CHELTENHAM
BOROUGH COUNCIL

2013 Air Quality Progress Report for Cheltenham Borough Council

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

May 2013

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Executive Summary

This Progress Report summarises the results from air quality monitoring that Cheltenham Borough Council has completed during 2012. It also provides details of progress with developing an air quality action plan, together with further assessment that has occurred within Cheltenham's designated Air Quality Management Area (AQMA) where elevated nitrogen dioxide levels are still being observed.

Since April 2009, Cheltenham Borough Council has monitored air quality for only one air pollutant - Nitrogen Dioxide (NO_2). The main source of NO_2 in Cheltenham is from vehicle emissions and seems to be a particular problem in narrow 'corridor' streets where stationary or slow moving traffic occurs. All other air quality pollutants that can be assessed under our Local Air Quality Management obligations, such as sulphur dioxide and PM_{10}, have been assessed during previous monitoring periods and were found to be within national objective limits.

A new AQMA was declared in November 2011 which covers the whole Borough due to identification of a number of separate locations that exceeded the annual mean national objective for NO_2 during 2010. Monitoring data for 2011 and 2012 continues to justify declaration of the AQMA.

An Air Quality Action Plan is being developed although progress with this has been slower than expected. A number of proposed measures are to be consulted upon in July with a view to implementation of agreed measures from 2013 onwards.

A roadside monitoring unit was installed on St Georges Street in August 2011 to measure NO_2 in real-time using an approved chemi-luminescence reference method. The data is ratified and reports are produced to provide information on roadside levels of NO_2 and to compare results with nearby diffusion tube monitoring results. In 2012, a triplicate diffusion tube co-location study commenced at the roadside unit. Results indicate very good correlation between roadside and co-located diffusion tube readings. The co-location data was used to calculate a local Bias Adjustment Factor for 2012 diffusion tube data.

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1 Introduction

1.1 Description of Local Authority Area

Cheltenham Borough Council is situated in central Gloucestershire. It is bordered by Tewkesbury Borough Council and Cotswold District Council (Figure 1). Cheltenham Borough Council has a population of approximately 111,700 and lies some five kilometres to the east of the M5 motorway mid-way between Bristol and Birmingham on the edge of the Cotswold Hills.

The Borough is based on the town of Cheltenham and is mainly urban with some areas of surrounding countryside. It covers an area of approximately 4,680 hectares of which 17 percent is designated as green belt and 22 percent as an area of outstanding natural beauty

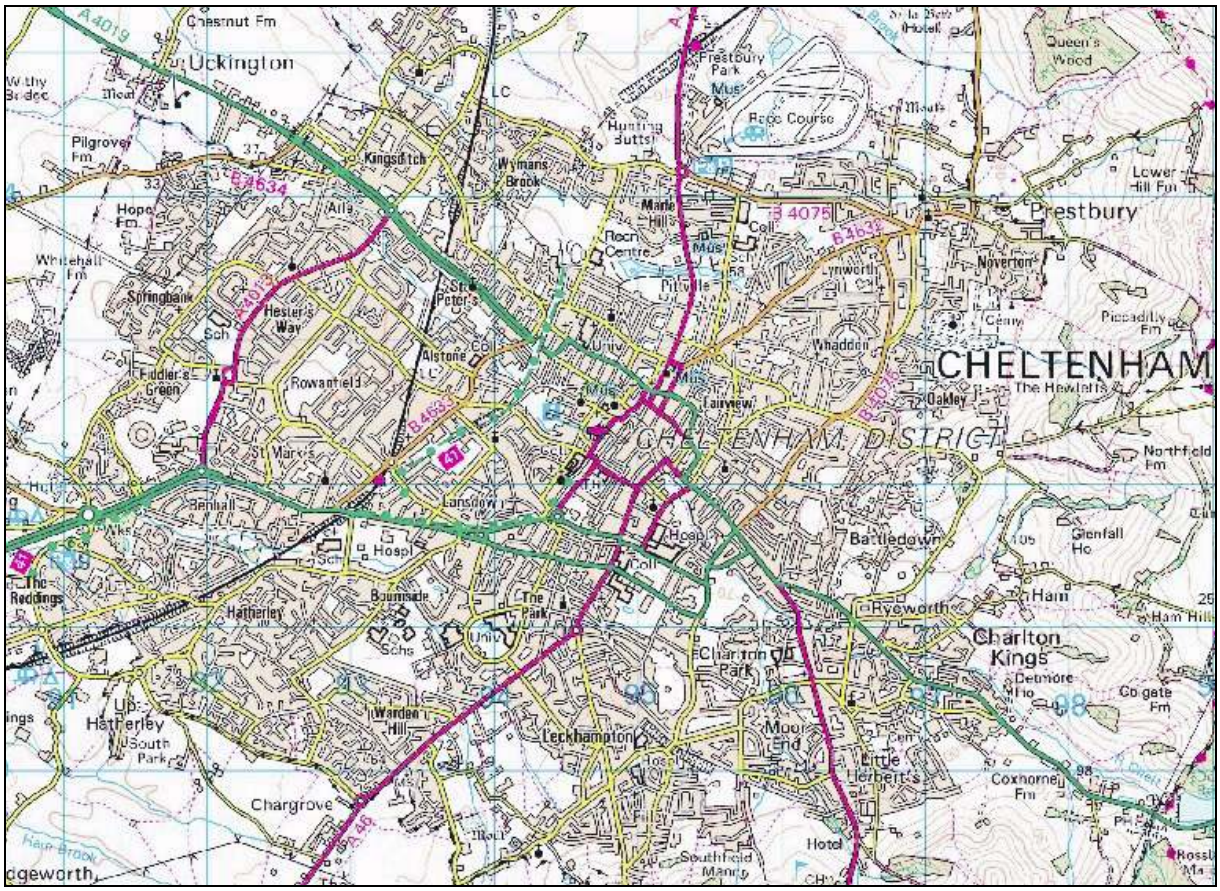


Figure 1. 1 Map of Cheltenham Borough Council area

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

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 LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre μg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1. 1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m^3	Running annual mean	31.12.2003
	5.00 µg/m^3	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10}) (gravimetric)	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m^3	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/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

In recent years Cheltenham Borough Council has submitted the following reports:

- 2007: Detailed Assessment of Bath Road for Nitrogen Dioxide
- 2008: Progress Report
- 2009: Updating and Screening Assessment
- 2010: Progress Report
- 2011: Progress Report
- 2011: Detailed Assessment
- 2012: Updating and Screening Assessment

A Detailed Assessment was completed for Bath Road and High Street in 2007 where an exceedance of the annual mean objective for NO_2 occurred with relevant exposure. In December 2008 an Air Quality Management Area (AQMA) was declared along a section of Bath Road and High Street in Cheltenham. The area was designated in relation to a likely breach of the nitrogen dioxide (annual mean) objective as specified in the Air Quality Regulations (England) 2000.

The Updating and Screening Assessment for 2009 did not identify any new sources of pollution with the exception of a new biomass burner which was granted planning permission at the University of Gloucestershire. An air pollution screening assessment will be carried out if the system goes ahead to determine whether or not a detailed assessment may be necessary. At present the system has been shelved and no timescales have been submitted.

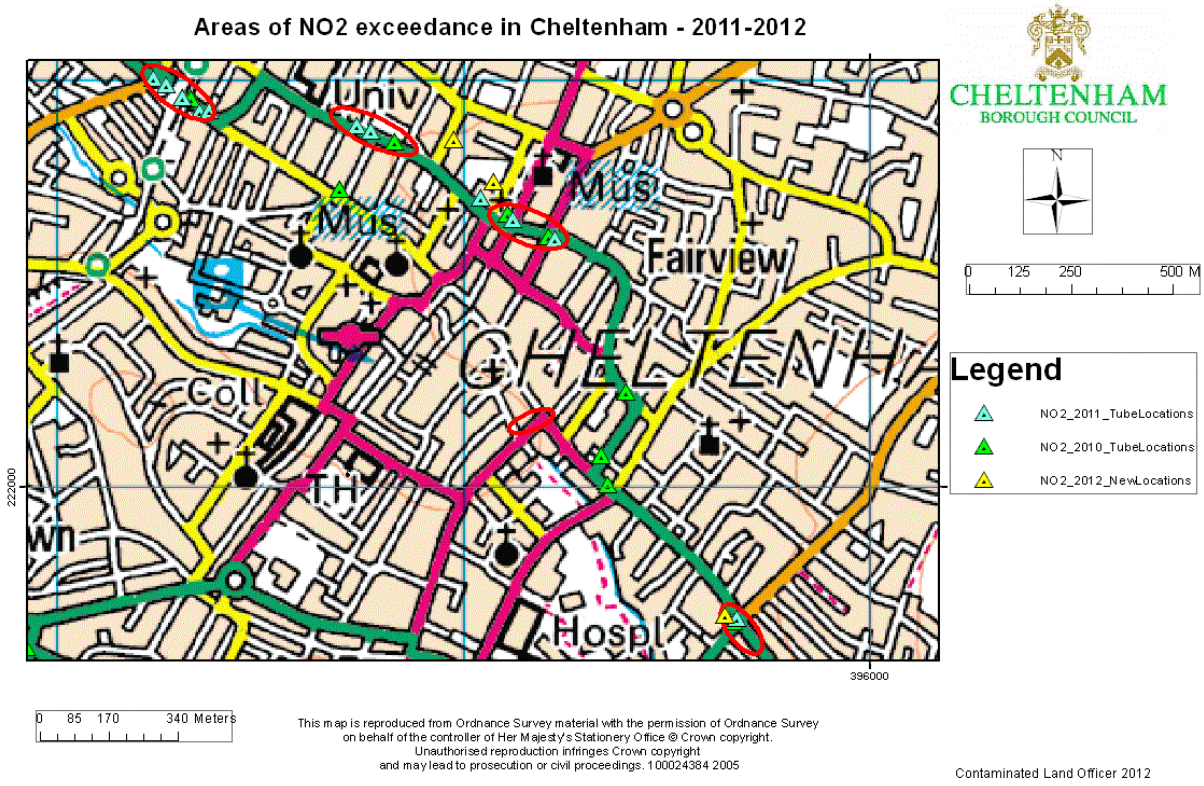
The 2010 Progress Report identified a number of new locations in Cheltenham which had exceeded the annual mean objective for NO_2. Following submission of a detailed assessment report in 2011, the existing AQMA was revoked and a new AQMA covering the whole of Cheltenham Borough was declared in relation to a likely breach of the nitrogen dioxide (annual mean) objective at a total of seven locations, including the old AQMA area.

