



COTSWOLD
DISTRICT COUNCIL

2010 Air Quality Progress Report for

Cotswold District Council

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

Date: July 2010

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Executive Summary

This Progress report for 2010 is the next stage of round 4 Review and Assessment for reporting on air quality required of local authorities. It considers Technical Guidance (LAQM.TG (09)) issued by Defra and the Devolved Administrations.

Cotswold District Council has maintained 22 diffusion tube monitoring sites for nitrogen dioxide across the district. Fourteen sites are representative of relevant exposure and relate to emissions from traffic, one is a background site. Additional diffusion tubes were introduced for a detailed assessment in Thames Street Lechlade as identified in the 2009 Updating and Screening report. Tubes also are co-located with the continuous analyser within the Air Quality Management Area (AQMA), declared in April 2008 for an area around the Air Balloon Roundabout junction Birdlip. All tubes are monitoring emissions related to traffic.

Continuous automatic monitoring for nitrogen dioxide is being undertaken within the AQMA the data will be used for the Further Assessment to be submitted in 2010 and the Council is currently working on an Air Quality Action Plan for this AQMA.

The conclusion from this Progress Report is that there are no new areas within Cotswold District Council that require a detailed assessment to be carried out; one site in Fairford will however be closely monitored.

The Council will submit a Further Assessment and Action Plan for the AQMA at The Air Balloon Roundabout Birdlip and Detailed Assessment in 2010 for Thames Street, Lechlade.

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1 Introduction

1.1 Description of Local Authority Area

Cotswold District Council is predominantly a rural area, geographically the largest of the Gloucestershire local authorities and crossed by three main traffic routes:

- A419/A417, which is a trunk road crossing from northwest to southeast;
- A429 southwest to northeast; and
- A40 which crosses the district west to east.

These roads mainly pass through countryside, bypassing most of the main towns, apart from the A429 that passes through the outskirts of Stow-on-the-Wold and Moreton-in-Marsh. Large portions of the District are classified as an area of outstanding natural beauty.

There are no industrial areas within the district or close by that make a significant impact on air quality. The industries within the district that emit any of the prescribed pollutants are not located close to relevant public exposure. The scale on which they operate does not produce emissions that contribute significantly to the air quality.

1.2 Purpose of Progress Report

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to Local Air Quality Management (LAQM) in **England** are set out in the Air Quality (England) Regulations 2000 (SI 928), and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043). They are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (for carbon monoxide the units used are milligrammes per cubic metre, mg/m^3). Table 1.1. includes the number of permitted exceedences in any given year (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles (PM₁₀) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Cotswold District Council has submitted the required reports to the satisfaction of Defra. Round 1 and Round 2 of Review and Assessment did not identify any air quality issues. The following table summarises the outcome of Round 3 Review and Assessment.

Table 1.2 : Summary of Previous Review and Assessment

Report Submitted	Outcome
Updating and Screening 2006	Diffusion tube monitoring carried out for NO ₂ and Benzene. No new issues identified. Monitoring continued for NO ₂ at the Air Balloon roundabout junction of the A417 at Birdlip in relation to potential exceedance identified.
Detailed Assessment 2007 for nitrogen dioxide (NO ₂) at A417 junction	Automatic monitoring undertaken of NO ₂ and dispersion modelling carried out at Birdlip confirmed need to declare AQMA.
Progress Report 2007	No new issues. Monitoring for NO ₂ continued with no changes.
Declaration of Local Air Quality Management Area April 2008	Exceedance of nitrogen dioxide related to road traffic emissions. Long term level from modelling 52.2µg/m ³ annual mean this exceeds the Air Quality Objective of 40µg/m ³ as annual mean. This is a major trunk route with a high number of HGV's where there are residential properties close by. See Figure 1. Further Assessment will be submitted 2010 and Action Plan will be also be submitted in 2010.
Round 4 Updating and Screening 2009	Monitoring of NO ₂ continued across the district. Continuous monitoring using a chemiluminescence analyser is positioned within the Air Quality Management area at Birdlip. A Further Assessment is being prepared and will be submitted 2010 for this site and an Action Plan prepared. Detailed Assessment being undertaken for Thames Street Lechlade, as identified in this Updating and Screening Report in relation to nitrogen dioxide from vehicle emissions; this report will be submitted in 2010. The area is a narrow congested street with slow moving traffic. The bias adjusted mean was 43.4µg/m ³ for 2008

Figure 1 Map of AQMA Boundaries



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Automatic monitoring is being carried out for nitrogen dioxide using a chemiluminescence analyser within the AQMA at Birdlip. This monitoring commenced in January 2009. The results of this will be used for the Further Assessment report.

The analyser was installed and commissioned by the supplier. Routine calibrations are undertaken in keeping with QA/QC controls; calibration checks are undertaken least every 4 weeks. These checks are carried out by Cotswold District Council officers in accordance with the supplier's procedures. Calibration checks include replacing the filter and running checks using supplied gases at known concentrations. The supplier services the analyser at six-month intervals. Fifteen months of monitoring have now been carried out. Diffusion tubes were co-located with the analyser.

Data

The raw data from the analyser is collected by modem and uploaded to the Enviro-technology services website. www.airqualitydata.com/cgi-bin/sites.cgi?1006

The raw data is ratified using the calibration data downloading the data to an excel spreadsheet template. Where the data has been short term it has been adjusted using guidance in TG(09) (section 2.2.1 below)

Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	Monitoring Technique	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Air Balloon Roundabout A417 Junction	Roadside	X393439	Y216093	NO ₂	Chemiluminescence	Y	Y(<1m)	8.3m	Y

Non-Automatic Monitoring

Cotswold District Council has maintained twenty-two sites for monitoring nitrogen dioxide by diffusion tubes. All sites relate to emissions from traffic and are sited where there is relevant public exposure, in accordance with guidance in TG (09). Details of the sites are given below, see table 2.2.

