EAST CAMBRIDGESHIRE DISTRICT COUNCIL

2023 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management, as amended by the Environment Act 2021

June 2023

Information	East Cambridgeshire District Council Details
Local Authority Officer	Peter Ord
Department	Environmental Services
Address	East Cambridgeshire District Council, The Grange, Nutholt Lane, Ely CB7 4EE
Telephone	01353 665555
E-mail	Peter.ord@eastcambs.gov.uk
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Executive Summary: Air Quality in Our Area

Air Quality in East Cambridgeshire

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

The mortality burden of air pollution within the UK is equivalent to 29,000 to 343,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

This Annual Status Report (ASR) relates to data gathered between 1st January and 31st December 2022. East Cambridgeshire is predominantly rural in character. Air quality is relatively good and has steadily improved over the years. As in many other areas of the country, road traffic emissions are the principal source of poor air quality. Nitrogen dioxide (NO_2) and particulate matter (PM) are the main contaminants of concern. Measured concentrations tend to be highest at the busier road junctions such as the junction of Broad Street and Back Hill in Ely, and the High Street -Twentypence Road junction in Wilburton, although measured concentrations at both of these locations are also well within the statutory limits.

In 2022, East Cambridgeshire District Council monitored NO_2 concentrations at 24 locations across the district using chemical diffusion tubes. Monitoring locations are occasionally varied to ensure a reasonable coverage across the district. Annual mean NO_2 values were derived for 22 of the 24 locations.

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[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

[2] Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

[3] Defra. Air quality appraisal: damage cost guidance, January 2023

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

By way of comparison, results for both 2021 and 2022 were available for 20 of the locations. Compared with 2021, 9 of the locations recorded a small increase in NO_2 concentrations; 8 recorded a small reduction; and 3 locations showed no change. When compared with the 2019 results (pre-COVID-19), all 2022 results show a marked reduction. Overall, the average reduction is approximately 33%. NO_2 concentrations were well within the statutory objectives at all locations. Local authorities are not required to monitor PM concentrations, but NO_2 levels serve as good indicator of likely PM concentrations.

This ASR has not identified the need to proceed to a Detailed Assessment for any pollutants. Statutory objectives are being met at all monitoring locations and the council has not designated any areas as Air Quality Management Areas (AQMAs). No new significant emission sources have been identified which could lead to poor air quality in the district. Air quality in the district continues to improve despite increases in population and road traffic levels having largely returned to pre-pandemic levels.

East Cambridgeshire District Council will continue to operate the NO_2 diffusion tube monitoring programme to demonstrate that air quality objectives continue to be met. The council works with the Cambridgeshire and Peterborough Combined Authority (CPCA), Cambridgeshire County Council, Network Rail, and others to promote measures which improve air quality, such as improving public transport, expanding rail services, providing electric vehicle charging points (EVCPs), and promoting active travel. The Council will compile and submit a further ASR in 2024.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and

[5] Defra. Environmental Improvement Plan 2023, January 2023

reduce $PM_{2.5}$ in their areas. The Road to Zero[6] details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas are designated due to elevated concentrations heavily influenced by transport emissions.

Although air quality in East Cambridgeshire is relatively good, the council supports any actions to maintain and improve air quality. East Cambridgeshire District Council is working with the CPCA, Cambridgeshire County Council and others to bring about transport improvements which will have a beneficial effect on air quality.

East Cambridgeshire District Council is supporting the CPCA in the development of the Local Transport and Connectivity Plan and the Strategic Bus Review with a view to improving transport links in the district and beyond, and reducing negative impacts on air quality. The Council is working with the CPCA and Network Rail on projects to improve rail infrastructure and expand provision, with a particular focus on the busy rail junction at Ely where five railway lines converge and which is currently operating at full capacity limiting further growth of passenger and cross-country freight services.

In 2020 East Cambridgeshire District Council produced a New Bus Services Proposals for East Cambridgeshire Prospectus; and in November 2021 adopted a Cycling and Walking Routes Strategy to help promote alternatives to private car journeys. Following a district-wide review of bus services and public consultation the Council is seeking funding from the CPCA to trial new bus services in the district, and is working with the environmental transport charity Sustrans to produce feasibility studies for the provision of new cycle routes.

In 2022 the priority has been to maintain existing bus services rather than to provide new services as bus operators faced increased operating costs which impacted the viability of the services provided.

The Council declared a climate change emergency in 2019 and has produced an Environmental and Climate Change Strategy and Action Plan setting itself the goal of achieving net zero carbon emissions by 2050.This target has now been brought forward to 2036. Many of the proposed actions will help bring about air quality improvements.

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

Conclusions and Priorities

Air quality objectives were met at all monitoring locations in 2022. The downward trend in annual mean NO_2 concentrations continued in 2022, although the more marked decline observed between 2019 and 2021 due to COVID-19 restrictions appeared to have levelled off in 2022.

East Cambridgeshire District Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality.

The Council will continue to help bring about improvements in air quality by working with the CPCA, Network Rail, and Cambridgeshire County Council to develop transport plans to improve public transport provision, encourage electric vehicle uptake, and promote active travel. The Council has included improving public transport and promoting active travel as priorities in its Corporate Plan.

Annual mean NO_2 levels at monitored sites fell by approximately 33% across the district between 2019 and 2022. This may be due to improvements in vehicle emission reduction technology, and changes in road traffic movement patterns following the COVID-19 pandemic.

Local Engagement and How to get Involved

East Cambridgeshire District Council works with other public bodies, including the CPCA, Network Rail, and Cambridgeshire County Council to bring about improvements in public transport and active travel provision to help improve air quality. The Council encourages the public to help improve air quality by reducing the number of car journeys they make, taking part in car sharing, choosing a low emission vehicle, switching off car engines when stationary; and by walking, cycling, and using public transport for journeys wherever possible.

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Services Department of East Cambridgeshire District Council with the support and agreement of the Strategic Planning Manager and Director (Community).

This ASR has been approved by the Chief Executive of East Cambridgeshire District Council and the Director of Public Health for Cambridgeshire and Peterborough.

If you have any comments on this ASR please send them to Peter Ord at:

East Cambridgeshire District Council, The Grange, Nutholt Lane, Ely CB7 4EE

Telephone: 01353 665555

Email: peter.ord@eastcambs.gov.uk

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1 Local Air Quality Management

This report provides an overview of air quality in East Cambridgeshire during 2022. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

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

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

East Cambridgeshire currently does not have any declared AQMAs. A local Air Quality Strategy is under development to help prevent and reduce polluting activities.

