2013 Air Quality Progress Report for *South Gloucestershire Council*

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

August 2013

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Executive Summary

This Progress Report on air quality within South Gloucestershire provides an update on monitoring data and an assessment of any new developments which might have an impact on air quality, as well as providing some context in relation to wider policies and processes being used to improve air quality. The report also updates on the progress made in implementing the Air Quality Action Plan for Kingswood and Staple Hill.

On comparison of the 2012 monitoring results with national air quality objectives, the report has concluded the following:

- For nitrogen dioxide, there are exceedences of the annual mean objective. The majority of these are within the Kingswood and Staple Hill air quality management areas (AQMAs), confirming they are still required. However, there are seven exceeding sites outside of the AQMAs.
- A Detailed Assessment is already underway in respect of one of these sites in Warmley High Street to confirm the exceedence and the extent of the potential air quality problem in this area.
- At the other six exceeding sites outside of the AQMAs, relevant exposure is set back from the monitoring sites. When the results were adjusted to reflect the distance to the closest relevant receptor, concentrations were predicted to be below the annual mean objective in relation to four of the sites.
- For the remaining two sites; site 52 (Hambrook - A4174 Ring Road) and site 127 (Soundwell at the Soundwell Road/Downend Road/Syston Way junction), exceedences were still predicted following distance adjustment of the results. However, further monitoring has been introduced at the façade of the closest relevant receptor to site 52, which showed concentrations to be below the annual mean objective, so no further action is required in respect of this site.
- For site 127, it is proposed to set up an additional monitoring site at the façade of the nearest residential property to better represent relevant exposure. Should any exceedences be identified at the new monitoring site or at the other

monitoring sites around this junction in subsequent review and assessment reports, a Detailed Assessment will be undertaken.

- The review of 2012 monitoring results for the Cribbs Causeway AQMA show nitrogen dioxide concentrations are below the annual mean objective at the façade of the only residential property within the AQMA. However, the AQMA will be retained pending further monitoring results before a decision is made as to whether to revoke it or not.
- For all other pollutants monitored, there are no exceedences of the objectives.

In relation to new developments that may impact on air quality, a proposed biomass boiler has been identified at Warmley Park School. A detailed dispersion modelling assessment will be carried out for this boiler and any necessary measures will be taken to ensure the boiler does not impact on local air quality prior to the boiler becoming operational.

In addition, there are a number of large scale developments coming forward, including several major housing developments and a proposed new gas fired power station (Seabank 3). These will continue to be assessed and where relevant monitored, with updates given in subsequent review and assessment reports.

Good progress is being made in the implementation of the Air Quality Action Plan for Kingswood and Staple Hill with progress made against all of the short and medium term actions and some of the long-term actions in both areas. Work will continue to implement the action plan measures and future progress will be reported in subsequent review and assessment reports.

Proposed Actions

The next course of action will be to complete the Detailed Assessment for nitrogen dioxide in Warmley High Street with a view to submitting the report to Defra by the end of April 2014 following a year of monitoring.

The 2014 Progress Report will also be completed as part of the review and assessment reporting cycle. This report will include the 2013 monitoring results, an update on new local developments, including an update on the Warmley Park school biomass boiler; and progress on the implementation of the Air Quality Action Plan for Kingswood and Staple Hill.

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1 Introduction

1.1 Description of Local Authority Area

South Gloucestershire lies to the north and east of the city of Bristol with the River Severn forming the western boundary. The area is a diverse mix of urban and rural areas, including major residential, industrial and commercial developments. The road network within the district contains the major junction of the M4 & M5 motorways. Main line intercity passenger rail services are available from Bristol Parkway Station in Stoke Gifford.

The population of South Gloucestershire is 266,100 (ONS 2012 Census, Mid year estimate). 60% of the population live in the built-up areas immediately adjoining Bristol, namely Filton, Patchway, Bradley Stoke, Kingswood, Downend, Staple Hill and Hanham; 19% live in the towns of Yate, Chipping Sodbury and Thornbury and the remaining 20% live in the more rural areas of South Gloucestershire. The population has grown by 8% on the number recorded in the 2001 Census (245,600) and the population is projected to continue to rise, meaning that managing future development and providing vital transport infrastructure is a key challenge.

The area has well-established manufacturing industries, such as aerospace and has attracted a number of high technology companies and national employers. There are high levels of car ownership and traffic congestion is a major issue linked to significant volumes of commuting traffic. The North Fringe of the Bristol urban area has seen a 50% increase in traffic over the last 20 years as a result of high levels of economic growth. The main pollutant source within South Gloucestershire is road traffic.

A map of the South Gloucestershire area is provided in Figure 3 (Appendix A).

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) 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 (USA) 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. 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 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

The previous and current review and assessment work in South Gloucestershire is summarised in Table 2.

Table 2 Summary of Review and Assessment Process

Stage/Report	Summary of work undertaken	Date Completed
Round 1		
Stage 1	Identification of main sources of pollution which may have a significant impact on air quality.	February 1999
Stage 2	Additional screening of pollutant concentrations.	November 2000
Stage 3	Detailed appraisal of potential impacts of significant sources of pollution and predictions of levels to future dates.	
Declaration of Air Quality Management Area	Area declared where predictions indicate NO_2 objectives will not be met (110m either side of the M4, M5, M32 and M49 motorways within South Gloucestershire).	November 2001
Stage 4	More detailed assessment work inside the declared area to provide confidence in the original decision to declare the area.	July 2003
Round 2		
Updating and Screening Assessment 2003	Identification of relevant changes since first round	May 2003
Revocation of AQMA	AQMA 110m either side of the M4. M5, M32 and M49 motorways revoked following further work.	March 2004
Annual Progress Report 2004	Report on progress over the previous year. Report identified potential future non-compliance with 24-hour PM10 objective at Yate.	May 2004
Annual Progress Report 2005	Report on progress over the previous year.	April 2005
Round 3		
Updating and Screening Assessment 2006	Identification of relevant changes since previous round. Report showed compliance with all objectives, including 24-hour PM_{10} objective at Yate, concluding that a Detailed Assessment previously identified in the 2004 Progress Report was no longer required.	May 2006
Annual Progress Report 2007	Report on progress over the previous year. Identified the need for a detailed assessment for potential exceedences of the annual mean NO_2 objective in Staple Hill, Kingswood and Cribbs Causeway (M5 Junction 17).	May 2007
Detailed Assessment 2008	Assessment of potential NO_2 exceedence locations identified in 2007 Progress Report (Cribbs Causeway, Kingswood and Staple Hill). Concluded AQMAs required in all three locations.	September 2008

Stage/Report	Summary of work undertaken	Date Completed
Round 4		
Updating and Screening Assessment 2009	Identification of relevant changes since previous round. Need for detailed assessment of NO_2 from moving trains identified at relevant locations along London Paddington to Swansea railway line.	April 2010
Declaration of AQMAs (Cribbs Causeway, Kingswood & Staple Hill)	Air Quality Management Areas declared in Cribbs Causeway, Kingswood and Staple Hill following outcome of Detailed Assessment.	April 2010
Progress Report (Combined 2010 & 2011)	Report on progress over the previous two years. No exceedences of NO_2 objectives outside the AQMAs and compliance with all other objectives.	August 2011
Further Assessment 2011	Further assessment of Cribbs Causeway, Kingswood and Staple Hill AQMAs. Extensions to Kingswood and Staple Hill AQMAs recommended along with possible revocation of Cribbs Causeway AQMA, depending on 2011 results.	September 2011
Air Quality Action Plan - Kingswood & Staple Hill	Identifies measures aimed at improving air quality in the Kingswood and Staple Hill AQMAs.	March 2012
Round 5		
Kingswood and Staple Hill AQMAs amended	Kingswood and Staple Hill AQMAs extended following outcomes of the Further Assessment.	May 2012
Detailed Assessment 2012	Assessment of NO_2 from moving trains at relevant locations along London Paddington to Swansea railway line as identified in USA 2009. No exceedences identified.	July 2012
Updating and Screening Assessment 2012	Identify relevant changes since previous round. Identified need for detailed assessment for potential exceedences of annual mean NO_2 objective in Warmley. Revocation of Cribbs Causeway AQMA initially proposed, however, following Defra recommendation, AQMA to be retained pending further monitoring.	November 2012
Progress Report 2013	Report on progress over the previous year. Detailed Assessment of Warmley for NO_2 proceeding. Cribbs Causeway AQMA retained.	August 2013 (this report)

In the first round of review and assessment, an AQMA was declared (in November 2001) 110 m either side of the motorway network within South Gloucestershire (M4, M5, M32 and M49) with respect to the annual mean nitrogen dioxide objective. This AQMA was subsequently revoked (in March 2004) following further assessment work.

The 2007 Annual Progress Report identified potential exceedences of the annual mean nitrogen dioxide objective in three locations:

- Staple Hill - at the Broad Street (A4175), High Street (B4465), Victoria Street and Soundwell Road (A4017) crossroads
- Kingswood - along Regent Street (A420)
- Cribbs Causeway – adjacent to the M5 Roundabout (Junction 17).

The three areas were investigated further within a Detailed Assessment completed in September 2008. The report concluded that AQMAs should be declared at all three locations. Maps of the AQMAs declared in April 2010 are included in Figure 4 – Figure 6 (Appendix A).

The Further Assessment of the three AQMAs was completed in September 2011. This concluded the Kingswood and Staple Hill AQMAs should be extended and that the Cribbs Causeway AQMA could potentially be revoked on the basis of 2010 monitoring results. However, it was recommended to continue monitoring and review the 2011 monitoring results before a decision was made. The Kingswood and Staple Hill AQMAs were subsequently amended in May 2012. Maps of these amended AQMAs are shown in Figure 7 and Figure 8 respectively (Appendix A). Progress on implementing the Air Quality Action Plan for Kingswood and Staple Hill (2012) is included in this Progress Report.

The 2012 Updating and Screening Assessment concluded that while there were still exceedences of the nitrogen dioxide annual mean objective, these were either;

- Within the Kingswood and Staple Hill AQMAs, confirming the AQMAs were still justified; or
- When adjusted for distance (where relevant exposure is set back from the monitoring site), the concentrations were below the objective.

The USA proposed the revocation of the Cribbs Causeway AQMA as the 2011 monitoring results also showed nitrogen dioxide concentrations were below the annual mean objective. However, the report appraisal by Defra recommended that the AQMA be retained pending further monitoring. The Council accepted this recommendation and an addendum was added to the USA report to update the position regarding the AQMA. The USA also identified the need to proceed to a detailed assessment for nitrogen dioxide in Warmley, which is underway and due to be reported in 2014.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

South Gloucestershire Council operated eight automatic monitors at six sites during 2012:

- two API Model 200A Chemiluminescent Analysers (NO_2)
- one Met One BAM 1020 Beta-Attenuated Mass Monitors (unheated) (PM_{10})
- one R&P TEOM series 1400a (PM_{10})
- one API Model 400a UV Absorption Analyser (O_3)
- three Millipore Volume Samplers (Heavy metals - Cd, Cu, Zn, Pb).

Details of the automatic monitoring sites are provided in Table 3 and maps of the sites are included in Figure 9 - Figure 12 (Appendix A).

For PM_{10} monitoring, the BAM data have been corrected for gradient (divided by 1.21) and the TEOM data have been corrected using the VCM tool[1] as per LAQM.TG(09). The Quality Assurance/Quality Control (QA/QC) regime for the automatic monitors is presented in Appendix B.

The Council also operated an automatic monitoring site in Kingswood (at the City of Bristol College, High Street) until September 2010 when the site ceased operation due to the sale of the building. Carbon monoxide (CO) was monitored at this site using an API Model 300 Infra Red Absorption Analyser until 2007, when long-term monitoring had demonstrated concentrations were well below the objective. Nitrogen dioxide and particulate matter (PM_{10}) continued to be monitored at the Kingswood automatic site using an API Model 200A Chemiluminescent Analyser (NO_2) and Met One BAM 1020 (unheated) (PM_{10}) until the site was decommissioned in 2010.

[1] http://www.volatile-correction-model.info/Default.aspx

Table 3 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Inlet Height (m)	Pollutants Monitored	Monitoring Technique	In AQMA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road (m) *(N/A if not applicable)*	Does this location represent worst-case exposure?
Filton Conygre House Conygre Road	Urban background	360768	179407	5	NO_2	Chemiluminescent	N	Y (6)	30	n/a
				6	PM_{10}	TEOM				
Yate Station Road	Roadside	370418	182525	1.6	NO_2	Chemiluminescent	N	Y (24)	6	N
				1.8	PM_{10}	Gravimetric (BAM)				
Badminton Memorial Hall, Hayes Lane	Rural	380516	182520	2.7	O_3	UV absorption	N	N	n/a	n/a
Yate Broad Lane	Urban background	370182	183751	2.0	Cd, Cu, Zn, Pb	Millipore volume sampler	N	N	140	n/a
Cribbs Causeway Zoo Annexe	Urban background	357609	181494	4.3	Cd, Cu, Zn, Pb	Millipore volume sampler	N	N	206	n/a
Pilning Trading Standards	Urban background	355847	184419	1.3	Cd, Cu, Zn, Pb	Millipore volume sampler	N	N	72	n/a

2.1.2 Non-Automatic Monitoring Sites

South Gloucestershire Council operates an extensive network of diffusion tube monitoring sites, predominantly monitoring nitrogen dioxide with some sites also measuring benzene, using BTX (benzene, toluene and xylene) tubes. Details of the monitoring sites are provided in Table 4.

During 2012, monitoring was carried out for nitrogen dioxide at 96 sites and at 6 sites for benzene. The number of benzene monitoring sites was reduced from 23 due to rationalisation of the network. Further details are given in section 2.2.4.

There were seventeen new nitrogen dioxide diffusion tube monitoring sites set up in 2012. Twelve of these were set up around the following busy road junctions identified through previous review and assessment work:

- Northville – A38 Gloucester Road North/ Northville Road/ Braemar Avenue (sites 117 and 118)
- Filton - B4056 Southmead Road/ A38 Gloucester Road North/ A4174 Station Road roundabout (sites 119, 120 and 121)
- Filton - Filton Avenue/Northville Road/ Ninth Avenue junction (sites 122 and 123)
- Filton - Filton Avenue/ A4174 Station Road (sites 124 and 125)
- Kingswood - Soundwell Road A4017/ Downend Road/ Syston Way (sites 126, 127 and 128).

Another new site (132) was set up in Hanham High Street. Previous review and assessment work had identified that while Hanham High Street was not strictly a narrow, congested street, there was relevant exposure within 2m of the kerb. It was not possible to site a diffusion tube at the worst case location. However, the new site is in a location more representative of relevant exposure than the existing site on Hanham High Street (site 22).

A further three new sites were set up to better represent relevant exposure. In Cribbs Causeway; sites 129 and 130 were set up at façades with relevant exposure, replacing site 64 (Cribbs Causeway – Holly Cottage) and in Bradley Stoke, site 131 replaced site 48 Aztec West. In Hambrook, the final new site (133) commenced in October 2012 at the façade of a property in a worst-case location, replacing site 52.

Sixteen diffusion tube sites ceased operation at the end of 2011, partly to offset the number of new sites introduced and to ensure that monitoring is targeted where it is needed. These sites are detailed below along with the reasons why the monitoring was discontinued specifically at that site:

- Site 2 Yate – The Avenue (monitored concentrations well below objective)
- Site 8 Filton Gloucester Road North St. Peter's Church (site not representative of relevant exposure)
- Site 9 Filton – 156 Gloucester Road North Kerbside (site not representative of relevant exposure; site 10 nearby at façade of property with relevant exposure)
- Site 16 Kingswood – 78 Regent Street Barclays façade (non-exceeding site within AQMA)
- Site 25 Bitton – Oakhill Avenue (monitored concentrations well below objective)
- Site 30 Mangotsfield – Richmond Road (monitored concentrations well below objective)
- Site 32 Almondsbury Depot (monitored concentrations well below objective; no relevant exposure)
- Site 48 Aztec West Roundabout (not representative of relevant exposure; replaced by site 131 which better represents relevant exposure)
- Site 49 Kingswood 38 Firework Close (monitored concentrations well below objective)
- Site 50 Hambrook – Old Gloucester Road (monitored concentrations below objective; site not at worst-case location)
- Site 59 Siston Common – The Willows (monitored concentrations well below objective)
- Site 64 Cribbs Causeway – Holly Cottage (relevant exposure set back from site; replaced by sites 129 and 130 where monitoring is at the façade)

- Site 89 Cribbs Causeway Blackhorse Hill The Ferns façade (site set up as part of Further Assessment of Cribbs Causeway AQMA, monitored concentrations well below objective)
- Site 91 Kingswood – 119 Regent Street Razzle Dazzle (site set up as part of Further Assessment of Kingswood AQMA, non-exceeding site within AQMA)
- Sites 99 and 100 Kingswood – High Street City of Bristol College (two of triplicate monitoring sites co-located with continuous analyser which ceased operation so sites no longer required)

During 2012, a further two sites also ceased at the end of September:

- Site 52 Hambrook – A4174 (site access issues and relevant exposure set back from the site; replaced with site 133 at façade in worst-case location)
- Site 55 Longwell Green Ring Road Roundabout Junction Leisure Road (relevant exposure set back from the site; site 58 more representative of relevant exposure).

There were some minor changes to a few site locations. Site 35 (Bradley Stoke - Woodlands Lane) was relocated to other side of road further from M4 and nearer to residential properties to better represent relevant exposure; Site 53 (Hambrook - Bristol Road rear of 17 Fenbrook Close) was relocated closer to road because of encroaching vegetation; Site 58 (Longwell Green – Kingsfield Lane) was relocated slightly further away from the A4174 ring road roundabout due to encroaching vegetation; and Site 83 in Chipping Sodbury was relocated from the roadside to the façade of nearest residential property to better represent relevant exposure.

Maps of the diffusion tube monitoring sites are available in Figure 13 – Figure 22 (Appendix A) and QA/QC procedures are detailed in Appendix B.

Table 4 Details of Non-Automatic Monitoring Sites

Site No.	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Site Height (m)	Pollutants Monitored	In AQMA?	Is monitoring co-located with a Continuous Analyser? (Y/N)	Relevant Exposure? *(Y/N with distance (m) from monitoring site to relevant exposure)*	Distance to kerb of nearest road (m) *(N/A if not applicable)*	Does this location represent worst-case exposure?
1	Yate - Station Road Motor Aids	Roadside	370721	182499	2.4	NO_2 Benzene	N	N	Y (5)	2.5	Y
4	Yate - Station Road Co-Location 1	Roadside	370418	182525	2.4	NO_2	N	Y	Y (24)	6	
5	Yate - Station Road Co-location 2	Roadside	370418	182525	2.4	NO_2	N	Y	Y (24)	6	
6	Yate - Station Road Co-location 3	Roadside	370418	182525	2.4	NO_2	N	Y	Y (24)	6	
10	Filton - 152 Gloucester Road North Pizza Plant façade	Roadside	360266	179136	2.2	NO_2	N	N	Y (0)	3.5	Y
11	Thornbury – 48 High Street Morgan Stone	Roadside	363654	189893	2.6	NO_2	N	N	N	0.5	Y
12	Stoke Gifford - Church Road rear of Friends Life	Roadside	362161	179570	2.5	NO_2	N	N	N	1	
13	Filton - MOD Roundabout	Roadside	361523	178732	2.3	NO_2	N	N	N	1	
14	Hambrook – Bristol Road opp The Gables	Roadside	363979	178551	2.1	NO_2	N	N	Y (33)	1	Y
17	Kingswood - 79 Regent Street HSBC	Roadside	364830	173878	2.6	NO_2	Y	N	N	2.5	
18	Kingswood - 70 Regent Street CM Lea facade	Roadside	364762	173852	2.4	NO_2	Y	N	Y (0)	5.5	
21	Downend – Boscombe Crescent St Augustines Church	Urban Background	365673	177475	2.6	NO_2 Benzene	N	N	N	1.5	
22	Hanham – 44 High Street Lloyds Bank	Roadside	364116	172413	2.6	NO_2	N	N	N	3	
23	Kingswood - Cecil Road	Roadside	364854	173717	2.4	NO_2	N	N	Y (16.5)	1	

Site No.	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Site Height (m)	Pollutants Monitored	In AQMA?	Is monitoring co-located with a Continuous Analyser? (Y/N)	Relevant Exposure? *(Y/N with distance (m) from monitoring site to relevant exposure)*	Distance to kerb of nearest road (m) *(N/A if not applicable)*	Does this location represent worst-case exposure?
26	Kingswood – 8 Gilbert Road	Urban Background	364846	174007	3.1	NO_2	N	N	Y (5)	1.5	
27	Kingswood - 90 Regent Street Nat West façade	Roadside	364866	173835	2.8	NO_2 Benzene	Y	N	Y (0)	2	Y
29	Staple Hill - 123 High Street Backhouse Bet	Roadside	364822	175932	2.7	NO_2	Y	N	Y (2)	1	Y
34	Bradley Stoke – 109 Ormonds Close M4 East of Almondsbury Interchange	Roadside	362395	182544	2.7	NO_2	N	N	Y (11)	24.8 (M4 33)	Y
35	Bradley Stoke - Woodlands Lane M4 East of Almondsbury Interchange (lp47)	Roadside	362118	183031	2.5	NO_2	N	N	Y (9.8)	3.3 (M4 22.5)	Y
36	Hambrook - Whiteshill M4 East of M32	Roadside	364556	178856	2.4	NO_2	N	N	Y (20)	37 (M4)	
37	Almondsbury - Old Aust Road M4 West of Almondsbury Interchange	Roadside	361147	184846	2.0	NO_2	N	N	Y (108)	7 (M4)	Y
38	Severn Beach – Ableton Lane Severn Beach Primary School	Urban Background	354282	184653	2.8	NO_2	N	N	Y (0)	49	
42	Little Stoke -Braydon Ave	Urban Background	361418	181674	2.6	NO_2 Benzene	N	N	Y (8)	1.5	
43	Patchway - Highwood Road opp St. Chad's Vicarage	Roadside	360442	181592	2.8	NO_2	N	N	Y (32)	3.5	
44	Stoke Gifford - Hatchet Road	Roadside	362061	180025	2.8	NO_2	N	N	Y (14)	4	
45	Bradley Stoke - Bradley Stoke Way	Roadside	363265	180539	2.8	NO_2	N	N	Y (27.5)	2.5	
46	Winterbourne - High Street opp Ridings School	Roadside	364852	180758	2.7	NO_2	N	N	Y (16.5)	1	
47	Bromley Heath - A4174	Roadside	364280	178371	2.8	NO_2	N	N	Y (42)	1.6	

Site No.	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Site Height (m)	Pollutants Monitored	In AQMA?	Is monitoring co-located with a Continuous Analyser? (Y/N)	Relevant Exposure? *(Y/N with distance (m) from monitoring site to relevant exposure)*	Distance to kerb of nearest road (m) *(N/A if not applicable)*	Does this location represent worst-case exposure?
51	Hambrook - Rear of 96 Old Gloucester Road	Urban Background	363760	178486	2.1	NO_2	N	N	Y (17)	24	
52	Hambrook - A4174	Roadside	363744	178512	-	NO_2 Benzene	N	N	Y (9)	3.4	Y
53	Hambrook – Bristol Road rear of 17 Fenbrook Close	Roadside	363907	178389	2.0	NO_2	N	N	Y (16)	6.5	
54	Longwell Green - A431 / Aldermoor Way	Roadside	365256	171656	2.7	NO_2 Benzene	N	N	Y (33)	1.5	
55	Longwell Green - Ring Road Roundabout Junction Leisure Road	Roadside	365364	172173	2.9	NO_2	N	N	Y (22)	1.5	
57	Coalpit Heath - Badminton Road The Salon/Carpet shop	Roadside	367742	181160	2.3	NO_2	N	N	Y (12)	2	
58	Longwell Green - Kingsfield Lane/ Aspects Leisure Site (lp6)	Roadside	365327	172141	2.6	NO_2	N	N	Y (27)	31 (A4174)	
60	Downend - North Street Kustom Floors & Furniture	Roadside	365101	176688	2.6	NO_2	N	N	Y (4)	1	
61	Staple Hill Crossroads - 1 Broad Street William Hill	Roadside	364926	175926	2.5	NO_2	Y	N	Y (0)	2.5	Y
62	Staple Hill Crossroads - 2 Broad Street Coffee Junction façade	Roadside	364909	175908	2.4	NO_2	Y	N	Y (0)	1.5	Y
63	Patchway – 28 Park Leaze	Roadside	359487	182479	2.6	NO_2	N	N	Y (8)	1.5	
67	Kingswood - 40 Regent Street Thomas Cook façade	Roadside	364671	173877	2.8	NO_2	Y	N	Y (0)	2.5	Y
68	Kingswood - 26-32 Regent Street Store Twenty One façade	Roadside	364631	173886	2.9	NO_2	Y	N	Y (0)	2.5	Y
69	Kingswood - 12 Regent Street Silver Brides façade	Roadside	364597	173892	2.5	NO_2	Y	N	Y (0)	2.5	Y

Site No.	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Site Height (m)	Pollutants Monitored	In AQMA?	Is monitoring co-located with a Continuous Analyser? (Y/N)	Relevant Exposure? *(Y/N with distance (m) from monitoring site to relevant exposure)*	Distance to kerb of nearest road (m) *(N/A if not applicable)*	Does this location represent worst-case exposure?
70	Kingswood - Two Mile Hill Road Job Centre Plus façade	Roadside	364533	173896	2.5	NO_2	Y	N	Y (0)	2.5	
71	Staple Hill - 11 The Square Liquidation Stock Warehouse	Roadside	365075	175918	2.7	NO_2	Y	N	Y (0.5)	6.5	
72	Staple Hill - 25 Broad Street Westbury Inks	Roadside	364990	175920	2.7	NO_2	Y	N	Y (6.5)	1.5	
73	Staple Hill - 11 Soundwell Road Starlight	Roadside	364902	175843	2.4	NO_2	Y	N	Y (1.5)	0.5	Y
74	Staple Hill - 29-31 Soundwell Road opp Page Comm Assoc	Roadside	364885	175772	2.5	NO_2	Y	N	Y (4)	0.5	
75	Staple Hill - 118 High Street Santander	Roadside	364856	175917	2.5	NO_2	Y	N	Y (2.5)	0.5	
76	Staple Hill - 84-86 High Street Staple Oak Pub façade	Roadside	364722	175926	2.7	NO_2	Y	N	Y (0)	2	
78	Staple Hill - 9-11 Victoria Street	Roadside	364909	176016	2.6	NO_2	Y	N	Y (3.7)	1.2	Y
79	Staple Hill - 27-29 Victoria Street	Roadside	364913	176067	2.6	NO_2	Y	N	Y (3.3)	1.2	Y
81	Cribbs Causeway - Hollywood Cottage Blackhorse Hill (nearest M5 Roundabout)	Roadside	357733	181305	2.7	NO_2	Y	N	Y (14.5)	1.5	
83	Chipping Sodbury – 51A Broad Street façade	Roadside	372791	182241	1.8	NO_2	N	N	Y (0)	5.2	Y
87	Cribbs Causeway – Blackhorse Hill Hollywood Cottage facade	Roadside	357733	181324	2.0	NO_2	Y	N	Y (0)	13	Y
88	Cribbs Causeway - Blackhorse Hill St. Swithin's Lodge facade	Roadside	357843	181433	2.0	NO_2	N	N	Y (0)	5	
90	Kingswood - Downend Road Junction with Boultons Road	Roadside	364665	173925	2.6	NO_2	Y	N	Y (5.5)	1.5	

Site No.	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Site Height (m)	Pollutants Monitored	In AQMA?	Is monitoring co-located with a Continuous Analyser? (Y/N)	Relevant Exposure? *(Y/N with distance (m) from monitoring site to relevant exposure)*	Distance to kerb of nearest road (m) *(N/A if not applicable)*	Does this location represent worst-case exposure?
92	Kingswood - Regent Street British Legion Club	Roadside	364968	173836	2.7	NO_2	Y	N	N	2	
93	Kingswood - Hanham Road Exchange Court Flats	Roadside	364979	173801	3.0	NO_2	Y	N	Y (0)	2	Y
94	Kingswood - High Street Kings Arms	Roadside	365023	173836	2.4	NO_2	Y	N	Y (0)	2	Y
95	Kingswood - 45 High Street Adam Lee	Roadside	365078	173846	2.5	NO_2	Y	N	Y (0)	2.7	Y
96	Kingswood - 71 High Street Homeless Project	Roadside	365164	173832	2.7	NO_2	Y	N	Y (5.5)	2.3	
97	Kingswood - 129 High Street	Roadside	365361	173804	2.5	NO_2	Y	N	Y (2)	1.5	Y
98	Kingswood - High Street City of Bristol College façade	Roadside	365463	173785	2.7	NO_2	Y	N	Y (0)	2.5	
101	Staple Hill - High Street lp outside Beech House	Roadside	364546	175951	2.9	NO_2	N	N	Y (9)	1.5	
102	Staple Hill - 58 High Street Aladdin's Cave	Roadside	364637	175934	2.4	NO_2	Y	N	Y (0)	1.5	Y
103	Staple Hill - Page Road Brookridge Court	Roadside	364751	175892	2.8	NO_2	N	N	Y (4.5)	2	
104	Staple Hill - Page Road Staple Hill Primary School	Roadside	364777	175817	2.7	NO_2	N	N	Y (19)	1.5	
105	Staple Hill - North Street lp outside no 2	Roadside	364932	176147	2.7	NO_2	Y	N	Y (2.5)	2	
106	Stoke Gifford - 73 Hambrook Lane façade	Other[a]	363112	179559	2.2	NO_2	N	N	Y (0)	10	Y
107	Stoke Gifford - 77 Hambrook Lane façade	Other[a]	363148	179547	1.7	NO_2	N	N	Y (0)	20	Y
108	Patchway - 204 Gloucester Road rear façade	Other[a]	360613	181680	2.0	NO_2	N	N	Y (0)	12	Y

Site No.	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Site Height (m)	Pollutants Monitored	In AQMA?	Is monitoring co-located with a Continuous Analyser? (Y/N)	Relevant Exposure? *(Y/N with distance (m) from monitoring site to relevant exposure)*	Distance to kerb of nearest road (m) *(N/A if not applicable)*	Does this location represent worst-case exposure?
109	Little Stoke - Clay Lane lp8 (rear of Gallivan Close)	Other[a]	360895	181410	2.8	NO_2	N	N	Y (13)	2	
110	Winterbourne - 2 Sandstone Rise rear façade	Other[a]	364992	179895	1.9	NO_2	N	N	Y (0)	13	Y
111	Winterbourne - 2 Down Road façade	Other[a]	364930	179842	2.2	NO_2	N	N	Y (0)	59	Y
112	Winterbourne - 106 Dragon Road façade	Other[a]	364930	179886	2.1	NO_2	N	N	Y (0)	31	Y
113	Patchway - 5 Falcon Close façade	Roadside	359112	181909	2.0	NO_2	N	N	Y (0)	7.5 (M5 45)	Y
114	Pilning - 23 Keens Grove façade	Roadside	355263	185351	2.7	NO_2	N	N	Y (0)	7	Y
115	Pilning - 2 Wick Road façade	Roadside	355212	185360	2.5	NO_2	N	N	Y (0)	8.5	Y
116	Warmley - 14 High Street Webbs	Roadside	366882	173562	3.1	NO_2	N	N	Y (0)	2.2	Y
117	Filton Northville - 29 Gloucester Road North Blockbuster	Roadside	359874	178259	2.5	NO_2	N	N	Y (2.5)	2.9	Y
118	Filton Northville - 19 Gloucester Road North Dental Lab	Roadside	359875	178207	2.5	NO_2	N	N	Y (3.4)	4.7	Y
119	Filton - 137 Gloucester Road North	Roadside	360263	179250	2.5	NO_2	N	N	Y (0.5)	3.6	
120	Filton – 709 Southmead Road	Roadside	360052	179013	2.4	NO_2	N	N	Y (6.7)	3	
121	Filton - 107 Gloucester Road North	Roadside	360080	178882	2.2	NO_2	N	N	Y (7.2)	2.8	
122	Filton - 549 Filton Avenue	Roadside	360566	178229	2.3	NO_2	N	N	Y (4.5)	4	Y
123	Filton - 542 Filton Avenue Al's Hobbies	Roadside	360575	178265	2.5	NO_2	N	N	Y (5)	4	

Site No.	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Site Height (m)	Pollutants Monitored	In AQMA?	Is monitoring co-located with a Continuous Analyser? (Y/N)	Relevant Exposure? *(Y/N with distance (m) from monitoring site to relevant exposure)*	Distance to kerb of nearest road (m) *(N/A if not applicable)*	Does this location represent worst-case exposure?
124	Filton - 702a Filton Ave Way Ahead	Roadside	360918	178905	2.4	NO_2	N	N	Y (6.6)	1.9	Y
125	Filton - 71 Station Road	Roadside	360891	179005	2.5	NO_2	N	N	Y (5.4)	0.5 (A4174 9.3)	
126	Soundwell - 296 Soundwell Road	Roadside	364528	174424	2.3	NO_2	N	N	Y (0.8)	3.5	Y
127	Soundwell - 264 Soundwell Road	Roadside	364585	174491	2.2	NO_2	N	N	Y (1.8)	2	Y
128	Kingswood - 109 Downend Road	Roadside	364587	174431	2.4	NO_2	N	N	Y (1.6)	2	Y
129	Cribbs Causeway – 1 Holly Cottages façade	Roadside	357508	181059	2.1	NO_2	N	N	Y (0)	18 (M5 44)	Y
130	Cribbs Causeway – 2 Mayfield Cottages façade	Roadside	357488	181011	1.8	NO_2	N	N	Y (0)	17 (A4018 38)	Y
131	Bradley Stoke - 188 Oaktree Crescent	Roadside	360949	182831	2.1	NO_2	N	N	Y (4.5)	11.7	Y
132	Hanham - 66 High St	Roadside	364178	172337	2.5	NO_2	N	N	Y (0.6)	2.7	Y
133	Hambrook - 123 Old Gloucester Road façade	Roadside	363736	178507	2.1	NO_2	N	N	Y (0)	10.4 (A4174)	Y

[a] Monitoring locations where any special source orientated monitoring is undertaken in relation to specific emission sources; in this case, railway line

2.2 Comparison of Monitoring Results with Air Quality Objectives

The following section presents all of the 2012 monitoring data and trends in monitoring data. Data from previous years are also included for context.

2.2.1 Nitrogen Dioxide (NO_2)

Automatic Monitoring Data

Nitrogen dioxide was monitored at two automatic monitoring sites in Filton and Yate during 2012. The Kingswood automatic monitoring site ceased operation during 2010. The results from automatic monitoring are shown in Table 5 and Table 6. The automatic sites are below the annual mean and hourly mean objectives in all years. Summary plots of the 2012 nitrogen dioxide hourly mean values at the Filton and Yate automatic monitoring sites are provided in Figure 26 (Appendix B).

The trend data presented in Figure 1 shows that annual mean nitrogen dioxide concentrations have generally been stable in recent years. Following a slight downward trend in 2011, the annual mean concentration at Filton slightly increased in 2012, while at Yate, it remained the same.