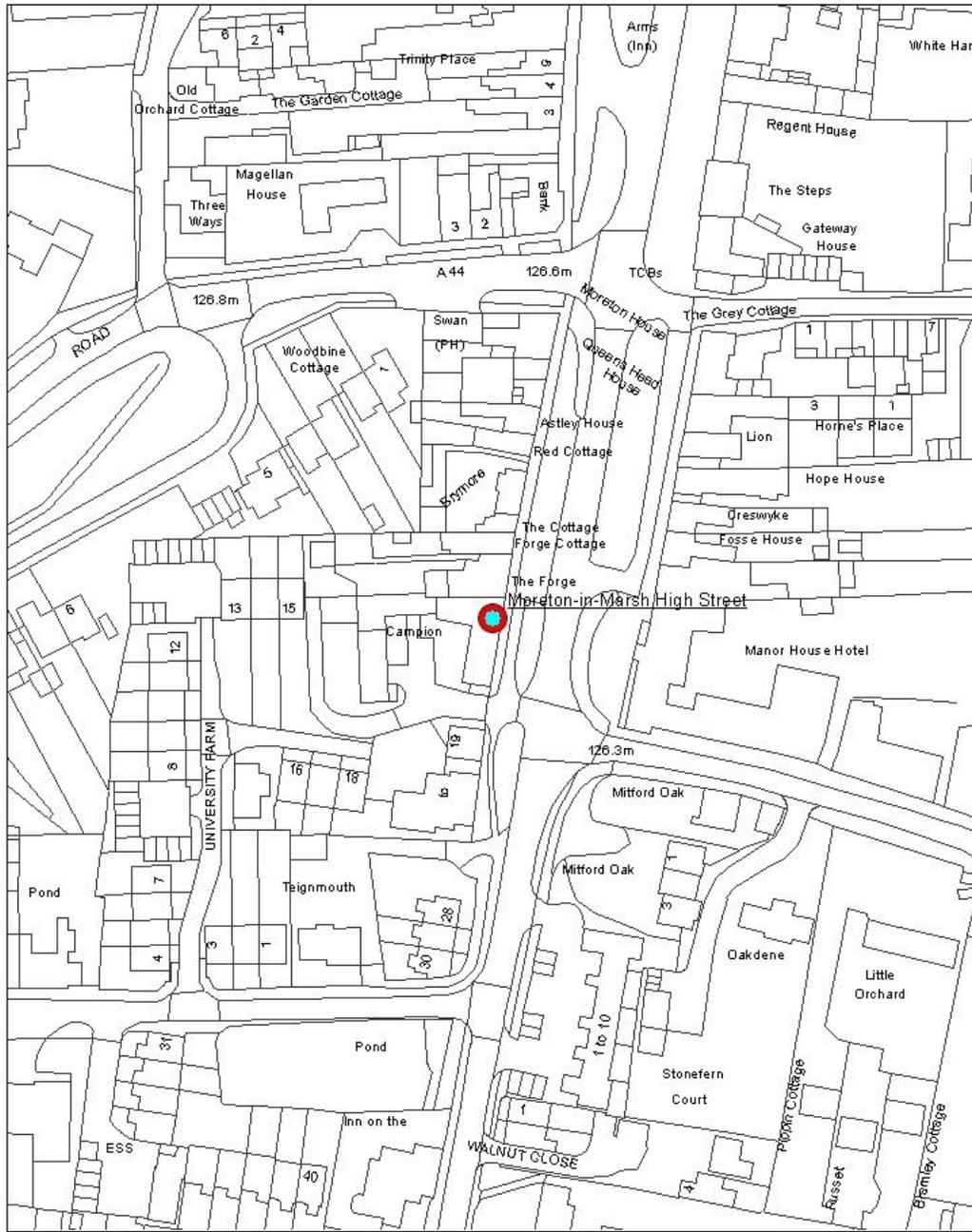
The diffusion tubes are supplied and analysed by Bristol Scientific Services. Details of their QA/QC and results of laboratory precision and Workplace Analysis Scheme for Proficiency (WASP) and are given in appendix A

Table 2.2 Details of Non- Automatic Monitoring Sites

Site Name	ID	Site Type	OS Grid Ref x	y	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Moreton-in-Marsh - High St	1	Roadside	420428	232254	NO2	N	Y (1m)	3m	Y
Stow-in-the Wold - Fosseyway Cottage	2	Roadside	419079	226054	NO2	N	Y (1m)	3m	N
Todenham Road (background site)	3	Roadside	422611	234046	NO2	N	Y	8m	y
Lechlade - Thames Street	4	Kerbside	421378	199506	NO2	N	Y	0.5m	y
Lechlade - Thames Street 2	5	Kerbside	421359	199404	NO2	N	Y(<1m)	0.5m	Y
Lechlade – High Street	6	Kerbside	421367	199532	NO2	N	Y(<1m)	0.5m	Y
Fairford - London Rd	7	Kerbside	415378	200949	NO2	N	Y (<1m)	<1m	Y
Fairford - Bridge St	8	Kerbside	415167	201004	NO2	N	Y (1m)	1m	Y
Cirencester - Castle Street	9	Kerbside	402222	202010	NO2	N	y(1m)	1m	y
Cirencester - London Rd (Wagon/Horses)	10	Kerbside	402735	201962	NO2	N	y (<1m)	<1m	y
Cirencester- Dollar Street	11	Kerbside	402159	202290	NO2	N	y(2m)	1m	y
Cirencester - Victoria Road	12	Roadside	402779	201667	NO2	N	y(2m)	2m	y
Tetbury - Long Street	13	Kerbside	389007	193197	NO2	Y	y(1m)	1m	y
Tetbury - Church St	14	Kerbside	389034	193110	NO2	N	y(1m)	1m	y
Birdlip Air Balloon	15	Kerbside	393446	216118	NO2	N	y(1m)	1m	y
Birdlip - Air Balloon 1	16	Kerbside	393459	216124	NO2	y	y(1m)	4m	y
Birdlip - Air Balloon 2	17	Kerbside	393459	216124	NO2	y	y(1m)	4m	y
Birdlip - Air Balloon 3	18	Kerbside	393459	216124	NO2	y	y(1m)	4m	y
Birdlip - Air Balloon, beer garden A	19	Kerbside	393476	216109	NO2	y	y(1m)	14m	y
Birdlip - Air Balloon, beer garden B	20	Kerbside	393459	216091	NO2	y	y(5m)	1m	y
Birdlip - Air Balloon, beer garden C	21	Kerbside	393424	216059	NO2	y	y22m	22m	y
Stow Lodge	22	Kerbside	403943	202961	NO2	N	y(5m)	0.5m	n

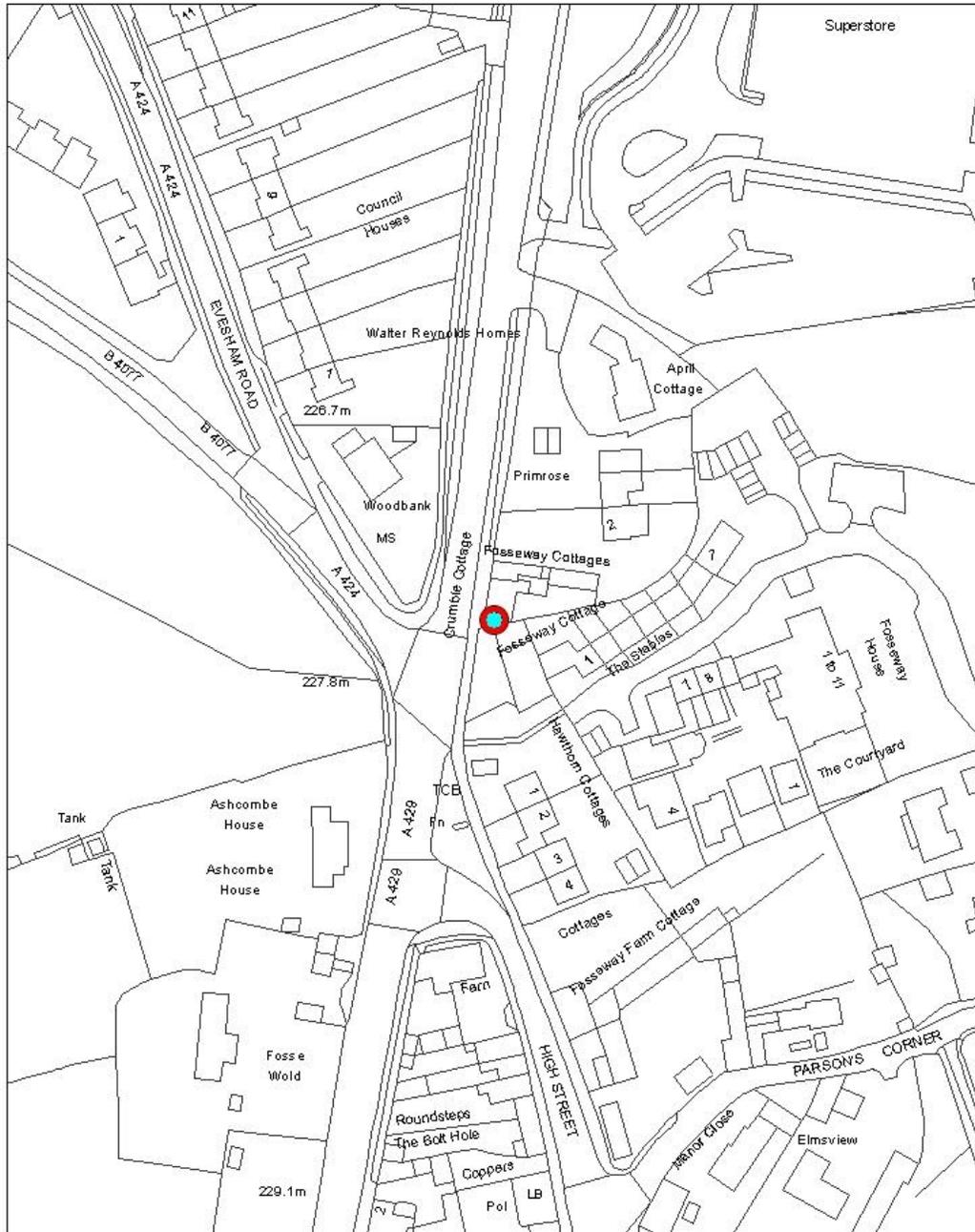
Figure 2.2 Map(s) of Non-Automatic Monitoring Sites

