



EAST CAMBRIDGESHIRE
DISTRICT COUNCIL

2018 Air Quality Annual Status Report (ASR)

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

June 2018

East Cambridgeshire District Council

Local Authority Officer	Peter Ord
Department	Environmental Services
Address	The Grange, Nutholt Lane, Ely, Cambridgeshire CB7 4EE
Telephone	01353 616463
E-mail	Peter.ord@eastcambs.gov.uk
Report Reference number	ASR 2018
Date	June 2018

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 billion³.

This ASR relates to data gathered between 1st January and 31st December 2017. 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 (NO₂) and particulates are the main contaminants of concern and East Cambridgeshire District Council currently monitors NO₂ levels at 21 sites across the district. Overall, there has been a gradual downward trend in annual mean NO₂ concentrations in recent years. In 2017 annual mean NO₂ concentrations declined at 13 of the 17 long term monitoring diffusion tube locations compared to 2016, rose slightly at three and remained the same at one (see Figure A.1). There is one area of relatively poor air quality in the district at Station Road, Ely which is subject to high traffic volumes. However, there is limited public exposure to the air quality in this area and recent road improvements are likely to lead to an improvement in air quality.

In October 2016 additional diffusion tubes were deployed on a temporary basis in the villages of Haddenham, Wilburton and Sutton in order to investigate the effects on air quality of traffic passing through those villages to avoid the busier main roads.

Monitoring at these locations was continued until the end of March 2017. Two of these locations at High Street, Wilburton, and The Brook, Sutton have been added to

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

the monitoring programme to give a more comprehensive coverage of the district. An extra background location at Granta Close, Witchford has also been added. The automatic monitoring station AS1 at Station Road, Ely was closed down in early January 2017 due to the expiry of the lease and the absence of suitable alternative accommodation. In preparation for this an additional diffusion tube location, NAS21, was established in October 2016 close to the former location of AS1. Although this location is not representative of public exposure, recording has been continued in order to evaluate the effect on NO₂ levels in the area when the Ely Southern By-pass opens in late summer 2018.

As well as meeting the annual mean air quality objective of 40 µg/m³ for NO₂ all of the individual monthly NO₂ levels were less than 40 µg/m³ with the exception of a single result for NAS18, High Street, Wilburton which recorded a value of 41.3 µg/m³ in December 2017. This monitoring point is close to the junction of the A1123 and B1049 which experiences high traffic flows at peak times. Higher localized NO₂ levels can occur during the winter months when weather conditions can retard the dispersion of poor quality air.

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 NO₂ diffusion tube monitoring programme to ensure that air quality objectives continue to be met. The council will compile and submit a further ASR in 2019.

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 Cambridgeshire County Council (CCC) to bring about improvements in transport infrastructure; and construction of the A142 Ely Southern Bypass began in April 2017. The new road will open in late summer 2018 and will remove the traffic which is the source of poor air quality in Station Road and Angel Drove. The two councils have developed a Transport Strategy for East Cambridgeshire 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 2017 in pursuit of improving local air quality. As well as contributing to the cost of the Ely Southern By-pass the council carried out extra monitoring in villages affected by road traffic and provided extra car parking at Ely and Littleport railway stations to encourage rail travel.

The council will 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	iii
Local Engagement and How to get Involved	iv
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.....	7
3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance	8
3.1 Summary of Monitoring Undertaken	8
3.1.1 Automatic Monitoring Sites	8
3.1.2 Non-Automatic Monitoring Sites.....	8
3.2 Individual Pollutants	8
3.2.1 Nitrogen Dioxide (NO ₂).....	8
Appendix A: Monitoring Results	10
Appendix B: Full Monthly Diffusion Tube Results for 2017	15
Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	17
Appendix D: Maps of Monitoring Locations	20
Appendix E: Summary of Air Quality Objectives in England	23
Glossary of Terms	24
References	25