During 2011 and 2012, the number of locations in Cheltenham that breached the annual mean objective for NO_2 reduced to five, however the AQMA designation remained justified as a result of the continued breaches at these locations.

No other pollutants are monitored in Cheltenham since previous rounds of review and assessment demonstrated that no breaches were likely.

Figure 1. 2 Map of AQMA Boundary

Figure 1. 3 Locations of NO2 exceedance in Cheltenham identified in 2011



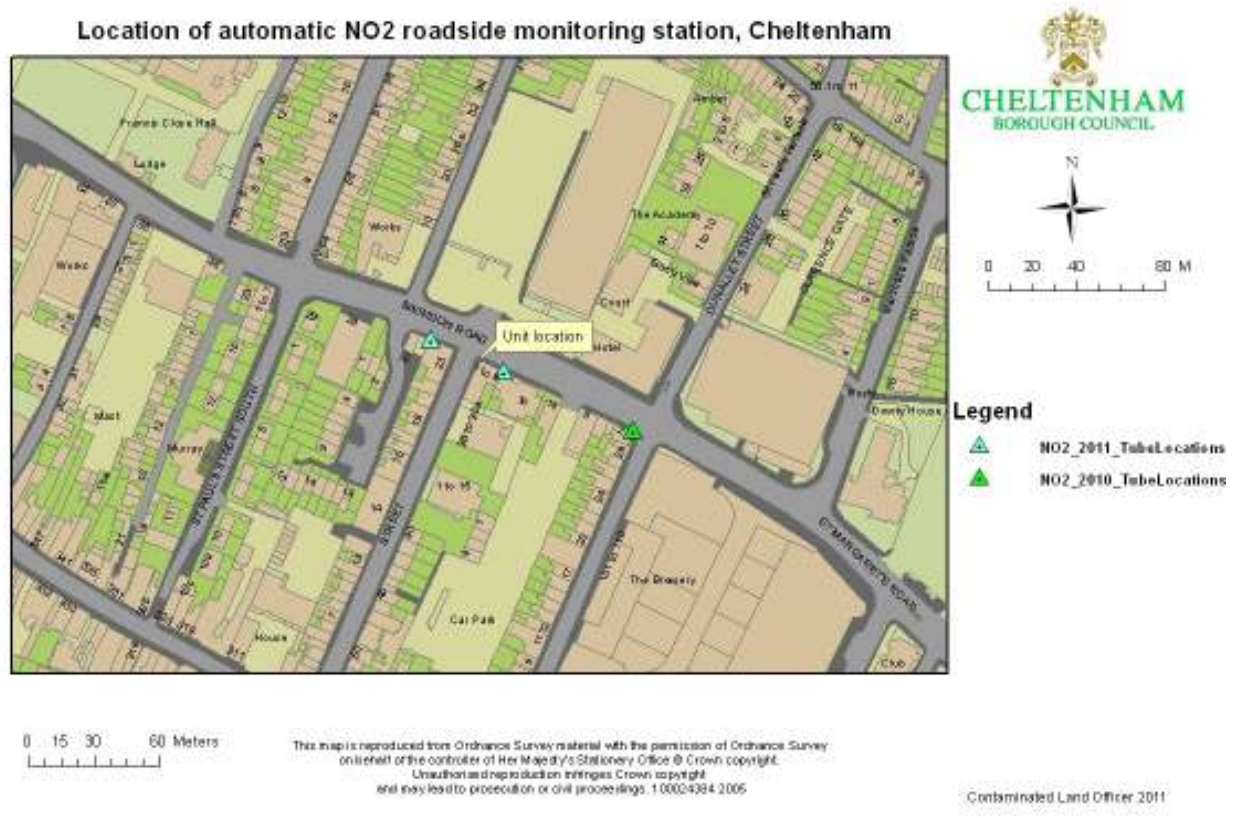
2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

A new roadside monitoring unit was installed at the junction of Swindon Road and St Georges Street, Cheltenham where exceedance of nitrogen dioxide (annual mean) had been recorded nearby from 2010 diffusion tube monitoring data. The unit measures NOx, NO_2 and NO and commenced operation in August 2011. Data is sent via telemetry to Enviro Technology limited and forwarded to AQDM for data validation and ratification purposes. Monthly routine calibration and maintenance is carried out by the equipment supplier, Enviro Technology Limited. The equipment is currently hired until January 2014 after which it may be removed unless further funding can be obtained to continue operation.

Figure 2. 1 Map of Automatic Monitoring Sites



Location of automatic NO2 roadside monitoring station, Cheltenham - detailed plan

Table 2. 1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	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?
St Georges Street	Kerbside	394760	228878	1.5m	NO_2	Y	Chemi-luminescence	Y (1m)	2m	Y

2.1.2 Non-Automatic Monitoring Sites

Cheltenham Borough Council has been undertaking NO_2 diffusion tube monitoring at a number of locations since 2003. Many of the monitoring locations have been consistently below the annual mean objective. Following a review at the beginning of 2010, several locations were replaced with new locations where there is relevant exposure and traffic congestion. Further monitoring tubes were installed in 2011 following exceedances of the nitrogen dioxide (annual mean) national objective levels at several new locations within the Borough with relevant exposure. At the beginning of 2012, a few further monitoring locations were installed to allow urban background measurement and a co-location study commenced at the automatic monitoring station in April 2012.

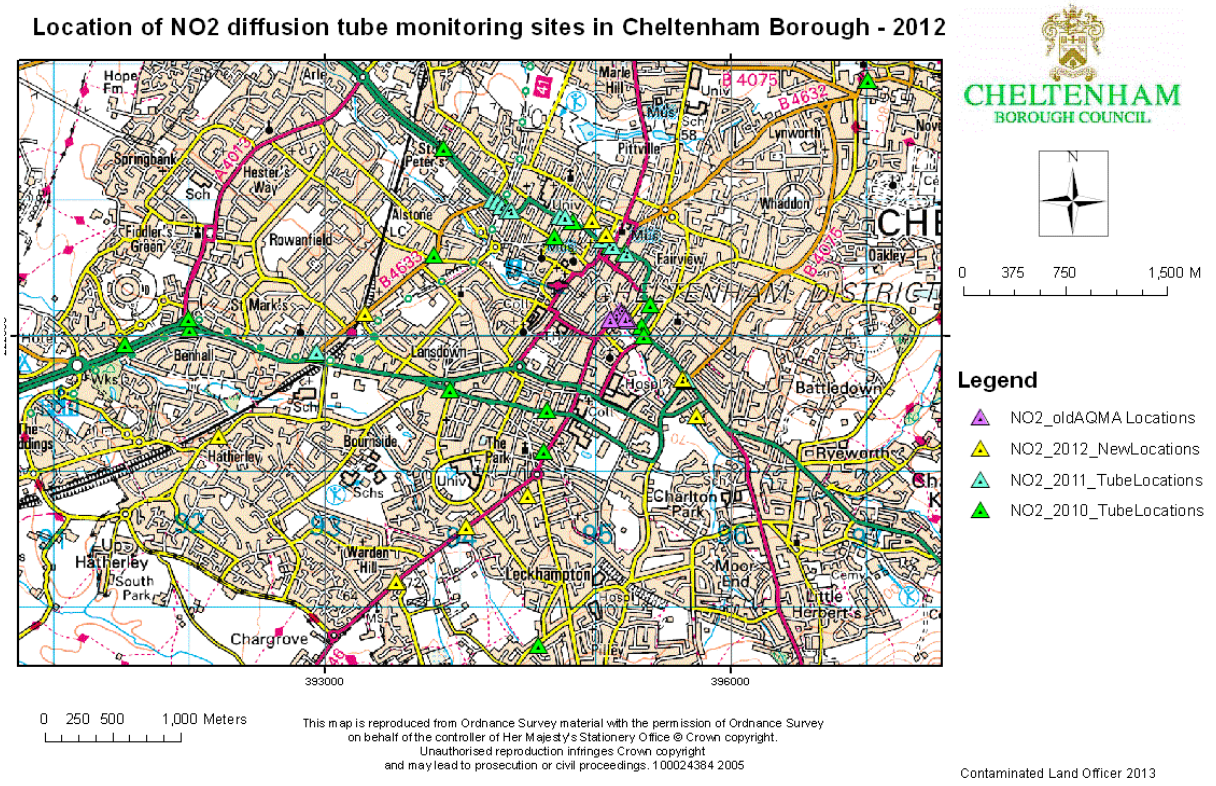
Figure 2.2 illustrates the approximate locations of all of the 2012 diffusion tube monitoring sites within Cheltenham Borough. Further following maps indicate these locations more precisely. Table 2.2 provides details of these locations.