2.2 Progress and Impact of Measures to address Air Quality in East Cambridgeshire

DEFRA's appraisal of last year's ASR concluded that during 2021 there was consistent compliance with the annual mean NO_2 Air Quality Objectives with all annual means being below 10% of the annual mean Air Quality Objective. DEFRA suggested that in future ASRs, the annual mean trend graph, Figure A1, should be made clearer and amended to include results from all monitoring sites; that fuller information be included in Table 2.1; that justification of the use of the chosen diffusion tube bias adjustment be included; and that a section on planning applications be included. These issues have all been addressed in this report.

East Cambridgeshire District Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. Seven measures are included with the type of measure and the progress East Cambridgeshire District Council has made during the reporting year of 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1.

More detail on these measures can be found in their respective Action Plans. Key completed measures are:

- the reconfiguration of council waste collection rounds to reduce vehicle mileage
- the installation of 24 EVCPs in council-owned car parks
- the prioritisation of 10 cycle routes for feasibility exploration and delivery. The feasibility studies were commissioned from Sustrans, a specialist environmental charity which advises on walking and cycling schemes. The studies will help give a better understanding of the factors that need to be considered to estimate the costs and deliver the cycle routes
- Sustrans also updated the construction costs for the remaining works needed to complete a cycle path between the villages of Wicken and Soham which was originally included in a report they produced in 2013. This information was used to inform a successful bid by East Cambridgeshire District and Soham Town Councils for CPCA Market Towns funding towards delivery of the route

East Cambridgeshire District Council expects the following measures to be completed over the course of the next reporting year:

- begin the use of Hydrotreated Vegetable Oil (HVO) in the Council's refuse collection vehicles in order to reduce CO_2 emissions. As HVO is a cleaner burning fuel this measure will also help to improve air quality
- finalise a staff travel plan to reduce mileage and cut the Council's transport emissions
- target a reduction of over 100 tonnes of black bag waste collected by the Council's refuse collection vehicles over the year to increase recycling rates and reduce the amount of fuel used, thus helping to improve air quality

East Cambridgeshire District Council's priorities for the coming year are:

- to continue to work with our partners to ensure our active travel infrastructure requirements are included in partner organisations policy documents such as the CPCA Local Transport and Connectivity Plan which is currently being refreshed; and the Cambridgeshire County Council Local Cycling and Walking Infrastructure Plan (LCWIP) and Active Travel Strategy for Cambridgeshire
- to continue to improve the renewable energy infrastructure to supply ECDC buildings, street lights and storage depots to reduce the burning of fossil fuels
- to improve energy improvements in homes across the district

- to use the Cycling and Walking Strategy as the basis for influencing change, bidding for funds and negotiating with developers. The Council has prioritised 10 cycle routes for feasibility exploration and delivery
- to progress the delivery of EVCPs and work with the CPCA on a county-wide strategy to roll out EVCPs

East Cambridgeshire District Council worked to implement these measures in partnership with the following stakeholders during 2022:

- Cambridgeshire and Peterborough Combined Authority
- Cambridgeshire County Council
- Network Rail

The principal challenges and barriers to implementation of the measures are the requirement to maintain and improve air quality at a time of increased development pressure and possible budget cuts and curbs on public spending by central government.

Progress on bus service improvements has been slower than expected. The priority in 2022 has been to maintain those existing bus services under threat by providing extra financial support from East Cambridgeshire District Council and the CPCA. In March 2022 the Council provided funding to support the Ely Zipper service; and in October 2022 the largest local bus operator, Stagecoach East, withdrew from a number of services citing as reasons a fall in passenger numbers and commercial viability. The CPCA stepped in to fund services with alternative operators.

The population of the district grew by 11% between 2007 and 2017; and East Cambridgeshire has been set a target of delivering 11,500 new dwellings and 9,200 additional jobs in the current local plan period which runs up to 2031. East Cambridgeshire residents rely heavily on private motor car travel due to the rural nature of the district and a lack of high-quality public transport. Approximately 79% of journeys to work in the district are made by private car or van. These factors have the potential to significantly impact air quality.

In order to protect air quality, planning applications for new development in East Cambridgeshire must comply with all relevant national and local policy and technical guidance. This includes the National Planning Policy Framework (Ministry of Housing, Communities and Local Government, 2021); Land Use Planning and Development Control: Planning for Air Quality (Environmental Protection UK and the Institute of Air Quality Management, 2017); and Policy ENV 9 of the East Cambridgeshire Local Plan,

2015 which states that all development proposals should minimise and where possible, reduce all emissions and other forms of pollution and ensure no deterioration in air quality. Proposals will be refused where there are unacceptable impacts. Air quality assessments are required for larger developments. East Cambridgeshire District Council did not identify any sites which required air quality assessments during the reporting year of 2022. Developers are required to produce Construction Environment Management Plans for approval to ensure that air quality is not put at risk during the construction phase of a development.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Local Transport and Connectivity Plan	Alternatives to private vehicle use	Other	2019	2023	CPCA	CPCA	NO	Funded	<£10k	Planning	Reduction in vehicle emissions not quantified	Compliance with AQ objectives	Due to be adopted by CPCA in July 2023	Lengthy Timescale
2	Ely Area Rail Capacity Scheme	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2019	2030	Network Rail	Department of Transport	NO	Not funded	> £10 million	Planning	Reduced emissions	Compliance with AQ objectives	Plans produced and public consultation completed. Funding for detailed design sought from central government.	Barriers are high cost and competition nationally with other rail schemes for funding
3	Strategic Bus Review, Bus Services Improvement Plan, and ECDC New Bus Services Proposals	Alternatives to private vehicle use	Other	2019	2024	CPCA	CPCA, ECDC	NO	Partially Funded	£10k - 50k	Planning	Reduced vehicle emissions	Compliance with AQ objectives	New Bus Service Improvement Plan being produced. Bus Network Review and Bus Reform work underway	Economic pressures on local bus operators require public subsidy to maintain existing services
4	East Cambridgeshire Cycling and Walking Routes Strategy	Alternatives to private vehicle use	Other	2019	2022	ECDC, CPCA	ECDC, CPCA	NO	Partially Funded	£10k - 50k	Implementation	Reduced vehicle emissions	Compliance with AQ objectives		Barriers are cost and competition with other schemes for funding
5	Environmental and Climate Change Strategy Action Plan	Policy Guidance and Development Control	Other policy	2019	2036	ECDC, local business and environmental organisations	ECDC	NO	Partially Funded	£10k - 50k	Implementation	Reduced emissions	Compliance with AQ objectives	Action Plan published and updated annually	ECDC now plans to achieve carbon net zero by 2036, 14 years ahead of government target. The measures will also benefit air quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
6	Install 24 EVCPs in 3 ECDC owned public car parks.	Promoting Low Emission Transport	Other	2019	2023	ECDC	Office for Zero Emissions, ECDC	NO	Funded	£10k - 50k	Implementation	Reduction in vehicle emissions not quantified	Compliance with AQ objectives	Completed. All 24 installed and operational	ECDC will bid for grants to install further EVCPs and will assist parish councils and residents to find grants to help install EVCPs
7	Shift ECDC refuse collection and other fleet vehicles from diesel fuel to Hydrated Vegetable Oil (HVO) fuel.	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2023	2030	ECDC	ECDC	NO	Partially Funded	£1 million - £10 million	Planning	Reduction in vehicle emissions not quantified	Compliance with AQ objectives	Policy approved	Fluctuations in price of HVO relative to diesel could make change uneconomic