List of Tables

Table 2.1 – Progress on Measures to Improve Air Quality	5
---	---

1 Local Air Quality Management

This report provides an overview of air quality in East Cambridgeshire during 2017. 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 2017 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:

- commencement of construction work on the A142 Ely Southern By-pass and implementation of the Transport Strategy for East Cambridgeshire.
- provision of extra parking at Ely and Littleport railway stations to encourage rail travel

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

- the A142 Ely Southern By-pass to be open for traffic with an improvement in air quality in the Angel Drove and Station Road area
- adoption of 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 NO₂ concentrations throughout the district
- to regularly review the monitoring network locations to ensure that any hotspots are identified
- 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

East Cambridgeshire District Council

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 by-pass	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	CCC, Department of Transport	2016	construction began spring 2017	Compliance with AQ limits	c 90% traffic reduction in Station Road	Construction in progress	Late summer 2018	none
2	Transport Strategy for East Cambridgeshire	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	CCC, ECDC	2016	2017	Compliance with AQ limits	Reduced vehicle emissions	Strategy adopted December 2016	ongoing	funding
3	Additional parking provision at Ely and Littleport railway stations	Promoting Travel Alternatives	Promote use of rail and inland waterways	ECDC	2016	2017	Compliance with AQ limits	Reduced vehicle emissions	Completed November 2017	2017	none
4	Soham Railway Station	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	Cambridgeshire and Peterborough Combined Authority, CCC, ECDC, Network Rail, Governance for Rail Infrastructure Projects	2015	to be decided	Compliance with AQ limits	Reduction in road traffic	Options and Feasibility Study prepared	to be arranged	cost and funding
5	Air Quality policies included in Local Plan review	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	ECDC	2017	2019	Compliance with AQ limits	Reduced vehicle emissions	Included in draft Local Plan review	Plan with Secretary of State for approval	New developments should provide attractive, accessible and integrated vehicle and cycle parking and facilities for electric and other ultra-low emission vehicles

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 2016, 0.2 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 2017. The Council's single automatic monitoring station NAS1 at Station Road, Ely was decommissioned in early January 2017 as the site housing the equipment was no longer available due to the expiry of the lease and the absence of alternative accommodation. Also, road improvements which are underway are likely to bring about improvements in air quality and there is no longer any necessity to consider the declaration of an Air Quality Management Area. Therefore, detailed monitoring data is no longer required

3.1.2 Non-Automatic Monitoring Sites

East Cambridgeshire District Council undertook non-automatic (passive) monitoring of NO₂ using diffusion tubes. The network was extended from 17 sites in 2016 to 21 sites in 2017. 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 (NO₂)

Table A2 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³. All data from the 21 NO₂ diffusion tube monitoring sites were within the air quality annual mean objective.

Decreases in NO₂ concentrations were recorded at 13 of the 17 long term monitoring locations compared with the results for 2016. Rises in NO₂ concentrations were recorded at three sites. A graph showing trends in annual mean NO₂ concentrations over time is shown in Figure A1 in Appendix A. The graph indicates a general downward trend in NO₂ 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 is due to high traffic flows and queuing traffic on the A142 in Station Road and Angel Drove. This road carries approximately 15,000 vehicles per day of which 8% are 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 must use the adjacent level crossing. Increases in passenger and freight rail traffic in recent years mean that the level crossing is now closed for around 40 minutes per hour during the day. When the gates are closed heavy traffic queues back on to the main carriageway blocking access to the underpass for smaller vehicles. Construction of the new A142 Ely Southern Bypass is in progress and the road will open in the late summer of 2018. The road will connect the A142 at Angel Drove to Stuntney Causeway and will largely remove the source of poor air quality in the area.

