
EAST CAMBRIDGESHIRE
DISTRICT COUNCIL
Fenland
CAMBRIDGESHIRE
Air Quality
Review and
Assessment
Progress Report 2004
Huntingdonshire
district council
South
Cambridgeshire
District Council

Executive Summary

This Report constitutes the Air Quality Review and Assessment Progress Reports for 2004 for the districts of East Cambridgeshire, Fenland, Huntingdonshire and South Cambridgeshire.

The Report includes air quality monitoring data from 2003 and makes predictions for the future for certain air pollutants. It also covers other issues and developments that have occurred in the last twelve months that may have a bearing on local air quality.

East Cambridgeshire District Council has found that air quality objectives are likely to be met throughout its area and so will next report findings with its next progress report in April 2005.

Fenland District Council has found that concentrations of Nitrogen Dioxide in Lynn Road, Wisbech are likely to exceed the objective(s) and will therefore take this matter forward for a detailed assessment. Fenland District Council will submit a Progress Report on its existing Air Quality Management Areas in Wisbech in a separate document. Fenland District Council has also become aware of a potential SO_2 exceedence in and around Whittlesey, following receipt of some Environment Agency dispersion modelling for two Hanson Brick processes in the town. The potential area of exceedence includes parts of Peterborough City Council and Huntingdonshire District Council.

Huntingdonshire District Council has found that concentrations of Nitrogen Dioxide in close proximity to the Huntingdon Inner Ring Road, and at least one associated feeder Road, to be likely to exceed the objective(s). Nitrogen Dioxide will therefore be taken forward for a detailed assessment. SO_2 will also be taken forward for a small area in the north of the district, which is potentially affected by emissions from the Hanson Brick processes.

South Cambridgeshire District Council has found high concentrations of Nitrogen Dioxide around the A14 corridor east of Bar Hill which includes the villages of Girton, Histon and Impington. High concentrations have also been measured in Sawston High Street. These scenarios will be taken forward to a detailed assessment. PM_{10} monitoring in Impington has revealed exceedences of the daily mean in 2003 so PM_{10} will also be taken forward for a detailed assessment.

Within the Administrative area of Cambridgeshire County there are proposed large-scale traffic schemes, which are likely to have an affect on air quality in the future. Although still at formative stages the schemes are discussed further.

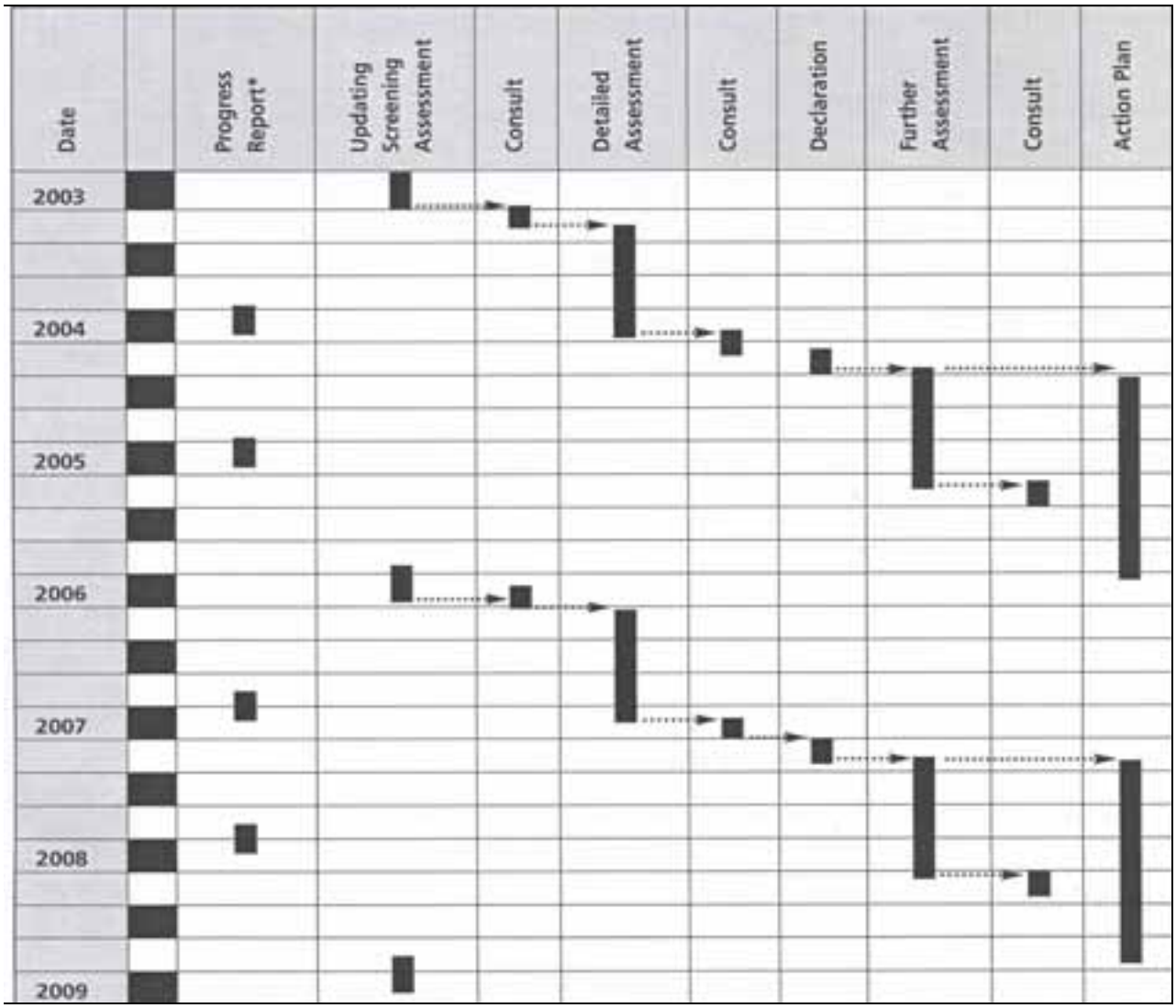
Index of Figures

1.0 Introduction

Local Authorities within the administrative area of Cambridgeshire have been jointly reporting findings, as required under the Environment Act 1995, since the introduction of the current air quality management regime in 1996.

Joint reports have been submitted to, and accepted by, the Government as required. The timetabling and nature of the reports are shown in Figure 1 below. These reports have been used to inform statutory consultees and others about local air quality.

Figure 1 – LAQM Timetable



Reporting on the second 'round' of review and assessment began in April 2003 with the submission of the Updating and Screening Assessment (USA). The USA concluded that East Cambridgeshire, Huntingdonshire and South Cambridgeshire were all predicted to comply with air quality objectives by the due dates. Cambridge City concluded that a detailed assessment would be required of Nitrogen dioxide in some areas of the City. Fenland found no evidence of any potential problems other than the existing Air Quality Management Areas (AQMA's) in Wisbech, which were identified in the first round of Review and Assessment.

There are Air Quality Objectives for seven pollutants measured over different averaging periods and these are shown in Figure 2.

Figure 2 - Air Quality Objectives.

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene			
All authorities	16.25 μg/m³	running annual mean	31.12.2003
Authorities in England and Wales only	5.00 μg/m³	annual mean	31.12.2010
Authorities in Scotland and Northern Ireland only[a]	3.25 μg/m³	running annual mean	31.12.2010
1,3-butadiene	2.25 μg/m³	running annual mean	31.12.2003
Carbon monoxide			
Authorities in England, Wales and Northern Ireland only[a]	10.0 mg/m³	maximum daily running 8-hour mean	31.12.2003
Authorities in Scotland only	10.0 mg/m³	running 8-hour mean[b]	31.12.2003
Lead	0.5 μg/m³	annual mean	31.12.2004
	0.25 μg/m³	annual mean	31.12.2008
Nitrogen dioxide[c]	200 μg/m³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 μg/m³	annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)[d]	50 μg/m³ not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
All authorities	40 μg/m³	annual mean	31.12.2004
Authorities in Scotland only[e]	50 μg/m³ not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 μg/m³	annual mean	31.12.2010
Sulphur dioxide	350 μg/m³ not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 μg/m³ not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 μg/m³ not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

[a] In Northern Ireland none of the objectives are currently in regulation. Air Quality (Northern Ireland) Regulations are scheduled for consultation early in 2003.

[b] The Air Quality Objective in Scotland has been defined in Regulations as the running 8-hour mean, in practice this is equivalent to the maximum daily running 8-hour mean.

[c] The objectives for nitrogen dioxide are provisional.

[d] Measured using the European gravimetric transfer sampler or equivalent.

[e] These 2010 Air Quality Objectives for PM_{10} apply in Scotland only, as set out in the Air Quality (Scotland) Amendment Regulations 2002.

This report represents the first progress report of the second round of Air Quality Review and Assessment, and it's purpose is to inform on monitoring data gathered during the last calendar year and on any changes that occurred in that year that may influence local air quality.

All the pollutants with air quality objectives have been considered but lead, carbon monoxide and 1,3 butadiene have not been reported as there is no indication that the objectives are at risk. The National Monitoring Network data has not suggested that any of these objectives are likely to be contravened.

Due to the different nature of the work now being conducted by the Cambridgeshire Authorities, Cambridge City Council will report it's detailed assessment separately. Fenland District Council has included it's progress report outside it's AQMAs but progress on action plans within the AQMAs will be reported separately.

2.0 New Monitoring Results

2.1 East Cambridgeshire

2.1.1 Nitrogen Dioxide Diffusion Tube Data, Annual Means for 2003

Annual mean objective being 40μg/m^3 by 31st December 2005.

The ten diffusion tube locations from the 2003 updating and screening assessment are joined by one new location.

Figure 3 – ECDC NO_2 Tube Results

Site Name	Site type	Distance from Kerb (m)	Uncorrected NO_2 μg/m^{-3}	Corrected* NO_2 μg/m^{-3}	Adjust to 2005 μg/m^{-3}	Adjust to 2010 μg/m^{-3}
38 Market St, Ely	Roadside	1.5	35.7	26.7	25.6	21
Abbot Thurston Av, Ely	Urban Background	1.5	25.4	19.1	18.3	15
Fieldside, Ely	Urban Background	3.5	27.5	20.6	19.7	16.2
Station Rd, Ely	Roadside	3	39.7	29.8	28.5	23.4
Main St, Littleport	Roadside	2	31.5	23.7	22.7	18.6
High St, Soham	Roadside	1.5	35.1	26.4	25.3	20.8
Sheriff's Court, Borough Green	Urban Background	1.5	20.6	15.5	14.9	12.2
Station Rd, Haddenham	Roadside	1.5	35.3	26.6	25.5	20.9
Tramar Drive, Sutton	Urban Background	1	27.9	21	20.1	16.5
Nutholt Lane, Ely (new location)	Roadside	2	39.7	29.8	28.6	23.5
A142, Witcham Toll	Roadside	2.5	40.7	30.6	29.3	24.1
Market Street, Fordham	Roadside	1	52.5	39.4	37.7	31

* The correction factor used in adjusting the annual mean was 0.75 derived from Harwell Scientifics comparison of tube data with that of a chemiluminescence continuous monitor.

Compared with the results detailed in the 2003 Updating & Screening Assessment the uncorrected tube reading for 2003 are slightly higher than those in 2002, when the bias figure is applied to the results the figures show relatively close correlation as do the predictions for 2005 & 2010.

- Harwell Scientifics supply and analyse the nitrogen dioxide tubes for East Cambridgeshire DC, as they do for the other Cambridgeshire LA's.

- Exposure periods for the diffusion tubes are those of the UK Nitrogen Dioxide Diffusion Tube Network run by NETCEN with the tubes being changed every four or five weeks.