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Under the Health and Social Care Act 2012, Public Health England introduced a Public Health Outcomes Framework (PHOF) which sets out key indicators of the state of public health. (This has recently been updated by the Office for Public Health Improvement and Disparities in 2023.) An indicator relating to air quality is included:

- D01 – Fraction of mortality attributable to particulate air pollution.

In 2021 this was estimated as 4.91% for East Cambridgeshire; this is below the average for the East of England of 5.47% and the average for England of 5.50%.

East Cambridgeshire District Council does not carry out monitoring or take any measures to specifically address $PM_{2.5}$ concentrations. However, any measures to reduce road traffic emissions are likely to have the effect of reducing emissions of $PM_{2.5}$. DEFRA estimates that $PM_{2.5}$ background levels in East Cambridgeshire are between 6 and 8µgm^{-3}.

East Cambridgeshire District Council is taking the following measures to address $PM_{2.5}$:

- Working with the CPCA through the Local Transport and Connectivity Plan to prioritise sustainable transport alternatives and reduce congestion
- Implementing actions identified in the New Bus Service Proposals for East Cambridgeshire Prospectus and the East Cambridgeshire Cycling and Walking Routes Strategy to encourage healthy and active travel and support public wellbeing
- Requiring applicants for planning permission for new development under the Town and Country Planning regime to provide Construction Environment Management Plans (CEMPs) to minimise the production of $PM_{2.5}$ and other particulates which might arise during construction work

- Moving the council’s vehicle fleet to cleaner fuels and reducing business mileage

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

This section sets out the monitoring undertaken within 2022 by East Cambridgeshire District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

East Cambridgeshire District Council did not undertake automatic (continuous) monitoring during 2022.

3.1.2 Non-Automatic Monitoring Sites

East Cambridgeshire District Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 24 locations during 2022. Table A.1 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D. The maps include locations where monitoring has taken place in previous years as well as the 2022 locations. (Note that monitoring point FO4, Market Street No.2, Fordham, is at the same location as the former NAS7.) Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

Table A.2 in Appendix A compares the adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represent the concentration following the application of bias adjustment and annualisation as required (i.e. the values are exclusive of any consideration of fall-off with distance adjustment).

Figure A.1 presents the trend in NO_2 annual mean concentrations for the monitoring sites between years 2018 to 2022. There were no exceedances of the annual mean objective of 40µg/m^3 in 2022 or in previous years and there is a general downward trend in NO_2 concentrations across the district.

The full 2022 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

This ASR relates to data gathered between 1st January and 31st December 2022. Two diffusion tube sites were switched to new locations during the year. Therefore, a full 12 months of monitoring data was not available at all locations. The annualisation methodology developed by DEFRA and published in LAQM.TG22 has been used to derive an annual mean value for one site where data capture was less than 75%.

Data for previous years is available for 20 of the locations. When compared with the results for the previous year, 9 the 20 locations recorded a small increase in NO_2 concentrations; 8 recorded a small decrease; and 3 locations showed no change. Compared with 2019 (pre-COVID-19), all results for 2022 show a marked decrease in NO_2 concentrations. This is generally consistent with findings nationally. The average decrease in measured concentrations is in the region of 33%.

NO_2 annual mean concentrations at all locations were well within the statutory objectives. This ASR has not identified the need to proceed to a Detailed Assessment for any pollutants. No new significant emission sources have been identified which could lead to poor air quality in the district. Air quality continues to improve despite increases in population and a near return to pre-pandemic traffic levels.

East Cambridgeshire District Council will continue to operate the NO_2 diffusion tube monitoring programme to demonstrate that air quality objectives continue to be met. The Council works with the Cambridgeshire and Peterborough Combined Authority, Cambridgeshire County Council, Network Rail, and others to promote measures which

improve air quality, such as improving public transport, expanding rail passenger and freight service provision, providing electric vehicle charging points (EVCPs), and promoting active travel.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
NAS1	Market Street, Ely	Roadside	554154	280427	NO2	No	0.0	1.5	No	2.5
NAS2	Abbot Thurston Avenue, Ely	Urban Background	554616	281320	NO2	No	4.5	1.5	No	2.3
NAS3	Station Road, Ely	Roadside	554322	279566	NO2	No	5.0	1.8	No	2.5
NAS5	Main Street, Littleport	Roadside	556845	280309	NO2	No	4.2	1.6	No	3.0
NAS8	Sheriffs Court, Burrough Green	Roadside	563721	255387	NO2	No	2.1	1.5	No	2.3
NAS10	Tramar Drive, Sutton	Urban Background	545012	279286	NO2	No	5.8	0.8	No	2.3
NAS11	Nutholt Lane, Ely	Roadside	554255	280536	NO2	No	0.0	2.5	No	2.3
NAS12	A142, Witcham Toll	Roadside	546346	279106	NO2	No	1.8	2.7	No	2.3
NAS13	A10, Stretham	Roadside	550811	274395	NO2	No	3.2	3.2	No	2.3
NAS14	High Street, Burwell	Roadside	558896	266364	NO2	No	1.5	1.5	No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
NAS15	Hop Row, Haddenham	Roadside	546466	275463	NO2	No	0.0	1.5	No	3.0
NAS16	High Street, Haddenham	Roadside	546382	275411	NO2	No	0.0	1.0	No	2.3
NAS17	West End, Haddenham	Roadside	546185	275594	NO2	No	0.0	1.5	No	2.3
NAS18	Post Office, Wilburton	Roadside	548320	274895	NO2	No	0.0	1.5	No	2.5
NAS20	Granta Close, Witchford	Roadside	549542	279026	NO2	No	4.0	1.5	No	2.5
NAS23B	Cage Hill, Swaffham Prior	Roadside	557052	264135	NO2	No	1.7	1.7	No	2.3
SU1	High Street, Sutton	Roadside	554659	278891	NO2	No	0.0	5.3	No	2.2
SO3	Station Road, Soham	Roadside	558856	273255	NO2	No	22.0	1.4	No	2.3
NAS7A	Soham Road, Fordham	Roadside	562046	271019	NO2	No	5.2	1.2	No	2.3
SO2	Fordham Road Soham	Roadside	559883	272550	NO2	No	7.0	1.8	No	2.3
NAS22A	Broad Street, Ely	Roadside	554353	280016	NO2	No	1.7	1.6	No	2.3
FO3	Mildenhall Road, Fordham	Roadside	563460	270786	NO2	No	6.0	3.4	No	2.3
EL1	Back Lane, Ely	Roadside	554420	280133	NO2	No	0.0	1.0	No	3.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
FO4	Market Street No 2, Fordham	Roadside	562682	270294	NO2	No	0.0	1.5	No	2.5