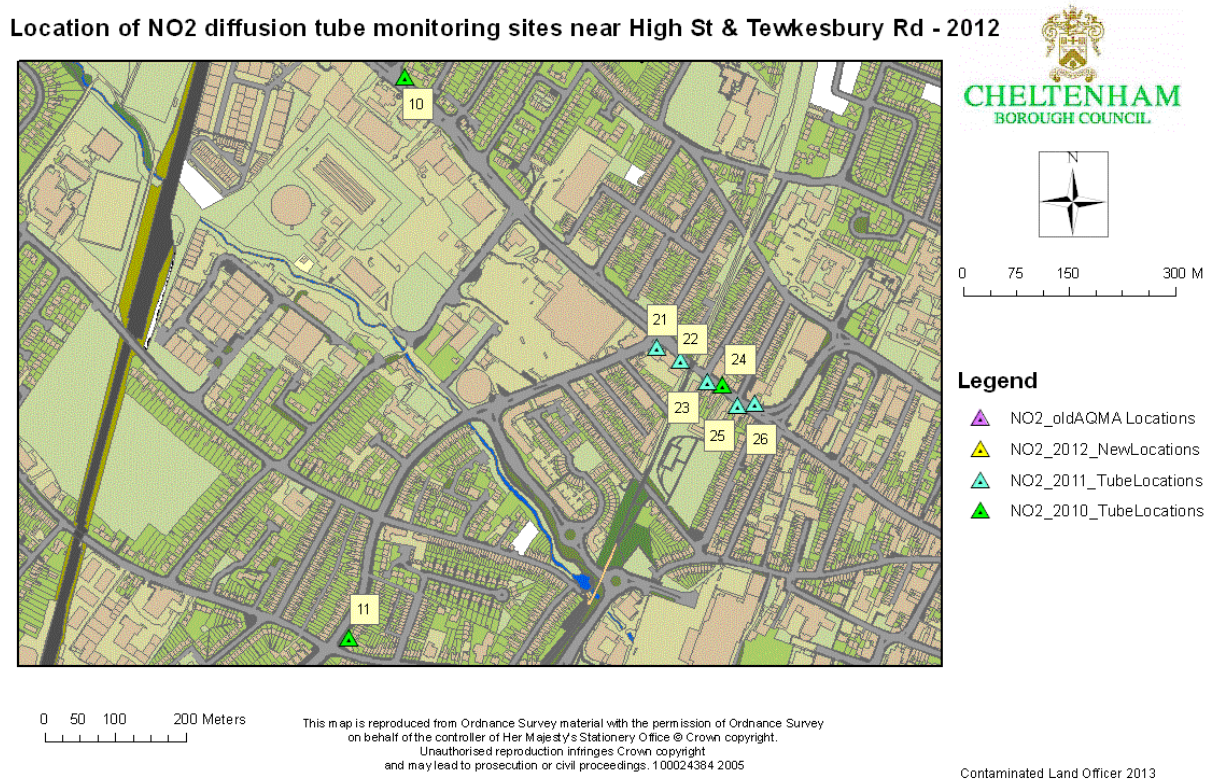
Details of Bias Adjustment

Nitrogen dioxide diffusion tubes used by Cheltenham Borough Council in 2012 were 20% TEA in water supplied and analysed by Gradko International Limited. It can be confirmed that the laboratory follows the procedures set out in the Harmonisation Practical Guidance Procedures under the DEFRA practical guidance. It also participates in the Workplace Analysis Scheme for Proficiency (WASP) scheme. This is an independent analytical proficiency-testing (PT) scheme, operated by the Health and Safety Laboratory (HSL). The results from the WASP scheme for this laboratory during 2012 indicate that 100% of the results submitted were deemed to be satisfactory. See Appendix 1 for QA/QC data for diffusion tube monitoring.

The tubes at all 46 locations throughout the Cheltenham Borough Council area have a monthly exposure period. For 2012 the Bias Adjustment factor applied to the diffusion tube data was a Local Bias Adjustment Factor obtained from the co-location diffusion tube study located at the St Georges Street roadside monitoring unit. The bias adjustment value for 2012 was 0.99.

Figure 2. 2 Maps of Non-Automatic Monitoring Sites





Location of NO2 diffusion tube monitoring sites near Swindon Rd & Fairview Rd - 2012

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N

0 37.5 75 150 M

Legend

- NO2_oldAQMA Locations
- NO2_2012_NewLocations
- NO2_2011_TubeLocations
- NO2_2010_TubeLocations

0 25 50 100 Meters

Contaminated Land Officer 2013

Location of NO2 diffusion tube monitoring sites near Leckhampton - 2012

CHELTENHAM BOROUGH COUNCIL

N

0 125 250 500 M

Legend

- NO2_oldAQMA Locations
- NO2_2012_NewLocations
- NO2_2011_TubeLocations
- NO2_2010_TubeLocations

0 85 170 340 Meters

Contaminated Land Officer 2013

Location of NO2 diffusion tube monitoring sites near Gloucester Road - 2012

CHELTENHAM BOROUGH COUNCIL

N

0 125 250 500 M

Legend

- NO2_oldAQMA Locations
- NO2_2012_NewLocations
- NO2_2011_TubeLocations
- NO2_2010_TubeLocations

0 87.5 175 350 Meters

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Location of NO2 diffusion tube monitoring sites near High St & Bath Rd - 2012

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N

0 37.5 75 150 M

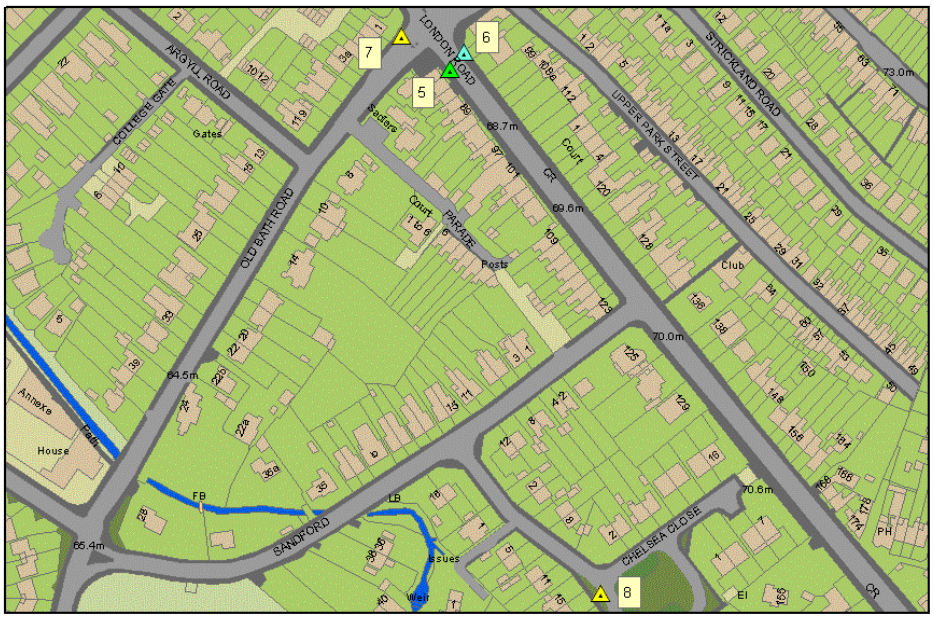
Legend

- NO2_oldAQMA Locations
- NO2_2012_NewLocations
- NO2_2011_TubeLocations
- NO2_2010_TubeLocations

0 25 50 100 Meters

Contaminated Land Officer 2013

Location of NO2 diffusion tube monitoring sites near London Road - 2012



CHELTENHAM BOROUGH COUNCIL

N

0 25 50 100 M

Legend

- NO2_oldAQMA Locations
- NO2_2012_NewLocations
- NO2_2011_TubeLocations
- NO2_2010_TubeLocations