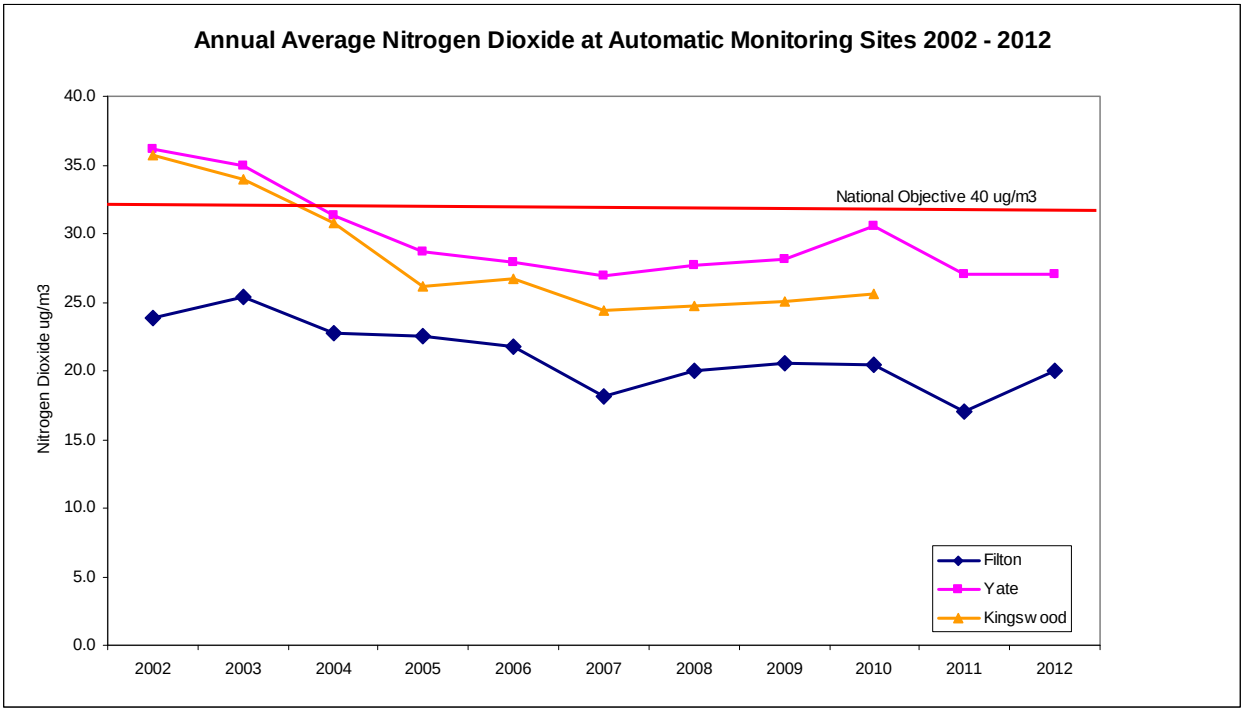

Figure 1 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Automatic Monitoring Sites

Table 5 Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site Name	Site Type	Within AQMA?	Valid Data Capture for monitoring period %[a]	Valid Data Capture 2012 % [b]	Annual Mean Concentration μg/m^3				
					2008	2009	2010	2011	2012
Filton Conygre House, Conygre Road	Urban background	N	n/a	96.8	20.0	20.5[c]	20.4[c]	17	20
Kingswood City of Bristol College, High Street	Roadside	N (not at time site operational)	n/a	n/a	24.6	25.7	25.6[c]	-	-
Yate Station Road	Roadside	N	n/a	90.3	27.7	28.1	30.6	27	27

Table 6 Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site Name	Site Type	Within AQMA?	Valid Data Capture for monitoring period %[a]	Valid Data Capture 2012 % [b]	Number of Exceedences of Hourly Mean (200 μg/m^3)				
					2008	2009	2010	2011	2012
Filton Conygre House, Conygre Road	Urban background	N	n/a	96.8	0	0 (50.3) [d]	0 (82.1) [d]	0	0
Kingswood City of Bristol College, High Street	Roadside	N (not at time site operational)	n/a	n/a	0	0 (118.9) [d]	0 (110.8) [d]	-	-
Yate Station Road	Roadside	N	n/a	90.3	0	0	0	1	0

[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 mean where data capture below 75% as in Box 3.2 of TG(09)

[d] If the data capture for full calendar year is less than 90%, the 99.8th percentile of hourly means is shown in brackets

Diffusion Tube Monitoring Data

The results of the diffusion tube monitoring for 2012 are presented in Table 7. Results for 2008 to 2012 are provided for comparison in Table 8. All results are bias adjusted using the relevant national bias adjustment factors for each year as detailed in Appendix B. Concentrations highlighted in red exceed the annual mean objective; those also underlined, indicate a potential exceedence of the hourly mean objective (>60 µg/m^3). Concentrations highlighted in blue are within 10% of the annual mean objective (>36 µg/m^3). The raw monthly monitoring data is shown in Table 32 (Appendix C).

Data capture for 2012 was 75% or above at all but the following eight sites; 51, 52, 55, 58, 79, 93, 105 and 133. This was mainly due to monitoring starting/finishing part way through the year or missing tubes on collection. The results for these sites have been annualised as detailed in Appendix B.

Discussion of 2012 Diffusion Tube Monitoring Results

In 2012, exceedences of the annual mean objective were measured at twenty seven monitoring sites. Of these, ten sites are within the Kingswood AQMA; nine are within the Staple Hill AQMA and one is within the Cribbs Causeway AQMA. These are detailed below:

Kingswood AQMA

- Site 18 Kingswood – 70 Regent Street CM Lea facade
- Site 67 Kingswood – 40 Regent Street Thomas Cook façade
- Site 68 Kingswood – 26-32 Regent Street Store Twenty One façade
- Site 69 Kingswood – 12 Regent Street Silver Brides façade
- Site 90 Kingswood – Downend Road Junction with Boultons Road
- Site 92 Kingswood – Regent Street British Legion Club
- Site 94 Kingswood – High Street Kings Arms façade
- Site 95 Kingswood – 45 High Street Adam Lee façade
- Site 96 Kingswood – 71 High Street Homeless Project
- Site 98 Kingswood – High Street City of Bristol College façade

Staple Hill AQMA

- Site 29 Staple Hill – 123 High Street Backhouse Bet
- Site 61 Staple Hill crossroads – 1 Broad Street William Hill
- Site 62 Staple Hill crossroads – 2 Broad Street Coffee Junction façade
- Site 72 Staple Hill – 25 Broad Street Westbury Inks
- Site 73 Staple Hill – 11 Soundwell Road Starlight
- Site 75 Staple Hill – 118 High Street Santander
- Site 78 Staple Hill – 9-11 Victoria Street
- Site 79 Staple Hill – 27-29 Victoria Street
- Site 102 Staple Hill – 58 High Street Aladdin's Cave

Cribbs Causeway AQMA

- Site 81 Cribbs Causeway – Hollywood Cottage, Blackhorse Hill (nearest M5 Roundabout)

It should be noted that site 81 within the Cribbs Causeway AQMA is located close to the roadside of the M5 Junction 17 roundabout and there is no relevant exposure at this location. Another monitoring site (site 87) is located directly at the façade of the only property (Hollywood Cottage) within the AQMA and the concentrations in 2010, 2011 and 2012 were below the objective. In early 2013, site 81 was discontinued and triplicate monitoring was set up at the façade. The current situation as regards the Cribbs Causeway AQMA is discussed further at the end of this section.

Exceedences outside AQMAs

Seven of the exceeding sites, however, are outside of the AQMAs. These are listed below:

- Site 14 Hambrook - Bristol Road opp The Gables
- Site 47 Bromley Heath - A4174
- Site 52 Hambrook - A4174
- Site 55 Longwell Green - Ring Road Roundabout/ Junction Leisure Road
- Site 116 Warmley - 14 High Street Webbs

- Site 120 Filton – 709 Southmead Road
- Site 127 Soundwell - 264 Soundwell Road

Relevant exposure is set back from all of these monitoring sites apart from site 116. For the remaining six sites, an adjustment to the façade of the nearest relevant receptor has been made using the "Nitrogen dioxide fall off with distance" calculator; an LAQM tool available on the Defra website[2]. The results of this are presented in Table 31 (Appendix B).

Distance adjustment at two of the sites; 52 and 127 estimated that concentrations at the facades of the nearest relevant receptors exceeded the annual mean objective with concentrations of 42.7 µg/m^3 and 42.2 µg/m^3 respectively. Site 52 was discontinued during 2012 and replaced with a new site (133) at the façade of the nearest residential property which showed concentrations to be well below the objective (28.8 µg/m^3) so no further action is required in respect of site 52.

With regard to site 127, bearing in mind that the fall off with distance calculator has some uncertainty and provides an estimation of the concentration at the nearest façade, it is proposed to set up an additional monitoring site at the façade of the nearest residential property to better represent relevant exposure for the remainder of 2013. This would also remove the potential influence of turbulence from traffic accelerating away from the junction, which can cause over-estimation of nitrogen dioxide concentrations.

Two other nearby monitoring sites (sites 126 and 128) were also set up at the same time as site 127 around the road junction and the concentrations measured at these sites were 32.9 µg/m^3 and 36.6 µg/m^3 respectively. While site 128 is just within 10% of the objective, both are sufficiently below the objective to not merit any further investigation at this stage, although relocating to the façades will be pursued. Should any exceedences be identified around this junction in the 2014 Progress Report, a Detailed Assessment will then be undertaken. (This approach was discussed and agreed during a telephone call to the LAQM Helpdesk on 5th June 2013.)

At the remaining four sites; 14, 47, 55 and 120, distance adjustment revealed that concentrations at the facades of properties were below the annual mean objective, although for sites 14 and 120, concentrations were within 10% of the objective at

[2] http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

38.4 µg/m^3 and 37.1 µg/m^3 respectively. In the case of site 14, which was initially above 60 µg/m^3, with the annual mean distance adjusted to below the objective, it is unlikely the 1-hour objective would be exceeded. In 2013, site 14 was replaced with a new site at a worst case location with relevant exposure (site 134 Hambrook Bristol Road Old Bakery) and site 47 was replaced with site 135 (Frenchay Harford Drive Dyrham Flats) to better represent relevant exposure. The results from these new sites will be reported in the 2014 Progress Report. In Longwell Green, site 55 was discontinued during 2012 and replaced (to better represent relevant exposure) with site 58, which was well below the objective. It is also proposed to relocate site 120 (Filton - Southmead Road) to the façade of the nearest residential property to better represent relevant exposure.

Detailed Assessment in Warmley High Street

For site 116 in Warmley High Street, the diffusion tube is located at the façade and represents relevant exposure. The 2012 result (50 µg/m^3) shows a potential exceedence of the annual mean objective at a location outside of the currently declared AQMAs. A detailed assessment has commenced and additional monitoring has been deployed in the area to confirm the exceedence and investigate the potential extent of the exceedence area, with a view to reporting the outcome to Defra by the end of April 2014.

Borderline Exceedences

There are sixteen sites approaching the objective, of these two (Sites 76 and 97) are already within the Kingswood and Staple Hill AQMAs. The remaining fourteen sites are listed below:

- Site 1 Yate – Station Road Motor Aids
- Site 10 Filton – 152 Gloucester Road North Pizza Plant façade
- Site 13 Filton – MOD Roundabout
- Site 44 Stoke Gifford – Hatchet Road
- Site 45 Bradley Stoke – Bradley Stoke Way
- Site 46 Winterbourne – High Street opp The Ridings School
- Site 54 Longwell Green – A431/Aldermoor Way

- Site 60 Downend – North Street Kustom Floors and Furniture
- Site 121 Filton – 107 Gloucester Road North
- Site 122 Filton – 549 Filton Avenue
- Site 124 Filton – 702a Filton Avenue Way Ahead
- Site 128 Kingswood – 109 Downend Road
- Site 131 Bradley Stoke – 188 Oaktree Crescent
- Site 132 Hanham – 66 High Street

At all of the above sites apart from one (site 10) relevant exposure is set back from the monitoring sites. Hence if these sites were distance adjusted to the nearest facades, it would bring the annual mean concentrations further below the objective.

However, monitoring at Site 10 is at the façade and represents worst-case relevant exposure. Concentrations at this site were higher in 2012 (39.5 µg/m^3) than in 2011 (34.8 µg/m^3) and were also within 10% of the objective (above 36 µg/m^3) in both 2008 and 2010. In 2012, additional monitoring sites (Sites 119 – 121) were set up to provide better spatial data of concentrations in the area. While an exceedence was indicated at site 120, on distance adjustment, the concentration is below the objective although it is still within 10% of the objective (37.1 µg/m^3), as is also the case for site 121 (37.6 µg/m^3). These sites will continue to be closely observed, especially with regard to planning or transport developments that may affect future nitrogen dioxide concentrations.

It is proposed to relocate the other borderline monitoring sites, wherever possible, to either the façade of the nearest residential property or to the nearest worse-case location to better represent relevant exposure.

Current Status of Cribbs Causeway AQMA

Following the declaration of the Cribbs Causeway AQMA in 2010 (see Figure 4), a Further Assessment of air quality within the AQMA was undertaken. The Further Assessment Report 2011 concluded the 2010 nitrogen dioxide concentration (33.0 µg/m^3) at monitoring site 87, located at the façade of the single property in the AQMA, was below the annual mean objective, indicating the AQMA was longer required. As a precaution, the recommendation was made to continue monitoring

and review the 2011 results and if these results were also below the objective, then it would be appropriate to revoke the AQMA.

The 2011 result (34.0 µg/m^3) also showed the annual mean nitrogen dioxide concentration at site 87 was below the objective. Consequently, the revocation of the AQMA was proposed in the 2012 USA. However, Defra recommended on appraisal of the report that the AQMA be retained pending further monitoring results.

While the 2010 and 2011 monitoring results at the façade of the single property within the AQMA were below the annual mean objective, Defra advised that as pollutant concentrations can vary significantly from one year to another, the Council should wait and review further monitoring data before making the decision to revoke the AQMA or not.

The Council has accepted the recommendation to retain the AQMA. Triplicate diffusion tube monitoring, which is considered to be more robust, has been set up at the façade of the single property within the AQMA. These results will be reported in the 2014 Progress Report. In the meantime, 2012 data reported in this report shows the annual mean concentration (35.0 µg/m^3) is still below the objective, although the nitrogen dioxide concentration has steadily increased by a 1 µg/m^3 per year since 2010.

As the AQMA can be only be revoked through a detailed assessment or Updating and Screening Assessment, a decision as to whether to revoke the AQMA or not, is likely to be made in the next USA due in 2015. By this time, the Council will have 5 years of monitoring data, of which 2 years will be triplicate monitoring. It is proposed to review the situation at this stage when there may also be a clearer picture of the future development proposed for the Cribbs Causeway area, which could impact on the AQMA.

It is proposed to update the residents and other relevant statutory consultees who were originally consulted on the revocation of the AQMA.

Table 7 Results of Nitrogen Dioxide Diffusion Tubes in 2012

Site No.	Site Name	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 = 0.95)
1	Yate - Station Road Motor Aids	Roadside	N	N	100%	**37.0**
4	Yate - Station Road Co-location 1	Roadside	N	Triplicate & Co-located	100%	29.6
5	Yate - Station Road Co-location 2	Roadside	N	Triplicate & Co-located	75%	30.3
6	Yate - Station Road Co-location 3	Roadside	N	Triplicate & Co-located	92%	27.8
10	Filton - 152 Gloucester Road North Pizza Plant façade	Roadside	N	N	100%	**39.5**
11	Thornbury – 48 High Street Morgan Stone	Roadside	N	N	100%	30.7
12	Stoke Gifford - Church Road rear of Friends Life	Roadside	N	N	100%	34.5
13	Filton - MOD Roundabout	Roadside	N	N	100%	**36.7**
14	Hambrook - Bristol Road opp The Gables	Roadside	N	N	75%	**63.4**
17	Kingswood - 79 Regent Street HSBC	Roadside	Y	N	100%	31.3
18	Kingswood - 70 Regent Street CM Lea facade	Roadside	Y	N	92%	**41.9**
21	Downend – Boscombe Crescent St Augustines Church	Urban Background	N	N	100%	21.8
22	Hanham - 44 High Street Lloyds Bank	Roadside	N	N	92%	34.9
23	Kingswood - Cecil Road	Roadside	N	N	100%	35.4
26	Kingswood – 8 Gilbert Road	Urban Background	N	N	100%	25.7
27	Kingswood - 90 Regent Street Nat West façade	Roadside	Y	N	100%	35.6

Site No.	Site Name	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 = 0.95)
29	Staple Hill - 123 High Street Backhouse Bet	Roadside	Y	N	100%	**43.6**
34	Bradley Stoke – 109 Ormonds Close M4 East of Almondsbury Interchange	Roadside	N	N	100%	33.6
35	Bradley Stoke - Woodlands Lane M4 East of Almondsbury Interchange (lp47)	Roadside	N	N	100%	35.3
36	Hambrook - Whiteshill M4 East of M32	Roadside	N	N	92%	23.7
37	Almondsbury - Old Aust Road M4 West of Almondsbury Interchange	Roadside	N	N	100%	34.5
38	Severn Beach – Ableton Lane Severn Beach Primary School	Urban Background	N	N	83%	17.6
42	Little Stoke -Braydon Ave	Urban Background	N	N	100%	28.1
43	Patchway - Highwood Road opp St. Chad's Vicarage	Roadside	N	N	100%	33.3
44	Stoke Gifford - Hatchet Road	Roadside	N	N	100%	**36.9**
45	Bradley Stoke - Bradley Stoke Way	Roadside	N	N	100%	**39.2**
46	Winterbourne - High Street opp The Ridings School	Roadside	N	N	100%	**37.2**
47	Bromley Heath - A4174	Roadside	N	N	100%	**47.7**
51	Hambrook - Rear of 96 Old Gloucester Road	Urban Background	N	N	67%	23.4[a]
52	Hambrook - A4174	Roadside	N	N	58%	**46.7**[a]
53	Hambrook – Bristol Road rear of 17 Fenbrook Close	Roadside	N	N	92%	33.6
54	Longwell Green - A431 / Aldermoor Way	Roadside	N	N	92%	**36.0**

Site No.	Site Name	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 = 0.95)
55	Longwell Green - Ring Road Roundabout Junction Leisure Road	Roadside	N	N	67%	**54.8**[a]
57	Coalpit Heath - Badminton Road The Salon/Carpet shop	Roadside	N	N	83%	34.0
58	Longwell Green - Kingsfield Lane/ Aspects Leisure Site (lp6)	Roadside	N	N	17%	19.4[a]
60	Downend - North Street Kustom Floors & Furniture	Roadside	N	N	100%	**38.0**
61	Staple Hill Crossroads - 1 Broad Street William Hill	Roadside	Y	N	83%	**45.8**
62	Staple Hill Crossroads - 2 Broad Street Coffee Junction façade	Roadside	Y	N	92%	**43.7**
63	Patchway – 28 Park Leaze	Roadside	N	N	100%	31.4
67	Kingswood - 40 Regent Street Thomas Cook façade	Roadside	Y	N	100%	**47.6**
68	Kingswood - 26-32 Regent Street Store Twenty One façade	Roadside	Y	N	100%	**48.2**
69	Kingswood - 12 Regent Street Silver Brides façade	Roadside	Y	N	100%	**41.9**
70	Kingswood - Two Mile Hill Road Job Centre Plus façade	Roadside	Y	N	75%	35.8
71	Staple Hill - 11 The Square Liquidation Stock Warehouse	Roadside	Y	N	92%	29.2
72	Staple Hill - 25 Broad Street Westbury Inks	Roadside	Y	N	83%	**40.3**
73	Staple Hill - 11 Soundwell Road Starlight	Roadside	Y	N	100%	**40.6**
74	Staple Hill - 29-31 Soundwell Road opp Page Comm Assoc	Roadside	Y	N	92%	35.3
75	Staple Hill - 118 High Street Santander	Roadside	Y	N	100%	**44.2**
76	Staple Hill - 84-86 High Street Staple Oak Pub façade	Roadside	Y	N	92%	**38.6**

Site No.	Site Name	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 = 0.95)
78	Staple Hill - 9-11 Victoria Street	Roadside	Y	N	83%	**52.8**
79	Staple Hill - 27-29 Victoria Street	Roadside	Y	N	67%	**45.9**[a]
81	Cribbs Causeway - Hollywood Cottage Blackhorse Hill (nearest M5 Roundabout)	Roadside	Y	N	100%	**72.3**
83	Chipping Sodbury – 51A Broad Street façade	Roadside	N	N	92%	29.2
87	Cribbs Causeway - Blackhorse Hill Hollywood Cottage facade	Roadside	Y	N	100%	35.0
88	Cribbs Causeway - Blackhorse Hill St. Swithin's Lodge facade	Roadside	N	N	100%	30.8
90	Kingswood - Downend Road Junction with Boultons Road	Roadside	Y	N	100%	**40.8**
92	Kingswood - Regent Street British Legion Club	Roadside	Y	N	92%	**41.9**
93	Kingswood - Hanham Road Exchange Court Flats	Roadside	Y	N	58%	34.8[a]
94	Kingswood - High Street Kings Arms facade	Roadside	Y	N	92%	**51.8**
95	Kingswood - 45 High Street Adam Lee facade	Roadside	Y	N	100%	**42.6**
96	Kingswood - 71 High Street Homeless Project	Roadside	Y	N	83%	**43.9**
97	Kingswood - 129 High Street	Roadside	Y	N	92%	**39.0**
98	Kingswood - High Street City of Bristol College facade	Roadside	Y	N	92%	**40.2**
101	Staple Hill - High Street lp outside Beech House	Roadside	N	N	92%	34.6
102	Staple Hill - 58 High Street Aladdin's Cave facade	Roadside	Y	N	92%	**47.8**

Site No.	Site Name	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 = 0.95)
103	Staple Hill - Page Road Brookridge Court	Roadside	N	N	75%	27.1
104	Staple Hill - Page Road Staple Hill Primary School	Roadside	N	N	100%	29.5
105	Staple Hill - North Street lp outside no 2	Roadside	Y	N	67%	32.1[a]
106	Stoke Gifford - 73 Hambrook Lane façade	Other	N	N	100%	26.4
107	Stoke Gifford - 77 Hambrook Lane façade	Other	N	N	92%	26.5
108	Patchway - 204 Gloucester Road rear façade	Other	N	N	75%	34.5
109	Little Stoke - Clay Lane lp8 (rear of Gallivan Close)	Other	N	N	92%	29.5
110	Winterbourne - 2 Sandstone Rise rear façade	Other	N	N	83%	26.5
111	Winterbourne - 2 Down Road façade	Other	N	N	92%	21.4
112	Winterbourne - 106 Dragon Road façade	Other	N	N	83%	21.0
113	Patchway - 5 Falcon Close façade	Roadside	N	N	83%	35.2
114	Pilning - 23 Keens Grove façade	Roadside	N	N	92%	30.6
115	Pilning - 2 Wick Road façade	Roadside	N	N	100%	30.3
116	Warmley - 14 High Street Webbs façade	Roadside	N	N	100%	**50.0**
117	Filton Northville - 29 Gloucester Road North Blockbuster	Roadside	N	N	75%	35.6
118	Filton Northville - 19 Gloucester Road North Dental Lab	Roadside	N	N	75%	34.2
119	Filton - 137 Gloucester Road North	Roadside	N	N	75%	35.5

Site No.	Site Name	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 = 0.95)
120	Filton – 709 Southmead Road	Roadside	N	N	83%	**43.3**
121	Filton - 107 Gloucester Road North	Roadside	N	N	83%	**37.6**
122	Filton - 549 Filton Avenue	Roadside	N	N	83%	**36.8**
123	Filton - 542 Filton Avenue Al's Hobbies	Roadside	N	N	75%	33.6
124	Filton - 702a Filton Ave Way Ahead	Roadside	N	N	83%	**37.8**
125	Filton - 71 Station Road	Roadside	N	N	83%	33.1
126	Soundwell - 296 Soundwell Road	Roadside	N	N	83%	32.9
127	Soundwell - 264 Soundwell Road	Roadside	N	N	83%	**45.9**
128	Kingswood - 109 Downend Road	Roadside	N	N	83%	**36.6**
129	Cribbs Causeway - 1 Holly Cottages façade	Roadside	N	N	83%	32.4
130	Cribbs Causeway - 2 Mayfield Cottages façade	Roadside	N	N	83%	31.0
131	Bradley Stoke - 188 Oaktree Crescent	Roadside	N	N	83%	**36.3**
132	Hanham - 66 High St	Roadside	N	N	83%	**36.7**
133	Hambrook - 123 Old Gloucester Road façade	Roadside	N	N	25%	28.8[a]

[a] Annualised mean where full calendar year data capture <75% as in Box 3.2 of TG(09)

Exceedence of NO_2 annual mean objective (40μg/m^3)

Exceedence of NO_2 annual mean objective >60μg/m^3 indicating potential exceedence of NO2 hourly mean objective

Borderline within 10% of NO_2 annual mean objective (>36μg/m^3)

Table 8 Results of Nitrogen Dioxide Diffusion Tubes (2008 to 2012)

Site No.	Site Name	Site Type	Within AQMA?	Annual Mean Concentration - Adjusted for Bias (μg/m^3)				
				2008 (Bias Adjustment Factor = 0.87)	2009 (Bias Adjustment Factor = 0.80)	2010 (Bias Adjustment Factor = 0.85)	2011 (Bias Adjustment Factor = 0.83)	2012 (Bias Adjustment Factor = 0.95)
1	Yate - Station Road Motor Aids	Roadside	N	34.4	32.2	**37.4**	31.2	**37.0**
4	Yate - Station Road Co-location 1	Roadside	N	30.3	26.9	27.9	26.4	29.6
5	Yate - Station Road Co-location 2	Roadside	N	29.8	27.7	28.0	25.7	30.3
6	Yate - Station Road Co-location 3	Roadside	N	30.1	27.1	28.5	25.3	27.8
10	Filton - 152 Gloucester Road North Pizza Plant façade	Roadside	N	**38.2**	35.9	**37.6**	34.8	**39.5**
11	Thornbury – 48 High Street Morgan Stone	Roadside	N	31.7	27.4	30.8	27.9	30.7
12	Stoke Gifford - Church Road rear of Friends Life	Roadside	N	31.0	27.9	32.5	27.3	34.5
13	Filton - MOD Roundabout	Roadside	N	34.2	31.2	35.1	28.9	**36.7**
14	Hambrook - Bristol Road opp The Gables	Roadside	N	**46.3**	**41.1**	**60.9**	**63.2**	**63.4**
17	Kingswood - 79 Regent Street HSBC	Roadside	Y	28.9	25.3	27.0	25.4	31.3
18	Kingswood - 70 Regent Street CM Lea facade	Roadside	Y	**45.6**	38.3	**40.8**	**37.3**	**41.9**
21	Downend – Boscombe Crescent St Augustines Church	Urban Background	N	22.4	19.0	21.9	18.6	21.8
22	Hanham - 44 High Street Lloyds Bank	Roadside	N	32.1	27.5	33.2	31.4	34.9
23	Kingswood - Cecil Road	Roadside	N	**39.3**	33.1	**36.4**	28.1	35.4
26	Kingswood – 8 Gilbert Road	Urban Background	N	29.0	23.4	24.7	22.3	25.7

Site No.	Site Name	Site Type	Within AQMA?	Annual Mean Concentration - Adjusted for Bias (μg/m^3)				
				2008 (Bias Adjustment Factor = 0.87)	2009 (Bias Adjustment Factor = 0.80)	2010 (Bias Adjustment Factor = 0.85)	2011 (Bias Adjustment Factor = 0.83)	2012 (Bias Adjustment Factor = 0.95)
27	Kingswood - 90 Regent Street Nat West façade	Roadside	Y	**41.9**	**39.3**	**38.6**	31.8	35.6
29	Staple Hill - 123 High Street Backhouse Bet	Roadside	Y	**42.2**	**39.7**	**45.4**	**37.9**	**43.6**
34	Bradley Stoke – 109 Ormonds Close M4 East of Almondsbury Interchange	Roadside	N	30.8	28.8	**37.0**	32.3	33.6
35	Bradley Stoke - Woodlands Lane M4 East of Almondsbury Interchange (lp47)	Roadside	N	**40.7**	**39.2**	**46.4**	**40.9**	35.3
36	Hambrook - Whiteshill M4 East of M32	Roadside	N	26.7	31.7	23.5	21.9	23.7
37	Almondsbury - Old Aust Road M4 West of Almondsbury Interchange	Roadside	N	29.5	34.7[a]	**40.0**	34.5	34.5
38	Severn Beach – Ableton Lane Severn Beach Primary School	Urban Background	N	17.0	15.3	17.8	16.2	17.6
42	Little Stoke -Braydon Ave	Urban Background	N	26.0	25.3	28.3	26.3	28.1
43	Patchway - Highwood Road opp St. Chad's Vicarage	Roadside	N	33.8	34.5	**40.5**	30.3	33.3
44	Stoke Gifford - Hatchet Road	Roadside	N	33.0	32.8	36.0	30.5	**36.9**
45	Bradley Stoke - Bradley Stoke Way	Roadside	N	**38.3**	**37.5**	**40.3**	**38.4**	**39.2**
46	Winterbourne - High Street opp The Ridings School	Roadside	N	34.2	31.6	35.5	33.0	**37.2**
47	Bromley Heath - A4174	Roadside	N	**46.5**	**44.9**	**51.2**	**42.8**	**47.7**
51	Hambrook - Rear of 96 Old Gloucester Road	Urban Background	N	28.0	23.4	28.2	21.4	23.4[a]
52	Hambrook - A4174	Roadside	N	**44.8**	**41.1**	**43.5**	**40.7**	**46.7**[a]

Site No.	Site Name	Site Type	Within AQMA?	Annual Mean Concentration - Adjusted for Bias (μg/m^3)				
				2008 (Bias Adjustment Factor = 0.87)	2009 (Bias Adjustment Factor = 0.80)	2010 (Bias Adjustment Factor = 0.85)	2011 (Bias Adjustment Factor = 0.83)	2012 (Bias Adjustment Factor = 0.95)
53	Hambrook – Bristol Road rear of 17 Fenbrook Close	Roadside	N	30.9	28.3	35.1	29.4	33.6
54	Longwell Green - A431 / Aldermoor Way	Roadside	N	33.8	33.2	**38.4**	32.7	**36.0**
55	Longwell Green - Ring Road Roundabout Junction Leisure Road	Roadside	N	**38.0**	33.6	**39.3**	**40.3**	**54.8**[a]
57	Coalpit Heath - Badminton Road The Salon/Carpet shop	Roadside	N	31.7	30.4	33.5	30.8	34.0
58	Longwell Green - Kingsfield Lane/ Aspects Leisure Site (lp6)	Roadside	N	24.8	20.7	27.7	23.1	19.4[a]
60	Downend - North Street Kustom Floors & Furniture	Roadside	N	30.4	32.5	**36.8**	34.6	**38.0**
61	Staple Hill Crossroads - 1 Broad Street William Hill	Roadside	Y	**44.5**	**41.7**	**47.3**	**40.7**	**45.8**
62	Staple Hill Crossroads - 2 Broad Street Coffee Junction façade	Roadside	Y	**43.5**	**39.9**	**47.4**	**40.3**	**43.7**
63	Patchway – 28 Park Leaze	Roadside	N	35.7	27.8	31.9	30.3	31.4
67	Kingswood - 40 Regent Street Thomas Cook façade	Roadside	Y	**45.8**	**41.9**	**42.2**	**42.2**	**47.6**
68	Kingswood - 26-32 Regent Street Store Twenty One façade	Roadside	Y	**48.3**	**41.9**	**45.0**	**43.6**	**48.2**
69	Kingswood - 12 Regent Street Silver Brides façade	Roadside	Y	**40.2**	**37.3**	**39.6**	**38.1**	**41.9**
70	Kingswood - Two Mile Hill Road Job Centre Plus façade	Roadside	Y	**36.3**	34.1	**37.8**	32.7	35.8
71	Staple Hill - 11 The Square Liquidation Stock Warehouse	Roadside	Y	29.1	25.9[a]	30.0	25.5	29.2
72	Staple Hill - 25 Broad Street Westbury Inks	Roadside	Y	35.2	32.6	35.4	31.2	**40.3**
73	Staple Hill - 11 Soundwell Road Starlight	Roadside	Y	**43.7**	**38.9**	**47.9**	**37.8**	**40.6**

Site No.	Site Name	Site Type	Within AQMA?	Annual Mean Concentration - Adjusted for Bias (μg/m^3)				
				2008 (Bias Adjustment Factor = 0.87)	2009 (Bias Adjustment Factor = 0.80)	2010 (Bias Adjustment Factor = 0.85)	2011 (Bias Adjustment Factor = 0.83)	2012 (Bias Adjustment Factor = 0.95)
74	Staple Hill - 29-31 Soundwell Road opp Page Comm Assoc	Roadside	Y	36.6	30.8	34.3	30.4	35.3
75	Staple Hill - 118 High Street Santander	Roadside	Y	43.7	43.0	42.8	42.7	44.2
76	Staple Hill - 84-86 High Street Staple Oak Pub façade	Roadside	Y	41.9	34.8	37.8	37.0	38.6
78	Staple Hill - 9-11 Victoria Street	Roadside	Y	44.9	41.5	45.5	43.0	52.8
79	Staple Hill - 27-29 Victoria Street	Roadside	Y	45.7	37.5	41.2	39.6	45.9[a]
81	Cribbs Causeway - Hollywood Cottage Blackhorse Hill (nearest M5 Roundabout)	Roadside	Y	62.6	56.0[a]	70.1	67.4	72.3
83	Chipping Sodbury – 51A Broad Street façade	Roadside	N	30.7	25.6	28.4	28.0	29.2
87	Cribbs Causeway - Blackhorse Hill Hollywood Cottage facade	Roadside	Y	n/a	33.0[a]	33.0	34.0	35.0
88	Cribbs Causeway - Blackhorse Hill St. Swithin's Lodge facade	Roadside	N	n/a	25.0[a]	25.9	25.6	30.8
90	Kingswood - Downend Road Junction with Boultons Road	Roadside	Y	n/a	30.1[a]	35.0	35.0	40.8
92	Kingswood - Regent Street British Legion Club	Roadside	Y	n/a	31.4[a]	37.3[d]	37.8	41.9
93	Kingswood - Hanham Road Exchange Court Flats	Roadside	Y	n/a	29.5[a]	38.4	34.3	34.8[a]
94	Kingswood - High Street Kings Arms facade	Roadside	Y	n/a	38.4[a]	44.5	46.0	51.8
95	Kingswood - 45 High Street Adam Lee facade	Roadside	Y	n/a	30.2[a]	42.8	38.0	42.6
96	Kingswood - 71 High Street Homeless Project	Roadside	Y	n/a	32.4[a]	40.8	37.5	43.9

