EAST CAMBRIDGESHIRE
DISTRICT COUNCIL

2019 Air Quality Annual Status Report (ASR)

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

June 2019

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
Report Reference number	ASR 2019
Date	June 2019

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 and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

This ASR relates to data gathered between 1st January and 31st December 2018. East Cambridgeshire is predominantly rural in character and air quality is relatively good. Statutory objectives are being met at all monitoring locations and the council has not designated any areas as Air Quality Management Areas. As in most other parts of the country road traffic emissions are the principal source of poor air quality. Nitrogen dioxide (NO_2) and particulates are the main contaminants of concern and East Cambridgeshire District Council currently monitors NO_2 levels at 21 sites across the district. Overall, there has been a gradual downward trend in annual mean NO_2 concentrations in recent years. In 2018 annual mean NO_2 concentrations declined at 16 of the 21 monitoring diffusion tube locations compared to 2017, and rose slightly at five. For several years relatively high concentrations were recorded at Station Road, Ely. The permanent closure of the Station Road level crossing and the opening of the A10 Ely Southern Bypass in October 2018 has resulted in a reduction in traffic movements and improvement in air quality at this location.

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. East Cambridgeshire District Council will continue to operate the NO_2 diffusion tube monitoring programme to demonstrate

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

that air quality objectives continue to be met. The council will compile and submit a further ASR in 2020.

Actions to Improve Air Quality

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 Cambridgeshire and Peterborough Combined Authority (CPCA), Cambridgeshire County Council and others to bring about transport improvements. The A142 Ely Southern Bypass opened in October 2018. This has removed much of the traffic which was the source of poor air quality in Station Road and Angel Drove. The CPCA will develop a new Local Transport Plan with a view to improving transport links in the district and reducing negative impacts on air quality.

Conclusions and Priorities

Rapid population growth and an increase in demand for new housing in the district may lead to an increase in road traffic which can have a negative impact on air quality. The council's main priority is to ensure that good air quality is maintained across the district at a time of increased development pressure.

East Cambridgeshire District Council has taken forward a number of direct measures during the current reporting year of 2018 in pursuit of improving local air quality. The council has contributed to the cost of the Ely Southern Bypass the council and is working with the CPCA to prepare a strategy for improved transport in the district and beyond.

The council will also continue to help bring about improvements in air quality by working with Cambridgeshire County Council to implement the objectives of the Transport Strategy for East Cambridgeshire.

Cambridgeshire Health and Wellbeing Board has approved a number of Joint Strategic Needs Assessments (JSNA). These help determine what actions local authorities, the NHS and others need to take to meet local health and social care needs; and also to address the wider determinants that impact on public health and wellbeing such as traffic and air quality. The Transport and Health JSNA includes an Air Pollution section and recommends that future actions focus on:

- Introducing low emission passenger fleets and vehicles

- Encouraging walking and cycling rather than car use
- Further assessment of shorter term measures to reduce exposure

East Cambridgeshire District Council will work with Cambridgeshire County Council towards achieving these aims.

The strategy supports measures to reduce heavy traffic through towns and villages and encourages all traffic to use the most appropriate route with a particular focus on heavy commercial vehicles with all non-local traffic encouraged to use the strategic road networks.

Local Engagement and How to get involved

East Cambridgeshire District Council encourages the public to help improve air quality by trying to reduce the number of car journeys undertaken, choosing a low emission vehicle, switching off car engines when stationary; and by walking, cycling, and using public transport wherever possible.

Table of Contents

Executive Summary: Air Quality in Our Area i

Air Quality in East Cambridgeshire i

Actions to Improve Air Quality ii

Conclusions and Priorities ii

Local Engagement and How to get Involved iii

1 Local Air Quality Management 1

2 Actions to Improve Air Quality 2

2.1 Air Quality Management Areas 2

2.2 Progress and Impact of Measures to address Air Quality in East Cambridgeshire 3

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations 6

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance 7

3.1 Summary of Monitoring Undertaken 7

3.1.1 Automatic Monitoring Sites 7

3.1.2 Non-Automatic Monitoring Sites 7

3.2 Individual Pollutants 7

3.2.1 Nitrogen Dioxide (NO_2) 7

Appendix A: Monitoring Results 9

Appendix B: Full Monthly Diffusion Tube Results for 2017 14

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC 16

Appendix D: Maps of Monitoring Locations 19

Appendix E: Summary of Air Quality Objectives in England 22

Glossary of Terms 23

References 24

List of Tables

Table 2.1 – Progress on Measures to Improve Air Quality 5
Table A.1 – Details of Non-Automatic Monitoring Sites 9
Table A.2 – Annual Mean NO_2 Monitoring Results 11
Table B.1 – NO_2 Monthly Diffusion Tube Results - 2018 14
Table C.1 – NO_2 Fall off with distance corrections 18

