FOREST OF DEAN DISTRICT COUNCIL

Air Quality Updating and Screening Assessment Forest of Dean District

2009

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

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Executive Summary

In 1995 the Environment Act provided for a National Air Quality Strategy requiring local authorities carry out Reviews and Assessments of the air quality in their area for seven specific pollutants. These are; carbon monoxide (CO), benzene, 1,3-butadiene, nitrogen dioxide (NO_2), lead, sulphur dioxide (SO_2) and PM_{10} (Particles under 10µm in diameter).

This Updating and Screening Assessment concluded the following:

- Three sites in the town of Lydney exceeded the nitrogen dioxide annual mean objective of 40µg/m^3. These sites will be within the proposed Lydney Air Quality Management Area to be declared shortly (end of 2009, beginning of 2010). There are no issues for any other pollutants.
- There are no road traffic sources of concern within Forest of Dean District Council's administrative area.
- There are no other transport sources of concern within Forest of Dean District Council's administrative area.
- There are no industrial sources of concern within Forest of Dean District Council's administrative area.
- There are no commercial or domestic sources of concern within Forest of Dean District Council's administrative area.
- There are no fugitive or uncontrolled sources of concern within Forest of Dean District Council's administrative area.
- At the end of 2009, beginning of 2010, the Lydney AQMA will be declared for exceedences of the nitrogen dioxide annual mean objective. A Further Assessment and Air Quality Action Plan will be developed in 2010/11. In April 2010 a Progress Report which forms part of the Local Air Quality Management (LAQM) will be submitted.

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1.0 Introduction

1.1 Description of Local Authority area

The Forest of Dean is a rural community situated in Gloucestershire. It is made up off our major towns (Lydney, Coleford, Cinderford and Newent) surrounded by numerous villages, with the remainder of the District comprising wooded areas and open space. The main industry is manufacturing and primary industry with many light engineering firms. The population is just over 80,000 with approximately 32,000 households. The main routes through the District include the M50 in the north of the District and numerous A-roads (e.g. A48 and the A40) (see map - Figure 1).

There are no major industrial areas within the district or close-by that significantly impacts on air quality. The industries within the District that emit any of the prescribed pollutants are not located close to relevant public exposure. The scale on which they operate does not produce emissions that significantly affect local air quality.

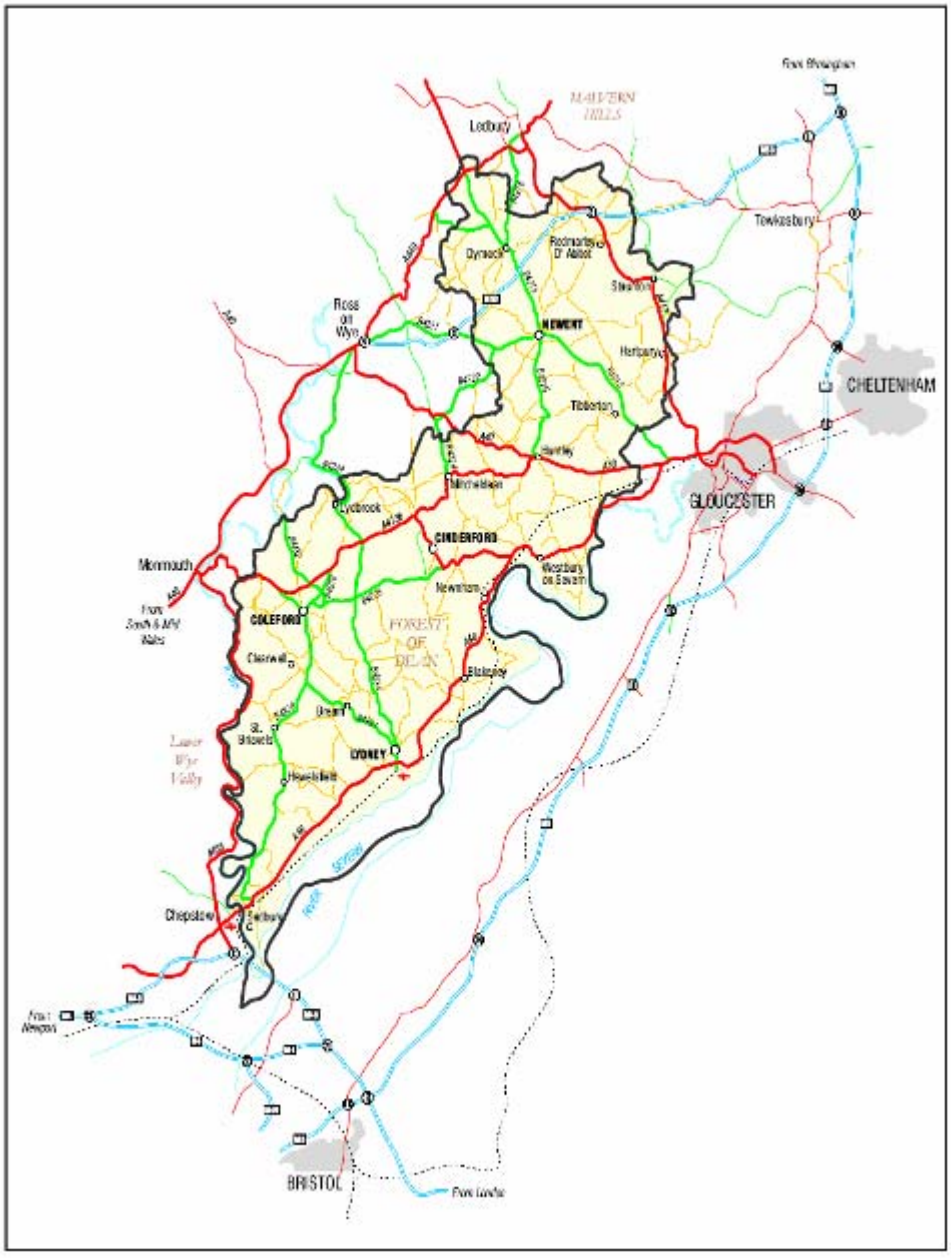

Figure 1 – Map of Forest of Dean District Council

1.2 Purpose of report

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

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 microgrammes per cubic metre μg/m^3 (milligram's per cubic metre (mg/m^3) for carbon monoxide)) with the number of exceedences in each year that are permitted (where applicable).

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	Running annual mean	31.12.2010
1,3-Butadiene	2.25 μg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 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
Particles (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

Table 1: Air Quality objectives included in regulations for the purpose of Local Air Quality Management in England

1.4 Summary of previous Review and Assessments

Forest of Dean District Council has previously undertaken the following review and assessment reports:

- Updating and Screening Assessment 2003 (Ref. 01)
- Progress Report 2004 (Ref. 02)
- Progress Report 2005 (Ref. 03)
- Updating and Screening Assessment 2006 (Ref. 04)
- Progress Report 2007 (Ref. 05)
- Detailed Assessment 2008-09 (Ref. 06)

Conclusions of Updating and Screening Assessment 2006 (Ref. 04)

The assessment has indicated that the carbon monoxide, benzene, 1,3-butadiene, lead, sulphur dioxide and PM_{10} objectives are unlikely to be exceeded at any location within the administrative area of the Forest of Dean District Council.

The assessment has indicated that the nitrogen dioxide annual mean objective will not be exceeded at any location within the administrative area of Forest of Dean District Council, and therefore a Detailed Assessment will not be required. The assessment also indicated that the nitrogen dioxide 1-hour objective is unlikely to be exceeded, and therefore a Detailed Assessment will not be required with respect to the hourly mean.

There are no new roads or roads with significantly changed flows within the administrative area of Forest of Dean District Council were identified since the last round of Review and Assessment.

There is one new industrial development (Part A1) in the Forest of Dean Council since the last round of Review and Assessment, Pemeroy Pressroom Products Ltd, crucible Close, Mushet Industrial Park. Coleford, Gloucestershire, GL16 8RE. The process is a low impact solvent recovery. The process was permitted on 02-11-05, no emission limited were set and the nearest significant receptor are houses in Sylvan Close approximately 50 metres away. It is not considered that this process will have a significant influence on air quality within the authority.

Conclusions of Progress Report 2007 (Ref. 05)

Forest of Dean currently manages 25 nitrogen dioxide diffusion tube sites. The monitoring data for 2006 indicates a potential exceedence of the nitrogen dioxide annual mean objective at Hill Street, Lydney. As a result of this, Forest of Dean District Council will submit a Detailed Assessment for this location in 2008. No other issues were identified

Forest of Dean District Council does not monitor for carbon monoxide, benzene, lead, 1,3-butadiene and PM_{10}.

The Sulphur Dioxide diffusion tube monitoring data is not comparable to any of the air quality objectives. An assessment of trends in annual mean concentrations indicate that 2006 concentrations are on average approximately 1.6$\mu g/m^3$ higher than 2004.

The Ozone diffusion tube monitoring data is not comparable to any of the air quality objectives. An assessment of trends in annual mean concentrations indicate that 2006 concentrations are on average approximately 26.5$\mu g/m^3$ higher than 2004.

No new developments have been identified that will significantly change traffic flows in the area or influence local air quality. Forest of Dean District Council will continue to keep a

watching brief on any changes to existing developments and/or the area or influence local air quality.

