EAST CAMBRIDGESHIRE
DISTRICT COUNCIL

2017 Air Quality Annual Status Report (ASR)

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

June 2017

Local Authority Officer	Peter Ord
Department	Environmental Services
Address	East Cambridgeshire District Council The Grange Nutholt Lane Ely Cambridgeshire CB7 4EE
Telephone	01353 665555
E-mail	peter.ord@eastcambs.gov.uk
Report Reference number	ASR 2017
Date	June 2017
Approved by	John Hill, Chief Executive, East Cambridgeshire District Council
Date	20th November 2017
Approved by	Dr Liz Robin, Director of Public Health, Cambridgeshire
Date	20th November 2017

Executive Summary: Air Quality in Our Area

The Environment Act, 1995 introduced the Local Air Quality Management (LAQM) regime which requires local authorities to review and assess air quality in their areas from time to time. This report forms the 2017 Annual Status Report (ASR) for East Cambridgeshire District Council and sets out the findings of a review of air quality in the district in 2016.

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 2016. East Cambridgeshire is predominantly rural in character and air quality is relatively good. Statutory objectives are being met 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 monitors NO_2 levels across the district. Overall, there has been a gradual downward trend in annual mean NO_2 concentrations across the district in recent years. However, in 2016 annual mean NO_2 concentrations rose slightly at 15 of the 18 monitoring locations compared to 2015 and fell at three (see Figure A.1). There is one area of poor air quality in the district at Station Road, Ely which is subject to high traffic volumes, although the automatic monitor at this location recorded a fall in the annual mean NO_2 concentration from 33.3 µg/m^3 in 2015 to 27.1 µg/m^3 in 2016.

[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

Additional diffusion tubes were deployed on a temporary basis in October 2016 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 busier main roads such as the A10 and A14. Three months of data is insufficient to derive reliable annual mean concentration figures. However, all of the monthly readings were within the NO_2 air quality objective of 40 µg/m^3 apart from the December result for one location in Wilburton High Street which recorded a value of 41.3 µg/m^3. This represents a marginal exceedance of the air quality objective. The monitoring point is close to the junction of the A1123 and B1049 which experiences high traffic flows at peak times. However, higher NO_2 levels tend to occur in the winter months as weather conditions prevent the dispersion of poor quality air and the annual mean objective is unlikely to be breached.

Due to the imminent expiry of the lease for the automatic monitoring station AS1 at Station Road, Ely and the lack of suitable alternative accommodation it was decided to close the monitoring station from January 2017. In preparation for this an additional diffusion tube site was placed close to the location of AS1 in October 2016.

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 ensure that air quality objectives continue to be met. The council will compile and submit a further ASR in 2018.

Actions to Improve Air Quality

Although air quality in East Cambridgeshire is relatively good, the council supports any actions to improve air quality. East Cambridgeshire District Council is working with Cambridgeshire County Council (CCC) to bring about improvements in transport infrastructure and a commencement date was set for construction of the A142 Ely Southern Bypass in spring 2017. The new road will open in 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 in increase in road traffic which can have a negative impact on air quality. The council's main priority is to ensure that air quality is maintained across the district at a time of increased development pressure.

Cambridgeshire Health and Wellbeing Board has approved a number of Joint Strategic Needs Assessments (JSNA). These help determine what actions local authorities, the local 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 a section on Air Pollution and recommends that future actions should 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.

East Cambridgeshire District Council has taken forward a number of direct measures during the current reporting year of 2016 in pursuit of improving local air quality including securing funding for the Ely Southern By-pass and formal adoption of the Transport Strategy for East Cambridgeshire in December 2016.

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

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

List of Tables

List of Figures

.

1 Local Air Quality Management

This report provides an overview of air quality in East Cambridgeshire during 2016. 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.

1.1 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's monitoring locations are available in Appendix D.

1.2 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.

Cambridgeshire Health and Wellbeing Board has approved a number of Joint Strategic Needs Assessments (JSNA). These help determine what actions local

authorities, the local 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 a section on Air Pollution and recommends that future actions should 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.

East Cambridgeshire District Council has taken forward a number of direct measures during the current reporting year of 2016 in pursuit of improving local air quality. Details of measures completed, in progress or planned are set out in Table 1.1. Measures taken include securing funding for the Ely Southern By-pass and formal adoption of the Transport Strategy for East Cambridgeshire in December 2016.