Notes:

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

(2) N/A if not applicable.

Table A.2 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
NAS1	554154	280427	Roadside	100	100.0	19.4	18.2	14.8	14.4	14.4
NAS2	554616	281320	Urban Background	100	100.0	11.7	11.9	9.8	9.3	9.3
NAS3	554322	279566	Roadside	100	100.0	28.9	19.5	15.4	15.6	15.9
NAS5	556845	280309	Roadside	100	100.0	15.2	15.3	12.8	11.7	12.0
NAS8	563721	255387	Roadside	100	100.0	10.2	9.9	8.2	7.4	8.8
NAS10	545012	279286	Urban Background	100	100.0	14.8	13.5	11.4	11.1	10.8
NAS11	554255	280536	Roadside	100	100.0	18.6	18.6	14.1	13.6	15.0
NAS12	546346	279106	Roadside	100	100.0	26.0	25.8	19.9	19.0	19.9
NAS13	550811	274395	Roadside	100	100.0	20.2	19.2	14.6	14.6	15.8
NAS14	558896	266364	Roadside	67.3	67.3	22.6	22.1	13.6	14.3	14.9
NAS15	546466	275463	Roadside	100	100.0	23.6	22.4	17.8	17.2	16.8
NAS16	546382	275411	Roadside	100	15.4	17.9	16.8	13.3	13.9	-
NAS17	546185	275594	Roadside	50	7.7	16.9	18.0	12.4	12.9	-

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
NAS18	548320	274895	Roadside	75	75.0	29.2	30.0	20.8	20.8	20.8
NAS20	549542	279026	Roadside	100	100.0	11.7	11.1	8.6	8.3	8.1
NAS23B	557052	264135	Roadside	100	100.0			9.7	11.1	11.0
SU1	554659	278891	Roadside	100	100.0				10.5	10.4
SO3	558856	273255	Roadside	100	100.0				10.1	10.6
NAS7A	562046	271019	Roadside	100	90.4				14.0	14.2
SO2	559883	272550	Roadside	100	100.0				15.9	15.8
NAS22A	554353	280016	Roadside	100	100.0				20.6	20.2
FO3	563460	270786	Roadside	100	90.4				19.3	17.5
EL1	554420	280133	Roadside	100	84.6					17.4
FO4	562682	270294	Roadside	90	76.9					13.0

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

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

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

Notes:

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

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

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

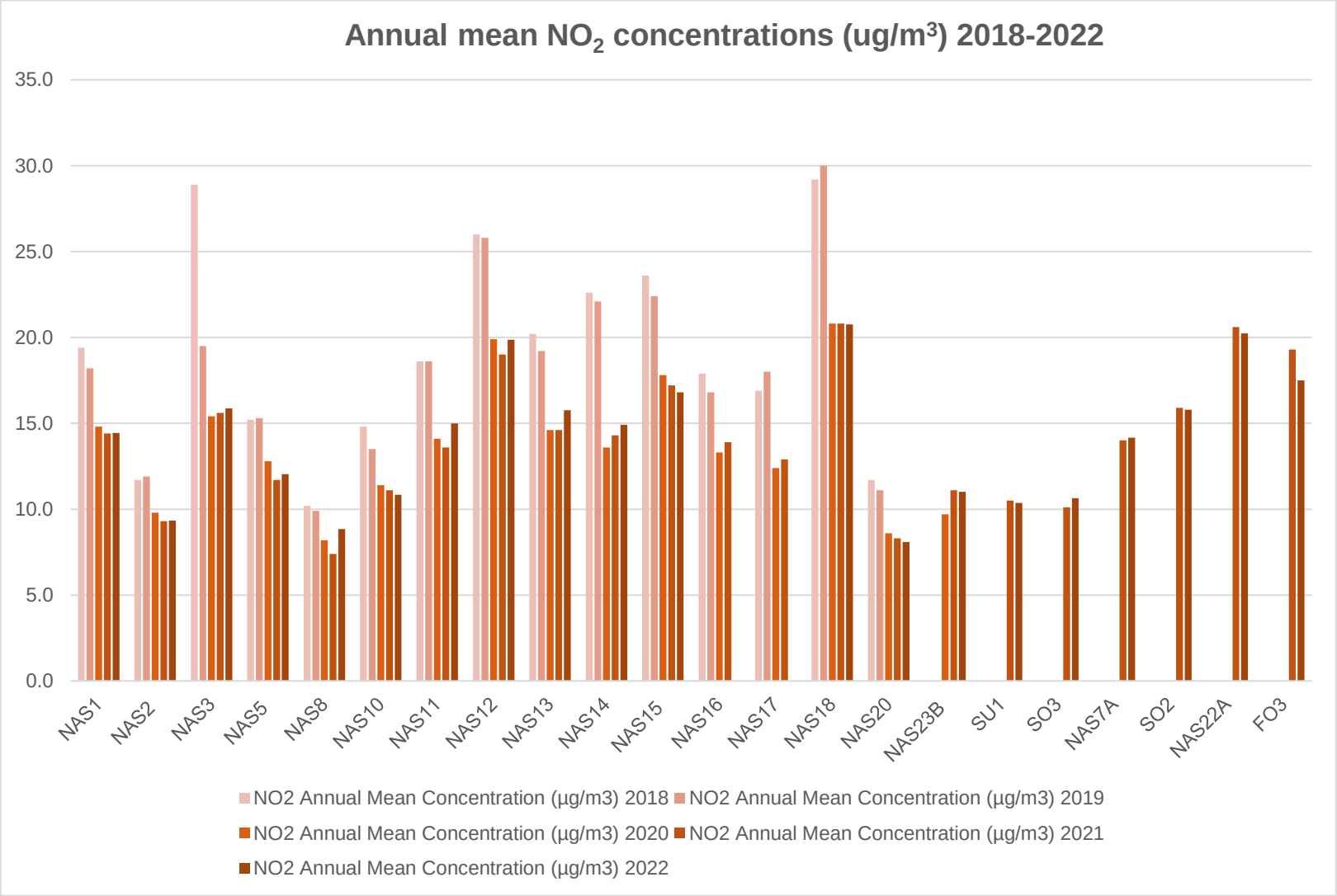
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

