associated with the COVID-19 pandemic, and therefore should be treated with caution.

Corby Data QA/QC

1.1 QA/QC procedures have been appropriately applied to the monitoring data; a national bias adjustment factor of 0.81 was applied to the raw diffusion tube measurements in the 2021 ASR which was obtained from the National Diffusion Tube Bias Adjustment Factor Spreadsheet Version 09/21¹⁴. Annualisation was applied to site 15N due to insufficient data capture of less than 75%. Distance correction was not applied to 2020 monitoring data as concentrations are below 36 µg/m³ at all sites, in accordance with paragraph 7.78 of LAQM TG(16)³.

1.2 Diffusion tube analysis was conducted by Gradko International using the 20% TEA in water method.

Corby Current Measures

2.8 CBC currently has five measures in place which are aimed at improving air quality. Four of the measures are targeted at sustainable transport within the borough, and one measure is aimed at measuring home energy conservation as part of statutory Home Energy Conservation Act 1995.

2.9 The five measures, and their expected efficacy are detailed as followed:

- *Measure 1 – support North Northamptonshire Council's transport plan to promote walking, cycling and public transport in order to support the modal shift away from the private car.* The aim of the transport plan is to reduced transport CO₂ emissions. Since the report was published in 2020, it is not currently possible to determine the effectiveness of this measure; however, successful implementation of this measure is expected to result in positive impacts for air quality.
- *Measure 2 – encourage lower carbon transport alternatives and increase the proportion of low-carbon fuelled vehicles.* In 2020/21, electric vehicle charging episodes had decreased by 27.5% from 2019,

¹² Corby Borough Council. Stage 1 Air Quality Review and Assessment, 2000a

¹³ Corby Borough Council. Stage 2 Air Quality Review and Assessment, 2000b

¹⁴ Defra. National Diffusion Tube Bias Adjustment Factor Spreadsheet Version 09/21, October 2021

which is believed to be due to the restrictions imposed by the COVID-19 pandemic. In order to determine the effectiveness of this measure, charging episodes should be monitored to determine if they return to pre pandemic levels. Lower carbon emissions will also mean lower NOx emissions.

- *Measure 3 – to work with taxi companies and license holders to consider low carbon vehicles.* In 2020, there were six London Electric Vehicle Company Hackney Carriages licensed in Corby, a decrease of three compared to 2019. Similar to Measure 1, it is not yet possible to determine the effectiveness of this measure as the taxi industry has been heavily impacted by the COVID-19 pandemic. However, as taxis will undertake more journeys than private vehicles, improving their emissions will have a proportionally greater impact.
- *Measure 4 – the promotion of low carbon fleet and staff vehicle schemes in the business sector.* In 2018, the Council's fleet consisted of ten electric vehicles, whereas in 2019 and 2020 the Council's fleet consisted of nineteen electric vehicles. This measure has been successful in encouraging an increase to the low carbon vehicle fleet; however, since the number of electric vehicles has not increased from 2019 to 2020, it is suggested that this measure is reviewed and re-prioritised for the 2022 ASR.
- *Measure 5 – measuring home energy conservation as part of statutory Home Energy Conservation Act 1995.* A report was published in May 2019, with an update expected in 2021; however, this is not yet released. To determine the effectiveness of this measure, the 2021 report should be reviewed when available. Targeting domestic emissions is more likely to improve PM concentrations, however.

Corby Relevance of Measures

- 2.10 Four of the measures in the 2021 ASR were updated in 2020, whereas one measure was most recently updated in 2017. However, the updated measures are just a continuation of the measures mentioned in previous ASRs. Therefore, it is suggested that a full review of measures is undertaken. This should provide insight into the current effectiveness of measures implemented, as well as identifying potential new measures which could be implemented to further improve air quality in Corby.

Corby Utilisation of COVID-19 Guidance and Impact of Pandemic

- 2.11 Following the initial lockdown in March 2020, all officers were asked to work from home which disrupted the collection of diffusion tubes. Tubes that were installed on the 23rd March 2020 were removed between the 8th and 11th May 2020, therefore concentrations recorded during this period should be treated with caution due to the length of exposure. However, a time weighted average has been applied as per the methodology applied to the LAQM data processing tool¹⁵, therefore this impact can be described as 'Small'.
- 2.12 Other than the delay to picking up diffusion tubes in the first spring 2020 lockdown, there were no further direct impacts on CBC's ability to meet statutory LAQM requirements.
- 2.13 Throughout 2020, all resources and staff available were redirected to community resilience and COVID-19 enforcement, therefore any pro-active work relating to air quality was unable to be done. Due to a lack of resources, CBC did not participate in any events relating to Clean Air Day 2020. As a result, this impact can be described as 'Large'.

Corby Additional Information

- 2.14 CBC did not include any additional appendices in the 2021 ASR.

Corby Deadlines

- 2.15 The CBC 2021 ASR was submitted after the original deadline. This is partly due to resource delays because of the COVID-19 pandemic, and because the 2020 report was also delayed, this had to be completed before the 2021 report was finalised.

Corby Approval

- 2.16 The CBC 2021 ASR is yet to be approved due to its late submission.

¹⁵ Defra, Diffusion Tube Data Processing Tool v1.2, 2021

Table 3. Corby 2021 ASR summary

Declared AQMAs	Number of NO ₂ Diffusion Tubes	Additional Air Quality Monitoring	Number of Exceedances & Highest Concentration (brackets)	Air Quality Trends	Data QA/QC	Current AQAP Measures	Measures Updated since 2020?	COVID-19 Impacts	Additional Information	Submitted on time?	Defra Appraisal	Overall Score
CBC does not currently have any declared AQMAs.	17	CBC does not undertake any additional air quality monitoring.	CBC did not record any exceedances of the NO ₂ annual mean objective at any of its sites in 2020 (24.3 µg/m ³).	NO ₂ concentrations show a decreasing trend in Corby for the previous five years.	QA/QC procedures have been appropriately applied to the monitoring data.	CBC currently has five measures in place directly targeted towards air quality.	The measures targeted at tackling air quality have not been thoroughly updated since the 2020 ASR.	CBC has used the COVID-19 impact matrix in determining the impact of COVID-19, which the impact is described as 'Large'.	CBC does not have any additional appendices.	No	Not yet available.	6
1	1	0	1	1	1	1	0	0	0	0	0	

2.17 The overall strengths within CBC's 2021 ASR, and local air quality, are as follows:

- Air quality within CBC is showing an improving trend in recent years. In 2020, there were no designated AQMAs and there were also no exceedances of the annual mean NO₂ objective at any of the monitoring sites;
- Air quality trends in the previous five years have been presented and discussed, and a robust comparison to air quality objectives was provided;
- The Council has used the COVID-19 impact matrix in determining the impact of COVID-19 upon LAQM work; and
- QA/QC procedures have been applied appropriately, with relevant calculations and values clearly shown within the Appendix. In addition, details including who performed the tube analysis, the analytical solution used in the analysis and the PT results for the laboratory have been included, which has been suggested by Defra in their appraisal of previous ASRs.

2.18 Areas which can be improved in future ASRs, and air quality management, are as follows:

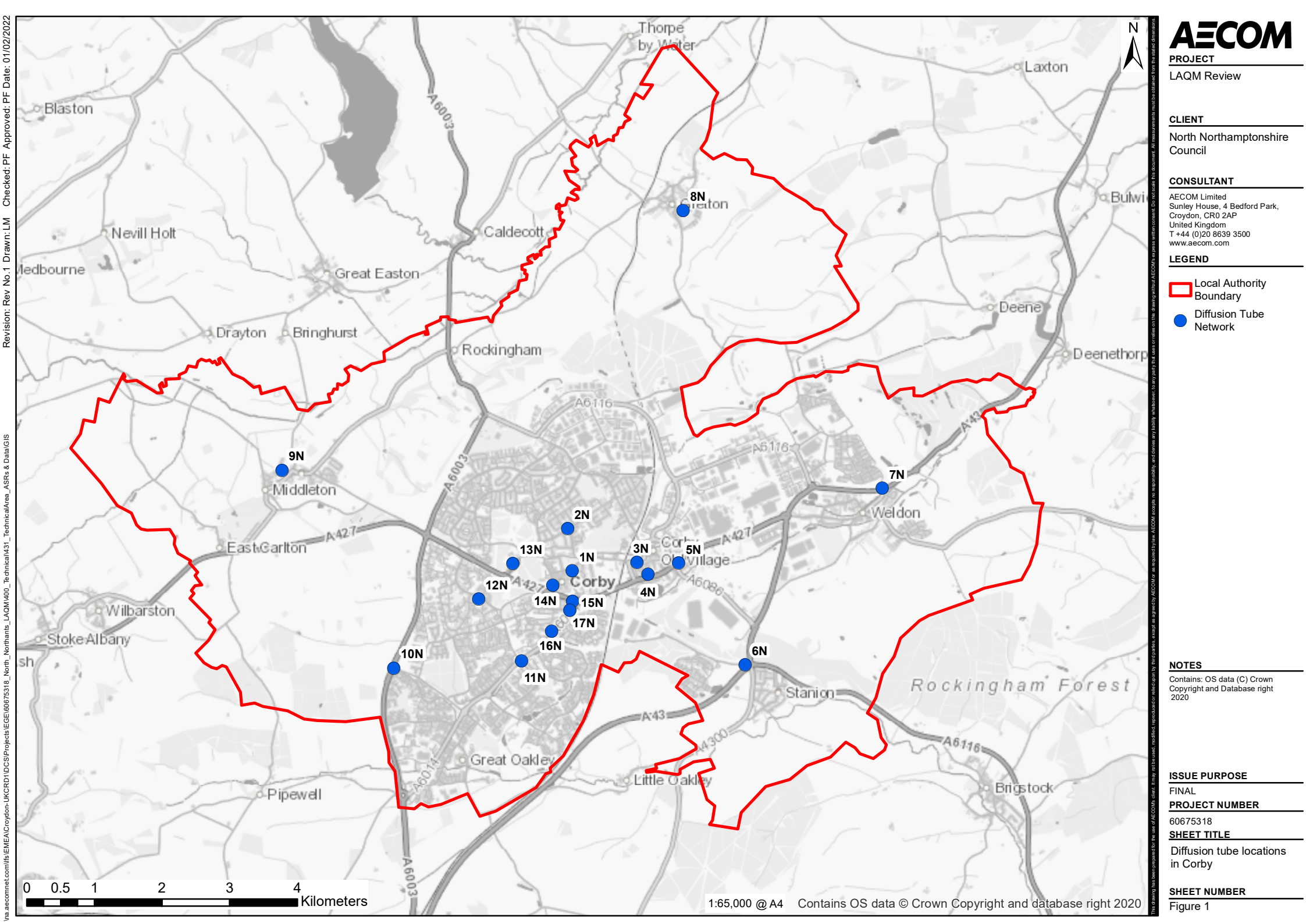
- The Council's ASR does not appear to have been approved by the relevant public health body. Greater public health engagement could help to improve the relevance of the actions within the ASR to local people;
- CBC's 2021 ASR was submitted after the original deadline due to resource delays as a result of the COVID-19 pandemic;
- The height of the diffusion tube at site 15N is not reported;
- Diffusion tube locations 6N, 7N, 11N and 13N, all of which are roadside locations are greater than the recommended 50m from relevant exposure; and
- There are a number of gaps within the table summarising the progress on measures to improve air quality. There could be more information provided on existing measures, and a more comprehensive review and update to relevant measures undertaken; and
- CBC should consider the monitoring of additional pollutants, such as PM₁₀ or PM_{2.5} to identify any potential new hotspots.