Site ID: 1 Moreton in Marsh



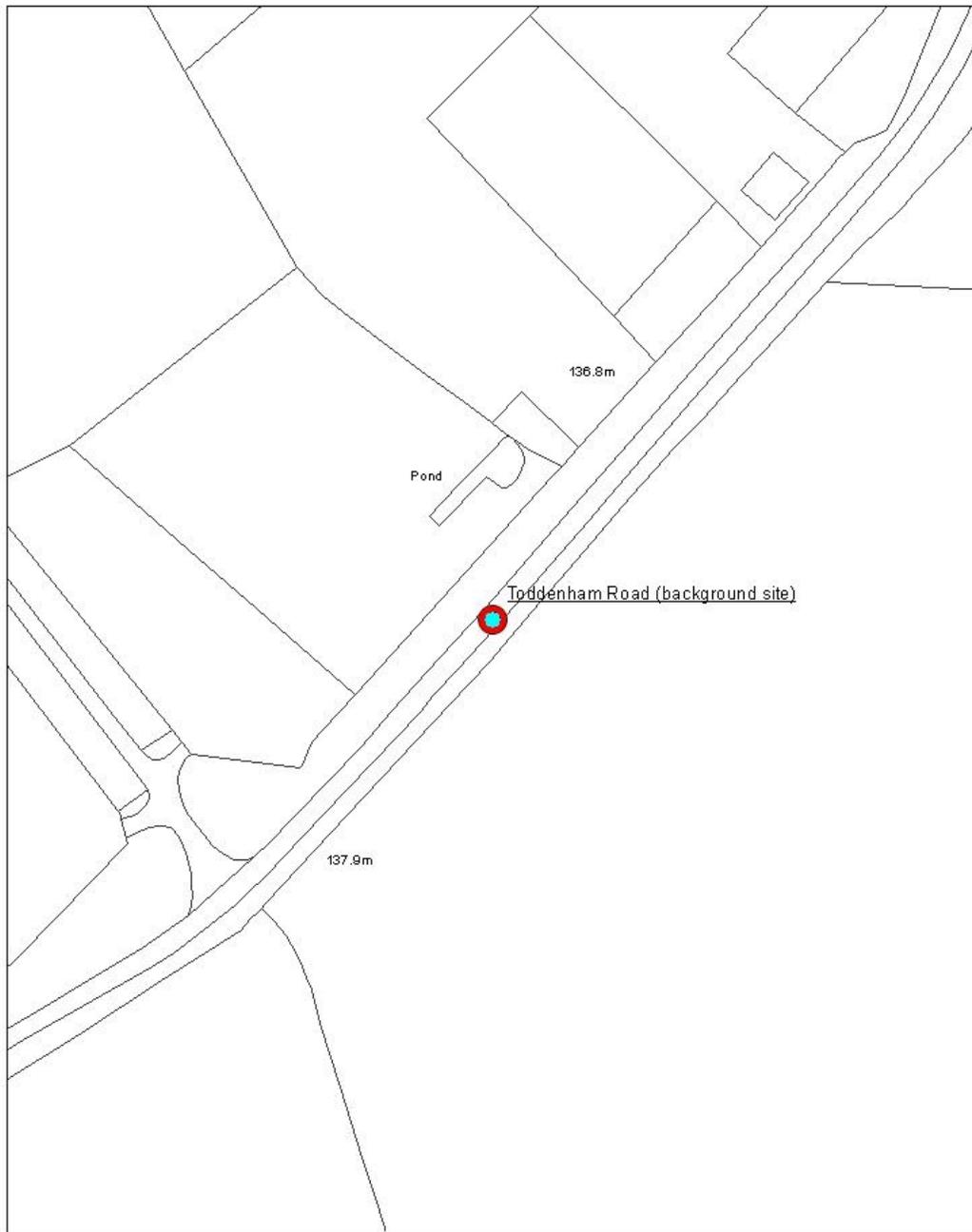
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Site ID: 2 Stow in the Wold – Fosseway Cottage