- QA/QC procedures are as detailed in the UK NO_2 Diffusion Tube Network Instruction Manual, this document can be found at www.airquality.co.uk/archive/reports/cat06/no2instr.pdf

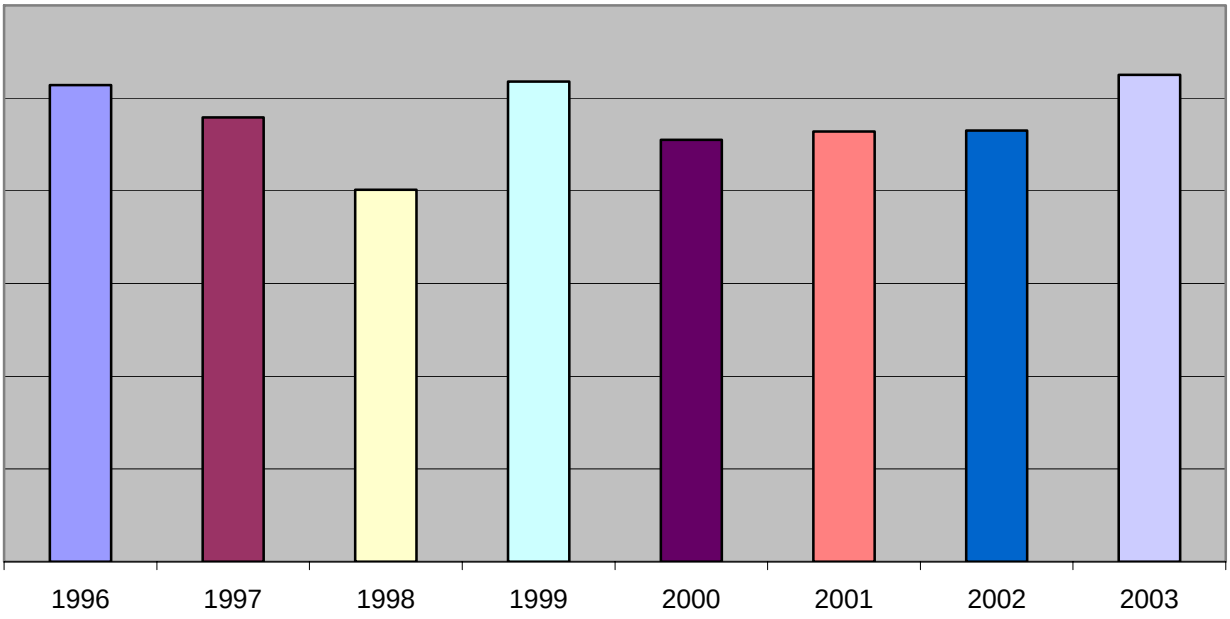
- The new monitoring location at Nutholt Lane was placed to assess the worst-case relevant exposure on a busy road in the district.

- A map detailing the locations of the diffusion tubes can be found Figure 6.

- The new location is at NGR reference TL544 805 (Nutholt Lane).

The graph below shows annual means at Market Street, Fordham, where uncorrected raw data has consistently exceeded 40μgm^{-3}, as can be seen last years annual mean was the highest recorded since monitoring commenced at this site, overall the values are relatively consistent and as yet do not show any significant trend towards higher or lower future values.

Figure 4 - NO_2 Diffusion Tube data trend in Market Street, Fordham *



* Annual means, raw data.

2.1.2 PM_{10} Monitoring Data

PM_{10} Annual mean and number of exceedences of the annual mean for 2003.

Annual mean objective being 40μgm^{-3} and the 24 hour mean objective being 50μgm^{-3}, not to be exceeded more than 35 times a year, however the 90th percentile is shown below due to data capture limitations as per guidance in LAQM.TG(03).

Figure 5 - Comparison of PM_{10} Concentrations

Site Name	Site Type	Annual mean concentration in μgm^{-3}	90th Percentile μgm^{-3} of daily means
Wicken Fen, without 1.3 interim adjustment factor applied	Rural	26.2	48
Norwich Centre, TEOM, February,2003. With interim adjustment factor applied.	Urban Centre	28.1	46.4
Wicken Fen, with interim adjustment factor of 1.3 applied	Rural	34.1	62.4

- The particulate monitor used is an Eberline FH 62-IR Beta-attenuation monitor with a heated inlet manifold, although this is held at 40^{o}C as opposed to 50^{o}C, the standard used in TEOM monitors.

- Data capture for the year is 88%, this is due to problems encountered with the data logger during February which resulted in no data being captured for that month and early March. On the advice of the Air Quality Helpdesk the results were not scaled up from 88% as per box 8.5 in the technical guidance, LAQM.TG(03), due to the lack of rural monitoring sites measuring PM_{10}, no rural AUN sites monitor particulates in East Anglia. Due to the absence of data for February the helpdesk suggested the inclusion of data from the nearest AUN site that monitors PM_{10} for comparison purposes although Norwich Centre is an urban centre location as opposed to the rural location at Wicken Fen.

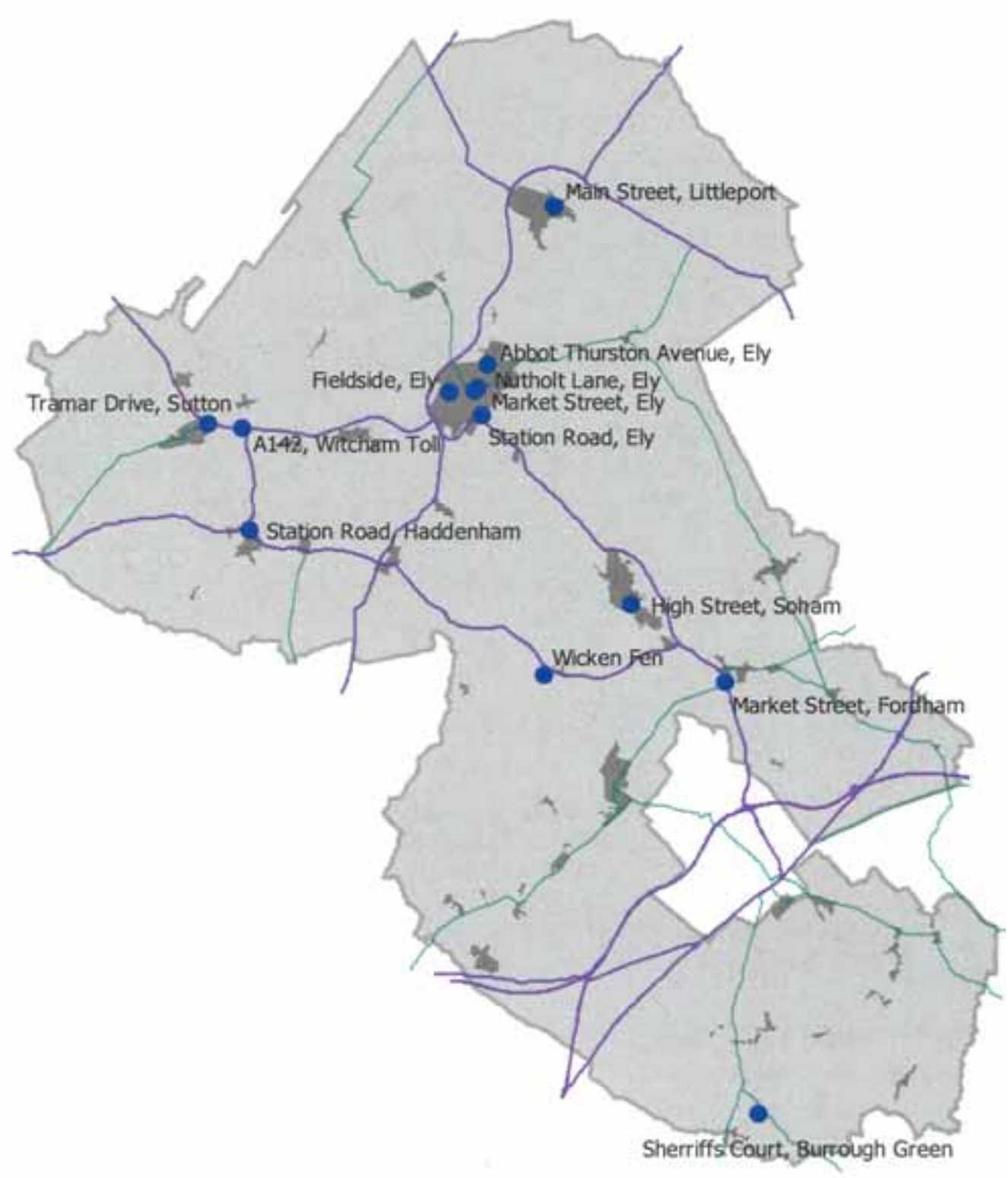
- The monitor is located within the AUN rural monitoring station at Wicken Fen, approximate NG reference 556400, 269200 shown in figure 6.

- There are no relevant receptors at the monitoring location which is surrounded to the south and east by arable land, to the north lies a wetland nature reserve and to the east the site is boarded by a public foot path, an unmade dust track, with fen drainage channels beyond. The nearest receptor is an isolated farm, some 260m to the east of the site away from the public footpath.

- Service, repair and calibration of the Eberline particulate monitor are carried out under an annual contract with the equipment suppliers, Themo Electron.

- This is the first years worth of data from this monitor, as such any trends can not yet be identified.

Figure 6 - Air Quality Monitoring Locations in East Cambridgeshire



2.2 Fenland District Council

2.2.1 Nitrogen Dioxide Monitoring

Fenland District Council has 10 diffusion tubes situated around the District

Figure 7 - FDC NO_2 Tube results

Name of Site	Map Reference	Site Designation	Annual Mean 2003 μgm^{-3}	Correction For Bias	Adjustment to	
					2005	2010
March, City Road	TL416965	B'ground	25.9	19.4	18.40	15.14
March, Cavalry Drive	TL417955	Roadside	29.6	22.2	21.03	17.31
Manea, Park Road	TL481890	B'ground	20.1	15.1	14.30	11.77
Chatteris, Huntingdon Road	TL387857	Roadside	36.3	27.3	25.83	21.26
Whittlesey, Orchard Street	TL269972	Roadside	39.3	29.4	27.90	22.96
Whittlesey, Drybread Road	TL275974	Roadside	32.9	24.7	23.38	19.24
Thorney Toll	TF343039	Roadside	37.0	27.7	26.28	21.62
Foul Anchor	TF467182	Roadside	29.7	22.3	21.11	17.37
Wisbech, Lynn Road	TF462099	Roadside	58.0	43.5	41.24	33.94
Wisbech, New Drove	TF461079	Roadside	24.9	18.7	17.71	14.57

The majority of sites were well under the 2005 objective concentration. Lynn Road, however, highlights a minor exceedence. The Council will take this site forward for detailed assessment.

The Council has reassessed its NO_2 monitoring strategy and reference to traffic flow data for Wisbech and March and has identified four supplementary sites where relevant exposure may occur in the worst-case. The Council will introduce the new sites from April 2004.

2.2.2 Odour Monitoring in Wisbech

In 2003, the Council received many complaints regarding the Nestlé Purina PetCare pet food factory in Wisbech. The factory is currently authorised as a Part B process under the Local Air Pollution Control regime. Environmental Protection Officers witnessed significant concentrations of unpleasant odour emanating from the pet food factory. The Council decided to employ Enviros Consulting Ltd to advise on BATNEEC for the odour and to audit the factory's authorisation conditions. The report is available on the Public register.

2.3 Huntingdonshire District Council

2.3.1 Nitrogen Dioxide

Huntingdonshire DC has two real-time analysers measuring oxides of Nitrogen in their area. One analyser is housed in a mobile unit that was located 25m North of the elevated A14 at Godmanchester until the end of May 2003. The other analyser is housed at Pathfinder House, on the Huntingdon Ring road, with the inlet 3m from the kerb. Due to the annual data capture of both analysers being less than 75% the data has been adjusted to correct for the missing data in accordance with the Technical Guidance methodology. The corrections have been made using 2003 data.

2.3.2 Real time analyser on the Huntingdon Ring Road

The analyser is housed on the first floor of the district council head quarters on the Huntingdon inner ring road. The inlet is approximately 3m from the kerbside. A short distance around the Ring Road are residential receptors that are as close to the road so this monitoring position can be considered as representative of a receptor location. Due to a data capture of 73% being achieved for the year the data has been corrected using the procedure in LAQM.TG(03) Box 6.5.

Figure 8 – Correction for Missing Data – NO2 Analyser at Huntingdon

NO_2(μg/m^3) for 2003.	**Cambridge**	**Thurrock**	**Norwich Roadside**	**Averages**
Annual Mean (μg/m^3) =	45	38	33	
Mean 17 May - 17 June	48	31	26	
Mean 19 July - 28 Oct	43	35	32	
Ratio 1: AM/PM(1) =	0.94	1.25	1.27	**1.15**
Ratio 2: AM/PM(2) =	1.06	1.08	1.02	**1.05**

The annual average from the analyser is 45.70μg/m^3. To correct for the missing data this figure is then multiplied by the two ratios derived above.