The council will continue to help bring about improvements in air quality by working with Cambridgeshire County to implement the Transport Strategy for East Cambridgeshire. The strategy seeks to ensure that the transport network and new initiatives should:

- Prioritise sustainable transport alternatives and reduce congestion
- Contribute to reducing transport emissions of NOx, PM_{10} and $PM_{2.5}$
- Encourage healthy and active travel and support people's wellbeing

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 nonlocal traffic encouraged to use the strategic road networks.

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

- Start of construction of A142 Ely southern by-pass to improve air quality in the south of Ely

- Additional commuter parking at Ely and Littleport railway stations to encourage rail use and so improve air quality in the district and beyond

The principal challenges and barriers to implementation that East Cambridgeshire District Council faces are the requirement to maintain and improve air quality at a time of increased development pressure across the district. East Cambridgeshire has been a 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 1.1 – 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	Ely A142 Southern by-pass	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	CCC, Department of Transport	2016	construction begins 2017	Compliance with AQ limits	c.90% traffic reduction in Station Road	Contractor appointed.	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	Reduce vehicle emissions	Strategy adopted December 2016	ongoing	none
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	Contractors appointed	2017	none
4	Soham Railway Station	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	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	to be arranged	cost

1.3 $PM_{2.5}$ – 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 4.9% in 2015, two 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

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

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

East Cambridgeshire District Council undertook automatic (continuous) monitoring at one site in Station Road, Ely during 2016. Table A.1 in Appendix A shows the details of the site. A map showing the location of the monitoring site is provided in Appendix D. Further details on how the monitor was calibrated and how the data has been adjusted are included in Appendix C.

2.1.2 Non-Automatic Monitoring Sites

East Cambridgeshire District Council undertook non- automatic (passive) monitoring of NO_2 at 17 sites during 2016 using diffusion tubes. Table A.2 in Appendix A shows details of the sites.

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

In addition East Cambridgeshire District Council deployed a number of extra diffusion tubes in October 2016 to screen air quality at village locations subject to heavy traffic.

2.2 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.

2.2.1 Nitrogen Dioxide (NO_2)

Table A.3 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 40 µg/m^3.

For diffusion tubes, the full 2016 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200 µg/m^3, not to be exceeded more than 18 times per year.

AS1, the automatic monitoring station at Station Road, Ely recorded an annual mean NO_2 concentration of 27.11 µg/m^3 in 2016. This is within the air quality limit of 40 µg/m^3 and represents a fall in concentration compared to the 2015 figure of 33.3 µg/m^3. As the monitor is located more than 10m from the roadside an adjustment must be applied using the procedure specified in DEFRA LAQM Technical Guidance TG16. A background NO_2 value of 13.19 µg/m^3 was obtained from the DEFRA website. Applying the adjustment results in a predicted annual mean concentration at a human receptor of 43.8 µg/m^3. Although this represents an exceedance of the annual mean it must be treated with caution. It should also be noted that the nearby diffusion tube site NAS3, located 64m further south in Station Road, recorded a mean value of 20.4 µg/m^3. AS1 did not record any exceedances of the 1-hour mean of 200 µg/m^3.

All data from the seventeen regular NO_2 diffusion tube monitoring sites were within the air quality annual mean objective of 40 µg/m^3.

Increases in NO_2 concentrations were recorded at 14 of the 17 sites compared with the results for 2015. Falls in NO_2 concentration were recorded at three sites. Both increases and decreases were relatively small. This rise in mean values is in contrast to the general downward trend in NO_2 concentrations in recent years. A graph showing trends in annual mean NO_2 concentrations is shown in Figure A1 in Appendix A.

The 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 will begin in early 2017. 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.