2.19 The recommendations for the combined 2022 ASR are as follows:

- The Council should aim to submit their 2022 ASR before the proposed deadline, to allow for a timelier appraisal and to follow up on any potential comments received;
- Ensure that monitoring heights and other metadata for all diffusion tube locations are included in the report;
- A review and refresh of action measures is recommended;
- The Council should consider closer collaboration with the relevant public health body in the preparation of the report;
- Regular liaison with West Northamptonshire Council (WNC) via a county wide pollution group is recommended; and
- Carry out a review of current diffusion tube locations to ensure that they are situated at locations which are best representative of relevant exposure.

Corby Air Quality Monitoring

2.20 A summary of the diffusion tube locations is shown in Figure 1.



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- Local Authority Boundary
- Diffusion Tube Network

NOTES

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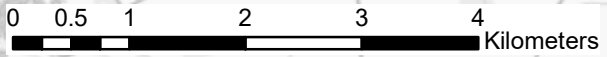
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SHEET TITLE

Diffusion tube locations in Corby

SHEET NUMBER

Figure 1



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- 2.21 Of the 17 current diffusion tube locations within the borough, 14 are classified as 'roadside' locations whereas three locations are classified as 'urban background'. To further improve the diffusion tube network within the borough, the repositioning of some locations should be considered as they are currently not representative of annual mean exposure. For instance, site 13N, located at Lakeside Health Centre, is listed as currently being positioned 317m from the point of relevant exposure. If this were to be positioned closer to a point of relevant exposure, it would provide a better understanding of the current air quality at locations where the objectives apply.
- 2.22 Generally speaking, the current sites do appear to cover the locations likely to represent worst-case concentrations within the urban centre of Corby itself, particularly around the A427 Westcott Way / Oakley Road Roundabout.
- 2.23 Table 4 provides a summary of the non-automatic monitoring sites within the borough.

Table 4. Summary of non-automatic monitoring locations in Corby.

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Height (m)
1N	Elizabeth Street	Roadside	488424	288706	22	1	3.4
2N	Occupation Road	Roadside	488354	289329	0	11	3.2
3N	High Street, Old Village	Roadside	489380	288833	0	6	3.6
4N	Scott Road	Roadside	489399	288605	7	1	2.0
5N	Weldon Road	Roadside	489997	288821	0	15	3.1
6N	Little Stanion/A43/A6116 Roundabout	Roadside	490981	287322	180	3	3.3
7N	Priots Hall/A43 Roundabout	Roadside	492992	289919	168	1	3.3
8N	Kirby Road, Gretton	Urban Background	490063	294032	0	15	3.5
9N	Berryfield Road, Cottingham	Urban Background	484133	290194	0	13	3.4
10N	Danesholm Road/A6003	Urban Background	485788	287272	89	5.6	3.3
11N	Oldland Road	Roadside	487675	287373	68	2.3	3.4
12N	Beanfield Avenue	Roadside	487039	288292	5	2	3.6
13N	Lakeside Health Centre	Roadside	487546	288816	317	1.5	3.8
14N	George Street	Roadside	488135	288494	84	1	3.2
15N	Westcott Way	Roadside	488180	288325	9	7	-
16N	Shannon Court	Roadside	488122	287817	0	10	3.4
17N	Gainsborough Rd	Roadside	488387	288122	12	1	3.2

2.24 Recommendations for CBC monitoring are as follows:

- CBC should consider the implementation of automatic continuous monitors if funding permits, to monitor concentrations of PM₁₀ and PM_{2.5} at potential hotspots within the borough;
- Additional monitoring could also be considered in Rockingham, due to residential buildings being located adjacent to the A6003. It is possible that these locations experience elevated concentrations of NO₂ as a result;
- Additional monitoring could also be considered at schools within the borough, as has been undertaken in many boroughs, since children are potentially more vulnerable to elevated pollutant concentrations; and
- Further monitoring could be considered near Weldon Road due to the location of the Tata Steel factory. Elevated concentrations might be expected in this vicinity due to the industrial process and the increased volume of heavy goods vehicles (HGVs). To the east of the site is a housing estate, and to the south of the site is Weldon C of E Primary School, both of which are sensitive receptors. Therefore, additional monitoring should be considered.

Kettering

Kettering LAQM History

2.25 A summary of Kettering Borough Council's (KBC) LAQM work to date is detailed as follows:

- KBC began collecting data using diffusion tubes in 2002, monitoring site types range from town centre roadside, to rural background locations. According to records on the LAQM Portal, a USA was carried out in 2002, prior to the first Progress Report in 2013.
- Progress Report (2013) - All AQS objectives were achieved, no likely exceedances of any objectives identified. No detailed assessments were undertaken in the borough and a review of the national monitoring data suggested that there was no need to monitor any other pollutants.
- Progress Report (2014) - All AQS objectives were achieved, no likely exceedances of any objectives identified. The scope of the air quality monitoring programme was amended at the end of June 2015. It was restarted in January 2016 to focus on areas of local congestion, high volumes of traffic, or where there are sensitive receptors in close proximity to roads.
- ASR (2016/2017) - All AQS objectives were achieved, no likely exceedances of any objectives identified. The borough was subject to rapid expansion at this time, with the development of large housing estates and mixed-use estates such as the East Kettering Urban Extension. Air quality assessments determined the impact to be insignificant, however the Council were looking to implement air quality incentives to reduce the impact.
- ASR (2018) – One location exceeded the annual mean NO₂ objective, at site KT11. A review of the monitoring locations was undertaken at the end of 2016. Monitoring at new locations and those that were to be retained into 2017 did not recommence until April 2017. One of the new locations, London Road, was close to the annual mean NO₂ objective and as such monitoring was continued into 2018. KBC continued to proactively encourage more sustainable travel through its planning policies, and the Council applied to the Office of Low Emission Vehicles for funding to install electric charging points in the borough.
- ASR (2019) - All AQS objectives were achieved, no likely exceedances of any objectives identified. The Council commissioned a detailed air quality assessment at London Road/St Mary's Road junction (KT11) as it continued to show elevated annual NO₂ concentrations in 2018.
- ASR (2020) – In June 2019, three new diffusion tube locations were added to the Council's monitoring network, with one of the locations showing an exceedance of the NO₂ annual mean objective (RW4). The Council were to continue monitoring at this location before the declaration of an AQMA. The results of the quantitative air quality assessment at the junction of London Road/St Mary's Road for the proposed changes to the traffic signals at this junction concluded that an exceedance may occur at the junction of London Road/Bowling Green Road. Monitoring data showed that the junction did not show any exceedance of the AQS objectives, however the Council concluded that they would continue to monitor at this junction.
- ASR (2021) - All AQS objectives were achieved, no likely exceedances of any objectives identified. The previous exceedance of the NO₂ annual mean objective was no longer an exceedance in 2020, therefore an AQMA was not recommended, though this is likely to be partly due to COVID-19 restrictions. Several new monitoring locations were introduced in areas which it was considered may potentially see exceedances of the AQS objectives in 2021 and beyond.

Kettering 2021 ASR

2.26 The Local Authority officer responsible for the KBC 2021 ASR was Rowan Castle. The 2021 ASR was produced by WSP.

Kettering AQMAs

2.27 KBC does not currently have any declared AQMAs. Site KT11 showed elevated NO₂ concentrations in 2017, 2018 and 2019 but did not exceed the objective. There was a reduction in annual mean NO₂ concentrations in 2020 potentially due to COVID-19 and a reduction in traffic flows. Site KW4 exceeded the objective in 2019 but not in 2020. The Council should continue monitoring at these locations and consider declaring an AQMA if there are exceedances in 2021.

Kettering NO₂ Diffusion Tubes

2.28 KBC undertook non-automatic (i.e. passive) monitoring of NO₂ at 45 locations during 2020. In the last five years, KBC has expanded its diffusion tube network from 32 to 45 sites. Two of these locations are classified as 'urban background', three are classified as 'façade' and the remaining are classified as 'roadside'.

Kettering Additional Monitoring

2.29 KBC do not undertake any additional monitoring of PM₁₀, PM_{2.5} or SO₂. KBC has not undertaken any additional monitoring of pollutants at any point in time. Therefore, there is a lack of historical data beyond NO₂.

Kettering Exceedances

2.30 KBC did not record any exceedances of either the annual or 1-hour mean NO₂ objective in 2020. However, the Council recorded an exceedance at RW4 in 2019 which was no longer an exceedance in 2020. This result could have been influenced by the COVID-19 pandemic.

Kettering Air Quality Trends

2.31 Concentrations of NO₂ have been steadily decreasing for the previous five years from 2016 to 2020. In 2020, concentrations at all sites reduced from 2019 by 25.8% on average, with a maximum decrease of 35.7%. This large reduction in NO₂ concentration is likely to be due to the COVID-19 pandemic that began in 2020 and resulted in reduced levels of traffic.

Kettering Data QA/QC

2.32 QA/QC procedures have been appropriately applied to the monitoring data; a national bias adjustment factor of 0.81 was applied to the raw diffusion tube measurements in the 2021 ASR which was obtained from the National Diffusion Tube Bias Adjustment Factor Spreadsheet Version 09/21¹⁴ and annualisation was applied to twelve sites due to insufficient data capture of less than 75%.

2.33 The Council has also included a figure showing the National Bias Adjustment Factor spreadsheet within the report, which is considered an example of good practice.

2.34 Diffusion tube analysis was conducted by Gradko International using the 20% TEA in water method.

Kettering Current Measures

2.35 KBC currently have eight measures in place targeted at improving air quality within the borough.

2.36 The eight measures currently listed in the 2021 ASR are as follows:

- Measure 1 – to engage with the East Midlands Air Quality network;
- Measure 2 – to implement the East Midlands Air Quality Planning Guidance, and to link to other local and regional polices;
- Measure 3 – the installation of electric vehicle charging points in the borough;
- Measure 4 – the introduction of environment charges through permit systems and economic instruments;
- Measure 5 – the enforcement of Environmental Permit Conditions;
- Measure 6 – to ensure planning conditions requiring construction/demolition management plans are to include dust suppression and to enforce dust/mud controls where no planning condition exists through legislation;
- Measure 7 – to implement an age policy for taxis; and
- Measure 8 – the promotion of cycling and walking.

2.37 Since many of these measures have not been updated since 2016, it is therefore difficult to determine the effectiveness of the current measures in place. However, each measure should in theory improve air quality, though many of these are indirect benefits through awareness and policy measures.

Kettering Relevance of Measures

2.38 The measures which are included in the KBC 2021 ASR are mainly out of date, with only one measure listed as expecting completion in 2020. All other measures are listed as expecting completion before 2020 and therefore are out of date and are considered to require updates.

2.39 For the 2022 ASR, a complete review of the current measures in place should be undertaken. This would help to determine current effectiveness of the measures, as well as the implementation of new measures targeted at improving air quality that may better reflect the current situation.

Kettering Utilisation of COVID-19 Guidance and Impact of Pandemic

2.40 The COVID-19 pandemic has imposed challenges/constraints upon LAQM within Kettering. The impacts of COVID-19 upon LAQM work in 2020 are detailed below:

- The implementation of measures aimed at air quality was not progressed during 2020, apart from the scooter scheme and electric vehicle charging points. This is mainly due to the various lockdowns implemented by the UK Government and staff shortages leading to little development of measures. This is described as a 'Medium' impact using the COVID-19 impact matrix;
- There was no improvement on the interactions between KBC and the public to spread the air quality message. This was due to the public and staff working from home, as well as the Council Offices being shut during most of 2020. This is described as a 'Medium' impact using the COVID-19 impact matrix.
- The monitoring survey was also impacted. During the March 2020 lockdown, diffusion tubes were put out in early March and not collected and analysed until late April, meaning the March exposure lasted for almost two months. This is described as a 'Small' impact using the COVID-19 impact matrix.