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

Figure A.1 – Trends in Annual Mean NO_2 Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO_2 2022 Diffusion Tube Results (µg/m^3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
NAS1	554154	280427	23.0	20.8	25.7	16.8	14.7	14.4	14.4	17.3	17.4	18.6	19.8	25.1	19.0	14.4	-	
NAS2	554616	281320	20.1	15.3	18.2	8.0	8.0	8.3	7.0	8.0	10.8	14.7	9.4	19.5	12.3	9.3	-	
NAS3	554322	279566	26.8	21.2	24.2	18.9	18.2	18.0	15.7	19.4	19.5	21.3	23.7	23.7	20.9	15.9	-	
NAS5	556845	280309	25.1	17.7	21.5	12.7	12.9	12.3	11.9	11.6	11.9	16.1	17.3	19.0	15.8	12.0	-	
NAS8	563721	255387	18.0	12.7	18.6	7.7	7.7	7.8	6.5	11.5	8.6	11.2	12.3	17.1	11.6	8.8	-	
NAS10	545012	279286	24.0	16.1	21.3	13.2	9.9	9.9	10.9	12.1	13.2	15.3	8.5	16.8	14.3	10.8	-	
NAS11	554255	280536	31.4	20.1	28.0	15.0	14.3	14.7	14.2	15.8	15.1	21.7	22.8	23.6	19.7	15.0	-	
NAS12	546346	279106	30.6	24.7	42.1	26.9	20.7	22.4	24.9	27.9	28.9	25.3	22.9	16.3	26.1	19.9	-	
NAS13	550811	274395	21.2	14.5	29.4	21.2	14.9	15.9	16.3	22.2	20.4	23.5	23.8	25.5	20.7	15.8	-	
NAS14	558896	266364	27.7	20.4		15.5	14.7	15.8		14.8	19.3	14.4			17.8	14.9	-	Annualisation applied
NAS15	546466	275463	35.2	22.9	24.8	16.4	18.0	18.6	19.6	19.1	20.3	23.1	20.8	26.6	22.1	16.8	-	
NAS16	546382	275411	24.9	16.4											-	-	-	
NAS17	546185	275594	24.4												-	-	-	
NAS18	548320	274895	34.2		33.9	20.5			22.4	22.0	22.0	32.2	27.7	30.9	27.3	20.8	-	
NAS20	549542	279026	14.9	13.7	16.6	10.2	8.0	7.1	6.9	7.9	9.8	12.5	8.5	11.5	10.6	8.1	-	
NAS23B	557052	264135	25.4	18.2	23.8	11.5	10.6	13.3	9.8	7.4	12.9	12.9	7.2	20.9	14.5	11.0	-	
SU1	554659	278891	19.3	14.3	18.2	11.6	9.9	9.8	10.0	12.9	11.0	12.4	13.9	20.4	13.6	10.4	-	
SO3	558856	273255	23.4	12.9	19.0	11.8	9.8	9.1	8.7	9.6	11.3	14.0	17.3	21.0	14.0	10.6	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
NAS7 A	562046	271019	29.2	21.5	25.1	16.6	15.7	14.1	14.5	13.5	15.9	20.4	18.5		18.6	14.2	-	
SO2	559883	272550	31.7	24.6	21.8	18.4	19.2	19.2	17.2	18.0	17.4	18.3	19.3	24.3	20.8	15.8	-	
NAS2 2A	554353	280016	32.1	24.3	40.1	26.6	24.6	24.2	23.4	24.7	27.0	30.4	22.5	19.5	26.6	20.2	-	
FO3	563460	270786	32.4	24.3	27.3	24.6	20.8	21.7	19.8	21.2	24.0	19.4	17.7		23.0	17.5	-	
EL1	554420	280133			27.6	21.1	18.8	22.8	19.3	21.5	20.8	27.7	25.0	23.7	22.8	17.4	-	
FO4	562682	270294			26.8	16.5	15.1	12.9	14.2	15.1	16.4	19.7		17.2	17.1	13.0	-	

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

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column.**

☒ **East Cambridgeshire District Council confirms that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within East Cambridgeshire During 2022

East Cambridgeshire District Council has not identified any new sources relating to air quality within the reporting year of 2022.

Additional Air Quality Works Undertaken by East Cambridgeshire District Council During 2022

East Cambridgeshire District Council has not completed any additional works within the reporting year of 2022.

QA/QC of Diffusion Tube Monitoring

East Cambridgeshire District Council's diffusion tubes were supplied and analysed by:

SOCOTEC UK
Unit 12, Moorbrook
Southmead Industrial Estate
Didcot,
Oxfordshire OX11 7HP

The tubes were prepared by spiking a 50:50 mixture of acetone and triethanolamine (TEA) onto the grids prior to being assembled.

The DEFRA Local Air Quality Management Helpdesk publishes information on laboratory performance in the precision of diffusion tube analysis. This can be found at: http://laqm.defra.gov.uk/diffusion-tubes/precision.html

For the purposes of LAQM, tube precision is classed as 'Good' or 'Poor' as follows. Tubes are considered to have Good precision where the coefficient of variation (CV) of duplicate or triplicate diffusion tubes for eight or more periods during the year is less than 20%, and the average CV of all monitoring periods is less than 10%. Tubes are considered to have

Poor precision where the CV of four or more periods is greater than 20% and/or the average CV is greater than 10%.

The distinction between Good and Poor precision is an indicator of how well the same measurement can be reproduced. This precision will reflect the laboratory's performance/consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field. Any laboratory can show Poor precision for a particular period/co-location study if this is due to poor handling of the tubes in the field. In 2021 the Socotec Didcot laboratory received a rating of Good in all 27 out of 27 studies for 50% TEA in acetone.