Detailed Assessment 2008-09 (Ref. 06)

Forest of Dean District Council's Progress Report, submitted to the Department for Environment, Food and Rural Affairs (Defra) in July 2007, identified the need for a Detailed Assessment at Hill Street, Lydney on the basis of exceedences of the annual mean objective for nitrogen dioxide (NO_2) (40 µg/m^3) at sites of relevant exposure.

This Detailed Assessment reports on the results of the diffusion tube monitoring in Lydney in 2007 and uses atmospheric dispersion modelling to estimate the extent of likely NO_2 exceedences. Contour mapping derived from the model is then used to indicate the need for, and the suggested extent of, an Air Quality Management Area (AQMA) for Lydney.

The NO_2 diffusion tube monitoring and atmospheric dispersion modelling indicates that there are exceedences of the annual mean NO_2 objective at sites of relevant exposure along High Street, Lydney. It is recommended that the Forest of Dean declare an AQMA to cover, as a minimum, the roads and affronting residential properties in Lydney High Street as far as the junction with Temple Way, Hill Street up to Bathurst Park Road, and Bream Road up to The Orchards turnoff. It is also recommended that the NO_2 monitoring network be improved within the proposed AQMA to assist the Council with their Further Assessment to be completed twelve months after the AQMA is declared.

2.0 New Monitoring Data

2.1 Summary of monitoring undertaken

2.1.1 Automatic monitoring sites

Forest of Dean District Council does not undertake any continuous monitoring within their administrative area.

2.1.2 Non-automatic monitoring

The Forest of Dean District Council have been undertaking NO_2 monitoring with diffusion tubes at 25 sites in 2008. The diffusion tubes were supplied and analysed by Bristol Scientific Services (QA/QC data can be found in Appendix D). Tubes were prepared using 50µl of 20% Triethanolamine in Water. The tube preparation and subsequent analysis follow the procedures in the harmonised "Practical Guidance" document (Ref. 08). All diffusion tubes are stored, handled and exposed in accordance with the relevant guidance. All diffusion tubes have a monthly exposure period.

Where necessary diffusion tubes with less that 75% (nine months) data has been annualised using the methodology outlined in Box 3.2 of the Technical Guidance (LAQM.TG(09)) (Ref. 07).

The Forest of Dean District Council does not undertake any co-location studies; so bias adjustment factors were obtained from the National Bias Adjustment Factor Spreadsheet (Version 05/09) (Appendix D).

- 2006 – 0.90 for 5 studies
- 2007 – 0.77 for 5 studies
- 2008 – 0.87 for 4 studies

In 2008/09, a Detailed Assessment was undertaken in Lydney from the evidence of the progress report 2007 which identified potential exceedence of the nitrogen dioxide annual mean objective of 40µg/m^3. Results of 2007 NO_2 monitoring data showed that two sites, 29 High Street, Lydney and 61 High Street, Lydney exceeded the annual mean objective (bias adjusted) in the Lydney area, with 1 Hill street, Lydney; Unit 1 Regents Walk, Newerne Street, Lydney within 10% of annual mean objective. Lydney has not been declared an AQMA at the present time, however it is anticipated that Lydney will be declared an AQMA by the end of 2009.

Table 2 shows details of the non-automatic (diffusion tube) monitoring sites.

Table 2: Details of non-automatic monitoring sites – diffusion tubes

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst case Location
St Briavels - Grove House	Rural / Background	355192	205129	NO_2	No	N (<1 m)	60m	N/A
Staunton - Staunton Service Station	Rural / Background	354755	212673	NO_2	No	Y (30 m)	20m	Yes
Five Acres - crossroads	Rural / Roadside	358041	212291	NO_2	No	N (20m)	3m	Yes
Edge End - road sign	Rural / Roadside	359265	213139	NO_2	No	N (18m)	10m	Yes
Cinderford - 9 St Whites Rd	Town / Roadside	365458	212855	NO_2	No	Y (<1m)	4m	Yes
Cinderford - bus stop timetable	Town / Roadside	365834	214037	NO_2	No	N (20m)	10m	Yes
Cinderford – High St sign	Town / Roadside	365234	214748	NO_2	No	N (10m)	2m	Yes
Nailbridge - window shop	Rural / Roadside	364531	216191	NO_2	No	N (15m)	2m	No
Mitcheldean - Lamb Inn	Rural / Roadside	366509	218280	NO_2	No	N (4m)	2m	Yes
Huntley - crossroads sign	Rural / Roadside	371688	219367	NO_2	No	N (20m)	1m	Yes
Huntley - The Red Lion	Rural / Roadside	372194	219372	NO_2	No	N (3m)	1m	Yes
Newent - Community Centre	Town / Roadside	372029	226222	NO_2	No	N (20m)	2m	Yes
Newent - F.O.D.D.C. Branch Office	Town / Roadside	372288	225852	NO_2	No	N (<1m)	2m	Yes
Bromsberrow - Freedom Farm	Rural / Background	273220	232813	NO_2	No	N (80m)	1m	Yes
Lydney - 57 High St	Town / Roadside	363147	203072	NO_2	Yes*	Y (<1m)	2m	Yes
Lydney - 45 High St	Town / Roadside	363115	203032	NO_2	Yes*	Y (3m)	1m	Yes
Lydney - 29 High St	Town / Roadside	363025	202964	NO_2	Yes*	Y (<1m)	1m	Yes
Lydney - 21 High St	Town / Roadside	362994	202939	NO_2	Yes*	Y (<1m)	2m	Yes
Westbury-on-Severn - High St - bus stop timetable	Rural / Background	371649	214054	NO_2	No	N (10m)	5m	Yes
Newnham-on-Severn - High St - Severnside Press	Rural / Background	369036	211589	NO_2	No	Y (2m)	1m	Yes
Lydney - Unit 1, Regents Arcade	Town / Roadside	363443	203206	NO_2	Yes*	Y (1m)	1m	Yes
Lydney - Art/picture gallery	Town / Roadside	363189	203110	NO_2	Yes*	N (1m)	1m	Yes
Lydney Bypass	Rural / Background	363474	202431	NO_2	No	N (200m)	1m	No
Sedbury - A48	Rural / Background	354266	194166	NO_2	No	N (10m)	2m	No
Coleford - Kingshead	Town / Roadside	357610	210739	NO_2	No	Y (5m)	3m	Yes
Whitecroft, Yertiz	Rural / Roadside	361778	206140	SO_2	No	Y (5m)	1m	Yes
St Briavels, Grove House	Rural / Roadside	355192	205129	Ozone	No	N (<1 m)	60m	No

*** Sites in the Detailed Assessment area and proposed Lydney AQMA**

2.2 Comparison of monitoring results with AQ objectives

2.2.1 Nitrogen Dioxide

Table 3 indicates three locations where the annual mean objective of 40μg/m^3 for NO_2 was exceeded in 2008 (highlighted in bold - 57 High Street, Lydney; 29 High Street, Lydney; 1 Hill Street, Lydney). These locations were part of the recent Detailed Assessment and will be within the proposed Lydney AQMA to be declared shortly. All other monitoring locations were below the annual mean objectives and none of the monitoring sites are close to an annual mean of 60μg/m^3 suggesting that there are no concerns for the 1-hour objective. Forest of Dean District Council will not be undertaking a Detailed Assessment for NO_2 in 2010.

Forest of Dean District Council undertook a review in May 2009 of the diffusion tube network. The area was assessed and some of the tubes repositioned to provide a more representative and relevant exposure. Further monitoring and reviewing of the proposed AQMA will be undertaken during 2009/10. Table 4 provides the results of all nitrogen dioxide monitoring undertaken since the last Updating and Screening Assessment in 2006.

Table 3: Nitrogen dioxide diffusion tube concentrations in 2008

Monitoring Locations	Within AQMA	2008 Data Capture %	2008 NO_2 Concentrations (μg/m^3) Adjusted for bias
St Briavels - Grove House	No	92	6.8
Staunton - Staunton Service Station	No	100	15.5
Five Acres - crossroads	No	92	22.5
Edge End - road sign	No	83	14.9
Cinderford - 9 St Whites Rd	No	100	21.5
Cinderford - bus stop timetable	No	100	22.1
Cinderford – High St sign	No	100	18.2
Nailbridge - window shop	No	92	33.5
Mitcheldean - Lamb Inn	No	100	32.1
Huntley - crossroads sign	No	100	33.9
Huntley - The Red Lion	No	92	34.7
Newent - Community Centre	No	100	22.3
Newent - F.O.D.D.C. Branch Office	No	100	26.1
Bromsberrow - Freedom Farm	No	100	24.6
Lydney - 57 High St*	Yes*	92	**47.9**
Lydney - 45 High St*	Yes*	100	36.6
Lydney - 29 High St*	Yes*	100	**46.8**
Lydney - 21 High St*	Yes*	100	37.1
Westbury-on-Severn - High St - bus stop timetable	No	100	26.7
Newnham-on-Severn - High St - Severnside Press	No	100	37.3
Lydney - Unit 1, Regents Arcade*	Yes*	100	39.1
Lydney – 1 Hill Street, Art/picture Gallery*	Yes*	100	**43.1**
Lydney Bypass	No	100	18.0
Sedbury - A48	No	100	26.1
Coleford - Kingshead	No	92	30.0