Kettering Additional Information

2.41 KBC did not include any additional appendices in the 2021 ASR.

Kettering Deadlines

2.42 The KBC 2021 ASR was submitted on time, however further information was required by the LAQM team at DEFRA, meaning the report was accepted past the original deadline.

Kettering Approval

2.43 The KBC 2021 ASR has been appraised. The appraisal concluded that the Council has shown good practice in continuing to have an AQAP even though they do not have an AQMA, and the implementation of seven new sites in 2020 also supports this. However, the appraisal suggested that KBC should continue to monitor around RW4 as it was the only exceedance in 2019, and that 2020 concentrations may have been influenced by the COVID-19 pandemic.

Table 5. Kettering 2021 ASR summary.

Declared AQMAs	Number of NO ₂ Diffusion Tubes	Additional Air Quality Monitoring	Number of Exceedances & Highest Concentration (brackets)	Air Quality Trends	Data QA/QC	Current AQAP Measures	Measures updated since 2020?	COVID-19 Impacts	Additional Information	Submitted on time?	Defra Appraisal	Overall Score
KBC does not have any currently declared AQMAs.	KBC had 45 diffusion tube monitoring sites in 2020.	KBC does not currently undertake any additional monitoring.	KBC did not record any annual mean NO ₂ exceedances in 2020 (28.8 µg/m ³).	Overall, in the previous five years annual mean NO ₂ concentrations have been steadily declining.	QA/QC procedures have been appropriately applied to the monitoring data.	KBC currently has eight measures targeted at tackling air pollution.	KBC has not updated their measures since 2020.	KBC has used the COVID-19 guidance, with the largest impacts classified as 'Medium'.	KBC does not have any additional appendices.	N	Y	8
1	1	0	1	1	1	1	0	1	0	0	1	

2.44 The overall strengths of the 2021 ASR, and local air quality, are as follows:

- KBC does not currently have any designated AQMAs, and in 2020 they did not record any exceedances of the annual mean NO₂ objective;
- Air quality trends in the previous five years have been presented and discussed, and a robust comparison to AQS objectives has been provided. Air quality is improving in Kettering;
- QA/QC procedures have been applied appropriately, with distance correction and annualisation calculations provided. The Council has also included a screenshot of the national bias adjustment spreadsheet provided by Defra, which was recommended by Defra during their appraisal of the 2019 ASR;
- The Council has shown willingness to further improve and extend their diffusion tube network, with seven new sites being added in 2020. This is considered an example of good practice; and
- The Council has used the COVID-19 impact matrix in determining the impact of COVID-19 upon LAQM work, and the maximum impacts are described as 'Medium', indicating the pandemic has been managed reasonably effectively.

2.45 Areas which can be improved in future ASRs, and air quality management, are as follows:

- An update of the measures which are specifically targeted at improving air quality within the borough. Even though KBC is not required to produce AQAP measures since there is no active AQMA within the borough, which does show good practice, the measures are out of date and therefore require an update;
- KBC should continue monitoring around RW4, and consider the implementation of an AQMA as there is a potential that the exceedance in 2019 could return in 2021 due to the lifting of travel restrictions imposed by the COVID-19 pandemic;
- The Council's ASR has not been approved by the relevant public health body; and
- KBC's 2021 ASR was submitted after the original deadline.

2.46 The recommendations for the Council's 2022 ASR are as follows:

- KBC should aim to submit the 2022 ASR before the deadline;
- Greater collaboration with the relevant public health body should be sought;
- KBC should continue monitoring around RW4, as it was the only exceedance of the annual mean NO₂ objective in 2019;
- Regular liaison with WNC via a county wide pollution group is recommended; and;
- KBC should aim to update the measures which are targeted at improving air quality within the borough; and
- KBC could investigate the implementation of automatic continuous monitors, to monitor PM₁₀ and PM_{2.5} in the aim of identifying any potential hotspots.

Kettering Air Quality Monitoring

2.47 A summary of the diffusion tube locations is shown in Figure 2 and Figure 3.

- Diffusion Tube Network
- Local Authority Boundary

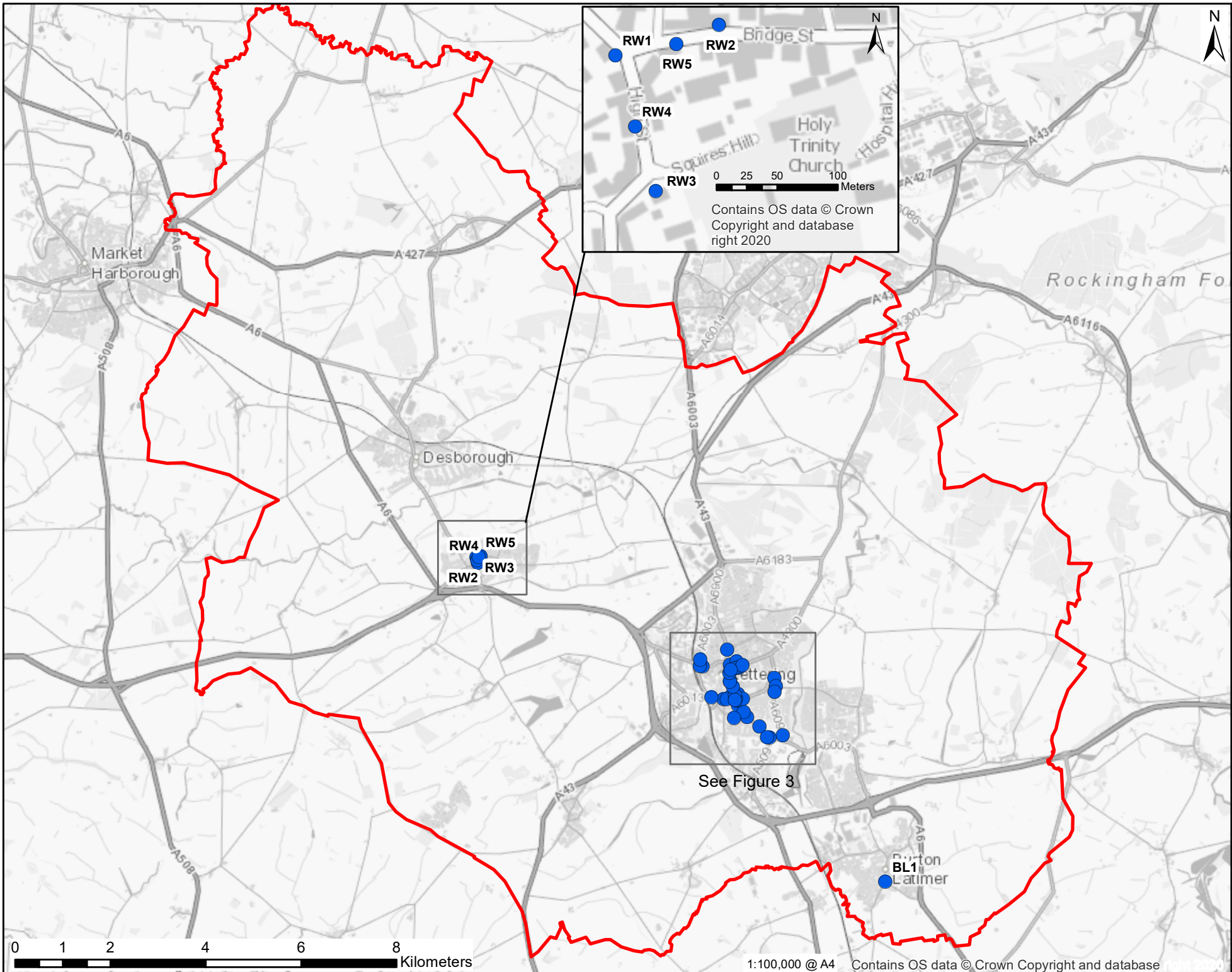
Contains: OS data (C) Crown Copyright and Database right 2020

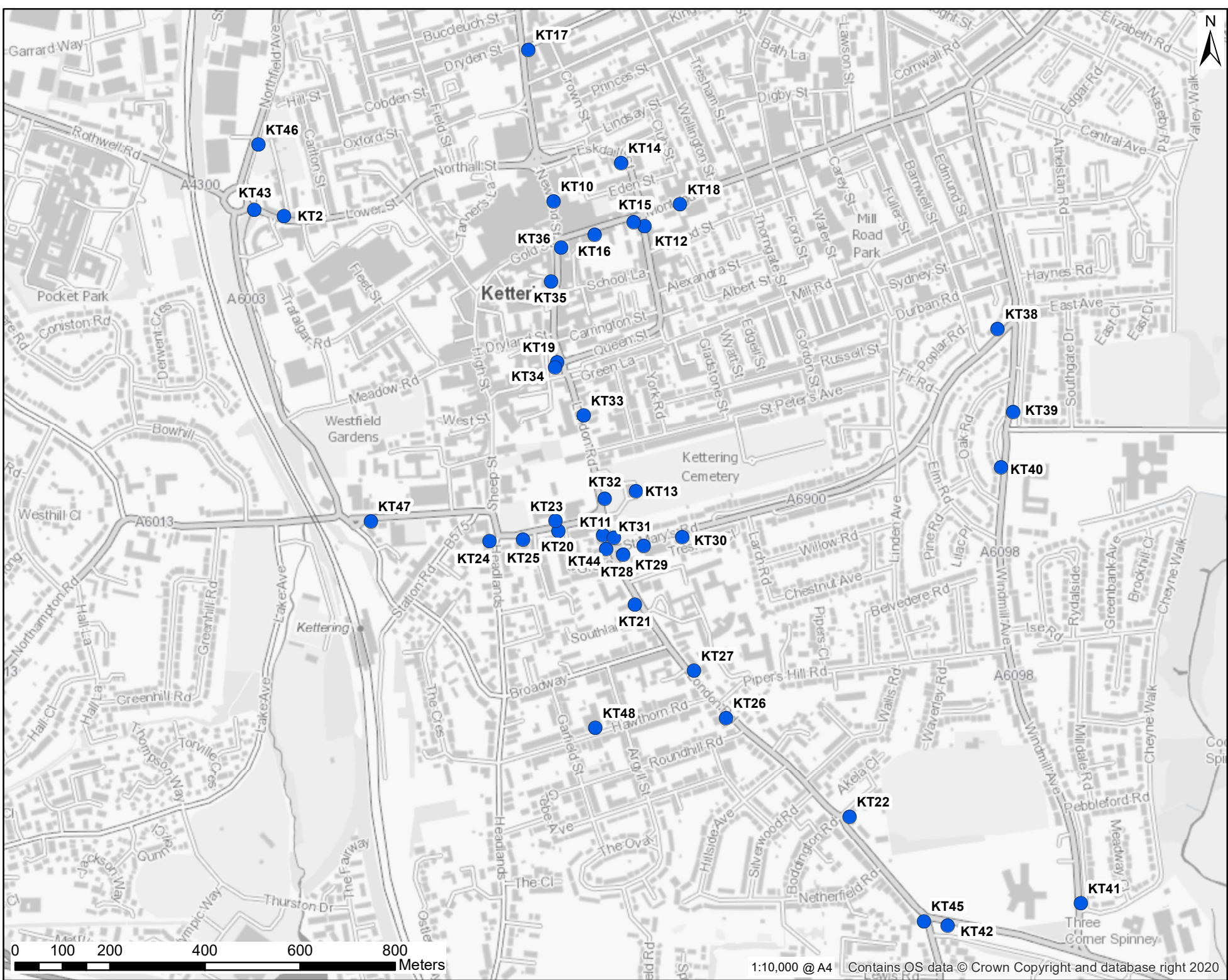
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Diffusion tube locations in Kettering

Figure 2





2.48 Of the 45 diffusion tube locations within the borough, two locations are classified as 'urban background', three are classified as 'façade' and the remaining locations are classified as 'roadside'.