0 15 30 60 Meters

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Location of NO2 diffusion tube monitoring sites at Westal Green and Suffolk Rd - 2012

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N

0 50 100 200 M

Legend

- NO2_oldAQMA Locations
- NO2_2012_NewLocations
- NO2_2011_TubeLocations
- NO2_2010_TubeLocations

0 30 60 120 Meters

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Location of NO2 diffusion tube monitoring site at Prestbury Post Office - 2012

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N

0 25 50 100 M

Legend

- NO2_oldAQMA Locations
- NO2_2012_NewLocations
- NO2_2011_TubeLocations
- NO2_2010_TubeLocations

0 15 30 60 Meters

Contaminated Land Officer 2013

Table 2. 2 Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser?	Relevant Exposure?	Distance to Kerb of Nearest Road (m)	Does this Location Represent Worst-Case Exposure?
1	Westal Green	Roadside	393924	221608	2.8	NO2	Y	N	Y	2m	Y
2	179 Bath Road	Roadside	394614	221153	3.0	NO2	Y	N	Y	2m	Y
3	51 Upper Norwood	Background	394494	220823	2.7	NO2	Y	N	Y	2m	
4	56 Church Road	Roadside	394577	219728	2.8	NO2	Y	N	Y	2m	Y
5	81 London Road	Roadside	395660	221670	2.7	NO2	Y	N	Y	5m	Y
6	104 London Road	Roadside	395672	221680	2.8	NO2	Y	N	Y	2m	Y
7	1 Bath Road	Roadside	395642	221685	3.0	NO2	Y	N	Y	2m	Y
8	17 Chelsea Close	Background	395740	221412	2.8	NO2	Y	N	Y	3m	
9	Prestbury Post Office	Roadside	397009	223888	2.7	NO2	Y	N	Y	2m	Y
10	91Tewkesbury Road	Roadside	393880	223390	2.7	NO2	Y	N	Y	5m	Y
11	124 Gloucester Road	Roadside	393802	222595	2.8	NO2	Y	N	Y	10m	Y
12	264 Gloucester Road	Roadside	393296	222170	3.0	NO2	Y	N	Y	2m	Y
13	338 Gloucester Road	Roadside	392940	221880	3.0	NO2	Y	N	Y	2m	Y
14	340 Gloucester Road	Roadside	392912	221862	2.9	NO2	Y	N	Y	2m	Y
15	Miserden Road	Roadside	391997	222051	2.7	NO2	Y	N	Y	5m	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser?	Relevant Exposure?	Distance to Kerb of Nearest Road (m)	Does this Location Represent Worst-Case Exposure?
16	P.E. Roundabout	Roadside	391996	222133	2.7	NO2	Y	N	Y	15m	Y
17	Telstar Road - GCHQ	Kerbside	391532	221923	2.9	NO2	Y	N	Y	1m	Y
18	233 Hatherley Rd	Roadside	392213	221265	3.0	NO2	Y	N	Y	2m	Y
19	7 Suffolk Road	Roadside	394640	221460	2.8	NO2	Y	N	Y	2m	Y
20	St Georges Street	Kerbside	394695	222733	2.9	NO2	Y	N	Y	2m	Y
21	2 Gloucester Road	Roadside	394235	223055	3.0	NO2	Y	N	Y	2m	Y
22	Opp. White Hart Street	Roadside	394268	222988	3.0	NO2	Y	N	Y	2m	Y
23	452 High Street	Roadside	394305	222960	3.0	NO2	Y	N	Y	2m	Y
24	443 High Street	Roadside	394330	222955	3.0	NO2	Y	N	Y	3m	Y
25	422 High Street	Roadside	394350	222923	3.0	NO2	Y	N	Y	2m	Y
26	Church Hill Court	Roadside	394378	222925	2.9	NO2	Y	N	Y	3m	Y
27	New Rutland - Swindon Rd	Roadside	394738	222888	3.0	NO2	Y	N	Y	2m	Y
28	Saracens Court	Roadside	394771	222874	2.9	NO2	Y	N	Y	2m	Y
29	2 Swindon Road	Kerbside	394830	222845	3.0	NO2	Y	N	Y	1m	Y
30	North Place West	Urbancentre	394975	222855	3.0	NO2	Y	N	N	100m	N
31	5 St Margaret'sTerrace	Roadside	395040	222715	3.0	NO2	Y	N	Y	3m	Y
32	North Place East	Roadside	395073	222750	3.0	NO2	Y	N	N	2m	N

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser?	Relevant Exposure?	Distance to Kerb of Nearest Road (m)	Does this Location Represent Worst-Case Exposure?
33	Portland St/Fairview Rd	Roadside	395110	222670	2.9	NO2	Y	N	Y	2m	Y
34	Millenium Plaza - Fairview	Kerbside	395117	222658	3.0	NO2	Y	N	Y	1m	Y
35	Winchcombe St/Fairview	Roadside	395210	222618	3.1	NO2	Y	N	Y	2m	Y
36	Regency Hall - Fairview	Roadside	395225	222610	3.1	NO2	Y	N	Y	2m	Y
37	7 Berkeley Place	Roadside	395340	222075	3.5	NO2	Y	N	Y	2m	Y
38	1 Hewlett Road	Roadside	395355	222055	2.9	NO2	Y	N	Y	2m	Y
39	The Swan	Roadside	395240	222112	3.0	NO2	Y	N	Y	2m	Y
40	Pisa Pizza	Roadside	395212	222130	3.2	NO2	Y	N	Y	2m	Y
41	The Restoration	Roadside	395202	222160	3.0	NO2	Y	N	Y	2m	Y
42	YMCA Shop	Roadside	395182	222183	3.2	NO2	Y	N	Y	2m	Y
43	Cutting Room	Roadside	395176	222169	3.2	NO2	Y	N	Y	2m	Y
44	8a Bath Road	Roadside	395146	222149	3.1	NO2	Y	N	Y	2m	Y
45	15a Bath Road	Roadside	395097	222124	3.0	NO2	Y	N	Y	2m	Y
46	Co-location – St Georges Street	Roadside	394760	222878	1.4	NO2	Y	Y	Y	2m	Y
47	Co-location – St Georges Street	Roadside	394760	222878	1.4	NO2	Y	Y	Y	2m	Y
48	Co-location – St Georges Street	Roadside	394760	222878	1.4	NO2	Y	Y	Y	2m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

During 2012, Cheltenham Borough Council only carried out monitoring for the air pollutant nitrogen dioxide (NO_2). This was due to the fact that previous rounds of review and assessment had demonstrated that other air pollutants were unlikely to be breached.

Nitrogen Dioxide (NO_2)

During 2012, Cheltenham Borough Council monitored 48 nitrogen dioxide diffusion tube locations across the Borough of which 3 were located at the roadside automatic monitoring instrument on St Georges Road, as a co-location study to obtain a local bias adjustment factor for NO_2. Further nitrogen dioxide monitoring tubes were added to the monitoring network at the beginning of 2012 to obtain urban background data together with data from new locations that previously were not subject to monitoring but where traffic congestion had been reported as a problem and where residential exposure was possible.

Automatic Monitoring Data

In 2011 Cheltenham Borough Council decided that the installation of a roadside monitoring box would be useful to help validate elevated levels of nitrogen dioxide being measured in the area from diffusion tubes. The location of the roadside monitoring box was selected on the basis of relevant exposure being present and proximity to nearby diffusion tube monitoring points where elevated levels of nitrogen dioxide had been recorded. It was also located at a road junction where traffic congestion is a problem.

The data obtained during 2012 indicated an annual mean level slightly below the National Objective limit at 37ug/m^3. The results from the automatic monitoring station are identified in Table 2.3 below. This annual average measurement obtained during 2012 is very similar to the data obtained from the co-location study which yielded a Bias Adjustment Factor of 0.99. The nearby annual mean results at two nearby diffusion tube monitoring locations (Sites 27 and 28) recorded 43.3 ug/m^3 and 41.2 ug/m^3 respectively.

Table 2. 3 Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2012 %	Annual Mean Concentration (µg/m^3)				
					2008	2009	2010	2011* [c]	2012
St Georges Street	Roadside	Y	99.8	99.8	n/a	n/a	n/a	35	37

[c] This mean has been annualised using data from two long-term continuous monitoring sites forming part of the national network (St Paul's in Bristol and St Ebbe's in Oxford).

Table 2. 4 Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2012 %	Number of Hourly Means > 200µg/m^3				
					2008	2009	2010	2011	2012
St Georges Street	Roadside	Y	99.8	99.8	n/a	n/a	n/a	0	0

Please see data report provided by AQDM in Appendix 3

Diffusion Tube Monitoring Data

Additional diffusion tubes were added to the monitoring network in Cheltenham at the beginning of 2012 to enhance coverage in areas where exceedances had been recorded in 2010 and 2011 and also to identify possible new locations where exceedance of the annual mean objective could be occurring where relevant exposure exists. In addition further monitoring locations were selected to obtain Urban Background data and a triplicate co-location study commenced on St Georges Street at the automatic roadside monitoring unit. Detailed location maps of all locations can be seen in Fig 2.2.