*** Sites in the Detailed Assessment area and proposed Lydney AQMA**

Table 4: Nitrogen dioxide diffusion tube concentrations 2006-2008

Monitoring Locations	Within AQMA?	Annual mean concentrations (μg/m^3) Bias Adjusted		
		2006	2007	2008
St Briavels - Grove House	No	7.4	6.6	6.8
Staunton - Staunton Service Station	No	13.4	13.9	15.5
Five Acres - crossroads	No	20.5	19.9	22.5
Edge End - road sign	No	15.5	15.1	14.9
Cinderford - 9 St Whites Rd	No	21.1	20.0	21.5
Cinderford - bus stop timetable	No	18.0	16.1	22.1
Cinderford - High St sign	No	19.2	15.1	18.2
Nailbridge - window shop	No	29.8	29.5	33.5
Mitcheldean - Lamb Inn	No	29.6	16.6	32.1
Huntley - crossroads sign	No	29.2	31.4	33.9
Huntley - The Red Lion	No	36.8	31.3	34.7
Newent - Community Centre	No	20.7	18.0	22.3
Newent - F.O.D.D.C. Branch Office	No	24.5	23.5	26.1
Bromsberrow - Freedom Farm	No	23.3	22.5	24.6
Lydney – 57/61 High St*	Yes*	16.7	**42.5**	**47.9**
Lydney - 45 High St*	Yes*	20.2	33.0	36.6
Lydney - 29 High St*	Yes*	19.3	**47.1**	**46.8**
Lydney - 21 High St*	Yes*	27.7	37.2	37.1
Westbury-on-Severn - High St - bus stop timetable	No	26.7	21.9	26.7
Newnham-on-Severn - High St - Severnside Press	No	31.8	31.1	37.3
Lydney - Unit 1, Regents Arcade*	Yes*	31.0	39.1	39.1
Lydney - Art/picture gallery*	Yes*	**40.7**	38.8	**43.1**
Lydney Bypass	No	15.6	14.0	18.0
Sedbury - A48	No	26.4	23.3	26.1
Coleford - Kingshead	No	30.0	27.1	30.0

*** Sites in the Detailed Assessment area and proposed Lydney AQMA**

2.2.2 PM_{10}

Forest of Dean District Council has not undertaken any PM_{10} monitoring within their administrative area since the last Updating and Screening Assessment in 2006.

2.2.3 Sulphur Dioxide

Forest of Dean District Council monitors concentrations of SO_2 at one site within the local authority using a monthly exposed diffusion tube. The usefulness of this data is negligible as the results are in no way comparable to the SO_2 air quality objectives. However, the annual mean results may be compared to previous year's results to study annual trends – see Table 5 and Figure 2. Since 2003 the diffusion tube concentrations have shown little variation, therefore it is anticipated that SO_2 monitoring will cease at the beginning of 2010. Forest of Dean District Council does not undertake any automatic monitoring for SO_2.

Table 5: Sulphur dioxide diffusion tube monitoring data 2006-2007

Monitoring Locations	Within AQMA?	Annual mean concentrations (μg/m^3)		
		2006	2007	2008
Whitecroft, Yertiz	No	2.1	4.8	2.9

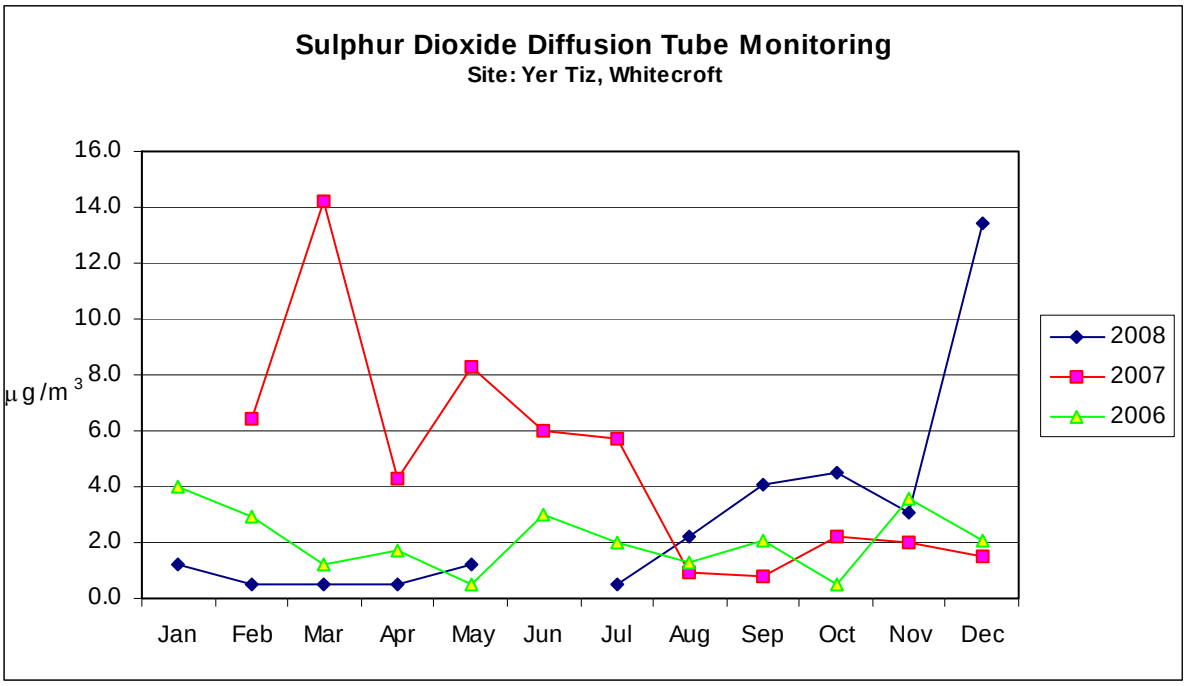

Figure 2: Monthly concentrations for sulphur dioxide diffusion tubes 2006-2008

2.2.4 Benzene

Forest of Dean District Council has not undertaken any benzene monitoring within their administrative area since the last Updating and Screening Assessment in 2006.

2.2.5 Other pollutants monitored

Forest of Dean District Council monitors concentrations of ozone at one site within the local authority using a monthly exposed diffusion tube. The usefulness of the data obtained is negligible as the results are in no way comparable to the ozone air quality objective. However, the annual mean results may be compared to previous year's results to study annual trends – see Table 6 and Figure 3. Since 2003 the diffusion tube concentrations have shown little variation.

Table 6: Ozone diffusion tube monitoring data 2006-2007

Monitoring Locations	Within AQMA?	Annual mean concentrations (μg/m^3)		
		2006	2007	2008
Grove House, St Briavels	No	41.0	36.8	38.9

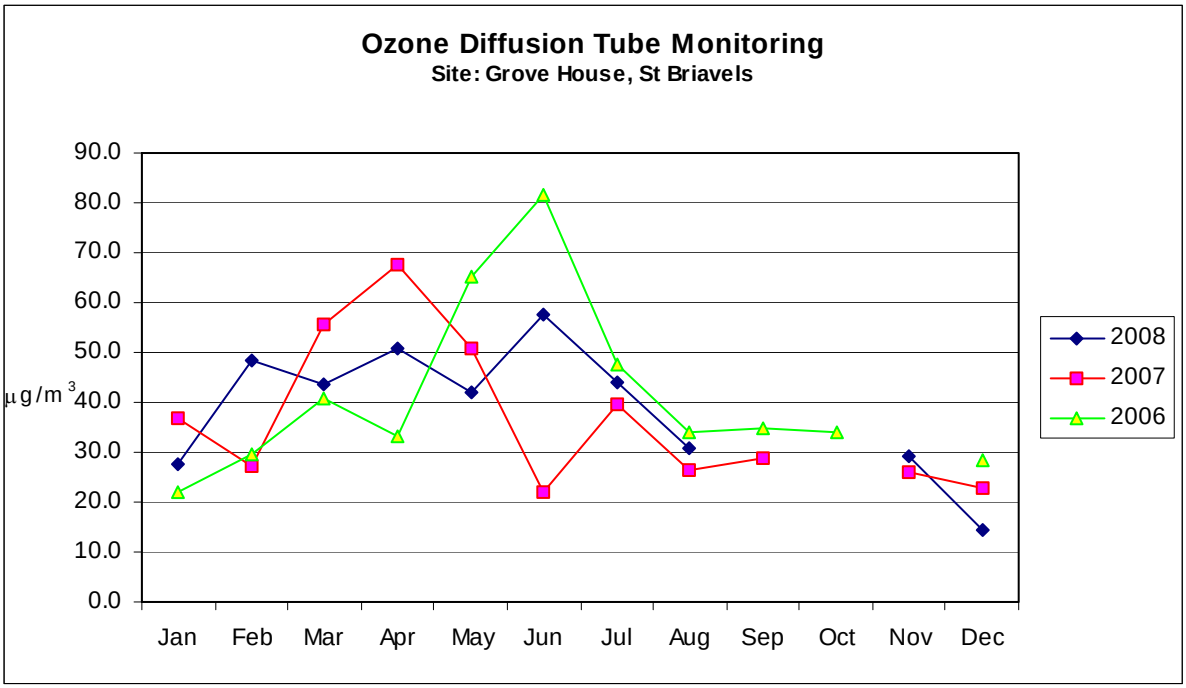

Figure 3: Monthly concentrations for ozone diffusion tubes 2006-2008

Carbon Monoxide - Forest of Dean District Council has not undertaken any carbon monoxide monitoring within their administrative area since the last Updating and Screening Assessment in 2006.