Site No.	Site Name	Site Type	Within AQMA?	Annual Mean Concentration - Adjusted for Bias (μg/m^3)				
				2008 (Bias Adjustment Factor = 0.87)	2009 (Bias Adjustment Factor = 0.80)	2010 (Bias Adjustment Factor = 0.85)	2011 (Bias Adjustment Factor = 0.83)	2012 (Bias Adjustment Factor = 0.95)
97	Kingswood - 129 High Street	Roadside	Y	n/a	31.5[a]	**39.0**	32.9	**39.0**
98	Kingswood - High Street City of Bristol College facade	Roadside	Y	n/a	31.7[a]	**37.6**	33.3	**40.2**
101	Staple Hill - High Street lp outside Beech House	Roadside	N	n/a	25.3[a]	31.2	27.2	34.6
102	Staple Hill - 58 High Street Aladdin's Cave facade	Roadside	Y	n/a	**43.5**	**44.8**	**42.1**	**47.8**
103	Staple Hill - Page Road Brookridge Court	Roadside	N	n/a	26.7[a]	28.1	24.9	27.1
104	Staple Hill - Page Road Staple Hill Primary School	Roadside	N	n/a	22.2[a]	28.1	23.4	29.5
105	Staple Hill – North Street lp outside no 2	Roadside	Y	n/a	27.6[a]	33.4	30.5	32.1[a]
106	Stoke Gifford 73 Hambrook Lane façade	Other	N	n/a	n/a	n/a	21.1	26.4
107	Stoke Gifford 77 Hambrook Lane façade	Other	N	n/a	n/a	n/a	18.6	26.5
108	Patchway 204 Gloucester Road Rear façade	Other	N	n/a	n/a	n/a	26.7	34.5
109	Little Stoke Clay Lane lp8 (rear of Gallivan Close)	Other	N	n/a	n/a	n/a	24.3	29.5
110	Winterbourne 2 Sandstone Rise Rear façade	Other	N	n/a	n/a	n/a	18.9	26.5
111	Winterbourne 2 Down Road façade	Other	N	n/a	n/a	n/a	19.5	21.4
112	Winterbourne 106 Dragon Road façade	Other	N	n/a	n/a	n/a	23.0[a]	21.0
113	Patchway 5 Falcon Close façade	Roadside	N	n/a	n/a	n/a	35.1	35.2
114	Pilning 23 Keens Grove façade	Roadside	N	n/a	n/a	n/a	25.8	30.6

Site No.	Site Name	Site Type	Within AQMA?	Annual Mean Concentration - Adjusted for Bias (μg/m^3)				
				2008 (Bias Adjustment Factor = 0.87)	2009 (Bias Adjustment Factor = 0.80)	2010 (Bias Adjustment Factor = 0.85)	2011 (Bias Adjustment Factor = 0.83)	2012 (Bias Adjustment Factor = 0.95)
115	Pilning 2 Wick Road façade	Roadside	N	n/a	n/a	n/a	25.4	30.3
116	Warmley 14 High Street Webbs façade	Roadside	N	n/a	n/a	n/a	**51.0**[a]	**50.0**
117	Filton Northville 29 Gloucester Road North Blockbuster	Roadside	N	n/a	n/a	n/a	n/a	35.6
118	Filton Northville 19 Gloucester Road North Dental Lab	Roadside	N	n/a	n/a	n/a	n/a	34.2
119	Filton 137 Gloucester Road North	Roadside	N	n/a	n/a	n/a	n/a	35.5
120	Filton 709 Southmead Road	Roadside	N	n/a	n/a	n/a	n/a	**43.3**
121	Filton 107 Gloucester Road North	Roadside	N	n/a	n/a	n/a	n/a	**37.6**
122	Filton 549 Filton Avenue	Roadside	N	n/a	n/a	n/a	n/a	**36.8**
123	Filton 542 Filton Avenue Al's Hobbies	Roadside	N	n/a	n/a	n/a	n/a	33.6
124	Filton 702a Filton Ave Way Ahead	Roadside	N	n/a	n/a	n/a	n/a	**37.8**
125	Filton 71 Station Road	Roadside	N	n/a	n/a	n/a	n/a	33.1
126	Soundwell 296 Soundwell Road	Roadside	N	n/a	n/a	n/a	n/a	32.9
127	Soundwell 264 Soundwell Road	Roadside	N	n/a	n/a	n/a	n/a	**45.9**
128	Kingswood 109 Downend Road	Roadside	N	n/a	n/a	n/a	n/a	**36.6**
129	Cribbs Causeway – 1 Holly Cottages façade	Roadside	N	n/a	n/a	n/a	n/a	32.4
130	Cribbs Causeway – 2 Mayfield Cottages façade	Roadside	N	n/a	n/a	n/a	n/a	31.0

Site No.	Site Name	Site Type	Within AQMA?	Annual Mean Concentration - Adjusted for Bias (μg/m^3)				
				2008 (Bias Adjustment Factor = 0.87)	2009 (Bias Adjustment Factor = 0.80)	2010 (Bias Adjustment Factor = 0.85)	2011 (Bias Adjustment Factor = 0.83)	2012 (Bias Adjustment Factor = 0.95)
131	Bradley Stoke - 188 Oaktree Crescent	Roadside	N	n/a	n/a	n/a	n/a	**36.3**
132	Hanham - 66 High St	Roadside	N	n/a	n/a	n/a	n/a	**36.7**
133	Hambrook - 123 Old Gloucester Road façade	Roadside	N	n/a	n/a	n/a	n/a	28.8[a]

[a] Annualised mean where full calendar year data capture <75% as in Box 3.2 of TG(09)

Exceedence of NO_2 annual mean objective (40μg/m^3)

Exceedence of NO_2 annual mean objective >60μg/m^3 indicating potential exceedence of NO2 hourly mean objective

Borderline within 10% of NO_2 annual mean objective (>36μg/m^3)

2.2.2 Particulate Matter (PM_{10})

During 2012, PM_{10} was monitored at two automatic monitoring sites in Filton and Yate. At Filton, PM_{10} is monitored using a TEOM and at Yate, using a BAM 1020. A BAM 1020 was also previously used at the Kingswood automatic monitoring site before the site ceased operation in 2010. All the results have been adjusted to gravimetric equivalent with the TEOM data corrected using the VCM (Volatile correction model) and the BAM data corrected for slope (see Appendix B).

The results from automatic monitoring are shown in Table 9 and Table 10. The PM_{10} concentrations are well below the annual mean objective (40 µg/m^3) and 24-hour mean objective (50 µg/m^3, not to be exceeded more than 35 times a year) in all years. Summary plots of the 2012 PM_{10} hourly mean values at the Filton and Yate automatic monitoring sites are provided in Figure 27(Appendix B).

The trend data presented in Figure 2 shows that PM_{10} concentrations have generally been stable since 2005, though in 2010 at Yate and 2011 at both Yate and Filton, there was a slight upward trend. However, in 2012, a slight decrease from 2011 concentrations can be observed at both sites.

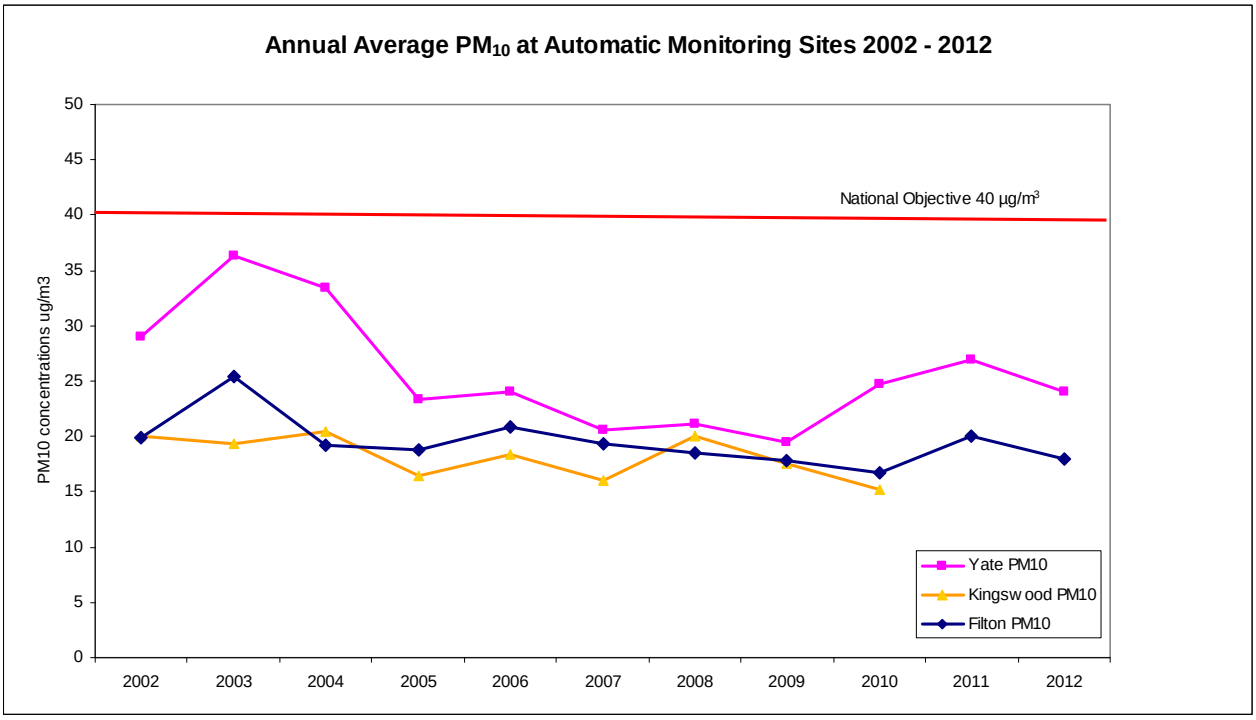

Figure 2 Trends in Annual Mean PM10 Concentrations

Table 9 Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site Name	Site Type	Within AQMA [a]?	Valid Data Capture 2012 % [b]	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration μg/m^3				
					2008	2009	2010	2011	2012
Filton Conygre House, Conygre Road	Urban background	N	95.2	Y	18.5	17.8	16.7	20	18
Kingswood City of Bristol College, High Street	Roadside	N	n/a	Y	20.0	17.5	15.2	-	-
Yate Station Road	Roadside	N	99.4	Y	21.1	19.5	24.7	27	24

Table 10 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour mean Objective

Site Name	Site Type	Within AQMA[a]?	Valid Data Capture 2012 % [b]	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 μg/m^3)				
					2008	2009	2010	2011	2012
Filton Conygre House, Conygre Road	Urban background	N	95.2	Y	5	3	0	8	4
Kingswood City of Bristol College, High Street	Roadside	N	n/a	Y	4	0	0 (23.7) [c]	-	-
Yate Station Road	Roadside	N	99.4	Y	6	2 (30.9) [c]	4 (34.5) [c]	14	7

[a] AQMAs declared for nitrogen dioxide only

[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] If data capture for the full calendar year is less than 90%, the 90.4th percentile of 24-hour means is shown in brackets

2.2.3 Sulphur Dioxide (SO_2)

South Gloucestershire Council does not monitor sulphur dioxide.

2.2.4 Benzene

In 2012, the benzene monitoring network was reduced from 23 sites to 6 because monitoring had shown no exceedences of the benzene objectives. The exposure periods of the BTX (Benzene, Toluene and Xylene) diffusion tubes used for the monitoring were also extended from fortnightly to monthly. The BTX tubes are co-located at six nitrogen dioxide monitoring sites. However, as one of the nitrogen dioxide sites (site 52) ceased operation at the end of September 2012, the benzene monitoring also ceased, leaving five operational benzene sites.

For 2012, the laboratory undertaking the benzene analysis changed from Bristol Scientific Services to Gradko (sub-contractor for Somerset Scientific Services). The analysis by Gradko achieved lower limits of detection, which is shown in lower annual means at all the sites in 2012 than in previous years. The monitoring results for benzene are presented in Table 11 and show measured concentrations are well below the annual mean objective.

Table 11 Results of Benzene Monitoring

Site No.	Site Name	Data capture 2012 (%)	Annual Mean (ug/m^3)				
			2008	2009	2010	2011	2012
1	Yate - Station Road Motor Aids	92	1.8	1.6	1.8	1.4	0.6
21	Downend – Boscombe Crescent St Augustines Church	100	1.1	1.0	1.1	0.8	0.3
27	Kingswood - 90 Regent Street Nat West	100	1.6	1.4	1.4	1.1	0.6
42	Little Stoke -Braydon Ave	83	1.0	1.0	1.1	0.8	0.5
52	Hambrook - A4174	75	1.0	1.3	1.3	1.0	0.7
54	Longwell Green - A431 / Aldermoor Way	92	1.4	1.5	1.3	1.3	0.7
Annual Mean Objective (ug/m^3)			**5**	**5**	**5**	**5**	**5**

2.2.5 Other Pollutants Monitored

The Council also monitors ozone and the heavy metals; lead, cadmium, zinc and copper. These results are presented in sections 2.2.6 to 2.2.11 below. The Council does not monitor 1,3-butadiene. Carbon monoxide monitoring ceased at the end of 2006.

2.2.6 Ozone

Ozone is a regional and trans-boundary pollutant. Consequently, the objective for ozone is not included in local air quality management regulations. The health-based objective for ozone, as specified in the national air quality strategy, is 100 µg/m^3, measured as an 8- hour mean, not to be exceeded more than ten times a year.

Data from the automatic monitor located at Badminton are presented in Table 12 and Table 13. There were 7 exceedences of 8-hour mean ozone objective in 2012, which is below the maximum number of exceedences allowed, so the guideline objective is not exceeded. Data capture for the 2nd and 3rd quarters is reported as this is when ozone concentrations are likely to be the highest. All of the exceedences occurred during these quarters.

Table 12 Results of Ozone Automatic Monitoring: Annual mean

Site Name	Within AQMA?	Data capture 2012 (%)	Data capture 2012 in 2nd & 3rd Quarter (%)	Annual Mean (ug/m^3)				
				2008	2009	2010	2011	2012
Badminton Memorial Hall, Hayes Lane	N	96.2	95.1	51.8	49.8	49.0	51.6	50.1
Guideline Objective (ug/m^3)				100	100	100	100	100

Table 13 Results of Ozone Automatic Monitoring: Comparison with 8-hour mean objective

Site Name	Within AQMA?	Data capture 2012 (%)	Data capture 2012 in 2nd & 3rd Quarter (%)	Number of exceedences of 8-hour mean (ug/m^3)				
				2008	2009	2010	2011	2012
Badminton Memorial Hall, Hayes Lane	N	96.2	95.1	9	6	6	10	7
Guideline Objective (no. of exceedences)				10	10	10	10	10

2.2.7 Heavy Metals

Lead, cadmium, copper and zinc are monitored at three sites using Millipore volume samplers. The monitoring sites at Cribbs Causeway and Pilning were selected as they are downwind of the industrial processes in Avonmouth and Severnside. The Yate site was selected as a background monitoring site. A map showing the location of the Millipore monitoring sites (Figure 23) is available in Appendix A.

Lead is included in the local air quality management regulations and has prescribed objectives. The results of lead monitoring are presented in section 2.2.8. Although cadmium, copper and zinc are not included in the regulations and have no locally applicable objectives, the monitoring results for these heavy metals are reported in sections 2.2.9 to 2.2.11.

In 2011, the laboratory undertaking the heavy metal sample analysis changed from Bristol Scientific Services to Somerset Scientific Services. The results from 2011 onwards are reported with a lower limit of detection for all the analysed metals.

2.2.8 Lead

The results of lead monitoring are presented in Table 14. There are no exceedences of the air quality objectives for lead with monitored concentrations well below the 2008 annual mean objective of 0.25 µg/m^3.

Table 14 Results of Lead Monitoring

Site Name	Data capture 2012 (%)	Annual Mean (ug/m^3)				
		2008	2009	2010	2011	2012
Yate Broad Lane	100	0.02	0.01	<0.01	0.008	0.008
Cribbs Causeway Zoo Annexe	92	<0.01	<0.01	<0.01	0.006	0.007
Pilning Trading Standards	100	<0.01	<0.01	0.04	0.005	0.006
Annual Mean Objective (ug/m3)		0.25	0.25	0.25	0.25	0.25

2.2.9 Cadmium

The results of cadmium monitoring are presented in Table 15. There are no air quality objectives for cadmium.

Table 15 Results of Cadmium monitoring

Site Name	Data capture 2012 (%)	Annual Mean (ug/m^3)				
		2008	2009	2010	2011	2012
Yate Broad Lane	100	<0.01	<0.01	<0.01	<0.005	<0.005
Cribbs Causeway Zoo Annexe	92	<0.01	<0.01	<0.01	<0.005	<0.005
Pilning Trading Standards	100	<0.01	<0.01	<0.01	<0.005	<0.005
Annual Mean Objective (ug/m3)		-	-	-	-	-

2.2.10 Copper

The results of copper monitoring are presented in Table 16. There are no air quality objectives for copper.

Table 16 Results of Copper monitoring

Site Name	Data capture 2012 (%)	Annual Mean (ug/m^3)				
		2008	2009	2010	2011	2012
Yate Broad Lane	100	<0.01	<0.01	<0.01	0.007	0.007
Cribbs Causeway Zoo Annexe	92	<0.01	<0.01	<0.01	0.006	0.006
Pilning Trading Standards	100	<0.01	<0.01	<0.01	0.006	0.006
Annual Mean Objective (ug/m3)		-	-	-	-	-

2.2.11 Zinc

The results of zinc monitoring are presented in Table 17. There are no air quality objectives for zinc.

Table 17 Results of Zinc monitoring

Site Name	Data capture 2012 (%)	Annual Mean (ug/m^3)				
		2008	2009	2010	2011	2012
Yate Broad Lane	100	0.03	0.02	0.01	0.017	0.015
Cribbs Causeway Zoo Annexe	92	0.01	0.01	0.01	0.014	0.015

Site Name	Data capture 2012 (%)	Annual Mean (ug/m^3)				
		2008	2009	2010	2011	2012
Pilning Trading Standards	100	0.01	0.01	0.02	0.012	0.013
Annual Mean Objective (ug/m^3)		-	-	-	-	-

2.2.12 Summary of Compliance with AQS Objectives

South Gloucestershire Council has examined the results from monitoring in the district.

Concentrations within the Kingswood and Staple Hill AQMAs still exceed the annual mean objective for nitrogen dioxide and the AQMAs should remain.

While concentrations within the Cribbs Causeway AQMA are below the annual mean objective for nitrogen dioxide, the AQMA has been retained pending further monitoring results.

South Gloucestershire Council has measured concentrations of nitrogen dioxide above the annual mean objective at a relevant location outside of the AQMAs and **has already commenced a Detailed Assessment** for Warmley High Street.

3 New Local Developments

This section deals with changes in the South Gloucestershire area since the 2012 Updating and Screening Assessment that may affect air quality.

3.1 Road Traffic Sources

No new road traffic sources have been identified since the 2012 Updating and Screening Assessment.

There is, however, a new bus station /public transport hub proposed as part of the redevelopment of the University of West of England (UWE) main campus in Frenchay. The redevelopment involves the eventual consolidation of the other UWE sites at the main campus. The air quality assessment undertaken did not predict any exceedences at proposed nearby receptors on campus. The planning application (PT12/3809/O) was approved in June 2013.

Details of the proposed Stoke Gifford Transport Link (SGTL) were outlined in the 2012 USA. The SGTL is a new single-carriageway road which will run from Parkway North in Stoke Gifford to the A4174 Ring Road at Harry Stoke and is part of the North Fringe to Hengrove Package. A planning application for the SGTL (PT13/1529/R3F) was received in May 2013, accompanied by an Environmental Statement which included an assessment of the air quality impacts.

Concentrations of nitrogen dioxide (NO_2) and particulate matter (PM_{10}) were predicted to remain below the relevant objectives, with the impacts described as negligible at all receptors. However, when sensitivity testing was carried out, which assumed no reduction in background concentrations and vehicle emissions from the base year of 2011, exceedences were predicted at one receptor. However, it is predicted that an exceedence would occur at this receptor both with and without the SGTL and that with the SGTL, there appears to be a slight beneficial effect on predicted concentrations at this receptor. Monitoring is already carried out at the façade of receptor in question (site 133) so the site will be closely observed. The application is pending decision.

In terms of traffic generating proposals, there are a number of large scale developments likely, some of which have already come forward and are outlined in

the Planning Applications section of this report. In particular, growth pressures could increase traffic related emissions in the North Bristol Fringe.

3.2 Other Transport Sources

There are no new or newly identified non-road transport sources in South Gloucestershire.

To update on Filton Airfield following the 2012 USA, the airfield closed at the end of December 2012, though use for the police helicopter and air ambulance has been retained. The Council's emerging Core Strategy has identified the site for mixed use development, which is likely to consist of approximately 2,500 homes and 50 hectares for employment use. Comments on the scope of the air quality assessment, as part of the Environmental Impact Assessment (EIA) for the mixed-use development of the site, were provided in October 2012. The airfield site forms part of the Cribbs Causeway/Patchway New Neighbourhood proposed in the Core Strategy with a total of 5,700 dwellings proposed for the new neighbourhood.

Update on 2012 Detailed Assessment of Moving Trains

A Detailed Assessment was completed in July 2012 for nitrogen dioxide from moving railway locomotives in four locations; Little Stoke, Patchway, Stoke Gifford and Winterbourne on the London Paddington to Swansea railway line. This concluded there were no exceedences or likely exceedences of the annual mean nitrogen dioxide objective at properties (ten in total) within 30m of the railway line based on monitoring undertaken during 2011.

The report stated monitoring would continue until at least the end of 2012 to obtain a full calendar year of data as a precautionary measure. The 2012 monitoring results confirm the concentrations to be below the annual mean objective at all of the detailed assessment sites (106 – 112). The concentrations are below 30 $\mu g/m^3$ at all sites, except site 108 (34.5 $\mu g/m^3$). Monitoring has continued at two of the sites (106 and 108) to assess the potential impact of developments in the area. Monitoring ceased in early 2013 at the other sites.

3.3 Industrial Sources

The following new or proposed industrial sources have been identified in South Gloucestershire since the 2012 Updating and Screening Assessment.

Rolls Royce Marine Test Facility, Filton

A planning application (PT11/1427/F) was submitted in May 2011 for a marine (WR-21) engine test facility at Rolls Royce. An air quality assessment undertaken by URS/Scott Wilson was submitted with the application. This concluded that the proposed facility would not increase the risk of the relevant short-term objectives being exceeded and that there would be an imperceptible impact on the annual mean objectives at the receptors considered. Planning approval was subsequently granted in July 2011.

A subsequent application (PT12/3207/F) was received for an extension to the test facility. This application was accompanied by the original air quality assessment and an addendum, undertaken by ARUP, to update the assessment. The proposed extension, new location and changed operating times of the facility were considered and no exceedences of the relevant objectives were indicated. Planning approval for this application was granted in November 2012.

Seabank 3 Combined Cycle Gas Turbine (CCGT), Severnside

In February 2013, South Gloucestershire Council was consulted by the Planning Inspectorate (PINS) on a scoping report for Seabank 3; a proposed combined cycle gas turbine power station which will generate up to 1400 MW of electricity at Severnside. The site is within the South Gloucestershire Council administrative boundary but because the proposal is for a nationally significant infra-structure project, it is determined by PINS. Comments were provided on the proposed scope of the air quality assessment.

There are no other changes in industrial sources since the 2012 USA. Full details of permitted installations in South Gloucestershire are provided in Table 33 (Part A1) and Table 34 (Part A2 and B1) in Appendix D.

3.4 Commercial and Domestic Sources

3.4.1 Biomass Combustion – Individual Installations

Two proposed biomass boilers with a thermal capacity between 50 kW and 20MW came forward during 2012. Details of the proposed boilers are given below though neither are operational yet.

HM Prison Leyhill,Tortworth

A planning application (PT12/3724/F) was received that proposed an energy centre incorporating a Binder RRK/SRF-S biomass boiler (999 kW) with wood chip fuel and 3 gas boilers (1320 kW each) at Leyhill Prison. It is anticipated the biomass boiler will operate continuously backed up by one of the three gas boilers to meet the winter load. One of the other gas boilers will be a back-up for the first and the third will be maintained on cold standby so it is anticipated that only one gas boiler will be operating at any one time. All three gas boilers will exhaust to a single stack with a separate stack for the biomass boiler.

An air quality assessment was undertaken by WSP Environmental Ltd for the biomass boiler and gas boiler stacks which included ADMS 5 modelling to confirm the required stack heights (11m) to ensure adequate dispersal. The assessment concluded the emissions arising from the proposed energy centre would not cause exceedences, with the predicted concentrations of nitrogen dioxide, PM_{10} and carbon monoxide (CO) well below the relevant objectives at the assessed receptors. The highest predicted concentration of nitrogen dioxide at the maximum point of impact however, was within 10% of the annual mean objective although there is no anticipated relevant exposure at this location. Planning permission was granted in June 2013.

Warmley Park School, Warmley

A biomass boiler is proposed at Warmley Park School; a South Gloucestershire Council premises. The D'Alessandro CS 180kW boiler will use wood pellets as fuel. Information on the proposed boiler was obtained from the Council's Property Services and is provided in Table 35 (Appendix E). Background concentrations of nitrogen dioxide and PM_{10} were obtained from the background maps available on the Defra website[3]. The biomass calculator; an LAQM tool also available on the Defra Website[4], could not be used to screen the impacts of the proposed boiler as it was outside the range of the calculator, so the LAQM Helpdesk was contacted to undertake an ADMS Screen of the boiler.

The ADMS screen indicated potential exceedences of annual and hourly mean nitrogen dioxide objectives. The results of the screening assessment are shown in

[3] http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html
[4] http://laqm.defra.gov.uk/review-and-assessment/tools/emissions.html#biomass

Table 36. Screening assessments are designed to be inherently conservative and use the worse-case scenarios so where screening shows a significant impact, then a more detailed dispersion modelling assessment is required. Such an assessment will be undertaken for the proposed boiler and the dispersion modelling will be used to verify the stack height necessary to ensure the adequate dispersal of pollutant prior to the boiler becoming operational.

An update on this proposed boiler will be included in the 2014 Progress Report. This approach was discussed with the LAQM Helpdesk via a telephone call on 12th August 2012 and felt to be appropriate as the boiler is not yet operational.

It is acknowledged other biomass plant we are not aware of may be operational within South Gloucestershire. It can be difficult to identify potential new biomass plant from planning applications as it is not necessarily stated in the application that biomass is included. Any biomass plant which is subsequently identified will be assessed in future reports.

3.4.2 Biomass Combustion – Combined Impacts

Numerous small biomass combustion units, while acceptable individually, may have a cumulative impact on PM_{10} concentrations. Some of South Gloucestershire is covered by a Smoke Control Area[5] which allows only approved fuels and appliances to be used.

The Building Control Department collated the notifications of solid fuel equipment installations in South Gloucestershire during 2012 provided by HETAS; the official body recognised by the Government to approve solid fuel domestic heating appliances. The 2012 installations were considered in addition to the 2011 installations to assess the cumulative impacts of the total known installations. Information on the type of fuel used was not available so it has been assumed that the installations could burn both biomass (wood) and other solid fuel. The postcodes of all the installations were mapped using GIS. A 500m grid was derived from this data and a total figure for PM_{10} emission per year was calculated according to the guidance in Box 5.8 D.1b LAQM.TG(09). The type of appliance was taken from Table 5.3 and was assumed to be a stove. The PM_{10} emissions from the appliances were taken to be that of wood as this is the mostly likely fuel to be burnt as the

[5] http://www.southglos.gov.uk/Pages/Article%20Pages/Community%20Services/Environmental%20Services/Smoke-control-areas.aspx

smoke control area only covers part of South Gloucestershire. Emissions per appliance per year were therefore 25.84 kg per year.

The emissions per 500m grid square were compared with the annual PM_{10} emission threshold in the nomogram 5.22. The 2012 maximum PM_{10} background concentration in South Gloucestershire from the background maps is 20.5 µg/m^3. The highest emitting grid square (with 9 appliances) was located on the Downend/ Mangotsfield border and using the assumptions above would emit 233 kg per year. From the nomogram, the threshold for a 21 µg/m^3 background PM_{10} concentration would be approximately 5000 kg PM_{10} per year, so the actual emissions are estimated to be well below the threshold. Even if each appliance was assumed to be a stove with coal as the primary fuel; the worse-case scenario at 27.27 kg per year per appliance, the maximum gird would only emit 245 kg PM_{10} per year, still well under the threshold.

Most of the addresses listed appear to be domestic properties. It is quite probable that there is under-reporting of the number of properties burning solid fuel or biomass, due to people not notifying Building Control of work to their property to enable this. However, the threshold emission rate is high enough for PM_{10} to make this an insignificant concern.

A map showing the individual solid fuel installations and PM_{10} emissions (assuming wood as the fuel) per 500m grid square is provided in Figure 24 (Appendix A).

3.5 New Developments with Fugitive or Uncontrolled Sources

No new developments with fugitive or uncontrolled particulate emissions have been identified since the 2012 USA.

South Gloucestershire Council has identified a proposed biomass boiler at Warmley Park School which may potentially impact on air quality following screening. A detailed dispersion modelling assessment will be carried out for the proposed boiler and the modelling will be used to verify the stack height necessary to ensure the adequate dispersal of pollutant prior to the boiler becoming operational. An update will be provided in the 2014 Progress Report.

4 Local / Regional Air Quality Strategy

South Gloucestershire Council does not currently have a local air quality strategy in place, nor is there one associated with the Joint Local Transport Plan (see Chapter 7). Air Quality Officers from the West of England local authorities were involved in the production of the Joint Local Transport Plan (JLTP3).

An area- based Air Quality Strategy was published for the four West of England local authorities (South Gloucestershire, Bristol, Bath and North East Somerset and North Somerset) in 2003 and reviewed in 2005. Ideally, this strategy should be reviewed again to ensure it remains up to date.

5 Planning Applications

Significant or major planning applications that have been received and/or approved by South Gloucestershire Council since the last update in the 2010/11 Progress Report are shown in the Table 18. Applications under consideration have also been included to give a picture of areas where changes may occur and an indication of possible impacts on air quality, particularly where the combined impacts of several developments may become important.

Planning applications within the Kingswood and Staple Hill AQMAs have not been included in Table 18 as generally, the applications received are for small-scale development because these areas are more established with less scope for development. As such, the individual developments are unlikely to have a significant impact on air quality although cumulatively, the impacts could add up. However, it is usually highlighted that the proposed development is within (or close to) an area of poor air quality and as such, may impact on the new receptors introduced by the development. Where appropriate, suitable conditions requesting mitigation, such as non-opening windows and mechanical ventilation from a clean air source, are recommended to the planning officer.