Nine additional diffusion tubes were deployed on a temporary basis from October 2016 in the villages of Haddenham, Wilburton and Sutton in order to investigate the effects on air quality of traffic using routes through those villages to avoid busier main roads such as the A10 and A14. Funding for this was obtained from the Cambridgeshire County Council Local Transport Plan budget. Three months of data is insufficient to derive reliable annual mean concentration figures. However, all of the monthly readings were within the NO_2 air quality objective of 40 µg/m^3 apart from the December result for one location in Wilburton High Street which recorded a value of 41.3 µg/m^3 after bias adjustment had been applied. This represents a marginal exceedance of the air quality objective. NO_2 levels are highest in the winter months when weather conditions prevent the NO_2 from dispersing and so a failure of the annual mean objective is unlikely. This location is close to the junction of the A1123 and B1049 which experiences high traffic flows at peak times.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
AS1	Station Road (Auto), Ely	Roadside	554309	279638	NO_2	NO	Chemiluminescent	1	15	2.25

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 – 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	NO_2	NO	1	1.5	NO	2.5
NAS2	Abbot Thurston Ave, Ely	Urban Background	554616	281320	NO_2	NO	4.5	1.5	NO	2.25
NAS3	Station Road, Ely	Roadside	554322	279566	NO_2	NO	15	3.5	NO	3.25
NAS4	Fieldside, Ely	Urban Background	553385	280309	NO_2	NO	7	3	NO	2.25
NAS5	Main Street, Littleport	Roadside	556845	286801	NO_2	NO	2.5	2	NO	2.25
NAS6	High Street, Soham	Roadside	559418	273098	NO_2	NO	1.5	1.5	NO	2.25
NAS7	Market Street, Fordham	Roadside	562682	270294	NO_2	NO	1.5	1.5	NO	2.25
NAS8	Sherriffs Court, Burrough Green	Urban Background	563721	255387	NO_2	NO	2	1.5	NO	2.25
NAS9	Station Road, Haddenham	Roadside	546419	275628	NO_2	NO	13	1	NO	2.25
NAS10	Tramar Drive, Sutton	Urban Background	545012	279286	NO_2	NO	8	2	NO	2.25
NAS11	Nutholt Lane, Ely	Roadside	554255	280536	NO_2	NO	2.5	2.5	NO	2.25

NAS12	A142, Witcham Toll	Roadside	546346	279106	NO_2	NO	5	1	NO	2.25
NAS13	A10, Stretham	Roadside	550811	274395	NO_2	NO	12	1.5	NO	2.25
NAS14	High Street, Burwell	Roadside	558896	266364	NO_2	NO	4	2	NO	2.25
NAS15	Hop Row, Haddenham	Roadside	546466	275463	NO_2	NO	2	1	NO	2.25
NAS16	High Street, Haddenham	Roadside	546382	275411	NO_2	NO	2	1	NO	2.25
NAS17	West End, Haddenham	Roadside	546185	275594	NO_2	NO	3	1	NO	2.25

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.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2016 (%) [2]	NO_2 Annual Mean Concentration (µg/m³) [3]				
					2012	2013	2014	2015	2016
AS1	Roadside	Automatic		96.23	41.5	32.65	32.7	33.3	27.11
NAS1	Roadside	Diffusion Tube		92	23.8	23.5	21	21.1	21.5
NAS2	Urban Background	Diffusion Tube		100	14.9	14	12.3	11.9	12.9
NAS3	Roadside	Diffusion Tube		100	20.8	23.2	21.6	20.1	20.4
NAS4	Urban Background	Diffusion Tube		100	15.4	15.6	13.8	14.5	15.2
NAS5	Roadside	Diffusion Tube		100	18	17.2	16.3	15.7	15.9
NAS6	Roadside	Diffusion Tube		92	24.1	22	20.5	18.5	19.8
NAS7	Roadside	Diffusion Tube		92	21.9	19.7	18.8	17.9	19.7
NAS8	Urban Background	Diffusion Tube		100	13.2	11.4	11.2	11.4	10.9
NAS9	Roadside	Diffusion Tube		100	24.5	26.4	25.9	21.2	24.8
NAS10	Urban Background	Diffusion Tube		100	17.9	16.3	13.1	15.1	16.3
NAS11	Roadside	Diffusion Tube		100	23	22	19.3	20.1	19.9
NAS12	Roadside	Diffusion Tube		100	29.9	30.9	29.5	26.7	27.2
NAS13	Roadside	Diffusion Tube		100	23.2	24.1	20.1	20.3	21.9
NAS14	Roadside	Diffusion Tube		75	25.6	21.6	18.4	19.4	24.6