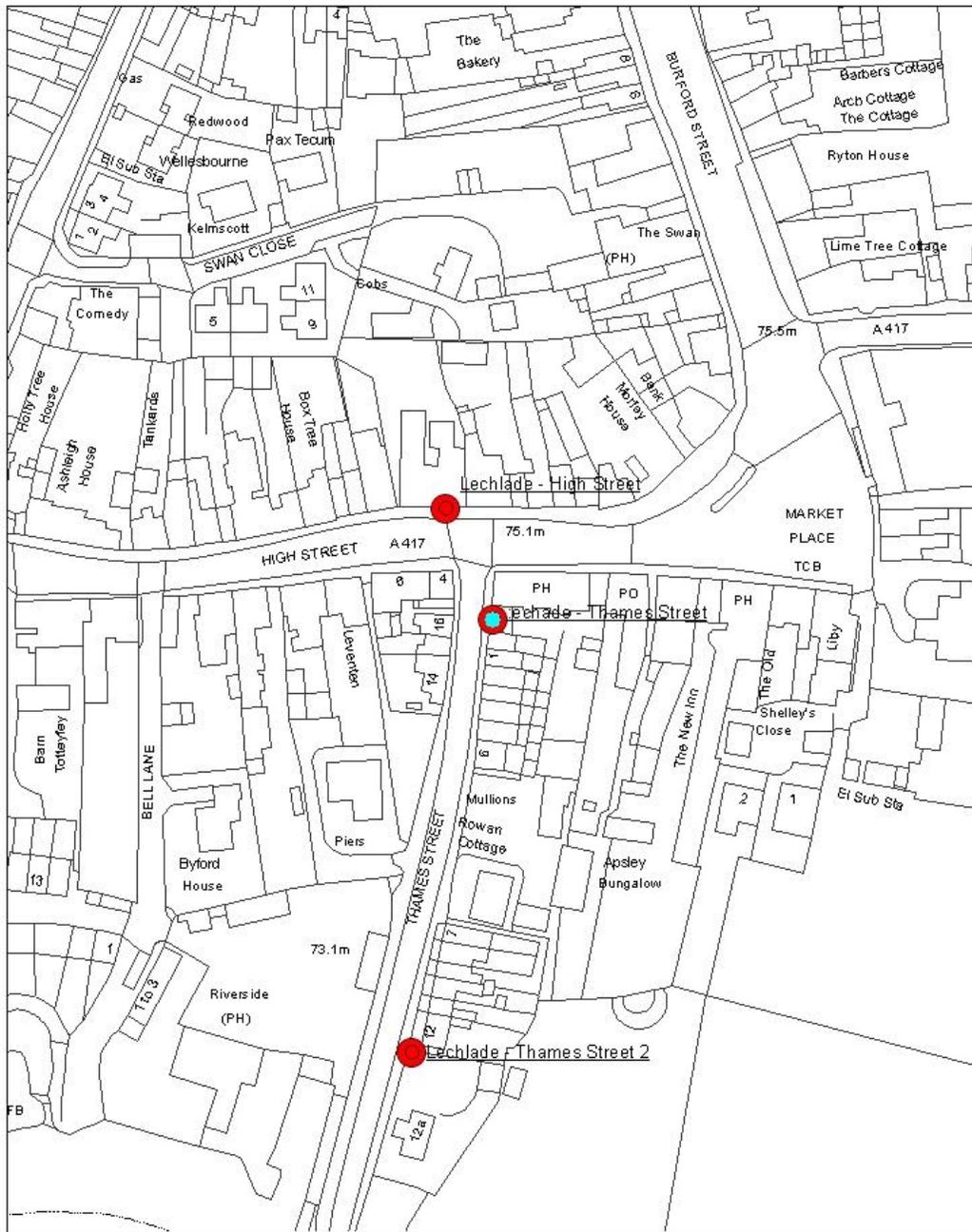


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Site ID: 3 Todenham Road (Background)

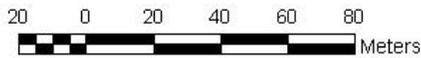
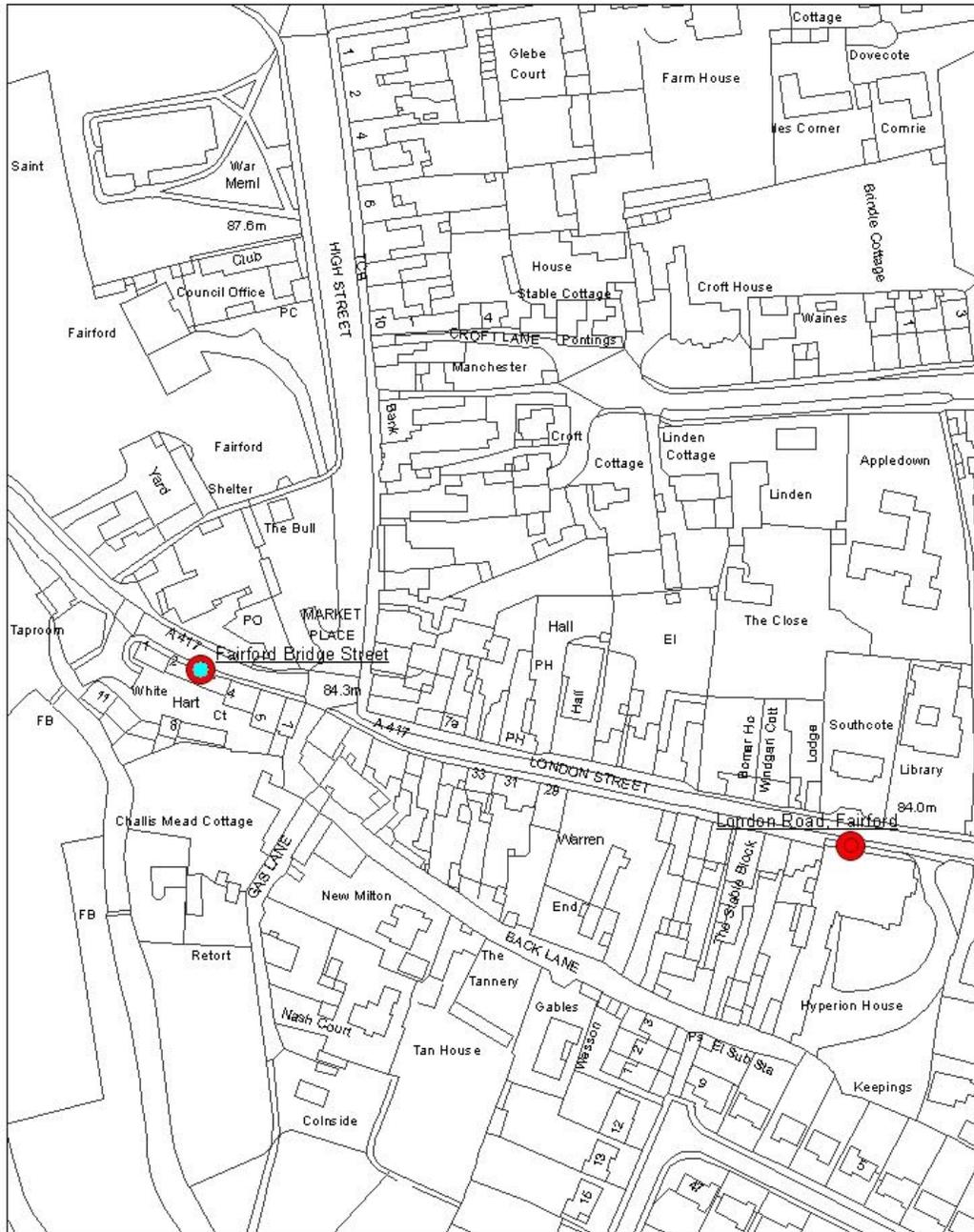