2.49 Additional monitoring should be introduced around RW4 as this was the only exceedance of the NO₂ annual mean objective in 2019. Since there was no exceedance recorded in 2020, which could have potentially been influenced by the COVID-19 pandemic, further monitoring at and around this site should be implemented to try and identify the extent of a potential hotspot of poor air quality within the borough.

2.50 Table 6 provides a summary of the non-automatic monitoring sites in Kettering.

Table 6. Summary of the non-automatic monitoring sites in Kettering.

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Height (m)
KT2	Lower St by flats	Roadside	486215	278916	1.3	3.5	2.5
KT10	Newlands Street	Façade	486783	278948	2.7	2.7	2.4
KT11	London Road/Bowling Green Road	Roadside	486887	278246	2.3	2.6	2.4
KT12	Victoria Street	Roadside	486974	278895	1.7	1.5	2.7
KT13	London Road cemetery	Urban background	486956	278338	69.9	2.0	2.5
KT14	Eden Street/Eskdail St	Roadside	486925	279028	1.9	1.6	2.4
KT15	Montagu St o/s Pauls	Roadside	486951	278904	3.1	0.5	2.3
KT16	Montagu Street o/s Bostons Diner	Roadside	486869	278877	1.3	0.4	2.3
KT17	Regent Street o/s no 2	Roadside	486729	279266	1.0	1.9	2.5
KT18	Stamford Road o/s J. Witness	Roadside	487049	278942	3.2	2.6	2.4
KT19	School Lane/Tordoff Place	Roadside	486854	278689	3.6	1.6	2.2
KT20	Bowling Green Road o/s no 9	Roadside	486793	278254	10.7	1.3	2.4
KT21	London Road/Southlands	Roadside	486954	278099	3.9	0.5	2.4
KT22	Woodcroft Way by flats	Roadside	487406	277653	5.7	2.0	2.1
KT23	Bowling Green Road o/s Council offices	Roadside	486787	278276	7.3	0.6	2.4
KT24	Sheep Street o/s HSS Hire shop	Roadside	486648	278233	6.4	3.4	2.4
KT25	o/s 47 Bowling Green Road	Roadside	486718	278236	3.7	1.7	2.4
KT26	112 London Road	Roadside	487146	277860	4.1	2.8	2.4
KT27	London Rd o/s Angels nursery	Roadside	487078	277960	4.5	1.8	2.4
KT28	London Rd/St Mary's Road Junction	Roadside	486929	278204	18.4	1.4	2.4
KT29	opp 1 St Mary's Road	Roadside	486972	278223	5.9	1.0	2.3

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Height (m)
KT30	o/s 2 St Mary's Road	Roadside	487054	278241	5.1	1.0	2.3
KT31	London Rd o/s pocket park	Roadside	486910	278240	42.3	2.9	2.4
KT32	London Rd o/s cemetery	Roadside	486890	278322	14.1	2.0	2.4
KT33	o/s 15 London Road	Roadside	486846	278497	6.1	0.4	2.4
KT34	Horsemarket Bus Stop	Roadside	486786	278599	19.5	0.8	2.3
KT35	Silver Street opp Café Culture	Roadside	486778	278779	4.0	0.8	2.3
KT36	o/s Simpson & Partners	Roadside	486799	278850	5.6	2.0	2.4
KT38	o/s 157 St Marys Rd	Roadside	487718	278679	6.2	1.5	2.2
KT39	o/s 144 Windmill Ave	Roadside	487751	278505	19.5	2.3	2.3
KT40	o/s 141 Windmill Ave	Roadside	487725	278388	11.3	0.8	2.2
KT41	Windmill Ave Junc Barton Rd	Roadside	487893	277471	18.4	1.7	2.1
KT42	Wicksteed Houses	Roadside	487613	277424	27.3	0.9	2.5
KT43	Lower St/Northfield Ave Junc	Roadside	486153	278930	8.0	3.2	2.4
KT44	o/s St Edwards Church London Rd	Roadside	486894	278216	5.0	2.3	2.5
KT45	Pytchley Road o/s No 6	Roadside	487563	277433	24.0	1.0	2.5
KT46	Northfield Av opp Carpet Right	Roadside	486161	279067	7.1	1.2	2.6
KT47	Northampton Road/Drill Hall Court flats	Roadside	486398	278274	1.3	2.5	2.5
KT48	Hawthorn Road o/s School	Roadside	486871	277840	3.0	4.7	2.3
BL1	Higham Rd/Finedon Rd Junc	Roadside	490048	274399	2.0	5.4	2.4
RW1	Opposite Old Bank	Roadside	481465	281208	2.1	1.6	2.3
RW2	Post Office High St	Façade	481550	281233	1.8	1.8	2.4
RW3	o/s Wheelwright House Squires Hill	Roadside	481498	281096	1.5	2.8	2.3
RW4	o/s ST Flooring	Façade	481481	281149	0.3	2.1	2.4
RW5	o/s Something Special Bridge St	Roadside	481515	281217	2.5	0.5	2.3

2.51 Recommendations for KBC monitoring are as follows:

- Budget permitting, KBC could consider the implementation of automatic continuous monitors to monitor concentrations of PM₁₀ and PM_{2.5} to enhance the understanding of other pollutants in the borough;
- KBC could also consider further monitoring in the village of Broughton because it is situated on the A43 into Kettering, and therefore has the potential to experience increased concentrations of NO₂ due to emissions from vehicular traffic; and
- Additional monitoring could also be considered at schools within the borough, as has been undertaken in many boroughs, since children are potentially more vulnerable to elevated pollutant concentrations.

East Northamptonshire

East Northamptonshire LAQM History

2.52 A summary of ENC's (ENC) LAQM work to date is detailed as follows:

- Stage 1 Report (1999/2000) – The first-round assessment concluded that the AQS objectives were expected to be met by their target dates.
- Stage 2 Report (2000/2003) – This identified two sources that caused concern with respect to concentrations of NO₂ and PM₁₀, which were the A6 in Higham Ferrers and Rushden, and a newly opened landfill site, Slipe Clay Pit. The Environmental Statement of the Rushden/Higham Ferrers bypass concluded that air quality would improve as a result of the opening of the bypass and link road. The operator of Slipe Clay Pit landfill site commissioned an air quality assessment in the vicinity of the landfill site, which recommended actions to reduce and monitor emissions from the site. It was concluded that a detailed assessment of the PM₁₀ concentrations in the vicinity of the landfill site was therefore not necessary.
- Progress Report (2004/2005) – The report provided an update on monitored air quality concentrations and developments that may affect air quality in the borough.
- USA (2006) – This report concluded that the AQS objectives for benzene, 1,3-butadiene, carbon monoxide, lead and SO₂ would be met. In 2005, the annual mean NO₂ concentration in the vicinity of Newton Road exceeded the AQS objectives. A subsequent Detailed Assessment concluded that an AQMA was not required for this area, however the report recommended continued monitoring as well as the implementation of more diffusion tube locations. It was also recommended that the Council install three co-located diffusion tubes at one location in Newton Road, to estimate local precision of diffusion tube measurements for future LAQM work.
- Progress Report (2007/2008) – The reports concluded that there were no exceedances in 2006 or 2007 of the AQS objectives.
- USA (2009) – The 2009 report identified that the presence of the Dodson and Horrell Ltd animal feed processing plant indicated the potential for significant releases of PM₁₀ emissions. A Detailed Assessment was undertaken, which indicated that the seven stacks would not significantly contribute to the ambient PM₁₀ concentrations in comparison to background levels.
- Progress Report (2010) – The report concluded that there was no requirement to undertake any detailed assessments within the district, as all pollutants met the AQS objectives.
- Progress Report (2011) – The report highlighted exceedances of the annual mean NO₂ objective at places of relevant exposure. Diffusion tube ENH 14-16 at Newton Road exceeded the objective, close to the Rushden Recycling Centre. However, the Centre was closed on 1st August 2011, whereafter air quality was expected to improve, so no AQMA was declared. Following this, no exceedances of the annual mean NO₂ objective were noted.
- Between 2012 and 2016, ENC produced two USAs, one Progress Report and one ASR. These reports concluded that all AQS objectives were achieved, and that there were no likely exceedances of any objectives identified.
- ASR (2017) – The report concluded that all monitoring locations were within the AQS objectives in 2016, however in comparison with 2016, all monitoring sites apart from one showed an increase in monitored concentrations. Annual mean NO₂ concentrations greater than 35 µg/m³ were recorded at four sites in the borough. These sites were ENC9A, ENC14/15/16, ENC17 and ENC19.
- ASR (2018) – The report concluded that annual mean NO₂ concentrations were below the AQS objectives in 2017. However, the majority of sites had shown a slight increase in NO₂ concentrations versus 2016. One site remained within 10% of the annual mean objective (ENC14/15/16).
- ASR (2019) – The report concluded that annual mean NO₂ concentrations were below the AQS objectives in 2018. Following a review of the existing monitoring network, there were a number of changes made to the locations of NO₂ diffusion tubes. The triplicate site at Newton Road was replaced by a single tube, and an additional nine sites were introduced into the network. Six of these sites were classified as 'roadside', two were classified as 'urban background' and one was classified as 'kerbside'.

- ASR (2020) – The report concluded that annual mean NO₂ concentrations were below that of AQS objectives in 2019, though two sites (ENC 13 and ENC 24) measured values within 10% of the objective. However, following distance correction, the annual mean concentrations were well below the objective. Following a review of the existing network, one additional NO₂ diffusion tube site was introduced into the network, classified as ‘roadside’ outside 123 Northampton Road. Benzene monitoring was removed due to consistent low readings over recent years and therefore the Council deemed this surplus to requirements.
- ASR (2021) – The report concluded that annual mean NO₂ concentrations were below the AQS objectives in 2020, and that there were no annual mean concentrations within 10% of the objective, which is the first time in over five years this has been recorded. However, this reduction can likely be attributed to the influence of COVID-19 upon pollutant concentrations.

East Northamptonshire 2021 ASR

2.53 The Local Authority officer responsible for ENC is Caroline Ellis. The ENC 2021 ASR was produced by Bureau Veritas.

East Northamptonshire AQMAs

2.54 ENC currently does not have any designated AQMAs.

East Northamptonshire NO₂ Diffusion Tubes

2.55 ENC undertook non-automatic (i.e. passive) monitoring of NO₂ at 33 sites during 2020. For the previous five years, ENC have expanded their diffusion tube network from 28 sites to 33 sites.

East Northamptonshire Additional Monitoring

2.56 ENC does not undertake any additional monitoring of PM₁₀, PM_{2.5} or SO₂. ENC has not undertaken any additional monitoring at any point in time.

East Northamptonshire Exceedances

2.57 ENC did not record any exceedances of the annual mean NO₂ objective in 2020. In addition, there were no monitoring locations with an annual mean within 10% of the objective. Between the years of 1999 and 2021, exceedances were recorded only in 2011. These exceedances were related to a recycling centre which closed down in August of that year.

East Northamptonshire Air Quality Trends

2.58 Over the previous five years, the district has shown a decreasing trend in NO₂ concentrations. Since 2016, there have been no exceedances of the NO₂ annual mean AQS objective at any monitoring location within East Northamptonshire. When comparing annual mean concentrations between 2019 and 2020, all monitoring sites have experienced a noticeable decrease in concentration of greater than 10% for all diffusion tube sites.