NAS15	Roadside	Diffusion Tube		100	31	28.3	27.1	26.8	27.6
NAS16	Roadside	Diffusion Tube		100	23.1	20.9	18.4	17.9	19
NAS17	Roadside	Diffusion Tube		100	22.8	22.7	20.6	25.7	24.7

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

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

☑ **If applicable, all 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) 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

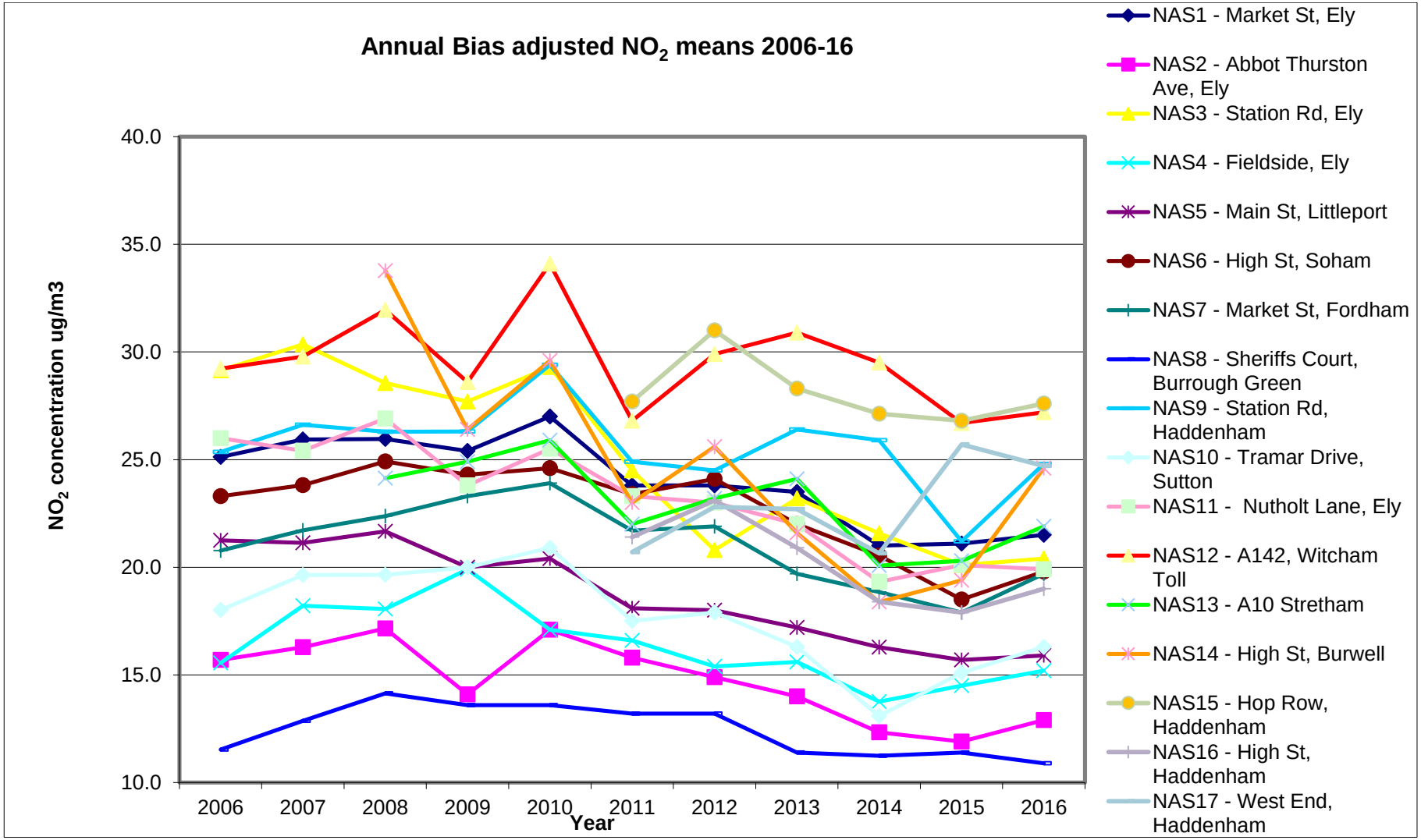


Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2016 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2012	2013	2014	2015	2016
AS1	Roadside	Automatic		96.23	0	0	0	0	0