Site ID: 4, 5, 6 Lechlade



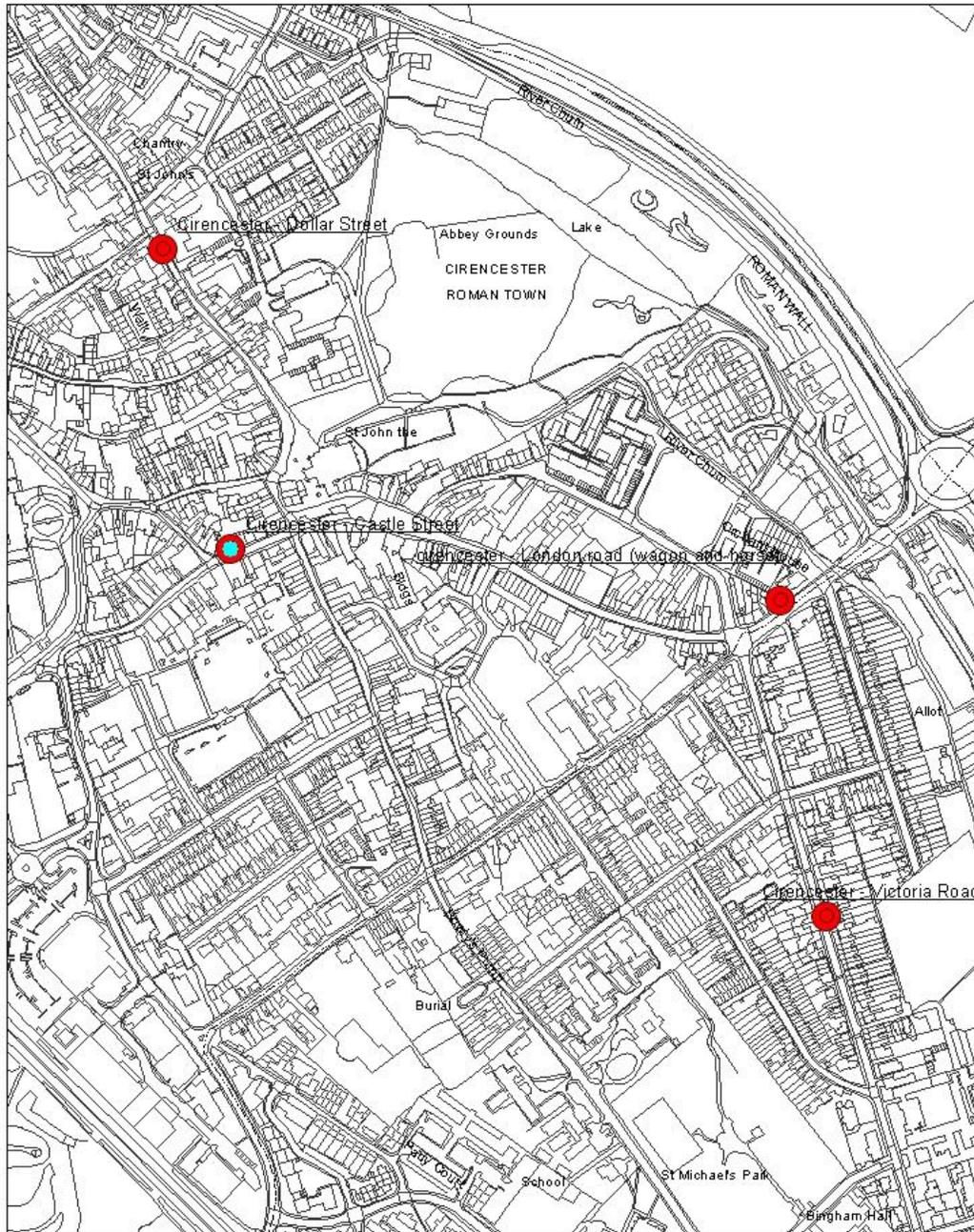
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Site ID: 7, 8 Fairford



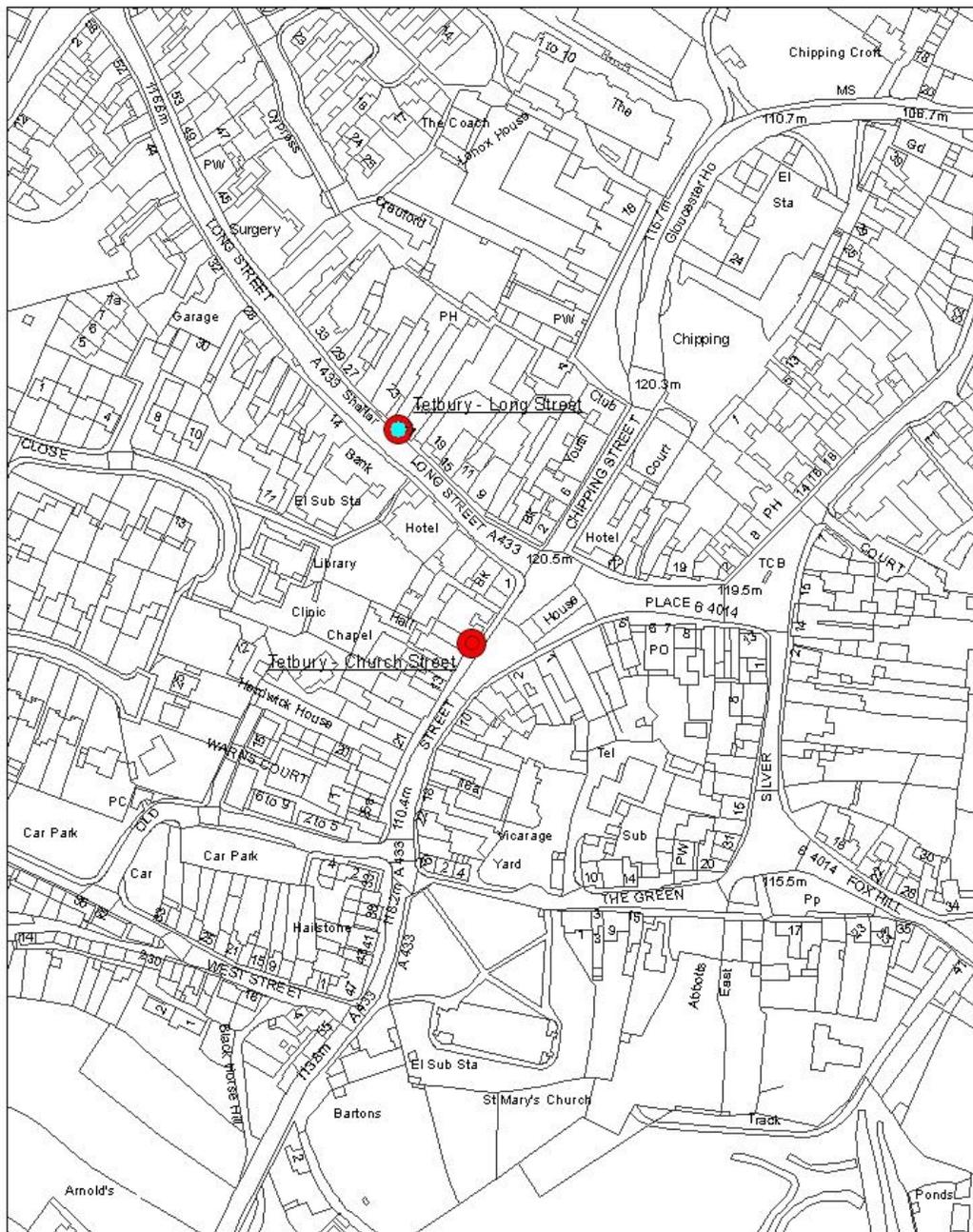
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Site ID: 9,10,11,12 Cirencester