Table 18 Major/Significant Planning Applications Received and/or Approved

Date Application Received	Reference	Location	Description	AQ Assessment	Application status
Earlier					
01-Jun-04	PK04/1965/O	Land at Emersons Green East Land to east of Avon Ring Road South of M4 Motorway and north west of disused railway line.	Urban extension on 99 hectares of land comprising of :- Residential development of up to 2550 dwellings; up to 100,000m2 of B1, B2, B8 and C1 employment floorspace. Up to 2,450 m2 of small scale A1, A2, A3 A4 and A5 uses. One, 2 - form entry primary school, a land reservation for a second 2 - form entry primary school and a land reservation for a secondary school. Community facilities including a community hall and cricket pavillion (class D1). Transportation infrastructure comprising connections to the Folly roundabout on Westerleigh Road and the Rosary roundabout on the Ring Road and the construction of the internal road network. A network of footways and cycleways. Structural landscaping. Formal and informal open space. Surface water attenuation areas. (Outline) with means of access to be determined.	Y –as part of EIA.	Approved - S106 Signed (14-Jun-13)
2011					
06-May-11	PT11/1442/O	Land At Park Farm Butt Lane Thornbury	Erection of up to 500 dwellings on 26.21 hectares of land with public open space, associated works and access. Outline application including access with all other matters reserved.	Y	Approved - S106 Signed (08-Mar-13)
01-Sep-11	PT11/2781/F	Filton Triangle Stoke Gifford Bristol BS34 7QG (Hitachi Rail Depot)	Erection of a Rail Maintenance Depot including sidings and associated maintenance buildings and accommodation, and fuel storage facilities. Improvements to existing access road, internal access roads and car parking, security fencing and landscaping.	Y - AQ Assessment as part of ES	Approved with Conditions (06-Feb-12)
07-Nov-11	PT11/3510/RM	Land At And To The North Of Ellinghurst Farm Pilning Bristol BS35 4JX	Erection of two buildings for storage and distribution (Use Class B8) with floor areas of 9,566sqm and 26,600sqm with associated access, parking and landscaping. Submitted under Condition 1 of planning permission SG4244 dated 27 November 1957.	Y as part of Environmental Statement	Approved with Conditions (29-May-12)
2012					
08-Feb-12	PK12/0429/O	Land North Of Peg Hill Yate Bristol South Gloucestershire BS37 7BL	Erection of up to 250 dwellings on 8.99 hectares of land with provision of open space and associated works. Outline application with access only.	N -requested	Approved with Conditions (05-Oct-12)
09/03/2012	PT12/0888/F	Land Between Long Down Avenue And University Of West Of England, Stoke	Erection of a 21,700 seater new sports stadium (Class D2) and ancillary Club Shop (500m2), Supporters Club Bar (784m2) and Offices (198m2), with associated Convenience Store (Class A1) (465m2), Gymnasium	EIA (AQ Assessment - AQC)	Approved with Conditions (17 Jan 2013)

Date Application Received	Reference	Location	Description	AQ Assessment	Application status
		Gifford	(Class D2) (1,280m2), Banqueting facilities (Class D1) (1,006m2), Media Study Centre/UWE Teaching Space (Class D1) (2.114m2). Construction of car park (1,000 spaces) and new vehicular access. Depositing of excavated material resulting from construction process, landscaping and lighting.		
22-Mar-12	PT12/1015/MW	Land At Willow Farm Severn Road Severnside Nr Hallen	Change of use of agricultural land to anaerobic digestion facility including weighbridges, reception building, biofilter, digestion and storage tanks and associated plant and infrastructure.	Y (AQC)	Approved with conditions (22-Jun-12)
13-Apr-12	PT12/1303/MW	Land Adjacent To Severnside Works Severn Road Severnside Bristol South Gloucestershire BS10 7SP	Construction of a bottom ash recycling facility, to include processing building, storage areas and bays, access road and associated infrastructure and development of the existing railhead, to save the Energy Recovery Centre (approved under reference PT09/5982/FMW).	EIA	Approved with conditions (28-Sep-12)
10-May-12	PK12/1619/F	Land at Anstey's Road Hanham Bristol BS15 3SS	Demolish an existing warehouse building and construction of a foodstore (2,918m2 gross internal floorspace) with associated car parking, landscaping, ancillary plant and equipment. Alterations to existing vehicular accesses on New Walk, Martin's Road and Anstey's Road and alterations to car parking to retained Sealtech premises.	AQ assessment	Approved - S106 signed (09-May-13)
22-May-12	PK12/1751/F	Land Between Iron Acton Way And North Road Engine Common Yate South Gloucestershire BS37 7LG	Mixed use development across 14.9 hectares of land comprising 210 new dwellings, 1329sq m of office floorspace (Use Class B1), 1914sq m of employment floorspace for light industrial use (Use Class B1c) and/or warehouse and distribution (Use class B8), new clubhouse and car park at Yate Town Football Club with provision of associated parking, infrastructure and landscaping.	Y	Appeal Dismissed (08-Apr-12)
01-Jun-12	PK12/1913/O	Land North Of Brimsham Park Yate	Mixed use development across 100.76 hectares of land comprising up to 2,450 new dwellings (Use Class C3), extra care housing (Use Class C1/C2), 5.11 hectares of employment land (Use Class B1,B2) provision of a local centre, two primary schools, together with the supporting infrastructure and facilities including: new vehicular and pedestrian accesses, public open space and landscaping. Outline application including access with all other matters reserved.	EIA	Pending Decision
07-Jun-12	PT12/1930/O	Land At Wyck Beck Road And Fishpool Hill Patchway/Cribbs Causeway	Mixed use development across 53.80 hectares of land comprising up to 1,100 new dwellings (Use Class C3) a local centre (Use Classes A1,A2,A3,D1,D2) a primary school together with supporting infrastructure and facilities including: new vehicular access with Wyck Beck Road, public open space and landscaping. Outline application including access with all other matters reserved.	EIA	Pending Consideration

Date Application Received	Reference	Location	Description	AQ Assessment	Application status
14-Jun-12	PT12/027/SCR	Bristol Parkway Railway Station Newbrick Road Stoke Gifford Bristol South Gloucestershire BS34 8YU	Proposed decked car park (within the station). Additional 715 spaces.	EIA not required. AQA undertaken but not submitted to SGC as permitted development.	Permitted development.
12-Jul-12	PT12/2395/O	Land At Morton Way North East Thornbury Bristol South Gloucestershire BS35 1LR	Residential development across 22.43 hectares of land comprising up to 300 new dwellings (Use Class C3) and a local shop (Use Class A1) with supporting infrastructure and facilities including vehicular access from Morton Way, public open space and landscaping. Hybrid application comprising full planning application for 109 new dwellings, outline application with all matters reserved except access for up to 191 new dwellings and a local shop.	Y	Appeal Allowed (planning permission granted) (23-May-13)
03-Sep-12	PT12/036/SCO	Land At Filton Airfield Filton	Mixed use Development (approximately 2,500 homes and 50 hectares for employment use).	Scoped AQ assessment	Scoping Opinion Complete
19-Nov-12	PT12/3809/O	University Of West Of England Coldharbour Lane Stoke Gifford Bristol South Gloucestershire BS16 1QY	Erection of new buildings on 55.1 hectares of land for; academic, recreation, administration and support purposes (44,055m2, Use Class D1); student residential and associated welfare facilities (30,790m2, sui generis use); 15,200m2 of mixed commercial uses, consisting of a Hotel (200 bedrooms [6,000m2, Use Class D1), Restaurant/Public House/Hot Food Take-away (1,200m2 Use Classes A3/A4/A5); Office/Research and Development (8,000m2, Use Class B1a/B1b); associated infrastructure including provision of a new public transport hub, 2 no. decked and at grade car parks, landscaping, internal highway realignment, amendments to 2 no. adopted vehicular access points; and the demolition of 7,330m2 existing buildings. Outline application with all matters reserved except access.	Y (campus receptors)	Approved with Conditions (17-Jun-13)
2013					
21-Dec-12	PT13/0002/O	Frenchay Hospital Frenchay Park Road Frenchay Bristol South Gloucestershire BS16 1LE	Redevelopment of hospital site to facilitate the construction of up to 490 residential units; a new health and social care centre and; a 1 form entry primary school, all with associated works. Outline application with access to be determined: all other matters reserved.	AQA (AQC)	Pending Consideration
03-Jan-13	PT13/0028/O	Land Between Badminton Road And Park Lane Woodlands Farm South Of Frampton Cotterell Coalpit	Residential development of up to 330 dwellings on 23.51 ha of land; 0.2 ha Local Centre (up to 465m2 Use Classes A1, A2, A3 and up to 465m2 Use Class D1); Community Square incorporating car parking for local centre. Construction of 1 no. vehicular access onto Badminton Road and 3 no.	Y	Refusal (15-Jul-13)

Date Application Received	Reference	Location	Description	AQ Assessment	Application status
		Heath South Gloucestershire BS36 2BL	vehicular accesses onto Park Lane. Landscaping, open space, allotments and all associated infrastructure. Outline application with all matters reserved except access.		
Feb 2013	N/A (PINS Application)	Land adjacent to Seabank Power Station, Severnside	Seabank 3 Combined Cycle Gas Turbine (for generation of up to 1400 MW of electricity) Scoping Report	Scoped AQ Assessment	SGC is PINS consultee
08-May-13	PT13/1529/R3F	Land Between Parkway North Roundabout At Southern End of Great Stoke Way & A4174 Avon Ring Road to NE Of UWE.	Construction of new road link incorporating single carriageway highway, (with additional bus lanes where appropriate) footways and cycle ways. Construction of bridge over the South Wales - London railway line and construction of new bridge over the Ham Brook. Associated works and landscaping. (Stoke Gifford Transport Link)	EIA	Pending Decision

6 Air Quality Planning Policies

6.1 National Planning Policy

Previously, planning policy at the national level was set out in Planning Policy Statements (PPS) and Planning Policy Guidance notes (PPG) but in March 2012 the Government published the National Planning Policy Framework (NPPF). The NPPF is a key part of the Government's reforms intended to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth. The Framework sets out planning policies for England and how they are expected to be applied.

Conserving and enhancing the natural environment is a key principle upon which the planning system should be based. The NPPF requires the planning system to contribute to, and enhance, the natural and local environment by preventing, both new and existing, development from contributing to, or being put at, unacceptable risk from, or being adversely affected by, unacceptable levels of air pollution (paragraph 109).

To this end, planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of air quality management areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in air quality management areas is consistent with the local air quality action plan (paragraph 124).

The Council's planning polices must be in conformity with policy set at the national level.

6.2 Local Planning Policy

Planning policies for South Gloucestershire are currently set out in the Local Plan. This Local Plan comprises the following documents - South Gloucestershire Local Plan (adopted 2006), the Minerals and Waste Local Plan (adopted 2002) and the West of England Joint Waste Core Strategy (adopted 2011), although some of the policies in the two local plans are no longer extant. These two local plans are being replaced by the Core Strategy and the Policies, Sites and Places Development Plan Document (DPD).

Policy EP1 in the 2006 South Gloucestershire Local Plan has been saved until replaced by the Core Strategy. This policy states that: “Development will not be permitted which would unacceptably harm the environment, or the health, safety and amenity of users of the site or surrounding land, as a result of pollution to water, air or soil, or through noise, vibration, light heat or radiation. Additionally, development would not be permitted where users of it would be unacceptably affected by reason of proximity to existing land uses”.

The Core Strategy, once adopted will be a key planning policy document for South Gloucestershire, setting out the general location of development, its type and scale, as well as protecting what is valued about the area. Managing the environment (and heritage) is one of the key issues which the Core Strategy seeks to address and to this end, new development is expected to “protect land, air and aqueous environments, buildings and people from pollution” (Policy CS9).

The Policies, Sites and Places DPD will allocate smaller scale (non-strategic) sites for various types of development and update the suite of detailed policies for development management in the two old local plans.

In total, 28,355 new homes are to be delivered within South Gloucestershire between 2006 and 2027.

7 Local Transport Plans and Strategies

The replacement Joint Local Transport Plan (JLTP), whilst being the second joint plan, is the third Local Transport Plan produced by the West of England councils. For this reason it is referred to as Joint Local Transport Plan 3 (JLTP3). It was published in March 2011 following approval by the four Councils and covers the period from 2011 to 2026.

The JLTP3 is based around five key goals:

- Reduce carbon emissions;
- Support economic growth;
- Promote accessibility;
- Contribute to better safety, security and health;
- Improve quality of life and a healthy natural environment.

The JLTP3 is in three parts with the:

- Strategy taking the long term policy view to 2026 (a refreshed strategy was approved by the West of England Joint Transport Executive Committee in March 2013);
- Delivery Plan setting out implementation proposals over the shorter term (the 2012/13 to 2014/15 Delivery Plan was published in March 2012);
- Supplementary Documents covering walking, parking, public transport, traffic management and freight, smarter choices, road safety, cycling and rural transport in more detail (these were finalised and approved by the West of England Joint Transport Executive Committee in March 2013).

The delivery of sustainable transport in South Gloucestershire, in conjunction with the other West of England authorities and together with the key goals listed above of reducing carbon emissions and improving the quality of the natural environment, should help improve air quality adjacent to the road network.

8 Climate Change Strategies

The South Gloucestershire Climate Change Strategy – Low Carbon South Gloucestershire Plan was published in April 2013. It provides a strategic framework and short term action plans for reducing carbon emissions in South Gloucestershire and delivering the transition to a low carbon future.

The aims of the strategy are to:

- Reduce the demand for energy - Power Down
- Increase the generation of renewable and low carbon energy - Power Up
- Lead, influence and enable the change to a low carbon South Gloucestershire.

The overarching targets are:

- To reduce carbon emissions in South Gloucestershire by 80% by 2050 in line with the UK target with interim target reductions of 50% by 2025, 35% by 2020 and 29% by 2015
- For the equivalent of 7.5% of South Gloucestershire's total energy demand to be generated from renewable energy installations in South Gloucestershire by 2020.

There are six priorities for action:

- **Low Carbon Council**

  Reduce carbon emissions across the council estate and operations

- **Low Carbon Homes**

  Reduce carbon emissions and energy consumption in our homes

- **Low Carbon Travel**

  Reduce transport energy use and carbon emissions from transport

- **Low Carbon Economy**

  Promote business resource efficiency and help low carbon and local businesses grow in South Gloucestershire

- **Low Carbon Energy**

  Enable the development of secure supplies of renewable and low carbon energy

- **Low Carbon Communities**

  Support and promote neighbourhood energy planning and community action for low carbon living

Action plans have been produced for each of the six priority areas. The action plans include a summary of the issues and key actions for the next two years.

The priorities and actions have been selected following an assessment of issues that can be controlled and influenced locally. Many of the actions will deliver significant health, economic and social benefits and this has also been taken into account. Much of the work will be delivered in partnership with other organisations and those involved in delivery are outlined for each priority area.

The Strategy is owned and managed jointly by South Gloucestershire Council and the South Gloucestershire Partnership, which includes members from organisations such as voluntary and community groups, local businesses and other public agencies as well as the Council. The Strategy will be monitored and reviewed annually.

9 Implementation of Action Plans

The Air Quality Action Plan (AQAP) aimed at improving air quality in the Kingswood and Staple Hill AQMAs was produced in 2012. Good progress is being made against many of the action plan measures. Detailed progress on the action measures for Kingswood AQMA is set out in Table 19 and for the Staple Hill AQMA, in Table 21. However, the following is a brief summary of progress to date:

In the Kingswood Action Plan there are:

- 8 short term actions (2012-13), of which progress is being made against all;
- 5 medium term actions (by 2016), of which progress is being made against all; and
- 8 long term actions (2016 onwards), of which of which progress is being made against 3.

In the Staple Hill Action Plan there are:

- 6 short term actions (2012-13), of which progress is being made against all;
- 6 medium term actions (by 2016), of which progress is being made against all;
- 7 long term actions (2016 onwards), of which of which progress is being made against 2.

In 2012, Defra air quality grant funding was secured to progress actions KL4 and SL3; Review of traffic signal numbers and operations. Further details are included in the relevant progress report tables.

Also the capital programme for 2013/14 contains a number of schemes that contribute to the action plan measures for Kingswood (Table 20) and Staple Hill (Table 22).

Table 19 Kingswood Air Quality Action Plan Progress

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
KS1	Travel Plan for Kingswood Civic Centre	Put in place a travel plan which will encourage sustainable travel and reduce car usage at the Kingswood Civic Centre.	SGC	.	2011-2012	• reduction in solo occupancy vehicles • increased cycling levels • increased walking levels	No specific target emissions reduction.	SGC staff based at the Kingswood Civic Centre are covered by the following corporately promoted travel planning measures: • Car share scheme • Pool cars • Cycle Parking facilities • Bike purchase scheme • Public Transport Information provision • Telephone and Video conferencing facilities • Staff parking restricted by permit. A pool car was allocated to the Kingswood Civic Centre Offices in 2012, although all SGC pool cars are available to be booked by staff based at Kingswood. Kingswood Civic Centre staff parking policy has also been subject to a review and a new policy will be implemented by autumn 2013. Staff travel roadshows will be available to help staff during summer 2013.	Ongoing.	Modal shift from car and private vehicle use to public transport and more sustainable modes such as cycling and walking will provide some improvement in air quality within the AQMA.
KS2	Parking review	Review of parking issues within the AQMA.	SGC		2012/2013	• Road safety benefits • Reduced congestion	No specific target emissions reduction.	The Kingswood town centre parking review has been included in the local transport capital programme 2011 – 2014 (ref NM06/2011) and is currently progressing. The review is comprehensive so is not anticipated to be completed until April 2014. Provisional allocation of £30,000 for 2013/14.	April 2014	Impact of action considered too small to be measurable, although positive impact may be seen over time.
KS3	Ensure Air Quality is a priority in development of transport schemes.	Introducing air quality considerations into capital programme development.	SGC		Ongoing	Number of actions taken forward within Capital Programme	No specific target emissions reduction.	Part of the new prioritisation system now adopted for the Local Transport Plan's (LTP) capital programme on traffic safety schemes contains a strategic assessment relating to the contribution that a scheme might make to LTP carbon emissions/air quality goals.	Ongoing.	No specific target emissions reduction.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
KS4	Bus partnership	Work with operators to address air quality issues through partnership working.	SGC in partnership with bus operators		2012/2013	Number of buses replaced for lower emission vehicles	No specific target emissions reduction.	The two main operators, First and Wessex deploy eco-driving technology that reduces engine emissions. Wessex Buses have introduced a batch of new vehicles to Euro 5 specification. Some four vehicles that operate on service 507 (Southmead – Kingswood – Keynsham) were replaced in this way.	Ongoing	No specific target emissions reduction. Conversion of buses to higher Euro standard should reduce NOx emissions.
KS5	Review of Council Fleet to ensure lowest emission vehicles	Set an example as the authority lead to ensure that vehicles/ community transport are efficient vehicles with low emissions.	SGC		By 2016	Reduction in vehicle emissions	No specific target emissions reduction.	The Council constantly re-assesses the fleet, with the majority of vehicles covered by the European Directive (on ambient air quality and cleaner air) and the introduction of Euro 5 engines.	Ongoing.	No specific target emissions reduction. Conversion to higher Euro standard vehicles should reduce NOx emissions.
KS6	Promotion of more efficient use of taxi ranks and bus stops	Programme to encourage drivers to switch off engines when stationary within AQMA.	SGC in liaison with taxi operators and bus operators		2012/2013	Number of bus/taxi operators signed up to programme	No specific target emissions reduction.	First have a “Drive Green” driving performance system which aims to monitor drivers’ standard of driving, improve fuel economy and reduce emissions. A system of switching the bus engine off at each bus stop and then back on again when it is ready to pull away would be ideal. However, operators’ current fleets comprise conventional diesel vehicles and any saving of emissions whilst the engine is switched off for a few seconds is negated by increased emissions when the engine is restarted. Hybrid vehicles involve switching from diesel to battery when the vehicle is stationary and back to diesel to provide the power needed to	Ongoing	No specific target emissions reduction.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
								pull away. Because of the price premium on the capital cost of alternative fuel vehicles it will be some years before First and other operators renew their fleets with hybrid buses or gas-powered vehicles. Obviously if the government improves the incentives to operators to purchase hybrids or gas-powered vehicles that situation would change. As part of the Better by Bus fund, the bus lay-by at Regent Street is programmed to be extended by June 2013 and the depth of the taxi bay has been increased. These improvements will assist traffic flow which will contribute to improving air quality. The Parking Review being undertaken under KS2 will investigate whether any current parking arrangements are negatively impacting on the operation of bus stops and taxi ranks.		
KS7	Ensure adequate landscaping is considered within new planning applications and urban designs.	Encourage the planting of trees and plants through the planning process.	SGC		Ongoing.	Number of new trees planted. NB: Data relating to the indicator for this measure is not available. New indicator to be identified.	No specific target emissions reduction.	The Council is at an advanced stage of preparing the South Gloucestershire Core Strategy. Policy CS2 seeks to ensure that Green Infrastructure is planned, delivered and managed as an integral part of creating sustainable communities. Policy CS9 sets out the Council's planning policy for management of the natural environment. When assessing planning applications the Council will use relevant policies, including the National Planning Policy Framework, to ensure that landscaping and planting is appropriate for the development proposed.	Ongoing.	No specific target emissions reduction.
KS8	Promotion of VOSA Smoky Vehicle Hotline.	Promote the VOSA Smoky Vehicle Hotline to encourage vehicles to be reported.	SGC		Ongoing	Number of vehicles reported to VOSA (if data available). N.B. VOSA has informed the Council that it does not	No specific target emissions reduction.	Information added to the Council's website on the Exhaust emissions testing and Improving air quality web pages. Review of action plan to determine if this action can be closed.	Ongoing	No specific target emissions reduction.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
						monitor data relating to numbers of vehicles reported or their locations. Therefore the indicator for this action is no longer appropriate. New Indicator for inclusion in future progress reports: Number of hits on the Council's webpages containing hotline information				
KM1	School travel planning	Ensure all schools local to the AQMA have travel plans in place to reduce car dependency at each site.	SGC in conjunct-ion with local schools	-	By 2016	Reduction in number of cars arriving at the site	No specific target emissions reduction.	The Government has changed the emphasis on school travel planning so travel plans are now the responsibility for schools to progress and implement. Monitoring of school travel plans by the Council is therefore now difficult, however the Council will continue to work with schools to promote and facilitate sustainable travel. At the John Cabot Academy all year 7 pupils are undertaking cycle training (72 pupils trained as of Dec 12), new cycle storage is being built, and a sustainable travel incentive scheme is being introduced to year 7 pupils to encourage more pupils to travel sustainably. In addition, construction of new cycle	As the Government has changed the emphasis on school travel planning, travel plans are now the responsibility for schools to progress and implement.	No specific target emissions reduction. Effect on air quality considered to be too small to be measurable, although positive impact may be seen over time associated with modal shift to more sustainable forms of transport.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
								storage is anticipated to be completed by May/June 2013. LTP Capital Programme provisional allocation of £50,000 for the implementation of a 20 mph zone around the John Cabot School which will assist with air quality through lower vehicle speeds. The Grange Secondary School has put 14 pupils through Bikeability cycle training last academic year and a sustainable travel incentive scheme is being introduced to year 7pupils.		
KM2	Travel planning for Kingswood Town Centre	Plan to encourage more sustainable travel to Kingswood Town Centre both for residents and workers.	SGC in conjunction with Kingswood Business Association		By 2016	Measured by increased: • Cycling levels • Bus patronage • Walking levels	No specific target emissions reduction.	A Sustainable Travel Officer was employed in Jan 2013 through LSTF, and is devising a project plan for engaging communities to implement a series of initiatives that will encourage travel behaviour change and reduce the number of single occupancy car use journeys. The Officer will also engage with key representative forums such as the Kingswood Community Lead Group. A series of community engagement events will take place in Kingswood during the summer of 2013, with the aim of consulting with communities to identify barriers and solutions to encourage more journeys to be made by sustainable travel modes. Members of the LSTF Sustainable Travel Field Team will be present at major community events such as the Kingswood Family Week event in May and will engage residents in Personalised Travel Planning to identify regular journeys in the local area that could be made by walking, cycling or public transport.		No specific target emissions reduction. Modal shift from car and private vehicle use to public transport and more sustainable modes such as cycling and walking will provide some improvement in air quality within the AQMA.
KM3	Review bus terminals and timing points	Undertake a review of the bus stops within the	SGC in conjunction with bus		By 2016	Reduction in number of buses idling at bus stops	No specific target emissions reduction.	Review still to be undertaken, however the following related progress has taken place:	Ongoing.	No specific target emissions reduction.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
		AQMA to reduce number of buses idling at them.	operators					1) The two main operators, First and Wessex deploy eco-driving technology that reduces engine idling. 2) Recent changes to the bus network have reduced the volume of services terminating in Cecil Road, Kingswood. 3) Grant funding of £170,000 for bus stop infrastructure improvement provisionally allocated in 2013/14 for the A420.		
KM4	Smarter Choices promotions/ roadshows	Undertake promotion of sustainable travel in particular around the shopping area by holding roadshows and events where residents and workers can talk to represent-atives.	SGC		2012/13	Measured by increased: • Cycling levels • Bus patronage • Walking levels Also measure by number of proactive events	No specific target emissions reduction.	A Sustainable Travel Officer was employed in Jan 2013 through LSTF, and is devising a project plan for engaging communities to implement a series of initiatives that will encourage travel behaviour change and reduce the number of single occupancy car use journeys. The Officer will also engage with key representative forums such as the Kingswood Community Lead Group. A series of community engagement events will take place in Kingswood during the summer of 2013, with the aim of consulting with communities to identify barriers and solutions to encourage more journeys to be made by sustainable travel modes. Members of the LSTF Sustainable Travel Field Team will be present at major community events such as the Kingswood Family Week event in May and will engage residents in Personalised Travel Planning to identify regular journeys in the local area that could be made by walking, cycling or public transport.	TBC	No specific target emissions reduction. Modal shift from car and private vehicle use to public transport and more sustainable modes such as cycling and walking will provide some improvement in air quality within the AQMA.
KM5	Cycling infrastructure	Review the current cycling provision and seek to improve access by bicycle by introducing more traffic free cycle	SGC		By 2016	Increases in numbers of cyclists.	No specific target emissions reduction.	As part of the LSTF Move to Secondary school project, the Council is delivering additional cycle parking in John Cabot School. This is anticipated to be completed by May/June 2013. Other new cycling infrastructure may also be prioritised through the summer 2013 engagement described in SM5 and SM2.	Ongoing.	No specific target emissions reduction. Modal shift from car and private vehicle use to more sustainable modes such as cycling will provide some improvement in air quality within the AQMA.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
		lanes, improved on carriageway cycle provision, cycle parking and facilities where appropriate.						The Council applied for DEFRA AQ grant funding to improve cycling infrastructure in June 2012, however the bid was unsuccessful.		
KL1	ECO Stars Fleet Recognition Scheme	Introduce award scheme for efficient and cleaner fleet vehicles both in house and promote to businesses within South Gloucester-shire.	SGC	Ongoing	2016 onwards	Membership numbers.	No specific target emissions reduction.	Initial contact made with the Scheme providers to assess the most practical way to take this initiative forward.	TBC	No specific target emissions reduction. Cleaner fleet vehicles should reduce NOx emissions.
KL2	Car club	Establish a car club with the objective to reduce car ownership levels.	SGC	TBC	2016 onwards	Car club membership	No specific target emissions reduction.	Long term action - no progress yet.	TBC	No specific target emissions reduction.
KL3	Restrict traffic turning movements onto A420	By restricting traffic turning onto A420 the free flow of traffic is maintained and therefore not idling which improves emissions.	SGC	TBC	2016 onwards	Reduction in volume of traffic travelling towards and along A420	No specific target emissions reduction.	Long term action - no progress yet. Possible need for micro-simulation model to test options which could cost £50-100K that may require additional funding. The implementation of other actions may negate the need for this action to be implemented – future review of action plan to investigate retention.	TBC	No specific target emissions reduction.
KL4	Review traffic	Review	SGC	2012	2016	Improved	No specific	DEFRA Air Quality Grant awarded to	December	No specific target

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
	signal numbers and operations	implications of traffic signals and signal timings to improve traffic flows on the A420.			onwards	traffic speeds and reduced congestion	target emissions reduction.	take action forward. Project Initiation Document and work programme finalised January 2013. The review will focus on the numbers of traffic signals, particularly pedestrian traffic signals. It will assess how they currently operate, taking into account any road safety implications and severance. Provisional allocation of £87,000 (across two scheme headings) for signal upgrades in Kingswood for 2013/14. Initial consultants report received in April 2013 outlining draft proposals. MOVA signalling system has been installed as part of the Better Bus Fund at Hanham Road/High Street. Traffic signal upgrades have also been made at the Regent Street/Downend Road and Two Mile Hill/Blackhorse Road junctions (performance to be reviewed in Oct 2013). These improvements will assist traffic flow which will contribute to improving air quality.	2013.	emissions reduction. If the outcome of the review is implemented, traffic, pedestrian and air quality monitoring data will be collected and reviewed.
KL5	Review of delivery bays	Review the designated delivery bays to reduce congestion where possible.	SGC		2016 onwards	• number of reported issues with delivery bays • reduced congestion	No specific target emissions reduction.	Entry and exit kerbing into delivery bays on the High Street has been adjusted to allow easier access and reduce delays. The impact of this will be reviewed in a future review of the AQAP.	TBC	No specific target emissions reduction.
KL6	Controlled deliveries/collections	Restrict deliveries/ collections (e.g. waste collections) to off peak hours and explore use of freight consolidation	SGC	TBC	2016 onwards	Number of delivery & collection agreements made with businesses	No specific target emissions reduction.	Long term action - no progress yet.	TBC	No specific target emissions reduction.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
		centre with electric vehicles for delivery.								
KL7	Reclassify strategic routes and signing strategy	By reclassifying the routes it would reroute strategic traffic and therefore reduce the traffic volumes.	SGC	TBC	2016 onwards	Reduction in traffic volumes on and travelling towards A420	No specific target emissions reduction.	Long term action - no progress yet.	TBC	No specific target emissions reduction.
KL8	Taxi ranks	Undertake review of operations by taxi's within the AQMA.	SGC in conjunction with taxi operators	TBC	2016 onwards	Production of review report	No specific target emissions reduction.	Long term action - no progress yet. Investigate potential for progressing in conjunction with the Council's licensing team. The Parking Review (action KS2) contains an allocation of £30,000 for 2013/14 which will contribute towards this action. Review of AQAP to investigate potential to bring forward this action in advance of 2016.	TBC	No specific target emissions reduction.

Additional supporting information for Kingswood Action Plan

Table 20 LTP Capital Programme Schemes from 2012/13 & 2013/14 relevant to Kingswood AQMA

Scheme No.	Area Forum	Parish (Ward)	Scheme Name	Description	Funding Source	Estimated Costs
BB02/2012	KF	Kingswood (Kings Chase/ Woodstock)	A420 Kingswood Town Centre	Public Transport infrastructure improvements - Bus Stop upgrades, Shelters, Real Time information, delivery improvements and public domain measures	GRANT	£170,000
BB03/2012	KF	Kingswood (Kings Chase/ Woodstock)	A420 Traffic Signal junction upgrades	Traffic signal upgrades at High Street/Blackhorse Road, High Street/Downend Road and High Street/Hanham Road	GRANT	£80,000
NM76/2013	TC	(Kings Chase) (Woodstock)	A420 Regent Street, Kingswood	Review and recommend measures to improve Air Quality at existing signal installations	GRANT	£7,000
NM06/2011	TC	Kingswood (Kings Chase/ Woodstock)	Kingswood Town Centre	Kingswood Town Centre Parking and Taxi Rank review, including Residents Parking - Year 3 Implementation	LTP	£30,000
SC21/2011	TC	Kingswood (Rodway)	Blackhorse Road, near Barley Close Primary School	Pedestrian improvement - Year 3 Implementation. Introduction raised junction table and pedestrian improvements	LTP	£60,000
CR39/2013	TC	(Kings Chase/ Woodstock)	A420 High Street/Alma Road	Implement formal pedestrian crossing facility including raised table	DEV (GD3128) (GD3360) (GD3346)	£92,000
CR39/2013	TC	(Kings Chase/ Woodstock)	A420 High Street/Alma Road	Implement formal pedestrian crossing facility including raised table	LTP	£30,000
LST 14/2012	TC	Various	Move to Secondary School	John Cabot School 20mph zone	GRANT	£50,000

Table 21 Staple Hill Air Quality Action Plan Progress

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
SS1	Ensure Air Quality is a priority in development of transport schemes	Introducing air quality considerations into capital programme development.	SGC		Ongoing	Number of actions taken forward within Capital Programme	No specific target emissions reduction.	Part of the new prioritisation system now adopted for the Local Transport Plan's (LTP) capital programme on traffic safety schemes contains a strategic assessment relating to the contribution that a scheme might make to LTP carbon emissions/air quality goals.	Ongoing	No specific target emissions reduction.
SS2	Bus partnership	Work with operators to address air quality issues through partnership working.	SGC in partnership with bus operators		2012/2013	Number of buses replaced for lower emission vehicles.	No specific target emissions reduction.	The two main operators, First and Wessex deploy eco-driving technology that reduces engine emissions. The majority of buses passing through Staple Hill are already meeting lower emission standards. Additionally, as part of new contract arrangements with Wessex, the 2 vehicles on service 533 were replaced with lower emission vehicles. Newer vehicles are also expected imminently on First service 7.	Ongoing.	No specific target emissions reduction. Conversion of buses to higher Euro standard should reduce NOx emissions.
SS3	Review of Council Fleet to ensure lowest emission vehicles	Set an example as the authority lead to ensure that vehicles/ community transport are efficient vehicles with low emissions.	SGC		By 2016	Reduction in vehicle emissions.	No specific target emissions reduction.	The Council constantly re-assesses the fleet, with the majority of vehicles covered by the European Directive (on ambient air quality and cleaner air) and the introduction of EURO 5 engines.	Ongoing.	No specific target emissions reduction. Conversion to higher Euro standard vehicles should reduce NOx emissions.
SS4	Promotion of more efficient use of taxi ranks and bus stops	Education of drivers to switch off engines.	SGC in liaison with taxi operators and bus operators		2012/2013	Number of bus/taxi operators signed up to programme	No specific target emissions reduction.	First have a "Drive Green" driving performance system which aims to monitor drivers' standard of driving, improve fuel economy and reduce emissions. A system of switching the bus engine off at each bus stop and then back on again when it is ready to pull away would be ideal. However, operators' current fleets comprise conventional diesel vehicles and any saving of	Ongoing	No specific target emissions reduction.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
								emissions whilst the engine is switched off for a few seconds is negated by increased emissions when the engine is restarted. Hybrid vehicles involve switching from diesel to battery when the vehicle is stationary and back to diesel to provide the power needed to pull away. Because of the price premium on the capital cost of alternative fuel vehicles it will be some years before First and other operators renew their fleets with hybrid buses or gas-powered vehicles. Obviously if the government improves the incentives to operators to purchase hybrids or gas-powered vehicles that situation would change. The Parking Review being undertaken under SM4 will investigate whether any current parking arrangements are negatively impacting on the operation of bus stops and taxi ranks.		
SS5	Ensure adequate landscaping is considered within new planning applications and urban designs.	Encourage the planting of trees and plants through the planning process.	SGC		Ongoing.	Number of new trees planted. NB: Data relating to the indicator for this measure is not available. New indicator to be identified.	No specific target emissions reduction.	The Council is at an advanced stage of preparing the South Gloucestershire Core Strategy. Policy CS2 seeks to ensure that Green Infrastructure is planned, delivered and managed as an integral part of creating sustainable communities. Policy CS9 sets out the Council's planning policy for management of the natural environment. When assessing planning applications the Council will use relevant policies, including the National Planning Policy Framework, to ensure that landscaping and planting is appropriate for the development proposed.	Ongoing.	No specific target emissions reduction.
SS6	Promotion of VOSA Smoky Vehicle Hotline.	Promote the VOSA Smoky Vehicle Hotline to encourage older vehicles to be reported.	SGC		Ongoing	Number of vehicles reported to VOSA (if data available). N.B. VOSA has informed the Council that it does	No specific target emissions reduction.	Information added to the Council's website on the Exhaust emissions testing and Improving air quality web pages. Review of AQAP to determine if this action can be closed.	Ongoing	No specific target emissions reduction.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
						not monitor data relating to numbers of vehicles reported or their locations. Therefore the indicator for this action is no longer appropriate. New Indicator for inclusion in future progress reports: Number of hits on the Council's webpages containing hotline information				
SM1	School travel planning	Ensure all schools local to the AQMA have travel plans in place to reduce car dependency at each site.	SGC in conjunction with local schools	-	By 2016	Reduction in number of cars arriving at the site.	No specific target emissions reduction.	The Government has changed the emphasis on school travel planning so travel plans are now the responsibility for schools to progress and implement. Monitoring of school travel plans by the Council is therefore now difficult, however the Council will continue to work with schools to promote and facilitate sustainable travel. Mangotsfield Secondary School has put 8 pupils through Bikeability cycle training this academic year and a sustainable travel incentive scheme is being introduced to year 7pupils. New 20mph zone around the school, cycle route and pedestrian	As the Government has changed the emphasis on school travel planning, travel plans are now the responsibility for schools to progress and implement.	No specific target emissions reduction. Effect on air quality considered to be too small to be measurable, although positive impact may be seen over time associated with modal shift to more sustainable forms of transport.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
								facilities. New cycle storage is being built with completion of construction anticipated June/July 2013.		
SM2	Travel planning for Staple Hill Town Centre	Undertake travel surveys or interviews to ascertain modes of travel particularly to the shops/ workplaces. Focus will be on deliveries and visitors where parking.	SGC in conjunction with Staple Hill Chamber of Trade	TBC	By 2016	• Cycling levels • Bus patronage • Walking levels	No specific target emissions reduction.	A Sustainable Travel Officer was employed in Jan 2013 through LSTF, and is devising a project plan for engaging communities to implement a series of initiatives that will encourage travel behaviour change and reduce the number of single occupancy car use journeys. The Officer will also engage with key representative forums such as the Staple Hill Regeneration Partnership. A series of community engagement events will take place in Staple Hill during the summer of 2013, with the aim of consulting with communities to identify barriers and solutions to encourage more journeys to be made by sustainable travel modes. Members of the LSTF Sustainable Travel Field Team will be present at major community events and will engage residents in Personalised Travel Planning to identify regular journeys in the local area that could be made by walking, cycling or public transport.	TBC	No specific target emissions reduction. Modal shift from car and private vehicle use to public transport and more sustainable modes such as cycling and walking will provide some improvement in air quality within the AQMA.
SM3	Relocation of bus stops on Soundwell Road	Relocating the bus stops to more suitable positions where they do not completely stop the flow of traffic in both directions.	SGC		By 2016	Measured by relocation of bus stop	No specific target emissions reduction.	These bus stop locations were reviewed when the shelters were recently replaced, but due to site constraints a better location could not be found. Action closed out, as found to be unable to re-locate the stops. Future review of action plan to remove action.	Unknown. Initial on-site investigation has revealed relocation of bus stops may not be possible due to site constraints.	No specific target emissions reduction.
SM4	Parking Review	Review of parking issues within the AQMA.	SGC	TBC	By 2016	Measured by: • Road safety benefits • Reduced congestion	No specific target emissions reduction.	This measure has been identified as a possible scheme in a future local transport capital programme. The Chase Area Forum will be asked to prioritise this measure as part of their delegated funding in March 2013. The scheme is included in the provisional capital programme for 2013/14 with funding allocation of £50,000.	Unknown - not yet in capital programme	Impact of action considered too small to be measurable, although positive impact may be seen over time.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
SM5	Smarter Choices promotions /roadshows	Undertake promotion of sustainable travel in particular around the shopping areas with residents and workers by holding roadshows and events where people can talk to representatives.	SGC		2012-2013	Measured by increases in number of: • Cyclists • Bus patronage Also measure by number of proactive events	No specific target emissions reduction.	A Sustainable Travel Officer was employed in Jan 2013 through LSTF, and is devising a project plan for engaging communities to implement a series of initiatives that will encourage travel behaviour change and reduce the number of single occupancy car use journeys. The Officer will also engage with key representative forums such as the Staple Hill Regeneration Partnership. A series of community engagement events will take place in Staple Hill during the summer of 2013, with the aim of consulting with communities to identify barriers and solutions to encourage more journeys to be made by sustainable travel modes. Members of the LSTF Sustainable Travel Field Team will be present at major community events and will engage residents in Personalised Travel Planning to identify regular journeys in the local area that could be made by walking, cycling or public transport.	TBC	No specific target emissions reduction. Modal shift from car and private vehicle use to public transport and more sustainable modes such as cycling and walking will provide some improvement in air quality within the AQMA.
SM6	Cycling infrastructure	Review the current cycling provision and seek to improve access by bicycle by introducing more traffic free cycle lanes, improved on carriageway cycle facilities, cycle parking and facilities where appropriate.	SGC		By 2016	Measured by increases in numbers of cyclists.	No specific target emissions reduction.	New cycling storage is being planned at Mangotsfield secondary school. Construction is estimated to be completed by June/July 2013. Other new cycling infrastructure may also be prioritised through the summer 2013 engagement described in SM5 and SM2. The Council applied for DEFRA AQ grant funding to improve cycling infrastructure in June 2012, however the bid was unsuccessful.	Ongoing	No specific target emissions reduction. Modal shift from car and private vehicle use to more sustainable modes such as cycling will provide some improvement in air quality within the AQMA.
SL1	ECO Stars Fleet Recognition Scheme	Introduce award scheme for efficient and cleaner fleet vehicles both in house and promote to businesses within	SGC	Ongoing	2016 onwards	Measured by membership numbers.	No specific target emissions reduction.	Initial contact made with the Scheme providers to assess the most practical way to take this initiative forward.	TBC	No specific target emissions reduction. Cleaner fleet vehicles should reduce NOx emissions.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
		South Gloucester-shire.								
SL2	Car club	Establish a car club with the objective to reduce car ownership levels.	SGC	TBC	2016 onwards	Measured by car club membership.	No specific target emissions reduction.	Long term action - no progress yet.	TBC	No specific target emissions reduction.
SL3	Review traffic signal numbers and operations	Review implications of traffic signals and signal timings to improve traffic flows through Staple Hill.	SGC	2012	2016 onwards	Measured by improved traffic speeds.	No specific target emissions reduction.	1) The Local Transport Capital Programme included the introduction of a new traffic signal control strategy at the junction of A4175 Broad Street/A4017 Victoria Street (ref NM50/2012). The Chase Area Forum prioritised this measure as part of their delegated funding and the scheme was completed in 2012. 2) DEFRA Air Quality Grant awarded to implement a similar scheme at High Street (B4465), Pendennis Road and Acacia Road crossroads. The aim of the project is to improve the timing of the traffic signals to allow better traffic flow through the junction. £8,000 of grant funding allocated in LTP capital programme (ref NM75/2013). Project Initiation Document and work programme finalised January 2013.	1) September 2012 2) October 2013	No specific target emissions reduction. If the outcome of the review is implemented, traffic, pedestrian and air quality monitoring data will be collected and reviewed.
SL4	Review of delivery bays	Review the designated delivery bays to reduce congestion where possible.	SGC	-	2016 onwards	Measured by • number of reported issues with delivery bays • Reduced congestion	No specific target emissions reduction.	Long term action – no progress yet.	TBC	No specific target emissions reduction.
SL5	Restrict traffic turning movements at A4017 junction.	By restricting traffic turning at A4017, the free flow of traffic is maintained and therefore not idling which improves emissions.	SGC	TBC	2016 onwards	Measured by reduction in traffic volumes at A4017 junction.	No specific target emissions reduction.	Long term action - no progress yet. This action will be reviewed once the signals upgrade identified under action SL3 has been completed. Improvements in traffic flow resulting from the upgrade may negate the need for this action.	TBC	No specific target emissions reduction.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Estimated completion date	Comments relating to emission reductions
SL6	Controlled deliveries/collections	Restrict deliveries/ collections (e.g. waste collections) to off peak hours and explore use of freight consolidation centre with electric vehicles for delivery.	SGC	TBC	2016 onwards	Measured by number of delivery & collection agreements made with businesses	No specific target emissions reduction.	Long term action - no progress yet.	TBC	No specific target emissions reduction.
SL7	Reclassify strategic routes and signing strategy	By reclassifying the routes it would reroute strategic traffic and therefore reduce the traffic volumes.	SGC	TBC	2016 onwards	Measured by reduction in traffic volumes on and travelling towards A4017.	No specific target emissions reduction.	Long term action - no progress yet.	TBC	No specific target emissions reduction.