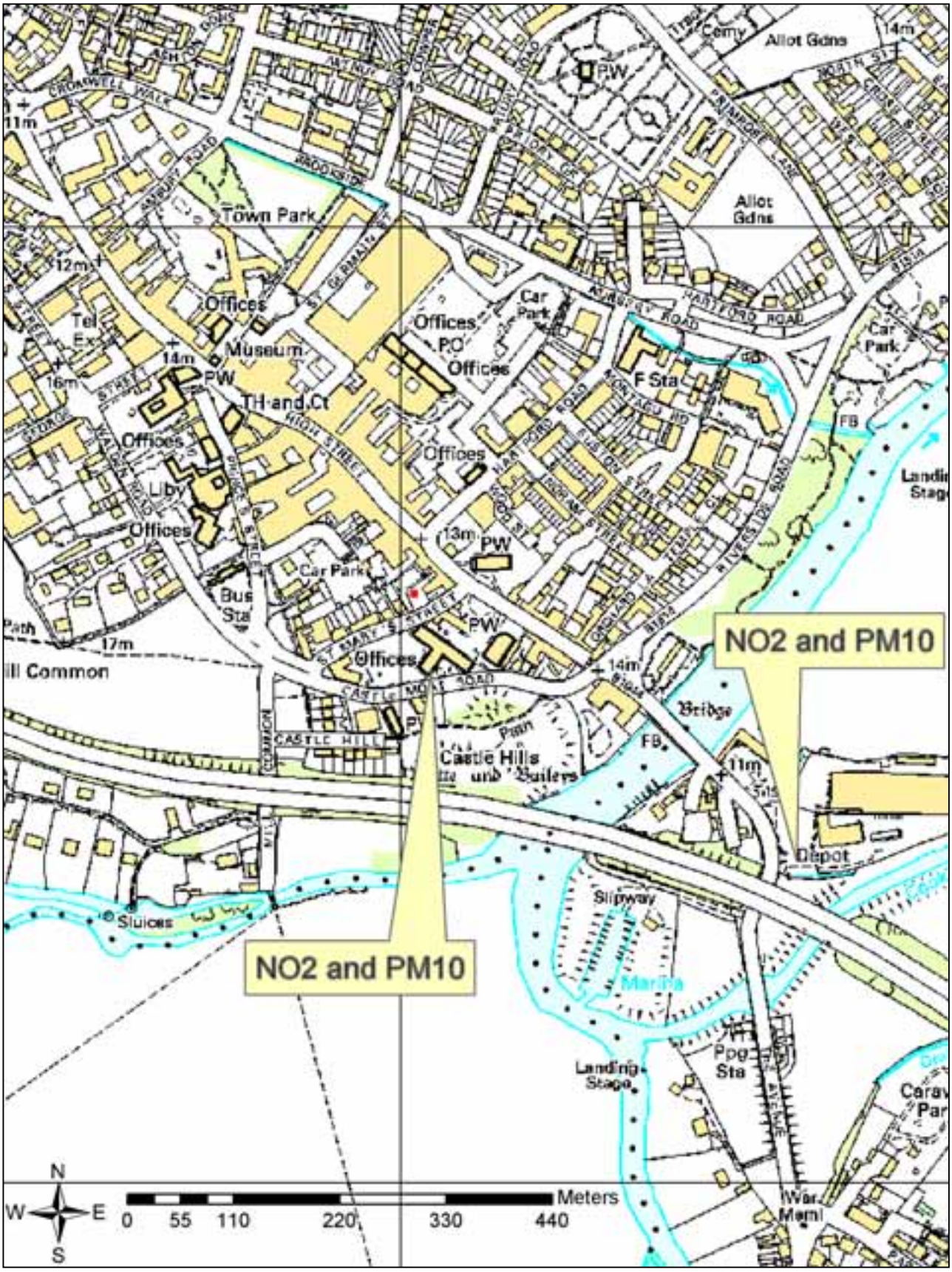
45.7 * 1.15 * 1.05 = 55.21μg/m^3.

This figure is now corrected for the two compliance years.

Annual mean adjusted to 2005: (0.892/0.941) * 55.21 = **52.3μg/m^3.**

Annual mean adjusted to 2010: (0.734/0.941) * 55.21 = **43.06μg/m^3.**

Figure 9 – Analyser Map



Real time analyser in Mobile Unit (Godmanchester 01/01/03 – 31/05/03)

This analyser is housed in a mobile unit with a PM_{10} analyser and was located 25m North of the elevated A14 at Godmanchester until the end of May 2003. These instruments have now been relocated in a superior location but there is no further significant data for 2003. This limited data has been corrected to derive an annual average following the same procedure as above.

Figure 10 - Mobile Unit at Godmanchester

Figure 11 – Correction for Missing Data – NO_2 Analyser at Godmanchester

NO_2(μg/m^3) for 2003.	Cambridge	Thurrock	Norwich Roadside	Average
Annual Mean (μg/m^3) =	45.40	38.35	32.66	
Period Mean 01/06/03 - 31/12/03 =	43.49	35.28	32.03	
Ratio 1: AM/PM(1) =	1.04	1.09	1.02	**1.05**

The average from the analyser for the period 01/01/03 – 31/05/01 is 48.25μg/m^3. To correct for the missing data this figure is then multiplied by the ratio derived above.

48.25 * 1.05 = 50.66μg/m^3.

This figure is now corrected for the two compliance years.

Annual mean adjusted to 2005: (0.892/0.941) * 50.7 = **48.06μg/m^3.**

Annual mean adjusted to 2010: (0.734/0.941) * 50.7 = **39.55μg/m^3.**

Both the adjusted annual means predicted for 2005 are significantly above the objective of 40μg/m^3 annual mean. The poor metrology of 2003 is the primary cause of the substantial increase in measured concentrations of NO_2 compared with those from 2001 and 2002 reported in the last USA. Considering the size of the predicted exceedences, however, it is proposed to proceed to a detailed assessment of the area encompassing both real-time NO_2 analysers.

NO_2 Diffusion Tube Data 2003.

Huntingdonshire District Council (HDC) has been using NO_2 diffusion tubes since 1996. 22 NO2 diffusion tubes are now exposed monthly around the district. The 'Pathfinder' tube is collocated with a real time analyser. The three 'mobile' tubes are collocated with a mobile analyser. The tube supplier is Harwell Scientifics and the preparation method is 50% TEA in Acetone. The bias figure provided by the supplier is 0.75. The bias figure derived locally is 0.9. The lab supplied figure has been used to correct the data.

Figure 12 – NO_2 Diffusion Tube Annual Means

Site Name	Description	Annual mean 2003 (μgm^{-3})	Lab Bias	2005 Adjustment	2010 Adjustment
Brampton 1	Background	30.29	22.72	21.53	17.72
Sawtry 1	Background	30.16	22.62	21.44	17.64
Ramsey	Background	29.88	22.41	21.25	17.48
St. Ives	Background	31.13	23.35	22.13	18.21
Fenstanton	Background	36.96	27.72	26.28	21.62
Huntingdon	Roadside	46.41	34.81	33.00	27.15
Godmanchester	Roadside	44.00	33.00	31.28	25.74
Blethan Drive	Roadside	51.24	38.43	36.43	29.97
Brampton 2	Roadside	30.29	22.72	21.53	17.72
Southoe 1	Roadside	36.11	27.09	25.68	21.13
Southoe 2	Background	29.45	22.08	20.93	17.23
Buckden	Roadside	37.78	28.34	26.86	22.10
Alconbury	Background	37.78	28.34	26.86	22.10
Sawtry 2	Roadside	34.86	26.14	24.78	20.39
High St.	Kerbside	52.84	39.63	37.57	30.91
The Paddock	Kerbside	35.38	26.54	25.16	20.70
Avenue Rd	Background	30.94	23.21	22.00	18.10
Harland Rd	Background	28.89	21.67	20.54	16.90
Ring Road	Kerbside	57.54	43.15	40.91	33.66
Mobile 1	Background	43.40	32.55	30.86	25.39
Mobile 2	Background	41.60	31.20	29.57	24.33
Mobile 3	Background	42.87	32.15	30.48	25.08

Looking at data from both real-time analysers and the diffusion tube at Pathfinder House, it is clear that the NO_2 annual average objective is at risk of being contravened on the Huntingdon inner ring road and one or more of its four feeder roads.

The very high NO_2 concentrations reported are largely symptomatic of the adverse 2003 metrology, which compounded air quality episodes around the country. The data cannot be discounted on these grounds, however, as the same monitoring locations were very close to the objectives in 2002. It seems there is an underlying problem with slow moving traffic on the Ring Road combined with heavy traffic flows on the nearby elevated A14.

It is proposed to take NO_2 forward for a detailed assessment of the Huntingdon Inner Ring Road and it's feeder roads.