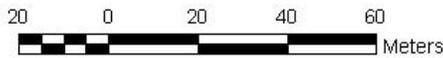
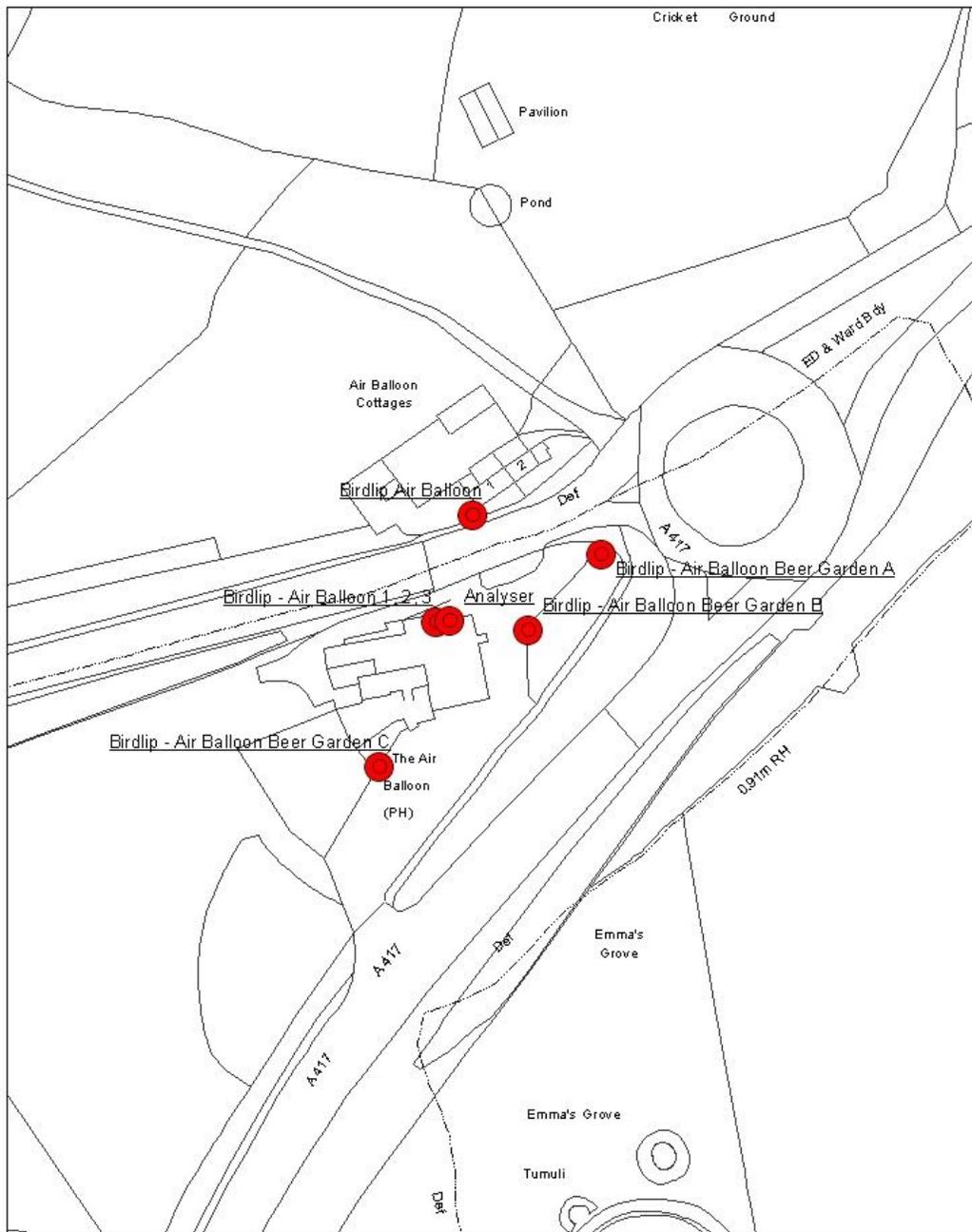
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Site ID: 13, 14 Tetbury



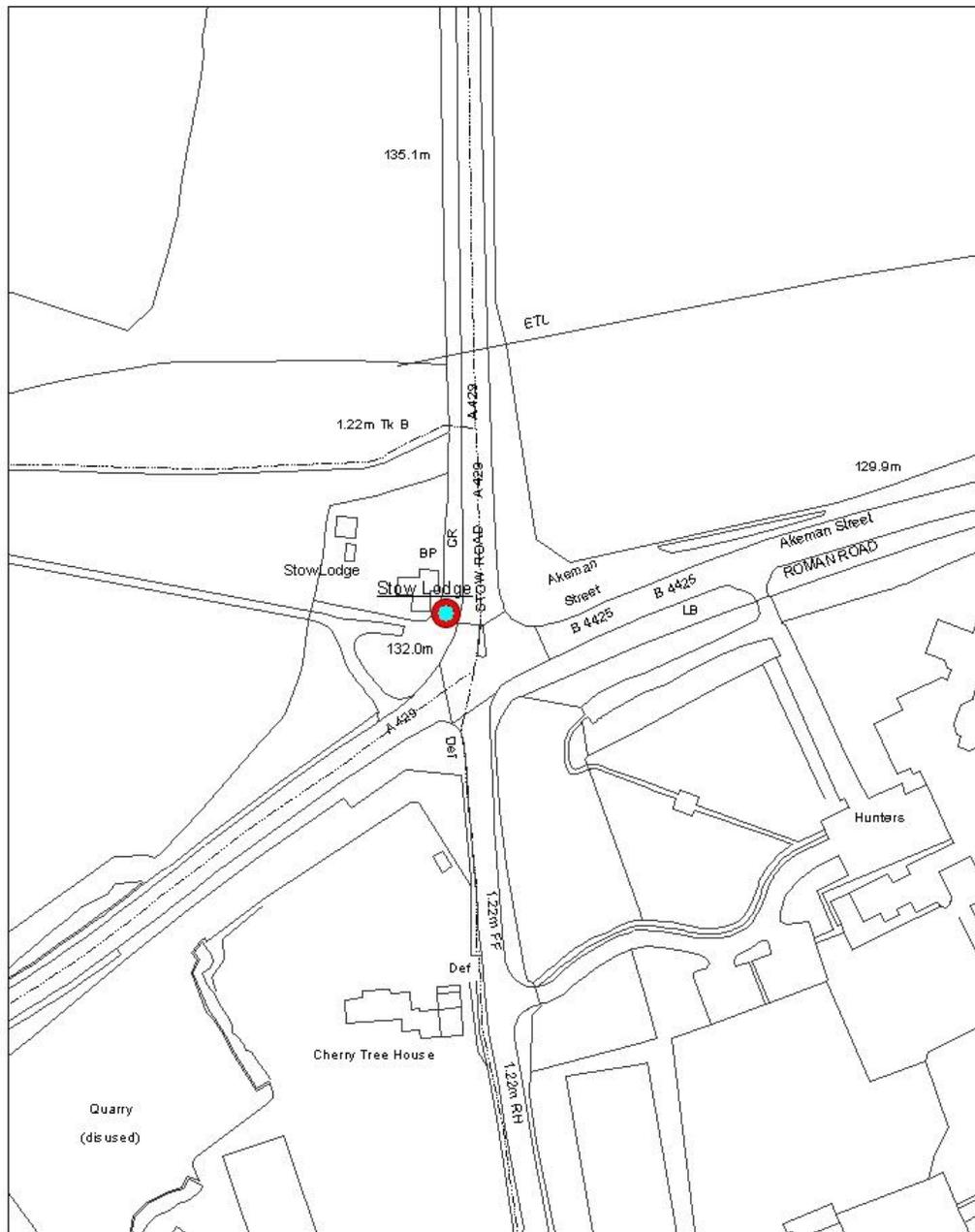
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Site ID: 15,16,17,18,19,29,21 and analyzer, Air Balloon Birdlip



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Site ID: 22 Stow Lodge



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Cotswold District Council carried out monitoring of NO₂ using both diffusion tubes at 22 locations in 2009 and a chemiluminescence analyzer sited within the LAMQA.

NO₂ Diffusion Tubes:

The diffusion tubes (20% TEA in water) are supplied and analysed by Bristol Scientific Services. The tubes at all locations through out the Cotswold District Council area have a monthly exposure period. The bias adjustment factor calculated from the bias adjustment spreadsheet was 0.77 (version (04/08)). Further details of the tube locations, bias adjustment factor used, and results can be found in Appendix 1 and 2.

Automatic Monitoring Data

Cotswold District Council maintains one automatic monitoring site that has been operational since January 2009. The chemiluminescence analyser is situated within the LAQMA at the Air Balloon roundabout Birdlip. Some of the data capture was unreliable with missing data therefore only nine months of data is being used and the figures adjusted for short term data capture.