Additional Supporting Information for Staple Hill Action Plan

Table 22 LTP Capital Programme Schemes from 2012/13 & 2013/14 relevant to Staple Hill AQMA

Scheme No.	Area Forum	Parish (Ward)	Scheme Name	Description	Funding Source	Estimated Costs
NM75/2013	TC	(Staple Hill)	B4465 High Street/Pendennis Road/Acacia Road	Introduce new signal control strategy at existing signal installation to improve local Air Quality	GRANT	£8,000
NM73/2013	TC	Unparished (Staple Hill Ward)	Staple Hill Parking Review	(On street and Off Street) Area Forum Schemes (TC59,50)	LTP	£50,000
NM67/2012	TC	Kingswood (Staple Hill)	Morley Road	Traffic management measures including waiting restrictions	DEV (GD3259) DEV (GD3259)	£49,000
NM68/2012	TC	Kingswood (Staple Hill)	Portland Street	Traffic management measures including waiting restrictions	DEV (GD3261) (GD3306)	£16,000

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

For nitrogen dioxide, there are exceedences of the annual mean objective. The majority of these are within the Kingswood and Staple Hill air quality management areas, confirming they are still required. However, there are seven exceeding sites outside of the AQMAs. A Detailed Assessment is already underway in respect of one of these sites (116) in Warmley High Street to confirm the exceedence of the nitrogen dioxide annual mean objective and investigate the extent of the potential air quality problem in this area.

At the other six exceeding sites outside of the AQMAs, relevant exposure is set back from the monitoring sites so the results have been adjusted for distance to represent concentrations at the façade of the nearest residential properties. This revealed concentrations to be below the annual mean objective at the property facades in relation to four of the sites (14, 47, 55 and 120). However, distance adjustment of results for two sites; 52 and 127 estimated concentrations that exceeded the annual mean objective at the façade. However, Site 52 was discontinued during 2012 and replaced with a new site (133) at the façade of the nearest residential property, which showed concentrations to be below the objective so no further action is required in respect of site 52.

With regard to site 127, it is proposed to set up an additional monitoring site at the façade of the nearest residential property to better represent relevant exposure. Should any exceedences be identified at the new monitoring site or at the other monitoring sites around this junction (sites 126 and 128) in subsequent review and assessment reports, a Detailed Assessment will be undertaken.

The review of 2012 monitoring results for the Cribbs Causeway AQMA show nitrogen dioxide concentrations are below the annual mean objective at the façade of the only residential property within the AQMA. However, the AQMA will be retained pending further monitoring results before a decision is made as to whether to revoke it or not.

For all other pollutants monitored; particulate matter (PM_{10}), benzene and heavy metals, namely lead, there are no exceedences of the relevant objectives.

10.2 Conclusions relating to New Local Developments

South Gloucestershire Council has identified a proposed biomass boiler at Warmley Park School which may impact on air quality in the Local Authority area following screening. A detailed dispersion modelling assessment will be carried out and the modelling will be used to verify the stack height necessary to ensure the adequate dispersal of pollutant prior to the boiler becoming operational. An update will be provided in the 2014 Progress Report.

In addition, there are a number of large scale developments coming forward, in particular, major housing developments and a proposed new gas fired power station (Seabank 3), which will continue to be assessed and where relevant monitored, with updates given in subsequent review and assessment reports.

10.3 Other Conclusions

Good progress is being made in the implementation of the Air Quality Action Plan for Kingswood and Staple Hill with progress made against all of the short and medium term actions and some of the long-term actions in both areas. Work will continue to implement the action plan measures and future progress will be reported in subsequent review and assessment reports.

10.4 Proposed Actions

The next course of action will be to complete the Detailed Assessment for nitrogen dioxide in Warmley with a view to submitting the report to Defra by the end of April 2014 following a year of monitoring.

Current monitoring will continue across the district at sites of relevant exposure. The monitoring network will continue to be reviewed to ensure that sites represent worst-case exposure wherever possible. The monitoring results will be reported to Defra in the 2014 Progress Report, along with an update on new local developments, including an update on Warmley Park School biomass boiler and progress on the implementation of the Air Quality Action Plan for Kingswood and Staple Hill.

11 References

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Defra, 2009b. Local Air Quality Management Technical Guidance (LAQM.TG(09))

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West of England Partnership, 2011. Joint Local Transport Plan 3

12 Glossary

ADMS	Atmospheric Dispersion Modelling System
AQMA	Air Quality Management Area
AQAP	Air Quality Action Plan
AURN	Automatic Urban and Rural Network
BAM	Beta Attenuation Monitor (for PM_{10} measurement)
BTX	Benzene, Toluene, Xylene
CO	Carbon monoxide
Defra	Department for Environment, Food and Rural Affairs
Exceedence	A period of time where the concentration of a pollutant is greater than the appropriate air quality objective
GIS	Geographical Information System
LAQM	Local Air Quality Management
LAQM.TG(09)	Defra Local Air Quality Management Technical Guidance 2009
NO_2	Nitrogen dioxide
NOx	Nitrogen oxides
O_3	Ozone
PM_{10}	Particulate matter with diameter less than 10 µm
QA/QC	Quality Assurance/ Quality Control
SO_2	Sulphur dioxide
TEOM	Tapered Element Oscillating Microbalance (for PM_{10} measurement)
UKAS	United Kingdom Accreditation Service
USA	Updating and Screening Assessment. An air quality assessment that is undertaken every 3 years in the LAQM process
VCM	Volatile Correction Model
WASP	Workplace Analysis Scheme for Proficiency (assesses laboratory proficiency in diffusion tube analysis)
$\mu g/m^3$	Microgrammes per cubic metre
mg/m^3	Milligrammes per cubic metre

Appendices

Appendix A: Maps

Appendix B: QA/QC Data

Appendix C: Monthly Diffusion Tube Data

Appendix D: Part A1, A2 and B Permitted Processes

Appendix E: Biomass Boiler Screening

Appendix A: Maps

District Map

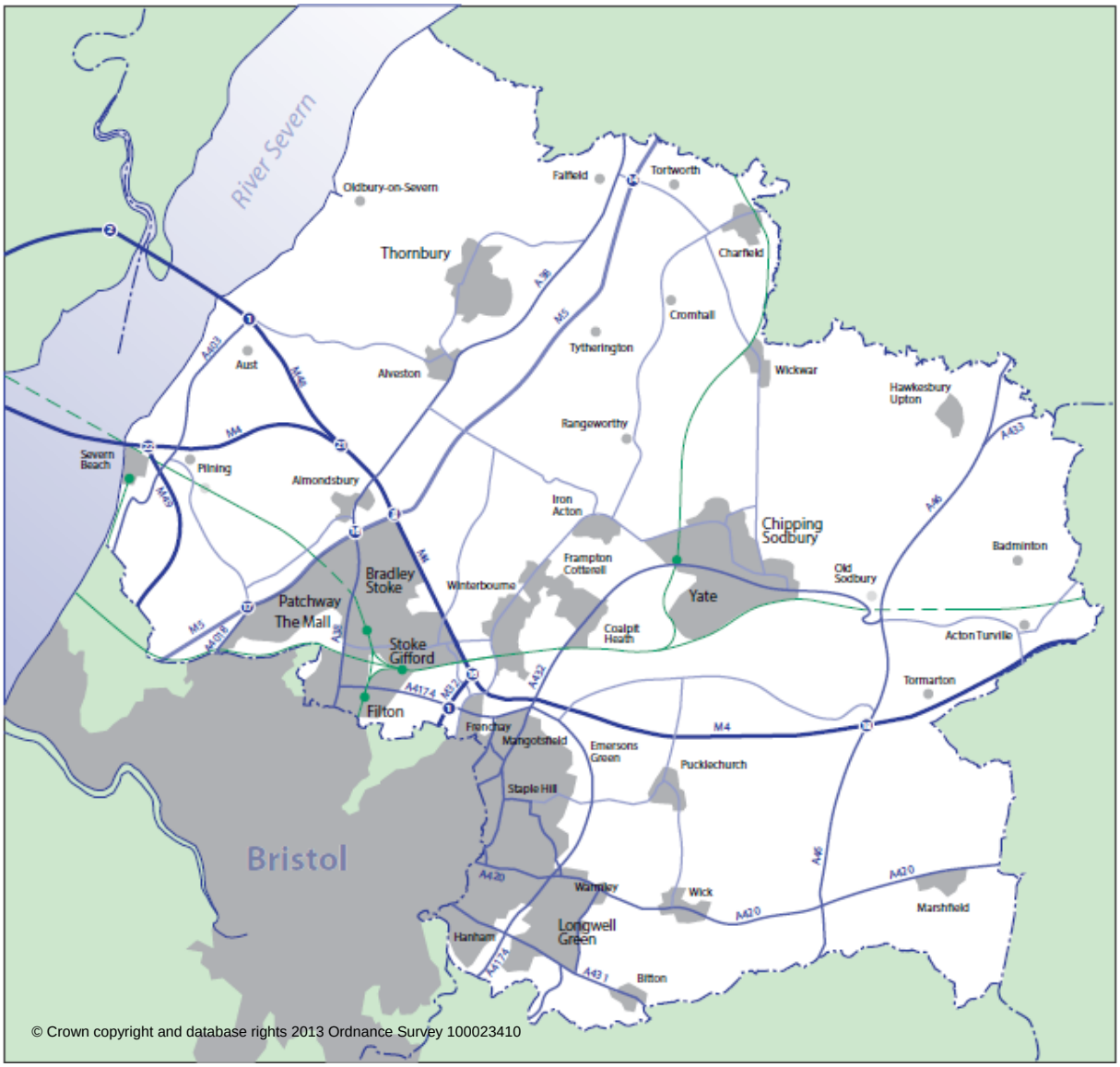


Figure 3 Map of South Gloucestershire Area

Air Quality Management Area Maps

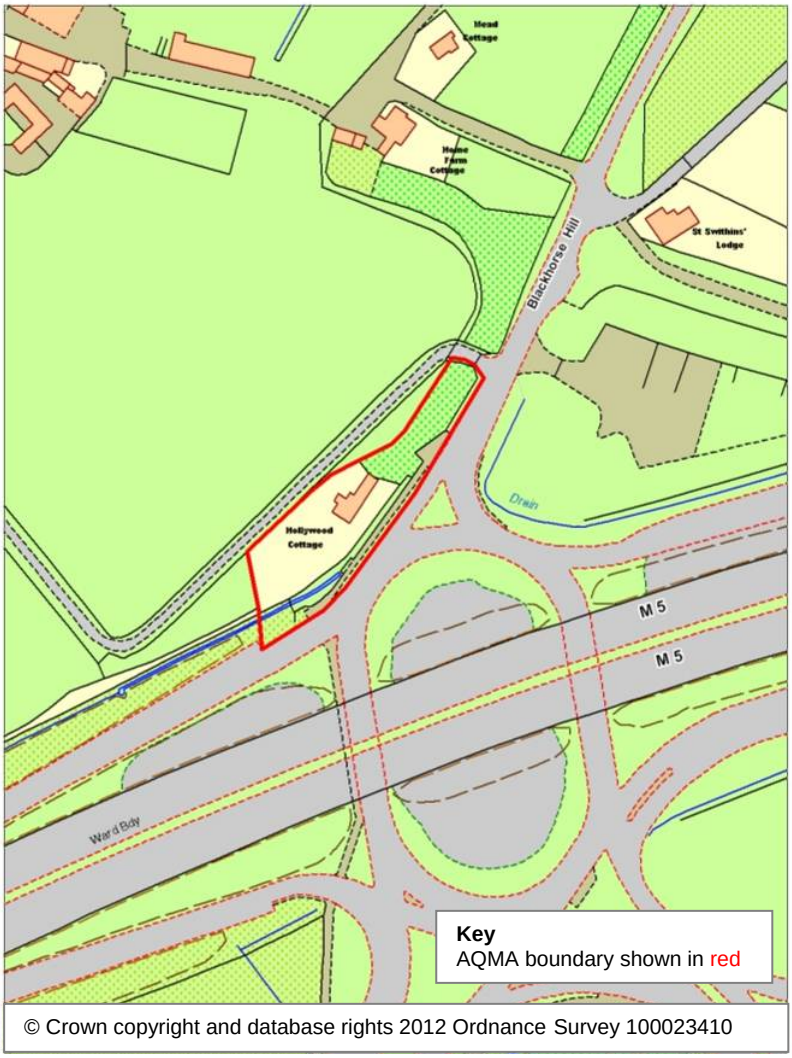


Figure 4 Cribbs Causeway AQMA (Declared 2010)

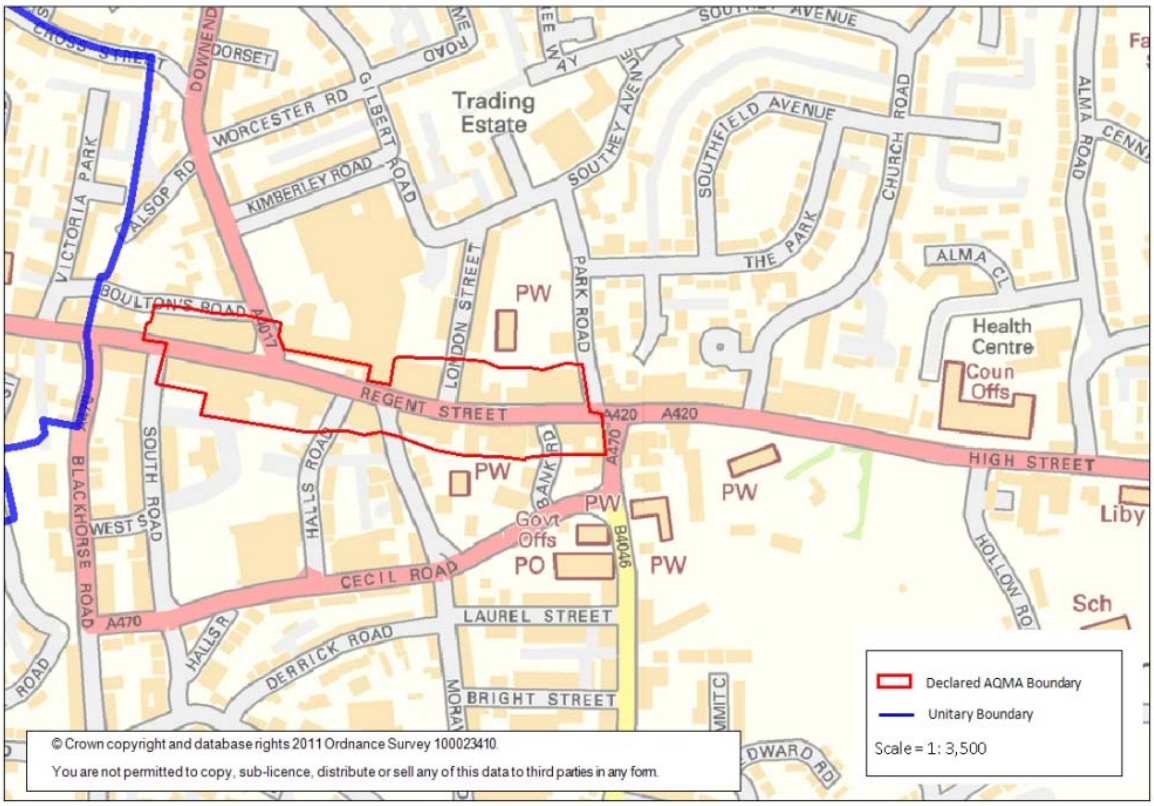


Figure 5 Kingswood AQMA (Declared 2010)

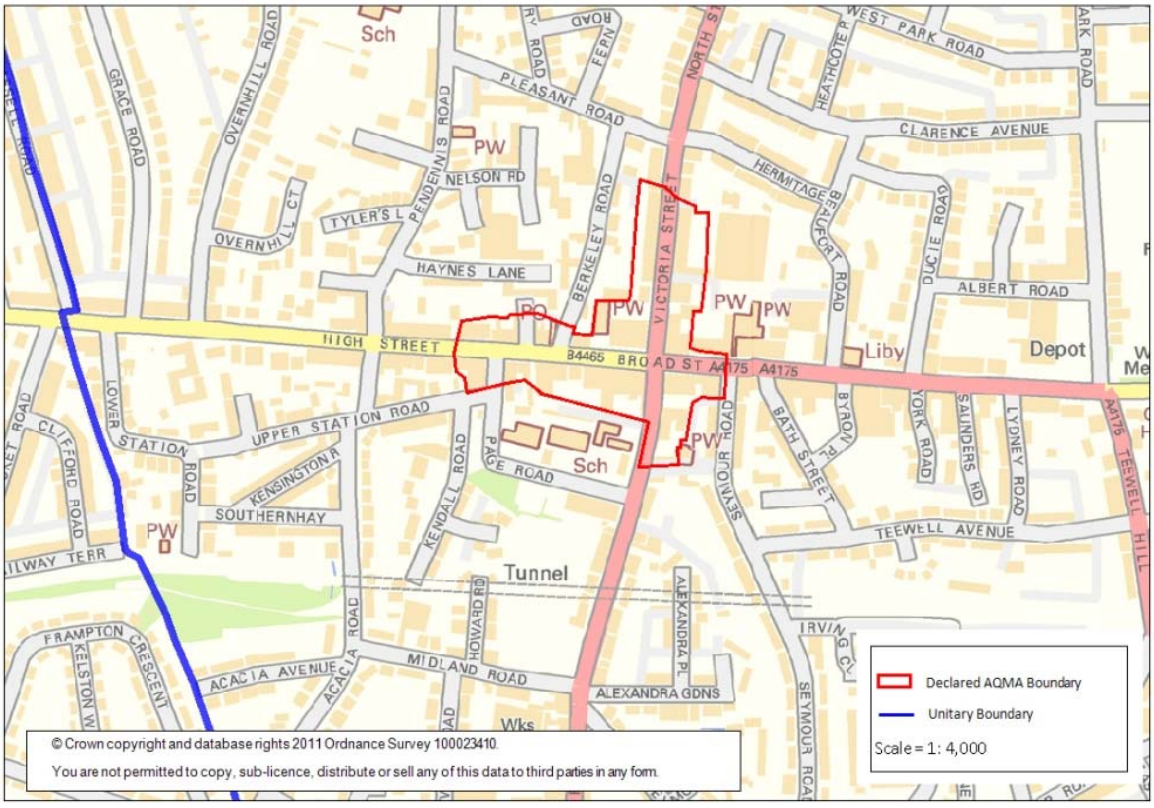


Figure 6 Staple Hill AQMA (Declared 2010)

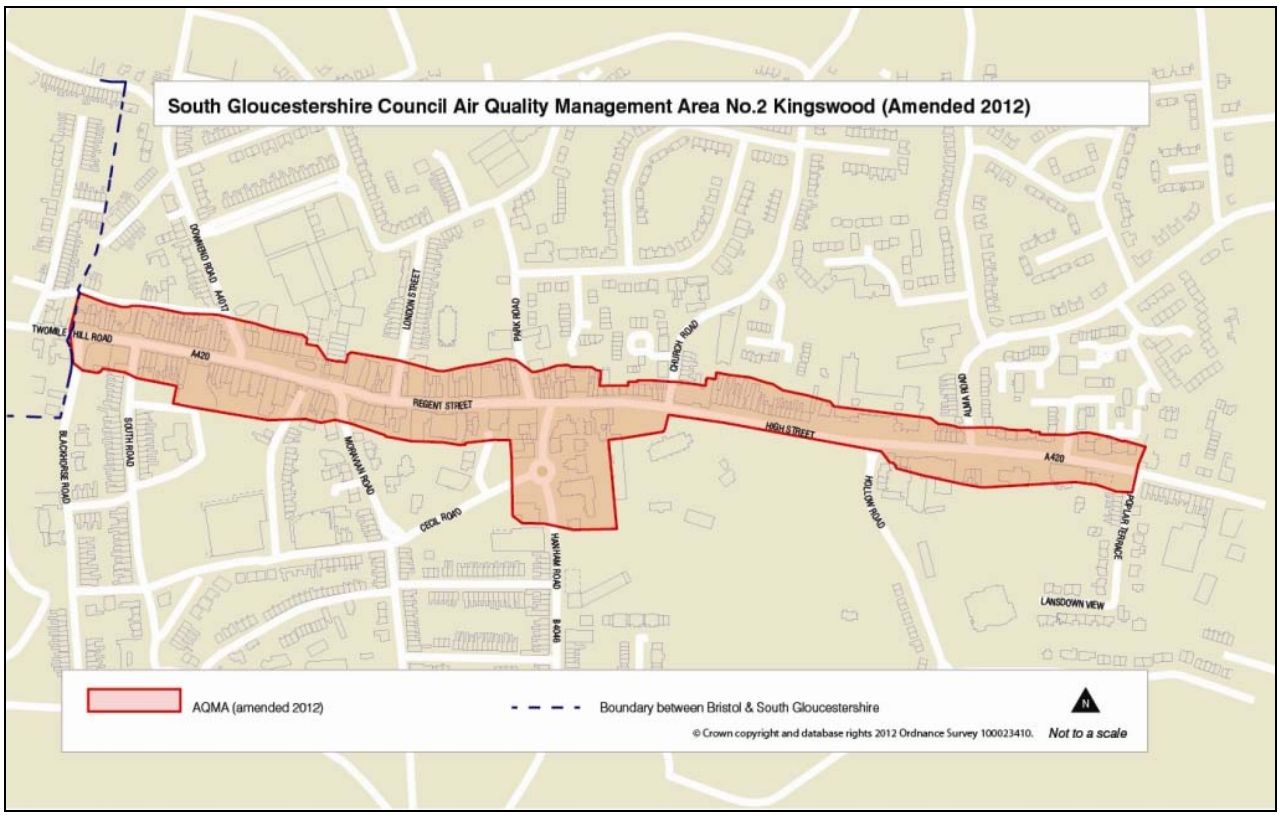


Figure 7 Kingswood AQMA (Amended 2012)

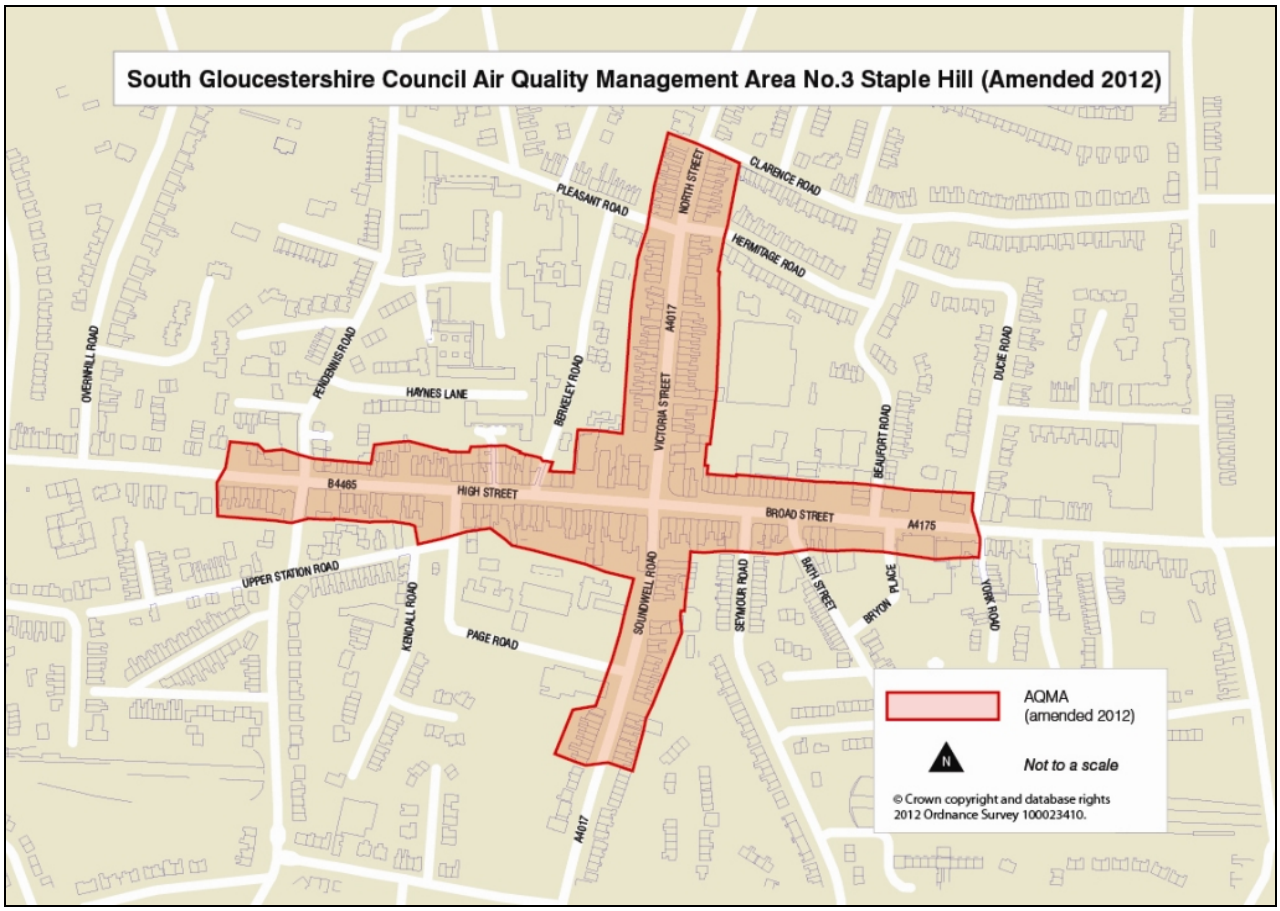


Figure 8 Staple Hill AQMA (Amended 2012)