Figure 13 - NO_2 Diffusion Tube data trend at Pathfinder House, Huntingdon *

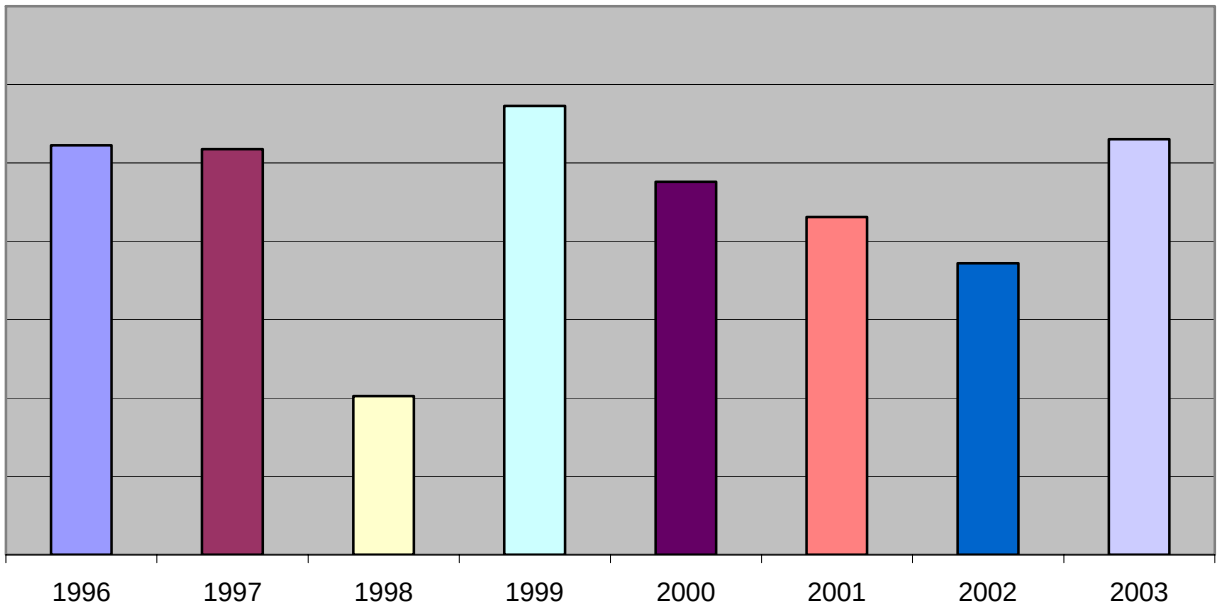
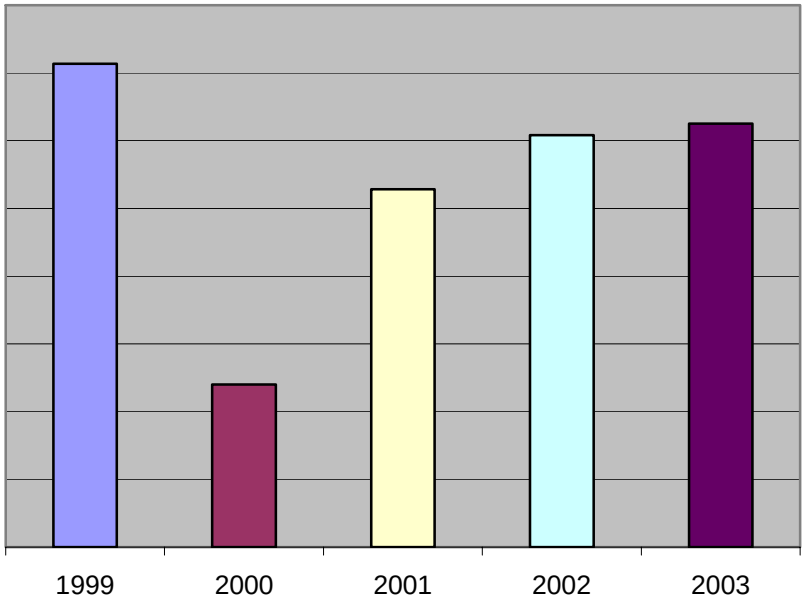
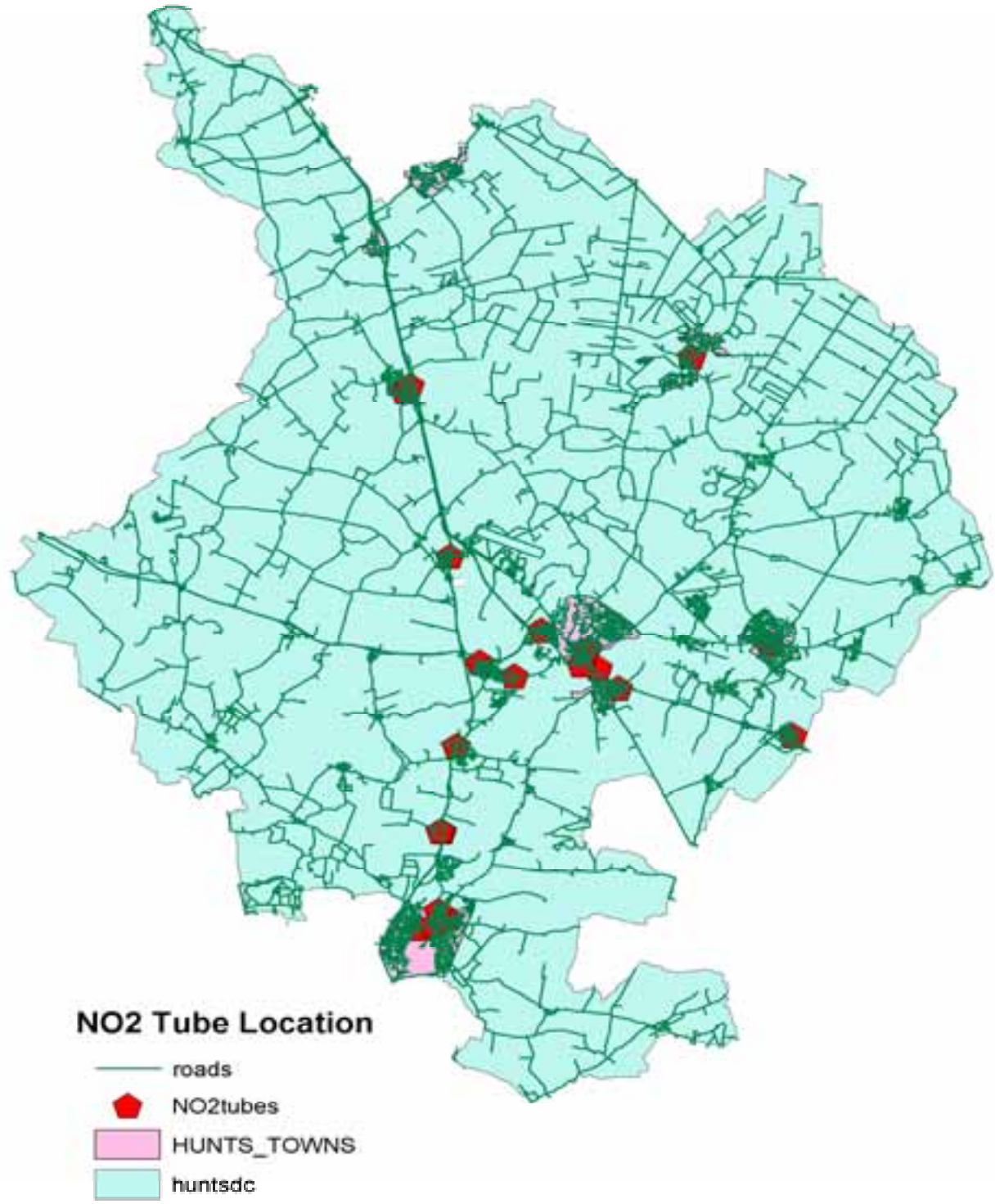


Figure 14 - NO_2 Diffusion Tube data trend in Tennis Court Avenue, Huntingdon *



* Annual means, raw data.

Figure 15 – Locations of NO_2 Diffusion Tubes in Huntingdonshire



2.3.2 PM_{10} Monitoring Data

The Council operate two real-time PM_{10} analysers. One, at a kerbside location on the Huntingdon inner Ring Road, and one mobile unit that was relocated during 2003 which included being off line for some months. Data for the mobile unit will not be reported here.

Realtime analyser on the Huntingdon Ring Road

This analyser is a TEOM sited in an enclosure on the pavement next to the Councils Head Quarters. The inlet is approximately 3m from the kerbside. A short distance around the Ring Road are residential receptors that are as close to the road so this monitoring position can be considered as representative of a receptor location. Due to a data capture of 52% being achieved for the year the data has been corrected using the procedure in LAQM.TG(03) Box 8.5.

Figure 16 – HDC TEOM on Huntingdon ring road

Figure 17 – Correction for missing data – Huntingdon TEOM

PM_{10} μgm^{-3}	Norwich	Southend	Thurrock	Average
Annual Average PM_{10} μgm^{-3}=	17.912	16.328	22.952	
Period Mean 9 May - 22 May =	12.151	13.155	15.245	
Period Mean 18 June - 16 Nov =	17.886	15.901	22.462	
Ratio Am/Pm1 =	1.474	1.241	1.506	**1.407**
Ratio Am/Pm2 =	1.001	1.027	1.022	**1.017**

The annual average from the analyser is 15.80μg/m^3. To correct for the missing data this figure is then multiplied by the two ratios derived above.

15.8 * 1.407 * 1.017 = 22.61μg/m^3.

This TEOM data is then corrected to gravimetric equivalent.

22.61 * 1.3 = 29.39μg/m^3.

We must now derive the coarse, primary and secondary fractions.

For 2003 the coarse is considered to be 10.5μg/m^3.

For 2003 the local secondary PM_{10} is 8.28 * 0.955 = 7.9μg/m^3.

Therefore the local primary for 2003 is:

29.39 – 10.5 – 7.9 = 10.99μg/m^3.

So the local primary for 2004 is 10.99 * (0.930/0.954) = 10.71μg/m^3.

The local secondary for 2004 is 7.9 * (0.932/0.955) = 7.71μg/m^3.
So the predicted concentration in 2004 is:

Coarse(2004) + local primary(2004) + local secondary(2004)

10.5 + 10.71 + 7.71 = **28.92μg/m^3**.

So from Fig 8.1 of LAQM.TG(03) we use the following equation to derive the number of daily exceedences in 2004.

-18.5 + (0.00145 * 28.92^3) + 206/28.92 = **23.69 days**.

Realtime analyser in Mobile Unit (Godmanchester 01/01/03 – 31/05/03)

This PM_{10} analyser is a Beta attenuation module and was located about 25m down wind from an elevated section of the A14 at Godmanchester until the end of May 2003. Due this monitoring period being less that nine months the data is corrected in accordance with the procedure contained in the technical guidance.

Figure 18 – Correction for Missing Data – Godmanchester BAM

PM_{10} μgm^{-3}	**Norwich**	**Southend**	**Thurrock**	**Average**
Annual Average PM_{10} μgm^{-3}=	17.912	16.328	22.952	
Period Mean 01/06/03 - 31/12/03 =	17.395	14.945	20.855	
Ratio Am/Pm =	0.971	0.915	0.909	**0.932**

The annual average from the analyser is 24.41μg/m^3. To correct for the missing data this figure is then multiplied by the ratio derived above.

24.41 * 0.932 = 22.75μg/m^3.

Since the BAM has a heated inlet the most recent advice is to apply a 1.3 correction factor to this data.

22.75 * 1.3 = 29.58μg/m^3.

We must now derive the coarse, primary and secondary fractions.

For 2003 the coarse is considered to be 10.5μg/m^3.

For 2003 the local secondary PM_{10} is 8.28 * 0.955 = 7.9μg/m^3.

Therefore the local primary for 2003 is:

29.58 – 10.5 – 7.9 = 11.18μg/m^3.

So the local primary for 2004 is 10.99 * (0.930/0.954) = 10.71μg/m^3.

The local secondary for 2004 is 7.9 * (0.932/0.955) = 7.71μg/m^3.

So the predicted concentration in 2004 is:

Coarse(2004) + local primary(2004) + local secondary(2004)

10.5 + 11.18 + 7.71 = **29.39μg/m^3**.

So from Fig 8.1 of LAQM.TG(03) we use the following equation to derive the number of daily exceedences in 2004.

-18.5 + (0.00145 * 29.39^3) + 206/29.39 = **25.32 days**.

Both PM_{10} monitoring stations are measuring concentrations that do not appear to pose a threat to the objectives.

2.3.3 Benzene

In the summer of 2003 Fenside Waste Management Limited made an application for a permit from the Environment Agency to allow co disposal of hazardous and non hazardous waste at their landfill site on the edge of the village of Warboys. The application sought to regulise disposal practices that had been in use since 1998. As a statutory consultee to the permitting process Huntingdonshire District Council became aware that this site was a potential source of fugitive emissions of benzene. A diffusion tube survey was commenced to ascertain levels likely to occur at the nearest receptors, and also at the Landfill site itself. There is currently insufficient data to derive annual averages but the low concentrations recorded to date are encouraging.

The tubes are chromasorb ATD tubes analysed by thermal desorption-gas chromatography-mass spectrometry supplied and analysed by Scientifics. Scientifics report an accuracy of +/-20%, whilst LAQM.TG(03) suggests the tubes over read by 30%. The data reported is raw data. The tubes are exposed for fortnightly periods.

Figure 19 - Benzene Diffusion Tube Results - Results in μgm^{-3}

	Site		
Exposure Dates	**Warboys Landfill**	**Woodview**	**Wingate**
23/10/2003	1.01	1.72	2.21
06/11/2003	1.40	1.30	1.24
19/11/2003	0.88	0.52	0.59
03/12/2003	1.72	1.53	1.53
18/12/2003	0.59	1.01	1.11
08/01/2004	1.14	0.81	1.20

Although recorded concentrations are low the benzene monitoring will provisionally continue until October 2004, as a precautionary measure, providing a twelve-month data set for further consideration.

2.4 South Cambridgeshire District Council

2.4.1 Nitrogen Dioxide

Continuous monitoring of nitrogen Dioxide has taken place at a roadside location on the eastbound carriageway of the A14 at Bar Hill (TL 386 637) since 2001. The monitor employed is a Thermo Electron oxide of nitrogen analyser that utilises the chemiluminescent technique to obtain continuous hourly average ambient oxides of nitrogen concentrations. The National Environmental Technology Centre (NETCEN) provides an independent audit and data review service of this equipment. The results available for this site are a fully scaled and ratified dataset from March 2001 to December 2003.

Figure 20 – SCDC Mobile Unit at Bar Hill

Progress Report Guidance LAQM.PRG(03) suggest that if data is available for less than 9 months then they should be adjusted to provide an estimate of the annual mean using the procedure set out in LAQM.TG(03). Data for Bar Hill has been adjusted for 2001 and 2002 but data capture achieved over 90% in 2003 and therefore no adjustment has been made to the results.

From the results in Figure 21 it would appear that there are no implications for the hourly objective, however the annual mean objective is exceeded and shown to be likely to exceed the objective in 2005 by the method described in Box 6.6 of Technical Guidance LAQM.TG(03).