Table E.1 – Air Quality Objectives in England 22

List of Figures

Figure A.1 – Trends in Annual Mean NO_2 Concentrations 13

Figure D.1 – Map of Air Quality Monitoring Sites in East Cambridgeshire……..……19
Figure D.2 – Map of Air Quality Monitoring Sites in Ely……..20
Figure D.3 – Map of Air Quality Monitoring Sites in Haddenham……..21

1 Local Air Quality Management

This report provides an overview of air quality in East Cambridgeshire during 2018. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by 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 can be found in Table E.1 in Appendix E.

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 must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

East Cambridgeshire District Council currently does not have any AQMAs. For reference, maps of East Cambridgeshire District Council's monitoring locations are provided in Appendix D.

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

DEFRA's appraisal of last year's ASR concluded that air quality targets were being met in East Cambridgeshire. As in most other parts of the country road traffic emissions are the principal source of poor air quality.

East Cambridgeshire District Council has taken forward a number of direct measures during the current reporting year of 2018 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1.

Key completed measures are:

- Opening of the A142 Ely Southern Bypass and implementation of the Transport Strategy for East Cambridgeshire.
- Railway station improvements at Ely and Littleport to encourage rail travel

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

- Planning and design for a new railway station at Soham, and railway station improvements at Littleport to allow extra capacity and promote rail travel
- Preparation and adoption of a revised Local Plan to include policies to encourage the use of electric vehicles

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

- to continue to monitor NO_2 concentrations throughout the district
- to regularly review the monitoring network locations to ensure that any hotspots are identified
- to support transport infrastructure improvements
- to encourage walking and cycling rather than car use

The principal challenges and barriers to implementation that East Cambridgeshire District Council anticipates facing are the requirements to maintain and improve air quality at a time of increased development pressure across the district. 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. These developments have the potential to significantly impact air quality.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	A142 Ely Southern Bypass	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	CPCA,CCC, Department of Transport, ECDC	2016	2017	Compliance with AQ limits	Reduced vehicle emissions	Bypass opened October 31st 2018	October 2018	None
2	Transport Strategy for East Cambridgeshire	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	ECDC, CCC	2016	2017	Compliance with AQ limits	Reduced vehicle emissions	Adopted December 2016	ongoing	
3	Soham Railway Station	Transport Planning and Infrastructure	Air Quality Planning and Policy Guidance	CPCA, CCC, ECDC, Network Rail, Governance for Rail Infrastructure Projects	2018	Early 2020s	Compliance with AQ limit	Reduced vehicle emission	Planning and design underway	Early 2020s	
4	Littleport Railway Station improvements	Transport Planning and Infrastructure	Public Transport improvement – interchanges, stations and services	CPCA, CCC, ECDC, Network Rail, Governance for Rail Infrastructure Projects	2018	2019	Compliance with AQ limit	Reduced vehicle emission	Planning and design underway	2019	

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Under the Health and Social Care Act 2012 the government introduced a Public Health Outcomes Framework (PHOF) which sets out key indicators of the state of public health and includes an indicator relating to air pollution:

- 3.01- Fraction of mortality attributable to particulate air pollution.

This was estimated as 5.2% in 2017, 0.3 percentage points below the average for the East of England.

East Cambridgeshire District Council does not carry out monitoring or take any measures to specifically address $PM_{2.5}$ concentrations. However, measures to reduce road traffic emissions generally are likely to reduce emissions of $PM_{2.5}$.

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

- Working with Cambridgeshire County Council through the Transport Strategy for East Cambridgeshire to prioritise sustainable transport alternatives and reduce congestion
- Encouraging healthy and active travel and supporting people's wellbeing
- Requiring applicants to provide Construction Environment Management Plans to minimise the production of $PM_{2.5}$ and other particulates which might arise during construction work in considering applications for planning approvals for new development under Town and Country Planning.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

East Cambridgeshire District Council did not undertake any automatic (continuous) monitoring in 2018.