Lead - Forest of Dean District Council has not undertaken any lead monitoring within their administrative area since the last Updating and Screening Assessment in 2006.

1,3-Butadiene - Forest of Dean District Council has not undertaken any 1,3-Butadiene monitoring within their administrative area since the last Updating and Screening Assessment in 2006.

Forest of Dean District Council has examined the concentrations from all monitoring locations. Concentrations of NO_2 outside the proposed Lydney AQMA are all below the objective at relevant locations, therefore there is no need to proceed to a Detailed Assessment in 2010.

3.0 Road Traffic Sources

Emissions from road traffic are the most significant source of influence on air quality within Forest of Dean District. Previous reviews have established that levels of NO_2 may be of concern and therefore nitrogen dioxide diffusion tube monitoring takes place at 25 sites throughout the district. There are no roads within the district with a significant percentage of bus or HGVs. There are seven specific areas of concern, assessments of which follow Box 5.3 LAQM.TG(09) [(Ref. 07)].

3.1 Narrow congested streets with residential properties close to the kerb

Concentrations of NO_2 are often higher where traffic is slow moving, with stop/start driving, and where buildings on either side reduce dispersion - Section A.1 of Box 5.3 of LAQM TG(09) [(Ref. 07)]. The Detailed Assessment (2009) identified locations of potential concern by Forest of Dean District Council. The results from the diffusion tube monitoring study in conjunction with dispersion modelling study in Lydney indicate that the 40 $\mu g/m^3$ NO_2 annual mean objective is being exceeded at the façade of buildings with relevant exposure. Conclusion and recommendations indicate that a Air Quality Management Area which should include, as a minimum the roads and affronting residential properties in Lydney High Street as far as the junction with Temple Way, Hill Street up to Bathurst Park Road, and Bream Road up to The Orchards turnoff. Additional nitrogen dioxide diffusion tubes have been installed along the Bream Road. No other areas that meet the criteria, however NO_2 monitoring network addresses any other areas of concern.

Forest of Dean District Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy streets where people may spend 1-hour or more close to traffic

There are some street locations where individuals may regularly spend 1-hour or more, for example, streets with many shops and streets with outdoor cafes and bars - Section A.2 of Box 5.3 of TG(09) [(Ref. 07)]. Having reviewed potential locations within Forest of Dean Council's administrative area, no busy streets of concern have been identified since the last round of Updating and Screening Assessment in 2006 where people may spend 1-hour or more close to traffic.

Forest of Dean Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a high flow of buses and/or HGVs

Levels of NO_2 and PM_{10} need to be considered where there is an unusually high proportion of buses and/or HGVs - Section A.3 of Box 5.3 of LAQM TG(09) [(Ref. 07)] . Having reviewed potential locations within Forest of Dean Council's administrative area, no locations of concern have been identified since the last round of Updating and Screening Assessment in 2006.

Forest of Dean Council confirms that there are no new/newly-identified roads with high flows of buses/HGVs.

3.4 Junctions and busy roads

Levels of NO_2 and PM_{10} need to be considered at "busy" junctions due to the combined impact of traffic emissions from more than one road and the resultant higher emissions due to stop/start driving. - Section A.4 of Box 5.3 of TG(09) [(Ref. 07)]. Having reviewed potential locations within Forest of Dean District Council's administrative area, no busy junctions of concern have been identified since the last round of Updating and Screening Assessment in 2006.

Forest of Dean Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New roads constructed or proposed since the last round of review and assessment

Levels of NO_2 and PM_{10} need to be considered for newly constructed or proposed roads - Section A.5 of Box 5.3 of LAQM TG(09) [(Ref. 07)]. Having reviewed potential locations within Forest of Dean District Council's administrative area, no new roads constructed or proposed since the last round of Updating and Screening Assessment in 2006.

Forest of Dean District Council confirms that there are no new/proposed roads.

3.6 All roads with significantly changed traffic flows

Levels of NO_2 and PM_{10} need to be considered for any roads where there has been a "large" increase in traffic flow. An increase of more than 25% is considered "large" - Section A.6 of Box 5.3 of LAQM TG(09) [(Ref.07)]. Having reviewed traffic flow data within Forest of Dean District Council's administrative area, no roads with a large increase in traffic flow have been identified since the last round of Updating and Screening Assessment in 2006.

Forest of Dean District Council confirms that there are no new/newly-identified roads with significantly changed traffic flows.

3.7 Bus and coach stations

Levels of NO_2, both the annual mean and the 1-hour objective, must be considered for bus stations or sections of bus stations that are not enclosed, and where there is relevant exposure, including at nearby residential properties. - Section A.7 of Box 5.3 of LAQM TG(09) [(Ref.07)]. Forest of Dean District Council has no bus or coach station that meets the assessment criteria.

Forest of Dean District Council confirms that there are no relevant bus stations in the Local Authority area.

4.0 Other Transport Sources

4.1 Airports

Levels of NO_2 from airports must be considered as aircraft are potentially significant sources of Nitrogen Oxides (NO_X) emissions, especially during takeoff - Section B.1 of Box 5.4 of LAQM TG(09) [(Ref.07)]. Forest of Dean District Council has no airports within their administrative area.

Forest of Dean District Council confirms that there are no airports in the Local Authority area.

4.2 Railways (diesel and steam trains)

Stationary locomotives, both diesel and coal fired, can give rise to high levels of SO_2 close to the point of emission. Recent evidence suggests that moving diesel locomotives, in sufficient numbers, can also give rise to high NO_2 concentrations close to the track. These two potentially significant sources are considered separately below - Section B.2 of Box 5.4 of LAQM TG(09) [(Ref.07)].

4.2.1 Stationary trains

Measurements were made on the Council's GIS mapping system to establish that there are no relevant exposure sites within 15m of the track at Lydney Junction station. Trains are also not regularly stationary for 15 minutes or more. There are no relevant exposure sites within 15m of the track of the Dean Forest Railway, which is a privately owned railway operating steam and diesel locomotives. The railway operates from Lydney to Parkend.

Forest of Dean District Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving trains

National Rail's Timetable Map 2009 shows that none of the rail lines with a heavy traffic of diesel passenger trains, as listed in Table 1 of the FAQ Guidance on Assessing Emissions from Railway Traffic [(Ref. 09)] pass through it's district. Nor is Forest of Dean District Council one of the authorities listed in Table 2 of this document.

Forest of Dean District Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (shipping)

Large ships generally burn oils with a high Sulphur content in their main engines (bunker oils). If there are sufficient movements in a port they can give rise to a sufficient number of 15-minute periods above 266 $\mu g/m^3$, as to exceed the 15-minute objective for SO_2. Forest of Dean District Council has no commercial ports within their administrative area.

Forest of Dean District Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5.0 Industrial Sources

5.1 New or proposed industrial installations

Although Industrial sources are unlikely to make a significant local contribution to annual mean concentrations they may be significant in terms of the short-term objectives, especially if there is an impact from several sources. All of the regulated pollutants need to be considered, although those most at risk of requiring further work are SO_2, NO_2, PM_{10} and Benzene – Section C.1 of Box 5.5 of LAQM TG(09) [(Ref. 07)].

5.1.1 New/proposed installations for which an air quality assessment has been carried out

There are no new or proposed installations for which an air quality assessment was, or would be required.

Forest of Dean District Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.1.2 Existing installations where emissions have increased substantially or new relevant exposure has been introduced

There are no existing installations with substantially increased emissions and none with any new relevant exposure introduced.

Forest of Dean District Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or significantly changed installations with no previous air quality assessment

There are no new or significantly changed installations with no previous air quality assessments.

Forest of Dean District Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major fuel (petrol) storage depots

Major petrol fuel depots could emit sufficient benzene to put the 2010 objective at risk of being exceeded, especially if combined with higher levels from nearby busy roads –Section C.2 of Box 5.5 of LAQM TG(09) [(Ref. 07)]. There are no major fuel (petrol) storage depots within the Local Authority area.

Forest of Dean District Council confirms there are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol stations

Petrol stations could emit sufficient benzene to put the 2010 objective at risk of being exceeded, especially if combined with higher levels from nearby busy roads - Section C.3 of Box 5.5 of LAQM TG(09) [Ref. 07]. Forest of Dean District Council has considered busy roads as defined and all petrol stations located on them. None have relevant exposure within 10 metres of the pumps.

Forest of Dean District Council confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry farms

There is the potential for localised exceedences of the PM_{10} objectives associated with emissions from certain large poultry farms - Section C.4 of Box 5.5 of LAQM TG(09) [Ref. 07]. There is one such farm which is permitted by the Environment Agency: Stone End Farm, Churcham, 900,000 Chicken broilers reared within - mechanically side ventilated housing. This is above the criteria of 400,000 birds, however there are no relevant exposures within 100m of the units – see Table 5, Appendix A.

Forest of Dean District Council confirms that there are no petrol stations meeting the specified criteria**.**

6.0 Commercial and Domestic Sources

6.1 Biomass combustion – individual installations

Biomass burning can lead to an increase in PM_{10} emissions, due to the process of combustion – aerosol formation from volatile materials distilled from the wood is also an issue. Compared to conventional gas-burning, biomass burning can also result in an increase in the overall NO_X emissions due to the fuel-derived portion that is not present in gas combustion - Section D.1a of Box 5.8 LAQM.TG(09) (Ref. 07). Forest of Dean District Council received several enquiries during 2008 regarding the necessity for consideration of biomass boilers under the Clean Air Act 1993. All such boilers were well below 50kW.