Figure 21 - Air Quality Statistics for NO_2 Measured at the A14 Bar Hill

	NO_2 2001	**NO_2 2002**	**NO_2 2003**	**National Air Quality Objectives**
Maximum hourly mean	124.2 µg/m^3	145.2 µg/m^3	166 µg/m^3	
Hourly mean 99.8th percentile	109.0 µg/m^3	113.0 µg/m^3	132 µg/m^3	**200 µg/m^3 [18 exceedences]**
Number of exceedences of the AQS 200µg/m^3			0	**18**
Annual Recorded Mean	38.2 µg/m^3	43.9 µg/m^3	49.7 µg/m^3	**40 µg/m^3**
Data Capture	72%	67%	91.7%	**90%**
Annual Mean (Adjusted)	40.5 µg/m^3	41.9 µg/m^3		**40 µg/m^3**
Estimated Annual Mean in 2005	36.1 µg/m^3	38.6 µg/m^3	**47.1 µg/m^3**	**40 µg/m^3**

As this monitor is in a relevant location on the busiest section of the A14 in Cambridgeshire it would appear that a detailed assessment of nitrogen dioxide is required for this section of the A14 corridor.

In February 2002 a similar monitor was installed at Impington on the westbound carriageway of the A14. This site is independently audited and data reviewed by Air Quality Monitoring Services Ltd. The results available are a fully scaled and ratified dataset from February 2002 to December 2003. As data capture was below 75% in 2002 the data has been adjusted to provide an estimate of the annual mean using LAQM.TG(03) (Box A1.3, page A1-16). The main losses of data for 2003 occurred from New Year to 24 January and between 19 July and 8 August.

This site, which is funded as part of the Cambridgeshire Transport Plan, was set up to represent a worst-case relevant exposure. As can be seen in Figure 22 the monitor is positioned in a roadside location 8 metres from the kerbside of the A14 westbound adjacent to the convergence of the slip road from the A1049. This stretch of carriageway is regularly congested at peak times. The monitor is between two residential properties whose gardens are a similar distance from the kerbside which is just perceptible in the following photograph.

Figure 22 – SCDC Monitoring Unit at Impington

Figure 23 - Air Quality Statistics for NO_2 Measured at the A14 (W), Impington

	NO_2 2002	NO_2 2003	**National Air Quality Objectives**
Maximum hourly mean measured	236.7 µg/m^3	485.5 µg/m^3	
Hourly mean 99.8th percentile	184.3 µg/m^3	**294.7 µg/m^3**	**200 µg/m^3 [18 exceedences]**
Annual Recorded Mean	48.5 µg/m^3	52.2 µg/m^3	**40 µg/m^3**
Data Capture	72 %	80.7 %	**90%**
Annual Mean (Adjusted)	52.7 µg/m^3	52.2 µg/m^3	**40 µg/m^3**
Estimated Annual Mean in 2005	48.5 µg/m^3	**49.5 µg/m^3**	**40 µg/m^3**

Results for 2003 show that there was an enormous increase in the scale of the hourly averages recorded. Although data capture was only 80.7% for 2003 there were 141 hours recorded where the hourly average was above the 200µg/m^3 hourly objective (140 of them between February and April). This is compared with 2 hours in 2002. The only other site with such an increase in hourly exceedences is the London Marylebone Road monitor which recorded 432 exceedences in 2003 but only 2 in 2002. The annual mean for Impington in both years exceeds the objective and the forecast to 2005 indicates that both the annual and hourly objectives are at risk at this site.

The local councils and the Highways Agency have been considering proposals for improving the A14 for several years and major consultation was undertaken on the resulting options appraised in the Cambridge to Huntingdon Multi Modal Study. Improvements proposed for this stretch are to include a third lane in both directions, it is thought that this will assist flow and decrease emissions. Officers are currently in the preliminary stages of responding to the environmental statement, which will consider in detail the air quality implications.

The monitoring of nitrogen dioxide by diffusion tube has been an ongoing project since 1995. There are currently 12 sites within the District as detailed in Figure 24. The tubes are supplied and analysed by Harwell Scientifics a UKAS accredited laboratory (0322). The tube preparation method is 50% TEA in Acetone and analysis is by desorption with distilled water, and the extract analysed using a segmented flow auto analyser with ultraviolet detection. The exposure periods for the diffusion tubes are those of the UK Nitrogen Dioxide Diffusion Tube Network run by NETCEN which effectively is a four or five week duration. QA/QC procedures are as detailed in the UK NO_2 Diffusion Tube Network Instruction Manual, this document can be found at www.airquality.co.uk/archive/reports/cat06/no2instr.pdf

The diffusion tube bias adjustment is calculated from a co-location study carried out at the continuous chemiluminescent monitor at Bar Hill. This gives a bias adjustment factor of 0.93 for 2003. The following table shows the annual mean diffusion tube concentration recorded for 2003, corrected for bias and year adjusted to 2005.

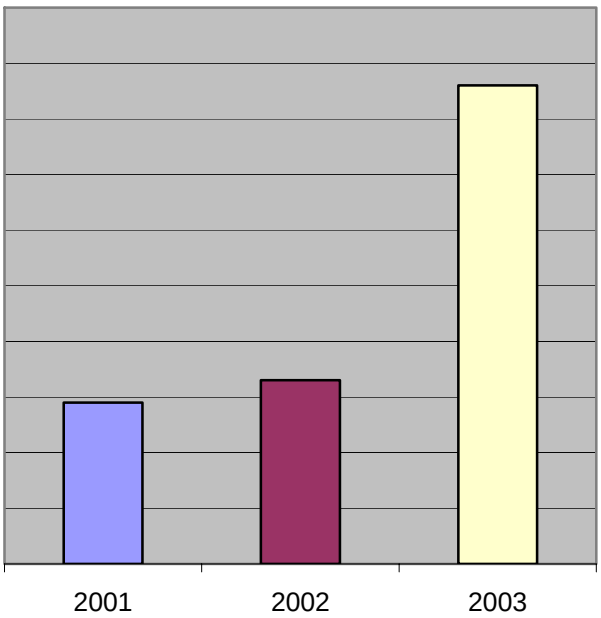
Figure 24 - Annual Mean NO_2 Concentration (µg/m^3) Measured by Diffusion Tube in South Cambridgeshire

Diffusion Tube Site	Site Designation	Annual Mean 2003 µg/m^3	Corrected for bias µg/m^3	Estimated to 2005
High Street, Histon. TL439 637	**Roadside**	**50.6**	**47.1**	**44.6**
Narrow Lane, Histon. TL441 641	Background	29.3	27.3	25.9
High Street, Sawston. TL486 490	**Roadside**	**49.0**	**45.6**	**43.2**
Paddock Way, Sawston TL487 493	Background	28.2	26.3	24.9
The Coppice, Histon. TL442 620	Background	36.1	33.6	31.9
Lone Tree Ave., Histon. TL441 618	Background	36.5	34.0	32.2
A505, Thriplow. TL440 445	Roadside	40.4	37.5	35.6
High Street, Linton. TL561 468	Roadside	39.6	36.8	34.9
High Street, Tadlow. TL281 474	Background	27.8	25.9	24.5
High Street, Harston. TL425 510	Roadside	38.7	36.0	34.1
Garner Close, Milton. TL475 631	Background	32.7	30.4	28.8
High Street, Girton. TL425 614	**Roadside**	**51.7**	**48.1**	**45.6**

Three sites were found to be greater than the 40 µg/m^3 annual mean objective. High Street, Histon (Figure 25) is a narrow village road which although is not subject to excessive traffic flows can become congested at peak times owing to vehicles parking on the road and causing obstructions to the flow of traffic. The tube is adjacent to a residential façade and is therefore in a relevant location.

Figure 25 – SCDC NO_2 Diffusion Tube Site in High Street, Histon

Figure 26 - NO_2 Diffusion Tube data trend in High Street, Histon *

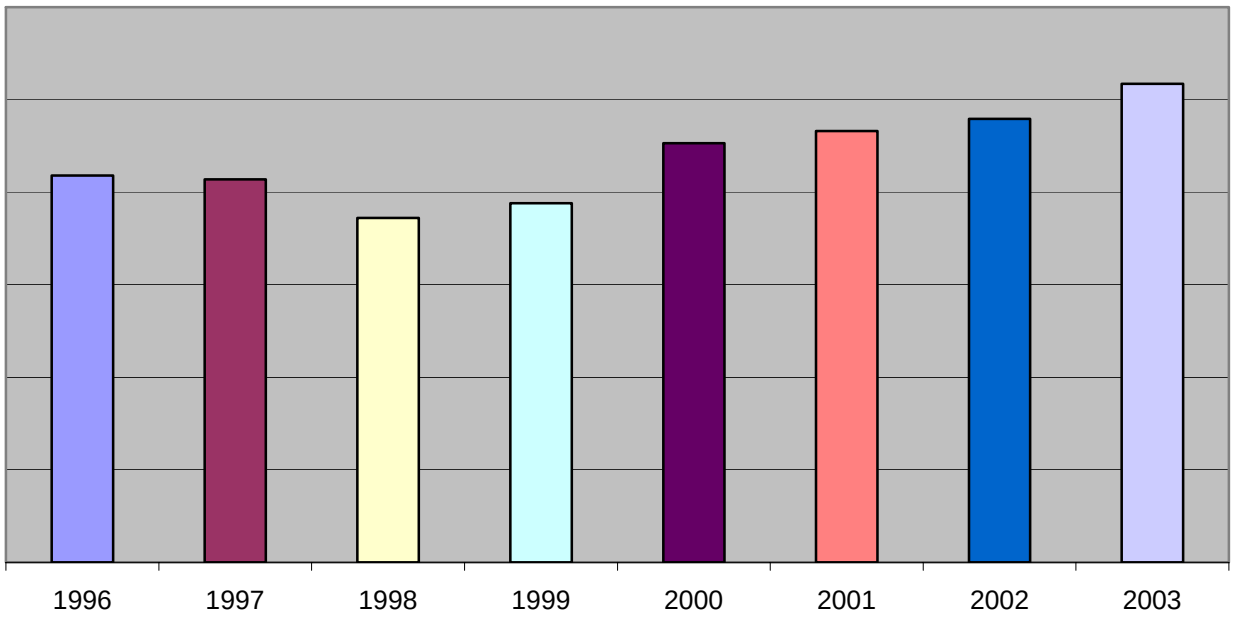


* Annual means, raw data.

The monitoring location in Girton is at the entrance to a small development and opposite a local shop. From Figure 27 it can be seen that the tube is situated on a lamppost in a roadside location and on a bridge over the A14 dual carriageway below. The site is an equal distance from the A14 as local residential gardens.

Figure 27 – SCDC NO_2 Diffusion Tube Site in Cambridge Road, Girton

Figure 28 - NO_2 Diffusion Tube data trend in Cambridge Road, Girton*



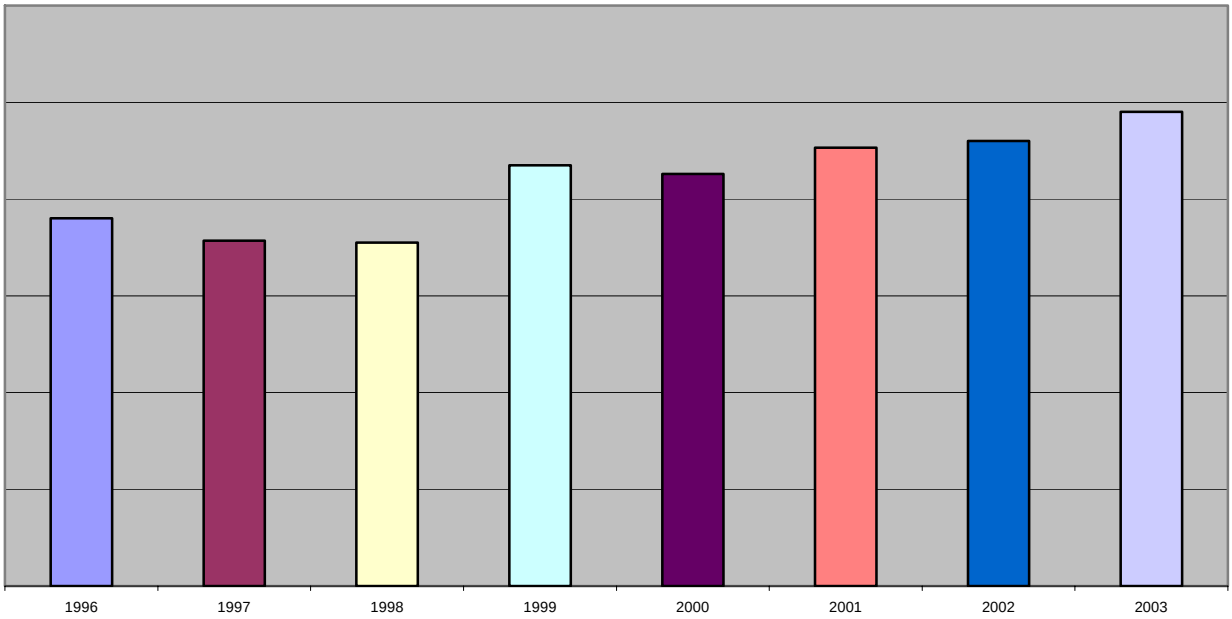
* Annual means, raw data.