3.1.2 Non-Automatic Monitoring Sites

East Cambridgeshire District Council undertook non-automatic (passive) monitoring of NO_2 using diffusion tubes at 21 sites in 2018. Table A.1 in Appendix shows site details.

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

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A2 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3. All data from the 21 NO_2 diffusion tube monitoring sites were within the air quality annual mean objective.

Decreases in NO_2 concentrations were recorded at 16 of the 21 monitoring locations compared with the results for 2017. Rises in NO_2 concentrations were recorded at five sites. A graph showing trends in annual mean NO_2 concentrations over time is shown in Figure A1 in Appendix A. The graph indicates a general downward trend in NO_2 concentrations since 2008. The annual means plotted are the bias adjusted annual mean values without distance correction.

The relatively poor air quality recorded at Station Road, Ely was due to high traffic flows and queuing traffic on the A142 in Station Road and Angel Drove. This road carried approximately 15,000 vehicles per day of which 8% were HGVs. The road passes under the Ely to Kings Lynn railway line to the north of the station via an underpass which has a height restriction. Taller vehicles used the adjacent level crossing. Increases in passenger and freight rail traffic in recent years meant that the level crossing was often closed for around 40 minutes per hour during the day. The opening of the new A142 Ely Southern Bypass in October 2018 which connects the A142 at Angel Drove to Stuntney Causeway has reduced the volume of traffic and led to an imrovement in air quality.

Appendix A: Monitoring Results

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
NAS1	Market Street, Ely	Roadside	554154	280427	NO2	NO	0	1.5	NO	2.5
NAS2	Abbot Thurston Avenue, Ely	Urban Background	554616	281320	NO2	NO	4.5	1.5	NO	2.25
NAS3	Station Road, Ely	Roadside	554322	279566	NO2	NO	N/A	1.8	NO	2.5
NAS4	Fieldside, Ely	Urban Background	553385	280309	NO2	NO	0.9	0.4	NO	3
NAS5	Main Street, Littleport	Roadside	556845	286801	NO2	NO	4.2	1.6	NO	2.25
NAS6	High Street, Soham	Roadside	559418	273098	NO2	NO	0	1.5	NO	2.5
NAS7	Market Street, Fordham	Roadside	562682	270294	NO2	NO	0	1.5	NO	2.5
NAS8	Sherrifs Court, Burrough Green	Urban Background	563721	255387	NO2	NO	2.1	1.5	NO	2.5
NAS9	Station Road, Haddenham	Roadside	546419	275628	NO2	NO	3.8	1.3	NO	2.5
NAS10	Tramar Drive, Sutton	Urban Background	545012	279286	NO2	NO	5.8	0.8	NO	2.25

NAS11	Nutholt Lane, Ely	Roadside	554255	280536	NO2	NO	0	2.5	NO	2.25
NAS12	A142, Witcham Toll	Roadside	546346	279106	NO2	NO	1.8	2.7	NO	2.25
NAS13	A10, Stretham	Roadside	550811	274395	NO2	NO	10.8	3.2	NO	2.25
NAS14	High Street, Burwell	Roadside	558896	266364	NO2	NO	0	1.5	NO	2.25
NAS15	Hop Row, Haddenham	Roadside	546466	275463	NO2	NO	0	1.5	NO	3
NAS16	High Street, Haddenham	Roadside	546382	275411	NO2	NO	0	1	NO	2.25
NAS17	West End, Haddenham	Roadside	546185	275594	NO2	NO	0	1.5	NO	2.25
NAS18	High Street, Wilburton	Roadside	548320	274895	NO2	NO	0	1.5	NO	2.5
NAS19	The Brook, Sutton	Roadside	544179	279004	NO2	NO	12	1.3	NO	2.8
NAS20	Granta Close, Witchford	Roadside	549542	279026	NO2	NO	4	1.5	NO	2.5
NAS21	Station Road Roundabout, Ely	Roadside	554296	279649	NO2	NO	N/A	2	NO	2.6

Notes:

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

(2) N/A if not applicable.