Results for 2012 suggest that the significant fall in annual mean levels of NO_2 observed in 2011have not been sustained and levels of NO_2 have remained broadly similar to those levels measured in 2011. The number of areas that are currently exceeding the annual mean objective for NO_2 with relevant exposure is five (with data obtained from 10 diffusion tubes), reduced from the original 7 locations as reported in the Detailed Assessment report of 2011. Those areas exceeding the annual mean objective for NO_2 are indicated in Fig 1.2. and are identified as; High Street/Bath Road, Swindon Road near St Georges Street, High Street near Tewkesbury Road, London Road/Hales Road junction and Fairview Road Winchcombe Street junction. The sites at Gloucester Road and Suffolk Road that were reported as exceeding the annual mean objective in 2011 have continued to indicate NO_2 levels below this objective.

The monitored levels of NO_2 recorded during 2012 continue to justify the declaration of the current AQMA and progression with the development of an Air Quality Action Plan for Cheltenham.

The results for monitoring during 2012 are identified in Table 2.5 below.

Table 2. 5 Results of NO_2 Diffusion Tubes 2012

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (%)	2012 Annual Mean Concentration (µg/m^3) – Bias Adjustment factor = 0.99
1	Westal Green	Roadside	Y	N	100	31.4
2	179 Bath Road	Roadside	Y	N	100	30.8
3	51 Upper Norwood	Background	Y	N	100	18.8
4	56 Church Road	Roadside	Y	N	91.7	22.4
5	81 London Road	Roadside	Y	N	100	**42.5**
6	104 London Road	Roadside	Y	N	91.7	39.0
7	1 Bath Road	Roadside	Y	N	91.7	39.4
8	17 Chelsea Close	Background	Y	N	100	17.0
9	Prestbury Post Office	Roadside	Y	N	91.7	35.5
10	91Tewkesbury Road	Roadside	Y	N	100	31.0
11	124 Gloucester Road	Roadside	Y	N	100	30.5
12	264 Gloucester Road	Roadside	Y	N	100	37.1
13	338 Gloucester Road	Roadside	Y	N	100	37.2
14	340 Gloucester Road	Roadside	Y	N	100	39.6
15	Miserden Road	Roadside	Y	N	100	27.7
16	P.E. Roundabout	Roadside	Y	N	100	28.7

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (%)	2012 Annual Mean Concentration (µg/m^3) – Bias Adjustment factor = 0.99
17	Telstar Road - GCHQ	Kerbside	Y	N	100	35.4
18	233 Hatherley Rd	Roadside	Y	N	100	28.3
19	7 Suffolk Road	Roadside	Y	N	100	31.6
20	St Georges Street	Kerbside	Y	N	100	31.6
21	2 Gloucester Road	Roadside	Y	N	100	35.9
22	Opp. White Hart Street	Roadside	Y	N	100	**44.3**
23	452 High Street	Roadside	Y	N	91.7	**45.1**
24	443 High Street	Roadside	Y	N	100	39.1
25	422 High Street	Roadside	Y	N	100	**49.8**
26	Church Hill Court	Roadside	Y	N	100	30.4
27	New Rutland - Swindon Rd	Roadside	Y	N	100	**43.3**
28	Saracens Court	Roadside	Y	N	100	**41.3**
29	2 Swindon Road	Kerbside	Y	N	100	**40.3**
30	North Place West	Urbancentre	Y	N	91.7	27.8
31	5 St Margaret'sTerrace	Roadside	Y	N	83.3	35.2
32	North Place East	Roadside	Y	N	100	33.0
33	Portland St/Fairview Rd	Roadside	Y	N	100	37.7
34	Millenium Plaza - Fairview	Kerbside	Y	N	100	33.5

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (%)	2012 Annual Mean Concentration (µg/m^3) – Bias Adjustment factor = 0.99
35	Winchcombe St/Fairview	Roadside	Y	N	91.7	37.7
36	Regency Hall - Fairview	Roadside	Y	N	100	**42.0**
37	7 Berkeley Place	Roadside	Y	N	100	31.3
38	1 Hewlett Road	Roadside	Y	N	100	**40.3***
39	The Swan	Roadside	Y	N	100	30.8
40	Pisa Pizza	Roadside	Y	N	100	33.1
41	The Restoration	Roadside	Y	N	100	**40.5**
42	YMCA Shop	Roadside	Y	N	91.7	38.0
43	Cutting Room	Roadside	Y	N	100	37.9
44	8a Bath Road	Roadside	Y	N	100	**42.0**
45	15a Bath Road	Roadside	Y	N	100	35.0
46	Co-location – St Georges Street	Roadside	Y	Y	75	34.5
47	Co-location – St Georges Street	Roadside	Y	Y	75	35.0
48	Co-location – St Georges Street	Roadside	Y	Y	75	34.7

*The monitoring result at this location is not representative of public exposure due to the distance from the nearest property façade (approximately 5m). Utilising the NO_2 fall-off with distance calculator tool and a local background level from a nearby location at Chelsea Close of 17.0ug/m^3, the estimated exposure level at the building façade is 35.3ug/m^3

Table 2. 6 Results of NO_2 Diffusion Tubes (2008 to 2012)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias				
			2008 (Bias Adjustment Factor = 0.87)	2009 (Bias Adjustment Factor = 0.84)	2010 (Bias Adjustment Factor = 0.85)	2011 (Bias Adjustment Factor = 0.83)	2012 (Bias Adjustment Factor = 0.99)
1	Roadside	Y	31.6	33.9	35.8	30.3	31.4
2	Roadside	Y	32.7	32.2	34.7	33.2	30.8
3	Background	Y					18.8
4	Roadside	Y	23.5	22.6	25.2	22.2	22.4
5	Roadside	Y			**45.5**	**42.5**	**42.5**
6	Roadside	Y				39.3	39.0
7	Roadside	Y					39.4
8	Background	Y					17.0
9	Roadside	Y	34.4	35.0	37.0	35.7	35.5
10	Roadside	Y			31.9	27.6	31.0
11	Roadside	Y	31.2	29.8	34.0	29.6	30.5
12	Roadside	Y					37.1
13	Roadside	Y				37.3	37.2
14	Roadside	Y			**44.5**	39.7	39.6
15	Roadside	Y	31.4	28.5	32.7	28.2	27.7
16	Roadside	Y	30.0	29.3	30.4	28.3	28.7