The AIR/WASP (Workplace Analysis scheme for Proficiency) NO_2 proficiency testing scheme is an independent analytical testing scheme operated on behalf of DEFRA and the Devolved Administrations to test laboratory proficiency. Details of laboratory performance can be found at: http://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html.

SOCOTEC achieved a score of 100% Satisfactory in the proficiency testing round carried out in 2021.

All monitoring has been completed in adherence with the 2022 Diffusion Tube Monitoring Calendar issued by DEFRA.

Diffusion Tube Annualisation

Annualisation was required in respect of one site, NAS14, High Street, Burwell, where data capture was less than 75% but greater than 25%. Two sites with a data capture below 25% did not require annualisation.

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

Site ID	Annualisation Factor Site 1 Wicken Fen	Annualisation Factor Site 2 Sandy Roadside	Annualisation Factor <Site 3 Name>	Annualisation Factor <Site 4 Name>	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
NAS14	1.1647	1.0367	-	-	1.1007	17.8	19.6

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides

guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

East Cambridgeshire District Council has applied a national bias adjustment factor of 0.76 to the 2022 monitoring data as shown in Table C.2.

Table C.2 – National Bias Adjustment Factor Spreadsheet

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/23

Follow the steps below in the correct order to show the results of relevant co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2023
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List. If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List. If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List. If a year is not shown, we have no data [2]

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[5] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision [6]	Bias Adjustment Factor (A) (Cm/Dm)
Aberdeen Scientific Services	20% TEA in water	2022		Overall Factor[3] (7 studies)				Use		0.76
Edinburgh Scientific Services	50% TEA in acetone	2022		Overall Factor[3] (1 study)				Use		0.81
Glasgow Scientific Services	20% TEA in water	2022		Overall Factor[3] (6 studies)				Use		1.05
Gradko	20% TEA in water	2022		Overall Factor[3] (27 studies)				Use		0.83
Gradko	50% TEA in acetone	2022		Overall Factor[3] (14 studies)				Use		0.82
Lambeth Scientific Services	50% TEA in acetone	2022		Overall Factor[3] (4 studies)				Use		0.95
Milton Keynes Council	20% TEA in water	2022		Overall Factor[3] (1 study)				Use		0.78
SOCOTEC Didcot	20% TEA in water	2022		Overall Factor[3] (5 studies)				Use		0.76
SOCOTEC Didcot	50% TEA in acetone	2022		Overall Factor[3] (26 studies)				Use		0.76
SOCOTEC Glasgow	20% TEA in water	2022		Overall Factor[3] (1 study)				Use		0.74
SOCOTEC Glasgow	50% TEA in acetone	2022		Overall Factor[3] (1 study)				Use		0.76
Somerset County Council	20% TEA in water	2022		Overall Factor[3] (6 studies)				Use		0.82
Staffordshire Scientific Services	20% TEA in water	2022		Overall Factor[3] (12 studies)				Use		0.87
Tayside Scientific Services	20% TEA in water	2022		Overall Factor[3] (1 study)				Use		0.75

A summary of bias adjustment factors used by East Cambridgeshire District Council over the past five years is presented in Table C.3.

Table C.3 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.76
2021	National	06/22	0.78
2020	National	09/19	0.77
2019	National	06/18	0.75
2018	National	09/17	0.77

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1. No diffusion tube NO_2 monitoring locations within East Cambridgeshire required distance correction during 2022.