Table A.2 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3)				
					2014	2015	2016	2017	2018
NAS1	Roadside	Diffusion Tube		100	21	21.1	21.5	19.7	19.4
NAS2	Urban Background	Diffusion Tube		100	12.3	11.9	12.9	12.2	11.7
NAS3	Roadside	Diffusion Tube		100	21.6	20.1	20.4	30.9	28.9
NAS4	Urban Background	Diffusion Tube		100	13.8	14.5	15.2	14.9	14.2
NAS5	Roadside	Diffusion Tube		100	16.3	15.7	15.9	15.6	15.2
NAS6	Roadside	Diffusion Tube		100	20.5	18.5	19.8	19.4	19.7
NAS7	Roadside	Diffusion Tube		100	18.8	17.9	19.7	19.3	17.9
NAS8	Urban Background	Diffusion Tube		100	11.2	11.4	10.9	10.9	10.2
NAS9	Roadside	Diffusion Tube		100	25.9	21.2	24.8	23.8	23.6
NAS10	Urban Background	Diffusion Tube		100	13.1	15.1	16.3	14.3	14.8
NAS11	Roadside	Diffusion Tube		100	19.3	20.1	19.9	19.4	18.6
NAS12	Roadside	Diffusion Tube		100	29.5	26.7	27.2	27	26.0
NAS13	Roadside	Diffusion Tube		100	20.1	20.3	21.9	18.2	20.2
NAS14	Roadside	Diffusion Tube		92	18.4	19.4	24.6	26.5	22.6

NAS15	Roadside	Diffusion Tube		100	27.1	26.8	27.6	28	23.6
NAS16	Roadside	Diffusion Tube		100	18.4	17.9	19	17.1	17.9
NAS17	Roadside	Diffusion Tube		83	20.6	25.7	19	18.3	16.9
NAS18	Roadside	Diffusion Tube		100				32	29.2
NAS19	Roadside	Diffusion Tube		100				18.8	16.6
NAS20	Roadside	Diffusion Tube		100				10.2	11.7
NAS21	Roadside	Diffusion Tube		92	32.7	33.3	27.11	32.5	24.1

☒ **Diffusion tube data has been bias corrected**

☒ **Annualisation has been conducted where data capture is <75%**

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.**

(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%).