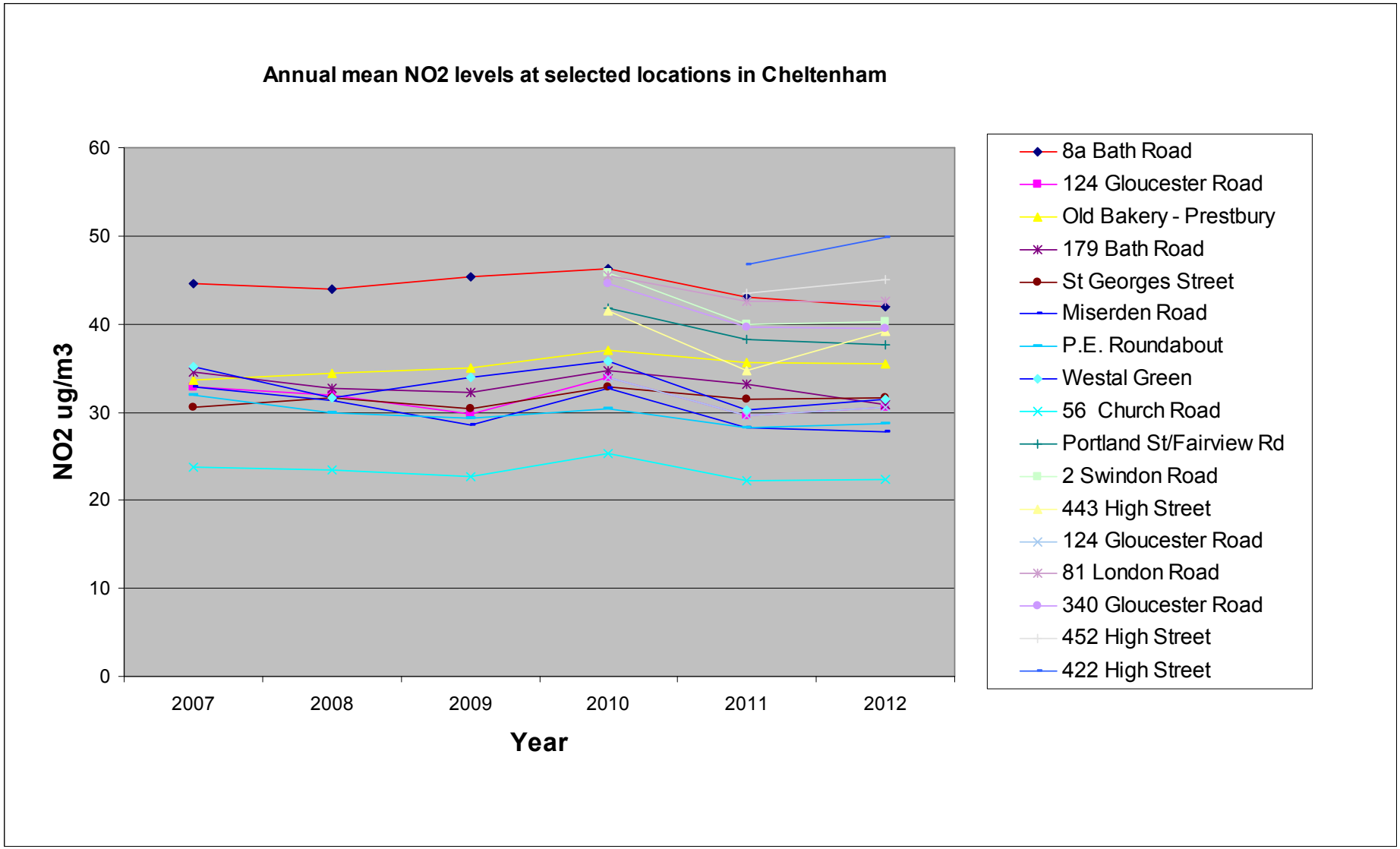
Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias				
			2008 (Bias Adjustment Factor = 0.87)	2009 (Bias Adjustment Factor = 0.84)	2010 (Bias Adjustment Factor = 0.85)	2011 (Bias Adjustment Factor = 0.83)	2012 (Bias Adjustment Factor = 0.99)
17	Kerbside	Y			36.5	33.9	35.4
18	Roadside	Y					28.3
19	Roadside	Y			**40.1**	31.0	31.6
20	Kerbside	Y	31.6	30.4	32.8	31.5	31.6
21	Roadside	Y				33.7	35.9
22	Roadside	Y				32.5	**44.3**
23	Roadside	Y				**43.5**	**45.1**
24	Roadside	Y			**41.4**	34.8	39.1
25	Roadside	Y				**46.7**	**49.8**
26	Roadside	Y				28.3	30.4
27	Roadside	Y				**44.0**	**43.3**
28	Roadside	Y				**40.2**	**41.3**
29	Kerbside	Y			**45.7**	**40.0**	**40.3**
30	Urbancentre	Y					27.8
31	Roadside	Y				35.6	35.2
32	Roadside	Y					33.0
33	Roadside	Y			**41.8**	38.2	37.7
34	Kerbside	Y				32.3	33.5

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias				
			2008 (Bias Adjustment Factor = 0.87)	2009 (Bias Adjustment Factor = 0.84)	2010 (Bias Adjustment Factor = 0.85)	2011 (Bias Adjustment Factor = 0.83)	2012 (Bias Adjustment Factor = 0.99)
35	Roadside	Y			39.6	37.1	37.7
36	Roadside	Y				**41.8**	**42.0**
37	Roadside	Y			38.2	29.6	31.3
38	Roadside	Y			**47.9**	38.9	**40.3**
39	Roadside	Y		32.4	35.8	31.0	30.8
40	Roadside	Y		34.6	36.2	32.8	33.1
41	Roadside	Y		38.6	**42.0**	37.3	**40.5**
42	Roadside	Y		**40.3**	**45.1**	37.0	38.0
43	Roadside	Y		**45.6**	**47.3**	39.9	37.9
44	Roadside	Y	**44.0**	**43.5**	**46.3**	**43.1**	**42.0**
45	Roadside	Y		34.8	39.8	34.2	35.0
46	Roadside	Y					34.5
47	Roadside	Y					35.0
48	Roadside	Y					34.7

In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

Blank results indicate that the monitoring location was not included during this year.

Figure 2. 3 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites



2.2.1 Particulate Matter (PM_{10})

No PM_{10} monitoring was carried out by Cheltenham Borough Council during the period covered by this report. Although historical Urban Background monitoring up to 2009 did not identify any exceedance of PM_{10} levels, it is possible that roadside locations near to busy roads and junctions could exhibit elevated levels of PM_{10}.

Unfortunately there is no currently practical or affordable method for measuring PM_{10} levels at roadside locations where there is potential exposure in Cheltenham.

2.2.2 Sulphur Dioxide (SO_2)

No Sulphur Dioxide monitoring was carried out by Cheltenham Borough Council during the period covered by this report.

2.2.3 Benzene

No Benzene monitoring was carried out by Cheltenham Borough Council during the period covered by this report.

2.2.4 Other Pollutants Monitored

No other pollutants were monitored by Cheltenham Borough Council during the period covered by this report.

2.2.5 Summary of Compliance with AQS Objectives

Cheltenham Borough Council has examined the results from monitoring in the Borough.

Concentrations within the AQMA still exceed the annual mean objective for nitrogen dioxide at several locations as identified within the report and the AQMA should remain.

3 New Local Developments

There is currently a proposal to re-develop the North Place and Portland Street Car Park areas in Cheltenham. An Air Quality Assessment was produced by Mouchel (reference: Cheltenham AQ Assessment Report 17102012_finalV5.doc).

The conclusions from the report were that analysis of the modelled results indicated that no exceedences of the Annual Mean, 24 hour or 1 hour Air Quality Objective for NO_2 and PM_{10} are predicted for either Do-Minimum or Do-Something Scenarios in the opening year (2016). The new exposure locations associated with the residential units within the proposed development are predicted to be well below the Directive 2008/50/EC limit values and the UK National Air Quality Strategy Objectives for NO_2 and PM_{10}.

Overall, the Air Quality Assessment concluded that the proposed development is likely to be compliant with European limit values and national air quality objectives with a negligible impact on local ambient levels of NO_2 and PM_{10} and, as such, there are no air quality reasons to prevent the local planning authority from granting planning permission.

3.1 Road Traffic Sources

There are no new significant road traffic sources identified within the Borough during the period covered by the report.

3.2 Other Transport Sources

There are no new other transport sources identified within the Borough during the period covered by the report.

3.3 Industrial Sources

There are no significant industrial sources of air pollution identified within the Borough during the period covered by this report

3.4 Commercial and Domestic Sources

There are no new significant commercial or domestic sources of air pollution identified within the Borough during the period covered by this report.

3.5 New Developments with Fugitive or Uncontrolled Sources

Cheltenham Borough 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.

Cheltenham Borough Council confirms that all the following have been considered:

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

4 Local / Regional Air Quality Strategy

Cheltenham Borough Council does not have a local air quality strategy. There is a Gloucestershire Air Quality Strategy but this is considered to be largely out of date and does not really set out targets and actions for individual authorities to work towards.

More importantly, Cheltenham Borough Council is in the process of developing its own Air Quality Action Plan in conjunction with proposals agreed under the Gloucestershire Local Sustainable Transport Plan. Public consultation over the proposed measures will shortly occur with a view to implementation over the next few years.

5 Planning Applications

The main planning application submitted during 2012 was for the re-development of North Place and Portland Street Car Parks as already described under Section 3.

Another planning application was submitted for the re-development of the Lower High Street to update the retail provision in this location and allow better links to the existing Brewery retail complex. An Air Quality Assessment was submitted and this demonstrated that the development would have minimal impact on air quality. The report was produced by URS Limited in January 2012 (ref: 47061382). The main conclusion was that; 'On the basis of information available at this time it is unlikely that the proposed development could generate changes in annual mean concentrations of nitrogen dioxide that would be large enough to interfere with the successful implementation of measures to reduce baseline air pollutant concentrations that might be included in the air quality action plan being developed by Cheltenham Borough Council. '

There is a proposal for a significant urban development to the south west of Cheltenham known as the 'Kidnapper's Lane Development'. This is currently meeting with stern local opposition and is subject to review. There is a requirement to produce a detailed Air Quality Assessment for this development. No planning application has been submitted yet.

6 Air Quality Planning Policies

Cheltenham Borough Council does not currently have any specific air quality planning policies. However as part of the Council's standard planning consultation procedures, all planning proposals are scrutinised by the relevant officer responsible for air quality and assessed for potential Air Quality implications. Recommendations are made as appropriate to ensure that sufficient information is submitted by the applicant to demonstrate that the development will not have a significant negative impact on local air quality and will not contribute to exceedances of any national air quality objectives. The Officer will consider various aspects of the development such as scale of the development, affect on traffic flow, local conditions – for example existing air quality and exposure – and whether the proposal incorporates any biomass boilers or PPC regulated processes. If it is considered that there is the potential for a significant impact on air quality from a proposed development then an Air Quality Impact Assessment will be requested from the developer which must define the magnitude of changes to air quality and the impacts at specific receptors together with appropriate mitigation measures.

Where required, a screening assessment will be carried by Cheltenham Borough Council on those proposed developments that could significantly impact air quality such as Biomass Boilers. This will progress to a detailed assessment where necessary.