East Northamptonshire Data QA/QC

2.59 QA/QC procedures have been appropriately applied to the monitoring data; a national bias adjustment factor of 0.81 was applied to the raw diffusion tube measurements in the 2021 ASR, which was obtained from the National Diffusion Tube Bias Adjustment Factor Spreadsheet Version 09/21¹⁴, annualisation was not applied to the data as all diffusion tube monitoring locations recorded data capture of 75% or more therefore it was not required and no diffusion tube monitoring locations required distance correction during 2020.

2.60 Diffusion tube analysis was conducted by Gradko International using the 20% TEA in water method.

East Northamptonshire Current Measures

2.61 ENC does not currently have any AQMAs therefore they are not required to produce an AQAP. However, several measures are being taken forward by the Council in response to air quality concerns across the district.

2.62 The measures are detailed as follows:

- The Environmental Protection team is consulted on all relevant planning applications and/or enquires, early discussions are encouraged with the applicant in respect to air quality and prevention or mitigation measures;

- All new planning applications continue to be directed to the requirements of the East Midlands Air Quality Network (EMAQN) 'Air Quality and Emissions Mitigation – Guidance for Developers'. This is an effective measure of tackling air quality issues associated with development, as it ensures that 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; and
 - Regular liaison with WNC via a county wide pollution group is recommended.
- 2.63 ENC are also continuing to take measures to reduce PM_{2.5} concentrations within the borough, which are detailed as follows:
- Requiring planning applications which have the potential to emit dust during site preparation and construction are to submit a construction/demolition management plan that addresses dust mitigation and management practices;
 - Investigate dust complaints, taking enforcement action if appropriate;
 - Encourage people not to burn garden waste but use the garden waste recycling scheme;
 - Provide good practice advice on how to operate open house fire or log-burners, promoting the Woodsure Ready to Burn Scheme;
 - Hackney cabs and private hire vehicles are restricted by an age policy that requires vehicles to be less than four years old;
 - Industrial installations are inspected regularly to ensure that they are compliant with the permit conditions;
 - Local highways and roads are wet swept as part of a proactive maintenance scheme to reduce the amount of dust build up that could become mobile in warmer weather;
 - ENC continues to work in partnership with schools for the 'anti-idling campaign';
 - Physical activity and healthy lifestyle choices are encouraged; and
 - Development mitigation measures encourage active travel. ENC have been working on The East Northamptonshire Greenway, which makes for attractive and safer walking and cycling routes in the heart of the Nene Valley.
- 2.64 These measures are effective at tackling air pollution within the borough as they are targeted at reducing concentrations of PM_{2.5}. There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases. Therefore, the measures targeted at PM_{2.5} should help significantly in the reduction of concentrations, and subsequently protect the health of residents.

East Northamptonshire Relevance of Measures

- 2.65 The East Northamptonshire measures targeted at tackling air pollution have not been updated since the 2017 ASR. A thorough review of the measures should therefore be undertaken, as well as an attempt to quantify the impact current measures have had thus far to assess their efficacy. Further measures can then be added as appropriate.

East Northamptonshire Utilisation of COVID-19 Guidance and Impact of Pandemic

- 2.66 COVID-19 has provided challenges for ENC with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Defra issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR and where applicable, this advice has been followed.
- 2.67 Due to COVID-19, very little time was afforded to implementing air quality initiatives due to resources being redirected elsewhere. Therefore, projects and initiatives were pushed back to future dates, but it was anticipated that these would be brought back into focus in 2021/22. The Council should ensure that this is the case as the pandemic's effects begin to lessen.
- 2.68 Within the 2021 ASR, the COVID-19 impact matrix was provided but not applied to quantify the impacts of COVID-19 upon LAQM work.

East Northamptonshire Additional Information

- 2.69 The Council has included an additional appendix containing comments from their Public Health team on their 2021 ASR, demonstrating collaboration in tackling air quality concerns.

East Northamptonshire Deadlines

2.70 ENC's 2021 ASR was submitted before the original deadline.

East Northamptonshire Approval

2.71 ENC's 2021 ASR has been appraised. The appraisal concluded that the additional comments from their Public Health team is an example of good practice, demonstrating collaboration in tackling air quality concerns.

Table 7. East Northamptonshire 2021 ASR summary.

Declared AQMAs	Number of NO ₂ Diffusion Tubes	Additional Air Quality Monitoring	Number of Exceedances & Highest Concentration (brackets)	Air Quality Trends	Data QA/QC	Current AQAP Measures	Measures updated since 2020?	COVID-19 Impacts	Additional Information	Submitted on time?	Defra Appraisal	Overall Score
ENC does not have any currently declared AQMAs.	ENC had 33 diffusion tube monitoring sites in 2020.	ENC does not currently undertake any additional monitoring.	ENC did not record any annual mean NO ₂ exceedances in 2020 (26.9 µg/m ³).	Overall, in the previous five years annual mean NO ₂ concentrations have been steadily declining.	QA/QC procedures have been appropriately applied to the monitoring data.	ENC currently has thirteen measures in place aimed at tackling air quality.	The measures have not been updated since 2017.	ENC has not used the COVID-19 impact matrix within their report.	ENC has included the public health contact comments in the appendix.	Y	Y	9
1	1	0	1	1	1	1	0	0	1	1	1	

2.72 The overall strengths of the 2021 ASR, and local air quality, are as follows:

- The 2021 ASR was submitted ahead of the submission deadline;
- ENC does not currently have any AQMAs and the Council recorded no exceedances of the annual mean NO₂ objective in 2020;
- Air quality trends in the previous five years have been presented and discussed, and a robust comparison to air quality objectives has been provided;
- QA/QC procedures have been applied appropriately, with distance correction and annualisation calculations provided in the Appendix; and
- ENC included comments from the public health contact in the appendix.

2.73 Areas which can be improved in future ASRs, and air quality management, are as follows:

- ENC did not use the COVID-19 impact matrix in determining the impact of COVID-19 upon LAQM work;
- ENC did not undertake any additional monitoring in 2020; and
- ENC should conduct a review of the current measures in place targeting air quality and update measures where necessary.

2.74 The recommendations for the combined 2022 ASR are as follows:

- If the Covid-19 impact matrix is required in this report, then the matrix should be used to determine the impact of COVID-19 upon LAQM work;
- There are currently no designated AQMAs in East Northamptonshire, therefore there is no requirement to produce an AQAP. However, for best practice, the 2022 ASR should include a summary table of the measures which are in place relevant to air quality;
- Regular liaison with WNC via a county wide pollution group is recommended;
- ENC could quantify the impact of current measures aimed at tackling PM_{2.5} concentrations; and
- ENC should review existing measures in place and update where necessary.

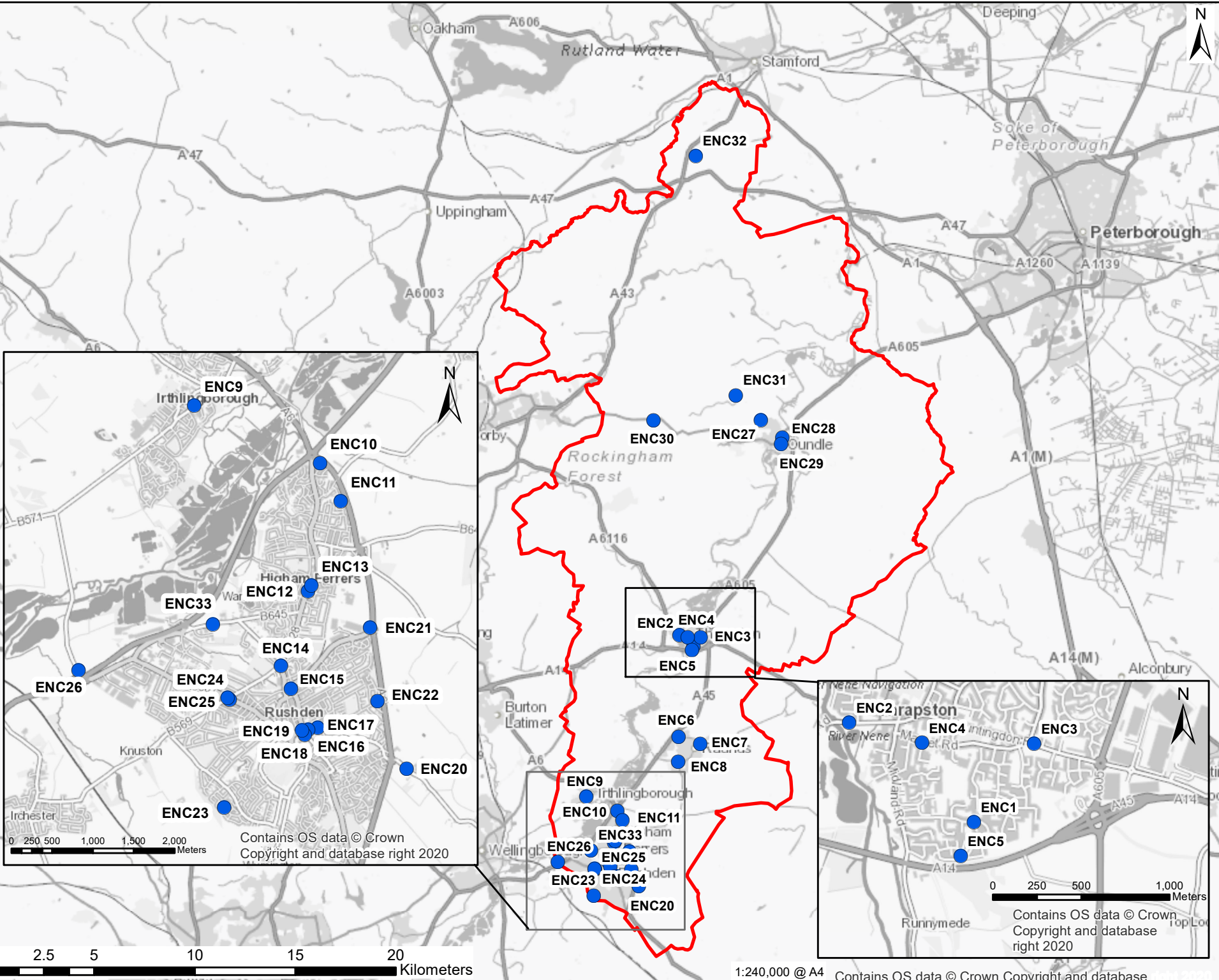
East Northamptonshire Air Quality Monitoring

2.75 A summary of the current diffusion tube locations is shown in Figure 4.

Revision: Rev.No.1, Drawn: L.M., Checked: P.F., Approved: P.F., Date: 01/02/2020

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- Diffusion Tube Network
- Local Authority Boundary



0 2.5 5 10 15 20 Kilometers

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NOTES

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60675318

SHEET TITLE

Diffusion tube locations in East Northamptonshire

SHEET NUMBER

Figure 4

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- 2.76 Of the 33 current diffusion tube locations within the borough, 27 locations are classified as 'roadside' whereas the remaining 6 locations are classified as 'urban background'. Generally, the majority of the sites are at locations which best represent relevant exposure; however, ENC should consider repositioning sites ENC 3, ENC 6, ENC 20, ENC 22, ENC 23, ENC 27 and ENC 31 to positions where they are less than 10m from the nearest relevant exposure.
- 2.77 To improve the diffusion tube network in East Northamptonshire, the Council should consider the repositioning of diffusion tubes where concentrations are historically low. Some sites which the Council should consider repositioning are ENC 4, ENC 8, ENC 18, ENC 23, ENC 30 and ENC 31. This could allow for the identification of potential new hotspots within the borough whilst maintaining the same budget.
- 2.78 Table 8 provides a summary of the non-automatic monitoring locations within the borough.

Table 8. Summary of the non-automatic monitoring locations in East Northamptonshire.