NAS3 in Station Road shows an apparent rise in annual mean NO₂ concentrations from 20.4 µg/m³ in 2016 to 30.9 µg/m³ in 2017, an increase of 10.5 µg/m³. However, this is most likely due to the fact that the tube was moved from its original location on the northbound side of the road to its present location on the southbound side following the loss of two tubes in January and February 2017. Although the distance between these two points is only c.15m, heavy goods vehicles queue on the southbound side of the road to use the rail crossing, whereas traffic on the northbound side near to the original location flows relatively freely. It is likely that the apparent rise reflects this change in monitoring location rather than any real increase in NO₂ concentrations as the new location is much closer to the stationary traffic. For this reason the 2017 result has not been included in the trend graph in Figure A1. The results for NAS3 demonstrate how high NO₂ concentrations can fall off quite rapidly with distance.

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	Tamar Drive, Sutton	Urban Background	545012	279286	NO2	NO	5.8	0.8	NO	2.25
NAS11	Nutholt Lane,	Roadside	554255	280536	NO2	NO	0	2.5	NO	2.25

East Cambridgeshire District Council

	Ely									
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 NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
AS1/NAS21	Roadside	Diffusion Tube	100	83	32.65	32.7	33.3	27.11	32.5
NAS1	Roadside	Diffusion Tube		92	23.5	21	21.1	21.5	19.7
NAS2	Urban Background	Diffusion Tube		100	14	12.3	11.9	2.9	2.2
NAS3	Roadside	Diffusion Tube		83	23.2	21.6	20.1	20.4	30.9
NAS4	Urban Background	Diffusion Tube		92	15.6	13.8	14.5	15.2	14.9
NAS5	Roadside	Diffusion Tube		100	17.2	16.3	15.7	15.9	15.6
NAS6	Roadside	Diffusion Tube		92	22	20.5	18.5	19.8	19.4
NAS7	Roadside	Diffusion Tube		92	19.7	18.8	17.9	19.7	19.3
NAS8	Urban Background	Diffusion Tube		92	11.4	11.2	11.4	10.9	10.9
NAS9	Roadside	Diffusion Tube		100	26.4	25.9	21.2	24.8	23.8
NAS10	Urban Background	Diffusion Tube		100	16.3	13.1	15.1	16.3	14.3
NAS11	Roadside	Diffusion Tube		100	22	19.3	20.1	19.9	19.4
NAS12	Roadside	Diffusion Tube		100	30.9	29.5	26.7	27.2	27
NAS13	Roadside	Diffusion Tube		100	24.1	20.1	20.3	21.9	18.2

NAS14	Roadside	Diffusion Tube		75	21.6	18.4	19.4	24.6	26.5
NAS15	Roadside	Diffusion Tube		83	28.3	27.1	26.8	27.6	28
NAS16	Roadside	Diffusion Tube		100	20.9	18.4	17.9	19	17.1
NAS17	Roadside	Diffusion Tube		100	22.7	20.6	25.7	19	18.3
NAS18	Roadside	Diffusion Tube		100					32
NAS19	Roadside	Diffusion Tube		100					18.8
NAS20	Roadside	Diffusion Tube	100	75					10.2