Cheltenham Borough Council is in the process of reviewing the Cheltenham Local Plan which expired in 2011. Through this process, the officer responsible for air quality at the Council is to ensure that a suitable air quality planning policy is included within the final Plan to ensure that air quality is taken seriously as a material planning consideration during early pre-application stages of development proposals.

In addition the Council officer responsible for air quality has produced a guidance document to assist both planners and developers to understand the importance of air quality as a material planning consideration and the requirements for submission of an air quality assessment. This guidance document awaits approval and adoption by the Council.

7 Local Transport Plans and Strategies

Cheltenham Borough Council's transport strategy is derived from the Gloucestershire Local Transport Plan. The latest Local Transport Plan has been produced and covers the period from 2011 to 2026. It can be viewed on line at the following location; http://www.gloucestershire.gov.uk/index.cfm?articleid=102114

The overall Local Transport Plan (LTP3) vision is: "Providing a safe and sustainable transport network within Gloucestershire" where safe means a transport network that people feel safe and secure using and sustainable means a transport network that is both environmentally and financially sustainable.

LTP3 has to address national transport priorities at the local level. These priorities are to;

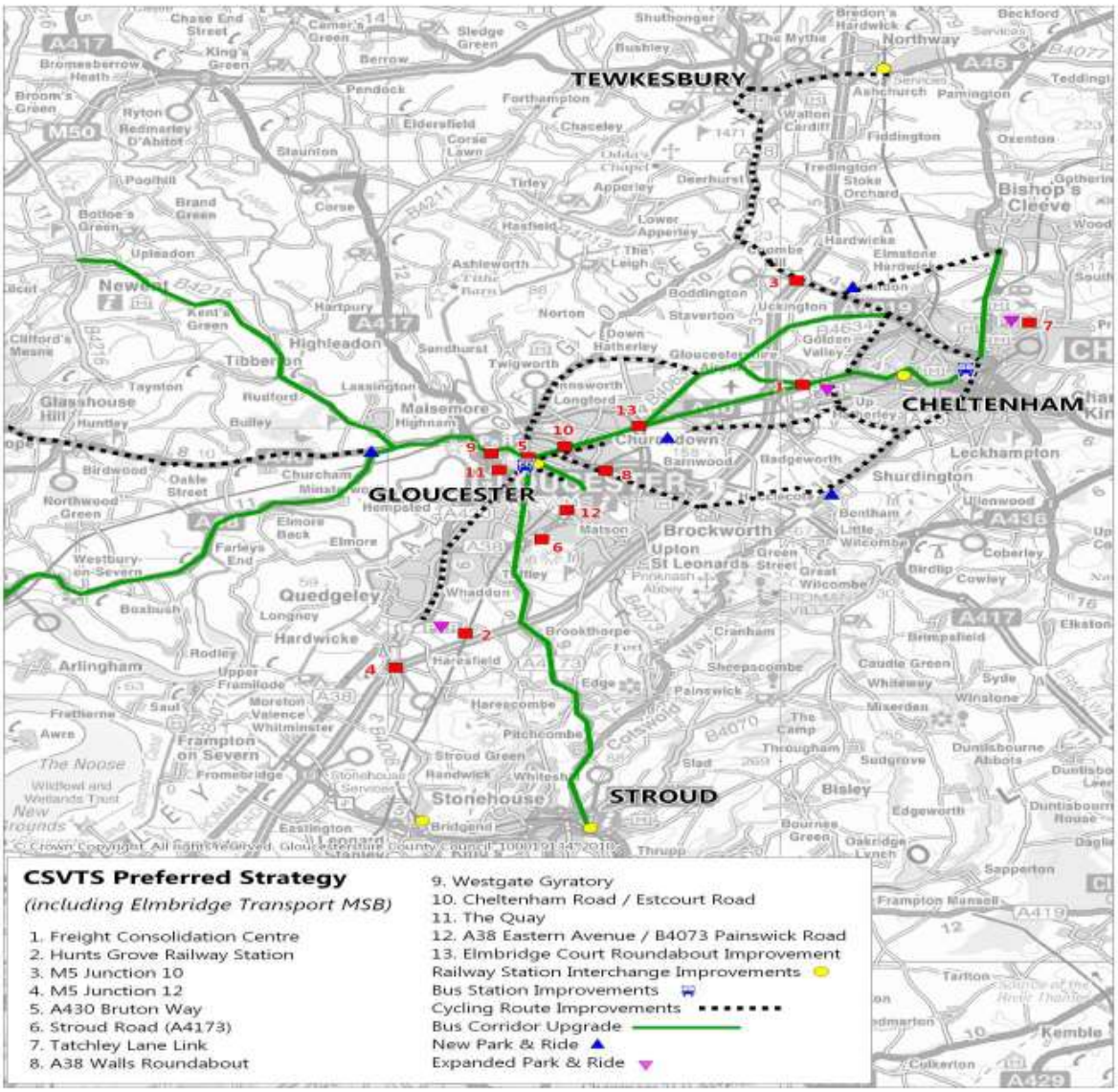
- Tackle climate change;
- Support economic growth;
- Promote equality of opportunity;
- Contribute to better safety, security and health;
- Improve quality of life.

and it has aligned these to four main themes, which are:-

- A greener, healthier Gloucestershire;
- Sustainable economic growth;
- A safer, securer transport system;
- Good access to services.

The LTP3 sets out how the county council, working with its agents in Cheltenham and Gloucester and elsewhere in the county, aims to achieve the above themes and improvements through implementation of a number of specific schemes.

A summary of the preferred schemes identified within LTP3 for the Central Severn Vale area which covers Cheltenham are illustrated on the plan below.



It is hoped that the adoption of these schemes will assist in reducing traffic vehicle movements in Cheltenham which should result in a consequential improvement in air quality.

However many of these schemes rely on significant funding which, due to the uncertain economic climate, may not be guaranteed.

Additionally it is recognised that people may not respond to measures to encourage them to change to travel by cycle, on foot, car-sharing or by public transport. This may therefore result in increased congestion and CO2 emissions.

8 Climate Change Strategies

Cheltenham Borough Council produced a Climate Change Strategy in 2005 which can be found on the following link;
http://www.cheltenham.gov.uk/site/scripts/download_info.php?fileID=955

The OVERARCHING AIM of this strategy is to make Cheltenham a carbon neutral borough.

The MAIN OBJECTIVES of the strategy are to:
• raise awareness of the potential impact of climate change;
• establish accurate data of greenhouse gas emissions from activities in Cheltenham;
• propose measures to help prevent the causes of climate change, by aiming to reduce CO2 emissions from activities in Cheltenham by 20% from 1990 levels by 2010 and by 60% by 2050;
• propose measures to help us adapt to the inevitable consequences of climate change;
• engage with external agencies and other stakeholders to gain commitment to addressing climate change issues and delivering the climate change action plan.

Although it doesn't specifically detail improvements to Air Quality it does highlight the need to reduce the impact of road transport in terms of greenhouse gas emissions.

The Strategy accepts that the most effective tools to reduce CO2 emissions from vehicles are likely to be EU and national legislation and taxes. Car manufacturers are reducing average CO2 emissions from new cars by 25% from 1995 to 2008, and changes to vehicle tax bands and company car taxation are designed to encourage cleaner vehicles.

However there is minimal evidence to demonstrate a reduction in car usage in Cheltenham. Recent traffic count data suggests that car use and congestion has not decreased since Cheltenham adopted its Climate Change Strategy.

9 Implementation of Action Plans

Cheltenham Borough Council in conjunction with Gloucestershire County Council are to undertake Public Consultation in July 2013 on some of the proposed measures that have been shortlisted under a draft Air Quality Action Plan. As a result, Cheltenham Borough Council is not in a position to publicise the full list of proposed measures in advance of the Public Consultation to ensure that the Public are the first to know about the proposals. I can however state at this point that those actions which are most likely to be implemented are those being funded through the County Council's Local Sustainable Transport Fund programme. These proposals include re-routing of traffic away from the town-centre ring-road through junction alterations, closure of the Boots Corner to through traffic, Bike-It officer for schools, Electric Vehicle charging points, promotion of Park& Ride and personalised travel plan interventions.

Implementation of other proposed measures is dependant on funding availability. In the current economic climate, it is difficult to predict with any certainty which if any of the remaining (non-LSTF funded) measures will be implemented. Feedback from the Public Consultation and wider Stakeholder consultation exercise will hopefully assist in refining the Action Plan and may result in significant amendments to the Action Plan proposals. Therefore any reporting on progress of Action Plan implementation is premature at this stage.

In terms of the requirement for an Air Quality Action Plan, this cannot be disputed, since levels of nitrogen dioxide are still in exceedance of the annual mean national objective at several locations in Cheltenham.