Notes:

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold.**

(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) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

Appendix B: Full Monthly Diffusion Tube Results for 2016

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2016

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	24.2	30.7	32.9	30.2	26.4	20.6	18.8	24.4	missing	23.4	36.3	39.5	27.9	21.5	
NAS2	17.9	23.9	17.6	16.1	12.6	8.5	9.1	10.5	13.3	13.4	23.4	31.1	16.5	12.9	
NAS3	28.1	30.1	25.8	24.3	25.2	20.5	19.2	23	27.9	24	31.3	38.8	26.5	20.4	
NAS4	24	26.2	21.7	16.2	15.2	10.6	11	12.3	17.8	14.7	31.1	36.5	19.8	15.2	
NAS5	22.2	23.2	25	21.7	16.5	11.8	13.4	16.9	21.6	16.5	27.1	33	20.7	15.9	
NAS6	27.5	31.5	32.5	31.6	26.1	20.7	14.9	18.2	22.8	20.2	missing	37.5	25.8	19.8	
NAS7	29.1	30.8	24.8	30.4	21.9	14.8	missing	18.7	24	19.8	31.1	36.2	25.6	19.7	
NAS8	17.7	19.9	15.2	14	9.3	7	7.2	10.1	12.1	10.5	17.8	28.4	14.1	10.9	
NAS9	34.9	36.4	38.1	30	26	30	23.4	27.7	34.3	26.8	43.9	34.4	32.2	24.8	
NAS10	23.7	26.2	23.8	23.5	19.5	12.5	11	13.9	18.4	18.7	28.2	34.1	21.1	16.3	
NAS11	22	30.6	28.2	25.5	21.7	16.1	17.4	22.2	25.4	20.9	36.4	44.1	25.9	20.2	
NAS12	38.7	40.3	33.4	39.7	29.3	29.2	24.8	31.1	36.3	31.4	43.8	46	35.3	27.2	
NAS13	28.3	30	30.9	28.6	28.3	22.3	15.6	20.1	28.4	29	37	42.1	28.4	21.9	
NAS14	30	31.9	28.9	27.2	19.2	missing	missing	missing	28.4	29	44.4	49	32.0	24.6	
NAS15	34.7	38.5	39	40.6	34.9	28.1	30.6	29.6	36.8	29.1	44.8	43.6	35.9	27.6	

NAS16	25.9	24.9	28.1	26.7	23.2	missing	14.3	16.4	21.2	23.2	32.6	34.5	24.6	19.0	
NAS17	37.9	39.9	30.5	35	31.2	24.7	27.2	28.9	32.6	24.1	38.5	35.2	32.1	25.0	

☑ **Local bias adjustment factor used**

☑ **National bias adjustment factor used**

☑ **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) 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 2016 gave an adjustment factor of 0.77 which was applied to the East Cambridgeshire District Council data.

QA/QC of Automatic Monitoring

The automatic nitrogen dioxide monitor is an Enviro Technology 200A chemiluminescent NOx anayler operated in partnership with Leicester City Council (LCC):

Leicester City Council
Air Quality
Planning Transport and Economic Development
2nd Floor, Rutland Wing
City Hall
115 Charles Street
Leicester LE1 1FZ

East Cambridgeshire District Council (ECDC) pays LCC for the hire, full quality assurance, and ratification of the instrument and dataset. The monitor is manually calibrated on a bi-monthly basis by ECDC. The output from the calibrations is forwarded to LCC. LCC sub-contracted data validation and ratification to the Environmental Research Group (ERG), Kings College, London.

The instrument is serviced by:

Enviro Technology Services plc
Kingfisher Business Park
Stroud
Gloucestershire GL5 2BY

The servicing contract resides with LCC. Servicing is carried out biannually.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes were supplied and analysed by:

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 2016 ESG Didcot received a rating of Good in 33 studies and Poor in 1 study.

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. In 2016 ESG Didcot achieved a score of 100% Satisfactory for January-February; 75% for April-May; 75% for July-August, and 100% for September-October.