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Inlet Height (m)
ENC 1	Oakleas Rise (no.37)	Urban Background	499867	278066	1.0	1.5	3.0
ENC 2	Traffic light on bridge, Bridge St (no.34)	Roadside	499161	278629	3.0	1.7	2.5
ENC 3	Huntingdon Rd	Roadside	500208	278510	18.0	3.0	2.8
ENC 4	Market Rd, corner of Grove Road (no.32)	Roadside	499573	278515	1.0	1.5	2.7
ENC 5	Junction Way (no.36)	Urban Background	499792	277873	N/A	1.6	2.5
ENC 6	Brick Kiln Road	Roadside	499119	273561	14.0	2.0	2.3
ENC 7	Wheelwright Close (no. 8)	Urban Background	500193	273219	5.0	1.0	2.9
ENC 8	London Road adj to 60 Titty Ho	Roadside	499103	272329	2.0	2.4	2.5
ENC 9	High Street	Roadside	494525	270591	5.0	1.6	2.5
ENC 10	Kestrel Close (opp no.23)	Urban Background	496068	269885	5.0	37.0	2.6
ENC 11	Elizabeth Way (no.34)	Roadside	496320	269420	8.0	1.6	3.0
ENC 12	High St	Roadside	495920	268317	6.0	1.3	2.9
ENC 13	High St outside 18/20	Kerbside	495962	268388	6.0	0.9	2.7
ENC 14	Higham Rd (no.16) / Washbrook Rd junction	Roadside	495587	267402	7.0	1.9	2.5
ENC 15	Beaconsfield Terrace	Roadside	495711	267120	3.0	1.6	2.6
ENC 16	Newton Road (no.42)	Roadside	496039	266643	7.0	1.8	2.4
ENC 17	Newton Road (no.18)	Roadside	495924	266621	1.0	1.5	2.7
ENC 18	Park Place (near entrance)	Roadside	495883	266560	3.0	1.5	2.9
ENC 19	Newton Road	Roadside	495849	266613	2.0	1.3	2.9

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Inlet Height (m)
ENC 20	Newton Rd, over A6 (Outside Lodge Farm)	Roadside	497127	266143	13.0	2.3	2.4
ENC 21	A6/Spire Way Roundabout	Roadside	496682	267872	N/A	3.3	2.2
ENC 22	Hayden Road	Urban Background	496772	266967	10.0	1.6	2.6
ENC 23	Farnham Drive (no.64)	Roadside	494895	265669	12.0	2.1	2.8
ENC 24	Washbrook Road crossroads (217 Wellingborough Road)	Roadside	494963	266988	3.0	1.7	2.5
ENC 25	Washbrook Road crossroads (218 Wellingborough Rd)	Roadside	494936	267014	5.0	1.6	2.6
ENC 26	Ditchford Road	Roadside	493108	267347	N/A	1.5	2.2
ENC 27	Wentworth Drive (opp no.19)	Roadside	503209	289307	10.0	1.5	2.6
ENC 28	North St (no.58)	Roadside	504272	288433	3.0	1.8	2.8
ENC 29	St Osyths Lane	Roadside	504222	288110	1.3	1.1	2.8
ENC 30	5 Laamas Cottages	Roadside	497862	289284	7.0	1.3	2.8
ENC 31	Top Road	Roadside	501961	290525	15.0	1.5	2.1
ENC 32	Woodfield, Collyweston	Urban Background	499960	302429	6.0	1.9	2.4
ENC 33	Outside Stables 123 Northampton Road	Roadside	494755	267911	7.0	0.8	2.7

- 2.79 ENC should consider the implementation of automatic continuous monitors, to monitor concentrations of PM₁₀ and PM_{2.5} at potential hotspots within the borough.
- 2.80 ENC should consider the monitoring of NO₂ in Irthlingborough, as it is situated near to the A6. This is an area where diffusion tubes currently positioned at areas of low concentrations could be repositioned too. This area has sensitive receptors including residential properties and schools such as Irthlingborough Junior School.
- 2.81 ENC should consider monitoring around the Biogen Westwood site in Rushden, as located approximately 1.5km north-west from the site is Avenue House Nursing & Care Home. This is because elderly residents at the care home are potentially more vulnerable to elevated pollutant concentrations.
- 2.82 Additional monitoring could also be considered at schools within the borough, as has been undertaken in many boroughs, since children are potentially more vulnerable to elevated pollutant concentrations.

Wellingborough

Wellingborough LAQM History

2.83 A summary of Wellingborough Borough Council's (WBC) LAQM work to date is detailed as follows:

- Stage 1 (2001) – The first round of review was completed in 2001, which included a Detailed Stage III assessment by consultants National Enviro Technology Centre for NO₂ and particulates. The report concluded that there was no need to declare an AQMA for Wellingborough as it was unlikely there would be any exceedances of the AQS objectives.
- Stage 2 (2005) – The second round of review and assessment was completed in 2005 and again included a Detailed Assessment in light of existing levels of NO₂ and PM₁₀ and proposed development in the area. The report concluded that there was no current risk of exceedance of the AQS objectives and that an AQMA should not be declared. However, it was recommended that NO₂ in Elsdon Road should continue to be monitored.
- Between 2006 and 2008, WBC produced one USA and two Progress Reports. The reports concluded that AQS objectives were unlikely to be exceeded.
- In 2007, Highways commissioned Atkins to undertake a Detailed Assessment of NO₂ within Wellingborough. As part of the assessment, Atkins developed a comprehensive air quality model for the borough. The air quality base year model (2005) took into account existing air quality data, current and proposed AQMAs, key roads, other road sources via grid emissions, street canyons, major car parks, bus stations and industrial area sources. The model also used data from existing transport models and data from extra NO₂ tubes and continuous analysers installed at various locations around the County. The air quality modelling base year results revealed that roads were not a key source of NO₂ in parts of Wellingborough. The results also showed that there was no need for an AQMA within Wellingborough based on NO₂ emissions. The 2010 Do-Minimum Air Quality Model included all road schemes and land development schemes to 2010, in addition to the other factors listed above. The 2010 air quality model determined that no AQMAs would need to be declared for Wellingborough with regard to NO₂ and that there were no areas at risk of exceeding the air quality objective for NO₂.
- Updating and Screening Assessment (2009) – The report concluded that the relevant AQS objectives for 1,3 butadiene, benzene, carbon monoxide, lead, NO₂ and PM₁₀ were being met in the area, and that emissions of these pollutants were likely to decrease in the future due to national and local measures.
- Between 2010 and 2016, WBC produced two Progress Reports, two USAs and one ASR. The reports concluded that there were no exceedances of the annual mean NO₂ objective.
- WBC did not produce a further ASR until 2021 but did continue air quality monitoring via NO₂ diffusion tubes throughout this time.
- ASR (2021) - The report concluded that there were no exceedances of the annual mean NO₂ objective. The results of the monitoring highlight a decreasing trend in NO₂ concentrations over the previous five years. Recorded concentrations were significantly lower in 2020 compared to 2019.

Wellingborough 2021 ASR

2.84 The Local Authority contact responsible for the 2021 WBC was Catherine Clooney. The 2021 ASR was produced by AECOM, on behalf of WBC.

Wellingborough AQMAs

2.85 WBC does not currently have any AQMAs.

Wellingborough NO₂ Diffusion Tubes

2.86 WBC undertook non-automatic (i.e. passive) monitoring of NO₂ at 11 sites during 2020. In the previous five years, WBC has expanded their diffusion tube monitoring network from 10 to 11 sites. Wellingborough Council has not undertaken any automatic monitoring in their history.

Wellingborough Additional Monitoring

2.87 WBC does not undertake any monitoring of additional pollutants such as PM₁₀, PM_{2.5} or SO₂.

Wellingborough Exceedances

2.88 WBC recorded no exceedances of the annual mean NO₂ objective in 2020 at any of their 11 NO₂ diffusion tube sites. However, it should be noted that these concentrations are expected to have been lower because of the COVID-19 pandemic and its associated lockdowns, leading to a reduction in vehicle traffic.

Wellingborough Air Quality Trends

2.89 Concentrations of NO₂ in Wellingborough have shown an overall steady decline in recent years. Since 2016, there have been three exceedances of the NO₂ annual mean objective, all of which were at Site 1 (Silver Street), with the most recent exceedance occurring in 2019.

2.90 Between 2016 to 2018, concentrations of NO₂ at all eleven diffusion tube locations showed a steady decline year on year. However, in 2019, concentrations of NO₂ then increased compared to 2018 at all diffusion tube sites. When comparing annual mean NO₂ concentrations between 2019 and 2020, all monitoring sites have experienced a noticeable decrease in annual mean NO₂ concentrations.

Wellingborough Data QA/QC

2.91 QA/QC procedures have been appropriately applied to the monitoring data; a national bias adjustment factor of 0.81 was applied to the raw diffusion tube measurements in the 2021 ASR, which was obtained from the National Diffusion Tube Bias Adjustment Factor Spreadsheet Version 09/21¹⁴. Annualisation was applied at one of the monitoring locations, Site 9 at Market Street as it recorded a data capture of 58.3%. The report highlights the annualisation summary, and all the values which were used to calculate the annualised mean. No diffusion tube monitoring locations required distance correction during 2020.

2.92 Diffusion tube analysis was conducted by Gradko International using the 20% TEA in water method.

Wellingborough Current Action Measures

2.93 WBC have seven measures in place aimed at improving air quality.

2.94 The seven measures and their efficiency are detailed as followed:

- Measure 1 – *The Council adopted the 'Air Quality and Emissions Mitigation – Guidance for Developers' in 2021.* This includes measures to improve air quality across the borough. It is not yet possible to determine the effectiveness of this measure due to its recent implementation.
- Measure 2 – *Involvement in the Virgin Media Park and Charge (VAPCH) on-street parking project, which funds on-street electric parking stations.* It is not possible to determine the effectiveness of this measure currently due to a lack of information, however it is likely to improve air quality if implemented.
- Measure 3 – *The Council are running a multi-story car park upgrade scheme.* To date, there have been four EV charging points installed using OLEV grant funding, which should help to encourage the uptake of low emission vehicles in and around the borough.
- Measure 4 – *The Council is promoting low emission transport through the VOI scooter project.* Since its implementation, this measure has been successful in the reduction of PM_{2.5} concentrations across the borough, with an estimated reduction in emissions of 1.8kg of PM_{2.5} and since its launch, there have been approximately 70,000 scooter rides in total.
- Measure 5 – *The Council have begun to develop walking and cycling route in the Nene Valley.* It is not possible to determine the effectiveness of this measure due to a lack of information, however if implemented it is likely to improve air quality within the borough.
- Measure 6 – *In 2020, the Council began to raise awareness of issues relating to climate change and greenhouse gases.* Though difficult to quantify, it is expected that by increasing awareness of the issues, people will alter their behaviour and therefore reduce emissions.
- Measure 7 – *The Climate Task and Finish group was set up by North Northamptonshire Council to facilitate actions to improve climate change.* Similar to measure 6, whilst difficult to quantify, indirect benefits are expected from this measure.

Wellingborough Relevance of Measures

2.95 It is not possible to determine the relevance of the measures in place targeting air quality within the borough due to a lack of information surrounding their start and completion date, however if successfully implemented, the measures are likely to be effective at improving air quality in the borough.

Wellingborough Utilisation of COVID-19 Guidance and Impact of Pandemic

2.96 During 2020, access to the diffusion tube monitoring sites was restricted in the first national lockdown. Therefore, it was not possible to maintain diffusion tube exposure periods at any site for April to June in line with the national monitoring calendar. This affected data capture in 2020, resulting in one monitoring site requiring annualisation. Using the COVID-19 impact matrix, this has been described as a 'Medium' impact.