The statutory requirement for submission of a Further Assessment Report in advance of an Action Plan has recently been consulted upon by DEFRA and it is unknown what the outcome will be. If still required, it will be submitted alongside the Action Plan when this has been finalised.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

The new monitoring data continues to demonstrate that the annual mean objective for NO_2 is being exceeded at locations in Cheltenham where there is relevant exposure. These locations are indicated in Fig. 1.2. and described in Section 2.2. Since 2010, two locations that previously exceeded the annual mean objective, at Gloucester Road and Suffolk Road, now fall within the national objective limit. However they are still being monitored in case the situation changes. It is hoped that the proposed Action Plan measures that are due to be implemented will help to reduce NO_2 levels further.

10.2 Conclusions relating to New Local Developments

No significant new local developments have occurred during the period covered by this report. There are proposals to undertake significant residential developments at perimeter locations within Cheltenham Borough and across the Borough boundary but these are at the pre-planning stage and will be assessed in more detail once the proposals are known more fully. Detailed Air Quality Assessments will be required by the developers in all cases.

10.3 Other Conclusions

There are no further conclusions.

10.4 Proposed Actions

Cheltenham Borough Council's proposed actions are to ensure that the shortlist of proposals identified within the draft Action Plan are consulted on widely and implemented as far as possible.

11 References

1. Local Air Quality Management – Technical Guidance LAQM.TG(09) – DEFRA (2009)
2. Updated Screening Assessment (2012) - Cheltenham Borough Council
3. Progress Report (2011) - Cheltenham Borough Council

Appendices

Appendix 1: QA/QC Data

Diffusion Tube Bias Adjustment Factors

During the period covered by this report, the diffusion tubes (20% TEA in Acetone) were supplied and analysed by Gradko International Limited. The tubes at all locations throughout the area have a monthly exposure period. For 2010 and 2011 a local bias adjustment was not available. Instead a National Bias Adjustment factor was calculated in March each year using the Bias Adjustment Factor Spreadsheet available at http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html. The bias adjustment factors utilised were:

- 2010 bias adjustment factor: 0.85
- 2011 bias adjustment factor: 0.83
- 2012 bias adjustment factor: 0.99

For 2012, a local Bias Adjustment factor was used from a triplicate co-location study that commenced at the Council's roadside Air Quality Monitoring Station in April 2012.

Factor from Local Co-location Studies

The Bias Adjustment Factor used for 2012 was from a local co-location study located at the roadside Automatic NO2 analyser instrument at the junction of St George's Street and Swindon Road. The Bias Adjustment Calculation resulted in a Bias Adjustment Factor of 0.99. This was calculated using the AEA_DifTPAB_v04.xls spreadsheet using nine months of data. A copy of the spreadsheet is included in Appendix 2.

Discussion of Choice of Factor to Use

The Local Bias Adjustment Factor was used since the triplicate study demonstrated good precision and we obtained high quality chemi-luminescence analyser results.

QA/QC of Automatic Monitoring

Cheltenham Borough Council's nitrogen dioxide Air Quality Monitoring Station (AQMS) on St Georges Street/Swindon Road junction is operated and managed by Enviro Technology Services plc. The unit was installed in August 2011 and Enviro Technology Services undertake routine monthly calibration visits and data download services. Bi-annual servicing and maintenance is also carried out.
Data received is ratified by Geoff Broughton from Air Quality Data Management (AQDM). Ratified data is provided to us every quarter (see Appendix 3).

The M200E NOx analyser is MCERTS approved and measures nitric oxide and oxides of nitrogen in total. The analyser uses a technique called chemiluminescence to detect the gases. The analytical technique used can be broadly explained by stating that a beam of light is directed onto the molecules of gases as they enter the analyser. As a result, the gas molecules themselves either emit or absorb light, and it is the intensity of the emitted or absorbed light that is measured by the analysers, and the concentrations of the pollutants are then calculated. The concentrations of the gases are then expressed in parts per billion (parts of gas per billion parts of air).

QA/QC of Diffusion Tube Monitoring

Gradko International Limited participates in the WASP scheme. The WASP performance testing scheme uses artificially spiked Palmes type diffusion tubes to test each participating laboratory's analytical performance on a quarterly basis. At the completion of the round, laboratories receive a report detailing how they have performed and how their results relate to those of their peers.

A summary of the WASP performance for Gradko International laboratory is provided in Table 1. This table provides the percentage of results where the z score was between -2 and +2 which is deemed to be a satisfactory z-score. Performance scores are currently based upon the z-score statistic, a widely used scoring system employed in chemical proficiency testing.

Table 1

The following table lists the results from Gradko International laboratory which participated in recent HSL WASP NO2 PT rounds and the percentage (%) of results submitted which were subsequently determined to be satisfactory based upon a z-score of < ± 2.

WASP round	WASP R116	WASP R117	WASP R118	WASP R119	WASP R120
Period	Jan – Mar 2012	Apr-Jun - 2012	Jun – Aug 2012	Oct – Dec 2012	Jan – Mar – 2013
Gradko	100%	100%	100%	100%	100%

Appendix 2: Copy of Diffusion Tube Co-location study calculation of Precision and Bias Adjustment

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	28/03/2012	03/05/2012	34.6	35.3	30.7	34	2.5	7	6.2	34.0	99.8	Good	Good
2	03/05/2012	30/05/2012	31.8	33.6	33.6	33	1.0	3	2.6	30.8	99.9	Good	Good
3	30/05/2012	29/06/2012	31.3	29.6	27.9	30	1.7	6	4.2	28.3	99.7	Good	Good
4	29/06/2012	31/07/2012	28.3	27.3	30.5	29	1.6	6	4.1	28.7	99.7	Good	Good
5	31/07/2012	30/08/2012	32.7	36.1	33.8	34	1.7	5	4.3	30.5	99.9	Good	Good
6	30/08/2012	02/10/2012	32.2	35.6	32.2	33	2.0	6	4.9	32.3	99.8	Good	Good
7	02/10/2012	30/10/2012	40.4	34.5	35.8	37	3.1	8	7.7	36.2	99.7	Good	Good
8	30/10/2012	30/11/2012	47.1	42.0	45.2	45	2.6	6	6.4	47.0	99.9	Good	Good
9	30/11/2012	02/01/2012	35.6	43.7	45.5	42	5.3	13	13.1	46.1	99.9	Good	Good
10													
11													
12													
13													
										Overall survey -->		Good precision	Good Overall DC

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision 9 out of 9 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%

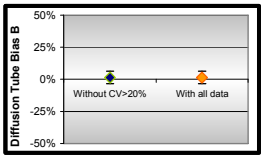
Bias calculated using 9 periods of data

Bias factor A	0.99 (0.95 - 1.04)
Bias B	1% (-4% - 5%)
Diffusion Tubes Mean:	35 μgm^{-3}
Mean CV (Precision):	7
Automatic Mean:	35 μgm^{-3}
Data Capture for periods used:	100%
Adjusted Tubes Mean:	35 (33 - 36) μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA

Bias calculated using 9 periods of data

Bias factor A	0.99 (0.95 - 1.04)
Bias B	1% (-4% - 5%)
Diffusion Tubes Mean:	35 μgm^{-3}
Mean CV (Precision):	7
Automatic Mean:	35 μgm^{-3}
Data Capture for periods used:	100%
Adjusted Tubes Mean:	35 (33 - 36) μgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

If you have any enquiries about this spreadsheet please contact the LAQM Helpdesk at: LAQMHelpdesk@uk.bureauveritas.com

Appendix 3: Ratified data from Automatic NO2 analyser on St Georges Road – Swindon Road junction

Produced by AQDM on behalf of Cheltenham B.C.

CHELTENHAM SWINDON ROAD 2012

These data have been fully ratified by AQDM to LAQM TG(09) standards

Site Description

Junction of Swindon Road and St George St

Air Quality Statistics

Pollutant	NO_2	NO	NO_X
Number Very High #	0	-	-
Number High #	0	-	-
Number Moderate #	0	-	-
Number Low #	8765	-	-
Maximum 15-minute mean	185 µg m^{-3}	435 µg m^{-3}	806 µg m^{-3}
Maximum hourly mean	141 µg m^{-3}	321 µg m^{-3}	621 µg m^{-3}
Maximum running 8-hour mean	114 µg m^{-3}	233 µg m^{-3}	454 µg m^{-3}
Maximum running 24-hour mean	90 µg m^{-3}	150 µg m^{-3}	304 µg m^{-3}
Maximum daily mean	88 µg m^{-3}	132 µg m^{-3}	282 µg m^{-3}
Average	37 µg m^{-3}	26 µg m^{-3}	77 µg m^{-3}
Data capture	99.8 %	99.8 %	99.8 %

Daily Air Quality Index (DAQI) as defined by COMEAP 1st January 2012
Mass units for the gases are at 20'C and 1013mb
NO_X mass units are NO_X as NO_2 µg m^{-3}

Air Quality Exceedences

Pollutant	Air Quality (England) Regulations 2000 & (Amendment) Regulations 2002	Max Conc	Number	Days	Allowed	Exceeded
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	37 µg m^{-3}	0	-	-	No
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	141 µg m^{-3}	0	0	18 hours	No