NO2 Fall-off with distance calculator – AS1 Station Road, Ely

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

For AS1 Station Road, Ely a background value of 13.19 µg/m^3 was obtained from the DEFRA website. https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2013

The calculator predicts an annual mean concentration at a human receptor of 43.8 µg/m^3. This represents an exceedance of the annual mean air quality objective. However, as the monitor is more than 10m further from the kerb than the receptor the calculator recommends that this result must be treated with caution.

Appendix D: Maps of Monitoring Locations

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

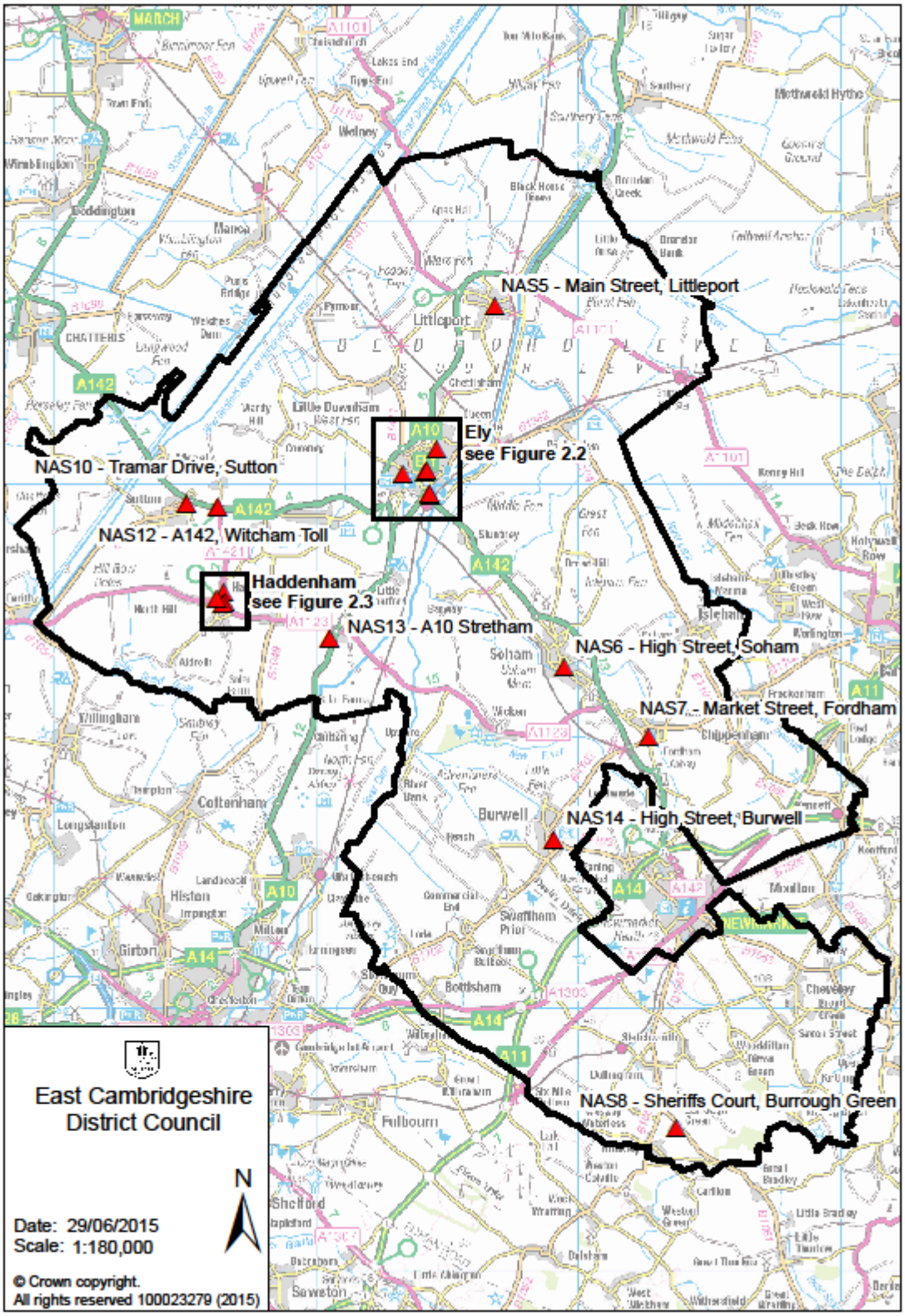


Figure D.2 - Map of Air Quality Monitoring Sites in Ely

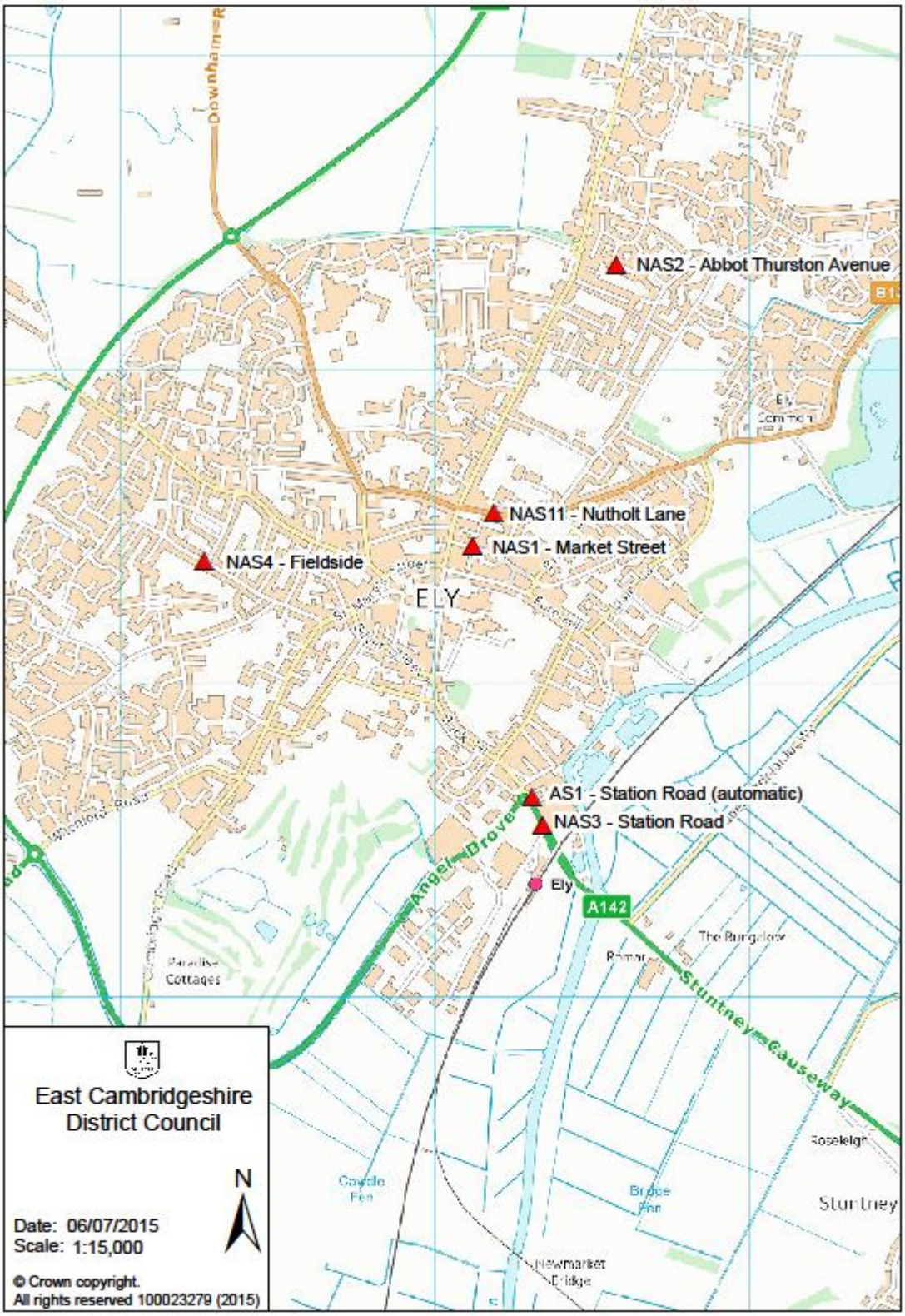
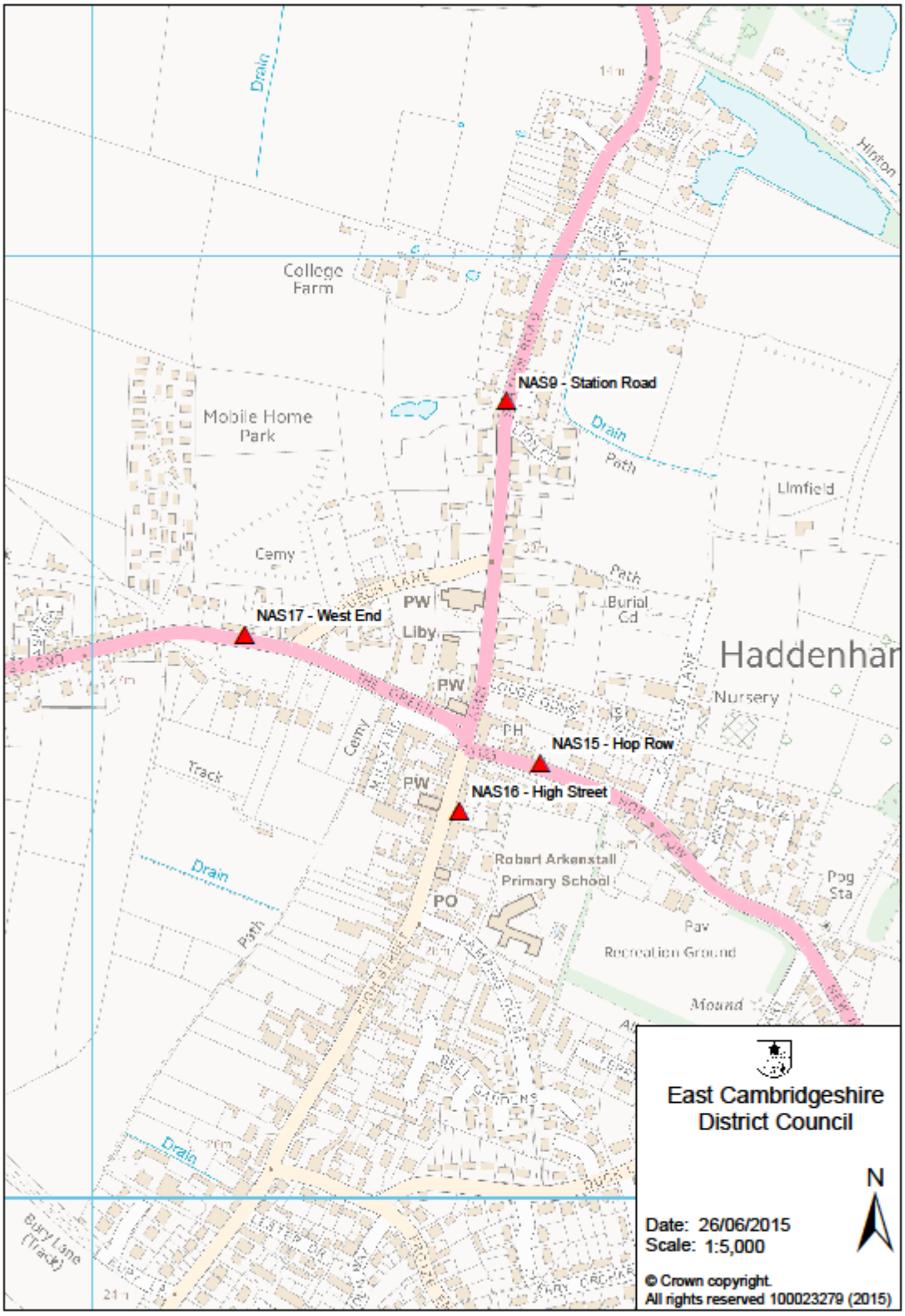


Figure D.3 - Map of Air Quality Monitoring Sites in Haddenham



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 micrograms 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
DEFRA	Department for Environment, Food and Rural Affairs
ECDC	East Cambridgeshire District Council
ESG	Environmental Scientifics Group
JSNA	Joint Strategic Needs Assessment
LAQM	Local Air Quality Management
LCC	Leicester City Council
NO2	Nitrogen Dioxide
NOx	Nitrogen Oxides
PM10	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM2.5	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 https://www.cambridgeshire.gov.uk/residents/travel-roads-and-parking/transport-plans-and-policies/transport-strategy-for-east-cambridgeshire/

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