Wellingborough Additional Information

2.97 WBC did not include any additional information in their 2021 ASR.

Wellingborough Deadlines

2.98 WBC 2021 ASR was submitted after the original deadline, likely due to resourcing constraints.

Wellingborough Approval

2.99 WBC 2021 ASR is currently waiting for appraisal.

Table 9. Wellingborough 2021 ASR summary.

Declared AQMAs	Number of NO ₂ Diffusion Tubes	Additional Air Quality Monitoring	Number of Exceedances & Highest Concentration (brackets)	Air Quality Trends	Data QA/QC	Current AQAP Measures	Measures updated since 2020?	COVID-19 Impacts	Additional Information	Submitted on time?	Defra Appraisal	Overall Score
WBC has no current AQMAs.	WBC currently has a diffusion tube network of eleven sites.	WBC currently does not have any additional air quality monitoring.	WBC did not have any exceedances of the annual mean NO ₂ objective in 2020 (30.2 µg/m ³).	In the previous five years, NO ₂ concentrations in Wellingborough have shown an overall decline.	QA/QC procedures have been appropriately applied to the monitoring data.	WBC has seven measures within their AQAP.	Measures within WBC AQAP have been updated since 2020.	WBC has used the COVID-19 impact matrix in their report, and impacts were at worst 'Medium'.	There are no additional appendices in the 2021 ASR.	No	Not yet appraised	8
1	1	0	1	1	1	1	1	1	0	0	0	

2.100 The overall strengths of the 2021 ASR, and local air quality, are as follows:

- WBC currently does not have any declared AQMAs, and in 2020 they did not record any exceedances of the annual mean NO₂ objective;
- Air quality trends in the previous five years have been presented and discussed, and a robust comparison to air quality objectives has been provided. Air quality is improving in Wellingborough;
- QA/QC procedures have been applied appropriately, with annualisation calculations provide in the Appendix; and
- WBC has used the COVID-19 impact matrix in their 2021 ASR to determine the impact of COVID-19 on their LAQM work, and impacts were at worst 'Medium', indicating the pandemic's impacts were managed relatively effectively.

2.101 Areas which can be improved in future ASRs, and air quality management, are as follows:

- The Council's 2021 ASR was submitted after the original deadline, and several years of reporting were missed post-2016;
- All information in the summary of non-automatic monitoring locations should be populated. The sections which need to be completely populated are distance to relevant exposure and distance to kerb of nearest road; and
- The Council did not appear to collaborate with the relevant public health body.

2.102 The recommendations for the combined 2022 ASR are as follows:

- WBC should aim to submit their ASR ahead of the deadline, to allow for a timelier appraisal;
- WBC should conduct a review of the current measures in place targeted towards air quality, to determine their effectiveness and identify potential new measures;
- WBC should continue to monitor around Silver Street (site 1) due to its possible exceedance. If the exceedance continues, then an AQMA should be declared;
- Regular liaison with WNC via a county wide pollution group is recommended;
- WBC should work collaboratively with the relevant public health body; and
- WBC Council should ensure that all monitoring site information is presented within the report.

Wellingborough Air Quality Monitoring

2.103 A summary of the diffusion tube locations in shown in Figure 5.

Revision: Rev No. 1 Drawn: LM Checked: PF Approved: PF Date: 01/02/2020

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- Diffusion Tube Network
- Local Authority Boundary

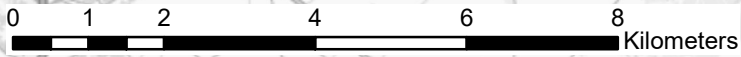
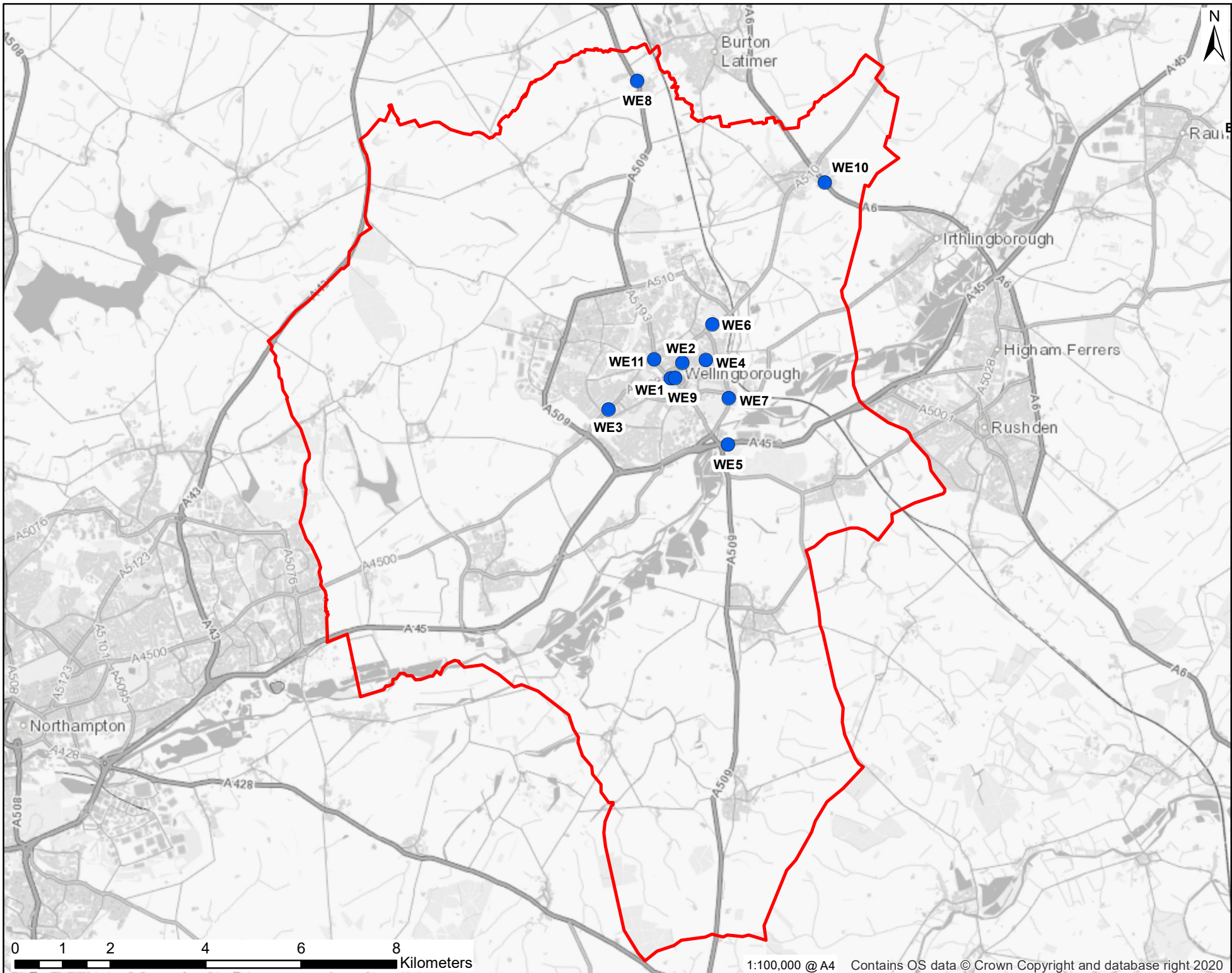
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Diffusion tube locations in Wellingborough

Figure 5



- 2.104 Of the 11 current diffusion tube locations within the borough, two are classified as 'urban background', one is classified as 'urban centre', six are classified as 'roadside' and two are classified as 'kerbside'.
- 2.105 To further improve the diffusion tube network across the borough, it is recommended that locations where concentrations are constantly low across a five-year period should be reviewed and repositioned. This would assist in the identification of potential new hotspots within the borough, where further measures could then be put in place as a result.
- 2.106 Site 1 (Silver Street) exceeded the annual mean NO₂ objective three times since 2015. This diffusion tube is located within a street canyon and was previously investigated by the former County Council in terms of modelling with respect to the bus stops located nearby. The modelling initially showed some exceedances of the objective value, however, later the modelling concluded that there would be no exceedances. It is suggested that if Site 1 shows an exceedance of the annual mean objective in 2021, where traffic flows are expected to return to pre-pandemic levels, then an AQMA should be declared for this area.
- 2.107 The implementation of Site 11 was a result of a local action group who wished to monitor the air quality in this area and introduce traffic management improvements. It should be noted that the results at this site could have been skewed by a development that was taking place in the local area at the time. Therefore, continued monitoring at this location to determine current levels of NO₂ is recommended.
- 2.108 Table 10 provides a summary of the non-automatic monitoring sites within the borough.

Table 10. Summary of the non-automatic monitoring sites in Wellingborough.

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Inlet Height (m)
Site 1	Silver Street, Wellingborough	Urban Centre	489131	267820	0.0	2.9	2.9
Site 2	Alma Street, Wellingborough	Kerbside	489382	268144	0.3	1.7	2.5
Site 3	Northampton Road, Wellingborough	Roadside	487831	267169	2.4	3.8	2.6
Site 4	Finedon Road, Wellingborough	Kerbside	490002	268946	2.3	1.51	2.4
Site 5	Butlin Court, Little Irchester	Roadside	49033	266433	0.5	15 (A45)	2.6
Site 6	Mill Road, Wellingborough	Urban background	489868	268204	0.0	3.1	2.6
Site 7	Ultra Close, The Embankment, Wellingborough	Roadside	490351	267400	4.5	2.7	2.9
Site 8	Kettering Road, Isham	Roadside	488431	274049	0.0	3.4	2.5
Site 9	Market Square, Wellingborough	Urban Background	489226	267829	-	34.0	2.9
Site 10	Irthlingborough Road, Finedon	Roadside	492372	271928	2.32 m	1.5	2.4
Site 11	Broad Green, Wellingborough	Roadside	488788	268215	-	-	2.3

2.109 Recommendations for WBC monitoring are as follows:

- Budget allowing, WBC could consider the implementation of automatic monitors to measure concentrations of PM₁₀ and PM_{2.5};
- WBC should also consider the implementation of NO₂ diffusion tubes to monitor concentrations at schools in the local area;

- WBC should consider the implementation of NO₂ diffusion tubes in Earls Barton, since it is situated near the A45 and is expected to experience elevated concentrations;
- WBC should consider the implementation of NO₂ diffusion tubes in Wollaston, since it is situated near the A509 and has sensitive receptors such as residential properties and Wollaston School;
- The majority of NO₂ monitoring within Wellingborough town centre is located on the east side, therefore, the Council should consider extending their diffusion tube network to the west side of the town, such as near the residential exposure on Sywell Road as approaches the A509, and towards Park Farm industrial estate.
- WBC should continue to monitor on Silver Street. They could consider expanding monitoring in this area if there are exceedances in 2021 as this will assist them in defining an AQMA boundary.