Forest of Dean District Council confirms that there are no biomass combustion plant in the Local Authority area.

6.2 Biomass combustion – combined impacts

There is the potential that many small biomass combustion installations (including domestic solid-fuel burning), whilst individually acceptable, could in combination lead to unacceptably high PM_{10} concentrations, particularly in areas where PM_{10} concentrations are close to or above the objectives. The impact of domestic biomass combustion in most areas is thought to be small at the time of writing, but could become more important in future - Section D.1b of Box 5.8 LAQM.TG(09) (Ref. 07). There are only a few isolated biomass boilers within Forest of Dean District Council. There are no areas that would meet the criteria as set out in the Technical Guidance LAQM.TG(09) (Ref. 07) and subsequent FAQ (Ref.11).

Forest of Dean District Council confirms that there are no biomass combustion plant in the Local Authority area.

6.3 Domestic solid-fuel burning

There is the potential in areas where significant coal burning takes place for exceedences of the objectives for SO_2 to occur - Section D.2 of chapter 5 LAQMTG(09) (Ref. 07). Having reviewed potential locations within Forest of Dean Councils administrative area, no areas of significant coal burning have been identified since the last round of Updating and Screening Assessment in 2006.

Forest of Dean District Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7.0 Fugitive or Uncontrolled Sources

Potentially elevated levels of PM_{10} can arise from the fugitive emissions from a range of sources including quarrying, stone cutting, gravel extraction and wind-blown dust from stockpiles and dusty surfaces - Section E of Box 5.10 LAQM TG(09) [(Ref. 07)]. . Having reviewed potential locations within Forest of Dean District Council's administrative area, no locations of concern have been identified since the last round of Updating and Screening Assessment in 2006.

Forest of Dean District Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8.0 Conclusions and Proposed Actions

8.1 Conclusions from new monitoring data

Three sites in the town of Lydney exceeded the nitrogen dioxide annual mean objective of 40µg/m^3. These sites will be within the proposed Lydney Air Quality Management Area to be declared shortly (end of 2009, beginning of 2010). There are no issues for any other pollutants.

8.2 Conclusions from assessment of sources

There are no road traffic sources of concern within Forest of Dean District Council's administrative area.

There are no other transport sources of concern within Forest of Dean District Council's administrative area.

There are no industrial sources of concern within Forest of Dean District Council's administrative area.

There are no commercial or domestic sources of concern within Forest of Dean District Council's administrative area.

There are no fugitive or uncontrolled sources of concern within Forest of Dean District Council's administrative area.

8.3 Proposed actions

At the end of 2009, beginning of 2010, the Lydney AQMA will be declared for exceedences of the nitrogen dioxide annual mean objective. A Further Assessment and Air Quality Action Plan will be developed in 2010/11. In April 2010 a Progress Report which forms part of the Local Air Quality Management (LAQM) will be submitted.

9.0 References

Table 7: Tables of references utilised in the generation of this Updating and Screening Assessment, 2009

Ref	Title	Author	Year
Ref. 01	Updating and Screening Assessment 2003	Forest of Dean District Council	2003
Ref. 02	Progress Report 2004	Forest of Dean District Council	2004
Ref. 03	Progress Report 2005	Forest of Dean District Council	2005
Ref. 04	Updating and Screening Assessment 2006	Forest of Dean District Council	2006
Ref. 05	Progress Report 2007	Forest of Dean District Council	2007
Ref. 06	Detailed Assessment 2009	Forest of Dean District Council	2009
Ref. 07	Local Air Quality Management - Technical Guidance (TG09)	DEFRA	2009
Ref. 08	Diffusion Tubes for Ambient NO_2 Monitoring: Practical. Guidance for Laboratories & Users	AEA for DEFRA	2008
Ref. 09	FAQ – Guidance on assessing emissions from railway locomotives	Review and Assessment Helpdesk	2009
Ref. 10	Summary of laboratory performance in WASP	AEA for DEFRA	2009
Ref. 11	FAQ - How can I identify areas in my district where burning of solid fuels such as coal, smokeless fuel or wood (i.e. biomass) might be leading to exceedences of the 2004 daily mean PM_{10} air quality objective?	Review and Assessment Helpdesk	2009

10.0 Bibliography

Table 8: Bibliography utilised in the generation of this Updating and Screening Assessment, 2009

Title	Author	Year
TS2506 – Lydney through traffic surveys – locations of existing ATC sites in Lydney	Gloucestershire Highways	2009
Traffic Flow – West of Severn Area 2007 – 24 Hour work day flow	Gloucestershire Highways	2007
Traffic Flow – West of Severn Area 2007 – Goods Vehicles over 3.5 tonnes 24 Hour work day flow	Gloucestershire Highways	2007
Gloucestershire Traffic Growth	Gloucestershire Highways	2007

11.0 Appendix A: List of Part A1 Permitted Processes

Environmental Agency permitted installations involving Part A1 prescribed activities regulated under Environmental Permitting (England & Wales) Regulations 2007

Table 9: List of Part A1 Permitted Processes

Permit	Company Name/Address	Description
XP3039GG	Englehard Sales Ltd Valley Road Cinderford Gloucestershire GL14 2PB	S4.2(A)(1)(b) Unless falling within another Section of this Schedule, any manufacturing activity which is likely to result in the release into the air of any hydrogen halide (other than the manufacture of glass or the coating, plating or surface treatment of metal) or which is likely to result in the release into the air or water of any halogen or any of the compounds mentioned in paragraph (a)(vi) (other than the treatment of water). S2.2A(1)(e) Recovering any of the following elements if the activity may result in their release into the air: gallium; indium; palladium; tellurium; thallium and S5.1(A)(1)(e) Unless carried out as part of any other activity in this Part, the incineration of non-hazardous waste in a plant which is not an incineration plant or a co-incineration plant but which has a capacity of 1 tonne or more per hour.
ZP3036LK	Freemans of Newent Ltd Town Farm Gloucester Road Newent Gloucestershire GL18 1HP	S6.8 A (1) (b) Slaughtering animals at plant with a carcass production capacity of more than 50 tonnes per day and S5.3 A(1) (c) (ii) Disposal of non-hazardous waste in a facility with a capacity of more than 50 tonnes per day by - physico-chemical treatment, not being treatment specified in any paragraph other than paragraph D9 in Annex IIA to Council Directive 75/442/EEC, which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D12 in that Annex (for example, evaporation, drying, calcination, etc) (D9).
BV1305IV	Surotech International Ltd Hafner House 11 Newent Business Park Gloucester Road Newent Gloucestershire GL18 1DZ	S4.1 A(1) (a) (iii) Producing organic chemicals such as organic compounds containing sulphur, such as sulphides, mercaptans, sulphonic acids, sulphonates, sulphates and sulphones and sulphur heterocyclics and (viii) plastic material, such as polymers, synthetic fibres and cellulose based fibres. S4.2 A(1) (a) (iv) Producing inorganic chemicals such as (iv) salts, such as ammonia chloride, potassium chlorate, potassium carbonate, sodium carbonate, perborate, silver nitrate, cupric acetate, ammonia phosphomolybdate and (c) Unless falling within any other Section of the Schedule any manufacturing activity involving the use of hydrogen cyanide or hydrogen sulphide.
BP3236LC	Glatfelter Lydney Ltd, Lydney Paper Mill, Church Road, Lydney, Gloucestershire GL15 5EJ	6.1 A(1) (a) Producing, in industrial plant pulp from timber or other fibrous materials and S6.1 A(1)(b) producing in industrial plant paper and board where the plant has a production capacity of more than 20 tonnes per day.

Permit	Company Name/Address	Description
AP3731SA	Pressroom Products Limited Crucible Close Mushet Industrial Park Coleford Gloucestershire GL16 8RE	Section 5.4 Part A(1)(a) Recovery of waste; by distillation of oil/organic solvent.
BK9326IX	SmithKline Beecham Plc Royal Forest Factory Coleford Gloucestershire GL16 8JB	Section 6.8 A(1)(d)(ii) – Treating and processing materials intended for the production of food products from vegetable raw materials at plant with a finished production capacity of more than 300 tonnes per day. Section 5.3 A(1)(c)(ii) - Disposal of non-hazardous waste in a facility with a capacity of more than 50 tonnes per day by - physico-chemical treatment, not being treatment specified in any paragraph other than paragraph D9 in Annex IIA to Council Directive 75/442/EEC, which results in finalcompounds or mixtures which are discarded by means of any of the operations numbered D1 to D12 in that Annex (for example, evaporation, drying, calcination, etc.) (D9).