The other location that exceeds the annual mean objective is located in Sawston, currently our largest village with a population of 8,000. The monitoring site is adjacent to the façade of the local public house and the same distance from the roadside as the façade of residential properties.

Figure 29 – SCDC NO_2 Diffusion Tube Site in High Street, Sawston

As these results are above the annual mean objective it is worthwhile looking at the wider context and considering the data obtained in previous years. This data has not been adjusted for bias as co-location studies have only been carried out for the last two years (2002 and 2003).

Figure 30 - NO_2 Diffusion Tube data trend in High Street Sawston *



* Annual means, raw data.

Figure 31 - Historical Measurements for Locations at Risk of Exceeding the Annual Mean Objective for Nitrogen Dioxide plus Background

Location	Annual Mean Nitrogen Dioxide Concentration (µg/m^3) As Measured (without bias correction)							
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
High Street, Histon. TL439 637						44.9	45.3	50.6
High Street, Girton. TL425 614	41.8	41.4	37.2	38.8	45.3	46.6	47.9	51.7
High Street, Sawston. TL486 490	***38.0***	***35.7***	***35.5***	***43.5***	***42.6***	45.3	46.0	49.0
High Street, Tadlow. TL281 474	21.6	19.7	18.9	21.2	20.6	20.8	20.6	27.8

(Figures in italics were at a previous monitoring location in High Street, SawstonTL485 490)

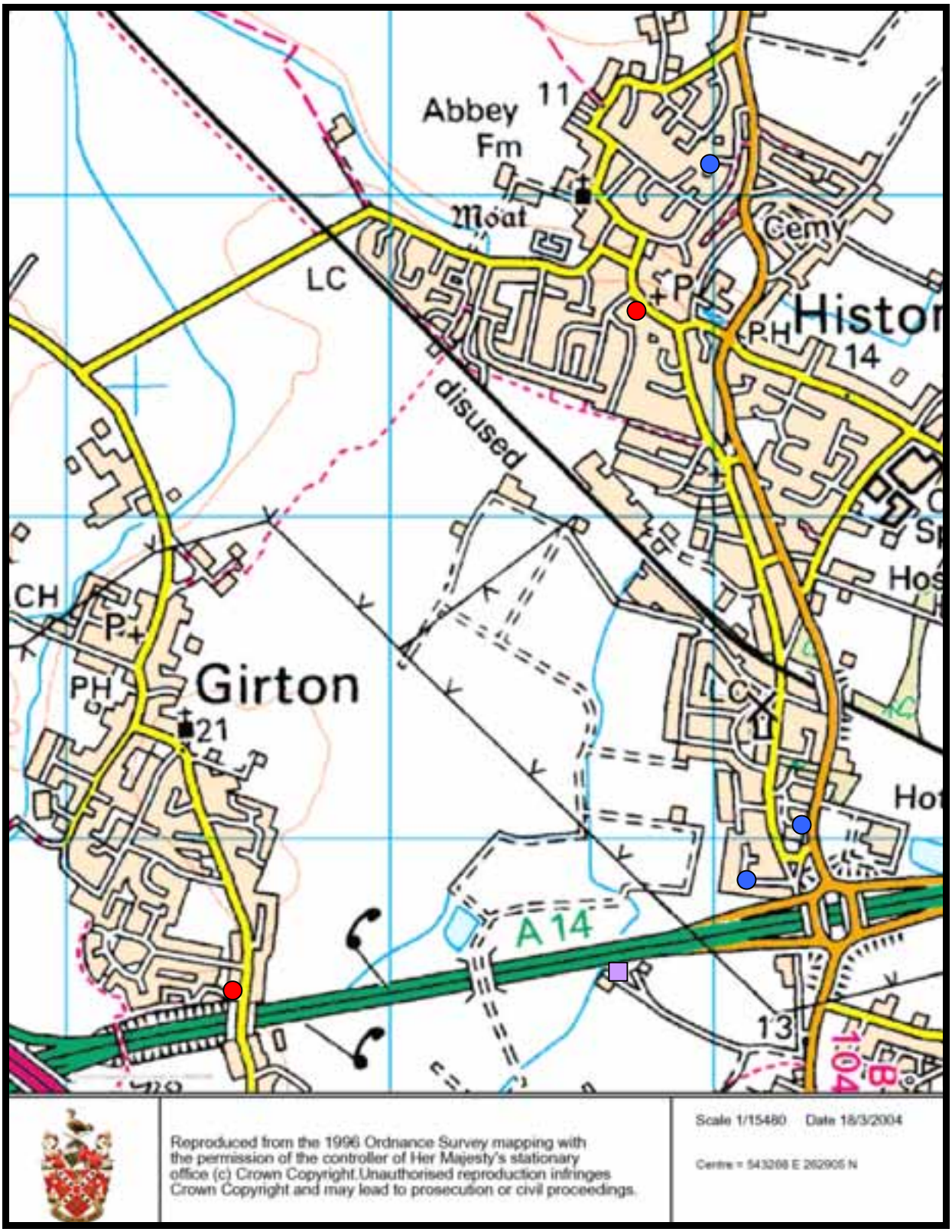
There appears to be a very obvious trend upwards in these figures since 1999. However the rural background at Tadlow gives a very different picture with concentrations being fairly stable until 2003 when there is a dramatic increase. There is an indication that weather conditions and/or a regional effect were a contributory factor in increasing nitrogen dioxide levels in 2003 and this may be an explanation for the exceptionally high results recorded.

Histon, Impington and Girton as well as being adjacent to the A14 are adjoining the city of Cambridge and there will inevitably be an urban contribution to the measured concentrations along with the traffic element. Figure 31 illustrates this to some degree showing that the annual mean concentration falls rapidly to the north of the A14 until a local traffic contribution (High Street, Histon) contributes to another exceedence of this objective. Cambridge City is currently undertaking a detailed assessment for nitrogen dioxide.

Cambridgeshire County Council have applied for a transport order to open a guided busway on the disused railway line running through Histon. This route may eventually connect Huntingdon to Cambridge City via the villages in between and provide an alternative transport option for commuters travelling into Cambridge, this is part of a wider strategy to reduce traffic on the A14. The route can be identified as the disused railway line in Figure 31 and may have a positive impact on air quality in the area.

A detailed assessment of nitrogen dioxide will be required for the A14 corridor from Bar Hill and including Girton, Histon and Impington. The High Street in Sawston should also be investigated further.

Figure 32 – Map of Monitoring Locations around the A14 at Girton, Histon & Impington



●	NO_2 Diffusion Tube Site with Annual Mean above the Objective in 2003.
●	NO_2 Diffusion Tube Site with Annual Mean below the Objective in 2003.
■	Continuous Monitoring Location. (Impington site) with exceedences of the annual mean and hourly objectives.

2.4.2 PM_{10} Monitoring Data

Fine particles are monitored at two locations in South Cambridgeshire, on the A14(E) (TL 385 637) at Bar Hill and on the A14(W) (TL 437 616) at Impington. Measurements at both sites are made using an Eberline FH 62-IR Beta-attenuation Monitor. This instrument has a heated inlet manifold which is held at 40ºC, the temperature is sufficient to drive off the volatile content of the sample and therefore the guidance given in LAQM.TG(03) is to correct for this by multiplying all measurements by a factor of 1.3 prior to comparison with the air quality objective. Results are quoted as $\mu g/m^3$ TEOM equivalents prior to correction and as $\mu g/m^3$ gravimetric subsequently.

The PM_{10} results measured at Bar Hill are quality assured and reported by NETCEN. The site was commissioned in March 2001 as described above for nitrogen dioxide and there is a fully scaled and ratified dataset available pursuant to this period.

Figure 33 - PM_{10} Concentrations Measured at the A14(E) Bar Hill

	2001	**2002**	**2003**	**National Air Quality Objectives**
Measured Annual Mean (TEOM equivalent)	22 $\mu g/m^3$	23 $\mu g/m^3$	25 $\mu g/m^3$	
Data capture of hourly means	75.2 %	96.5 %	92.4 %	90 %
Annual Mean (Gravimetric)	28.6$\mu g/m^3$ (corrected for period data – see below)	29.9$\mu g/m^3$	32.5$\mu g/m^3$	**40 $\mu g/m^3$**
Number of exceedences of 24 hour mean > 50$\mu g/m^3$	(9) (measured)	27	40	35
90th percentile (gravimetric)– reported where data capture is below 90%	48.1$\mu g/m^3$			

LAQM.TG(03) suggests that where data capture is less than 90% the annual mean concentration should be estimated by comparison with compliant datasets. This procedure is explained in Box 8.5 of LAQM.TG(03).

Figure 34 - Estimation of Annual Mean 2001

Long-term site	Annual Mean (Am)	Period Mean (Pm)	Ratio (Am/Pm)
Norwich	15.1	14.6	1.03
London A3	21.0	20.5	1.02
		Average (Ra)	1.025
Annual Mean = M * Ra = 21.8 * 1.025 = 22.35 μg/m^3			

The results in Figure 33 show that there were 40 exceedences of the daily objective at this site in 2003 whilst the annual mean is within the objective in all years. Forecasting to the objective year of 2004 can be done by the method described in LAQM.TG(03) as shown in Figure 35.

Figure 35 - Correction of Measured PM_{10} concentrations to 2004

Methodology	Calculation	Baseline Year		
		2001	2002	2003
Measured Annual Mean Concentration µg/m^3	CT_{year}	22	23	25
Adjusted to gravimetric equivalent	$CG_{year}=CT_{year}$ * 1.3	28.6	29.9	32.5
Local Secondary PM_{10} concentration in 2001 from internet maps.	$Csec_{2001}$	7.5	7.5	7.5
Estimate the local secondary PM_{10} concentration in the measurement year using correction factors in Box 8.7 LAQM.TG(03)	$Csec_{year}$ = [$Csec_{2001}$]* year factor	7.5	7.33	7.16
PM_{10} coarse concentration given in LAQM.TG(03)	10.5	10.5	10.5	10.5
Estimate the local primary PM_{10} concentration in the measurement year [$Cprim_{200?}$]	$Cprim_{year}$= [CG_{year}]- [$Csec_{year}$] – 10.5	10.6	12.07	14.84
Adjust the local primary PM_{10} concentration in the measurement year to 2004 [$Cprim_{2004}$] using the correction factors from Box 8.7	$Cprim_{2004}$ = [$Cprim_{year}$] * (2004 factor / year factor)	9.89	11.49	14.47
Calculate the secondary PM_{10} concentration in the measurement year to 2004 [$Csec_{2004}$] using the correction factors from Box 8.7	$Csec_{2004}$ = [$Csec_{2001}$]* 2004 factor	6.99	6.99	6.99
Calculate the total estimated PM_{10} concentration in 2004.	CG_{2004} = [$Cprim_{2004}$]+[$Csec_{2004}$] +10.5	27.38	30.55	31.96
Predicted Exceedences of 2004 24 hour objective derived using relationship in Figure 8.1 LAQM.TG(03)	y = -18.5 + 0.00145 x annual mean^3 + (206 / annual mean)	23	27	35

This shows that the corrected data from measurements made at the site since monitoring began indicate that the PM_{10} objective should be achieved at this location in 2004. However exceedences of the daily mean measured in 2003 show that this is essentially controlled by weather conditions and monitoring should continue at this site to support efforts through the air quality strategy to reduce particulate matter at this location.

Monitoring at the A14(W) in Impington at the site described above for nitrogen dioxide and shown in Figure 22 has been operating since 19 February 2002. The analyser is identical to the one at Bar Hill and therefore the data has been handled in the same manner. Air Quality Monitoring Services Ltd provides data ratification and auditing services at this site. The data sets for both years are presented below in Figure 36.