3. Summary

ASRs

- 3.1 The overall score for each LA is detailed below, and the breakdown of scores is presented in Table 12.
- Corby - 6
 - Kettering - 8
 - Earth Northamptonshire - 9
 - Wellingborough – 8
- 3.2 Whilst the scores vary from borough to borough, generally these are reasonable scores and it can therefore be concluded that air quality has been managed effectively across North Northamptonshire, with the main statutory obligations having been largely met.
- 3.3 The slightly lower score in Corby is reflective only of the 'High' rating afforded to the impact of COVID-19. Similar impacts were described in other areas but were not scored as such in the 2021 ASR, so this is not a cause for concern. Any reductions in marks below the maximum of 12 were generally related to not providing additional monitoring or assessment beyond NO₂ diffusion tubes, stagnated action measures (though COVID-19 has impacted this), and through late submission of ASRs.
- 3.4 The timely submittal of reports should be an easy process to rectify moving forward with the streamlined approach to reporting under the North Northamptonshire authority.
- 3.5 The overall strengths of the 2021 ASRs, and local air quality, from the four local authorities are as follows:
- None of the local authorities have any declared AQMAs;
 - All local authorities currently undertake NO₂ diffusion tube monitoring;
 - None of the local authorities recorded any exceedances of the NO₂ annual mean objective in 2020, though COVID-19 restrictions are likely to have at least in part contributed to this;
 - For the previous five-year period, all local authorities are demonstrating a decreasing trend of annual mean NO₂; and
 - QA/QC procedures have been appropriately applied to the monitoring data.
- 3.6 The common themes for areas of improvement on the 2021 ASRs and LAQM from the four local authorities, that can be incorporated into the 2022 combined report, are as follows:
- The implementation of additional monitoring, such as for PM₁₀, PM_{2.5} or SO₂, could be considered, to enhance the understanding of the range of pollutants for which there are AQS objectives. It is however acknowledged that previous rounds of assessment have indicated that it is unlikely that there are exceedances of said pollutants;
 - A full review of all the measures in place aimed at improving air quality in each region is recommended, both to ensure these are kept up to date and relevant, and so that measures can be effectively co-ordinated across what were previously separate entities;
 - The implementation of these measures should also be re-prioritised, following the COVID-19 pandemic;
 - North Northamptonshire should aim to submit the combined 2022 ASR ahead of the deadline to allow for a timely appraisal; and
 - Greater collaboration with the relevant public health authorities and pollution working group could be considered.

Monitoring

3.7 A summary of the current monitoring network in each local authority is summarised in Table 11 and displayed in Figure 6.

Table 11. Summary of the monitoring in each of the local authorities.

Local Authority	Number of Diffusion Tube Sites	Maximum Concentration ($\mu\text{g}/\text{m}^3$)
Corby	17	24.3
Kettering	45	28.8
East Northamptonshire	33	26.9
Wellingborough	11	30.2

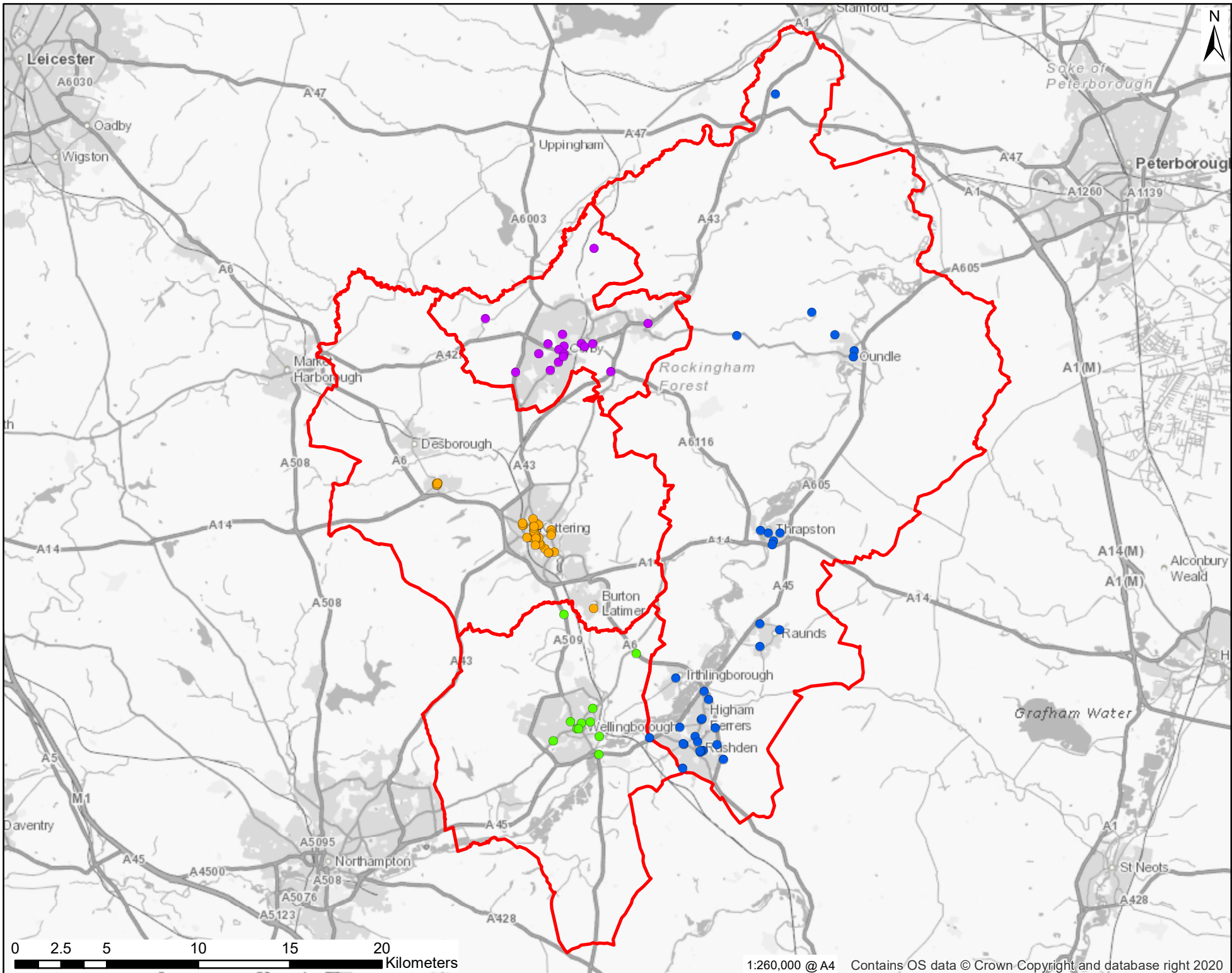
3.8 All local authorities could consider conducting a review of their current diffusion tube network to ensure these surveys are still fit for purpose. The recommended areas of improvement within each area are summarised as follows:

- Corby:
 - CBC should consider the implementation of automatic continuous monitors if funding permits, to monitor concentrations of PM_{10} and $\text{PM}_{2.5}$ at potential hotspots within the borough;
 - Additional monitoring could also be considered in Rockingham, due to residential buildings being located adjacent to the A6003. It is possible that these locations experience elevated concentrations of NO_2 as a result;
 - Additional monitoring could also be considered at schools within the borough, as has been undertaken in many boroughs, since children are potentially more vulnerable to elevated pollutant concentrations; and
 - Further monitoring could be considered near Weldon Road due to the location of the Tata Steel factory. Elevated concentrations might be expected in this vicinity due to the industrial process and the increased volume of HGVs. To the east of the site is a housing estate, and to the south of the site is Weldon C of E Primary School, both of which are sensitive receptors, therefore additional monitoring should be considered.
- Kettering:
 - Budget permitting, KBC could consider the implementation of automatic continuous monitors to monitor concentrations of PM_{10} and $\text{PM}_{2.5}$ to enhance the understanding of other pollutants in the borough;
 - KBC could also consider further monitoring in the village of Broughton because it is situated on the A43 into Kettering, and therefore has the potential to experience increased concentrations of NO_2 due to emissions from vehicular traffic; and
 - Additional monitoring could also be considered at schools within the borough, as has been undertaken in many boroughs, since children are potentially more vulnerable to elevated pollutant concentrations.
- East Northamptonshire:
 - ENC should consider the implementation of automatic continuous monitors, to monitor concentrations of PM_{10} and $\text{PM}_{2.5}$ at potential hotspots within the borough.
 - ENC should consider the monitoring of NO_2 in Irthlingborough, as it is situated near to the A6. This is an area where diffusion tubes currently positioned at areas of low concentrations could be repositioned too. This area has sensitive receptors including residential properties and schools such as Irthlingborough Junior School.
 - ENC should consider monitoring around the Biogen Westwood site in Rushden, as located approximately 1.5km north-west from the site is Avenue House Nursing & Care Home. This is because elderly residents at the care home are potentially more vulnerable to elevated pollutant concentrations.

- Additional monitoring could also be considered at schools within the borough, as has been undertaken in many boroughs, since children are potentially more vulnerable to elevated pollutant concentrations.
- Wellingborough:
 - Budget allowing, WBC could consider the implementation of automatic monitors to measure concentrations of PM₁₀ and PM_{2.5};
 - WBC should also consider the implementation of NO₂ diffusion tubes to monitor concentrations at schools in the local area;
 - WBC should consider the implementation of NO₂ diffusion tubes in Earls Barton, since it is situated near the A45 and is expected to experience elevated concentrations;
 - WBC should consider the implementation of NO₂ diffusion tubes in Wollaston, since it is situated near the A509 and has sensitive receptors such as residential properties and Wollaston School;
 - The majority of NO₂ monitoring within Wellingborough town centre is located on the east side, therefore, the Council should consider extending their diffusion tube network to the west side of the town, such as near the residential exposure on Sywell Road as approaches the A509, and towards Park Farm industrial estate.
 - WBC should continue to monitor on Silver Street. They could consider expanding monitoring in this area if there are exceedances in 2021 as this will assist them in defining an AQMA boundary.

Revision: Rev No.1 Drawn: LM Checked: PF Approved: PF Date: 01/02/2022

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- Kettering Diffusion Tube Network
- Wellingborough Diffusion Tube Network
- Corby Diffusion Tube Network
- Northamptonshire Diffusion Tube Network
- Local Authority Boundary

NOTES

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

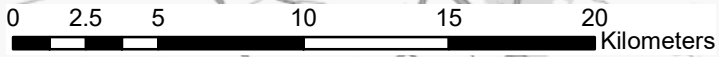
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SHEET TITLE

Diffusion tube locations in four local authorities

SHEET NUMBER

Figure 6



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Conclusions and Recommendations

- 3.9 To summarise, whilst the statutory obligations are currently being met, the overall recommendations to improve air quality management in North Northamptonshire, and the combined 2022 ASR, are as follows:
- The 2022 ASR should be submitted ahead of the submission deadline, to allow for a timely appraisal and the potential to address any comments that may arise from that appraisal;
 - NNC could consider extending the diffusion tube network, based on the suggestions made above;
 - NNC could consider the implementation of automatic monitors to monitor PM₁₀ and PM_{2.5} in locations where particulate concentrations may be elevated;
 - NNC could work in closer collaboration with the relevant public health body and WNC in producing the report, and to improve its usefulness to the local community;
 - The air quality action measures should be reviewed, to allow for an update of existing measures which may have stagnated and to ensure these are relevant to the entire region. New measures, as appropriate, can also then be added; and
 - Ensure that all local authorities continue to use the same laboratory and laboratory method for the analysis of diffusion tubes.
- 3.10 There is also a significant opportunity for each district to collaborate and take on board best practice measures from the neighbouring authorities, such as the continued use of the EMAQN 'Air Quality and Emissions Mitigation – Guidance for Developers', and utilisation of the county wide pollution group. Such practices should be continued through the merger process, which should help to maintain a high standard of air quality management in the area.

Table 12. Summary of the 2021 ASRs

Local Authority	Declared AQMAs	Number of NO ₂ Diffusion Tubes	Additional Air Quality Monitoring	Number of Exceedances & Highest Concentration (brackets)	Air Quality Trends	Data QA/QC	Current AQAP Measures	Measures updated since 2020?	COVID-19 Impacts	Additional Information	Submitted on time?	Defra Appraisal	Overall Score
Corby	1	1	0	1	1	1	1	0	0	0	0	0	6
Kettering	1	1	0	1	1	1	1	0	1	0	0	1	8
East Northamptonshire	1	1	0	1	1	1	1	0	0	1	1	1	9
Wellingborough	1	1	0	1	1	1	1	1	1	0	0	0	8