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

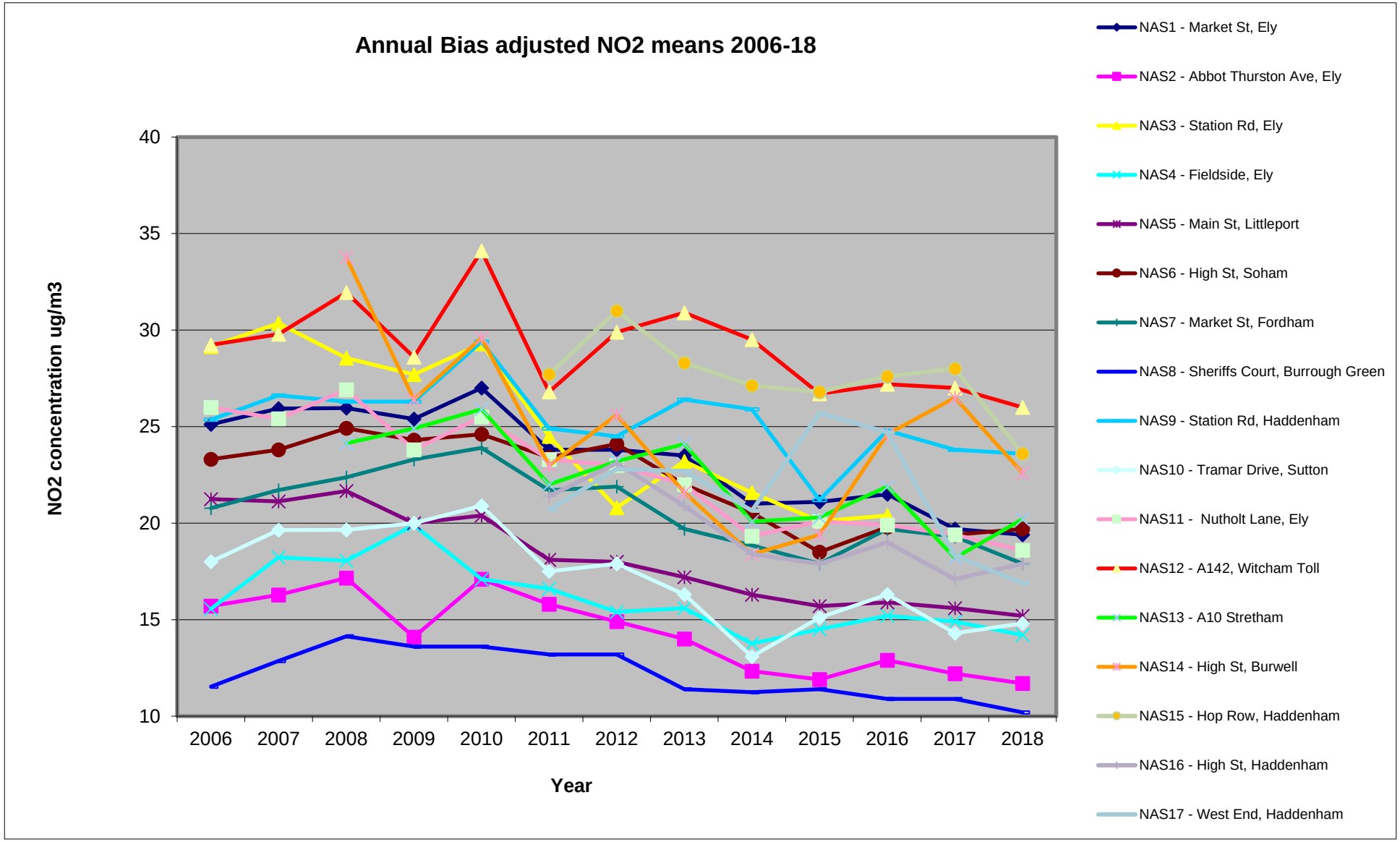

Figure A.1 – Trends in Annual Mean NO_2 Concentrations

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2018

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.77) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
NAS1	30.3	30.9	26.9	25.5	20.7	20.2	23.4	20.2	23.7	27.9	23.0	30.1	25.2	19.4	
NAS2	24.3	19.6	17.4	11.5	8.0	6.5	10.5	9.8	12.6	18.8	22.6	20.9	15.2	11.7	
NAS3	36.4	44.8	44.9	39.4	35.3	36.7	43.2	33.6	41.0	42.5	26.5	26.9	37.6	28.9	
NAS4	23.2	24.6	22.6	16.4	10.2	8.6	11.9	12.5	17.4	20.3	27.4	26.2	18.4	14.2	
NAS5	28.7	18.7	22.5	17.6	12.9	13.2	17.3	14.8	19.5	23.7	24.5	24.2	19.8	15.2	13.4
NAS6	29.3	32.6	30.0	24.1	24.8	21.3	21.7	18.3	20.7	26.3	30.3	28.4	25.6	19.7	
NAS7	28.9	25.1	27.8	21.4	17.7	18.0	21.4	19.8	20.6	24.3	28.8	24.4	23.2	17.9	
NAS8	20.8	14.3	15.6	11.0	7.3	5.7	8.6	8.9	12.2	15.2	24.9	15.2	13.3	10.2	
NAS9	30.7	35.9	28.9	32.7	28.8	27.0	30.0	25.8	29.6	34.5	34.0	29.7	30.6	23.6	
NAS10	24.5	24.0	22.2	18.8	16.2	12.8	13.7	12.6	15.7	22.5	22.4	24.7	19.2	14.8	
NAS11	34.2	29.8	29.0	23.7	14.4	17.6	20.9	18.0	21.3	24.5	29.5	26.9	24.2	18.6	
NAS12	32.9	40.3	37.4	33.0	39.1	29.0	33.7	27.3	27.8	26.6	43.0	35.7	33.8	26.0	23.7
NAS13	20.7	32.5	30.4	27.0	24.4	25.2	27.2	21.4	22.3	28.6	30.3	25.4	26.3	20.2	16.0
NAS14		33.7	29.4	29.1	29.7	13.8	28.7	25.3	29.5	37.9	33.4	31.6	29.3	22.6	
NAS15	34.1	30.8	29.6	26.5	28.2	24.8	31.9	28.1	32.0	34.6	32.5	34.2	30.6	23.6	