Table 10: List of Poultry Farms

Premises	Type of Farm	No. of Birds	Type of ventilation
Ploddy House Poultry Unit, Newent	Turkey broilers	52,000	Side vents
Cherry Rock Poultry Unit, Hartpury	Chicken broilers	270,000	Side vents
Woolaston Court Poultry Unit, Woolaston	Pullets	92,000	Roof vents
Cottrells Barn Poultry Unit, Mitcheldean	Pullets	64,000	Half roof & half side vents
Treetops Poultry Unit, Bream	Chicken broilers	318,000	Side vents
St Briavels & Severn View, St Briavels	Chicken layers	100,000 - caged	Side vents
		13,000 free range	Side vents
Roads Farm, St Briavels	Chicken layers	146,000 - caged	Side vents
Hill Farm, Lydney	Chicken broilers	110,000	Side vents
Stone End Farm, Churcham	Chicken broilers	900,000	Side vents

12.0 Appendix B: List of Part A2 Permitted Processes

Local Authority Pollution Prevention and Control (LAPPC) permitted installations involving Part 2A prescribed activities regulated under the Environmental Permitting (England & Wales) Regulations 2007

Table 11: List of Part A2 Permitted Processes

Permit	Company Name/Address	Description
PPC(A2)3	Broadmoor Brickworks, Whimsey I.E. Cinderford	Manufacture of Heavy Clay Goods (Bricks)
PPC(A2)4	Coleford Brick & Tile, Royal Forest of Dean Brickworks, Cinderford	Manufacture of Heavy Clay Goods (Bricks)
PPC(A2)19/92	Federal Mogul Camshafts, Tutnalls, Lydney	Ferrous Metal Foundary

13.0 Appendix C: List of Part B Permitted Processes

Local Authority Pollution Prevention and Control (LAPPC) permitted installations involving Part B prescribed activities regulated under the Environmental Permitting (England & Wales) Regulations 2007

Table 12: List of Part B Permitted Processes

Permit	Company Name/Address	Description
PPC/5/01	Severn Valley Woodworks, Northwood Green, Westbury	Timber and Wood Based Products
PPC/10/92	Forest Auto Salvage, Valley Road, Cinderford	Waste Oil Burner
PPC/14/92	Tarmac Western, Stowfield Quarry, Scowles Pitch, Coleford	Quarry Processes/Roadstone Coating
PPC/16/93	Clearwell Quarry, Stowe Green, St. Briavels	Quarry Processes/ Roadstone Coating
PPC/20/92	Bituchem Ltd., Birchwood Close, Forest Vale Industrial Estate, Cinderford	Roadstone Coating & Bitumen/Tar Processes
PPC/62/07	Cannop Foundry, Crabtree Rd, Cinderford	Ferrous & Non Ferrous Metal Foundry
PPC/25/92	P & J Loveridge, 157 High Street, Cinderford	Waste Oil Burner
PPC/32/92	Berwin Industrial Polymers, Church Road, Lydney	Rubber Processes
PPC/37/95	Staunton Service Station, Staunton, Coleford	Respraying of Road Vehicles
PPC/38/95	Rothdean Haulage, Station Street, Cinderford	Coating of Metal and Plastic
PPC/40/95	Formpave Ltd., Tufthorn Avenue, Coleford	Bulk use of Cement
PPC/42/95	Hanson Aggregates, Drybrook Quarry, Drybrook	Quarry Processes
PPC/43/95	Bituchem Ltd., Birchwood Close, Forest Vale I.E. Cinderford	Roadstone Coating & Bitumen/Tar Processes
PPC/65/09	Forest of Dean Asphalt, Clearwell Quarry, Stowe, St. Briavels, Lydney	Roadstone Coating
PPC/48/96	Crematoria Management Ltd., Yew Tree Brake, Cinderford	Cremation of human remains
PPC/49/92	T S Thomas Haulage Ltd., Church Road, Lydney	Waste Oil Burner

Permit	Company Name/Address	Description
PPC/50/98	Rackham Housefloors Ltd., Forest Vale I.E. Cinderford	Bulk Use of Cement
PPC/51/00	Buckland Agricultural, Court Farm Workshops Huntley Road, Tibberton	Waste Oil Burner
PPC/53/01	Newspace Containers Ltd., New Dun Works, Coleford	Coating of Metal and Plastic
PPC/54/02	Bardon Concrete, Clearwell Quarries Ltd., Stowe, St. Briavels, Lydney	Bulk Use of Cement
PPC/55/03	Milbury Precast, Lydney I.E. Harbour Road, Lydney	Bulk Use of Cement
PPC/56/03	C.G. Perrett, Lydney I.E. Harbour Road, Lydney	Mobile Crushing and Screening Plant
PPC/57/03	Paul Jones Motors, Spout Garage, Bank Street, Coleford	Waste Oil Burner
PPC/58/04	Dean Mowers Ltd., Central Garage, Blakeney	Waste Oil Burner
PPC/64/08	Cabin Centre, New Dunn Business Park, Sling	Waste Oil Burner
PPC/DC/1/06	Cavendish Dry Cleaners, 4 Cavendish Buildings, Hill St, Lydney	Dry Cleaning
PPC/31/92	Nobel Foods Ltd., (formerly Dean Foods), Clearwell Mill, Clearwell	Animal Feed Compounding
EPA/RCB/PVR/1/98	Thompson & Thompson, Cross Hands Garage, Lydney	Petrol Vapour Recovery
EPA/JAG/PVR/2/98	Lower Lane Superstop, Berry Hill, Coleford	Petrol Vapour Recovery
EPA/JAG/PVR/4/98	Alvington Service Station, Gloucester Road, Alvington	Petrol Vapour Recovery
EPA/DCS/PVR/5/98	Brierley Service Station, Brierley, Drybrook, Glos.	Petrol Vapour Recovery

Table 13: List of Petrol Stations

Permit	Company Name/Address	Description
EPA/DCS/PVR/6/98	Newent Self Serve, Gloucester Road, Newent	Petrol Vapour Recovery
EPA/DCS/PVR/7/98	Cross Hands Garage, Corse, Hartpury, Glos.	Petrol Vapour Recovery
EPA/DCS/PVR/8/98	Abbotswood Garage, Lower High Street, Cinderford	Petrol Vapour Recovery
EPA/JAG/PVR/9/98	Elton Service Station, Elton Corner, Westbury-on-Severn	Petrol Vapour Recovery
EPA/DCS/PVR/10/98	General Garage, Ross Road, Huntley	Petrol Vapour Recovery
EPA/DCS/PVR/11/99	Highleadon Filling Station, Newent	Petrol Vapour Recovery
EPA/JAG/PVR/12/99	Motorhouse Service Station, Old Station Way, Coleford	Petrol Vapour Recovery
EPA/DCS/PVR/14/00	Steam Mills Garage, Steam Mills, Cinderford	Petrol Vapour Recovery
EPA/JAG/PVR/15/00	Tesco Stores Ltd., Hill Street, Lydney, Glos.	Petrol Vapour Recovery
EPA/DCS/PVR/16/02	Mitcheldean Garage, New Road, Mitcheldean, Glos.	Petrol Vapour Recovery
EPA/JAG/PVR/17/02	Chaxhill Service Station, Chaxhill, Westbury-on-Severn	Petrol Vapour Recovery
PVR/18/04	Ken McNally's Auto Services, Cinderford	Petrol Vapour Recovery

14.0 Appendix D: QA/QC Data

14.1 Diffusion tube bias adjustment factors

The NO_2 diffusion tubes were supplied and analysed by Bristol Scientific Services. Tubes were prepared using 50µl of 20% triethanolamine in water. The tube preparation and subsequent analysis follow the procedures in the harmonised "Practical Guidance" document. All diffusion tubes are stored, handled and exposed in accordance with the relevant guidance. They are exposed for one month.

Forest of Dean District Council does not undertake any co-location studies; so bias adjustment factors were obtained from the National Bias Adjustment Factor Spreadsheet (Version v05/09).

- 2006 – 0.9 for 5 studies (Figure 4)
- 2007 – 0.77 for 5 studies (Figure 5)
- 2008 – 0.87 for 4 studies (Figure 6)

Spreadsheet Version Number: 05/09

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies

This spreadsheet will be updated in lat September 2009 on the R&A website

Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods

Whenever presenting adjusted data, you should state the adjustment factor used

This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

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Step 1:	Step 2:	Step 3:	Step 4:
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory	If a year is not shown, we have no data[2]	If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Review and Assessment Helpdesk 0117 328 3668 aqm-review@uwe.ac.uk.

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[5] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m3)	Automatic Monitor Mean Conc. (Cm) (µg/m3)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
Bristol Scientific Services	20% TEA in Water	2006	UB	Cheltenham BC	12	22	21	5.7%	G	**0.95**
Bristol Scientific Services	20% TEA in Water	2006	UB	LB Waltham Forest	10	36	34	4.6%	S	**0.96**
Bristol Scientific Services	20% TEA in Water	2006	Rural	Pembrokeshire CC	11	7	5	27.6%	G	**0.78**
Bristol Scientific Services	20% TEA in Water	2006	R	Brighton and Hove CC	11	38	33	13.9%	G	**0.88**
Bristol Scientific Services	20% TEA in Water	2006	K	AEA E&E Intercomparison	12	116	111	4.3%	G	**0.96**
Bristol Scientific Services	20% TEA in Water	2006		**Overall Factor[3] (5 studies)**				**Use**		**0.90**

Figure 4: Bias adjustment factor 2006

Spreadsheet Version Number: 05/09

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies

This spreadsheet will be updated in lat September 2009 on the R&A website

Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods

Whenever presenting adjusted data, you should state the adjustment factor used

This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

Published by Air Quality Consultants Ltd on behalf of Defra, the Welsh Assembly Government, the Scottish Government and the Department of the Environment Northern Irelanc

Step 1:	Step 2:	Step 3:	Step 4:
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory	If a year is not shown, we have no data[2]	If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Review and Assessment Helpdesk 0117 328 3668 aqm-review@uwe.ac.uk.