Appendix D: Maps of Monitoring Locations

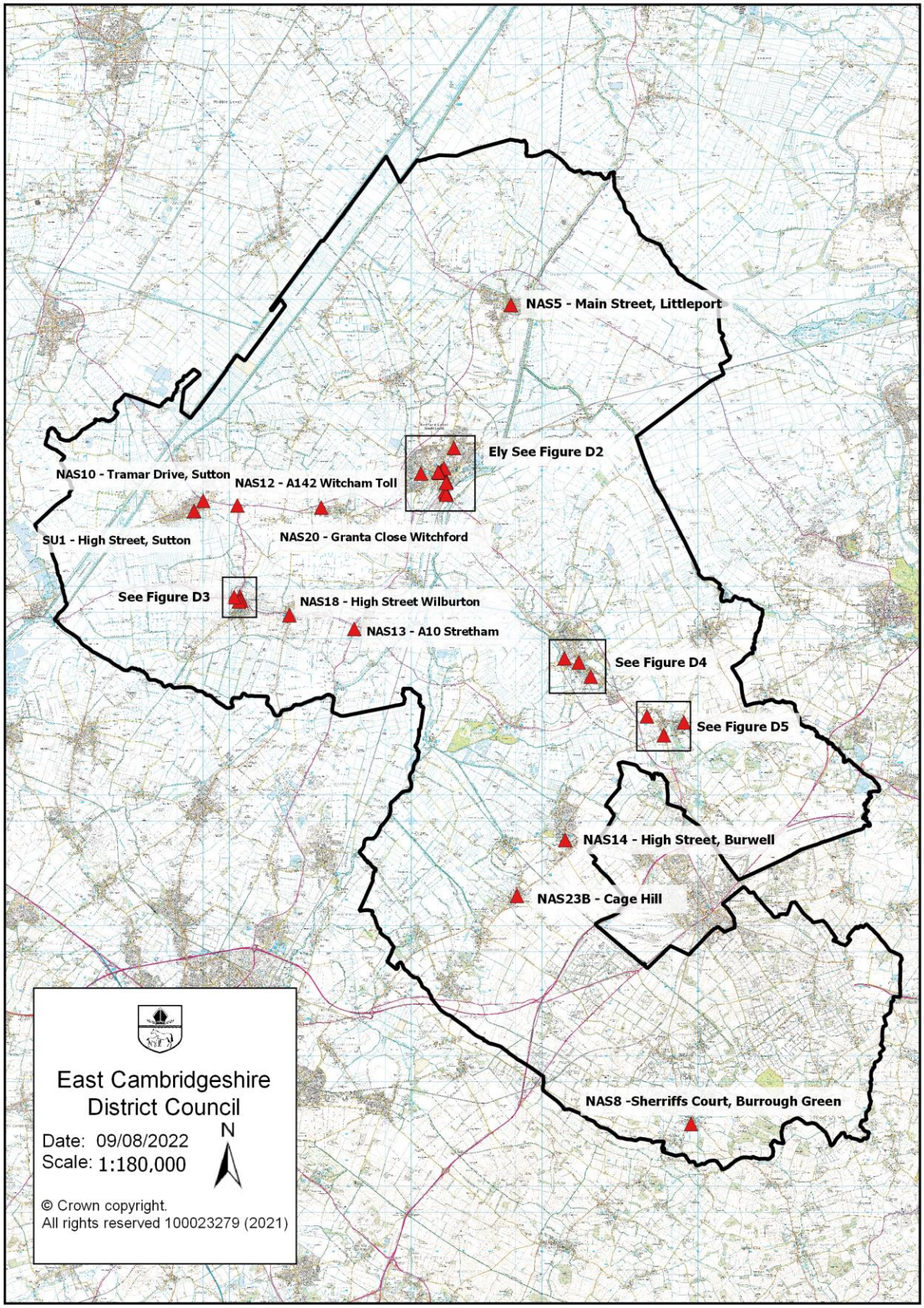


Figure D.1 – Map of Non-Automatic Monitoring Sites in East Cambridgeshire

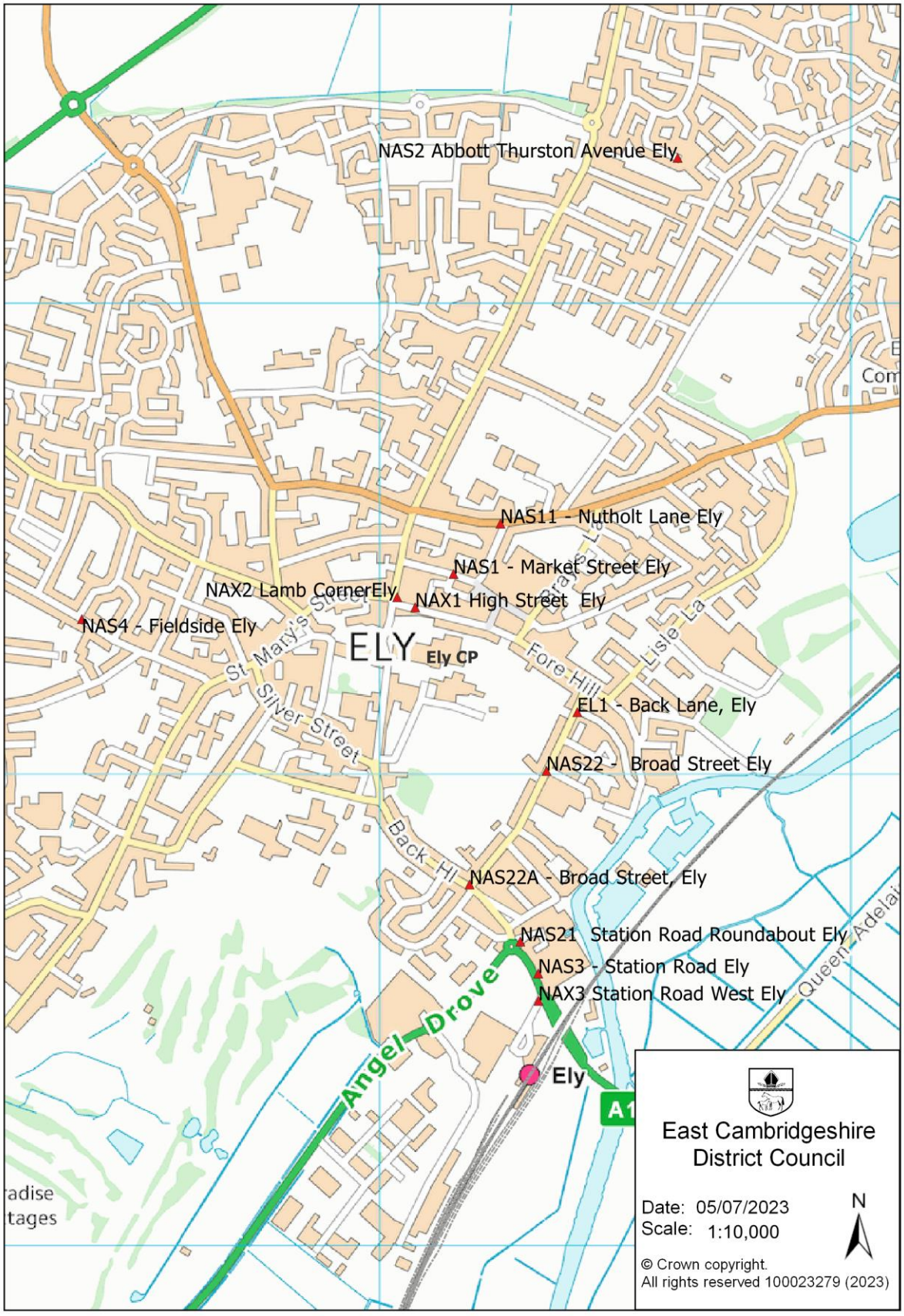


Figure D.2 – Map of Non-Automatic Monitoring Sites in Ely

Figure D.3 – Map of Non-Automatic Monitoring Sites in Haddenham

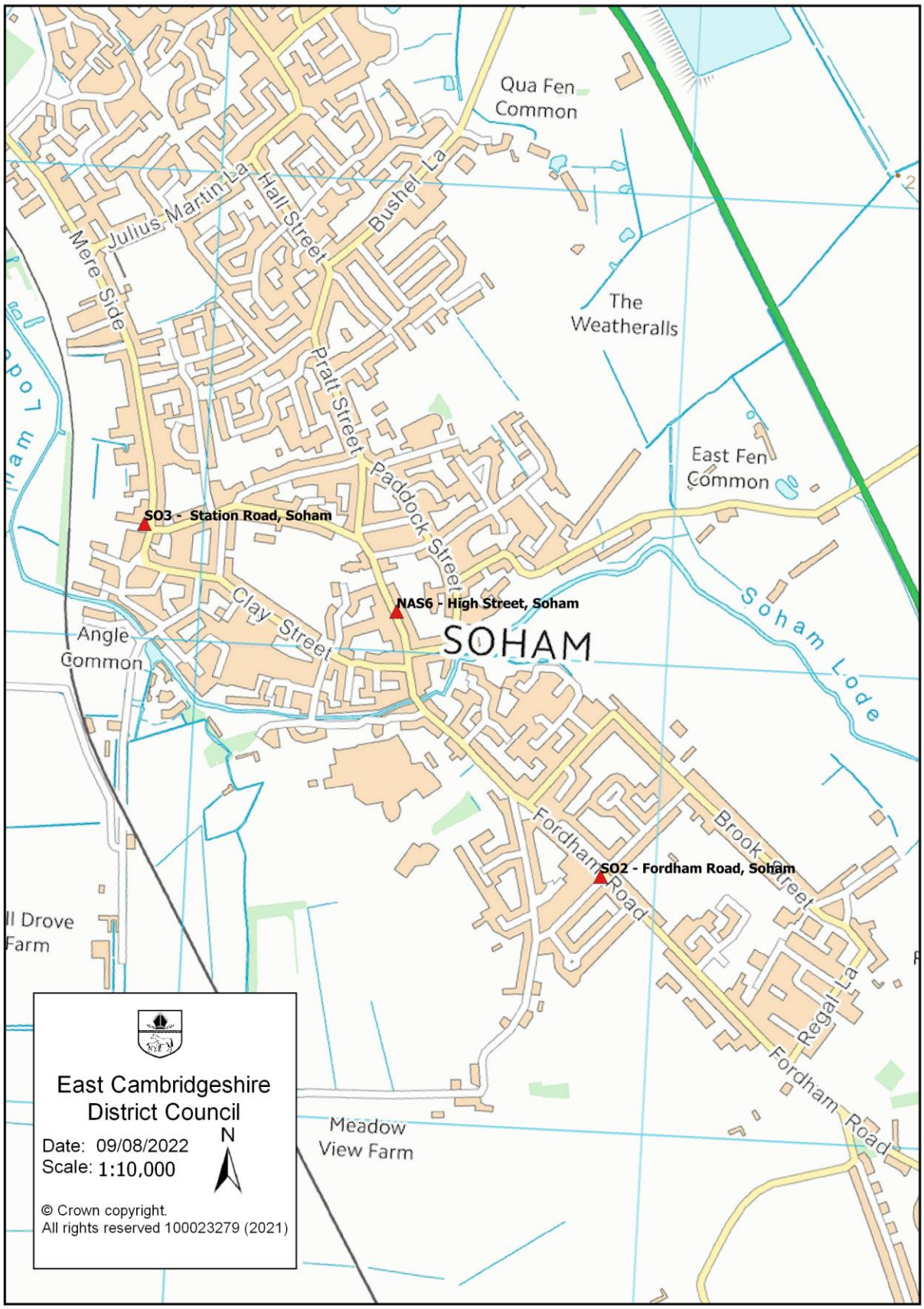


Figure D.4 – Map of Non-Automatic Monitoring Sites in Soham

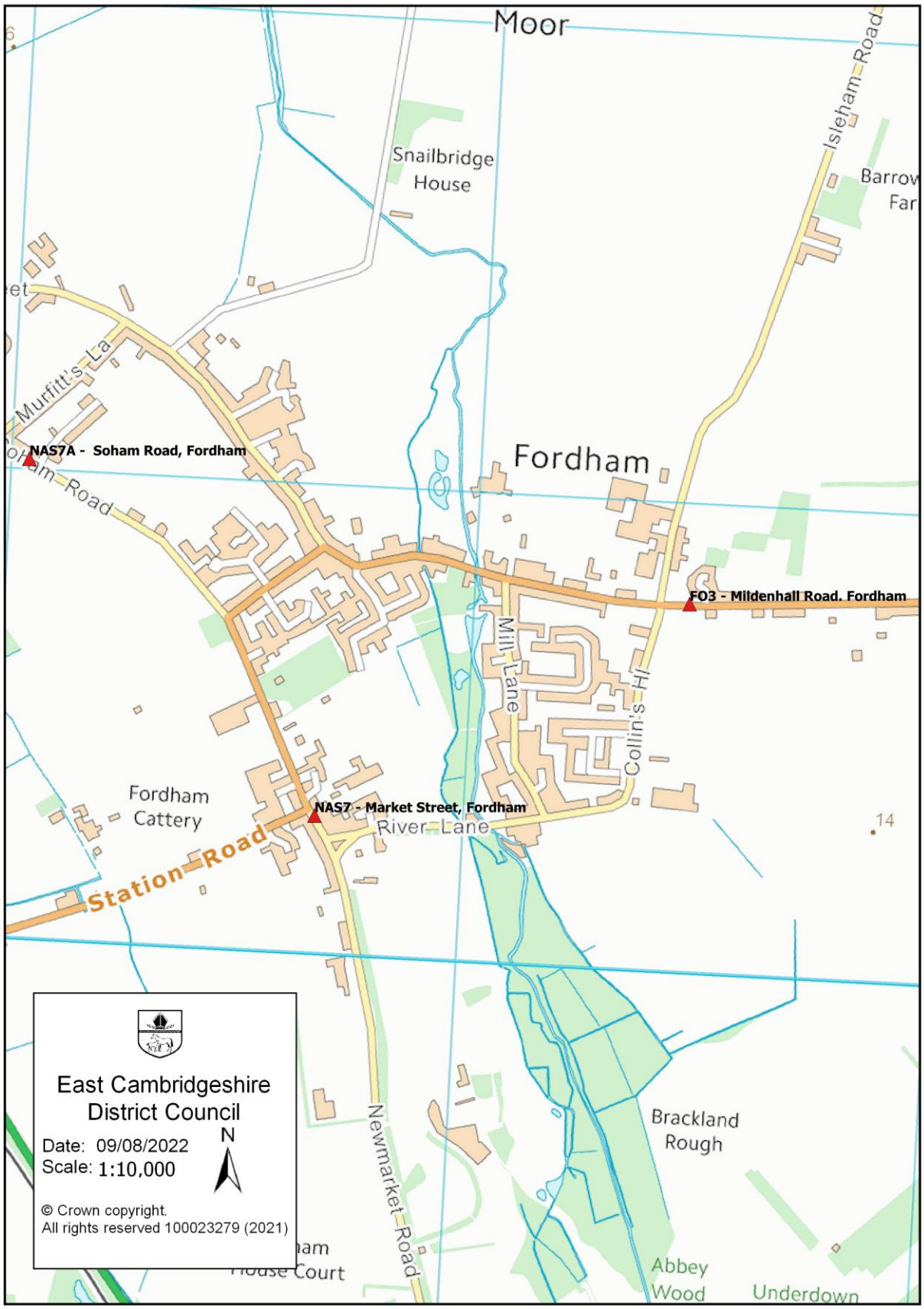


Figure D.5 – Map of Non-Automatic Monitoring Sites in Fordham

Appendix E: Summary of Air Quality Objectives in England

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

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

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
CCC	Cambridgeshire County Council
CPCA	Cambridgeshire and Peterborough Combined Authority
DEFRA	Department for Environment, Food and Rural Affairs
ECDC	East Cambridgeshire District Council
EVCP	Electric Vehicle Charging Point
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
TEA	Triethanolamine
$\mu g/m^3$	Microgrammes per cubic metre

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