NAS16	23.0	30.0	24.4	22.4	23.9	23.1	22.5	17.1	18.0	25.4	27.4	22.5	23.3	17.9	
NAS17		23.8	22.9	20.8		17.6	23.2	19.3	19.8	24.8	21.9	26.6	22.0	16.9	
NAS18	49.0	37.9	43.8	35.9	29.5	26.3	37.8	36.2	39.4	39.3	40.6	39.3	37.9	29.2	
NAS19	28.5	26.6	23.3	17.2	15.2	13.4	18.8	16.6	20.8	25.9	25.5	26.8	21.6	16.6	12.9
NAS20	18.5	18.5	14.4	24.1	8.7	7.1	11.3	9.9	13.3	18.0	20.1	18.3	15.2	11.7	
NAS21		25.2	37.5	33.7	23.8	19.3	31.0	31.8	39.3	33.9	33.9	35.3	31.3	24.1	

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

☒ **Where applicable, data has been distance corrected for relevant exposure**

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.**

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

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

Diffusion Tube Bias Adjustment Factors

Diffusion tube values have been multiplied by a bias correction factor of 0.77 obtained from the DEFRA LAQM Helpdesk national bias adjustment database (version 09/19).

Discussion of Choice of Factor to Use

No local co-location information was available so a bias adjustment factor was obtained from the national bias adjustment database which is available at: http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html.

Adjustment factors are derived from data from diffusion tubes which were co-located with real-time analysers.

Entering the parameters for ESG Didcot, and a 50% triethanolamine (TEA) in acetone preparation method for 2018 gave an adjustment factor of 0.77 which was applied to the East Cambridgeshire District Council data.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes were supplied and analysed by:

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

The tubes were prepared by spiking acetone: triethanolamine (50:50) 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 purpose of LAQM tube precision is classed as Good or Poor. For the purposes of Local Air Quality Management, tube precision is separated into two categories, "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 2018 SOCTEC received a rating of Good in all 30 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 all proficiency testing rounds in 2018.

NO2 Fall-off with distance calculator

This Excel tool has been developed by DEFRA to help local authorities derive the NO_2 concentration at locations relevant for exposure as it is not always possible to measure concentrations at precisely the desired location. The calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site. The monitoring can either be closer to the kerb than the receptor, or further from the kerb than the receptor.

The closer the monitor and the receptor are to each other, the more reliable the prediction will be. The methodology consists of comparing the monitored annual mean NO_2 concentrations at a given point against known relationships between NO_2 concentrations and the distance from a road source.

For information about the restrictions on the application of this tool, please see the "Limitations" tab. Any further information with regards to the use of this tool is provided within LAQM.TG(16).

http://laqm.defra.gov.uk/technical-guidance/index.html

Background values were obtained from the DEFRA website. https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2013

Table C.1 - NO2 Fall-off with distance corrections

Site Name/ID	Distance (m)		NO_2 Annual Mean Concentration ($\mu g/m^3$)		
	Monitoring Site to Kerb	Receptor to Kerb	Background	Monitored at Site	Predicted at Receptor
NAS5 - Littleport	1.6	5.8	8.8	15.2	13.4
NAS12 – A142 Witcham Toll	2.7	4.5	9.6	26	23.7
NAS13 – A10 Stretham	3.2	14	9.3	20.2	16.0
NAS19 – The Brook, Sutton	1.3	13.3	9.2	16.6	12.9