Diffusion tube data has been bias corrected

Annualisation has been conducted where data capture is <75%

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

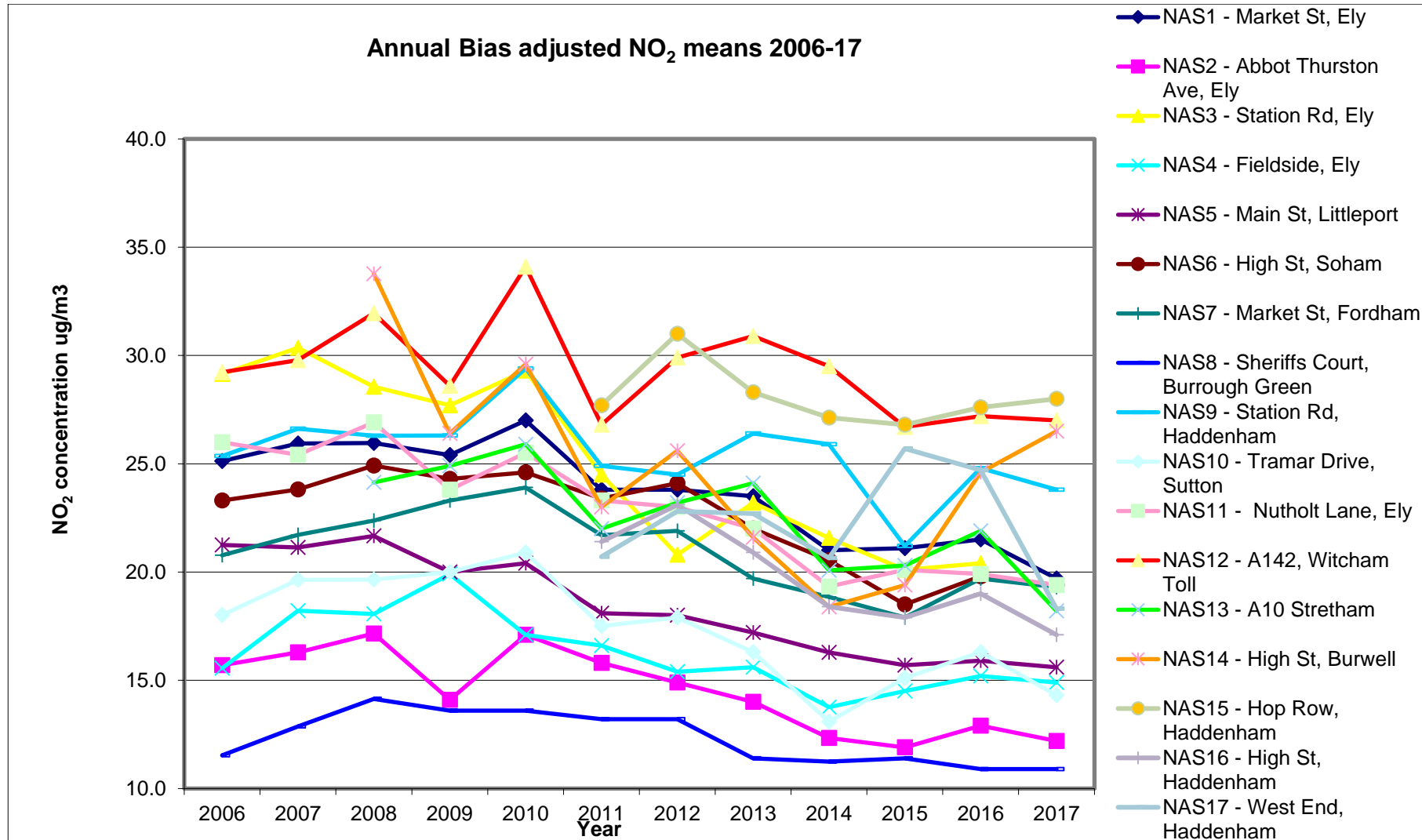
NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(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 NO₂ Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2017