Monitoring Site Maps

Maps of Automatic Monitoring Sites

Figure 9 All Automatic Monitoring Sites

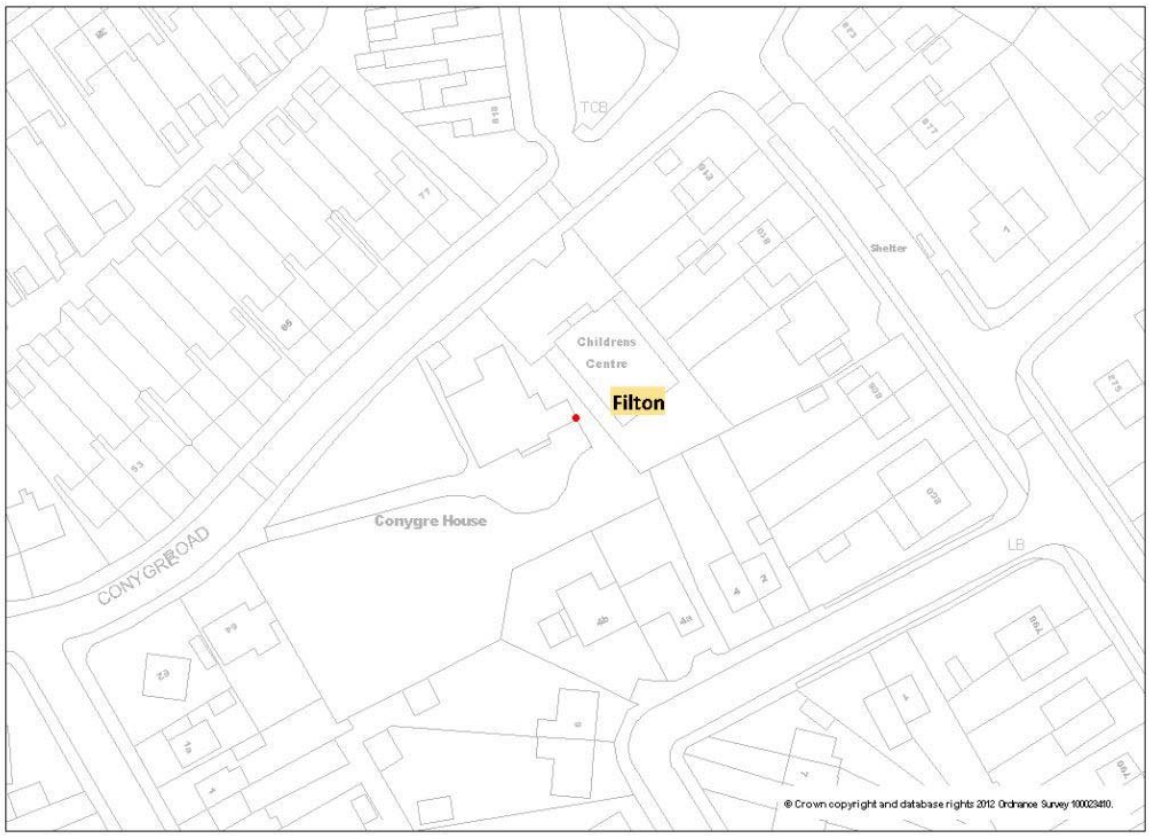


Figure 10 Automatic Monitoring Site Filton - Conygre House, Conygre Road

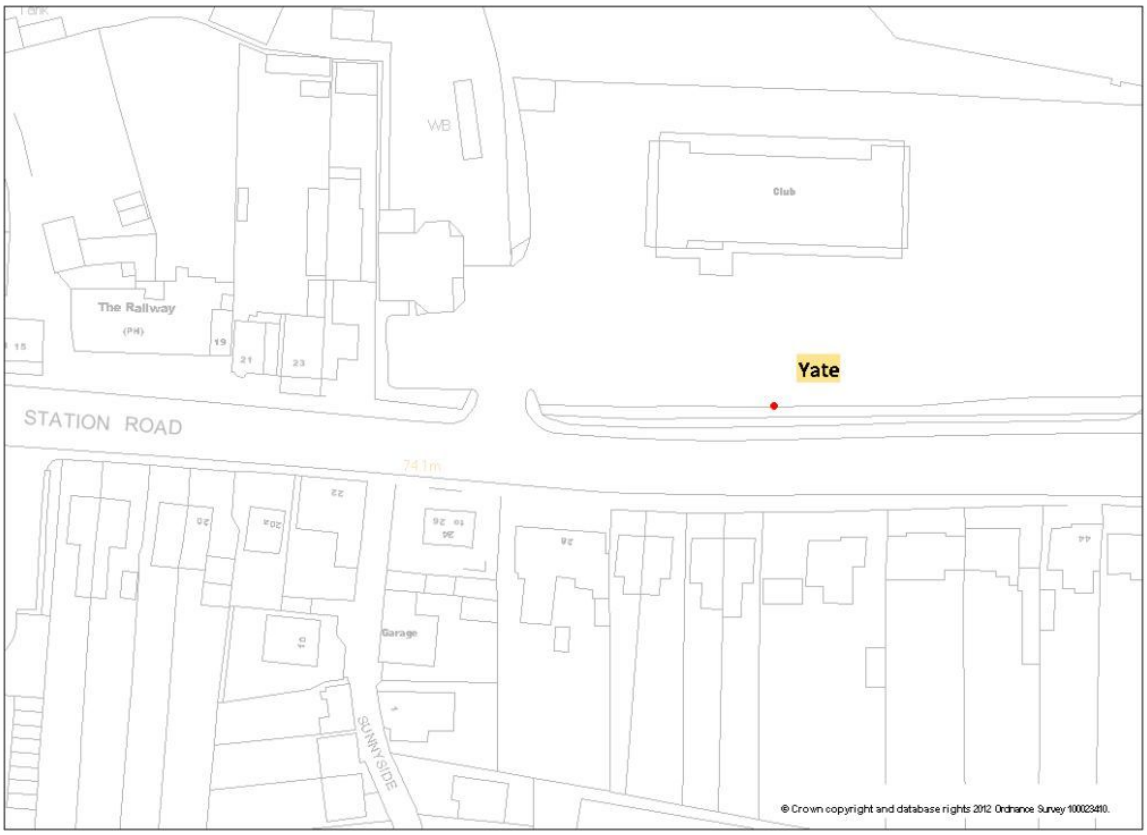


Figure 11 Automatic Monitoring Site Yate - Station Road

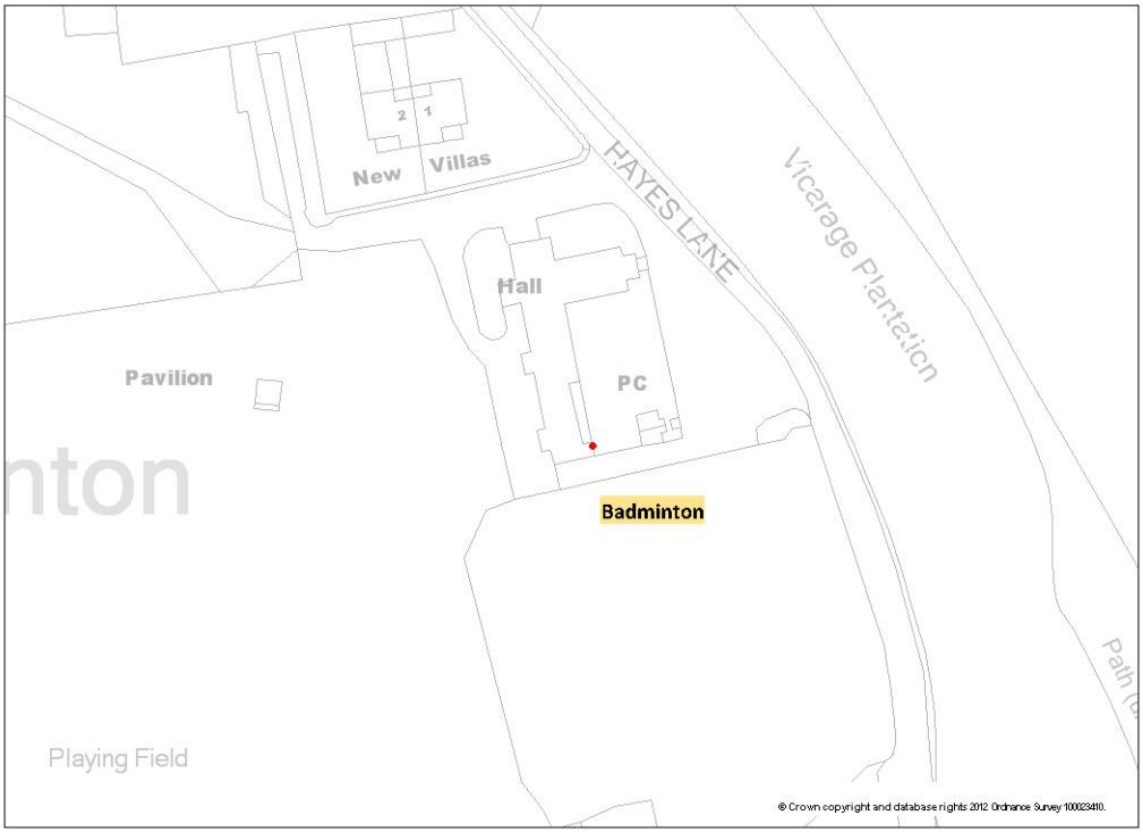


Figure 12 Automatic Monitoring Site Badminton - Memorial Hall, Hayes Lane

Maps of Diffusion Tube Monitoring Sites

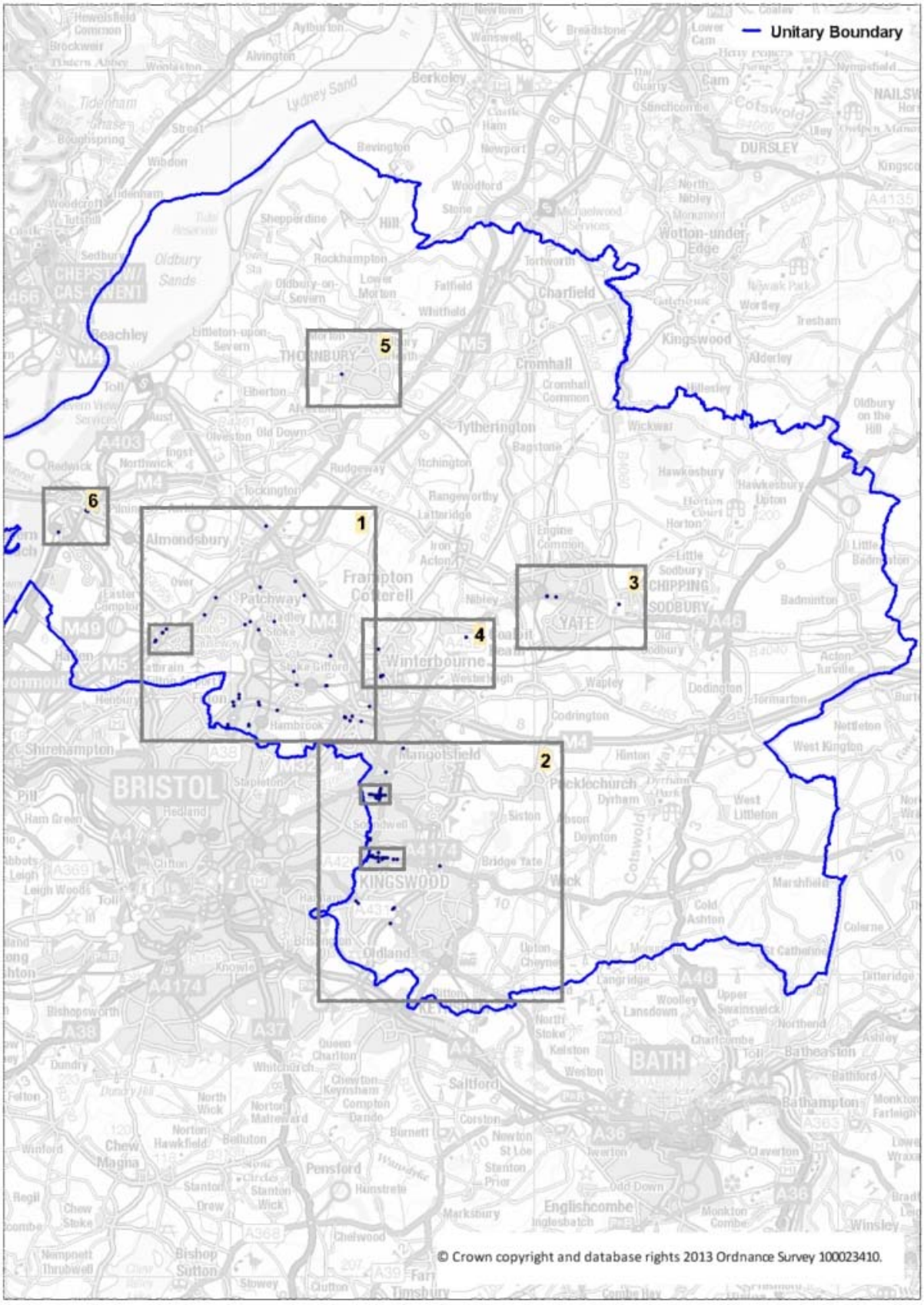


Figure 13 All Diffusion Tube Sites showing locations of following Figures

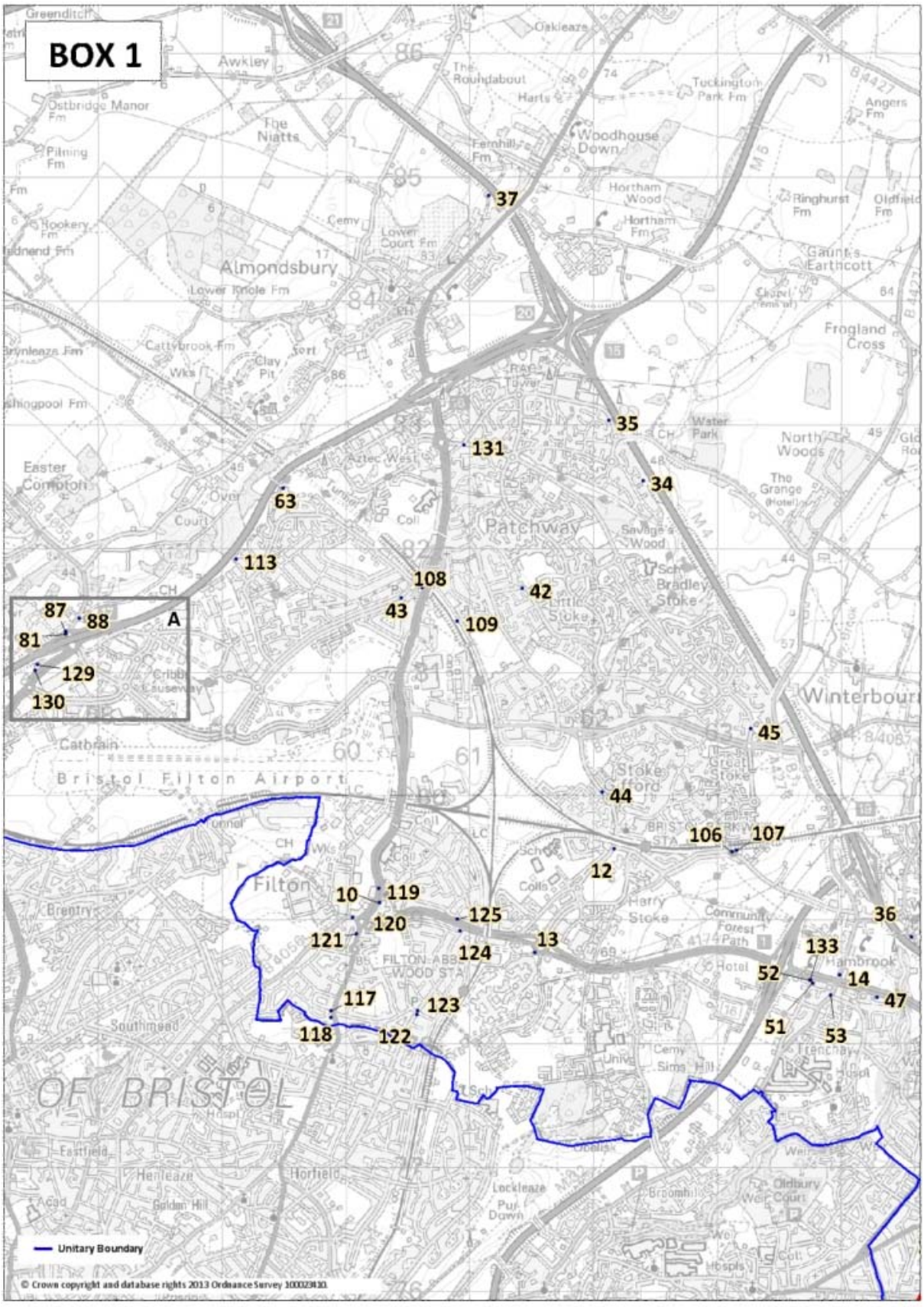


Figure 14 Diffusion Tube Sites in Bristol North (Box 1 Figure 13)

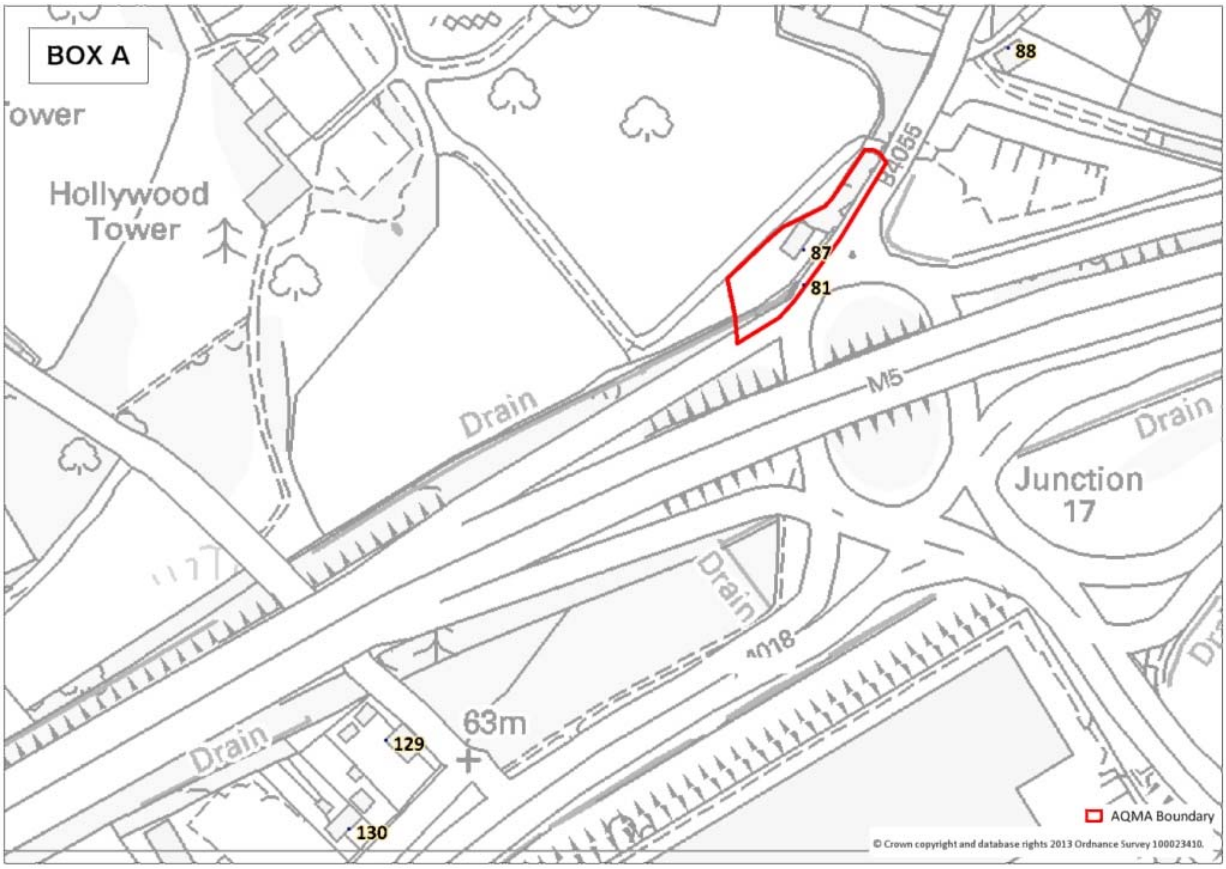


Figure 15 Diffusion Tube Sites in Cribbs Causeway (Box A Figure 14)

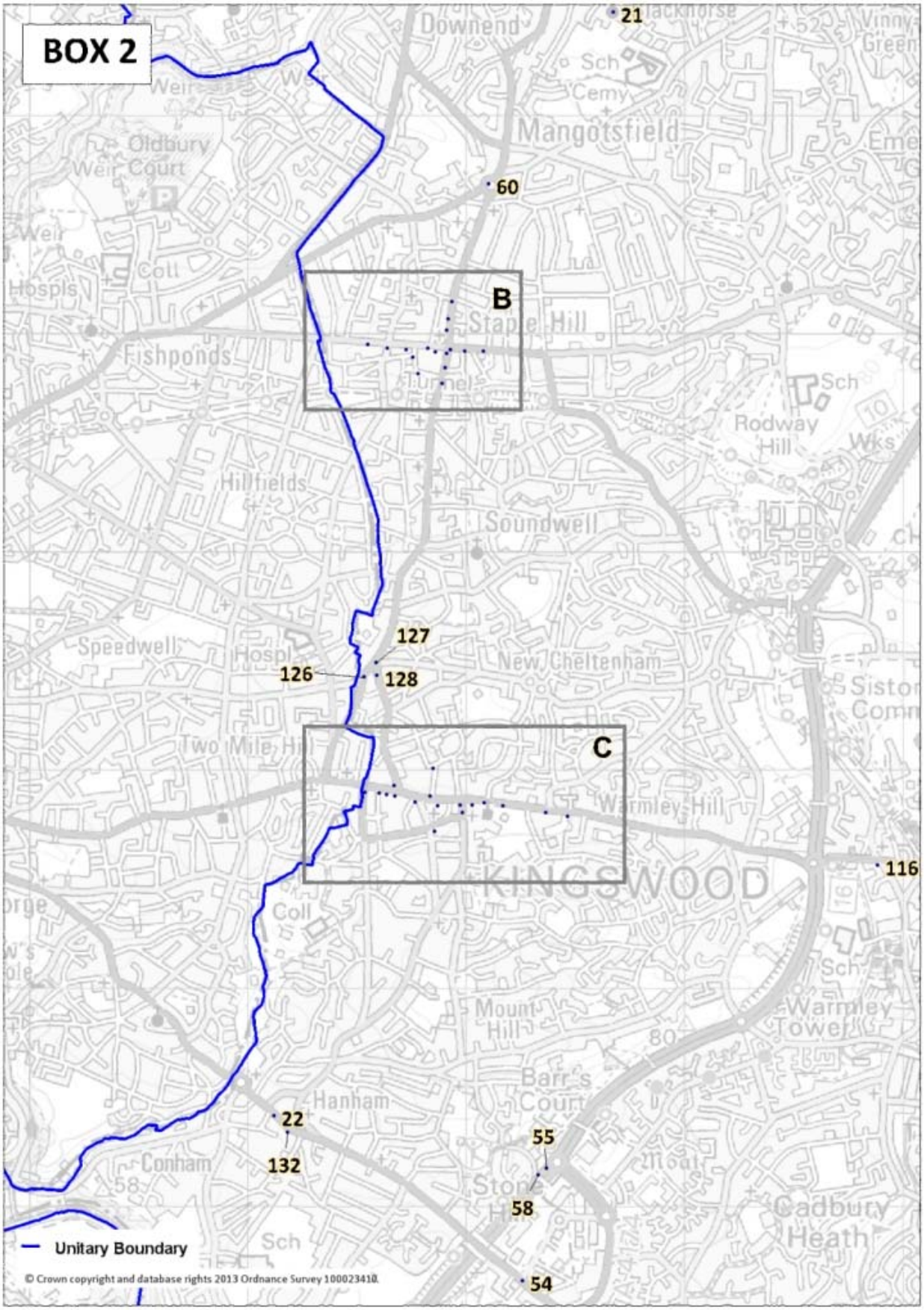


Figure 16 Diffusion Tube Sites in Bristol East (Box 2 Figure 13)

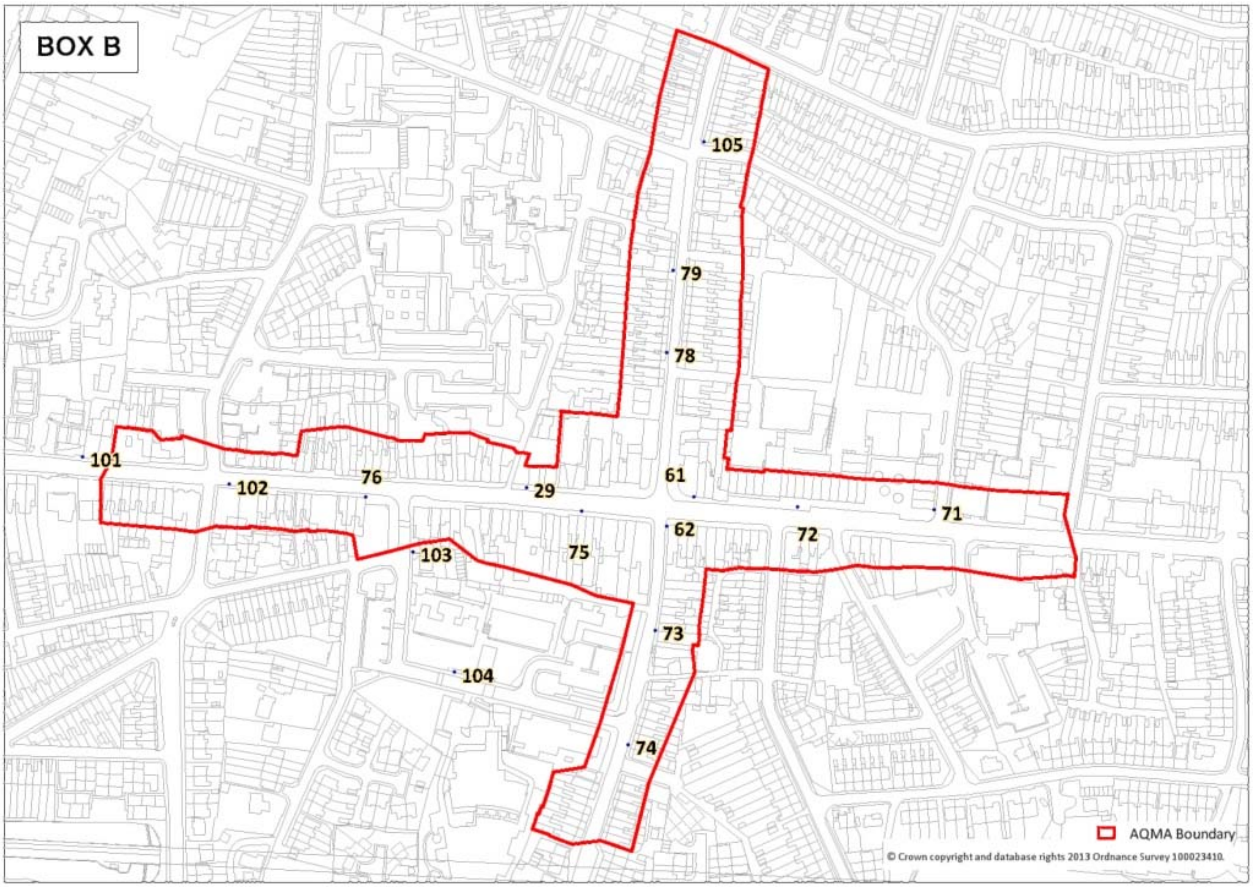


Figure 17 Diffusion Tube Sites in Staple Hill (Box B Figure 16)

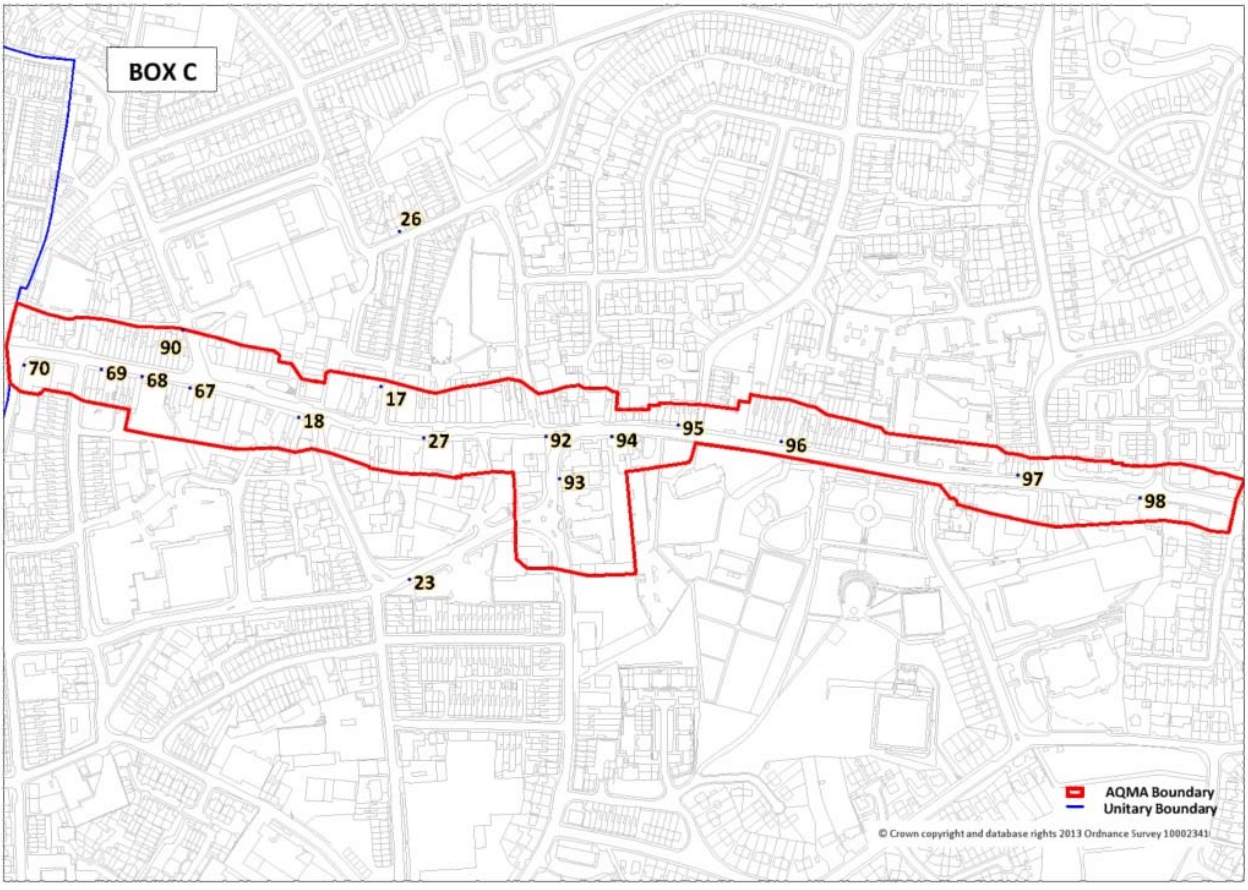


Figure 18 Diffusion Tube Sites in Kingswood (Box C Figure 16)

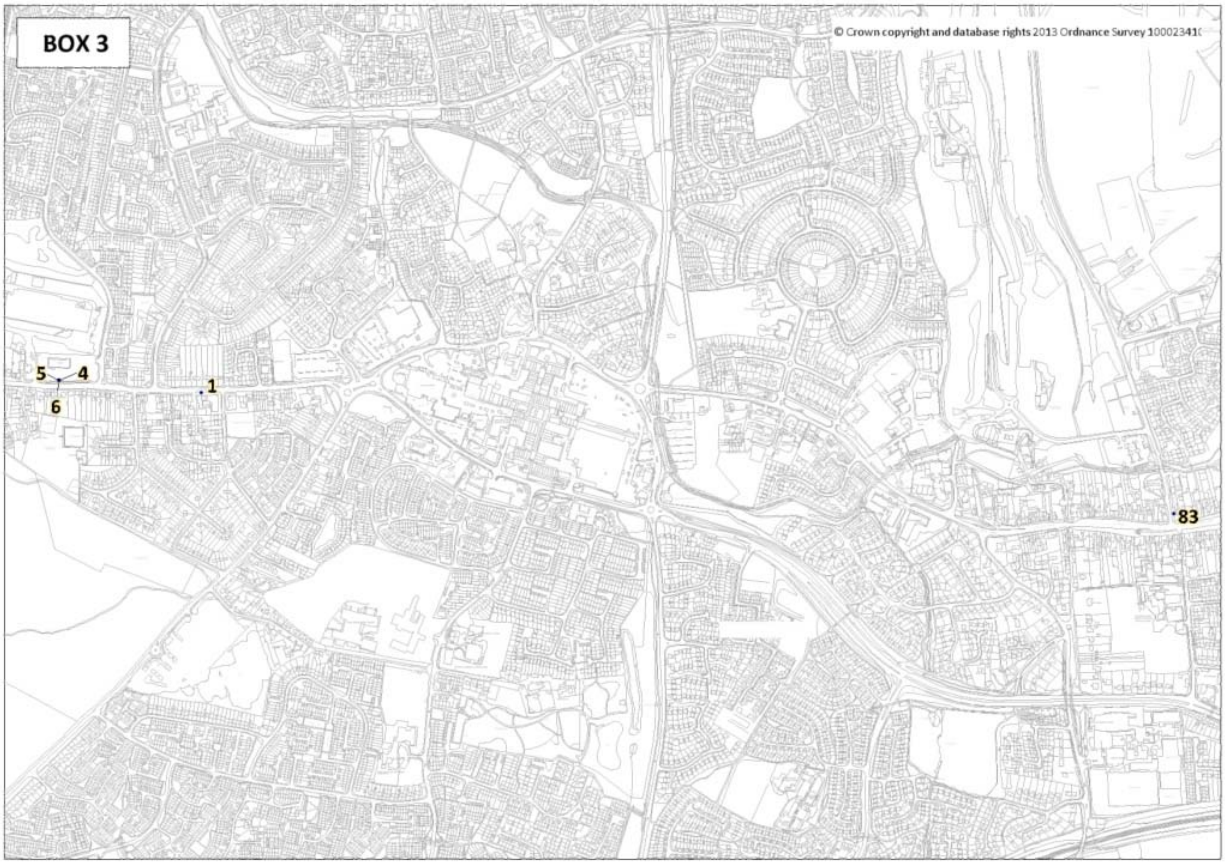


Figure 19 Diffusion Tube Sites in Yate and Chipping Sodbury (Box 3 Figure 13)

Figure 20 Diffusion Tube Sites in Frampton Cotterell, Winterbourne and Coalpit Heath (Box 4 Figure 13)

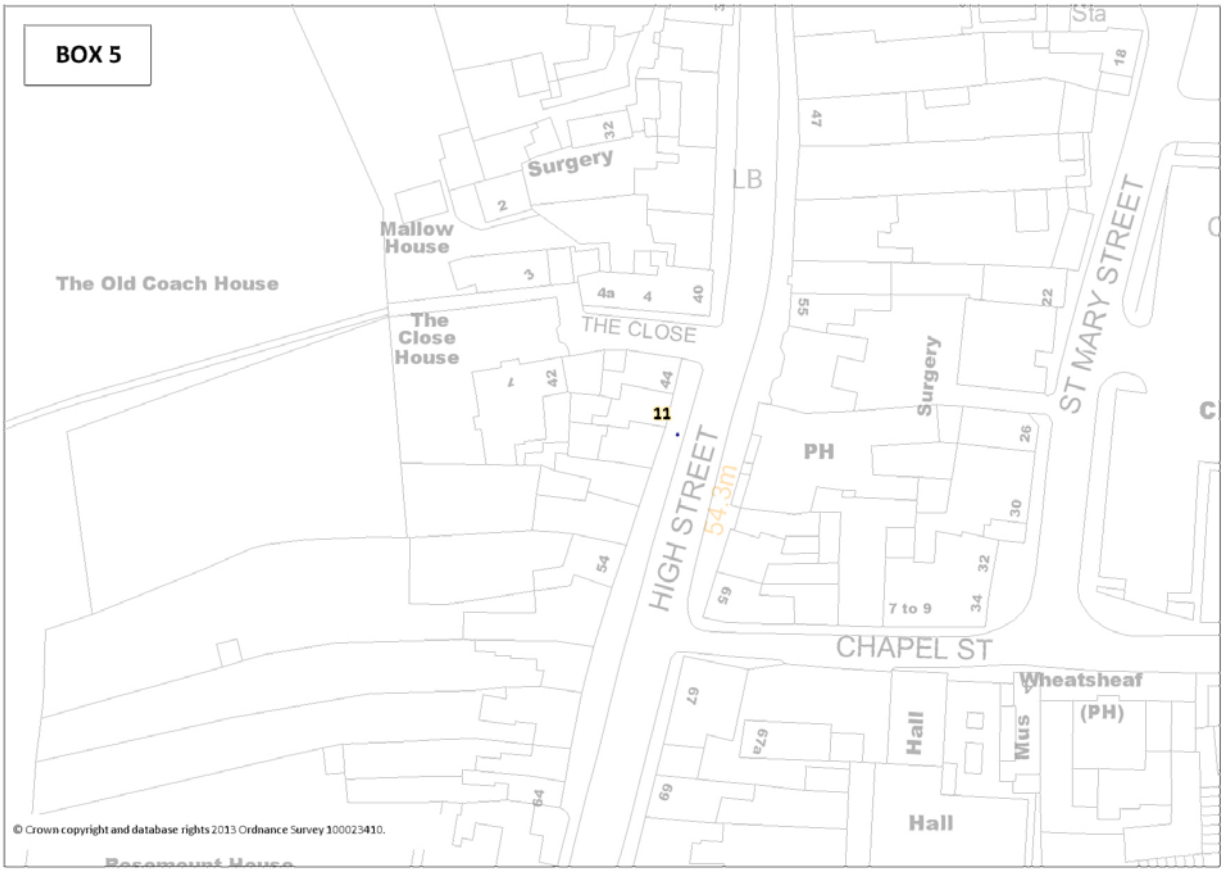


Figure 21 Diffusion Tube Site in Thornbury (Box 5 Figure 13)

Figure 22 Diffusion Tube Sites in Severn Beach and Pilning (Box 6 Figure 13)