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[5] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m3)	Automatic Monitor Mean Conc. (Cm) (µg/m3)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
Bristol Scientific Services	20% TEA in Water	2007	Rural	Pembrokeshire CC	11	7	5	36.9%	G	**0.73**
Bristol Scientific Services	20% TEA in Water	2007	R	Brighton and Hove CC	12	46	33	38.2%	G	**0.72**
Bristol Scientific Services	20% TEA in Water	2007	K	South Gloucestershire	9	29	24	21.0%	G	**0.83**
Bristol Scientific Services	20% TEA in Water	2007	R	West Wiltshire DC	9	38	26	48.6%	G	**0.67**
Bristol Scientific Services	20% TEA in Water	2007	K	AEA Tech Intercomparison	12	115	103	12.0%	G	**0.89**
Bristol Scientific Services	20% TEA in Water	2007		**Overall Factor[3] (5 studies)**				**Use**		**0.77**

Figure 5: Bias adjustment factor 2007

Spreadsheet Version Number: 05/09

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies

This spreadsheet will be updated in lat September 2009 on the R&A website

Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods

Whenever presenting adjusted data, you should state the adjustment factor used

This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

Published by Air Quality Consultants Ltd on behalf of Defra, the Welsh Assembly Government, the Scottish Government and the Department of the Environment Northern Ireland

Step 1:	Step 2:	Step 3:	Step 4:								
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.								
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory	If a year is not shown, we have no data[2]	If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Review and Assessment Helpdesk 0117 328 3668 aqm-review@uwe.ac.uk.								
Analysed By[1]	**Method** To undo your selection, choose (All) from the pop-up list	**Year**[5] To undo your selection, choose (All)	**Site Type**	**Local Authority**	**Length of Study (months)**	**Diffusion Tube Mean Conc. (Dm) (µg/m3)**	**Automatic Monitor Mean Conc. (Cm) (µg/m3)**	**Bias (B)**	**Tube Precision**[6]	**Bias Adjustment Factor (A) (Cm/Dm)**
Bristol Scientific Services	20% TEA in Water	2008	UB	LB Waltham Forest	12	41	36	14.2%	S	**0.88**
Bristol Scientific Services	20% TEA in Water	2008	R	Lewes DC	11	40	38	6.0%	S	**0.94**
Bristol Scientific Services	20% TEA in Water	2008	K	AEA Tech Intercomparison	12	122	116	5.4%	G	**0.95**
Bristol Scientific Services	20% TEA in Water	2008	R	Brighton and Hove CC	12	43	31	38.7%	G	**0.72**
Bristol Scientific Services	20% TEA in water	2008		**Overall Factor**[3] **(4 studies)**				**Use**		**0.87**

Figure 6: Bias adjustment factor 2008

14.2 QA/QC of Diffusion tube monitoring

Table 14 illustrate laboratories that have demonstrated satisfactory performance in the WASP scheme for analysis of NO_2 diffusion tubes, January 2008 – January 2009. Forest of Dean District Council use Bristol Scientific Services (Ref. 10). For further information about any particular laboratory's performance, please contact the laboratory directly. If you have any questions about these performance criteria, or the context in which they apply, please contact Alison Loader at AEA, on 0870 190 6518, or email alison.loader@aeat.co.uk. For more general enquiries about the WASP scheme, please contact Hannah Clark at HSL, hannah.clark@hsl.gov.uk.

Table 14: Diffusion tube laboratory performance

	Performance on basis of RPI, NEW CRITERIA, best 4 out of the 5 rounds 100-104	Laboratory Performance on basis of RPI, OLD CRITERIA, best 4 out of the 5 rounds 100-104
Aberdeen Public Analysts	Good	Good
Bodycote Clyde Analytical	Acceptable	Acceptable
Bristol City Council	**Good**	**Good**
Bureau Veritas	Good	Acceptable
Cardiff Scientific Services	Good	Good
Dundee City Council (Tayside)	Good	Acceptable
Edinburgh City Council	Good	Good
Glasgow Scientific Service	Good	Good
Gradko	Good	Good
Harwell Scientifics	Good	Good
Kent Scientific Services	Good	Good
Kirklees MBC	Good	Acceptable
Lambeth Scientific Services	Good	Good
Lancashire County Analysts	Good	Good
Milton Keynes Council	Good	Acceptable
Northampton Borough Council	Good	Good
South Yorkshire Laboratories	Good	Good
Staffordshire County Council	Good	Good
University of Essex	Good	Acceptable
Walsall MBC	Acceptable	Acceptable
West Yorks Analytical Services	Good	Good

Table 15: WASP Results Bristol Scientific Services Rounds 97-104 WASP Results Lab 152 Round 97 - onwards:

Round	97	98	99	100	101	102	103	104
Tube 1 (µg NO_2)	0.89	1.865	2.085	1.358	0.949	1.489	1.178	1.179
Tube 2 (µg NO_2)	1.573	1.228	2.093	1.474	2.576	1.431	0.916	1.108
Tube 3 (µg NO_2)	1.582	1.857	0.885	1.354	1.813	2.307	0.934	1.84
Tube 4 (µg NO_2)	0.914	1.217	0.879	1.467	0.914	1.96	1.071	1.96
Spike tube 1 (µg NO_2)	0.89	1.83	2.15	1.36	0.92	1.37	1.22	1.22
Spike tube 2 (µg NO_2)	1.58	1.19	2.15	1.47	1.86	1.37	0.94	1.22
Spike tube 3 (µg NO_2)	1.58	1.83	0.84	1.36	1.86	2.28	0.94	2.02
Spike tube 4 (µg NO_2)	0.89	1.19	0.84	1.47	0.92	2.28	1.22	2.02
Standardised result tube 1	1	1.019	0.97	0.999	1.032	1.087	0.966	0.966
Standardised result tube 2	0.996	1.032	0.973	1.003	1.385	1.045	0.974	0.908
Standardised result tube 3	1.001	1.015	1.054	0.996	0.975	1.012	0.994	0.911
Standardised result tube 4	1.027	1.023	1.046	0.998	0.993	0.86	0.878	0.97
Performance index	1.87	5.29	16.61	0.08	374.65	73.42	41.98	45.95
Rolling performance index				5.96	99.16	116.19	122.53	134
(NOT best of 4 out of 5)								
Rolling performance index				5.96	5.96	23.85	33.02	40.36
(best 4 out of 5)								
Performance classification				Good	Good	Good	Good	Good
(criteria from April 2009)								
Good =<56.25								
Acceptable =<225								
Unacceptable >225								