Site ID	NO ₂ Mean Concentrations (µg/m ³)													Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.77) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾	
NAS1	43.7	27.6	28.1	26.5	23.3	20.4	15.7	18.3	24.9	25.4	30.9	21.8	25.6	19.7		
NAS2	40.7	19.5	15.2	11.7	10.6	9.9	9.1	9.6	14.4	16.1	22.3	11.3	15.9	12.2		
NAS3			44.2	42	38.9	41	36.7	37.1	42.1	37.4	47.8	35.2	40.2	30.9		
NAS4	45.2		19.3	15.8	14	12.4	11.5	10.8	16	18.1	27.8	22.1	19.4	14.9		
NAS5	41.7	19.1	20.8	17.6	16	13.6	12.6	12.6	19.2	19.4	27.8	23.4	20.3	15.6	13.5	
NAS6	45.2	32.4	26.3	21.8	24.3	19.2	17.2	16.7	23.4	22.9	28.1	24.6	25.2	19.4		
NAS7	50	27.8	26.8	22.2	20.1	18.2	15.4	16.6	22.9	23.7	30.6	25.7	25.0	19.3		
NAS8	32.4	22.5	13.9	10.8	9.1	8.1	7.9	7.1	13.3	14.4	16.2		14.1	10.9		
NAS9	55.8	33.6	29	27.7	26.9	24.6	25.2	25.4	27.9	28	37.7	28.5	30.9	23.8		
NAS10	37	25.9	19.2	15.6	14.7	11	11	12.1	15.5	16.3	25.8	19.6	18.6	14.3		
NAS11	42.1	29.9	29.1	22.4	20.8	21.6	16.9	15.5	24.6	24.1	29.7	26.2	25.2	19.4		
NAS12	63.5	41.1	31.3	35	33.2	28.8	26.5	25.8	37.2	28.3	37.3	31.8	35.0	27.0	24.6	
NAS13	38.3	29.2	21.7	20.1	24.3	20.9	20.5	20.6	21.9	21.2	27.2	17.7	23.6	18.2	14.5	
NAS14	63.5	36.5	28.2	32.9	28	28.1	24.6	25.5	35	34.7	42	33.2	34.4	26.5		
NAS15	56.2	36.7	34.4	35.2	30.2	30.2			34.4	31.6	47.3	27.9	36.4	28.0		

East Cambridgeshire District Council

NAS16	40.8	28.3	22.6	17.1	22.5	16	14.9	14.8	21.9	19.6	26	22	22.2	17.1	
NAS17	51.8	37.5	30.6	31.4	9.9	9.7	9.7	10.2	15.2	25	33.1	21.8	23.8	18.3	
NAS18	71.4	45	42.9	38.7	32.8	33.2	32	35.4	43.8	42.6	40.5	39.7	41.5	32.0	
NAS19	48.2	30.4	25.1	18.3	17.6	17	16.7	16.3	20.1	23.7	31.1	27.9	24.4	18.8	13.5
NAS20					10	8.5	9.3	10.2	13.8	15.7	22.9	15.4	13.2	10.2	
NAS21	58.8	45.1	41.3	37.2			30.9	35.5	40.6	42.2	51.8	39.3	42.3	32.5	

- 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 NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 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 09/17).

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 2017 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 (Formerly Environmental Scientifics Group (ESG))
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 2017 ESG Didcot received a rating of Good in all 29 studies for 50% TEA in acetone.

The AIR/WASP (Workplace Analysis scheme for Proficiency) NO₂ 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>. ESG Didcot achieved a score of 100% Satisfactory in all proficiency testing rounds in 2017.

NO₂ Fall-off with distance calculator

This Excel tool has been developed by DEFRA to help local authorities derive the NO₂ 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 NO₂ 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 NO₂ concentrations at a given point against known relationships between NO₂ 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 (µg/m ³)		
	Monitoring Site to Kerb	Receptor to Kerb	Background	Monitored at Site	Predicted at Receptor
NAS5 - Littleport	1.6	5.8	8.3	15.6	13.5
NAS12 – A142 Witcham Toll	2.7	4.5	9	27	24.7
NAS13 – A10 Stretham	3.2	14	8.6	18.2	14.5
NAS19 – The Brook, Sutton	1.3	13.3	8	18.8	13.5