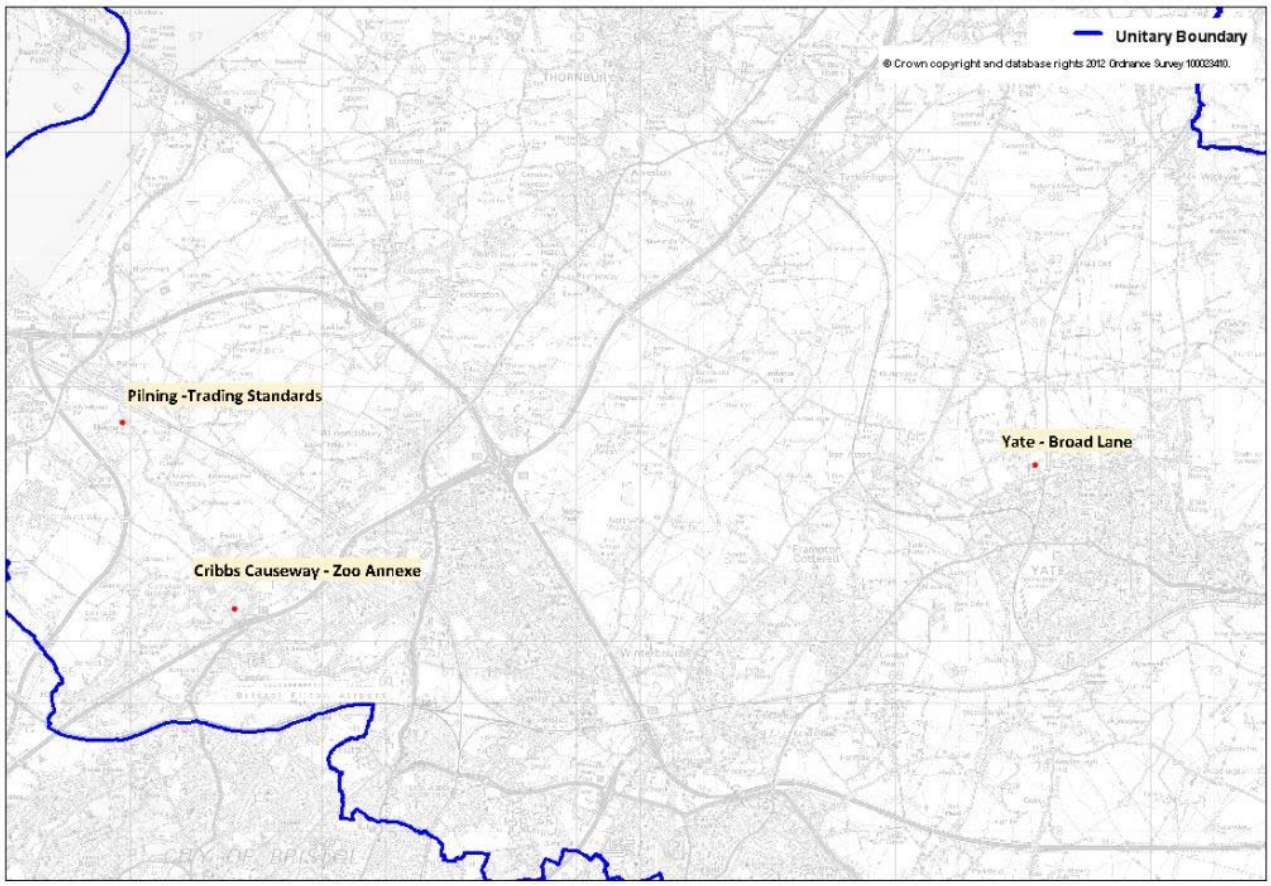


Figure 23 Heavy Metal Monitoring Sites

Map of Combined Impacts of Biomass Combustion

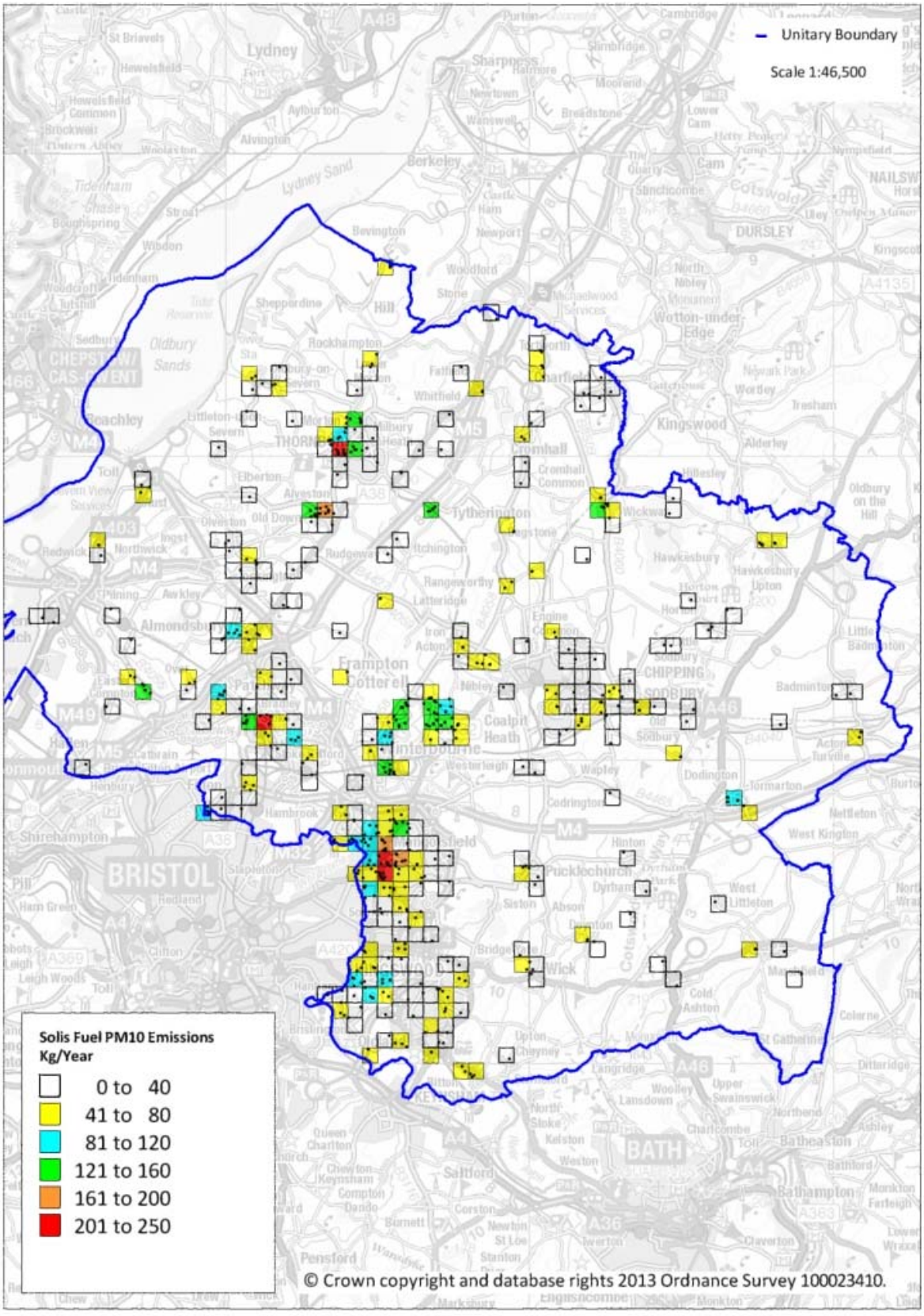


Figure 24 Individual Solid Fuel Installations and PM_{10} Emissions per 500m Grid Square (Wood as Fuel)

Appendix B: QA/QC Data

QA/QC of Diffusion Tube Monitoring

In January 2012, Somerset County Council Scientific Services took over the placement and analysis of the diffusion tubes from Bristol City Council Scientific Services. The tubes are prepared by the laboratory using 20% triethanolamine (TEA) in water. The laboratory, while not UKAS accredited for the analysis of diffusion tubes, participates in the Workplace Analysis Scheme for Proficiency (WASP). For nitrogen dioxide diffusion tubes, this involves analysis of four diffusion tubes spiked with a known amount of sodium nitrite every four months and comparison of participating laboratories results. The results from the WASP scheme for rounds 116 to 119 during 2012 show good performance for the laboratory[6].

Data Ratification and Bias Adjustment

The diffusion tube results are examined on a monthly basis to identify any spurious data and any suspect data is investigated further. Trends in monitored levels across the diffusion tube sites are compared to take into account seasonal factors, such as changing weather patterns and increased traffic flows, and to detect any local changes at the sites, such as road works. The monthly raw data is then averaged for the calendar year to give an annual mean.

While diffusion tubes provide a simple, cost-effective way of monitoring a wide range of locations, the accuracy of the tubes can be variable depending on the laboratory preparation, handling and analysis. To overcome this, a Bias Adjustment Factor, is applied to the raw mean for the relevant monitoring period. This factor is calculated from monitoring sites where triplicate diffusion tubes are co-located with an automatic NOx analyser by comparing results of the two measurement methods.

Diffusion Tube Bias Adjustment Factors

During 2012, the Council operated a co-location study at the Yate automatic monitoring site. The national bias-adjustment factor for 2012 for Somerset Scientific Services is 0.95 (spreadsheet version 07/13[7]).

There were two co-location studies, available in the national database, including the South Gloucestershire study. The co-location results show poor precision (ability for

[6] http://laqm.defra.gov.uk/documents/LAQM-WASP-Rounds-113-120-(April-2011--March-2013)-NO2-report.pdf
[7] http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

a measurement to be consistently reproduced) for both studies, though accuracy (ability of the measurement to represent the "true" value) is good. For the Yate study, bias is 5.1% with the mean diffusion tube concentrations of 28 µg/m^3 comparing well to the automatic monitor mean of 27µg/m^3.

Factor from Local Co-location Study

The precision and accuracy spreadsheet available on the LAQM Tools Defra webpage[8] was used to compare the triplicate co-located diffusion tubes with the automatic monitor in Yate and calculate a local bias adjustment factor of 0.97.

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	09/01/2012	30/01/2012	41.4	38.5	44.6	41	3.0	7	7.5		0	Good	Poor Data Capture
2	30/01/2012	28/02/2012	38.6	34.3	32.2	35	3.3	9	8.1	33.4	61.1	Good	Poor Data Capture
3	28/02/2012	27/03/2012	49.8	34.0	20.4	35	14.7	42	36.5	40.1	99.7	Poor Precision	Good
4	27/03/2012	23/04/2012	26.7	32.1	27.4	29	2.9	10	7.3	28.2	99.1	Good	Good
5	23/04/2012	29/05/2012	28.1							19.2	96.8		Good
6	29/05/2012	27/06/2012	22.2		26.3	24	2.9	12	26.4	18.8	99.6	Good	Good
7	27/06/2012	31/07/2012	25.4	27.5	24.3	26	1.6	6	4.1	19.5	99.6	Good	Good
8	31/07/2012	29/08/2012	21.7	23.7	22.0	22	1.1	5	2.7	20.4	99.9	Good	Good
9	29/08/2012	27/09/2012	21.0		24.9	23	2.8	12	24.8	23.4	99.6	Good	Good
10	27/09/2012	01/11/2012	28.6	27.6	29.2	28	0.8	3	2.0	27.1	99.9	Good	Good
11	01/11/2012	29/11/2012	35.0	33.3	36.3	35	1.5	4	3.7	38.0	99.9	Good	Good
12	29/11/2012	03/01/2012	35.2	35.9	34.8	35	0.6	2	1.4	35.6	96.8	Good	Good
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

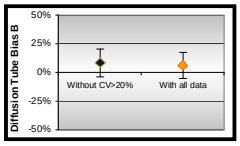
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	South Glos Yate

Precision: 10 out of 11 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 8 periods of data	
Bias factor A	0.95 (0.85 - 1.07)
Bias B	6% (-6% - 18%)
Diffusion Tubes Mean:	28 µgm^{-3}
Mean CV (Precision):	7
Automatic Mean:	26 µgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	26 (24 - 30) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 9 periods of data	
Bias factor A	0.97 (0.88 - 1.1)
Bias B	3% (-9% - 14%)
Diffusion Tubes Mean:	29 µgm^{-3}
Mean CV (Precision):	11 caution
Automatic Mean:	28 µgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	28 (25 - 31) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

Figure 25 Precision and Accuracy spreadsheet for Co-location Study at Yate

Discussion of Choice of Factor to Use

The national bias adjustment factor (0.95) and local bias adjustment factor (0.97) compare favourably. While there were fewer studies in the national database than in past years, in order to be consistent with previous reports, it was considered to be more robust to use the national factor.

Short-term to Long-term Data adjustment

Eight of the nitrogen dioxide diffusion tube monitoring sites had less than 75% data capture in 2012;

- Site 51 Hambrook – Rear of 96 Old Gloucester Road (67%)

[8] http://laqm.defra.gov.uk/bias-adjustment-factors/local-bias.html

- Site 52 Hambrook – A4174 (58%)
- Site 55 Longwell Green Ring Road Roundabout Junction Leisure Road (67%)
- Site 58 Longwell Green Kingsfield Lane/Aspects Leisure Site (17%)
- Site 79 Staple Hill 27- 29 Victoria Street (67%)
- Site 93 Kingswood Hanham Road Exchange Court Flats (58%)
- Site 105 Staple Hill North Street lp o/s no.2 (67%)
- Site 133 Hambrook – 123 Old Gloucester Road (25%)

Long-term data from a number of urban background monitoring sites from the national Automatic Urban and Rural Network (AURN), with data capture >90% for the relevant period, was used to generate adjustment factors to annualise the short term data as described in LAQM.TG(09) Box 3.2. This is shown in Table 23 to Table 30. Data was only used where data capture for the relevant period was >90%. Concentrations highlighted in red exceed the annual mean objective (40 µg/m^3) and those highlighted in blue are within 10% of the annual mean objective (>36 µg/m^3).

Table 23 Nitrogen dioxide data used to adjust short-term monitoring data to annual mean for Site 51

Site 51	**Hambrook – Rear of 96 Old Gloucester Road (Period 01/03/12 – 31/07/12 & 01/10/12 - 31/12/12)**			**Bias Adjusted Mean**	**Annualised Mean**
AURN Site	**Annual Mean (µg/m^3)**	**Period Mean (µg/m^3)**	**Ratio**		
Bristol St Paul's	31.5	31.7	0.99		
Cwmbran	13.6	13.7	0.99		
Cardiff Centre	27.1	Not included data capture <90%	-		
Newport	21.7	21.9	0.99		
		Average Ratio	**0.99**	**23.6**	**23.4**

Table 24 Nitrogen dioxide data used to adjust short-term monitoring data to annual mean for Site 52

Site 52	**Hambrook – A4174 (Period 01/03/12 – 30/09/12)**	**Bias Adjusted Mean**	**Annualised Mean**

AURN Site	Annual Mean (µg/m^3)	Period Mean (µg/m^3)	Ratio		
Bristol St Paul's	31.5	26.7	1.18		
Cwmbran	13.6	11.0	1.23		
Cardiff Centre	27.1	21.0	1.29		
Newport	21.7	18.5	1.17		
		Average Ratio	**1.22**	**38.3**	**46.7**

Table 25 Nitrogen dioxide data used to adjust short-term monitoring data to annual mean for Site 55

Site 55	Longwell Green – Ring Road Roundabout Junction Leisure Road (Period 01/01/12 – 31/01/12 & 01/03/12 - 30/09/12)			Bias Adjusted Mean	Annualised Mean
AURN Site	**Annual Mean (µg/m^3)**	**Period Mean (µg/m^3)**	**Ratio**		
Bristol St Paul's	31.5	27.5	1.15		
Cwmbran	13.6	11.6	1.17		
Cardiff Centre	27.1	21.9	1.24		
Newport	21.7	19.0	1.14		
		Average Ratio	**1.17**	**46.7**	**54.8**

Table 26 Nitrogen dioxide data used to adjust short-term monitoring data to annual mean for Site 58

Site 58	Longwell Green – Kingsfield Lane/Aspects Leisure Site (Period 01/10/12 – 30/11/12)			Bias Adjusted Mean	Annualised Mean
AURN Site	**Annual Mean (µg/m^3)**	**Period Mean (µg/m^3)**	**Ratio**		
Bristol St Paul's	31.5	37.4	0.84		
Cwmbran	13.6	16.9	0.80		
Cardiff Centre	27.1	35.1	0.77		
Newport	21.7	24.8	0.88		
		Average Ratio	**0.82**	**23.6**	**19.4**

Table 27 Nitrogen dioxide data used to adjust short-term monitoring data to annual mean for Site 79

Site 79	Staple Hill – 27 – 29 Victoria Street (Period 01/02/12 – 30/04/12; 01/06/12 – 31/07/12; 01/09/12 - 30/09/12 & 01/11/12 – 31/12/12)			Bias Adjusted Mean	Annualised Mean
AURN Site	**Annual Mean ($\mu g/m^3$)**	**Period Mean ($\mu g/m^3$)**	**Ratio**		
Bristol St Paul's	31.5	33.1	0.95		
Cwmbran	13.6	13.9	0.98		
Cardiff Centre	27.1	Not included data capture <90%	-		
Newport	21.7	22.8	0.95		
		Average Ratio	**0.96**	**47.8**	**45.9**

Table 28 Nitrogen dioxide data used to adjust short-term monitoring data to annual mean for Site 93

Site 93	Kingswood – Hanham Road Exchange Court Flats (Period 01/02/12 – 31/07/12 & 01/12/12 – 31/12/12)			Bias Adjusted Mean	Annualised Mean
AURN Site	**Annual Mean ($\mu g/m^3$)**	**Period Mean ($\mu g/m^3$)**	**Ratio**		
Bristol St Paul's	31.5	31.8	0.99		
Cwmbran	13.6	13.5	1.01		
Cardiff Centre	27.1	Not included data capture <90%	-		
Newport	21.7	22.6	0.96		
		Average Ratio	**0.99**	**35.3**	**34.8**

Table 29 Nitrogen dioxide data used to adjust short-term monitoring data to annual mean for Site 105

Site 105	Staple Hill – North Street lp o/s No.2 (Period 01/02/12 – 31/03/12 & 01/12/12 – 31/12/12)			Bias Adjusted Mean	Annualised Mean
AURN Site	**Annual Mean ($\mu g/m^3$)**	**Period Mean ($\mu g/m^3$)**	**Ratio**		
Bristol St Paul's	31.5	31.8	0.99		
Cwmbran	13.6	13.5	1.01		

Site 105	Staple Hill – North Street lp o/s No.2 (Period 01/02/12 – 31/03/12 & 01/12/12 – 31/12/12)			Bias Adjusted Mean	Annualised Mean
AURN Site	**Annual Mean ($\mu g/m^3$)**	**Period Mean ($\mu g/m^3$)**	**Ratio**		
Cardiff Centre	27.1	Not included data capture <90%	-		
Newport	21.7	22.6	0.96		
		Average Ratio	**0.99**	**35.3**	**34.8**

Table 30 Nitrogen dioxide data used to adjust short-term monitoring data to annual mean for Site 133

Site 133	Hambrook – 123 Old Gloucester Road (Period 01/10/12 – 31/12/12)			Bias Adjusted Mean	Annualised Mean
AURN Site	**Annual Mean ($\mu g/m^3$)**	**Period Mean ($\mu g/m^3$)**	**Ratio**		
Bristol St Paul's	31.5	37.9	0.83		
Cwmbran	13.6	16.6	0.81		
Cardiff Centre	27.1	Not included data capture <90%	-		
Newport	21.7	25.4	0.85		
		Average Ratio	**0.83**	**34.6**	**28.8**

Distance Adjustment to façade

There were six diffusion tube monitoring sites with measured exceedences in 2012 outside of AQMAs where the relevant exposure is set back from the monitoring site. The exceedences have been adjusted to the façade of the nearest relevant receptor using the nitrogen dioxide distance adjustment calculator on the LAQM Tools Defra webpage. Rather than represent the calculations for each site, the data and results from the calculator are presented in Table 31. Concentrations estimated to exceed the annual mean objective (40 $\mu g/m^3$) at the façade are highlighted in red and those within 10% of the annual mean objective (>36 $\mu g/m^3$) are highlighted in blue. The results for sites 14, 47 and 55 should be used with caution as the nearest receptor is more than 20m further from the kerb than the monitor.

Table 31 Adjustment of nitrogen dioxide to the façade of the nearest receptors

Site No.	Site Name	Monitor distance to kerb (m)	Receptor distance to kerb (m)	Background NO_2 2012 ($\mu g/m^3$)	Annual mean concentrations 2012 ($\mu g/m^3$) adjusted for bias	Adjusted to façade ($\mu g/m^3$)
14	Hambrook – Bristol Road opp The Gables	1	33	27.9	**63.4**	**38.4**
47	Bromley Heath - A4174	1.6	44	26.4	**47.7**	32.0
52	Hambrook - A4174	3.4	7.5	27.9	**46.7**[a]	**42.7**
55	Longwell Green - Ring Road Roundabout Junction Leisure Road	1.5	24	19.6	**54.8**[a]	33.4
120	Filton – 709 Southmead Road	3	9.7	22.9	**43.3**	**37.1**
127	Soundwell – 264 Soundwell Road	2	3.8	21.6	**45.9**	**42.2**

[a] Annualised mean where full calendar year data capture <75% as in Box 3.2 of TG(09)
Exceedence of NO_2 annual mean objective ($40\mu g/m^3$)
Exceedence of NO_2 annual mean objective $>60\mu g/m^3$ indicating potential exceedence of NO2 hourly mean objective
Borderline within 10% of NO_2 annual mean objective ($>36\mu g/m^3$)

QA/QC of Automatic Monitoring

The continuous monitoring sites follow the QA/QC programme outlined below:

- Daily checks on the data to ensure analysers and communications are operating correctly and faults are reported as soon as possible
- Repairs of faulty equipment under arrangements with outside contractors
- Four-weekly calibration checks on the analysers using nationally traceable standard gases by Bristol City Council (BCC) under contract to South Gloucestershire Council
- Ad-hoc site inspections to check equipment operational status, site security, detect equipment malfunction and to change inlet filters
- Planned six monthly servicing and re-calibration of the analysers by Enviro Technology Services under contract to South Gloucestershire Council.

Calibration methods

Calibration procedures are carried out four-weekly by BCC. The methodology for the calibration procedure, which includes a two point zero/span calibration check, is derived from the manufacturer's instruction handbooks as follows:

- Pre-calibration check - the site condition and status of the analyser is recorded prior to the zero/span check being conducted
- Zero check – the response of the analyser to the absence of the gas being monitored
- Span check – the response of the analyser to the presence of the gas of a known concentration
- Post calibration check - the site condition and status of the analyser on completion of all checks.

Each analyser zero/span check is fully documented and records are kept by the engineer centrally. Calibration factors are then sent by the engineer on spreadsheets and are used in the data scaling and ratification process. The two point calibration is conducted on the NOx analysers using a zero air scrubber and a reference nitric oxide (NO) mixture at a concentration of approximately 470 ppb, which is supplied and certified by BOC. The contents of the portable scrubber used for zero air

generation (hopcalite, activated charcoal, purafil and drierite) are changed when necessary or at least every six months.

Equipment Servicing and Maintenance

All the automatic analysers and associated equipment are serviced and maintained on a planned schedule following manufacturers' instructions. A six monthly full service and multi-point recalibration is carried out on the NOx analysers under contract by the equipment suppliers; Enviro Technology Services. The multi-point calibration involves the use of zero air, NO and NO_2 calibration gases, which are again traceable to national standards, enabling the analyser data slope and offset factors to be reset.

The contract also covers unscheduled site visits and repairs, for example in the event of equipment failure, within a specified period of time to minimise data loss. Results of the servicing, calibrations and repairs are fully documented and stored centrally with basic site visit records also stored at the analyser locations.

Data Processing, Validation and Ratification

Raw data from the analysers is downloaded automatically to a PC via a modem and telephone line from each site. All data is collected by Opsis EnviMan software. The Comvisioner and Reporter modules of the EnviMan software allow full data manipulation and frequent checks on data measurements.

The data outputs from the analysers are visually screened daily using EnviMan Comvisioner to check for obvious erroneous data and equipment faults. Periodically the data is validated, which involves visual examination of the monitoring data to check for any spurious or unusual measurements, such as large spikes, 'flat-lines' and excessive negative data. The suspicious data is 'flagged' for more detailed investigation.

The data is then scaled and ratified. This is undertaken on behalf of South Gloucestershire Council by Air Quality Data Management (AQDM), except for ozone, which is done in-house. This involves the data being scaled against the four weekly and full six monthly calibration data (for ozone; against six monthly data only). Data ratification involves a critical review of all the information relating to the dataset and monitoring location to amend, verify or delete data, as appropriate. Any initial spurious data that was flagged is also re-examined during this process and removed

if deemed appropriate. The original raw dataset is kept enabling any amendments to the data to be traced and allows the data to be re-examined if necessary.

The ratified data is the final data presented in this report. The ratified data from the continuous NOx analyser at Yate is used to obtain a local bias adjustment factor (BAF) through comparison with results obtained for triplicate NO_2 diffusion tubes co-located at this analyser site.

PM Monitoring Adjustment

All results have been adjusted to gravimetric equivalent. All BAM data (Kingswood and Yate) have been corrected for gradient (divided by 1.21) and the TEOM data (Filton) from 2008 onwards have been corrected using the VCM tool. Prior to the VCM tool, the 2007 TEOM data were multiplied by a factor of 1.3 as per LAQM guidance at that time.

Summary Plots

Summary plots of the 2012 hourly mean values for nitrogen dioxide and gravimetric PM_{10} at the Filton and Yate automatic monitoring sites are provided in Figure 26 and Figure 27 respectively.

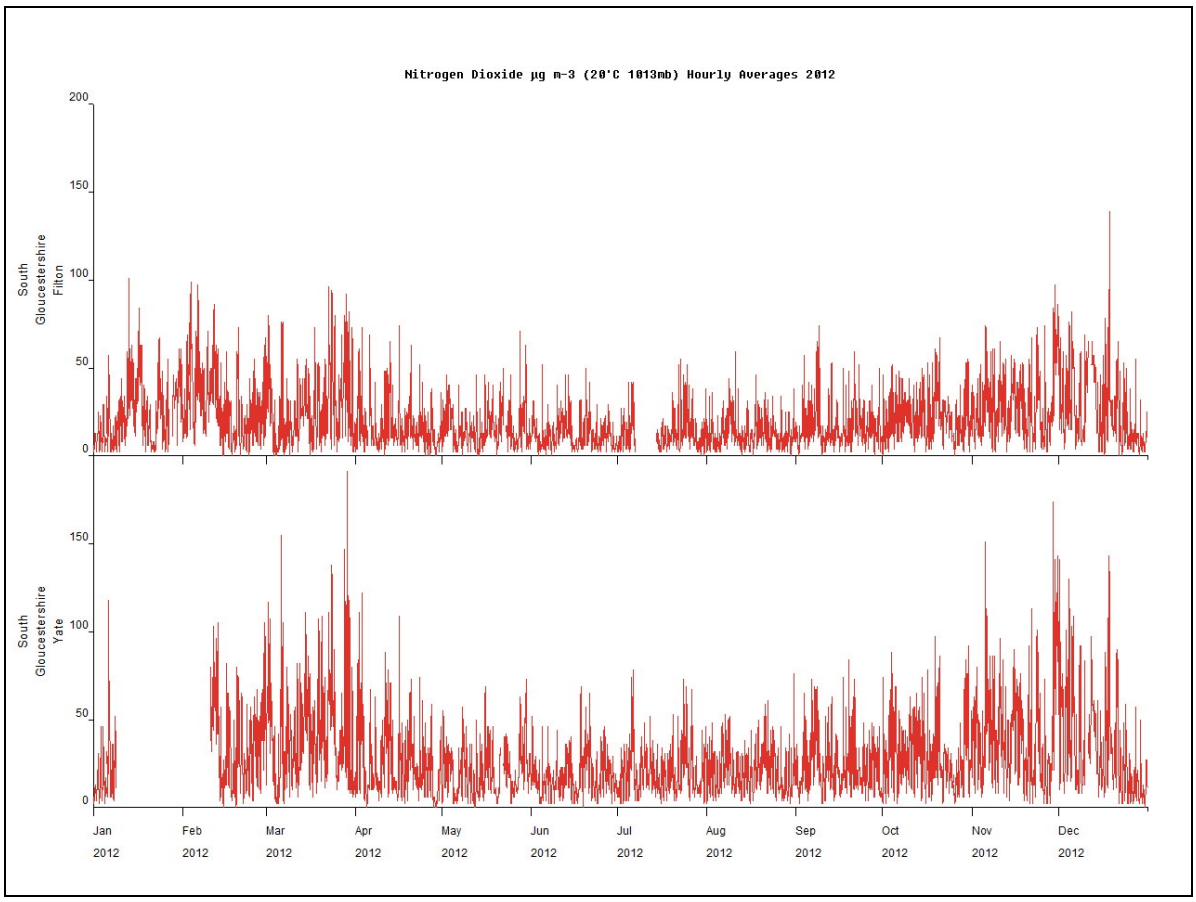


Figure 26 Nitrogen dioxide Hourly Averages 2012 Filton and Yate

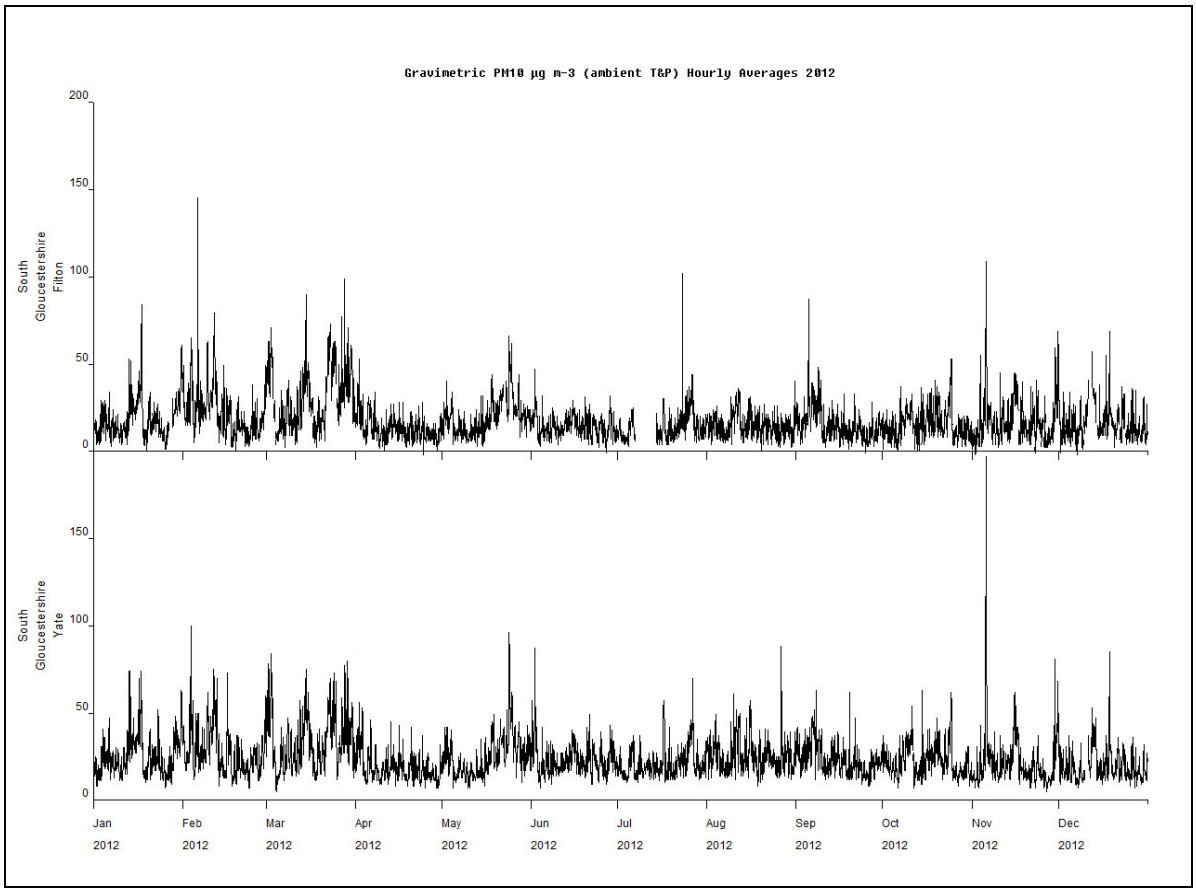


Figure 27 PM10 Hourly Averages 2012 Filton and Yate

Appendix C: Monthly Diffusion Tube Data

Table 32 2012 Monthly Nitrogen Dioxide Diffusion Tube Results

Site No.	Site Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Raw Mean	Bias Adj Mean (x 0.95)
1	Yate - Station Road Motor Aids	43.5	43.5	53.8	36.6	32.7	37.0	33.8	32.1	34.2	37.0	43.0	39.7	38.9	**37.0**
4	Yate - Station Road Co-Location 1	41.4	38.6	49.8	26.7	28.1	22.2	25.4	21.7	21.0	28.6	35.0	35.2	31.1	29.6
5	Yate - Station Road Co-location 2	38.5	34.3	34.0	32.1			27.5	23.7		27.6	33.3	35.9	31.9	30.3
6	Yate - Station Road Co-location 3	44.6	32.2	20.4	27.4		26.3	24.3	22.0	24.9	29.2	36.3	34.8	29.3	27.8
10	Filton - 152 Gloucester Road North Pizza Plant façade	55.5	37.8	29.1	35.2	35.9	37.0	39.5	47.4	46.3	41.1	45.9	48.5	41.6	**39.5**
11	Thornbury – 48 High Street Morgan Stone	39.4	25.2	42.4	31.1	27.4	31.1	32.5	24.7	34.9	29.4	36.7	32.9	32.3	30.7
12	Stoke Gifford - Church Road rear of Friends Life	42.7	43.7	39.7	34.7	31.3	30.2	28.9	25.2	38.5	37.2	39.4	43.9	36.3	34.5
13	Filton - MOD Roundabout	54.6	42.7	42.1	36.4	34.1	29.3	29.1	32.1	37.6	40.5	42.7	41.9	38.6	**36.7**
14	Hambrook – Bristol Road opp The Gables				54.8	54.5	61.0	67.8	68.4	74.0	68.9	94.6	56.5	66.7	**63.4**
17	Kingswood - 79 Regent Street HSBC	47.5	38.9	40.2	31.2	22.5	26.7	25.7	21.9	26.5	37.0	38.6	38.9	33.0	31.3
18	Kingswood - 70 Regent Street CM Lea facade	54.4	47.3	54.4	44.2		41.7	45.3	33.8	38.6	38.6	42.6	44.7	44.2	**41.9**
21	Downend – Boscombe Crescent St Augustines Church	28.4	38.6	36.7	25.1	19.2	16.2	12.7	10.1	19.4	18.2	22.5	28.3	23.0	21.8
22	Hanham – 44 High Street Lloyds Bank	44.6	36.3		43.9	35.4	33.1	29.8	32.5	35.2	36.6	36.5	40.6	36.8	34.9
23	Kingswood - Cecil Road	64.8	41.5	33.6	37.6	29.8	26.9	33.5	20.8	35.0	30.4	56.4	36.2	37.2	35.4