Figure 36 - PM_{10} Concentrations Measured at the A14(W) Impington

	2002	**2003**	**National Air Quality Objectives**
Measured Annual Mean (TEOM equivalent)	22.9 μg/m^3	30.2 μg/m^3	
Data capture of hourly means	80.2 %	88.1 %	90 %
Estimated Annual Mean (see below)	22.8 μg/m^3	30.1 μg/m^3	
Annual Mean (Gravimetric)	29.9 μg/m^3	39.1 μg/m^3	**40 μg/m^3**
Number of exceedences of 24 hour mean > 50μg/m^3	22 (measured)	72 (measured)	35
90th percentile (gravimetric)– reported where data capture is below 90%	54.6 μg/m^3	66.4 μg/m^3	

LAQM.TG(03) suggests that where data capture is less than 90% the annual mean concentration should be estimated by comparison with compliant datasets. This procedure is explained in Box 8.5 of LAQM.TG(03).

Figure 37 - Estimated Mean in 2002

Long-term site	**Annual Mean (Am)**	**Period Mean (Pm)**	**Ratio (Am/Pm)**
Norwich	16.07	16.13	0.996
Northampton	15.39	15.43	0.997
		Average (Ra)	0.9965
Annual Mean = M * Ra = 22.9 * 0.9965 = 22.8 μg/m^3			

Figure 38 - Estimated Mean in 2003

Long-term site	Annual Mean (Am)	Period Mean (Pm)	Ratio (Am/Pm)
Norwich	18.0	17.9	1.005
Northampton	17.0	17.2	0.988
		Average (Ra)	0.997
Annual Mean = M * Ra = 30.2 * 0.997 = 30.1 μg/m^3			

Monitoring shows that the annual mean objective was achieved in 2003 however the high level of exceedences recorded with the 90th percentile of daily means measured as 66.4 μg/m^3 gravimetric is cause for concern. The correction to 2004 is shown below.

Figure 39 - Correction of Measured PM_{10} concentrations to 2004

Methodology	Calculation	BaselineYear	
		2002	2003
Measured Annual Mean Concentration μg/m^3	CT_{year}	23	30
Adjusted to gravimetric equivalent	$CG_{year}=CT_{year}$ * 1.3	29.9	39
Local Secondary PM_{10} concentration in 2001 from internet maps.	$Csec_{2001}$	7.5	7.5
Estimate the local secondary PM_{10} concentration in the measurement year using correction factors in Box 8.7 LAQM.TG(03)	$Csec_{year}$ = [$Csec_{2001}$]* year factor	7.33	7.16
PM_{10} coarse concentration given in LAQM.TG(03)	10.5	10.5	10.5
Estimate the local primary PM_{10} concentration in the measurement year [$Cprim_{200?}$]	$Cprim_{year}$= [CG_{year}]- [$Csec_{year}$] – 10.5	12.07	21.34
Adjust the local primary PM_{10} concentration in the measurement year to 2004 [$Cprim_{2004}$] using the correction factors from Box 8.7	$Cprim_{2004}$ = [$Cprim_{year}$] * (2004 factor / year factor)	11.49	20.80
Calculate the secondary PM_{10} concentration in the measurement year to 2004 [$Csec_{2004}$] using the correction factors from Box 8.7	$Csec_{2004}$ = [$Csec_{year}$]* 2004 factor	6.99	6.99
Calculate the total estimated PM_{10} concentration in 2004.	CG_{2004} = [$Cprim_{2004}$] + [$Csec_{2004}$] + 10.5	28.98	38.29
Predicted Exceedences of 2004 24 hour objective derived using relationship in Figure 8.1 LAQM.TG(03)	y = -18.5 + 0.00145 x annual mean^3 + (206 / annual mean)	24	68

Figure 39 shows that whilst the annual mean PM_{10} may be achieved at this site the predicted number of 24 hour exceedences of 50 $\mu g/m^3$ (68) is almost double the objective of 35. Monitoring is continuing at this location and the developing air quality strategy and A14 Improvement Proposals will be used to attempt to reduce the level of fine particulates in this area.

2.4.3 Benzene

The benzene survey was carried out using Chromasorb ATD diffusion tubes supplied and analysed by Harwell Scientifics. The standard preparation and sample measurement was carried out in accordance with method HS/GWI/3015. The samples were analysed by thermal desorption-gas chromatography-mass spectrometry on a Perkin Elmer ATD. A Quality Control tube from an external standard source with known analyte loading was run with each sequence of samples. The overall uncertainty reported on the results is calculated to be +/- 20%.

Monitoring sites were chosen at locations where there was a relevant receptor at a busy roadside with a petrol station close by. Huntingdon Road is a busy arterial route leading from the A14 into the centre of Cambridge. At the other two locations there is also a small airfield, Cambridge Airfield adjacent to the Teversham site and the Imperial War Museum at Duxford, both of which are used for maintenance of aircraft so have extended periods of ground based full throttle engine testing. Results are presented below:

Figure 40 - Annual Mean Benzene Concentration ($\mu g/m^3$)

MONITORING LOCATION	ANNUAL MEAN BENZENE CONCENTRATION ($\mu g/m^3$)
(W) Huntingdon Road, Girton	0.43
(E)Huntingdon Road, Girton	0.28
A1303, Teversham	0.25
A505, Duxford	0.23

The results show that concentrations of benzene are likely to be well within the running annual mean of 16.25$\mu g/m^3$ (31 Dec 2003) and on target to achieve the annual mean objective by 2010. This is in accordance with the national picture that showed that the maximum running annual mean benzene concentration was below 16.25 $\mu g/m^3$ at all monitoring locations during 2003.

2.4.4 Sulphur Dioxide

Continuous monitoring of Sulphur Dioxide has been undertaken since 1989. An API sulphur dioxide analyser utilising the ultra violet fluorescence technique to obtain continuous 15-minute average ambient sulphur dioxide concentrations was commissioned at a site on Challis Green, Barrington (TL397 498) in February 1998. AEA Technology's National Environment Technology Centre (NETCEN) audit the equipment and scale and ratify the dataset. This site was established in a relevant location to monitor worst-case ground level concentrations from a local industrial source as predicted by modelling. There is a fully ratified dataset to December 2003 available for this site. An additional monitor has subsequently been installed at the Fruit Farm, Barrington (TL399 514) to investigate incidents of plume grounding at a non-relevant location. This site was commissioned in July 2003 and is audited by NETCEN. There is a fully ratified dataset available for July to 31 December 2003.

Sulphur dioxide is also monitored at Marshall Aerospace in Cambridge (TL 483 589) a fixed industrial source with several local boiler plants using medium fuel oil with a sulphur content of not more than 3.5% w/w. Cambridge City Council audit the site that is operated during the burning season and a fully ratified data set is available for the winters of 1999/00, 2000/01 and 2002/03 (February). The company implemented a phased programme to switch to low sulphur oil by 2003.

This target was accomplished and this is reflected in that all the objectives for sulphur dioxide are now being achieved at this location.

Figure 41 - Sulphur Dioxide Concentration Statistics

Location	Year	Maximum 15 Minute Mean ($\mu g/m^3$) [number of exceedences]	Maximum One Hour Mean ($\mu g/m^3$) [number of exceedences]	Maximum 24 Hour Mean ($\mu g/m^3$) [number of exceedences]	Data Capture (%)
Challis Green, Barrington	1998	192 [0]	160 [0]	32 [0]	23
	1999	125 [0]	117 [0]	32 [0]	83
	2000	114 [0]	85 [0]	32 [0]	60
	2001	106 [0]	106 [0]	29 [0]	96
	2002	138 [0]	94 [0]	18 [0]	94
	2003	133 [0]	104 [0]	41 [0]	97
Fruit Farm, Barrington	2003	330 [5]	269 [0]	80 [0]	94
Cambridge	2002/3	164 [0]	142 [0]	58 [0]	
National Air Quality Objective	**2004-5**	**266 [35]**	**350 [24]**	**125 [3]**	**90**

3.0 New Local Developments

3.1 East Cambridgeshire District Council

New Part A Processes

No new Part A processes have commenced operation in the previous year since the last Updating and Screening Assessment (USA).

New Part B Processes

A new mobile crushing and screening process was permitted on 3rd October 2003 operated by Eastern Recycling Ltd, based at NG TL564, 808. This new process is not considered to be significant in terms of assessment.
Two Part B processes have been subject to revocations, these being:-

- B & W Mechanical Handling, a coating of metal process located at TL 515,785.
- JRD Mouldings, an adhesive coatings process located at TL 604,722

New Retail Developments.

No new relevant retail developments since the USA.

New Road Schemes

Construction of the Fordham by-pass is now underway with completion due in May 2005, an air quality assessment was submitted as part of the planning application and model predictions contained therein show significant improvements in air quality for Fordham. The route however will not transfer potential air quality problems elsewhere, the route will by-pass the nitrogen dioxide diffusion tube located at Market Street, Fordham.

New Mineral Developments

No new mineral developments have been approved since the previous USA.

New Landfill Developments

No new landfill sites have been approved since the last USA.
However the Kennett landfill site assessed in the USA ceased operations in November 2003.

Mixed Use Development

No relevant mixed use developments have been approved in since the last USA.

3.2 Fenland District Council

New IPPC Installations

There have been no new IPPC installations permitted over the past year, however the Council has received consultations on the IPPC permit applications for:

Witcham Meadlands – Mick George (Haulage) Ltd – Quarry/Landfill site

Witcham Meadlands is a quarry for sand and gravel extraction at Block Fen, Mepal. The site also has permission for landfill of inert building material waste. Section 2.3.59 of the permit application clearly states that there is no risk of exceedance of objectives. The permit application includes a comprehensive dust action plan. We expect the Environment Agency to accept the air emissions section of the permit application.

March Landfill Site – East Waste Ltd – Landfill site

March Landfill Site is an existing landfill site that is situated off Hundred Road to the North of March. Section 2.3.59 of the permit application clearly states that there is no risk of exceedance of objectives. We expect the Environment Agency to accept the air emissions section of the permit application.

Whittlesey Works - Hanson Building Products - Brickworks and quarry

In appendix B2 of the permit application, Hanson have supplied modelling data for 1997 –2000 based on emissions data from the Stewartby works in Bedfordshire. SO_2, NO_2 and PM_{10} were all modelled. The data indicates significant exceedence of the 99.9^{th} percentile of 15-minute means of SO_2 over relevant locations in South-West Whittlesey (approximately 280µg/m^3). Therefore, the Council will carry the area surrounding the Brickworks forward for detailed assessment.

New LA-PPC Installations

Gemmix, White Walls, Eldernell Road, Coates – LA-PPC/26

Concrete batching plant - no relevant exposure

GRS Environmental, Lodge Farm, Floods Ferry, March – LA-PPC/27

Mobile crusher - not operated very often within the district, therefore, no relevant exposure.

Mr P Foreman, Hillside Road, March – LA-PPC/28

Mobile crusher – Still awaiting supplementary information regarding use, however, relevant exposure to PM_{10} not expected.

Mr R Singh, Lion House, Hostmoor Avenue, March – LA-PPC/29

Mobile crusher on waste recycling site – no relevant exposure

Corus Rail Consultancy, York – LA-PPC/30

Mobile crusher operated within the Network Rail Whitemoor site – refer to New Mineral Development.

Wisbech Vehicle Exchange, Old Lynn Road, Wisbech – LA-PPC/31

Waste oil burner – Wisbech Vehicle Exchange is situated far enough away from the PM_{10} AQMA not to contribute significantly towards exceedence, however, the burner is currently within the SO_2 AQMA.

The burner is situated within 10 metres of a relevant location for public exposure. However, waste oil combustion is not highlighted by the Technical Guidance document [LAQM. TG(03)] as a process likely to give rise to exceedences of any objectives in isolation. The Council expects to control the concentrations of PM_{10} and SO_2 through the permit conditions..

Sisco service station, Doddington Road, Wimblington – PVRR018

Petrol service station– no relevant exposure

New Retail Development

Aldi Supermarket, Sandylands, Wisbech.

Planning permission (F/YR04/0115) has been granted for a food retail outlet with associated parking. The outlet is to be situated on the same road as a larger established food retail outlet. It is not believed that the presence of the new development will significantly change the amount of traffic.