Appendix D: Maps of Monitoring Locations

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

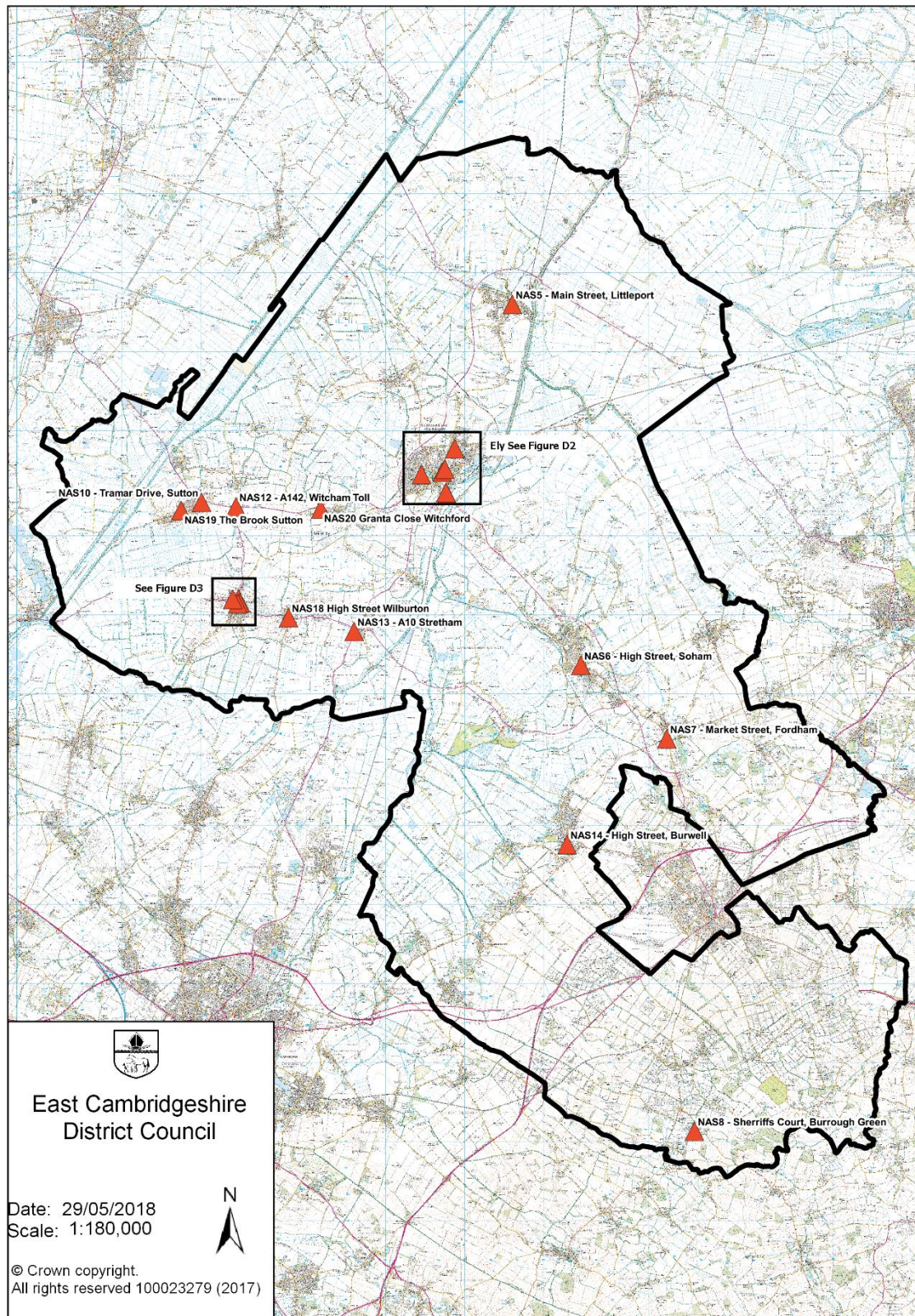


Figure D.2 - Map of Air Quality Monitoring Sites in Ely

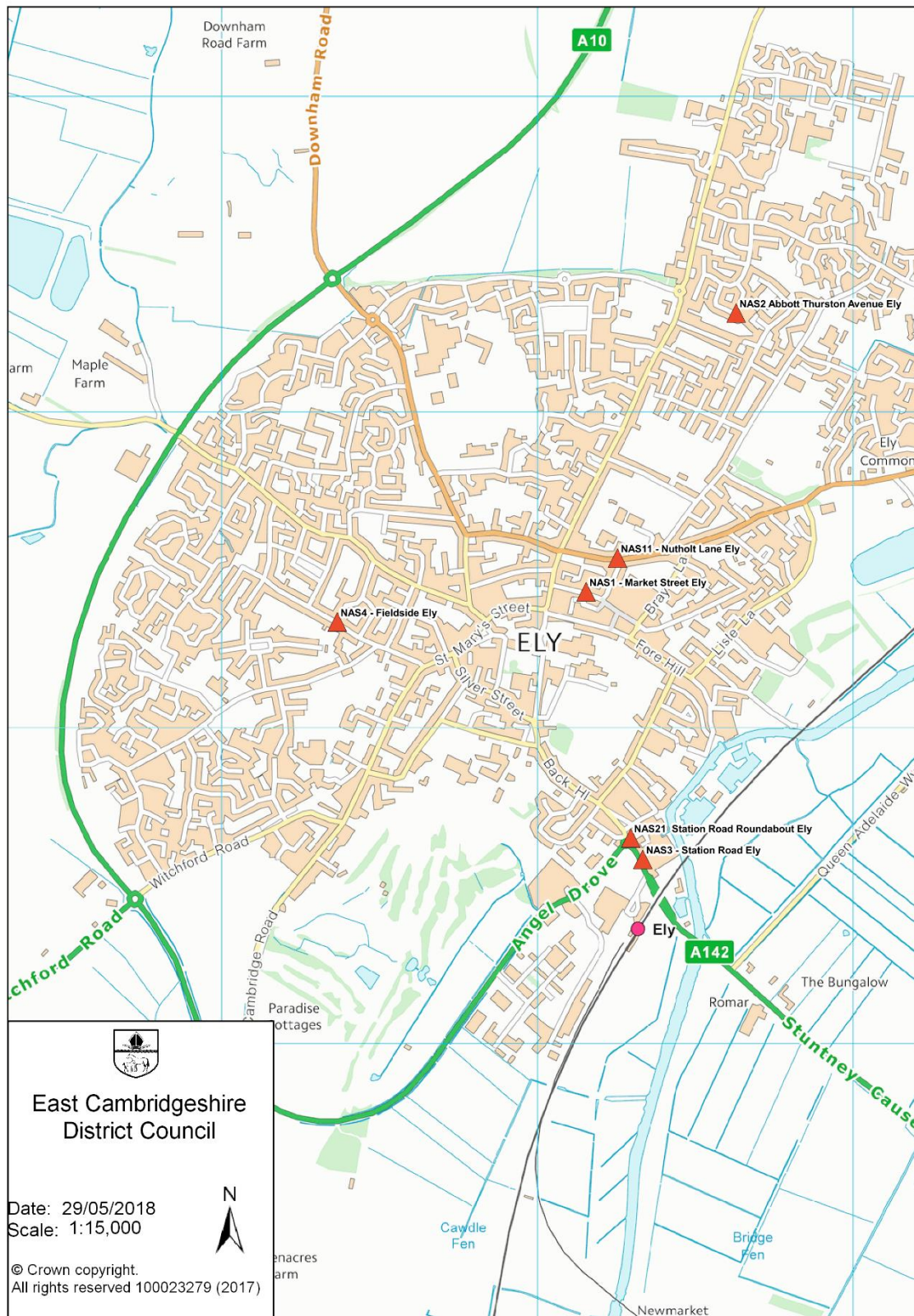


Figure D.3 - Map of Air Quality Monitoring Sites in Haddenham



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/m³).

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
DEFRA	Department for Environment, Food and Rural Affairs
ECDC	East Cambridgeshire District Council
ESG	Environmental Scientifics Group
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>