15.0 Appendix E: Diffusion Tube Locations

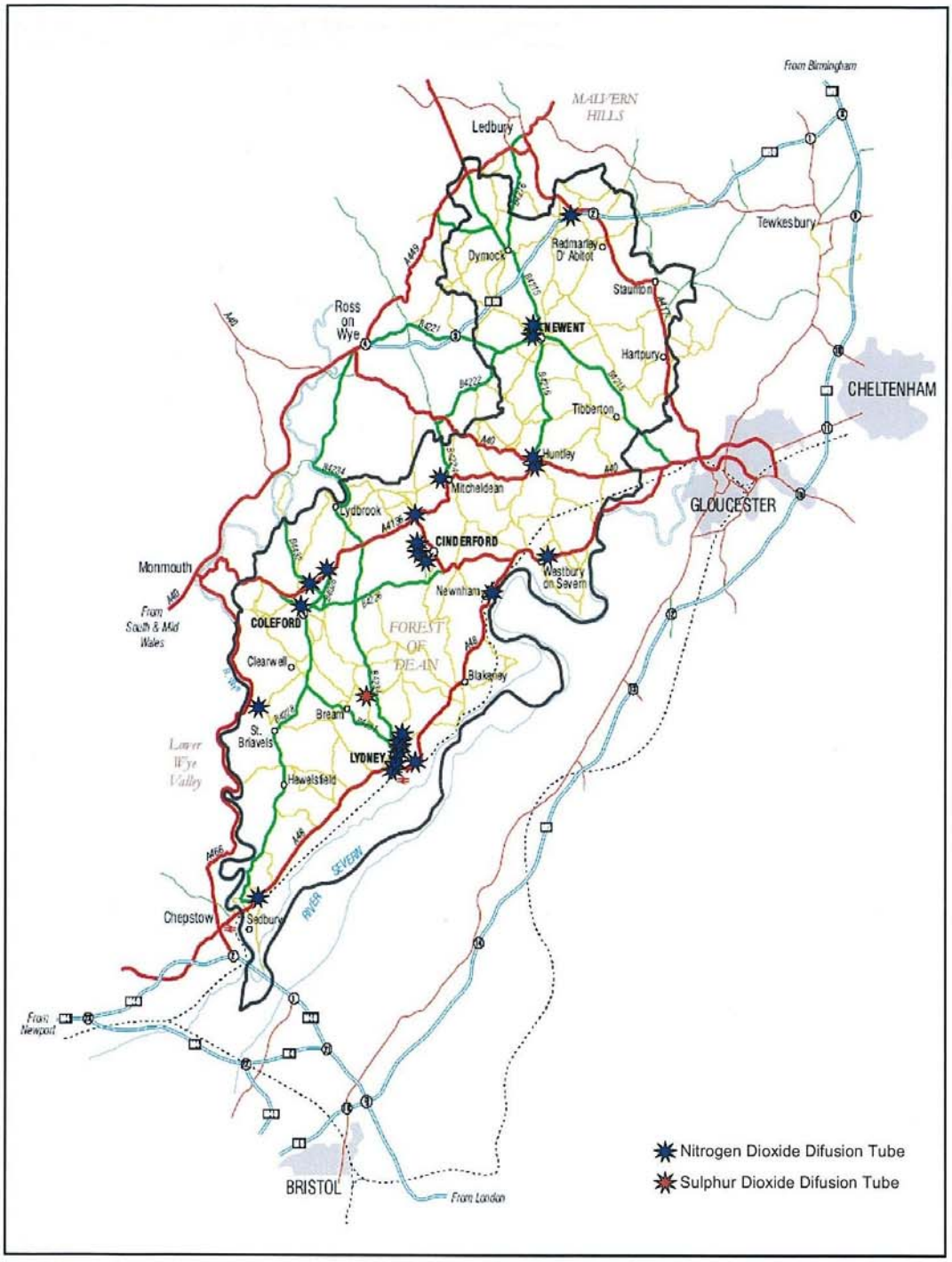

Figure 7: Map of monitoring locations in Forest of Dean

16.0 Appendix F: Other Information

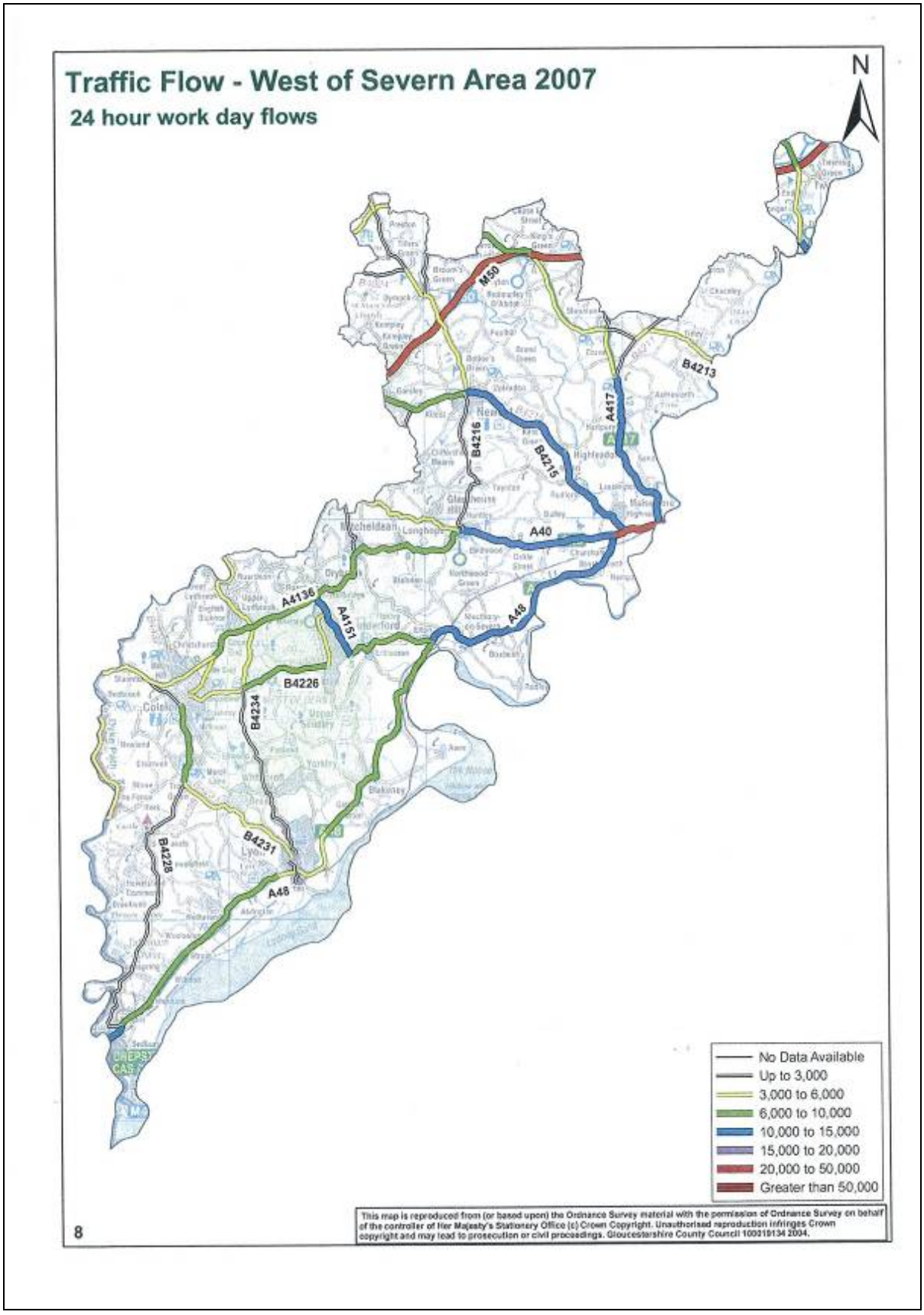

Figure 8: Map of traffic flows 24-hour work day flows, 2007.

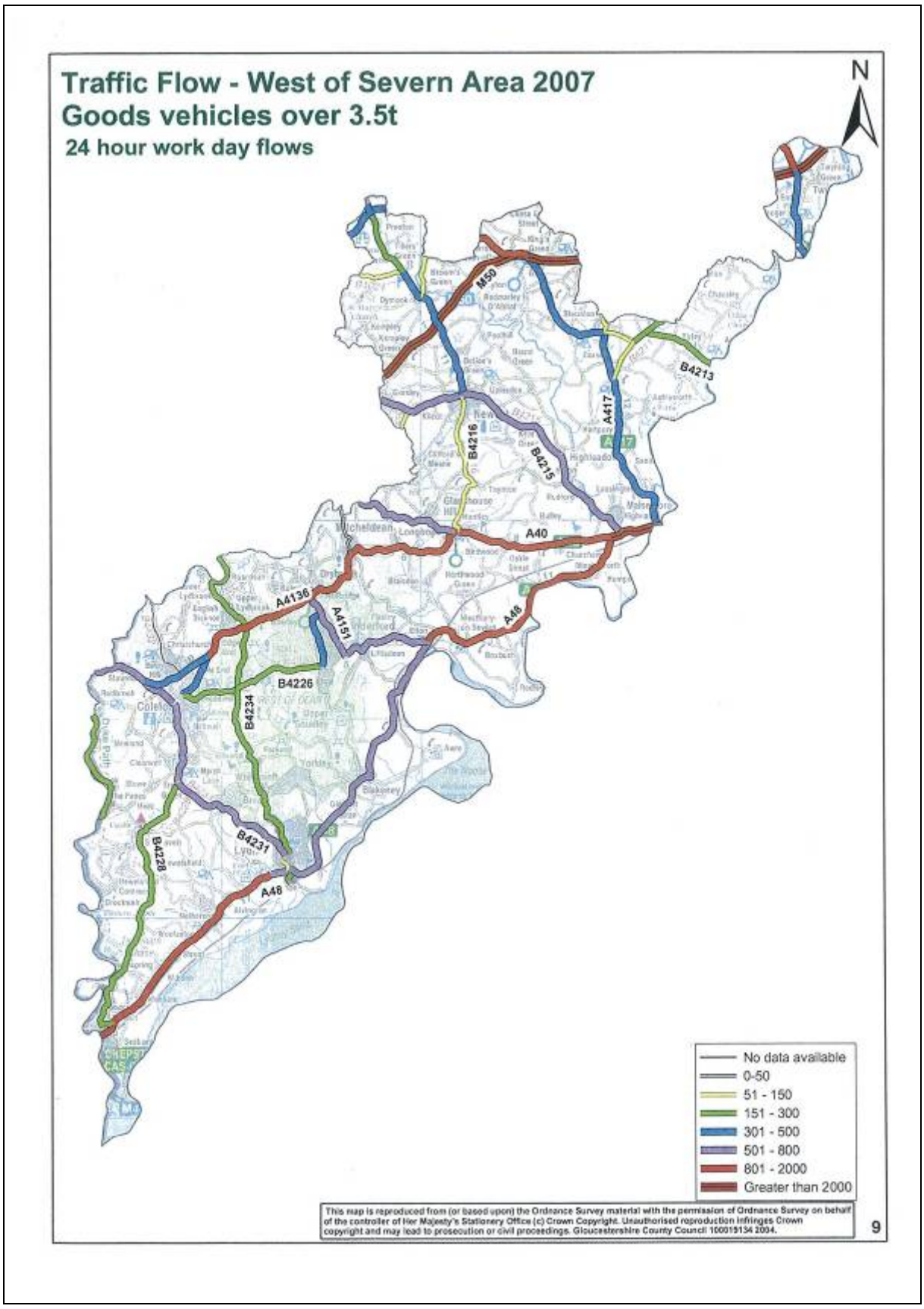

Figure 9: Map of traffic flows 24-hour work day flows (goods vehicles over 3.5T), 2007.