New Mineral Development

Network Rail, Whitemoor, March

Network Rail was granted planning permission in 27 November 2003 for a local engineering distribution centre. The site shares a boundary with relevant locations, but the risk of public exposure to particulates is not likely as the site is subject to background concentrations less than 20µg/m^3 and the stockpiles will be sited at least 450m from the nearest relevant locations for public exposure

The development is in the first of two phases of construction and is currently renewing track and recycling spent ballast. Air quality issues (especially dust) are dealt with by conditions within the planning decision. The second phase will include a concrete batching plant and a concrete sleeper factory. This will be operated by Corus Rail Consultancy under a LA-PPC permit. Once the site is fully operational, the risk of public exposure will be revisited.

New Road Schemes

There are no new road schemes.

New Mixed Development

Nestlé Purina PetCare, Cromwell Road, Wisbech

Nestlé Purina has been granted planning permission to double the production size of their "AluPouch" plant. This is not expected to affect the levels of regulated pollutants, however, the Council has highlighted the need to upgrade BATNEEC on site. The new development will be fitted with modular biofilters with coconut matting medium and 15metre stacks to aid dispersion of

odorous species. Consultation with Enviros has indicated that this should reduce odour concentrations to acceptable levels.

Garden Isle Ltd, Weasenham Lane, Wisbech

Garden Isle have been granted planning permission to relocate their factory into larger premises on an adjacent site. Currently, the factory emits all process exhaust to atmosphere without treatment. Although not believed to be a major source of particulate emission, the Council has received many complaints over recent years due to odour. The new factory will incorporate a gas-fired thermal oxidiser to treat odorous emissions. The exhaust emissions from the thermal oxidiser will be tested regularly.

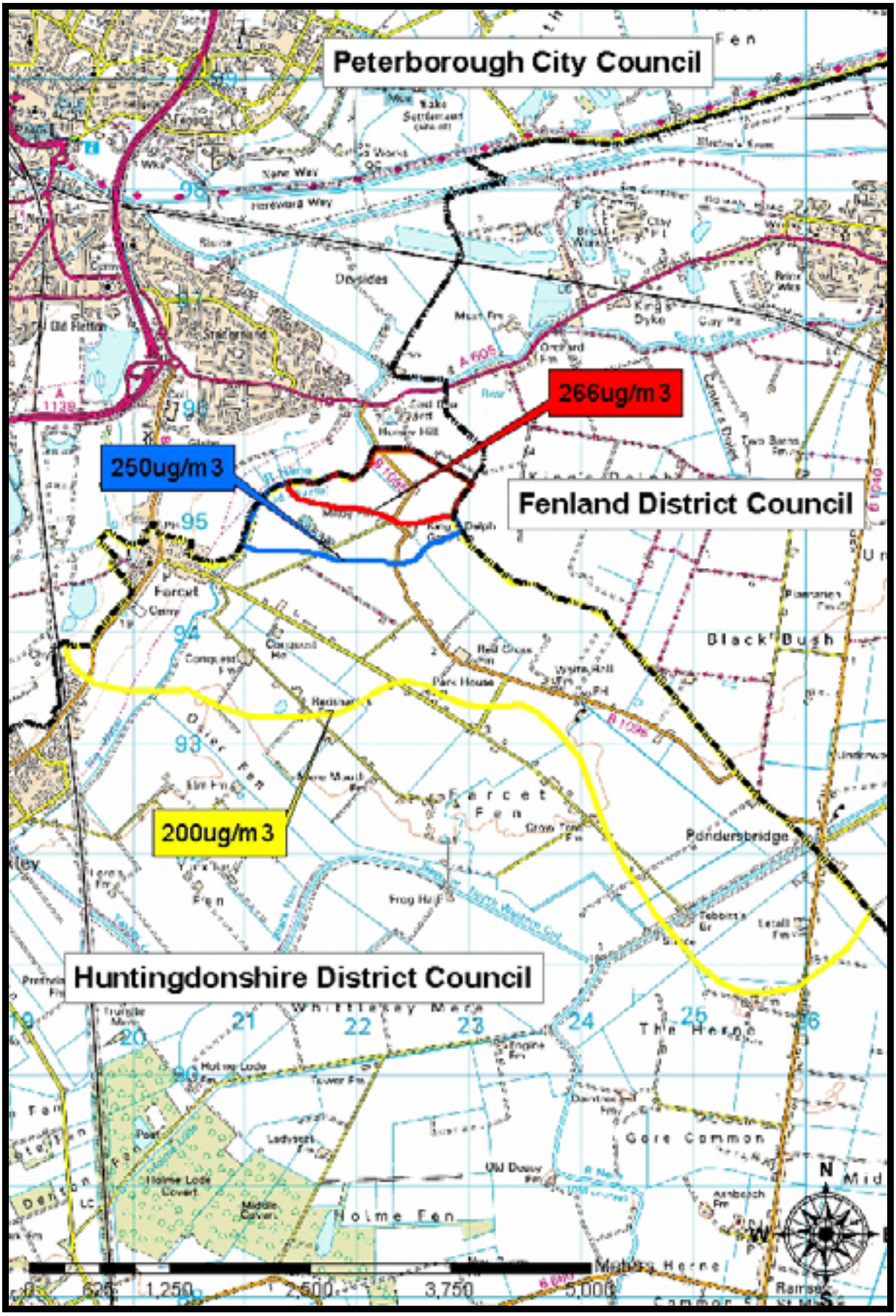
3.3 Huntingdonshire District Council

New Part A Processes

No new Part A processes have been authorised during 2003 since the last Updating and Screening Assessment (USA). The two existing Hanson Brick works in Whittlesey have submitted permit applications to the Environment Agency. Atmospheric dispersion modelling, reported in the application, suggests that contraventions of the SO2 15 - minute mean are likely in an area around the works, which include parts of Fenland District, Huntingdonshire District and Peterborough City as shown on Figure 42.

In accordance with advice from the helpdesk SO2 will be carried forward to a detailed assessment.

Figure 42 - Area of modelled exceedence of the SO2 15 minute mean around the Hanson Brick Works, Whittlesey. The area includes parts of three administration areas.



New Part B Processes

Two new processes have been permitted and considered, in terms of air quality, to be insignificant.

New Retail Developments

No relevant retail developments have been permitted since the USA.

New Road Schemes

There have been no new road schemes permitted since the USA. Proposals for the rerouting of the A14 from Brampton to Bar Hill continue to be considered and construction is forecast to be completed by 2008.

New Minerals Development

There have been no relevant mineral developments within the District in 2003.

New Landfill Development

Warboys Landfill Site.

The new PPC permit application at Warboys Landfill Site has identified a potential benzene emission, which is covered in the new monitoring data section above. An Environmental Impact Assessment submitted to the County Council in support of a planning application included dispersion modelling which suggested that process contributions from the landfill would not put air quality objectives at risk.

New Mixed Use Development

Alconbury Airfield.

The redevelopment of Alconbury Airfield was proposed some years ago but has only recently received outine planning permission, on appeal. The permission is for large scale warehousing, associated facilities, a rail connection and temporary recycling of aggregates. There are very strict planning conditions on atmospheric pollution attached to the permission and there is a strong possibility that the development will not proceed due to the developer's perception that the conditions are too onerous. If the development does proceed it will require detailed planning permissions prior to development commencing. Development will certainly not commence during the coming year and it is therefore proposed to report further in the progress report in 2005 if necessary.

Little Paxton Mill.

An application for residential development on 9 hectares of land in Little Paxton was supported by an Environmental Impact Assessment, which included air quality considerations. Dust emissions during construction are to be controlled by best practice and resulting changes in traffic movements are predicted to have a slight positive impact on air quality.

3.4 South Cambridgeshire District Council

New Part A Processes

No new Part A processes have been authorised during 2003 since the last Updating and Screening Assessment (USA).

New Part B Processes

No new Part B processes have been authorised during 2003 since the last Updating and Screening Assessment (USA).

New Retail Developments

No relevant retail developments have been permitted since the USA.

New Road Schemes

Construction has started of the Caxton by-pass on the A1198 at Caxton and permission has been granted for the by-pass on the same route at Papworth Everard. This will improve air quality within the villages of Caxton and Papworth Everard.

Consultation on the A14 Improvement – Environmental Scoping Report has just been received by this Council and officers are considering the air quality impacts in detail.

New Mineral Developments

There have been no relevant mineral developments within the District in 2003.

New Landfill Developments

There have been no relevant landfill developments within the District in 2003.

Mixed Use Development

The Northern Fringe of Cambridge has been granted planning approval for a mixed use development comprising residential, business and a school at the Arbury Camp. Although this site is adjacent to the A14 north of Cambridge detailed modelling showed that the relevant pollutants were expected to remain within the objectives at this site.

4.0 Action Plans

Of the District Councils who have contributed to this report only Fenland District Council have an existing AQMA. Fenland District Council will report on progress with their action plan within their AQMAs in a separate document.

5.0 Local Air Quality Strategy

The Air Quality Working Group (partnership of the five district councils and the county council) has started to develop a strategy for improving and maintaining air quality. Although not a statutory requirement the Group is aware that increased traffic growth and future population growth planned for the County, particularly in the Cambridge sub-region together with the outcomes of Review and Assessment processes may make it necessary to declare Air Quality Management Areas for one or more pollutants. It is also aware that assumptions about improved vehicle technology leading to a drop in emissions over the coming years were optimistic as vehicle use continues to rise across the county.

The Air Quality Strategy will provide a guide for each district to develop its own actions. It will include

1. Information on the air quality and relevant policies of each District;
2. Analysis of all measures and mechanisms for improving air quality enabling districts to mix and match solutions applicable to their own locality and problems;
3. Process details for selecting suitable projects, which involves all stakeholders and represents best value.
4. Anticipated timescales for implementation.

Implementation of this strategy will lead to a finite number of acceptable, cost-effective and well-defined projects which will bring about improvement or mitigation of rising air pollution levels across Cambridgeshire.

6.0 Planning and Policies

The Cambridgeshire and Peterborough Structure Plan was adopted by Cambridgeshire County Council in the autumn 2003. This identifies the scale and distribution of development required up to 2016. The scale of housing growth required is significantly greater than that experienced in recent years with most growth being concentrated in the Cambridge sub-region. The most significant growth locations identified are around Cambridge City and are for a new settlement in South Cambridgeshire District. These developments are still at the early planning stages.

Policy P7/8 in the Plan relates directly to air quality and requires new development to be located and designed to minimise and where possible avoid air, land and water pollution. It also states that Local Planning Authorities should resist proposals that will adversely affect air quality in Air Quality Management Areas. The supporting text states that “where new development is likely to put air quality objectives at risk it will be expected to incorporate measures which reduce the need to travel and minimise the use of private cars.”

7.0 Local Transport Plan and Strategies

The second Local Transport Plan (LTP) for Cambridgeshire was produced in July 2003, setting out its objectives, strategy and programmes for transport from 2004 to 2011. The vision is for a transport system which, *inter alia*, reduces congestion and encourages a healthier and more

sustainable Cambridgeshire. Its objectives include protecting and enhancing the built and natural environment. The Plan recognises that there is a need to minimise impacts on the environment and that sensitive design and promoting sustainable forms of transport will help achieve this.

The LTP strategy sets out a plan of action which aims to deliver its objectives using two main tools – widening choice for transport users and managing demand. As the county is so diverse, three different strategy areas have been identified – transport corridors, urban areas and their hinterlands, and rural areas. Many of the improvements planned for these areas will help to improve air quality. These include:

Figure 43 – Potential Air Quality Strategy Measures.

Transport area	Widening choice	Managing Demand
Transport corridors	• New Park & Ride sites & rural interchanges • Huntingdon to Cambridge Guided Bus	• Reducing traffic along corridors through Market Town Strategies • Speed reduction • Tackling congestion at worst bottlenecks
Urban areas	• Improved interchange facilities • Enhance cycle & pedestrian routes	• Traffic calming • Speed reduction measures • Reallocation of road space • Parking policies to restrict parking through fiscal or physical regimes • Restriction of unnecessary traffic in historic towns
Rural areas	• Improved facilities & services connecting to transport corridors	• Traffic calming

The LTP contains 10 major schemes (costing more than £5 million). These include the new bypasses, the Guided Bus, Chesterton Station, link and access roads. Apart from the Guided Bus reports on implementing these are included in each district section of this report.

Cambridgeshire Guided Bus

Cambridgeshire County Council applied for the legal powers to build the Guided Bus Scheme under the Transport and Works Act in February 2004. This Scheme is intended to provide a high quality public transport system between Huntingdon and Cambridge. The Environmental Statement submitted with the application contains an assessment of air quality.