Appendix D: Maps of Monitoring Locations

Figure D.1 - Map of Air Quality Monitoring Sites in East Cambridgeshire

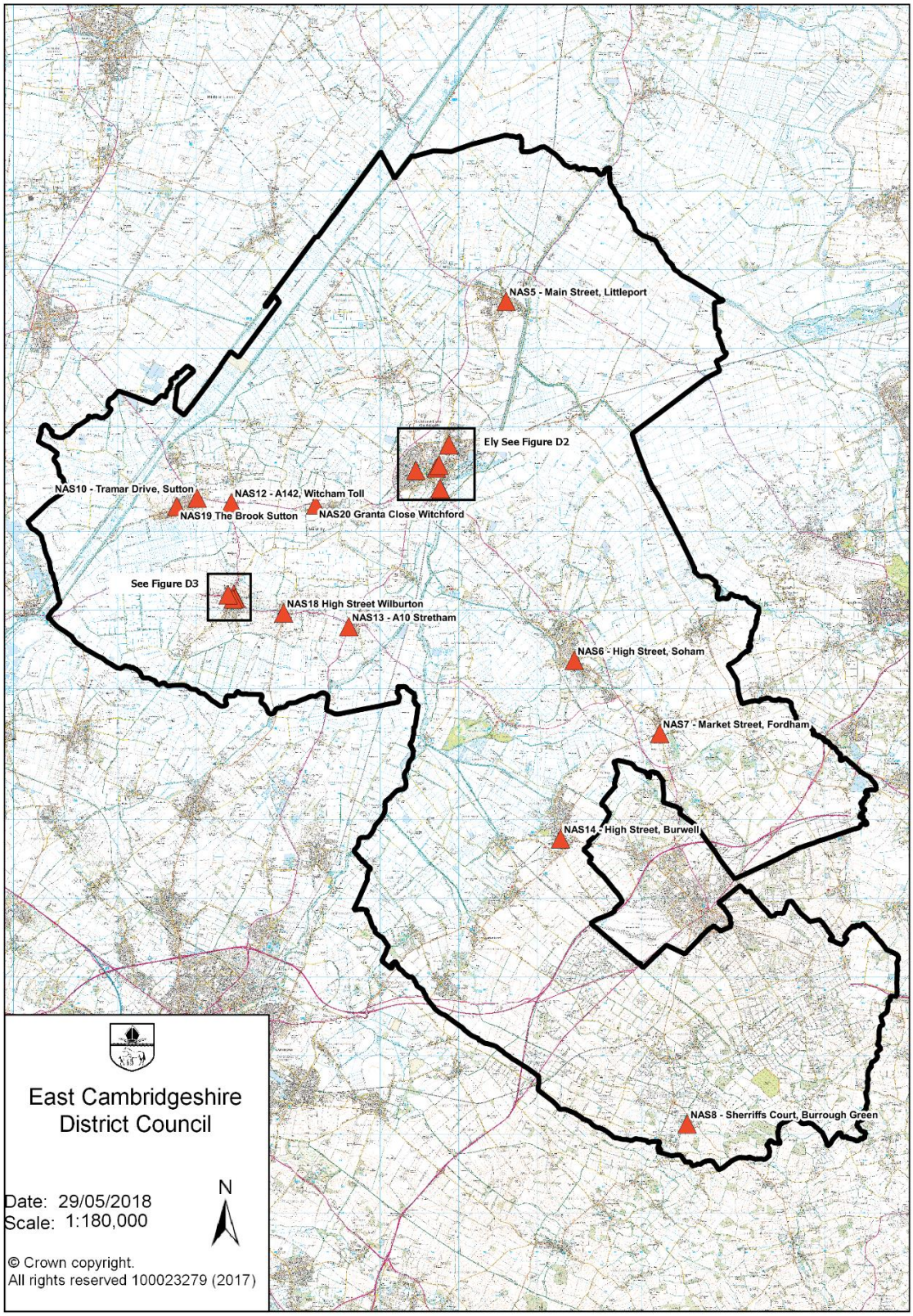

Figure D.2 - Map of Air Quality Monitoring Sites in Ely

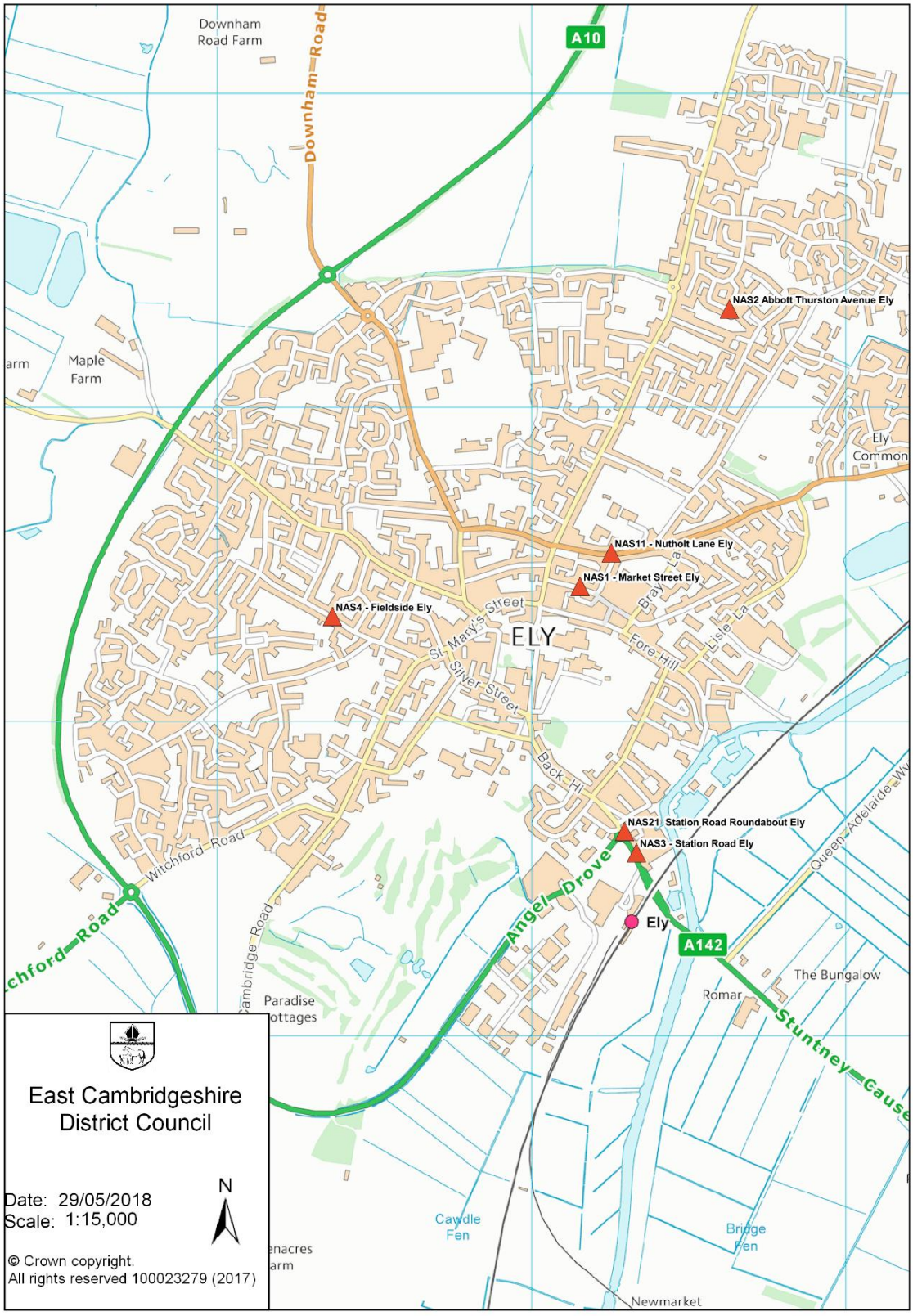

Figure D.3 - Map of Air Quality Monitoring Sites in Haddenham

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[4]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[4] 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	Air quality 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
EU	European Union
JSNA	Joint Strategic Needs Assessment
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control

References

Cambridgeshire County Council. Transport Strategy for East Cambridgeshire, 2016

http://www.cambridgeshire.gov.uk/info/20006/travel_roads_and_parking/66/transport_plans_and_policies/6

Cambridgeshire Health and Wellbeing Board. Transport and Health JSNA, 2015

http://cambridgeshireinsight.org.uk/JSNA/Transport-and-Health-2014/15

Department for Environment Food and Rural Affairs. Local Air Quality Management Policy Guidance (PG16) April 2016

http://laqm.defra.gov.uk/documents/LAQM-PG16-April-16-v1.pdf

Public Health England. Public Health Outcomes Framework, 2013-2016
https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data

Department for Environment Food and Rural Affairs. Local Air Quality Management Technical Guidance (TG16) April 2016

http://laqm.defra.gov.uk/technical-guidance/

Department for Environment Food and Rural Affairs. Nitrogen Dioxide Fall-off with distance calculator

http://laqm.defra.gov.uk/documents/NO2-Fall-Off-With-Distance-from-Roads-Calculator-v4.1.xls

DEFRA. National Diffusion Tube Bias Adjustment Factor Spreadsheet. Spreadsheet Version Number: 09/17

http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Department for Environment Food and Rural Affairs. Local Air Quality Management: Summary of Laboratory Performance in AIR NO2 Proficiency Testing Scheme (October 2015 - August 2017)

https://laqm.defra.gov.uk/assets/airptrounds10to21oct2015aug20171.pdf