Site No.	Site Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Raw Mean	Bias Adj Mean (x 0.95)
26	Kingswood – 8 Gilbert Road	38.9	40.8	18.3	28.3	21.3	20.3	20.7	21.2	23.6	28.0	30.8	32.8	27.1	25.7
27	Kingswood - 90 Regent Street Nat West façade	46.1	45.4	48.4	33.7	32.2	36.3	38.8	32.1	30.5	34.3	34.8	37.6	37.5	35.6
29	Staple Hill - 123 High Street Backhouse Bet	55.5	52.1	59.6	48.3	42.6	42.3	42.3	32.2	46.2	42.9	39.4	47.0	45.9	**43.6**
34	Bradley Stoke – 109 Ormonds Close M4 East of Almondsbury Interchange	44.4	37.0	50.6	34.3	34.9	32.9	24.8	19.4	34.8	35.6	39.4	36.9	35.4	33.6
35	Bradley Stoke - Woodlands Lane M4 East of Almondsbury Interchange (lp47)	58.4	49.9	51.7	37.9	27.0	28.7	25.9	19.5	34.0	35.4	41.3	36.1	37.2	35.3
36	Hambrook - Whiteshill M4 East of M32	33.9	31.9		21.4	18.7	25.2	24.7	17.1	28.6	22.9	23.7	26.6	25.0	23.7
37	Almondsbury - Old Aust Road M4 West of Almondsbury Interchange	48.7	41.0	48.2	34.8	36.0	29.8	25.0	29.8	32.0	33.5	49.0	27.9	36.3	34.5
38	Severn Beach – Ableton Lane Severn Beach Primary School			26.8	18.3	16.0	16.1	14.7	15.6	17.0	18.2	21.5	21.4	18.6	17.6
42	Little Stoke -Braydon Ave	42.4	39.1	18.0	28.2	21.0	21.8	28.1	20.8	29.7	28.7	41.0	36.4	29.6	28.1
43	Patchway - Highwood Road opp St. Chad's Vicarage	47.5	45.7	38.9	32.6	30.1	26.8	29.1	26.4	35.9	35.9	36.6	35.2	35.1	33.3
44	Stoke Gifford - Hatchet Road	27.3	38.3	55.9	38.1	31.1	40.9	37.0	28.4	44.9	39.1	42.0	42.9	38.8	**36.9**
45	Bradley Stoke - Bradley Stoke Way	55.2	46.5	44.4	37.0	31.8	30.1	39.6	35.5	42.0	42.3	47.5	43.3	41.3	**39.2**
46	Winterbourne - High Street opp Ridings School	33.2	46.9	53.5	39.1	29.8	35.9	37.4	32.9	40.3	41.7	41.1	37.8	39.1	**37.2**
47	Bromley Heath - A4174	66.9	61.1	46.3	56.3	46.4	45.4	41.4	37.8	45.5	50.5	51.8	52.8	50.2	**47.7**
51	Hambrook - Rear of 96 Old Gloucester Road			24.6	32.8	26.0	19.2	20.3			23.3	25.7	27.1	24.9	23.6

Site No.	Site Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Raw Mean	Bias Adj Mean (x 0.95)
52	Hambrook - A4174			39.4	53.4	40.2	38.0	38.7	28.9	43.7	D	D	D	40.3	**38.3**
53	Hambrook – Bristol Road rear of 17 Fenbrook Close	43.1	36.1	39.2	38.6		26.5	24.7	22.8	27.8	42.1	42.1	45.7	35.3	33.6
54	Longwell Green - A431 / Aldermoor Way		37.0	49.0	39.8	30.2	34.3	33.3	29.8	39.9	38.8	40.7	43.7	37.9	**36.0**
55	Longwell Green - Ring Road Roundabout Junction Leisure Road	31.7		51.3	49.1	49.6	53.0	52.4	52.8	53.3	D	D	D	49.1	**46.7**
57	Coalpit Heath - Badminton Road The Salon/Carpet shop	42.2		39.1	34.9		27.1	30.1	27.2	28.1	39.6	41.3	47.9	35.7	34.0
58	Longwell Green - Kingsfield Lane/ Aspects Leisure Site (lp6)	N/O	N/O	N/O	N/O	N/O	N/O	N/O	N/O	N/O	19.5	30.2		24.9	23.6
60	Downend - North Street Kustom Floors & Furniture	39.1	46.6	55.4	40.7	36.7	35.9	35.7	30.7	36.0	37.5	39.4	46.8	40.0	**38.0**
61	Staple Hill Crossroads - 1 Broad Street William Hill	48.8	51.8	59.9	49.9		46.2	42.9	43.2	47.2	39.4		52.6	48.2	**45.8**
62	Staple Hill Crossroads - 2 Broad Street Coffee Junction façade	57.3	43.0	56.5	47.0		43.5	48.3	41.9	36.0	44.2	48.6	40.2	46.0	**43.7**
63	Patchway – 28 Park Leaze	33.3	47.3	40.4	36.4	27.2	23.7	27.3	23.4	38.2	29.1	38.4	31.9	33.1	31.4
67	Kingswood - 40 Regent Street Thomas Cook façade	55.9	65.7	59.1	40.7	38.4	48.2	49.2	45.5	47.4	44.3	51.7	55.3	50.1	**47.6**
68	Kingswood - 26-32 Regent Street Store Twenty One façade	69.9	62.0	59.1	42.4	37.8	52.1	47.0	49.8	46.4	45.1	52.0	44.8	50.7	**48.2**
69	Kingswood - 12 Regent Street Silver Brides façade	56.8	52.0	52.1	42.6	38.3	40.3	44.0	33.9	38.1	38.6	45.6	47.1	44.1	**41.9**
70	Kingswood - Two Mile Hill Road Job Centre Plus façade			50.3	32.1	36.5	34.9	35.0	33.6	32.8	37.9	46.0		37.7	35.8
71	Staple Hill - 11 The Square Liquidation Stock Warehouse	38.4	45.6		33.9	24.6	26.2	25.4	21.1	26.4	31.7	33.3	31.5	30.7	29.2
72	Staple Hill - 25 Broad Street Westbury Inks	55.9	57.8	48.2	37.6		36.4	39.9	24.7	40.9		41.7	41.1	42.4	**40.3**

Site No.	Site Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Raw Mean	Bias Adj Mean (x 0.95)
73	Staple Hill - 11 Soundwell Road Starlight	39.5	40.5	63.2	48.8	39.8	36.4	40.3	31.3	37.5	42.6	46.7	45.8	42.7	**40.6**
74	Staple Hill - 29-31 Soundwell Road opp Page Comm Assoc	57.3	49.5	47.2	38.6	34.6	27.2	28.7	25.5	31.8	32.1	36.5		37.2	35.3
75	Staple Hill - 118 High Street Santander	60.2	58.3	52.9	38.2	36.7	41.4	36.5	20.7	52.1	44.2	62.3	54.7	46.5	**44.2**
76	Staple Hill - 84-86 High Street Staple Oak Pub façade	33.1	62.2	46.2	39.4	30.1	40.3	40.3	33.1		40.5	37.9	44.4	40.7	**38.6**
78	Staple Hill - 9-11 Victoria Street	58.4	83.9	69.5	52.4	41.9	52.0	51.9	42.2	50.4			53.5	55.6	**52.8**
79	Staple Hill - 27-29 Victoria Street		68.1	58.9	41.1		40.3	43.9		47.9		50.6	51.9	50.3	**47.8**
81	Cribbs Causeway - Hollywood Cottage Blackhorse Hill (nearest M5 Roundabout)	80.8	80.2	68.8	67.8	68.8	63.8	69.7	80.0	83.4	69.1	96.1	85.1	76.1	**72.3**
83	Chipping Sodbury – 51A Broad Street façade	49.5	40.3	49.1	25.2		26.3	23.0	18.6	19.2	25.6	32.1	29.4	30.7	29.2
87	Cribbs Causeway – Blackhorse Hill Hollywood Cottage facade	38.4	33.4	41.9	28.1	36.1	34.3	32.9	42.6	34.5	35.0	43.8	41.3	36.9	35.0
88	Cribbs Causeway - Blackhorse Hill St. Swithin's Lodge facade	41.2	38.7	40.7	28.2	26.1	32.7	30.0	28.8	26.6	29.3	31.5	35.7	32.5	30.8
90	Kingswood - Downend Road Junction with Boultons Road	55.0	53.5	52.4	37.0	35.9	35.4	38.2	36.8	39.5	37.9	45.4	47.7	42.9	**40.8**
92	Kingswood - Regent Street British Legion Club	51.7	50.8	33.8	47.2		42.0	49.7	33.9	42.2	40.8	50.8	42.4	44.1	**41.9**
93	Kingswood - Hanham Road Exchange Court Flats		37.5	49.7	38.3	35.7	32.2	33.0					33.7	37.2	35.3
94	Kingswood - High Street Kings Arms	62.0	58.6	44.0	48.5		54.0	52.1	54.3	51.0	49.7	63.5	61.9	54.5	**51.8**
95	Kingswood - 45 High Street Adam Lee	47.9	56.9	40.9	52.1	38.1	40.7	47.1	34.6	46.8	42.8	45.2	45.2	44.9	**42.6**
96	Kingswood - 71 High Street Homeless Project	68.8		57.5	49.3		37.2	40.7	34.3	40.5	40.9	44.2	49.2	46.3	**43.9**

Site No.	Site Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Raw Mean	Bias Adj Mean (x 0.95)
97	Kingswood - 129 High Street	45.9	53.8	52.4	47.6		37.3	31.5	26.3	37.0	41.3	43.2	35.7	41.1	**39.0**
98	Kingswood - High Street City of Bristol College façade		47.4	72.3	38.3	33.0	34.6	38.7	37.5	36.1	39.4	42.9	45.4	42.3	**40.2**
101	Staple Hill - High Street lp outside Beech House	50.1	37.0	48.5	31.2		27.2	26.4	23.2	31.9	44.3	36.7	44.8	36.5	34.6
102	Staple Hill - 58 High Street Aladdin's Cave	73.8	51.3	63.2	49.6	41.2	47.3	47.6	41.4	45.3	45.4		47.7	50.3	**47.8**
103	Staple Hill - Page Road Brookridge Court			44.4	29.1	25.3	21.6		15.1	26.9	29.2	30.7	34.1	28.5	27.1
104	Staple Hill - Page Road Staple Hill Primary School	52.1	43.0	40.9	29.1	23.0	25.4	25.5	15.9	23.5	27.2	33.6	33.1	31.0	29.5
105	Staple Hill - North Street lp outside no 2	54.5	50.1	41.8				27.8	15.4	28.9		34.2	36.7	36.2	34.4
106	Stoke Gifford - 73 Hambrook Lane façade	36.9	37.8	40.0	26.7	23.0	21.3	23.0	18.8	28.9	23.5	25.7	28.3	27.8	26.4
107	Stoke Gifford - 77 Hambrook Lane façade	30.3	41.1	32.7	24.0	23.6	16.0		33.7	23.7	25.2	25.9	30.7	27.9	26.5
108	Patchway - 204 Gloucester Road rear façade	47.0	47.6	46.4	32.1				24.5	28.3	29.4	34.2	37.1	36.3	34.5
109	Little Stoke - Clay Lane lp8 (rear of Gallivan Close)	46.9		40.7	29.1	24.9	26.0	26.6	22.7	31.7	30.0	31.0	32.2	31.1	29.5
110	Winterbourne - 2 Sandstone Rise rear façade	32.9	44.4	36.3	21.3			21.8	18.7	25.6	23.7	26.2	28.3	27.9	26.5
111	Winterbourne - 2 Down Road façade	26.2		18.6	23.4	19.2	20.9	21.3	18.6	23.9	24.3	22.4	29.6	22.6	21.4
112	Winterbourne - 106 Dragon Road façade			15.0	22.8	15.5	21.9	22.0	19.2	23.5	26.8	20.9	32.9	22.1	21.0
113	Patchway - 5 Falcon Close façade			42.8	43.2	32.1	36.3	36.8	29.1	46.8	32.0	33.1	38.1	37.0	35.2
114	Pilning - 23 Keens Grove façade	36.5	40.3		34.3	32.2	26.2	28.0	27.1	34.9	29.3	31.9	33.4	32.2	30.6

Site No.	Site Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Raw Mean	Bias Adj Mean (x 0.95)
115	Pilning - 2 Wick Road façade	35.6	38.3	36.0	29.2	25.8	29.1	29.9	28.6	34.0	27.9	34.7	33.3	31.9	30.3
116	Warmley - 14 High Street Webbs	58.8	74.8	37.7	48.5	41.6	53.1	53.1	49.0	48.3	49.9	62.1	54.3	52.6	**50.0**
117	Filton Northville - 29 Gloucester Road North Blockbuster	N/O	N/O	21.8	41.3		32.9	35.3	33.8	54.3	33.1	37.1	47.9	37.5	35.6
118	Filton Northville - 19 Gloucester Road North Dental Lab	N/O	N/O	19.7	34.7	29.6	36.6	34.3	38.1	43.0	46.7		41.7	36.0	34.2
119	Filton - 137 Gloucester Road North	N/O	N/O	28.8	37.4		36.6	25.9	32.5	45.2	43.2	39.2	47.6	37.4	35.5
120	Filton – 709 Southmead Road	N/O	N/O	46.6	42.7	50.2	41.6	42.6	40.1	49.1	48.3	53.0	41.4	45.6	**43.3**
121	Filton - 107 Gloucester Road North	N/O	N/O	41.6	39.5	41.1	33.8	31.8	32.9	35.4	41.9	44.5	53.0	39.5	**37.6**
122	Filton - 549 Filton Avenue	N/O	N/O	45.4	34.3	34.7	34.2	30.8	35.0	37.1	39.6	50.1	46.2	38.7	**36.8**
123	Filton - 542 Filton Avenue Al's Hobbies	N/O	N/O	39.1	34.3	33.2	32.3	31.4		36.7	42.5	29.8	39.3	35.4	33.6
124	Filton - 702a Filton Ave Way Ahead	N/O	N/O	53.6	39.8	36.9	30.5	33.7	30.4	38.6	44.1	48.2	41.6	39.7	**37.8**
125	Filton - 71 Station Road	N/O	N/O	28.2	27.6	29.4	30.5	34.2	34.1	41.0	40.9	40.2	42.2	34.8	33.1
126	Soundwell - 296 Soundwell Road	N/O	N/O	39.2	38.2	41.3	36.3	35.1	19.3	33.4	37.6	30.8	35.4	34.7	32.9
127	Soundwell - 264 Soundwell Road	N/O	N/O	57.4	50.3	43.8	46.6	52.3	44.9	46.0	41.2	50.4	50.4	48.3	**45.9**
128	Kingswood - 109 Downend Road	N/O	N/O	21.5	39.3	33.3	39.9	36.0	37.1	42.7	41.6	43.5	50.2	38.5	**36.6**
129	Cribbs Causeway – 1 Holly Cottages façade	N/O	N/O	25.9	39.8	31.7	33.8	34.4	28.8	36.5	31.4	39.2	39.7	34.1	32.4
130	Cribbs Causeway – 2 Mayfield Cottages façade	N/O	N/O	26.8	37.3	31.6	30.5	29.3	24.1	36.7	32.3	36.5	41.2	32.6	31.0

Site No.	Site Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Raw Mean	Bias Adj Mean (x 0.95)
131	Bradley Stoke - 188 Oaktree Crescent	N/O	N/O	32.5	43.9	42.5	31.3	33.7	30.3	40.6	38.7	42.7	45.8	38.2	**36.3**
132	Hanham - 66 High St	N/O	N/O	35.9	41.5	37.5	37.7	35.9	31.0	39.8	41.2	46.3	39.1	38.6	**36.7**
133	Hambrook - 123 Old Gloucester Road façade	N/O	N/O	N/O	N/O	N/O	N/O	N/O	N/O	N/O	36.2	32.7	40.5	36.5	34.6

Key: **Exceedence** of annual mean objective (40 µg/m^3)
Exceedence of NO_2 annual mean objective >60µg/m^3 indicating potential exceedence of NO2 hourly mean objective
Borderline within 10% of annual mean objective (>36 µg/m^3)
N/O Not operational
D Discontinued

Appendix D: Part A1, A2 and B Permitted Installations

Part A1 Processes

Table 33 Part A1 Processes

Permit Ref	Easting	Northing	Name and Address
SP3639LR	354770	181320	National Grid Gas PLC Avonmouth LNG Facility Severn Road Hallen BS10 7SQ
ZP3138KZ	361320	194930	P D Hook (Rearing) Jobs Green Poultry Farm Shepperdine Thombury Bristol BS35 1RL
AP3231KP	361500	193700	P. D. Hook (Rearing) Ltd Power Station Farm Oldbury Naite Oldbury-on-Severn Bristol BS35 1RQ
QP3032TQ	360930	181000	Rolls-Royce Power Developments Ltd Bristol OCGT Power Station Rolls-Royce Mael Works BS12 7QE
VP3032KR	362400	193000	Stonegate Ltd Great Leaze Farm Oldbury Lane Oldbury-on-Severn Bristol BS35 1RF
LP3337GY	372650	190460	Bourns Southend Poultry Farm Little Bristol Lane Charfield Gloucestershire GL12 8LL
FP3935TC	368000	176500	Cory Environmental (Gloucestershire) Limited Shortwood Quarry Landfill Site Cattybrook Road North Shortwood Bristol BS16 9NN
ZP3937KL	353750	182720	SITA UK Limited Land to the north of Seabank Power Station Severn Road (A403) Severnside Bristol

Permit Ref	Easting	Northing	Name and Address
NP3739SQ	354770	181320	Seabank Power Ltd Severn Road Hallen Bristol BS10 7SP
JP3231UR	369140	178830	Tulip Ltd Oakley Green Westerleigh Bristol BS37 8QZ
CP3738UC	368090	172160	Alec Jarrett Ltd Alec Jarrett Ltd High Street Oldland Common BS30 9TN
XP3637TM	354560	183240	AstraZeneca UK Ltd Avlon Works Severn Road Hallen Bristol BS10 7ZE
AP3935GA	354150	182850	Growhow UK (East)Ltd Severnside Fertilizer Works Severn Road Hallen Bristol BS10 7SJ
AP3630GS	360690	194380	Magnox Electric Plc Oldbury Power Station Oldbury Naite Oldbury-on-Severn Bristol BS35 1RQ

Part A2 and B Processes

Table 34 Part A2 and B Processes

Permit Ref	Easting	Northing	Name	Address	Postcode	Process Guidance Note(s)
LAEP A2 001	366913	173224	Amcor	83 Tower Road North Warmley Bristol	BS30 8XP	Surface treatment organic solvents
LAEP A2 003	363562	180524	Amcor	Winterbourne Road Bradley Stoke Bristol	BS34 8PT	Surface treatment organic solvents
LAEP A2 014	360081	183709	Ibstock Brickworks	Wentwood 2 Over Lane Almondsbury Bristol	BS32 4BP	Ceramics & heavy clay
LAEP B 001	370294	178477	Westerleigh Crematorium	Westerleigh Road Westerleigh Bristol	BS37 8QP	PG5/2 Crematoria
LAEP B 002	356775	179789	Cemex UK Materials Ltd	Station Road Henbury Bristol	BS10 7LT	PG3/1 Blending etc bulk cement
LAEP B 004	371673	189902	Cemex Materials UK Ltd	The Downs Road Wickwar Wotton-U-Edge Gloucestershire	GL12 8LF	PG3/1 Blending etc. bulk cement
LAEP B 006	365864	188906	Hanson Premix	Tytherington Wotton-Under-Edge Gloucestershire	GL12 8UW	PG3/1 Blending etc bulk cement
LAEP B 007	372352	182446	Hanson Premix	The Ridge Chipping Sodbury Bristol	BS37 6JX	PG3/1 Blending etc bulk cement
LAEP B 009	360967	179937	Stone Supplies Ltd	Northway Gloucester Road North, Filton Bristol	BS34 7QS	PG3/16 Mobile crushing & screening
LAEP B 010	367804	172443	S J Curtis	Southway Drive Warmley Bristol	BS30 5LW	PG6/34 Respraying road vehicles
LAEP B 015	372315	183163	Hanson Aggregates	The Ridge Chipping Sodbury Bristol	BS37 6JX	PG3/8 Quarry processes PG3/15 Mineral drying & roadstone coating
LAEP B 017	365889	188710	Hanson Aggregates	Tytherington Wotton-Under-Edge Gloucestershire	GL12 8UW	PG3/8 Quarry processes PG3/15 Mineral drying & roadstone coating

Permit Ref	Easting	Northing	Name	Address	Postcode	Process Guidance Note(s)
LAEP B 018	371034	172907	CEMEX	London Road Wick Bristol	BS30 5SJ	PG3/8 Quarry processes PG3/15 Mineral drying & roadstone coating
LAEP B 019	371521	189778	CEMEX	Churchwood Quarry Wickwar Quarry The Downs Road Wickwar, Wotton Under Edge	GL12 8NF	PG3/8 Quarry processes PG3/15 Mineral drying & roadstone coating
LAEP B 021	371551	189747	CEMEX	The Downs Road Wickwar Wotton U Edge	GL12 8LF	PG3/1 Blending etc bulk cement
LAEP B 022	371036	172904	Cemex Materials UK Ltd	London Road Wick Bristol	BS30 5SJ	PG3/1 Blending etc bulk cement
LAEP B 025	372149	182419	Sun Chemical Inks	The Ridge Factory Station Road, Yate Bristol	BS37 7AA	PG6/11 Printing ink manufacture
LAEP B 026	367256	173425	A Nicholls (Cow Mills) Ltd	8 London Road Warmley Bristol	BS30 5JF	PG6/26 Animal feed compounding
LAEP B 032	360819	180700	Rolls Royce plc	PO Box 3 Filton Bristol	BS34 7QE	PG2/4 non-ferrous foundry
LAEP B 039	360485	180698	Patchway Car Centre Limited	Gloucester Road Patchway Bristol	BS34 5TD	PG6/34 Respraying road vehicles
LAEP B 042	365817	175231	S J Cook & Sons (Kingswood) Ltd	Station Road Kingswood Bristol	BS15 4XX	PG6/34 Respraying road vehicles
LAEP B 044	359673	173360	Brin Jones	Golf Course Lane Filton Bristol	BS34 7QS	PG6/34 Respraying road vehicles
LAEP B 046	363759	172015	Advantage Valley Ltd	Memorial Road Hanham Bristol	BS15 3JD	PG6/34 Respraying road vehicles
LAEP B 051	372179	182321	A Nicholls (Cow Mills) Limited	A Nicholls Ltd Station Road Yate Bristol	BS37 4AD	PG6/26 Animal feed compounding
LAEP B 053	373069	182395	Chipping Sodbury Motor Company	Avon House Hatters Lane Chipping Sodbury Bristol	BS37 6AA	PG6/34 Respraying road vehicles

Permit Ref	Easting	Northing	Name	Address	Postcode	Process Guidance Note(s)
LAEP B 054	370035	182407	Billington Structures Limited	456B Badminton Road Yate Bristol	BS37 5HX	PG6/23 coat of metal
LAEP B 056	369998	182985	M & A Bodyworks	90 North Road Yate Bristol	BS37 7PR	PG6/34 Respray-ing road vehicles
LAEP B 058	379553	173905	M J Church Plant Hire Ltd	Star Farm Chippenham Road Marshfield Chippenham, Wiltshire	SN14 8LH	PG3/16 Mobile crushing & screening
LAEP B 060	369002	178186	Murco Petroleum Ltd	Westerleigh Terminal Oakleigh Green Westerleigh Bristol	BS37 8QZ	PG1/13 Storage petrol Terminal
LAEP B 062	360967	179937	Churngold Transport Limited	Northway Filton Bristol	BS34 7QG	PG3/16 Mobile crushing & screening
LAEP B 063	373363	174955	Cotswold Recycling Co Ltd	Lower Ledge Farm Doynton Lane Dyrham Chippenham, Wilts	SN14 8EX	PG3/16 Mobile crushing & screening PG3/8 Quarry processes
LAEP B 064	371034	172907	Cemex Materials UK Ltd	London Road Wick Bristol	BS30 5SJ	PG3/16 Mobile crushing & screening
LAEP B 066	364641	174166	S J Curtis	Dorset House Downend Road Kingswood Bristol	BS15 1SE	PG6/34 Respraying road vehicles
LAEP B 067	353701	183038	CPI Mortar	Unit 8, Severn View Industrial Central Avenue Hallen Bristol	BS10 7SD	PG3/1 Blending etc bulk cement PG3/15 Mineral drying & roadstone coating
LAEP B 069	365412	171710	UK Assistance Accident Repair Centre Ltd	Aldermoor Way Longwell Green Bristol		PG6/20 Painting vehicles
LAEP B 070	370896	172718	Cemex Materials UK, Mobile Concrete Batching	Wick Quarry London Road Wick Bristol	BS30 5SJ	PG3/1 Blending etc bulk cement
LAEP B 071	373352	174945	Cotswold Recycling Company Ltd	Lower Ledge Farm Doynton Lane Dyrham South Gloucestershire	SN14 8EY	PG3/16 Mobile crushing & screening

Permit Ref	Easting	Northing	Name	Address	Postcode	Process Guidance Note(s)
LAEP B 072	373352	174945	Cotswold Recycling Company Ltd	Lower Ledge Farm Doynton Lane Dyrham South Gloucestershire	SN14 8EY	PG3/16 Mobile crushing & screening
LAEP B 073	379553	173905	M J Church	Star Farm Chippenham Road Marshfield	SN14 8LH	PG3/16 Mobile crushing & screening
LAEP B 074	367844	172412	Bath Demolition Limited	Unit 2, Willcock House Southway Drive Warmley	BS30 5LW	PG3/16 Mobile crushing & screening
LAEP B 075	359508	179877	GKN Aerospace Ltd	Gloucester Road North Filton Bristol	BS34 7PH	PG6/40 Coating aircraft
LAEP B 076	367160	172868	Bristol and Bath Concrete	2 St Ivel Way Warmley Bristol	BS30 8TY	PG3/1 Blending etc bulk cement
LAEP B 077	355179	183263	GKN Aero Services Ltd	Unit 5020 Western Approach Distribution Park	BS35 4GG	PG6/40 Coating aircraft
LAEP B 078	355372	182952	Bristol and Avon Transport and Recycling Ltd	Western Approach Distribution Park, Govier Way Severn Beach	BS35 4GG	PG3/16 Mobile crushing & screening
LAEP DC 001	372008	182707	Ridgewood Cleaners	80 Firgrove Crescent Yate Bristol	BS37 7AG	PG 6/46 Dry Cleaning
LAEP DC 005	363693	190127	Hard Pressed for Time	7 High Street Thornbury Bristol	BS35 2AE	PG 6/46 Dry Cleaning
LAEP DC 006	364956	175938	VIP Cleaners	13 Broad Street Staple Hill Bristol	BS16 5LN	PG 6/46 Dry Cleaning
LAEP DC 007	364426	190230	Cleaning Centre	47D Oakleaze Road Thornbury Bristol	BS34 5RW	PG 6/46 Dry Cleaning
LAEP DC 008	378304	174736	Smarty	Unit 5, Martor Industrial Estate Tormarton Road Marshfield Chippenham Wiltshire	SN14 8LJ	PG 6/46 Dry Cleaning
LAEP PFS 004	360630	181512	Stoke Brook Service Station	184 Gloucester Road Patchway Bristol	BS34 5BB	PG1/14 Petrol service stations
LAEP PFS 005	360008	178627	Elm Park Service Station	73/75 Gloucester Road North Filton Bristol	BS34 7PL	PG1/14 Petrol service stations

Permit Ref	Easting	Northing	Name	Address	Postcode	Process Guidance Note(s)
LAEP PFS 006	375292	181566	Cotswold Service Station	Badminton Road Old Sodbury Bristol	BS37 6LX	PG1/14 Petrol service stations
LAEP PFS 007	367219	177122	Petrol Station	J Sainsbury Plc Emerson Way Emersons Green Bristol	BS16 7AE	PG1/14 Petrol service stations
LAEP PFS 008	361710	178947	Petrol Station	J Sainsbury Plc Fox Den Road Stoke Gifford Bristol	BS34 8SS	PG1/14 Petrol service stations
LAEP PFS 009	374405	173326	Pennsylvania Filling Station	Gloucester Road Cold Ashton South Gloucestershire	SN14 8LB	PG1/14 Petrol service stations
LAEP PFS 010	371297	172680	Star Wick Service Station	81 London Road Wick Bristol	BS30 5SJ	PG1/14 Petrol service stations
LAEP PFS 012	365113	181136	Esso	90/92 High Street Winterbourne Bristol	BS36 1RB	PG1/14 Petrol service stations
LAEP PFS 013	366035	182131	VMW Motors (Western) Limited	172 Bristol Road Frampton Cotterell Bristol	BS36 2AX	PG1/14 Petrol service stations
LAEP PFS 015	357089	189596	Moto Forecourt Kiosk	Motorway Service Station Severn Bridge Aust, Bristol	BS35 4BH	PG1/14 Petrol service stations
LAEP PFS 017	372470	192373	Charfield Service Station	The Garage Wotton Road Charfield Wotton-Under-Edge, Gloucestershire	GL12 8SR	PG1/14 Petrol service stations
LAEP PFS 018	365691	171137	Plev Ltd	106 Bath Road Longwell Green Bristol, South Gloucestershire	BS30 9DE	PG1/14 Petrol service stations
LAEP PFS 019	366608	177645	Blackhorse Garage	Blackhorse Garage Westerleigh Road Emersons Green Bristol	BS16 7AN	PG1/14 Petrol service stations
LAEP PFS 020	364303	189897	Thornbury Motors (1973) Ltd	Grovesend Road Thornbury Bristol	BS35 2EF	PG1/14 Petrol service stations
LAEP PFS 021	365552	172274	Asda Petrol Station	Asda Stores Ltd Craven Way Barrs Court South Gloucestershire	BS30 7DY	PG1/14 Petrol service stations
LAEP PFS 022	358719	181478	Asda Petrol Station	Asda Stores Ltd Highwood Lane Patchway Bristol	BS34 5TL	PG1/14 Petrol service stations

Permit Ref	Easting	Northing	Name	Address	Postcode	Process Guidance Note(s)
LAEP PFS 024	363637	189679	Tesco Petrol Station	Midland Way Thornbury Bristol	BS35 2BS	PG1/14 Petrol service stations
LAEP PFS 025	370995	182365	Stanshawes Service Station Ltd	Stanshawes Service Station Ltd Westerleigh Road Yate Bristol	BS37 4BG	PG1/14 Petrol service stations
LAEP PFS 028	366754	170316	Snax 24	114 Bath Road Willsbridge Bristol	BS30 6EF	PG1/14 Petrol service stations
LAEP PFS 029	376355	182189	Roman Camp Service Station	Tetbury Road Old Sodbury Bristol	BS37 6RL	PG1/14 Petrol service stations
LAEP PFS 03	364612	174594	Tesco Stores Ltd	Soundwell Road Kingswood Bristol	BS15 1PN	PG1/14 Petrol service stations
LAEP PFS 030	359884	178331	Texaco	31/39 Gloucester Road North Northville Bristol	BS7 0SH	PG1/14 Petrol service stations
LAEP PFS 034	366030	178509	Shell UK Ltd	Badminton Road Downend Bristol	BS36 1AH	PG1/14 Petrol service stations
LAEP PFS 035	357079	180430	Shell UK Ltd	Shell Cribbs Causeway Almondsbury Bristol	BS10 7TG	PG1/14 Petrol service stations
LAEP PFS 037	366740	173573	Warmley Service Station	39 Deanery Road Kingswood Bristol	BS15 9JB	PG1/14 Petrol service stations
LAEP PFS 038	370262	182505	Esso Snack & Shop	Yatebridge Service Station 10-12 Station Road Yate Bristol	BS37 4PS	PG1/14 Petrol service stations
LAEP PFS 040	360717	182083	Star Patchway	Patchway Service Station Gloucester Road Patchway Bristol,	BS34 6NA	PG1/14 Petrol service stations
LAEP PFS 042	371670	182320	Precinct Service Station	Precinct Service Station Link Road Yate Bristol	BS37 4AY	PG1/14 Petrol service stations
LAEP PFS 043	368912	183242	Pace Petroleum Limited	Victoria Garage Yate Road Iron Acton Bristol	BS37 9XY	PG1/14 Petrol service stations

Permit Ref	Easting	Northing	Name	Address	Postcode	Process Guidance Note(s)
LAEP PFS 044	361752	185330	Almondsbury Service Station	Almondsbury Filling Station Gloucester Road Almondsbury Bristol	BS32 4HY	PG1/14 Petrol service stations
LAEP PFS 046	359949	179067	Airbus UK Ltd	New Filton House Centre 10 Filton Bristol	BS99 7AR	PG1/14 Petrol service stations
LAEP PFS 047	371037	182594	Morrisons Petrol Station	Station Road Yate Bristol	BS37 5PW	PG1/14 Petrol service stations
LAEP PFS 048	357654	180674	Wm Morrison Supermarkets plc	Morrisons Supermarket Lysander Road Patchway Bristol	BS10 7UD	PG1/14 Petrol service stations
LAEP PFS 049	362006	181918	Tesco Petrol Station	Bradley Stoke Centre Bradley Stoke Bristol	BS32 8EF	PG1/14 Petrol service stations
LAEP WOB 004	356114	182156	Snows Commercials Ltd	Vimpennys Lane Compton Greenfield Bristol	BS35 5RY	PG1/1 Waste oil burner <0.4MW
LAEP WOB 005	372384	188561	Wickwar Garage	22 High Street Wickwar Wotton Under Edge, Gloucestershire	GL12 8NG	PG1/1 Waste oil burner <0.4MW
LAEP WOB 009	372586	189065	Mr R C Brine	Station Road Wickwar Wotton-under-Edge Gloucestershire	GL12 8NB	PG1/1 Waste oil burner <0.4MW
LAEP WOB 010	373057	182290	Jarrett Brothers	Unit 2, Trading Estate Hatters Lane Chipping Sodbury Bristol	BS37 6AA	PG1/1 Waste oil burner <0.4MW
LAEP WOB 011	369966	183218	Hall's Auto Electrical Ltd	Unit 16, Dean Court Dean Road Yate Bristol	BS37 5NJ	PG1/1 Waste oil burner <0.4MW
LAEP WOB 012	370117	183011	Watts Truck Centre Ltd	Great Western Business Park Dean Road Yate Bristol	BS37 5NH	PG1/2 Waste oil burner <3MW

Appendix E: Biomass Boiler Screening

ADMS-Screen of Biomass Boiler

Assumptions and Model Inputs

Table 35 Model Inputs for ADMS-Screen of Warmley Park School Biomass Boiler

Model Inputs		Warmley Park School, Warmley
Distance from stack of worst-case/ closest sensitive receptor (m)	1-hr mean impacts	30
	24-hr & annual mean impacts	58
Maximum short-term emission rates (g/s)	NO_2	0.08139
	PM_{10}	0.0125
Volumetric flow-rate of gases (m^3/s)		0.1514
Exit temperature (˚C)		170
Stack height (m)		4.75
Stack diameter (m)		0.29
Height of nearby buildings (m)		4.7
Background annual mean concentrations (ug/m^3)	NO_2	20.28
	PM_{10}	15.73

Assumptions

- Model meteorology for every hour in year (in reality, boiler operates 1380 hours/year, i.e. 16% of hours in year only)
- Assume all NOx to be NO_2 at sensitive receptors
- Generic meteorology for Wales/Central England

ADMS-Screen Results

Biomass Boiler - Warmley Park School, Tower Road North, Warmley

Table 36 ADMS-Screen predictions at worst-case receptor 40 m from stack – stack contribution to ground level concentrations

Objective	NO_2 (ug/m^3)	PM_{10} (ug/m^3)
Annual mean	25.7 if continuous release, and all NOx as NO_2	3.95 if continuous release
Maximum 1-hour mean i.e. 100% percentile	201	-
99.8th percentile of 1-hour means	199	-
90th percentile of daily means	-	9.15

Comments

ADMS-Screen has limitations which are important for this investigation:

- Can only model a single release point;
- Can only include a single stylised building
- Cannot account for terrain features.