Adjustment for short term monitoring

The annual mean has been adjusted in accordance with guidance from TG(09): this estimation uses data from long term automatic background sites to adjust the data:

Long-term site	Annual Mean 2009 (Am)	Period Mean 2009 (Pm)	Ratio (Am/Pm)
Charlton Makrell	9.0	9.5	0.95213
Harwell	10.0	10.4	0.95409
Leominster	11.6	11.8	0.98582
		Average R _A	0.96401

Adjusted annual mean for site (s):

s measured mean **M** x **R_A** = **53.58 X 0.96401** = **51.65mg/m³** annualised mean

Site ID	Location	Within AQMA?	Data Capture for monitoring period ^a %	Capture for full calendar year 2009 ^b %	(µg/m ³)		
					2007	2008	2009 ^c
	Air Balloon	y	75	100	n/a	n/a	51.65

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

^c Means "annualised" as in Box 3.2 of TG(09), monitoring was not carried out for the full year.

2.2.1 Nitrogen Dioxide

Table 2.3 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Site ID	Location	Within AQMA?	Data Capture for monitoring period ^a %	Data Capture for full calendar year 2009 ^b %	Number of Exceedences of hourly mean (200 µg/m ³)		
					2007 ^c	2008 ^c	2009
	Air Balloon	y	75	100	n/a	n/a	0

There was no exceedence of the hourly mean in 2009.

Diffusion Tube Monitoring Data

The annual mean results are shown in table 2.4 below. Where there was short term data capture the figures have been adjusted in accordance with guidance in TG (09) The figures have been bias adjusted in accordance with the guidance.

Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes

		Within AQMA?	Data Capture for monitoring period ^a	Data Capture for full calendar year	Annual mean concentrations (mg/m ³)		
			%	2009 ^b			
				%	2007 ^d	2008 ^d	2009 ^c
1	Moreton-in-Marsh - High St	N	75	75	26.6	30.5	27.31
2	Stow-in-the Wold - Fosseyway Cottage	N	83	100	34	36.2	34.68
3	Todenham Road (background site)	N	100	100	10.8	12.2	10.36
4	Lechlade - Thames Street	N	100	100	39.5	43.4	42.52
5	Thames Street 2	N	100	25	n/a	n/a	38.50
6	Lechlade High Street	N	100	25	n/a	n/a	42.77
7	Fairford - London Rd	N	83	100	26	38.8	41.38
8	Fairford - Bridge St	N	83	100	32.3	33.1	33.80
9	Cirencester - Castle Street	N	92	100	29.8	35.2	25.03
10	Cirencester - London Rd (Wagon/Horses)	N	100	100	31.9	35.2	36.75
11	Cirencester- Dollar Street	N	92	100	23.2	24.5	24.17
12	Cirencester - Victoria Road	N	100	75	19.7	22.1	18.74
13	Tetbury - Long Street	Y	100	100	29.8	32.5	33.81
14	Tetbury - Church St	N	100	100	32.1	37	34.98
15	Birdlip Air Balloon	N	100	100	54.3	68.1	71.02
22	Stow Lodge	n	100	100	29.2	34.1	35.85

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

^c “annualised” data - in Box 3.2 of TG(09),

2.2.2 PM₁₀

Cotswold District Council does not carry out any PM10 monitoring. The Council's Updating and Screening Assessment 2009 did not identify any issues with this pollutant.

2.2.3 Sulphur Dioxide

Cotswold District Council does not carry out any sulphur dioxide monitoring. The Council's Updating and Screening Assessment 2009 did not identify any issues with this pollutant.

2.2.4 Benzene

Screening Assessment 2009 did not identify any issues with this pollutant.

2.2.5 Other pollutants monitored

No other pollutants are monitored in Cotswold District Council's area.

2.2.6 Summary of Compliance with AQS Objectives

Cotswold District Council has examined the results from monitoring in the district. Concentrations outside of the AQMA are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

However, one site (site ID 7 Fairford) will be closely monitored as the annualised result is close to the national objective. [41.38]

3 New Local Developments

Cotswold District Council confirms that there are no new or newly identified local developments, which may have an impact on air quality within the Local Authority area.

4 Local / Regional Air Quality Strategy

A County-wide Air Quality Strategy for Gloucestershire was developed by the six local authorities in Gloucestershire under the Gloucestershire Pollution Group; which includes Cotswold District Council; together with the County and the University of the West of England's Air Quality Research Group (AQMRC). This document was adopted by the council and published in 2004. This document is currently being reviewed and updated and will be published later this year. The main objectives of the county strategy included:

- Working toward maintaining the national air quality objectives.
- Continue working towards reducing ozone concentrations.
- Comply with the LAQM timetable regarding the submission of reports.
- Provide a framework for designating, revoking and amending AQMAs within Gloucester and for developing AQAPs.
- Review and seek to improve the key structures and mechanisms in place regionally to deliver air quality improvements.
- Ensure that air quality is a key objective in all future LTPs.
- Review and reduce the main constraints to improving air quality.
- Reduce air pollution inline with the underlying principles of the European Ambient Air Quality Framework Directive (96/62/EC).
- Maintain good air quality and prevent the deterioration of air quality.
- Reduce emissions of CO₂ emitted by road transport.
- Consider subsequent reviews of the Strategy in conjunction with annual reviews of the LTP.

This document is available on the council's website:

http://www.cotswold.gov.uk/media/documents/Environmental%20protection/Gloucestershire_Air_Quality_Strategy_.pdf

5 Air Quality Planning Policies

There is no Supplementary Planning Guidance (SPG) to address air quality matters currently available to the District, although the authority has made use of the SPG on Planning and Air Quality produced by the Bristol, Gloucestershire and Somerset (BG&S) Environment Protection Committee in 2001.

6 Local Transport Plans and Strategies

Gloucestershire County Council has recently published the draft 3rd Local Transport Plan (LTP3) for 2011-26. The LTP3 recognises the need to work with district authorities over air quality issues related to traffic, particularly where there exists LAQMAs. In the Cotswold's district the area of the AQMA at Air Balloon Roundabout is highlighted as it is a major trunk route and an area of high traffic congestion and the plan commits to assisting with the Action Plan for this area.

The plan also seeks to encourage green travel including supporting an increase in railway traffic and other measures development will create and not lead to increased congestion. that will help reduce traffic congestion. Policies are also included to ensure that for any new developments the transport network is developed sufficiently to cope with the increased number of trips that new

7 Climate Change Strategies

Cotswold District Council has identified Lower Carbon Emissions as a council priority as stated in the council's Corporate Strategy. The delivery of this priority is primarily supported by addressing the council's own emissions and domestic emissions.

The council has committed to a 25% reduction in carbon dioxide from its own operations by 2015. The actions required to achieve this reduction are outlined in the Climate Change and Carbon Management Plan and combine a mixture of technical, behavioural and procedural solutions. Alongside this the council has signed up to the national 10:10 campaign to reduce carbon emissions by 10% during 2010.

Warm and Well is the mainstay of the Council's efforts to improve domestic energy efficiency. The scheme offers grants and discounts to provide an incentive for the installation of loft and cavity-wall insulation and heating systems/boilers. It's countywide but also includes South Gloucestershire Council and the Primary Care Trust. The scheme is managed on a daily basis by staff from the Severn Wye Energy Agency (SWEA) who are heavily involved with work in this field.

The annual report provides an excellent summary of scheme performance and shows that 927 properties were improved in the Cotswold District between 2001 and 2008; this produced a CO2 saving of over 5,000 tonnes. The latest figures for 2009/10 stated that 400 properties had so far been improved in the District.

Cotswold District Council is taking part in the Target 2050 Low Carbon Homes project. The aim is to develop 5 exemplar homes in each participating district that will showcase the low carbon improvements that can be made to 'hard to treat homes' (e.g. solid walls, no mains gas). Applications were invited from residents looking to give their homes a low carbon makeover and willing to invest some of their own money and a significant amount of time into demonstrating what can be achieved.

Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

There have been few changes in the sites that have been monitored the increase in numbers of diffusions tubes deployed is in relation to the additional monitoring within the AQMA and the need to undertake further monitoring at Thames Street Lechlade for a Detailed Assessment. This Detailed Assessment was identified in the Updating and Screening Report 2009 and is currently being undertaken.

No new areas of concern have been identified that will at this moment be taken to a Detailed Assessment. However a close watch will be kept at site 7 Bridge Street Fairford where the annualised result is close to the annual mean objective. (41.38 $\mu\text{g}/\text{m}^3$)

5.2 Other Conclusions

The Action Plan for the AQMA is due to be completed in 2010.

A Detailed assessment will be submitted in 2010 for Thames Street Lechlade.

5.3 Proposed Actions

Cotswold District Council will continue to monitor for nitrogen dioxide throughout the district where there is relevant public exposure in accordance with guidance issued.

A Further assessment will be completed for the AQMA at Birdlip.

A Detailed Assessment will be produced for Thames Street Lechlade in respect of nitrogen dioxide.

Cotswold District Council will complete the Action Plan for the Air Balloon Roundabout Birdlip

Cotswold District Council will submit a Progress Report for 2011.

9 References

- Technical Guidance (LAQM.TG (09)) issued by Defra and the Devolved Administrations.
- Gloucestershire Air Quality Strategy 2004
- Gloucestershire County Council Local Transport Plan 3 (draft)

Appendices

Appendix A: QA/QC Data

Appendix B: 2009 Nitrogen dioxide diffusion tube data

Appendix A: QA:QC Data

QA/QC of automatic monitoring

The QA/QC for the automatic monitor meets the requirements as set out in TG (09). Regular calibration of the analyser is undertaken and the analyser is serviced and full checks carried out six monthly.

Where the data collection was missing or considered unreliable the data was annualised using guidance form TG(09)

Diffusion Tube Bias Adjustment Factors

Calculation of the 2009 bias adjustment factor

Cotswold District Council's diffusion tubes are supplied and analysed by Bristol Scientific Services and utilise 20% TEA in water. A national bias adjustment factor has been applied. A bias adjustment factor for 2009 was estimated using the published Bias Adjustment Factors Spreadsheet (v03/10). A factor of 0.84 was estimated from two studies. Although in many cases, using an overall correction factor derived from as many co-location studies as possible will provide the 'best estimate' of the 'true' annual mean concentration, it is important to recognise that there will still be uncertainty associated with this bias adjusted annual mean. One analysis has shown that the uncertainty for tubes bias adjusted in this way is $\pm 20\%$ (at 95% confidence level). This compares with a typical value of $\pm 10\%$ for chemiluminescence monitors subject to appropriate

Where necessary any short term data has been adjusted to determine an annual mean.

QA/QC of diffusion tube monitoring

Cotswold District Council's diffusion tubes are supplied and analysed by Bristol Scientific Services and utilise 20% TEA in water. The tube preparation and subsequent analysis follow the procedures in the harmonised "Practical Guidance" document. The Laboratory participates in the WASP scheme and its performance is classified as good.

Bristol Scientific Services laboratory follows the procedures set out in the Harmonisation Practical Guidance Procedures under the DEFRA practical guidance.

Appendix B

Table of Nitrogen Dioxide Diffusion Tube results for 2009

ID	Site	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Capture	Bias adjusted
														Mean		2009
		µg/m ³	%	µg/m ³												
1	Moreton-in-Marsh - High St	31.7	38.3	31.5	36.3	27.3	35.6	26.6	27.7	37.6	-	-	-	na	75	27.31
2	Stow-in-the-Wold - Fosseway Cottage	-	42.9	42.4	49.0	43.0	38.0	-	38.0	40.3	50.6	25.6	43.0	41.3	83.0	34.68
3	Todenham Road (background site)	16.3	16.8	12.7	10.9	8.9	13.8	7.9	-	11.4	-	-	-	12.3	67	10.36
4	Lechlade - Thames Street	37.7	49.6	41.5	58.2	44.3	54.7	52.6	47.2	48.5	55.4	58.9	58.9	50.6	100.0	42.52
5	Lechlade - Thames Street 2	-	-	-	-	-	-	-	-	new site	23.5	57.0	57.0	54.3#	25.0	45.60
6	Lechlade - High St	-	-	-	-	-	-	-	-	new site	47.4	58.9	46.5	55.9#	25.0	46.94
7	Fairford - London Rd	51.2	45.4		32.9	30.3	31.7		35.3	29.4	37.1	46.5	57.6	48.4	83.0	40.68
8	Fairford - Bridge St	59.7	49.7	40.4	52.2	36.4	47.9	48.3	-	-	51.6	57.6	48.7	39.7#	83.0	41.41
9	Cirencester - Castle Street	47.1	48.7	41.8	45.8	37.0	45.2	31.0	25.7	32.6	39.1	48.7	-	40.2	92.0	33.35
10	Cirencester - London Rd (Wagon/Horses)	43.4	53.5	45.0	48.8	39.1	48.1	38.4	31.2	48.3	-	31.0	51.2	43.4	92.0	36.49
11	Cirencester- Dollar Street	-	36.4	31.4	29.2	21.4	25.4	21.8	19.3	19.0	47.1	27.8	37.7	28.8	92.0	24.17
12	Cirencester - Victoria Road	34.7	32.4	21.8	27.1	17.4	18.3	16.4	15.8	17.0	-	-	-	22.3	75.0	18.74
13	Tetbury - Long Street	44.4	47.1	41.0	39.8	32.0	37.1	36.7	33.3	29.3	48.5	37.9	56.1	40.3	100.0	33.81
14	Tetbury - Church St	39.1	55.7	36.0	40.5	37.7	41.9	42.5	34.7	43.3	40.8	36.4	51.0	41.6	100.0	34.98
15	Birdlip - Air Balloon	78.4	101.7	84.9	76.3	75.7	77.8	123.1	83.1	72.1	77.7	85.1	78.6	84.5	100.0	71.02
16	Birdlip - Air Balloon 1	50.5	48.9	51.4	67.7	47.2	71.6	49.3	39.6	50.0	59.2	41.0	51.0	52.3	100.0	43.92
17	Birdlip - Air Balloon 2	55.6	55.6	54.0	71.7	51.3	71.7	49.2	40.5	50.2	65.6	37.5	48.7	54.3	100.0	45.61
18	Birdlip - Air Balloon 3	56.7	51.4	51.5	70.7	49.6	68.0	49.7	41.9	48.9	69.6	33.6	57.0	54.0	100.0	45.39
19	Birdlip - Air Balloon, beer garden A	57.6	53.2	56.1	66.7	53.7	63.9		41.3	42.0	58.1	44.7	61.8	54.5	92.0	45.76
20	Birdlip - Air Balloon, beer garden B	45.1	32.5	33.5	44.9	39.0	43.5	27.8	24.8	34.1	37.4	32.2	39.9	36.2	100.0	30.43
21	Birdlip - Air Balloon, beer garden C	42.2	40.6	40.6	42.9	32.9	43.5	31.5	30.4	33.4	40.1	31.4	41.7	37.6	100.0	31.58
22	Stow Lodge	49.3	43.6	39.2	40.4	42.4	43.7	43.0	38.1	38.4	42.7	41.8	49.5	42.7	100.0	35.85

Data adjusted for short term missing data